SUBMITTAL TO THE BOARD OF SUPERVISORS
COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

ITEM: 3.51
(ID # 29129)
MEETING DATE:
Tuesday, November 18, 2025

FROM : TLMA - AVIATION

SUBJECT: TRANSPORTATION LAND MANAGEMENT AGENCY/AVIATION: Ratification and Approval of a 5-year Cooperative Service Agreement with the United States Department of Agriculture, for wildlife management services at all County Airports; CEQA Exempt per State CEQA Guidelines Section 15301 and 15061(b)(3); Districts 3, 4, and 5. [$764,838 Total Cost - Aviation Operating Budget 100%] (Clerk to File Notice of Exemption)

RECOMMENDED MOTION: That the Board of Supervisors:

1. Find that the proposed project is exempt from the provisions of the California Environmental Quality Act (CEQA) pursuant to State CEQA Guidelines section 15301, Class 1 Existing Facilities Exemption; Section 15061(b)(3);

2. Ratify and Approve the attached 5-year Cooperative Service Agreement between the County of Riverside, TLMA Aviation, and the United States Department of Agriculture for wildlife management services at all five (5) County Airports and associated Work Plans;

3. Authorize the TLMA Director or designee, to execute the Cooperative Service Agreement and Work and Financial Plan on behalf of the County;

4. Direct the Clerk of the Board to file the Notice of Exemption with the County Clerk and the State Clearinghouse within five (5) days of approval by the Board of Supervisors; and

5. Authorize the Purchasing Agent to issue Purchase Orders to United States Department of Agriculture, in an amount not to exceed $764,838.08 for invoices for wildlife management services at all five (5) County Airports and associated Work Plans.

ACTION:Policy

Rania Odenbaugh
Rania Odenbaugh, TLMA Director 11/12/2025

MINUTES OF THE BOARD OF SUPERVISORS

On motion of Supervisor Perez, seconded by Supervisor Spiegel and duly carried by unanimous vote, IT WAS ORDERED that the above matter is approved as recommended.

Ayes:	Medina, Spiegel, Washington, Perez, and Gutierrez
Nays:	None
Absent:	None
Date:	November 18, 2025
xc:	Aviation, Recorder, State Clearinghouse

Kimberly A. Rector
Clerk of the Board
By: _____
Deputy

SUBMITTAL TO THE BOARD OF SUPERVISORS COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

FINANCIAL DATA	Current Fiscal Year:	Next Fiscal Year:	Total Cost:	Ongoing Cost
COST	$ 142,691	$ 147,213	$ 764,838	$ 0
NET COUNTY COST	$ 0	$ 0	$ 0	$ 0
SOURCE OF FUNDS: 100% TLMA Aviation Budget			**Budget Adjustment:** No	
			For Fiscal Year: 25/26-31/32	

C.E.O. RECOMMENDATION: Approve

BACKGROUND:

Summary

Riverside County operates the Blythe Airport, the Chiriaco-Summit Airport, the Hemet-Ryan Airport, the French Valley Airport, and the Jacqueline Cochran Regional Airport. These five (5) general aviation airports provide critical aviation infrastructure in support of life and safety air operations. Critical air operations based at County Airports include wildfire and firefighting support by the California Department of Forestry and Fire Protection, law enforcement operations by the California Highway Patrol and the Riverside County Sheriff, and air medical/ambulance operations. Riverside County Airports provide critical infrastructure and connect communities with the nation's air transportation system.

In September of 2014, the Federal Aviation Administration (FAA) issued a grant to Riverside County to conduct a wildlife assessment at French Valley, Hemet-Ryan and Jacqueline Cochran Regional Airports. This wildlife assessment found significant wildlife presence at each of these airports. As a result of this finding, the FAA required a wildlife hazard management plan be implemented to manage wildlife hazards at these three airports.

A wildlife hazard management plan outlines the specific measures the airports will take to manage wildlife hazards. A certified airport wildlife biologist professional is required to implement wildlife management efforts and to ensure full compliance with federal and state laws for wildlife management. Airport staff can implement limited harassment and deterrence measures.

The US Department of Agriculture (USDA) offers airport services for wildlife management. They employ certified airport wildlife biologists that support airports throughout the United State. The Aviation Department has approached the USDA to solicit their full-time wildlife services for the implementation of the wildlife hazard management plan at all County Airports.

The County contracted with USDA for a 5-year term from October 1, 2020, to September 30, 2025 (see January 25, 2021; Agenda Item 3.26). The contract included a clause to amend for an additional 5-year term by mutual agreement of the parties. The parties have since agreed to an additional 5-year term to commence October 1, 2025, to September 30, 2031, as set forth in the attached Cooperative Service Agreement.

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The attached USDA Cooperative Service Agreement and Workplans have been approved by County Counsel as to form.

Impact on Residents and Businesses
Wildlife services from USDA will reduce wildlife habitat and increase safety at County Airports.

Additional Fiscal Information
There are no general fund impacts, or budget adjustment anticipated at this time.

Below is the breakdown of cost as suggested in the Work Plan based on federal fiscal year of October 1, 2026 to September 30, 2031:

FY26 $142,691.20
FY27 $147,212.86
FY28 $152,148.68
FY29 $158,263.85
FY30 $164,521.49

ATTACHMENTS:
Cooperative Service Agreement
USDA Workplan
French Valley Airport - Wildlife Hazard Management Plan
Hemet-Ryan Airport - Wildlife Hazard Management Plan
Jacqueline Cochran Regional Airport - Wildlife Hazard Management Plan

Melissa Curtis
Melissa Curtis, Deputy Director of Purchasing and Fleet 11/7/2025

Charissa Leach, Assistant CEO 11/12/2025

Crystal Carrillo
Crystal Carrillo, Senior Management Analyst 11/12/2025

Aaron Gettis
Aaron Gettis, Chief of Deputy County Counsel 11/6/2025

USDA-APHIS-WS AGREEMENT NUMBER: 26-7306-7124-RA
WBS: AP.RA.RX06.73.0268

COOPERATIVE SERVICE AGREEMENT
between
RIVERSIDE COUNTY AIRPORT AUTHORITY (COOPERATOR)
and
UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE (APHIS)
WILDLIFE SERVICES (WS)

ARTICLE 1 - PURPOSE

The purpose of this Cooperative Service Agreement (Agreement) is to reduce and minimize threats posed by wildlife to aircraft and human safety at airports under the ownership of the Riverside County Airport Authority. This work is to be completed by the United States Department of Agriculture Animal and Plant Health Inspection Service Wildlife Services (APHIS-WS) under the Agreement with the Riverside County Airport Authority. Airports to be included under this Agreement are Chiriaco Summit Airport (Chiriaco Summit), French Valley Airport (Murrieta), Hemet Ryan Airport (Hemet), Jacqueline Cochran Regional Airport (Thermal), and Blythe Airport (Blythe).

ARTICLE 2 - AUTHORITY

APHIS-WS has statutory authority under the Act of March 2, 1931, 46 Stat. 1468-69, 7 U.S.C. §§ 8351-8352, as amended, and the Act of December 22, 1987, Public Law No. 100-202, § 101(k), 101 Stat. 1329-331, 7 U.S.C. § 8353, to cooperate with States, local jurisdictions, individuals, public and private agencies, organizations, and institutions while conducting a program of wildlife services involving mammal and bird species that are reservoirs for zoonotic diseases, or animal species that are injurious and/or a nuisance to, among other things, agriculture, horticulture, forestry, animal husbandry, wildlife, and human health and safety.

ARTICLE 3 - MUTUAL RESPONSIBILITIES

The cooperating parties mutually understand and agree to/that: 12/2/2025

1. APHIS-WS shall perform services set forth in the Work Plan (Project), which is attached hereto as Exhibit "A" and made a part hereof. The parties may mutually agree in writing, at any time during the term of this Agreement, to amend, modify, add or delete services from the Work Plan.

2. The Cooperator certifies that APHIS-WS has advised the Cooperator there may be private sector service providers available to provide wildlife damage management (WDM) services that the Cooperator is seeking from APHIS-WS.

3. There will be no equipment with a procurement price of $5,000 or more per unit purchased directly with funds from the Cooperator for use on the Project. All other equipment purchased for the Project is and will remain the property of APHIS-WS.

RECEIVED RIVERSIDE COUNTY
CLERK/BOARD OF SUPERVISORS
2025 DEC 29 AM 9:08

4. The cooperating parties agree to coordinate with each other before responding to media requests on work associated with the Project.

ARTICLE 4 - COOPERATOR RESPONSIBILITIES

Cooperator agrees:

1. To designate, and hereby designates, Angela Jamison, County Airport Director, (951) 955-9418, ajamison@rivco.org, as the authorized representative who shall be responsible for collaboratively administering the activities conducted under this Agreement;

2. To authorize, and hereby authorizes, APHIS-WS to conduct direct control activities as defined in the Work Plan. APHIS-WS will be considered an invitee on the land controlled by the Cooperator. Cooperator will be required to exercise reasonable care to warn APHIS-WS to dangerous conditions or activities in the project areas.

3. To reimburse APHIS-WS for costs, not to exceed the annually approved amount specified in the Financial Plan, which is attached hereto as Exhibit "B" and made a part hereof. If costs are projected to exceed the not-to-exceed amount reflected in the Financial Plan, the Agreement, including the Work Plan and Financial Plan, shall be formally revised by an amendment to the Agreement, which shall be signed by both parties before services and activities resulting in additional costs are performed. The Cooperator agrees to pay all costs of services submitted via an invoice from APHIS-WS within 30 days of the date of the submitted invoice(s). Late payments are subject to interest, penalties, and administrative charges and costs as set forth under the Debt Collection Improvement Act of 1996.

4. To provide a Tax Identification Number or Social Security Number in compliance with the Debt Collection Improvement Act of 1996.

5. As a condition of this Agreement, the Cooperator ensures and certifies that it is not currently debarred or suspended and is free of delinquent Federal debt.

6. To notify APHIS-WS verbally or in writing as far in advance as practical of the date and time of any proposed meeting between the parties related to the Project.

7. The Cooperator acknowledges that APHIS-WS shall be responsible for administration of APHIS-WS activities and supervision of APHIS-WS personnel.

8. To obtain the appropriate permits for removal activities for species listed in the Work Plan and list USDA, APHIS, Wildlife Services as subpermitees.

9. To provide an indoor working space to complete necessary paperwork.

10. The Cooperator will not be connected to the USDA APHIS computer network(s).

ARTICLE 5 -APHIS-WS RESPONSIBILITIES

APHIS-WS agrees:

1. To designate, and hereby designates, the following as the APHIS-WS authorized representative who shall be responsible for collaboratively administering the activities conducted in this agreement.

Jeffrey B. Flores/California State Director

USDA-APHIS-Wildlife Services-CA

10365 Old Placerville Rd. Suite 210

Sacramento, CA 95827

(916) 979-2029

Email: jeffrey.b.flores@usda.gov

2. To conduct activities at sites designated by Cooperator as described in the Work Plan and Financial Plan. APHIS-WS will provide qualified personnel and other resources necessary to implement the approved WDM activities delineated in the Work Plan and Financial Plan of this Agreement.

3. That the performance of WDM activities by APHIS-WS under this Agreement is contingent upon the determination by APHIS-WS that such actions are in compliance with the National Environmental Policy Act, Endangered Species Act, and any other applicable federal statutes. APHIS-WS will not make a final decision to conduct requested WDM activities until it has made the determination of such compliance.

4. To invoice Cooperator monthly for actual costs incurred by APHIS-WS during the performance of services agreed upon and specified in the Work Plan. Authorized auditing representatives of the Cooperator shall be accorded reasonable opportunity to inspect the accounts and records of APHIS-WS pertaining to such claims for reimbursement to the extent permitted by Federal law and regulations.

ARTICLE 6 - CONTINGENCY STATEMENT

This Agreement is contingent upon the passage by Congress of an appropriation from which expenditures may be legally met and shall not obligate APHIS-WS upon failure of Congress to so appropriate. This Agreement may also be reduced or terminated if Congress only provides APHIS-WS funds for a finite period under a continuing resolution.

ARTICLE 7 - NON-EXCLUSIVE SERVICE CLAUSE

Nothing in this Agreement shall prevent APHIS-WS from entering into separate agreements with any other organization or individual for the purpose of providing wildlife damage management services exclusive of those provided for under this Agreement.

ARTICLE 8 - CONGRESSIONAL RESTRICTIONS

Pursuant to Section 22, Title 41, United States Code, no member of or delegate to Congress shall be admitted to any share or part of this Agreement or to any benefit to arise therefrom.

ARTICLE 9 - LAWS AND REGULATIONS

This Agreement is not a procurement contract (31 U.S.C. 6303), nor is it considered a grant agreement (31 U.S.C. 6304). In this Agreement, APHIS-WS provides goods or services on a cost-recovery basis to nonfederal recipients, in accordance with all applicable laws, regulations and policies.

ARTICLE 10 - LIABILITY

APHIS-WS assumes no liability for any actions or activities conducted under this Agreement except to the extent that recourse or remedies are provided by Congress under the Federal Tort Claims Act (28 U.S.C. 1346(b), 2401(b), and 2671-2680).

ARTICLE 11-NON-DISCRIMINATION CLAUSE

The United States Department of Agriculture prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program. Not all prohibited bases apply to all programs.

ARTICLE 12 - DURATION, REVISIONS, EXTENSIONS, AND TERMINATIONS

This Agreement shall become effective on October 01, 2025, and shall continue through September 30, 2030, not to exceed five years. This Agreement may be amended by mutual agreement of the parties in writing. The Cooperator must submit a written request to extend the end date at least IO days prior to expiration of the Agreement. Also, this Agreement may be terminated at any time by mutual agreement of the parties in writing, or by one party provided that party notifies the other in writing at least 60 days prior to effecting such action. Further, in the event the Cooperator does not provide necessary funds, APHIS-WS is relieved of the obligation to provide services under this Agreement

In accordance with the Debt Collection Improvement Act of 1996, the Department of Treasury requires a Taxpayer Identification Number for individuals or businesses conducting business with the agency.

Cooperator's Tax ID No.: 95-6000930
APHIS-WS's Tax ID: 41-0696271

AUTHORIZATION:

Cooperator: Riverside County Airport Authority

Angela Jamison
Representative, Riverside County Airport Authority

12/29/25
Date

UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
WILDLIFE SERVICES

Jeffrey B. Flores, State Director, California
USDA-APHIS-WS
CA State Office
10365 Old Placerville Rd. Suite 210
Sacramento, CA 95827

12/2/2025
Date

Wendy Anderson, Director, Western Region
USDA-APHIS-WS
Western Regional Office
2150 Centre Ave. Building B
Mail Stop 3W9
Fort Collins, CO 80526-8117

12/15/2025
Date

FORM APPROVED COUNTY COUNSEL
BY: _____ 11-6-25
AARON C. GETTIS DATE

USDA APHIS WILDLIFE SERVICES
WORK AND FINANCIAL PLAN

COOPERATOR:	**RIVERSIDE COUNTY AIRPORT AUTHORITY**
AGREEMENT NO.:	**26-7306-7124-RA**
ACCOUNT WBS:	**AP.RA.RX:06.73.0268**
AGREEMENT DATES:	**October 1, 2025-2029– September 30, 2026-2030**
AGREEMENT AMOUNT:	**FY26 $142,691.20**
	FY27 $147,212.86
	FY28 $152,148.68
	FY29 $158,263.85
	FY30 $164,521.49

Pursuant to Cooperative Service Agreement No. 26-7306-7124-RA between Riverside County Airport Authority (Cooperator) and the United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services (APHIS-WS) under the agreement with the Riverside County Airport Authority. Airports to be included under this agreement are French Vally Airport (Murrieta), Hemet Ryan Airport (Hemet), Chiriaco Summit Airport, Jacqueline Cochran Regional Airport (Thermal), and Blythe Airport (Blythe). This Work and Financial Plan defines the objectives, plan of action, resources, and budget for cooperative wildlife services program.

OBJECTIVES/GOALS

APHIS-WS objective is to provide professional wildlife damage management assistance to reduce/minimize and to manage damage caused by potential avian and mammalian species that are threats to aircraft and human health and safety at Airports within the jurisdiction of Riverside County.

Specific goals are:

1. To provide direct assistance with wildlife conflicts or damage at Riverside County Airports.
2. To identify wildlife hazards to aircraft and human safety at Riverside County Airports.
3. To provide integrated pest management recommendations to Riverside County Airports on mitigating wildlife hazards to aircraft and human safety.
4. WS will provide operational wildlife damage management to include nonlethal and lethal control of wildlife to provide the safest air operations possible. These techniques will include but not be limited to trapping, hazing, pyrotechnics, and shooting of birds and mammals.
5. To provide training to Riverside County Airport personnel in identifying and managing wildlife hazards at the facility.
6. WS will conduct wildlife analysis and provide quarterly reports to Riverside County Airports and will review landscaping plans and assist in wildlife monitoring during construction projects.
7. Assistance with annually renewing and maintaining the migratory bird depredation permits and ensure all activities conducted at Riverside County Airports are in compliance with the provisions of applicable permits, as well as federal, state, and local laws.
8. To respond to wildlife strike incidents during working hours while on site and provide removal services and document the strike report in accordance with applicable regulatory requirements.

PLAN OF ACTION

The objectives of the wildlife damage management program will be accomplished in the following manner.

1. APHIS-WS will provide technical assistance and or direct management at times and locations for where it is determined there is a need to resolve problems caused by wildlife. Management efforts will be directed towards specific offending individuals or local groups of animals. Method selection will be based on an evaluation of selectivity, humaneness, human safety, effectiveness, legality, and practicality.

   Technical Assistance: APHIS-WS' personnel may provide verbal or written advice, recommendations, information, demonstrations, or training to use in managing wildlife damage problems. Generally, implementation of technical assistance recommendations is the responsibility of the resource/property owner.

Direct Management: Direct management is usually provided when the resource/property owner's efforts have proven ineffective and/or technical assistance alone is inadequate. Direct management methods/techniques may include trap equipment, shooting, and other methods as mutually agreed upon.

2. APHIS-WS District Supervisor Brian Bonesteel, California District Seven, will supervise this project, (619) 561-3752, This project will be monitored by Jeffrey B. Flores, WS-California State Director, in Sacramento, California, (916) 979-2675, in cooperation with Angela Jamison the County Airport Manager (951) 955-9418

3. APHIS-WS will invoice Cooperator monthly for the actual costs incurred in providing service, provided there are billable expenses posted at the time of billing for the month of service. The combined monthly billings for the performance period in this Work and Financial Plan will not exceed $142,691.20 for FY26, $147,212.86 for FY27, $152,148.68 for FY28, $158,263.85 for FY29, and $164,521.49 for FY30. In some cases, the work is done during the period of performance, but expenses post outside of the agreement end date, resulting in a final invoice after the period of performance has ended.

4. In accordance with the Debt Collection Improvement Act (DCIA) of 1996, bills issued by APHIS-WS are due and payable within 30 days of the invoice date. The DCIA requires that all debts older than 120 days be forwarded to debt collection centers or commercial collection agencies for more aggressive action. Debtors have the option to verify, challenge and compromise claims, and have access to administrative appeals procedures which are both reasonable and protect the interests of the United States.

PROCUREMENT

The cooperator understands that additional supplies and equipment may need to be purchased under this agreement to replace consumed, damaged, or lost supplies/equipment. Any items remaining at the end of the agreement will remain in the possession of APHIS-WS.

STIPULATIONS AND RESTRICTIONS:

1. All operations shall have the joint concurrence of APHIS-WS and Cooperator and shall be under the direct supervision of APHIS-WS. APHIS-WS will conduct the program in accordance with its established operating policies and all applicable state and federal laws and regulations.
2. APHIS-WS will cooperate with the California Department of Fish and Wildlife, the U.S. Fish and Wildlife Service, California Department of Transportation, California Fire marshal's Office, county and local city governments, and other entities to ensure compliance with Federal, State, and local laws and regulations.
3. Wildlife Damage Management: A Work Initiation Document for Wildlife Damage Management (WS Form 12A), a Work Initiation Document for Wildlife Damage Management – Multiple Resource Owners (WS Form 12B) or a Work Initiation Document for Management of Wildlife Damage on Urban Properties (WS Form 12C) will be executed between APHIS-WS and the landowner, lessee, or administrator before any APHIS-WS work is conducted.

COST ESTIMATE FOR SERVICES:

Salary, including possible overtime, benefits, vehicle, supplies, and material costs are charged at actual cost. The distribution of the budget for this work plan may vary as necessary to accomplish the purpose of this Agreement. See Attachment A for a description of supplies and services.

FY2026

Cost Element	Full Cost
Personnel Compensation	$95,340.16
Travel	$1,960.00
Vehicles	$6,372.00
Other Services - CEC	$2,550.57
Supplies and Materials	$3,000.00
Equipment	$3,000.00

Subtotal (Direct Charges)		$112,222.73
Pooled Job Costs	11.00%	$12,344.50
Indirect Costs (WS)	16.15%	$18,123.97
Agreement Total		$142,691.20

The distribution of the budget from this Financial Plan may vary as necessary to accomplish the purpose of this agreement but may not exceed: $142,691.20 for FY26.

FY2027

Cost Element	Full Cost
Personnel Compensation	$98,578.32
Travel	$1,960.00
Vehicles	$6,690.00
Other Services - CEC	$2,550.57
Supplies and Materials	$3,000.00
Equipment	$3,000.00

Subtotal (Direct Charges)		$115,778.89
Pooled Job Costs	11.00%	$12,735.68
Indirect Costs (WS)	16.15%	$18,698.29
Agreement Total		$147,212.86

The distribution of the budget from this Financial Plan may vary as necessary to accomplish the purpose of this agreement but may not exceed: $147,212.86 for FY27.

FY2028

Cost Element	Full Cost
Personnel Compensation	$102,460.20

Travel	$1,960.00
Vehicles	$6,690.00
Other Services - CEC	$2,550.57
Supplies and Materials	$3,000.00
Equipment	$3,000.00

Subtotal (Direct Charges)		$119,660.77
Pooled Job Costs	11.00%	$13,162.69
Indirect Costs (WS)	16.15%	$19,325.22
Agreement Total		$152,148.68

The distribution of the budget from this Financial Plan may vary as necessary to accomplish the purpose of this agreement but may not exceed: $152,148.68 for FY28.

FY2029

Cost Element	Full Cost
Personnel Compensation	$107,269.62
Travel	$1,960.00
Vehicles	$6,690.00
Other Services - CEC	$2,550.57
Supplies and Materials	$3,000.00
Equipment	$3,000.00

Subtotal (Direct Charges)		$124,470.19
Pooled Job Costs	11.00%	$13,691.72
Indirect Costs (WS)	16.15%	$20,101.94
Agreement Total		$158,263.85

The distribution of the budget from this Financial Plan may vary as necessary to accomplish the purpose of this agreement but may not exceed: $158,263.85 for FY29.

FY2030

Cost Element	Full Cost
Personnel Compensation	$112,191.09
Travel	$1,960.00

Vehicles		$6,690.00
Other Services - CEC		$2,550.57
Supplies and Materials		$3,000.00
Equipment		$3,000.00

Subtotal (Direct Charges)		$129,391.66
Pooled Job Costs	11.00%	$14,233.08
Indirect Costs (WS)	16.15%	$20,896.75
Agreement Total		$164,521.49

The distribution of the budget from this Financial Plan may vary as necessary to accomplish the purpose of this agreement but may not exceed: $164,521.49 for FY30.

AUTHORIZATION:

Angela Jamison — 12/29/25

Representative:
Angela Jamison, County Airport Director — Date

UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
WILDLIFE SERVICES

Jeffrey B. Flores, State Director, USDA-APHIS-WS-California — 12/2/2025 Date

Wendy Anderson, Director, USDA-APHIS-WS-Western Region — 12/15/2025 Date

FORM APPROVED COUNTY COUNSEL
BY: AARON C. GETTIS — 11.6.25 DATE

ATTACHMENT A

Schedule of Supplies / Services

WS Description of WS Supplies and Services: 10/01/25 – 9/30/30.

Salaries:
Salary hours associated with this project include, but are not limited to, providing technical assistance, field work, equipment maintenance, vehicle maintenance, boat maintenance, mandatory training, annual leave, sick leave, awards, travel to and from the official duty station, data entry, data analysis, project coordination, administrative support, health and retirement benefits, taxes, etc. These salaries provide the Wildlife Services Specialists that help meet the goals and fulfill the duties outlined in the AWP. Examples of this work include, but are not limited to, smolt protection from avian predators through harassment, providing facility and project protection from pigeons and marmot damage through a lethal removal program.

Vehicle Operating Costs:
The vehicle provides transportation of personnel and equipment assigned to the project. A flat rate is charged per vehicle used, per pay period that cooperatively funds vehicle operating costs. Vehicle operating costs include but are not limited to repair and maintenance, fuel consumption, oil changes, tire replacement, tire changes seasonally, and eventual vehicle replacement and depreciation costs resulting from wear and tear.

Supplies:
The supply charge is based on the quantity of supplies expected to be used for an operating project during the work period. Costs include, but are not limited to pyrotechnics, pyrotechnic launchers, traps and trap materials, office supplies, binoculars, ammunition, firearm maintenance cost, uniform allowance, computer accessories for data entry, euthanasia equipment, wildlife capture, restraint and handling devices, spotlights, and similar supplies and equipment.

Training / Travel
A flat rate is budgeted per project for costs associated with training for all specialists for that project. Costs include, but may not limited to, the cost of on-line training, reimbursement of travel costs, per diem, lodging, training facilities rentals, instructor fees and training materials for seasonal and full-time employees related to individual operating projects.

Pooled Job Costs:
Pooled Job Costs (11% of subtotal) covers costs that may not be directly associated with one particular project and are distributed across all identifiable projects to which the costs pertain. Costs may include supervision not directly charged, employee retirement, severance, sick leave, self-insurance, OWCP costs, and vehicle, boat, and camp trailer repair and replacement.

Administrative Costs:
Administrative costs (16.15 % of subtotal) cover administrative infrastructure in the U.S. Department of Agriculture APHIS-WS.

Peter Aldana
Riverside County
Assessor-County Clerk-Recorder
2724 Gateway Drive
Riverside, CA 92507
(951) 486-7000
www.rivcoacr.org

Receipt: 25-355129

Product	Name	Extended
FISH	CLERK FISH AND GAME FILINGS	$50.00
	# Pages	3
	Document #	E-202501024
	Filing Type	7
	State Fee Prev Charged	false
	No Charge Clerk Fee	false
F&G Notice of Exemption Fee		$50.00
Total		$50.00
Tender (On Account)		$50.00

Account#	TRANS
Account Name	TRANS - TRANSPORTATION DEPT
Balance	$2,047.00
Comment	SST3622S1176

11/19/25, 9:14 AM PST
Gateway Clerk

State of California - Department of Fish and Wildlife

2025 ENVIRONMENTAL DOCUMENT FILING FEE CASH RECEIPT

DFW 753.5a (REV. 01/01/25) Previously DFG 753.5a

RECEIPT NUMBER: 25-355129

STATE CLEARINGHOUSE NUMBER *(If applicable)*

SEE INSTRUCTIONS ON REVERSE. TYPE OR PRINT CLEARLY.

LEAD AGENCY	LEAD AGENCY EMAIL	DATE
COUNTY OF RIVERSIDE TRANSPORTATION	JRUIZ@RIVCO.ORG	11/19/2025

COUNTY/STATE AGENCY OF FILING	DOCUMENT NUMBER
RIVERSIDE	E-202501024

PROJECT TITLE

RATIFICATION AND APPROVAL OF A 5-YEAR COOPERATIVE SERVICE AGREEMENT WITH THE UNITED STATES DEPARTMENT OF AGRICULTURE, FOR WILDLIFE MANAGEMENT SERVICES AT

PROJECT APPLICANT NAME	PROJECT APPLICANT EMAIL	PHONE NUMBER
RIVERSIDE COUNTY TRANSPORTATION AND	JRUIZ@RIVCO.ORG	(951) 955-5746

PROJECT APPLICANT ADDRESS	CITY	STATE	ZIP CODE
4080 LEMON STREET, 14TH FLOOR, 14TH FLOOR	RIVERSIDE	CALI	92501

PROJECT APPLICANT *(Check appropriate box)*

☒ Local Public Agency ☐ School District ☐ Other Special District ☐ State Agency ☐ Private Entity

CHECK APPLICABLE FEES:

☐ Environmental Impact Report (EIR)	$4,123.50	$
☐ Mitigated/Negative Declaration (MND)(ND)	$2,968.75	$
☐ Certified Regulatory Program (CRP) document - payment due directly to CDFW	$1,401.75	$

☒ Exempt from fee

- ☒ Notice of Exemption (attach)
- ☐ CDFW No Effect Determination (attach)

☐ Fee previously paid (attach previously issued cash receipt copy)

☐ Water Right Application or Petition Fee (State Water Resources Control Board only)	$850.00	$
☒ County documentary handling fee		$ $50.00
☐ Other		$

PAYMENT METHOD:

☐ Cash ☐ Credit ☐ Check ☒ Other **TOTAL RECEIVED** $ $50.00

SIGNATURE	AGENCY OF FILING PRINTED NAME AND TITLE
X I Tejeda	Deputy Isabel Tejeda

ORIGINAL - PROJECT APPLICANT | COPY - CDFW/ASB | COPY - LEAD AGENCY | COPY - COUNTY CLERK | DFW 753.5a (Rev. 01012025)

RIVERSIDE COUNTY CLERK & RECORDER

AUTHORIZATION TO BILL
BY JOURNAL VOUCHER

Project Name: Ratification and Approval of a 5-year Cooperative Service Agreement with the United States Department of Agriculture, for wildlife management services at County Airports; CEQA Exempt; Districts 3, 4, and 5.

Accounting String: 523230-40710-1910700000 - ED19102001

DATE: November 6, 2025

AGENCY: Riverside County

THIS AUTHORIZES THE COUNTY CLERK & RECORDER TO BILL FOR FILING AND HANDLING FEES FOR THE ACCOMPANYING DOCUMENT(S).

NUMBER OF DOCUMENTS INCLUDED: One (1)

AUTHORIZED AND PRESENTED BY: Jose Ruiz, TLMA Regional Office Manager, TLMA-Aviation

Signature: Jose Ruiz

-TO BE FILLED IN BY COUNTY CLERK-

ACCEPTED BY: Cassandra Sandoval Isabel Tejeda

DATE: NOV 19 2025

RECEIPT # (S) 25-355129

County of Riverside
TLMA Aviation
4080 Lemon Street, 14th Floor, Riverside, CA 92501

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County of Riverside
Peter Aldana
Assessor-County Clerk-Recorder
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Page 1 of 3
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NOTICE OF EXEMPTION

November 6, 2025

Project Name: Ratification and Approval of a 5-year Cooperative Service Agreement with the United States Department of Agriculture, for wildlife management services at County Airports; CEQA Exempt; Districts 3, 4, and 5.

Project Location: Hemet-Ryan Airport- 4710 West Stetson Avenue, Hemet, French Valley Airport- 37600 Sky Canyon Road, Jacqueline Cochran Regional Airport – 58860 Higgins Drive, Thermal; Riverside County

Description of Project: Riverside County operates the Blythe Airport, the Chiriaco-Summit Airport, the Hemet-Ryan Airport, the French Valley Airport, and the Jacqueline Cochran Regional Airport. These five (5) general aviation airports provide critical aviation infrastructure in support of life and safety air operations. Critical air operations based at County Airports include wildfire and firefighting support by the California Department of Forestry and Fire Protection, law enforcement operations by the California Highway Patrol and the Riverside County Sheriff, and air medical/ambulance operations. Riverside County Airports provide critical infrastructure and connect communities with the nation's air transportation system.

In September of 2014, the Federal Aviation Administration (FAA) issued a grant to Riverside County to conduct a wildlife assessment at French Valley, Hemet-Ryan and Jacqueline Cochran Regional Airports. This wildlife assessment found significant wildlife presence at each of these airports. As a result of this finding, the FAA required a wildlife hazard management plan be implemented to manage wildlife hazards at these three airports. A wildlife hazard management plan outlines the specific measures the airports will take to manage wildlife hazards. A certified airport wildlife biologist professional is required to implement wildlife management efforts and to ensure full compliance with federal and state laws for wildlife management. Airport staff can implement limited harassment and deterrence measures.

The US Department of Agriculture (USDA) offers airport services for wildlife management. They employ certified airport wildlife biologists that support airports throughout the United State. The Aviation Department has approached the USDA to solicit their full-time wildlife services for the implementation of the wildlife hazard management plan at four County Airports. The services will be retained in the form of a cooperative services agreement and work plans. The approval of the USDA Cooperative Service

Agreement is defined as the proposed project under the California Environmental Quality Act (CEQA). The project is the procurement of wildlife management services at existing facilities; no expansion of the existing facilities will occur. The operation of the facilities will continue to provide aviation services. No additional direct or indirect physical environmental impacts are anticipated.

Name of Public Agency Approving Project: County of Riverside

Name of Person or Agency Carrying Out Project: Riverside County Transportation and Land Management Agency – Aviation Division

Exempt Status: State CEQA Guidelines Section 15301, Class 1, Existing Facilities Exemption; Section 15061(b)(3), General Rule or "Common Sense" Exemption. Codified under California Code of Regulations Title 14, Article 5, Section 15061.

Reason Why Project is Exempt: The proposed project is categorically exempt from the provisions of CEQA specifically by the State CEQA Guidelines as identified below. The project will not result in any specific or general exceptions to the use of the categorical exemption as detailed under State CEQA Guidelines Section 15300.2. The project will not cause an impact to an environmental resource of hazardous or critical concern, nor would the project involve unusual circumstances that could potentially have a significant effect on the environment. The project is limited to the approval of a USDA Cooperative Service Agreement. Furthermore, this project would not result in any physical direct or reasonably foreseeable indirect impacts to the environment.

- **Section 15301 – Class 1 Existing Facilities Exemption:** This categorical exemption includes the operation, repair, maintenance, leasing, or minor alteration of existing public or private structures or facilities, provided the exemption only involves negligible or no expansion of the previous site's use. The project, as proposed, will be consistent with the existing land use and would not result in a physical change to the property. These improvements fall within the criteria identified in Section 15301 (c) and (d) which allow for the repair and maintenance of existing transportation facilities and rehabilitation of structures and facilities to meet standards of health and safety. Therefore, the project is exempt as it meets the scope and intent of the Categorical Exemption identified in Section 15301, Article 19, Categorical Exemptions of the CEQA Guidelines.

- **Section 15061 (b) (3) – "Common Sense" Exemption:** In accordance with CEQA, the use of the Common Sense Exemption is based on the "general rule that CEQA applies only to projects which have the potential for causing a significant effect on the environment." State CEQA Guidelines, Section 15061(b) (3). The use of this exemption is appropriate if "it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment." *Ibid.* This determination is an issue of fact and if sufficient evidence exists in the record that the activity cannot have a significant effect on the environment, then the exemption applies and no further evaluation under CEQA is required. See *No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal. 3d 68. The ruling in this case stated that if a project falls within a category exempt by administrative regulation or 'it can be seen with certainty that the activity in question will not have a significant effect on the environment', no further agency evaluation is required. With certainty, there is no possibility that the project may have a significant effect on the environment. Approval of the USDA Cooperative Service Agreement would result in the same continued operation of the airport and will not create any new significant direct or indirect environmental impacts. Therefore, in no way, would the project as proposed have the potential

to cause a significant environmental impact and the project is exempt from further CEQA analysis.

Signed: Jose Ruiz **Date:** 11/6/2025

Jose Ruiz, TLMA Regional Office
Manager, County of Riverside
TLMA-Aviation Division

Document Root (Read-Only)

Selected Document

2025110701 - NOE - Ratification and Approval of a 5-year Cooperative Service Agreement with the United States Department of Agriculture, for wildlife management services at County

Riverside County
Created - **11/18/2025** | Submitted - **11/18/2025** | Posted - **11/18/2025** | Received - **11/18/2025** | Published - **11/18/2025**
Whitney N Mayo

Document Details

Public Agency

Riverside County

Document Type

Notice of Exemption

Document Status

Published

Title

Ratification and Approval of a 5-year Cooperative Service Agreement with the United States Department of Agriculture, for wildlife management services at County

Document Description

Riverside County operates the Blythe Airport, the Chiriaco-Summit Airport, the Hemet-Ryan Airport, the French Valley Airport, and the Jacqueline Cochran Regional Airport. These five (5) general aviation airports provide critical aviation infrastructure in support of life and safety air operations. Critical air operations based at County Airports include wildfire and firefighting support by the California Department of Forestry and Fire Protection, law enforcement operations by the California Highway Patrol and the Riverside County Sheriff, and air medical/ambulance operations. Riverside County Airports provide critical infrastructure and connect communities with the nation's air transportation system.
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Attachments (Upload Project Documents)

3.51 - NOE - Cooperative Agreement with USDA.pdf

Contacts

County of Riverside Transportation Department - Aviation Division - *Jose Ruiz*

4080 Lemon Street 14th Floor
Riverside, CA 92501
Phone : (951) 955-5746
jruiz@rivco.org

Regions

Southern California

Counties

Riverside

Cities

Thermal

Location Details

Cross Streets

Hemet-Ryan Airport- 4710 West Stetson Avenue

Other Location Info

Hemet-Ryan Airport- 4710 West Stetson Avenue, Hemet, French Valley Airport- 37600 Sky Canyon Road, Jacqueline Cochran Regional Airport – 58860 Higgins Drive, Thermal; Riverside County

Notice of Exemption

Exempt Status

Categorical Exemption

Type, Section Number or Code Number

15301

Reasons why project is exempt

The proposed project is categorically exempt from the provisions of CEQA specifically by the State CEQA Guidelines as identified below. The project will not result in any specific or general exceptions to the use of the categorical exemption as detailed under State CEQA Guidelines Section 15300.2. The project will not cause an impact to an environmental resource of hazardous or critical concern, nor would the project involve unusual circumstances that could potentially have a significant effect on the environment. The project is limited to the approval of a USDA Cooperative Service Agreement. Furthermore, this project would not result in any physical direct or reasonably foreseeable indirect impacts to the environment.
This categorical exemption includes the operation, repair, maintenance, leasing, or minor alteration of existing public or private structures or facilities, provided the exemption only involves negligible or no expansion of the previous site's use. The project, as proposed, will be consistent with the existing land use and would not result in a physical change to the property. These improvements fall within the criteria identified in Section 15301 (c) and (d) which allow for the repair and maintenance of existing transportation facilities and rehabilitation of structures and facilities to meet standards of health and safety. Therefore, the project is exempt as it meets the scope and intent of the Categorical Exemption identified in Section 15301, Article 19, Categorical Exemptions of the CEQA Guidelines.
Therefore, in no way, would the project as proposed have the potential to cause a significant environmental impact and the project is exempt from further CEQA analysis.

Exempt Status

Other

Type, Section Number or Code Number

15061(b)(3)

Reasons why project is exempt

The proposed project is categorically exempt from the provisions of CEQA specifically by the State CEQA Guidelines as identified below. The project will not result in any specific or general exceptions to the use of the categorical exemption as detailed under State CEQA Guidelines Section 15300.2. The project will not cause an impact to an environmental resource of hazardous or critical concern, nor would the project involve unusual circumstances that could potentially have a significant effect on the environment. The project is limited to the approval of a USDA Cooperative Service Agreement. Furthermore, this project would not result in any physical direct or reasonably foreseeable indirect impacts to the environment.
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Therefore, in no way, would the project as proposed have the potential to cause a significant environmental impact and the project is exempt from further CEQA analysis.

County Clerk(s)

Riverside

Signature

Title

Date

Outlook

SCH Number 2025110701

From Thomas Hubbard <THOMAS.HUBBARD@lci.ca.gov>
Date Tue 11/18/2025 1:02 PM
To Mayo, Whitney <WMayo@Rivco.org>

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Please contact the SCH with any questions at state.clearinghouse@lci.ca.gov.

Thank you,

Thomas Hubbard | *he/him*
Jr. CEQA Analyst

Governor's Office of Land Use and Climate Innovation
Formerly known as the Governor's Office of Planning and Research
Thomas.Hubbard@lci.ca.gov

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Final

Wildlife Hazard Assessment Report for the French Valley Airport Murrieta, California

Prepared for:

Riverside County Aviation Department
3403 10th Street, Suite 500
Riverside, CA 92501

February 2017

Prepared by:

Mead & Hunt

With assistance from:

CBC
CASKEY BIOLOGICAL CONSULTING

U.S. Department
of Transportation
**Federal Aviation
Administration**

Western Pacific Region
American Samoa, Arizona, California, Guam, Hawaii, Nevada

P.O. Box 92007
Los Angeles, California
90009

February 2, 2017

Mr. Tim Miller
Aviation Director
EDA Aviation Division
3403 10th Street, Suite 400
Riverside, California 92501

Dear Mr. Miller:

Wildlife Hazard Assessment
French Valley Airport
Murrieta/Temecula, California

We accept the French Valley Airport (F70) Wildlife Hazard Assessment (WHA), which was conducted by Mead & Hunt.

In reviewing the WHA, it appears there was enough wildlife activity in the area to warrant the development of a Wildlife Hazard Management Plan (WHMP). The management techniques contained in Chapter 5 and 6 of the WHA can be used in developing the WHMP. The recommendations appear to be good sound practices.

As the WHMP is being developed, we urge you to begin the process of obtaining the necessary permits to control wildlife. The list located on page 68 of the WHA contains the species that require a depredation permit. You and your staff will need to be trained to recognize which species do not require a permit for removal and which species are protected.

There are several critical recommended wildlife hazard management measures for your airport that you need to address. Some of the critical Habitat Modification measures do not require additional resources but to mow more often and check on the condition of gates and fencing more often. The WHA contains numerous other high to moderate items which you should also adopt.

Should you have any questions or comments regarding this letter, please do not hesitate to contact me at (310) 725-3636 or via email at elizabeth.louie@faa.gov.

Sincerely,

Elizabeth Louie
Airport Certification Safety Inspector

cc: Lisa Harmon, Aviation Project Manager, Mead & Hunt

Acknowledgment

Successful wildlife hazard monitoring requires cooperation from many members of the airport community. Mead & Hunt, Inc., would like to thank Mr. Daryl Shippy and Ms. Vicki Powszok of the Riverside County Economic Development Agency and the staff of the French Valley Airport for their ongoing assistance throughout the 12-month monitoring period associated with the development of this Wildlife Hazard Assessment.

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Chapter 1

Introduction

1.1 Overview of Wildlife Hazards to Aircraft

Conflicts between aircraft and wildlife have occurred since the dawn of aviation. Orville Wright was the pilot associated with the first documented bird strike in 1905 during a flight over Dayton, Ohio. The first fatality associated with a wildlife strike occurred on April 3, 1912, when Calbraith Rodgers died after his aircraft struck a gull and crashed in Long Beach, California.

Data compiled by the Federal Aviation Administration (FAA) indicates that the number of conflicts between wildlife and aircraft has continued to increase since that time. Based on data obtained from the National Wildlife Strike Database, several factors have evolved in recent years to affect the relationship between wildlife and aviation safety:

- *The use of faster and quieter aircraft.* Commercial air carriers have replaced their older three- or four-engine aircraft fleets with more efficient, faster, and quieter two-engine aircraft. In many cases, birds are less able to detect and avoid new aircraft using turbofan engines. In the event that wildlife is ingested by aircraft engines, aircraft with two engines may be more vulnerable than earlier aircraft equipped with three or four engines (FAA and USDA, 2014).

- *Increased air traffic.* The amount of military and civilian air traffic has increased substantially worldwide. Passenger enplanements in the U.S. increased from approximately 310 million in 1980 to 732 million in 2013, and commercial air traffic increased from approximately 18 million aircraft movements in 1980 to 25 million in 2013 (FAA and USDA, 2014). The growth in air traffic has increased the risk of potential conflicts between aviation and wildlife.

- *Increased wildlife populations and adaptation to urban areas.* The populations of many wildlife species commonly involved in strikes have increased markedly in the last few decades (FAA and USDA, 2014). As development has increased, the availability of natural or open areas that support these species has decreased. In addition, the size of the areas that once separated airports and nearby metropolitan areas also has decreased. As a result, the remaining open space provides habitat, shelter, and feeding areas for greater populations of wildlife.

As a result of these factors, ongoing changes in the aviation industry, and changes in land use, the number of documented wildlife strikes on and near airports continues to increase worldwide.

The FAA wildlife strike database includes records for more than 156,000 strikes during the period from January 1, 1990 through 2014, but the FAA estimates that the database represents only a portion of the actual number of bird strikes that occurred during this period (FAA and USDA, 2015). Based on FAA strike records, most wildlife strikes occurred in the immediate airport vicinity during aircraft approach or departure and more than 70 percent occur at altitudes of less than 500 feet above ground level (AGL) (FAA and USDA, 2015).

1.1.1 Safety Effects

The most recent analysis of wildlife strikes to civil aviation in the United States was performed by the FAA and the United States Department of Agriculture (USDA) Animal Plant Health Inspection Service (APHIS). The agencies reviewed data from the National Wildlife Strike Database for the 25-year period from 1990 through 2014 (FAA and USDA, 2015). Wildlife strikes to civil aircraft have resulted in human injuries and fatalities. From 1990 to 2014 a total of 388 injuries and 26 fatalities were associated with wildlife strikes. Species associated with these strikes include unidentified bird species, American white pelicans, Canada geese, white-tailed deer, brown pelicans, and turkey vultures. Sixty-seven aircraft were destroyed or damaged beyond repair. Terrestrial mammals (primarily white-tailed deer), Canada geese, and vultures were responsible for these incidents. Approximately 60 percent of the strikes that resulted in the destruction of aircraft occurred at GA airports (FAA and USDA, 2015).

1.1.2 Economic Losses

Wildlife strikes also can pose economic challenges to aircraft operators. Wildlife strikes may cause expensive structural and mechanical damage to aircraft even if they do not result in a crash (Blokpoel, 1976; Cleary and Dolbeer, 2005). Aircraft engines were the component most frequently reported as being damaged by bird strikes, and landing gear, propellers, and wing/rotors were identified as the components most often damaged by mammal strikes (FAA and USDA, 2014).

From 1990 to 2014 reported losses from bird strikes resulted in more than 981,000 hours of aircraft downtime and an estimated $707 million in direct and other monetary losses. In addition to direct monetary losses, indirect costs also were incurred as a result of lost revenue, passenger rescheduling, accommodations, and flight cancellations (FAA and USDA, 2014).

1.2 Regulatory Background

The FAA is the agency responsible for administering Federal Aviation Regulations (FARs). Regulations associated with wildlife management are set forth at 14 CFR Part 139.337 (see **Appendix A**).

The French Valley Airport (F70 or “the airport”) does not hold an FAA certificate pursuant to FAR Part 139, but it is a federally obligated general aviation (GA) airport for which Riverside County (County) receives federal funds to undertake capital improvements. When an airport owner, such as the County, accepts funds from FAA-administered airport financial assistance programs, it must agree to certain obligations known as grant assurances. These grant assurance require an airport operator to maintain and operate its facilities safely, efficiently, and in accordance with specified conditions.

The FAA has established 37 specific grant assurances to which airport operators must adhere if they are to receive federal funds. Wildlife hazard management is associated with FAA Grant assurance No. 19, Operation and Maintenance:

19. Operation and Maintenance.

a. The airport and all facilities which are necessary to serve the aeronautical users of the airport, other than facilities owned or controlled by the United States, shall be operated at all times in a safe and serviceable condition and in accordance with the minimum standards as may be required or prescribed by applicable Federal, state and local agencies for maintenance and operation. It will not cause or permit any activity or action thereon which would interfere with its use for airport purposes. It will suitably operate and maintain the airport and all facilities thereon or connected therewith, with due regard to climatic and flood conditions. Any proposal to temporarily close the airport for non-aeronautical purposes must first be approved by the Secretary. In furtherance of this assurance, the sponsor will have in effect arrangements for-

1) Operating the airport's aeronautical facilities whenever required;

2) Promptly marking and lighting hazards resulting from airport conditions, including temporary conditions; and

3) Promptly notifying airmen of any condition affecting aeronautical use of the airport. Nothing contained herein shall be construed to require that the airport be operated for aeronautical use during temporary periods when snow, flood or other climatic conditions interfere with such operation and maintenance. Further, nothing herein shall be construed as requiring the maintenance, repair, restoration, or replacement of any structure or facility which is substantially damaged or destroyed due to an act of God or other condition or circumstance beyond the control of the sponsor.

b. It will suitably operate and maintain noise compatibility program items that it owns or controls upon which Federal funds have been expended.

The FAA addresses wildlife hazard management in accordance with Grant Assurance No. 19 because it is a safety issue. The FAA can require the operator of a federally obligated airport to conduct a Wildlife Hazard Assessment (WHA), and if necessary, prepare a Wildlife Hazard Management Plan (WHMP).

1.2.1 Wildlife Hazard Assessment Process and Contents

The performance of a WHA is the first step in developing a more complete and site-specific understanding of wildlife hazards at an airport. The WHA must be conducted by a qualified wildlife biologist who meets the requirements of FAA Advisory Circular (AC) 150/5200-36A, "Qualifications for Wildlife Biologists Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards at Airports" (**Appendix B**). The qualifications of this report's author are included in **Appendix C**.

A WHA must be conducted in accordance with specific protocols. As described in *Wildlife Hazard Management at Airports: A Manual for Airport Personnel* (Cleary and Dolbeer, 2005), *a* WHA includes 12 months of ongoing wildlife monitoring to identify the presence of wildlife species, especially migratory birds, and seasonal fluctuations in the behaviors and abundance of species that occur at the airport and in its vicinity. Based on the results of the 12-month monitoring effort, specific measures or recommendations are formulated to reduce wildlife hazards at the airport. As described in *Wildlife Hazard Management at Airports: A Manual for Airport Personnel* (Cleary and Dolbeer, 2005) and FAA guidance set forth at FAR Part 139.337*,* a WHA must address the following:

(1) An analysis of the events or circumstances that prompted the assessment.

(2) Identification of the wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences.

(3) Identification and location of features on and near the airport that attract wildlife.

(4) A description of wildlife hazards to air carrier operations.

(5) Recommended actions for reducing identified wildlife hazards to air carrier aircraft.

As identified by FAA regulations, a WHA must address or include the following data:

- *Wildlife Strike Records and Analysis.* Each WHA must include a thorough review of available wildlife strike records associated with the airport.

- *Wildlife Populations on and Near the Airport.* Field studies associated with the WHA must be performed to determine wildlife population including such factors as: abundance, seasonal fluctuations, movement patterns, behaviors, and periods of activity, with a particular emphasis on the species most threatening to aircraft safety.

- *Wildlife Attractants and Land Use Practices.* The WHA must identify potential habitat or wildlife attractants on the airport and within the airport vicinity.

- *Wildlife Management Recommendations.* The WHA must provide specific recommendations for reducing wildlife hazards to air carrier operations. The prioritized recommendations will serve as a framework for the development of a WHMP, should the FAA Administrator determine that one is necessary.

1.2.2 Wildlife Hazard Management Plan

Based on the results of the WHA, the FAA may require an airport operator to prepare a WHMP. The FAA's decision to require the preparation of a WHMP may be based on the presence and abundance of wildlife identified in the WHA, aeronautical activity, and other pertinent factors. When required, a WHMP must be developed in accordance with 14 CFR Part 139.337, subparts (c), (d), and (e) and address the responsibilities, policies, and procedures necessary to reduce wildlife hazards.

1.3 Wildlife Hazard Strike History for French Valley Airport

The FAA National Wildlife Strike Database was reviewed to identify whether any wildlife strikes had been documented in association with F70. No wildlife strike records were found/reported for F70. However, the FAA database must be considered with caution. The FAA estimates that only 20 percent of all strikes that occurred nationwide from 1990 to 2008 were recorded in the databased, and only 40 percent of all strikes that occurred since 2009 were recorded.

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2.1 Airport Location and Facilities

F70 is located in southwestern Riverside County, California, near the communities of Temecula, Murrieta, and Winchester. F70 is located in the lower Coachella Valley, between the San Jacinto Mountains to the southwest and the San Bernardino Mountains to the northeast. The airport is adjacent to US Highway 79 and east of Interstates 15 and 215 (Riverside County, 2016; see **Figures 2-1 and 2-2**).

The 261-acre airport was constructed in 1989 as a replacement for the Rancho California Airport. The airport is owned and operated by the Riverside County Economic Development Agency as a public-use airport. The airport is not equipped with an air traffic control tower, but the airfield is accessible 24 hours a day, seven days a week. During the 12-month period ending in July 2015, F70 supported approximately 98,000 annual operations including single- and multi-engine, piston- and turbine-powered aircraft, ultralights, helicopters (Airnav, 2016). The airport is used primarily for general aviation (GA) operations.

F70 includes a single runway and four helipads. Runway 18/36 is 6,000 feet long, 75 feet wide, and aligned in a north-south direction. Runway 18 (non-precision) and Runway 36 (basic) are equipped with two-light precision approach path indicator (PAPI) and runway end identifier lights. Two helipads are on the south end of the local apron and two are on the transient apron. F70 is served by three Fixed-Based Operators (FBOs), which provide services such as fuel sales, hangar and tie-down rentals, aircraft repairs, and a flight school.

Photo 1: *Aircraft near the terminal building.*

All of the buildings at F70 are located west of the runway, including a terminal building, aircraft fueling facilities, maintenance, storage, the general aviation apron, various businesses, and the FBOs. Riverside County Fire Department (RCFD) Fire Station No. 83 is located near the airport entrance from Sky Canyon Drive, but it does not serve as an air rescue and firefighting (ARFF) facility. A copy of the Airport Layout Plan (ALP) and WHA Study Design are provided in **Appendix D**.

Figure 2-1.
Site Location Map

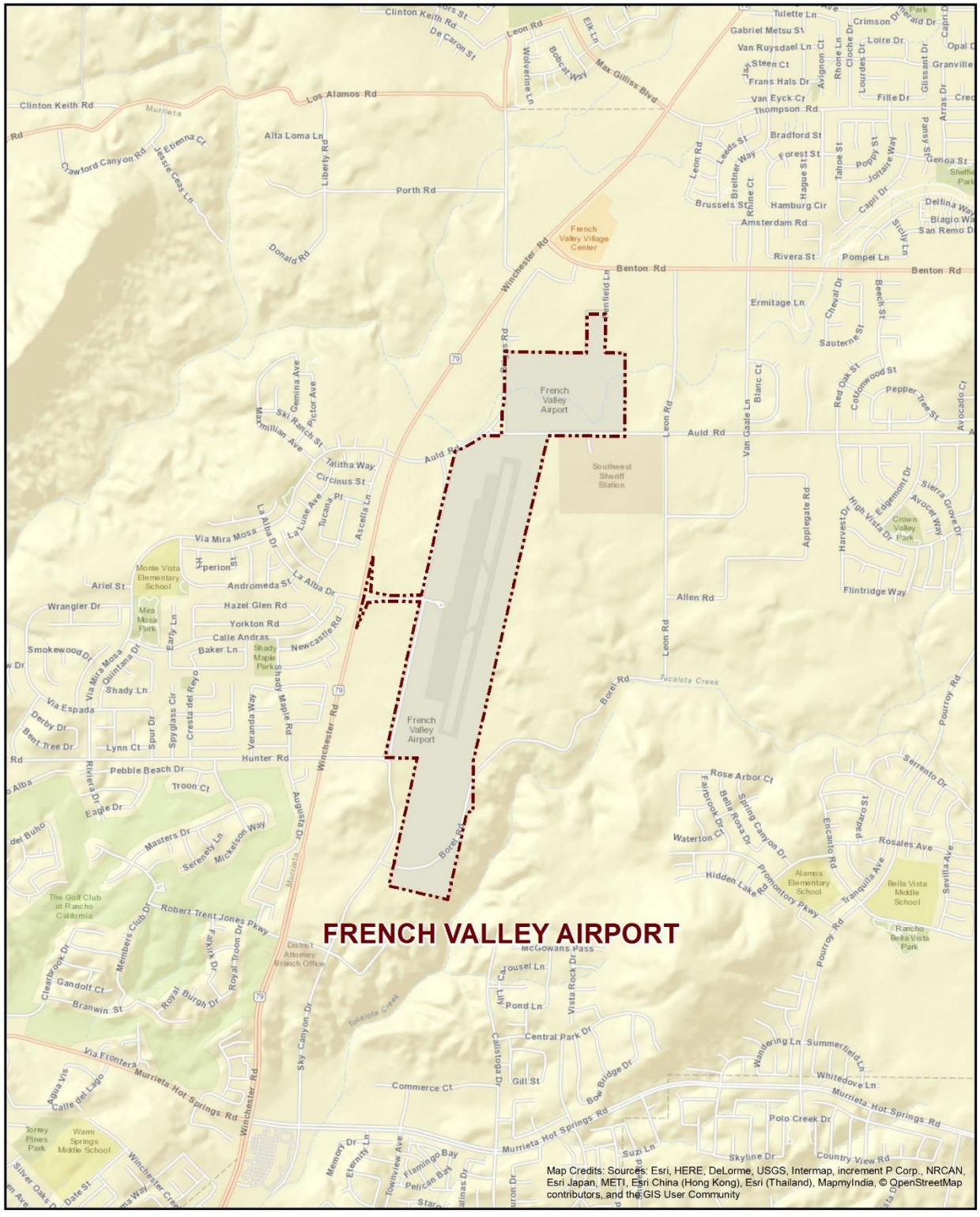

Figure 2-2.

Site Vicinity Map

Photo 2: *Looking north across an FBO ramp.*

2.2 Airport Setting

F70 is located in the unincorporated community of French Valley in southwestern Riverside County (see **Figure 2-1**). Land use in the vicinity of the airport includes commercial use, some heavy industrial use and multiple residential subdivisions to the west. Much of the area to the north and east is rural residential, though the area is rapidly growing (see **Figure 2-2**).

The area around F70 is characterized by a desert climate, with hot dry summers and warm winters. Average temperatures range from the low 60s in degrees Fahrenheit (°F) during the winter months to high 90s °F during the summer. The average annual precipitation is 11.5 inches. The airport is located at a surveyed elevation of 1,349.5 feet above mean sea level (MSL).

The FAA defines the critical zone for wildlife hazards as the area within 10,000 feet of aircraft movement areas and within 5 miles of approach/departure surfaces (see **Figure 2-3**).

Photo 3: *The infield is dominated by large expanses of short grass (looking south).*

Photo 4: *Looking west from the eastern property boundary.*

Dominant landscape features within the Airport Operations Area (AOA) include hardscapes and annual short grasslands. Hardscapes include runways and taxiways, aircraft parking, storage areas, roads, buildings, hangars, and other airport structures. Infield areas are characterized by annual short grasslands and weedy vegetation along the eastern property boundary.

Photo 5: *Looking south along the eastern perimeter fence at an area dominated by weedy vegetation.*

2.3 Wildlife Attractants in the Airport Vicinity

Some natural and constructed features were observed that could attract potentially hazardous wildlife to the airport, and these features were considered during development of the wildlife survey design (see **Figure 2-3**). Such features included Tucalota Creek, The Golf Course at Rancho California, and the small pond located on airport property, but outside and north of the airport perimeter fence. These observations were used as input to develop the wildlife survey design (see **Figure 2-3**).

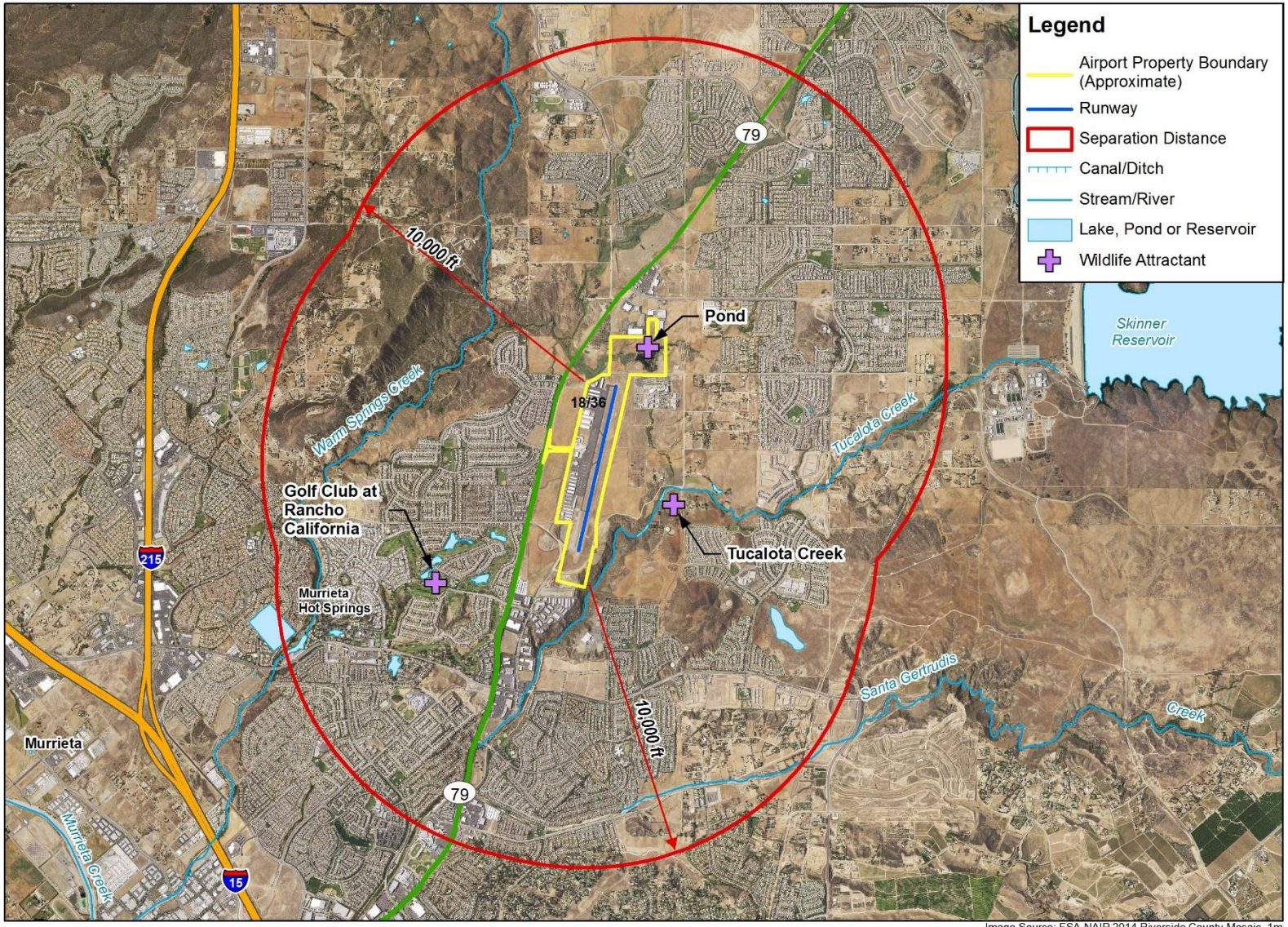

Image Source: FSA-NAIP 2014 Riverside County Mosaic, 1m
National Hydrography Dataset (NHD): HUC-8 18070302 and 18070202

Figure 2-3.

FAA Critical Zone (10,000-ft Separation Distance) and Observed Wildlife Attractants

2.3.1 On-site Wildlife Attractants

Wildlife attractants on the airport are associated with large expanses of short grass areas in the AOA and the weedy vegetation along the eastern property boundary. Although the airport is equipped with a complete perimeter fence, coyotes gain access to the AOA through holes in the fence and gaps beneath the fence. Several culverts are located along the eastern property boundary that allow mammals to enter the AOA.

Photo 6: *Culverts with open ends allow coyotes and other mammals to enter the AOA.*

Pond Northeast of Runway

An unnamed pond can be found northeast of the AOA on airport property as shown on Figure 2-3. Surrounded by large cottonwood and eucalyptus trees, this pond provides all the necessary elements for wildlife to forage, drink water, and nest. Monitoring Point 8 was established near this pond, which was visited throughout the year by medium- to large-sized waterfowl and shorebirds throughout the year (see **Figure 4-1**).

2.3.2 Off-site Wildlife Attractants

The Golf Course at Rancho California is a public golf course is located southwest of the AOA (see **Figure 2-3**). Golf courses are especially attractive to wildlife, especially avian species, due to the large grassy areas and numerous small ponds. These features provide birds with foraging opportunities. Monitoring Point No. 7 was established near the golf course pond. This and all monitoring points are discussed in **Chapter 4** and shown on **Figure 4-1**.

2.3.3 Regional Wildlife Attractants

The airport is located approximately 3.25 miles west of Skinner Reservoir, a manmade lake that receives water from the California Aqueduct. Skinner Reservoir provides wildlife with opportunities for foraging, feeding, nesting, and protection. The reservoir is inhabited and visited by a wide range of birds and other wildlife species such as herons, ducks, hawks, rabbits, squirrels, and deer.

2.3.4 Wildlife Hazard Management Efforts

County maintenance staff members conduct limited wildlife hazard management efforts. Staff members harass wildlife when it observed on the runway. Vegetation within runway safety areas is mowed when weather and growing conditions permit.

Photo 7: *Short grasslands on the airport are mowed as growing conditions permit.*

F70 includes a 6-foot chain-link perimeter fence that is equipped with barbed wire outriggers. Vegetation has grown adjacent to the perimeter fence that provides suitable nesting habitat for birds and cover for mammals. Numerous holes were observed in and beneath the fence that that allow medium- to large-sized mammals to access the AOA (e.g., coyotes). Several gates contain large holes and gaps that also provide wildlife with access to the AOA.

Photo 8: *Dense vegetation grows along the perimeter fence.*

Chapter 3

Regulatory Context and Applicable Regulations

Most wildlife and their habitats are protected by one or more federal, state, and/or local laws. Before conducting any type of active wildlife hazard management at the airport, whether harassment or lethal control, the legal status of all species must be determined. Many of the resource management agencies involved in wildlife management require permits to actively manage the target species, and they will generally issue permits depending on the species and management method used. The County is responsible for adhering to federal, state, and local regulations regarding wildlife management and for obtaining the appropriate permits.

3.1 Federal Regulations Pertaining to Wildlife Management

The federal government has passed several acts to protect wildlife, and the acts form the basis of most wildlife regulations included in the Code of Federal Regulations. Federal wildlife laws are primarily administered and enforced by the USFWS and include migratory birds and threatened and endangered species of flora and fauna.

Each of the following federal Acts has the potential to affect wildlife management activities at airports and must be considered when enacting wildlife hazard management measures:

- The Clean Water Act (Sections 404, 402, and 401)
- The Endangered Species Act (ESA)
- The Fish and Wildlife Coordination Act (FWCA)
- The Bald and Golden Eagle Protection Act (BGEPA)
- The Migratory Bird Treaty Act (MBTA)
- The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)
- The National Environmental Policy Act (NEPA)
- Executive Order 11988, Floodplain Management

3.1.1 Clean Water Act (Sections 404, 402, and 401)

Activities that result in a discharge of dredged or fill material into waters of the United States are regulated by the U.S. Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA). Discharges of dredged or fill material into waters of the United States, including wetlands, generally require a permit from USACE. However, isolated wetlands that are not hydrologically connected to waters of the United States are not regulated by USACE. If activities designed to manage wildlife hazards would result in the discharge of dredged or fill material into a jurisdictional water of the U.S., the County would need to apply for a permit from USACE before completing such activities.

Pursuant to Section 401 of the CWA, projects that require a USACE Permit for the discharge of dredge or fill material must also obtain a certificate from the appropriate state agency to confirm that the intended dredge or fill activity is consistent with the state's water quality standards and criteria. In California, the authority to grant water quality certification is delegated by the State Water Resources Control Board (SWRCB) to the Regional Water Quality Control Boards (RWQCBs). If wildlife hazard management activities at F70 necessitated a federal water quality permit, the County would need to cooperate with the issuing federal agency to obtain Section 401 certification.

Section 402 of the Clean Water Act prohibits the discharge of all pollutants into surface waters unless permitted under the National Pollution Discharge Elimination System (NPDES), which is administered by EPA or by a state with a federally approved control program (33 USC 1311, 1342). A General Construction Activity Storm Water Permit is a type of NPDES permit that allows stormwater waste discharges associated with construction activity into surface waters of the state. This permit is required for construction activities involving one or more acres of soil disturbance; discharges that contribute to violation of water quality standards, or are significant contributors of pollutants to receiving waters; specified industrial activities; or discharges from municipal storm drain systems serving populations of 100,000 or more. If construction activities associated with the implementation of wildlife management measures at F70 would result in the disturbance of 1 acre or more or create any non-point source discharge, the disturbance would contribute to a violation of state water quality standards. In such instances, the County would need to apply for a NPDES permit.

3.1.2 Endangered Species Act

Section 7 of the Endangered Species Act (ESA) (16 United States Code [USC] 1531 to 1543) requires all federal agencies, in consultation with the USFWS and National Marine Fisheries Services (NMFS), to ensure that their actions do not jeopardize the continued existence of species listed as endangered or threatened, or result in the destruction or adverse modification of the critical habitat of these species. Through federal actions and the establishment of state programs, the federal ESA:

- Authorizes the determination and listing of species as endangered and threatened;
- Prohibits unauthorized taking, possession, sale, and transport of endangered species;
- Provides authority to acquire land for the conservation of listed species, using land and water conservation funds;
- Authorizes establishment of cooperative agreements and grants-in-aid to states that establish and maintain active and adequate programs for endangered and threatened wildlife and plants;

- Authorizes the assessment of civil and criminal penalties for violating the Act or regulations; and

- Authorizes the payment of rewards to anyone furnishing information leading to arrest and conviction for any violation of the Act or any regulation issued thereunder.

The Federal ESA would be applicable at F70 if any habitat management actions directed towards a species causing a threat to air traffic also affected critical habitat for a species listed as federally endangered or threatened. Compliance with the ESA also would affect abatement methods directed at a listed species that causes threats to air traffic. Activities that would affect species protected under the federal ESA were not identified during standardized wildlife surveys. A list of federal- and state-listed species are presented in **Appendix E**. If proposed wildlife management activities at F70 had the potential to affect a listed species, the FAA would be required to consult with the USFWS.

3.1.3 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA) requires all federal agencies to consult with the USFWS, NOAA Fisheries, and the California Department of Fish and Wildlife (CDFW) before they approve projects that affect, control, or modify surface waters. Although the recommendations of these agencies are not binding, federal agencies are required to "give full consideration" to measures recommended by these agencies in order to reduce impacts on wildlife and fisheries resources. Numerous wildlife species use the land and water resources in the vicinity of F70. If wildlife management activities on F70 would affect nearby surface waters, the County would need to coordinate with the USFWS, National Oceanic and Atmospheric Administration (NOAA) Fisheries, and the CDFW to avoid or mitigate adverse effects.

3.1.4 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) provides for the protection of the bald eagle and the golden eagle by prohibiting, except under certain specified conditions, the taking, possession, and commerce of such birds. The BGEPA allows take, possession, and transportation of bald and golden eagles under specified conditions, including scientific, educational, and Native American religious purposes, or in circumstances when take may be necessary to ensure the protection of wildlife, agriculture, or other interests particular to a specific locality. Before taking, possessing, or transporting any bald or golden eagle, or golden eagle nest, a permit must be obtained from USFWS. To manage wildlife hazards associated with golden eagles or their nests, the County will be required to consult with USFWS and obtain an eagle permit, as appropriate. (Refer to Chapters 5 and 6 for additional information regarding the management of eagles and other raptors.)

3.1.5 Migratory Bird Treaty Act of 1918

The Migratory Bird Treaty Act (MBTA) was established with the U.S., Great Britain (for Canada), Mexico, Japan, and Russia for the protection of migratory birds. Specific provisions include the establishment of a Federal prohibition, unless permitted by regulations, to:

> …pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention…for the protection of migratory birds…or any part, nest, or egg of any such bird (16 U.S.C. 703).

The MBTA applies to several species that were identified during standardized wildlife surveys at F70. To reduce the threat that species afforded protection under the MBTA, an airport operator must obtain a depredation permit from the USFWS before it can lethally remove birds and nests with eggs or young. (No permits are required from USFWS to manage habitat or harass/disperse MBTA species.)

Numerous migratory birds use habitats on F70 and in its vicinity. Since wildlife management activities could affect any of these birds, the County must consult with and obtain a migratory bird permit from the USFWS, which includes an airport depredation permit for direct lethal control if required in the interest of public aviation safety. Once procured, this permit must be renewed annually and maintained on file in the Airport Administration Office. (For more information on permits, refer to Chapters 5 and 6.)

3.1.6 Federal Insecticide, Fungicide, and Rodenticide Act

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) gives the EPA authority over the distribution, sale, and use of pesticides. All pesticides used in the United States must be registered (licensed) by the EPA. Registration ensures that pesticides will be properly labeled and that, if used in accordance with specifications, will not cause unreasonable harm to the environment. Use of each registered pesticide must be consistent with use directions contained on the label or labeling.

FIFRA applies to some ongoing and recommended wildlife hazard management measures at F70. When the use of pesticides is included as part of an integrated wildlife management program, the property owner is responsible for ensuring that all products used to achieve the program goals are implemented according to applicable regulations and instructions.

3.1.7 National Environmental Policy Act

Under the National Environmental Policy Act of 1969 (NEPA) and its implementing regulations (40 CFR Parts 1500 to 1508), federal agencies must analyze and disclose the environmental effects of their proposed actions and a reasonable range of alternatives in the appropriate level of

assessment. Specifically, NEPA is triggered when an action requires a permit, entitlement, or funding from a federal agency; when an action is jointly undertaken with a federal agency; or when an action is proposed on federal land. Since a WHA is a study, it is not subject to review under NEPA. However, the implementation of some wildlife hazard management measures identified in the WHA may be subject to NEPA.

3.1.8 Executive Order 11988, Floodplain Management

Executive Order 11988 requires that all federal agencies take actions to reduce the risk of flood loss, to restore and preserve the natural and beneficial values served by the floodplain, and to minimize the impact of floods on human safety, health, and welfare. The Order defines floodplains as "the lowland and relatively flat areas adjoining inland and coastal waters including flood prone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year" (i.e., the area that would be inundated by a 100-year flood).

If proposed, wildlife management practices would involve a federal action that could impact floodplains, the County will take appropriate actions to minimize impacts to the floodplain.

3.2 State of California Laws and Regulations

The State of California has passed many environmental laws and regulations to protect wildlife and habitat. The following laws and regulations may apply to specific wildlife hazard management measures at F70:

- The California Endangered Species Act
- The California Fish and Game Code (various sections)
- The Porter-Cologne Water Quality Act
- Herbicide and Pesticide Use
- The California Environmental Quality Act

3.2.1 California Endangered Species Act

Pursuant to the California Endangered Species Act (CESA) and Section 2081 of the California Fish and Game Code (FGC), a permit is required from the CDFW for projects that could result in the "take" of a state-listed threatened or endangered species. Under CESA, the definition of "take" applies to an activity that would directly or indirectly kill an individual of a species. Unlike the federal ESA, the definition does not include activities that "harm" or "harass" such species. Wildlife hazard management activities at F70 that require the removal of a state-listed endangered or threatened species would be subject to CESA.

3.2.2 California Fish and Game Code, Section 3470-3472.2

The California FGC recognizes that resources on California's public use airports must be managed in a way that is both biologically sound and in accordance with FAA regulations and policies. The code allows airport operators to protect the health, welfare, and safety of the traveling public through the performance of limited and authorized wildlife hazing, harassment, and depredation. Such activities may be performed only when they are in accordance with a current valid federal fish and wildlife depredation permit and when the following conditions are met:

(a) The taking occurs on lands owned or leased by the airport.

(b) The taking does not occur on lands owned or leased by the airport that are reserved for habitat mitigation or conservation purposes of the species being taken, including lands in a habitat conservation plan, or a natural communities conservation plan.

(c) There is no taking of a fully protected, candidate, threatened, or endangered species.

The code states that such take is authorized only to relieve or prevent injurious situations and may only be performed as part of an integrated wildlife management program that emphasizes nonlethal management techniques.

3.2.3 California Fish and Game Code – Fully Protected Species

Four sections of the California FGC identify fully protected species: Sections 3511, 4700, 5050, and 5515. The statutes prohibit take or possession of fully protected species at any time. The CDFW is unable to authorize incidental take of fully protected species when activities are proposed in areas inhabited by those species, with the exception of specified scientific purposes. The presence of any fully protected species at F70 would require additional coordination with the CDFW. Management activities at F70 that may be subject to state codes associated with fully protected species could occur if such a species requires removal because it posed a potential hazard to public safety. White-tailed kites are identified as fully protected species and were observed during the 12-month survey at F70.

3.2.4 California Fish and Game Code Section 1602 – Streambed Alternations

Diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California that supports wildlife resources are subject to regulation by the CDFW, pursuant to Section 1602 of the FGC. The code identifies a stream as a body of water that flows at least periodically or intermittently through a bed or channel that has banks and supports wildlife, fish, or aquatic life. The CDFW may also have jurisdiction over altered or artificial waterways based on the value of those waterways to fish and wildlife. Section 1602 would apply to wildlife hazard management measures at F70 if the County wished to alter a stream near the airport to remove or reduce a wildlife hazard.

3.2.5 Porter-Cologne Water Quality Control Act

Pursuant to the Porter-Cologne Water Quality Control Act, waters of the state fall under the jurisdiction of Regional Water Quality Control Boards (RWQCBs), which must prepare and maintain water quality control plans or basin plans. Each plan identifies water quality standards for surface water and groundwater, and sets forth actions to control pollution sources to achieve the standards. Projects that affect wetlands or waters must meet the waste discharge requirements of the RWQCB.

3.2.6 Herbicide and Pesticide Use

The California Department of Pesticide Regulation (DPR) and the County Agricultural Commissioner (CAC) regulate the sale and use of pesticides and herbicides in the County of Riverside. Requirements that are specific for use in California may be associated with many pesticides approved by the EPA. Applicators of a pesticide designated as a restricted material must either be licensed by the Department of Pesticide Regulation (DPR) or work under the supervision of a licensed pesticide applicator. For aquatic pesticides, the applicator must hold a qualified applicator certificate with the category "aquatic." The use of a pesticide must be reported to the CAC where required by law or by agreement with the DPR.

3.2.7 California Environmental Quality Act

The California Environmental Quality Act (CEQA) applies to proposed projects that will be undertaken by, or require the discretionary approval of, state and local agencies. An action is defined as a project under CEQA if it has the potential to cause a direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment that meets the following:

- An activity directly undertaken by any public agency.
- An activity that is supported by contracts, grants, subsidies, loans or other assistance from public agencies.
- An activity that involves the issuance of a permit, license or entitlement from public agencies.

A WHA is a study, and as such it would not be subject to CEQA. However, the implementation of any wildlife hazard management measures that could potentially cause direct or indirect changes in the environment could be subject to CEQA. Proposed wildlife hazard management measures that require compliance with the California ESA and Federal Migratory Bird Act would require CEQA compliance.

3.3 Legal Status of Key Species

Numerous federally listed and state-listed endangered and threatened animal species are known to occur in Riverside County, California, and a complete species list is included in **Appendix E**. F70 is located in the Murrieta and Bachelor Mountain quadrangles of California. **Table 3-1** presents federal- and state-listed animal species that are known to occur in the Murrieta and Bachelor Mountain quadrangles and species of federal and state concern as listed in the California Natural Diversity Database (CNDDB).

As shown on **Table 3-1,** several protected or candidate birds are known to exist in the airport vicinity. Seven of the 30 listed bird species were observed during the 12-month survey period, and these species are highlighted in Table 3-1.

Table 3-1. Federal and State Threatened, Endangered, and Special Concern Animal Species in the Murrieta and Bachelor Mountain Quadrangles

Common Name	Scientific Name	Status
Birds		
Bald eagle	*Haliaeetus leucocephalus*	FD, SE, FP
Belding's savannah sparrow	*Passerculus sandwichensis beldingi*	SE
Bell's sage sparrow	*Artemisiospiza belli belli*	WL
Black-tailed gnatcatcher	*Polioptila melanura*	WL
Burrowing owl	*Athene cunicularia*	SSC
California horned lark	*Eremophila alpestris actia*	WL
Clark's marsh wren	*Cistothorus palustris clarkae*	SSC
Coastal California gnatcatcher	*Polioptila californica californica*	FT, SSC
Cooper's hawk	Accipiter cooperii	WL
Ferruginous hawk	*Buteo regalis*	WL
Golden eagle	Aquila chrysaetos	FP, WL
Grasshopper sparrow	*Ammodramus savannarum*	SSC
Least Bell's vireo	*Vireo bellii pusillus*	FE, SE
Loggerhead shrike	Lanius ludovicianus	SSC
Long-eared owl	*Asio otus*	SSC
Merlin	Falco columbarius	WL
Northern harrier	*Circus cyaneus*	SSC
Olive-sided flycatcher	*Contopus cooperi*	SSC
Oregon vesper sparrow	*Pooecetes gramineus affinis*	FE, SE
Osprey	*Pandion haliaetus*	WL
Prairie falcon	*Falco mexicanus*	WL
Short-eared owl	*Asio flammeus*	SSC
Southern California rufous-crowned sparrow	*Aimophila ruficeps canescens*	FE, SE
Southwestern willow flycatcher	*Empidonax traillii extimus*	FE, SE
Swainson's hawk	*Buteo swainsoni*	ST
Tricolored blackbird	*Agelaius tricolor*	SSC
White-tailed kite	*Elanus leucurus*	FP
Yellow warbler	*Setophaga petechia*	SSC
Yellow-breasted chat	*Icteria virens*	SSC
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*	SSC

Mammals		
Dulzura pocket mouse	*Chaetodipus californicus femoralis*	SSC
Jacumba pocket mouse	*Perognathus longimembris internationalis*	SSC
Los Angeles pocket mouse	*Perognathus longimembris brevinasus*	SSC
Northwestern San Diego pocket mouse	*Chaetodipus fallax fallax*	SSC
San Bernardino kangaroo rat	*Dipodomys merriami parvus*	FE, SSC
San Diego black-tailed jackrabbit	*Lepus californicus bennettii*	SSC
San Diego desert woodrat	*Neotoma lepida intermedia*	SSC
Stephens' kangaroo rat	*Dipodomys stephensi*	FE, ST
Western mastiff bat	*Eumops perotis californicus*	SSC
Reptiles		
Coast horned lizard	*Phrynosoma blainvillii*	SSC
Orangethroat whiptail	*Aspidoscelis hyperythra*	SSC
Red-diamond rattlesnake	*Crotalus ruber*	SSC
Silvery legless lizard	*Anniella pulchra pulchra*	SSC
Two-striped garter snake	*Thamnophis hammondii*	SSC
Western pond turtle	*Emys marmorata*	SSC
Amphibians		
Arroyo toad	*Anaxyrus californicus*	FE, SSC
Coast Range newt	*Taricha torosa*	SSC
Western spadefoot	*Spea hammondii*	SSC

Key:
FE = Federally listed Endangered Species
FT = Federally listed Threatened Species
FD = Federally Delisted Species
SE = State-listed Endangered Species
ST = State-listed Threatened Species
FP = Fully Protected State Species - Identify and provide additional protection to those animals that are rare or face possible extinction
SSC = State Species of Special Concern
WL = State Watch List

Source:
California Natural Diversity Database (CNDDB), 2016.

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Fieldwork for the WHA was accomplished through five tasks performed during a 12-month monitoring that began in June 2015 and concluded in May 2016. These tasks included:

- A preliminary site reconnaissance visit on June 17, 2015;
- Twice-monthly monitoring events focusing on avian wildlife;
- Two small mammal monitoring events;
- Two nocturnal spotlight surveys; and
- Monitoring using a game camera to document wildlife presence.

Sections 4.1 through 4.5 summarize the methods used to conduct these tasks.

4.1 Preliminary Site Reconnaissance Visit

The project team conducted a preliminary site reconnaissance visit on June 17, 2015. The preliminary site visit was performed to identify potential wildlife attractants and monitoring locations for project surveys. As described in FAA AC 150/5200-33B, "Hazardous Wildlife Attractants On or Near Airports" (**Appendix F**), the project team considered the area within 10,000 feet of the airport, as well as the area within 5 miles of approach departure corridors when identifying monitoring locations for the surveys.

Based on the results of the preliminary site visit, the team identified 11 survey locations for the twice-monthly surveys and large mammal monitoring events. Seven locations (points 1 through 6, and 8) were associated with the AOA to provide visual coverage of runways, taxiways, infield turf grass/weedy vegetation and structures, ramps, hangars, and buildings (see **Table 4-1** and **Figure 4-1**). Four monitoring points (point 7 and points 9 through 11) were associated with off-site locations, such as the Golf Club at Rancho California, Tucalota Creek, and adjacent residential development.

Table 4-1
Summary of Wildlife Hazard Assessment Monitoring Locations
French Valley Airport

Monitoring point	Location/View
On-site Monitoring Locations	
1	View of the north end of the airfield, taxiway, approach/departure corridors for Runway 18/36, infield vegetation, north ramp area, and surrounding hangars
2	View of Runway 18/36, taxiways, runway safety areas, terminal, hangars, and FBO ramp area
3	View of the south end of the airfield, approach/departure corridors for Runway 36/18, infield vegetation, taxiway, and surrounding hangars
4	View of south-central end of Runway 36/18, runway safety areas, short grass vegetation, and adjacent off-site areas
5	View of north-central end of Runway 18/36, runway safety areas, short grass vegetation, and adjacent off-site areas

Table 4-1 Summary of Wildlife Hazard Assessment Monitoring Locations French Valley Airport	
Monitoring point	**Location/View**
6	View of vacant land to the west of the airport, power and utility lines
7	View of the Golf Club at Rancho California golf course
8	View of a large pond and woodland area northeast of AOA
9	View of the approach end of Runway 36 and vacant land
10	View of vacant land, power lines, rural residential lands, and a creek.
11	View of the approach end of Runway 18 and commercial development and buildings

4.2 Twice-Monthly Wildlife Monitoring Surveys

Two wildlife surveys were performed for a 12-month period that began in June 2015 and ended in May 2016 for a total of 24 survey events. The following procedures and criteria were implemented during each monitoring event:

- The time of day and order of point counts were randomized;
- Each monitoring point was surveyed for a 5-minute period. All bird and mammal species observed or heard during the 5-minute period were identified and counted, and their locations were recorded on field data forms;
- The behavior of all birds (e.g., perched, flying, loafing, etc.) and the approximate height of birds in flight above ground level were recorded; and
- The associated habitat type was recorded for all mammals and for all perched and foraging birds.

Project biologists recorded observations pertaining to both avian and non-avian species. The condition of the perimeter fence was monitored, and the presence of other non-avian species encountered during the twice-monthly surveys was recorded based on observations, conversations with F70 staff, or other evidence (e.g., scat, tracks, etc.). **Appendix G** presents a copy of the field data form used for each monitoring event.

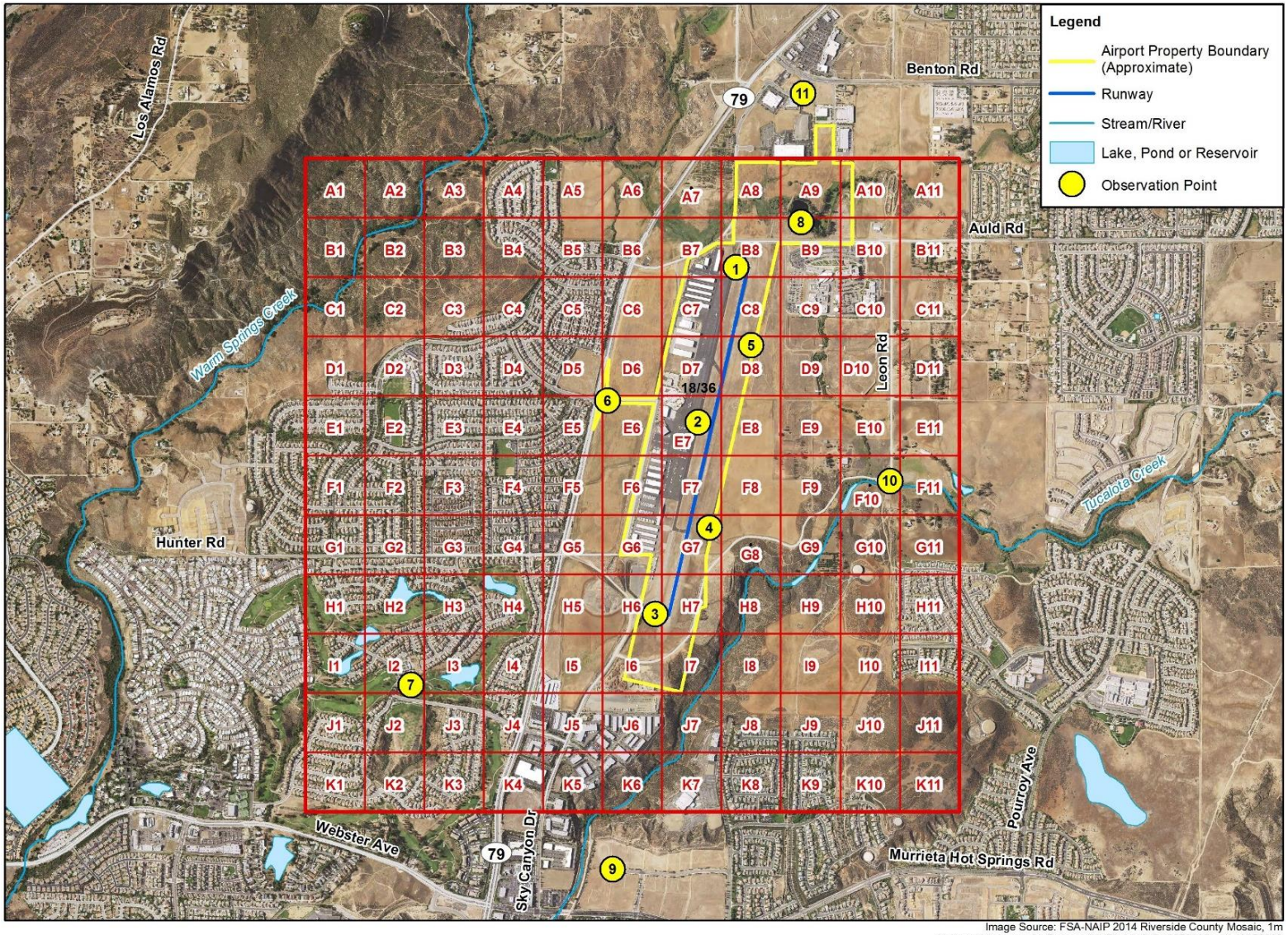


Figure 4-1.
Wildlife Observation Points with Grid

4.3 Small Mammal Surveys

Two small mammals (rodent) monitoring events were performed at F70. One was performed in November 2015 and another in March 2016. Each small mammal monitoring event was conducted over a period of three days and two nights.

Three transects, or trap lines composed of 50 live traps, were established within the airport property for each survey. The traps were placed along each transect at approximately 30-foot intervals. Locations of the trap lines are shown in **Figure 4-2** and described by date below.

For the November and March surveys, trap lines were placed in the following locations:

- Hardscape ground and shrub scrub at south end of Runway 18/36 (Transects A and F on Figure 4-2)
- Medium-height grass (6 to 12 inches) within the runway safety area along the south side of Runway 18/36 (Transects B and E on Figure 4-2)
- Short grass (3 to 6 inches) within the runway safety area along the north side of Runway 18/36 (Transects C and D on Figure 4-2)

4.4 Spotlight Surveys

Two spotlight surveys were conducted during the 12-month period, one in November 2015 and another in March 2016. The field team used the same survey locations identified for the twice-monthly monitoring events as well as driving the perimeter roads, internal roads, and along taxiways. The surveys were conducted approximately 1 to 1.5 hours after sunset.

4.5 Game Camera Surveys

One game camera was installed within the AOA to monitor mammal activity during the 12-month assessment. The location of the game cameras was adjusted to capture conditions in different areas of the airport. Typically a game camera was moved if little wildlife activity was detected in a specific location. **Figure 4-3** illustrates the locations in which the game cameras were placed throughout the study and the following list indicates when each location was used.

- Camera Location 1 - June
- Camera Location 2 - first half of July, August, November
- Camera Location 3 - second half of July, September, October
- Camera Location 4 - December, January, February, March, April, May

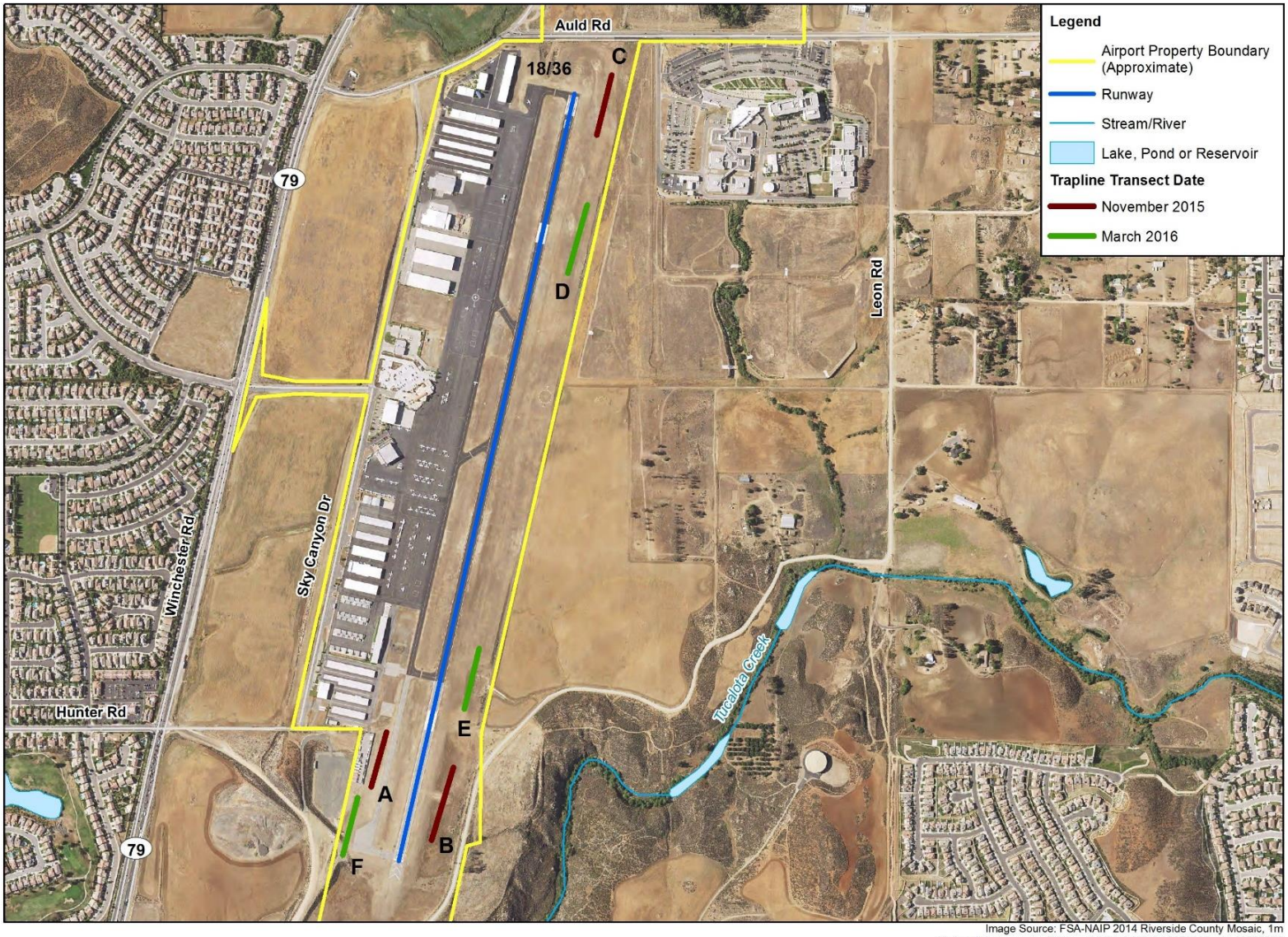


Figure 4-2.
Small Mammal Trapping Transects

Figure 4-3.
Game Camera Locations

Chapter 5

Results and Discussion

Chapter 5 presents the results of the 12-month wildlife monitoring effort performed from June 2015 to May 2016. Section 5.1 presents the results of the twice-monthly avian surveys, and Section 5.2 presents the results of the mammal surveys.

Section 5 presents the following data for each species or avian guild identified:

- Description,
- Abundance,
- Legal status,
- Management techniques, and
- Relative risk posed by each guild or species.

One or more management techniques is presented for each species or guild identified. A guild is defined as a group of species that have similar habits or resource requirements. In some cases, the discussion will identify the likely success of a specific management technique based on past experience, industry data, or site-specific conditions. A more detailed discussion of recommended management techniques that may be implemented by Airport staff is presented in **Chapter 6**, "Conclusions and Recommendations."

In FAA AC 150/5200-33B, "Hazardous Wildlife Attractants on and Near Airports" (**Appendix F**), the FAA acknowledges that not all species pose the same risk to aircraft operations. As the FAA states, "aircraft collisions with birds and other wildlife are a serious economic and public safety problem. While many species of wildlife can pose a threat to aircraft safety, they are not equally hazardous" (FAA, 2007). Some species may pose a greater risk to aircraft operations based on their size, behavior, abundance, or proximity to the airport and its associated airspace.

The conventional guideline in assessing the threat to aviation posed by a specific species considers three priorities in descending order of severity:

- Large flocking birds, such as gulls or waterfowl;
- Small flocking birds, such as starlings; and
- Large singular birds, such as hawks or herons.

Large birds, due to their greater body mass, can strike an aircraft with greater impact and cause more damage to aircraft and affect flight. Birds that congregate in large flocks provide increased opportunities for a strike compared to solitary birds, and flocking birds have the capacity to disable more than one engine when a strike occurs.

A more detailed analysis of the comparative hazards posed by various wildlife was provided in a study by Richard A. Dolbeer, *et al.* entitled *Ranking the Hazard Level of Wildlife Species to Aviation*. The study considered the number of strikes caused by each species, the severity of damage caused by the strike,

and the resulting effect on the flight. The wildlife species that was determined to be most hazardous, deer, was assigned a hazard value of 100. All other wildlife species were then assigned a numerical value in proportion to its risk compared to that of deer. A numerical ranking of relative hazards was developed that reinforces the conventional guidelines. In general, this formula also recognizes a greater threat of large-bodied wildlife. **Table 5-1** summarizes the species and their relative ranking as provided by Dolbeer *et al.*

Table 5-1
Ranking of the Relative Hazards to Aviation of 25 Species of Wildlife

Species	Hazard Value	Species	Hazard Value
1. Deer	100	14. Owls	23
2. Vultures	63	15. Horned lark/buntings	17
3. Geese	55	16. Crows/ravens	16
4. Cormorant/pelican	54	17. Coyotes	14
5. Cranes	47	18. Mourning Dove	14
6. Eagles	41	19. Shorebirds	10
7. Ducks	39	20. Blackbirds-starlings	10
8. Osprey	39	21. American kestrels	9
9. Turkey/pheasant	33	22. Meadowlarks	7
10. Herons	27	23. Swallows	4
11. Hawks	25	24. Sparrows	4
12. Gulls	24	25. Nighthawks	1
13. Pigeons	23		

Source: Ranking the Hazard Level of Wildlife Species to Civil Aviation in the USA, R.A. Dolbeer, et al., 2000.

Throughout Chapter 5, the discussion of each guild or species observed during field studies concludes with a general statement regarding the relative risk that the species or guild poses to aircraft operations at F70. The discussion is based on the following:

- The likelihood that the guild member or species would be involved in a wildlife strike and the potential severity of the impact (effect on flight or potential damage) (see **Table 5-2**); and

- Whether the species was identified by FAA as one of the 25 species or wildlife groups commonly involved in damaging strikes in the United States (see **Table 5-2).**

Table 5-2 General Risk Assessment Matrix			
Probability/ Likelihood of Conflict:	**Severity of Impact/Effect on Flight**		
	Low	**Moderate**	**High**
High (Probable or Likely)	**Moderate**	**High**	**Critical**
Moderate	**Low**	**Moderate**	**High**
Low (Improbable or Unlikely)	**Low**	**Low**	**Moderate**

The discussion of relative hazards is provided so that the airport operator can consider this data when making decisions regarding the allocation of its resources to address wildlife hazards.

5.1 Avian Surveys

As described in Chapter 4, surveys were performed twice each month during the 12-month WHA monitoring period. Observations and evidence of birds and mammals were recorded during these surveys. Avian wildlife observations are summarized in Section 5.1, and mammal observations are summarized in Section 5.2.

Section 5.1.1 summarizes the results for all avian species observed. Ten guilds, or groups of similar species, were identified during WHA field studies. Sections 5.1.2 through 5.1.9 describe the survey results for each guild. The discussion presented for each guild presents the total number of birds observed, the abundance of each species per month, location, behavior observed, and the relative risk posed by the species within the guild.

5.1.1 All Species Combined

As shown in **Table 5-3,** a total of 59 bird species were identified during the 24 field surveys as well as birds that could not be identified to the species level. Nearly 3,900 birds were observed during the 12-month assessment.

Table 5-3. Abundance of Bird Species at F70 June 2015 to May 2016			
Guild and Common Name	***Scientific Name***	**Guild and Species Abundance**	**Guild and Species Percent of Abundance**
Waterfowl		**705**	**18.24%**
American Coot	*Fulica americana*	281	39.86%
Canada Goose	*Branta canadensis*	157	22.27%
Gadwall	*Anas strepera*	2	0.28%
Lesser Scaup	*Aythya affinis*	99	14.04%
Mallard	*Anas platyrhynchos*	112	15.89%
Northern Pintail	*Anas acuta*	30	4.26%
Northern Shoveler	*Anas clypeata*	16	2.27%

Table 5-3. Abundance of Bird Species at F70 June 2015 to May 2016

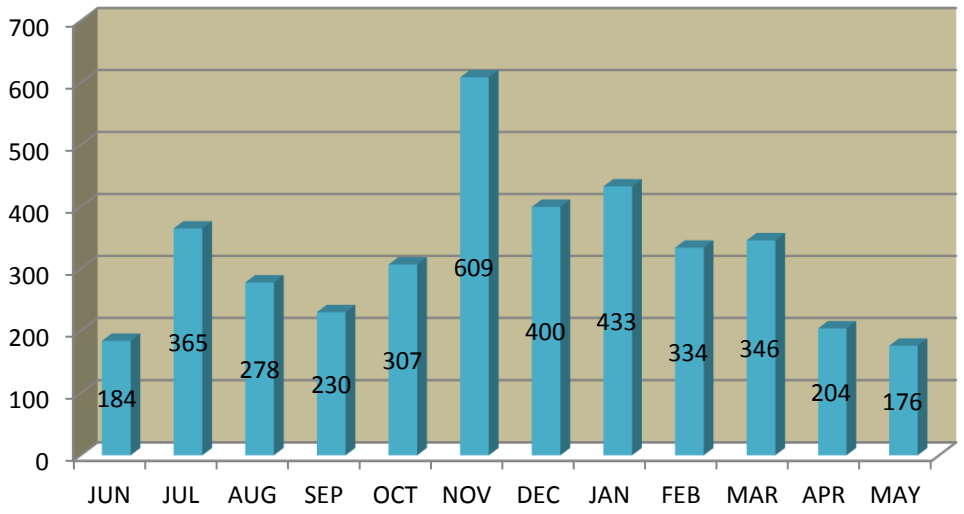
Guild and Common Name	*Scientific Name*	Guild and Species Abundance	Guild and Species Percent of Abundance
Pied-billed Grebe	*Podilymbus podiceps*	4	0.57%
Redhead	*Aythya americana*	4	0.57%
Blackbirds and Starlings		**330**	**8.54%**
Brewer's Blackbird	*Euphagus cyanocephalus*	4	1.21%
European Starling	*Sturnus vulgaris*	294	89.09%
Great-tailed Grackle	*Quiscalus mexicanus*	1	0.30%
Red-winged Blackbird	*Agelaius phoeniceus*	31	9.39%
Doves and Pigeons		**612**	**15.83%**
Eurasian Collared-Dove	*Streptopelia decaocto*	1	0.16%
Mourning Dove	*Zenaida macroura*	579	94.61%
Rock Pigeon	*Columba livia*	32	5.23%
Shorebirds		**133**	**3.44%**
Great Blue Heron	*Ardea herodias*	4	3.01%
Great Egret	*Ardea alba*	6	4.51%
Killdeer	*Charadrius vociferus*	99	74.44%
Snowy Egret	*Egretta thula*	3	2.26%
White-faced Ibis	*Plegadis chihi*	21	15.79%
Sparrows, Finches and Warblers		**734**	**18.99%**
Black-headed Grosbeak	*Pheucticus melanocephalus*	12	1.63%
Blue Grosbeak	*Passerina caerulea*	1	0.14%
California Towhee	*Melozone crissalis*	3	0.41%
House Finch	*Haemorhous mexicanus*	364	49.59%
House Wren	*Troglodytes aedon*	1	0.14%
Lark Sparrow	*Chondestes grammacus*	35	4.77%
Savannah Sparrow	*Passerculus sandwichensis*	49	6.68%
Song Sparrow	*Melospiza melodia*	7	0.95%
White-crowned Sparrow	*Zonotrichia leucophrys*	174	23.71%
Yellow Warbler	*Setophaga petechia*	1	0.14%
Yellow-rumped Warbler	*Setophaga coronata*	87	11.85%
Corvids		**391**	**10.11%**
American Crow	*Corvus brachyrhynchos*	337	86.19%
Common Raven	*Corvus corax*	54	13.81%
Raptors		**150**	**3.88%**
American Kestrel	*Falco sparverius*	52	34.67%
Burrowing Owl	*Athene cunicularia*	25	16.67%
Cooper's Hawk	*Accipiter cooperii*	3	2.00%
Golden Eagle	*Aquila chrysaetos*	1	0.67%
Merlin	*Falco columbarius*	1	0.67%

Table 5-3. Abundance of Bird Species at F70 June 2015 to May 2016

Guild and Common Name	*Scientific Name*	Guild and Species Abundance	Guild and Species Percent of Abundance
Red-tailed Hawk	*Buteo jamaicensis*	65	43.33%
Turkey Vulture	*Cathartes aura*	3	2.00%
Songbirds		**684**	**17.69%**
Black Phoebe	*Sayornis nigricans*	30	4.39%
Bullock's Oriole	*Icterus bullockii*	1	0.15%
Bushtit	*Psaltriparus minimus*	16	2.34%
Horned Lark	*Eremophila alpestris*	276	40.35%
Loggerhead Shrike	*Lanius ludovicianus*	7	1.02%
Northern Mockingbird	*Mimus polyglottos*	6	0.88%
Say's Phoebe	*Sayornis saya*	44	6.43%
Western Bluebird	*Sialia mexicana*	2	0.29%
Western Kingbird	*Tyrannus verticalis*	40	5.85%
Western Meadowlark	*Sturnella neglecta*	262	38.30%
Other		**127**	**3.00%**
Anna's Hummingbird	*Calypte anna*	18	15.52%
Belted Kingfisher	*Megaceryle alcyon*	2	1.72%
California Quail	*Callipepla californica*	63	54.31%
Gambel's Quail	*Callipepla gambelii*	1	0.86%
Greater Roadrunner	*Geococcyx californianus*	2	1.72%
Gull (unidentified species)	*Larus (sp)*	4	0.1
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	7	0.18
Unidentified Bird	*Aves (gen, sp)*	30	25.86%
	Total	**3,866**	**100.00%**

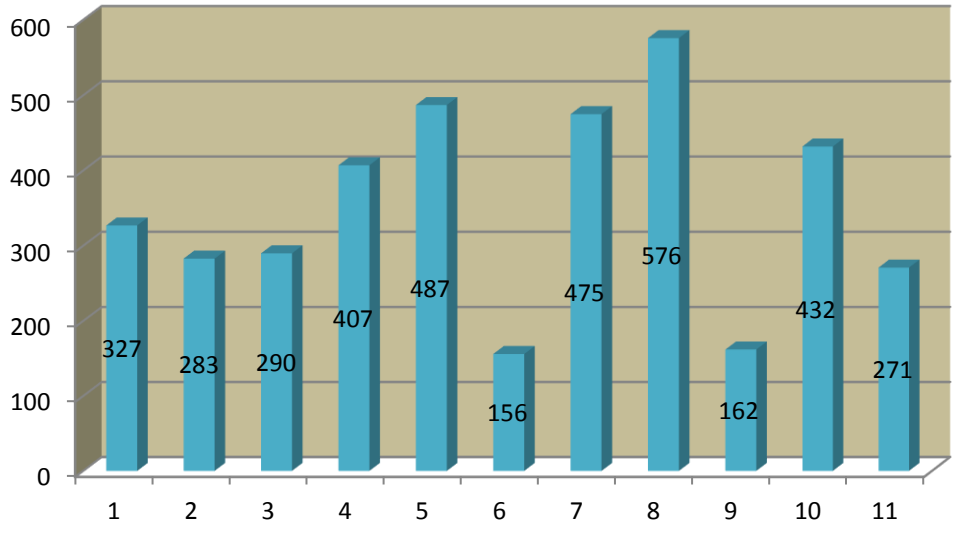
As shown on **Figure 5-1**, birds were generally more abundant during the five-month period from November through March, which correlates to the wintering populations of birds in the region. Approximately 55 percent of all birds were observed during this period. More birds were observed in November than any other month (609 birds), comprising 16 percent of the total number throughout the 12-month monitoring period. The comparatively greater number of birds observed in February was attributable to large flocks of European starlings, American crows, and horned larks that were observed on and around the airport. The fewest number of birds was observed in May (5 percent of the total number observed). The low number may be attributed to very high winds, which cause birds to find temporary shelter.

Figure 5-1. Total Number of Birds Observed On and Near F70 by Month (2015 to 2016)



As shown on **Figure 5-2**, the greatest number of birds (576 birds) was observed from Point 8, which was located on airport property, but outside of the perimeter fence and northeast of Runway 18 (see **Figure 4-1**). Point 8 was located adjacent to an unnamed pond that is surrounded by large cottonwood and eucalyptus trees. Birds were also abundant near Points 4 and 5, which were associated with the runway safety area east of the runway, and at Point 10, which was associated with power lines (perching) an Tucalota Creek . Fewer birds were observed at points 6 and 9, both of which were located off-site in open areas to the west and south of airport where there were few attractants for birds.

Figure 5-2. Total Number of Birds Observed On and Near F70 by Location (2015 to 2016)

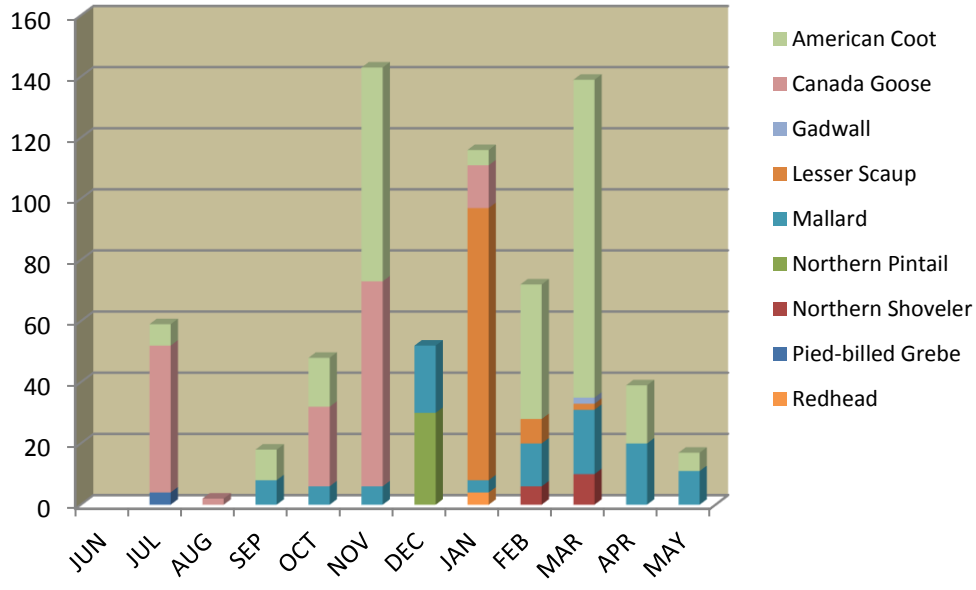


5.1.2 Waterfowl

Description. Waterfowl are large aquatic birds with webbed feet and flat, heavy bills. Waterfowl pose one of the most serious threats to aircraft operations because of their abundance, size, and flocking behavior. Waterfowl species are attracted to open water ponds and basins to feed, nest, loaf, and escape predators. Geese and ducks will also frequent agricultural fields, parks, and golf courses to graze on the manicured grasses. Although nine species of waterfowl were observed during the 12-month monitoring period, American coots and Canada geese accounted for nearly two-thirds of the waterfowl observed.

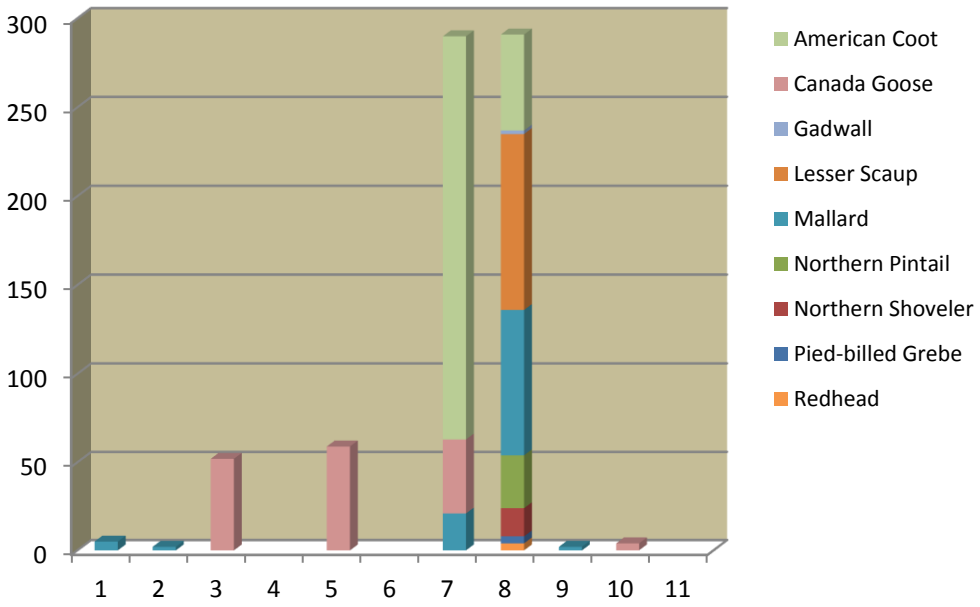
Abundance. Waterfowl accounted for approximately 18 percent of the total number of birds observed during the assessment. Waterfowl were observed during all months except June. However, waterfowl were significantly more abundant in November through March, when nearly 75 percent of total waterfowl was observed. The abundance of waterfowl during the winter is likely attributable to the presence of overwintering populations (**Figure 5-3**).

Figure 5-3. Waterfowl Observed On and Near F70 by Month (2015 to 2016)



Waterfowl were observed from eight monitoring locations. However, 82 percent were observed from monitoring points 7 and 8 (**Figure 5-4**). Point 7 was located west of F70 at the Golf Club at Rancho California, and point 8 was located adjacent to the unnamed pond that is on airport property northeast of the runway and north of Auld Road. Both of these locations are associated with water bodies that are attractive to waterfowl species. Waterfowl (e.g. Canada geese, mallards) were observed flying across or over the AOA during the 12-month assessment.

Figure 5-4. Waterfowl Observed On and Near F70 by Location (2015 to 2016)



Management and Legal Status. Waterfowl are migratory game birds that are protected by the MBTA. Depredation permits from the USFWS are required for lethal management. However, most waterfowl species can be hunted in areas where firearm discharge is legal during defined periods of the fall and winter in accordance with a valid hunting license and federal waterfowl stamps. The hunting season corresponds with the fall migration period.

F70 is positioned near the Pacific Flyway (see **Figure 5-5**), which supports enormous waterfowl migrations annually. Because the area has been altered significantly as a result of development, migrating and resident waterfowl are attracted to the available water features, such as sanitation ponds, stormwater management ponds, and golf courses. Waterfowl are known to pose a risk to aircraft and human health and safety.

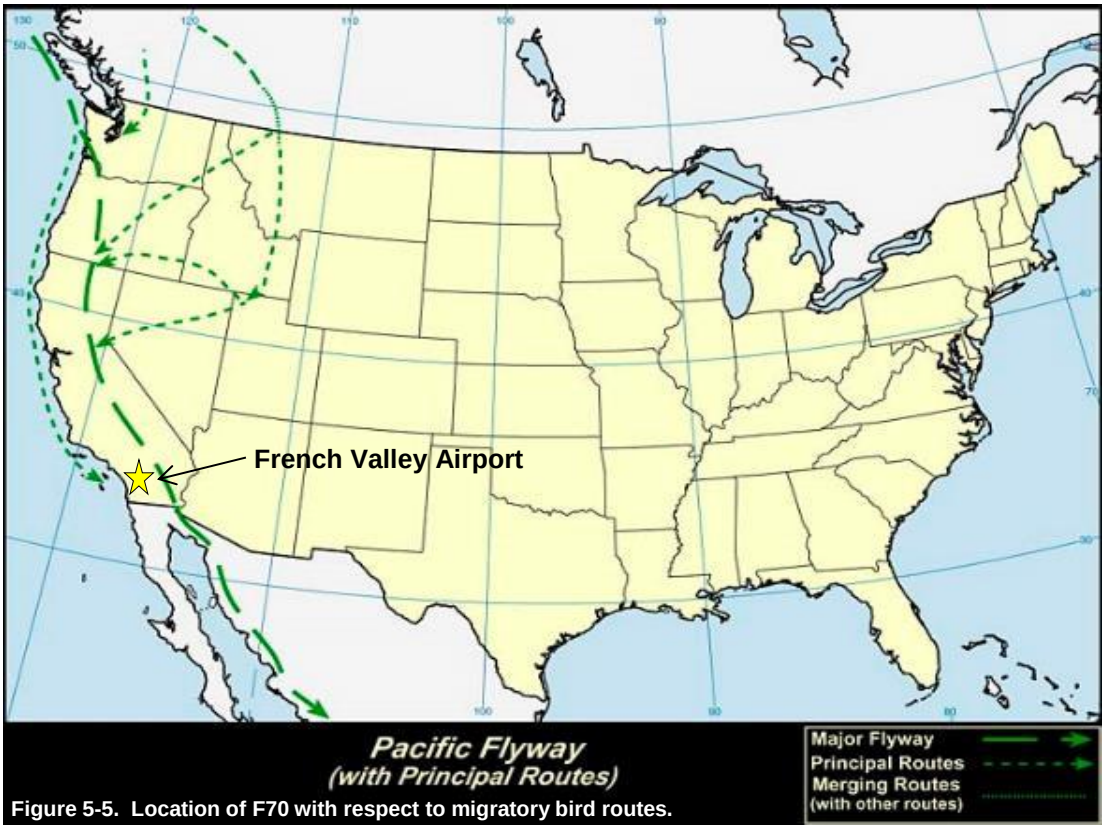


Figure 5-5. Location of F70 with respect to migratory bird routes.

Source: Nutty Birdwatcher, 2012.

Waterfowl were observed frequently near F70 during the five-month period from November through March. The greatest number of waterfowl was observed near areas associated with water bodies. However, even waterfowl attracted to off-site features has the potential to pass through the area at low altitudes and pose a risk to airport operations.

Although waterfowl were observed from on-site monitoring locations, comparatively few waterfowl were observed on the airport; most were observed as they flew above the site. However, if waterfowl are observed on the airfield, they should be harassed immediately and dispersed using vehicles and pyrotechnic devices. Waterfowl that is observed near aircraft movement areas can pose hazards to aircraft operations.

Management Measures. Waterfowl can be harassed from the airfield using pyrotechnic devices, such as screamers and bangers. Airport personnel must be persistent with these methods. Lethal reinforcement may be necessary if waterfowl become habituated to pyrotechnics and become more common and in greater abundance within the AOA. The County should obtain a federal depredation permit to perform lethal management for Canada geese should they occur within the AOA.

Relative Risk. The members of the waterfowl guild have a high likelihood of being involved in a wildlife strike based on their size and flocking behavior. The FAA ranks geese as third in its composite ranking of hazardous wildlife species and ducks as seventh. All have the potential to

cause a high degree of impact on flight. Although no strikes with waterfowl have been documented at F70, waterfowl were abundant near the airport. The overall risk posed by waterfowl at F70 is ***high.***

5.1.3 Blackbirds and Starlings

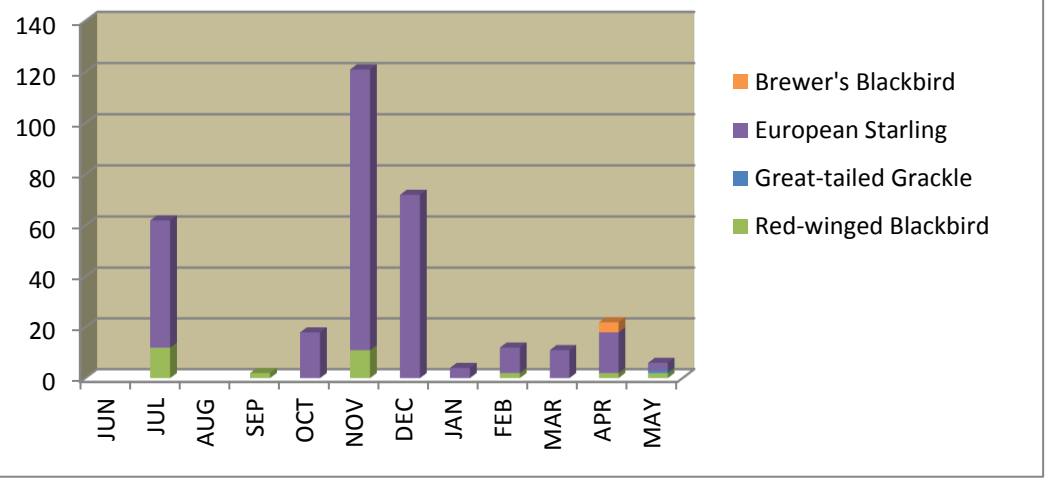
Description. Four species of blackbirds and starlings were observed on and near F70: European starlings, great-tailed grackles, red-winged blackbirds, and Brewer's blackbirds. European starlings comprised 89 percent of the guild members observed, and red-winged blackbirds comprised 9 percent.

European starlings are medium-sized, chunky birds that have short tails that have a triangular shape when flying. During the breeding season, the bills of both male and female starlings are yellow. Red-winged blackbirds are boldly colored and often seen roosting on cattails and on utility wires. Glossy-black males have red-and-yellow shoulder patches. Females are a subdued, streaky brown, almost like a large, dark sparrow.

Starlings and blackbirds are found in a variety of habitats from urban to rural environments. Starlings are attracted to water and to open, grassy areas in which they can forage. They are also attracted to trees or buildings that contain cavities for nesting. Structures with ill-fitting doors or broken windows are readily used. In the winter, these species form roosts in areas where cover and warmth are provided. Brewer's blackbirds and great-tailed grackles often spend days on suburban lawns, parks, golf courses, fields, and marshes. Blackbirds are primarily granivorous, whereas starlings prefer a diet with a higher protein content that includes fruits, insects, spiders, earthworms, garbage, snails, weed seeds, and other grains.

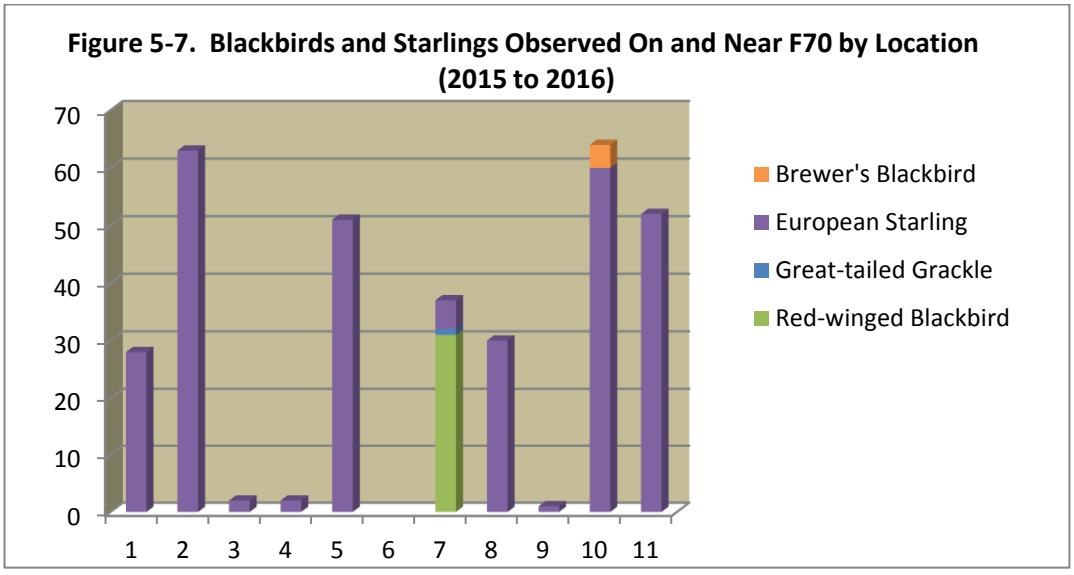
Abundance. A total of 330 blackbirds and starlings was observed, representing approximately 9 percent of the total number of all birds observed. European starlings were observed during most of the year, though more than half were observed during the November and December (see **Figure 5-6**). The higher number observed in November and December coincides with the increased concentrations that occur as starlings form large flocks to exploit resources, such as food. Large flocks of starlings and blackbirds move around the landscape seeking productive foraging areas, and their abundance can vary significantly both on and off the airport.

Figure 5-6. Blackbirds and Starlings Observed On and Near F70 by Month



European starlings were observed from most on- and off-site monitoring locations. Most starlings and blackbirds observed from on-site monitoring points were observed from points 1, 2, and 5, which were located on the northern end of the airport (see **Figure 5-7**). Red-winged blackbirds were only observed near Point 7, which was located on airport property northeast of the runway. Starlings and blackbirds were also observed in comparatively higher numbers from off-site points 10 and 11. Point 10 was located in a rural area east of the airport with open grasslands and near a large transmission line, where starlings were observed loafing in the fields or perching on the transmission line. Point 11 was located north of the airport in a commercial development area, where starlings were observed perching on building and utility lines.

Figure 5-7. Blackbirds and Starlings Observed On and Near F70 by Location (2015 to 2016)



Legal Status. The European starling is an exotic species that was introduced to the United States from Europe in 1890. The species is not protected by federal or state laws, and neither a federal nor state permit is required to take starlings. Blackbirds (tri-colored, red-winged, and

Brewer's), cowbirds, and great-tailed grackles are migratory birds that are protected by the MBTA. However, pursuant to the CFR at 50 CFR 21.43, Depredation Order for Blackbirds, Cowbirds, Grackles, Crows and Magpies, these species (except for tri-colored blackbirds) can be taken any time of the year in California without a federal or state permit when they are "found committing or about to commit depredations upon ornamental or shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance." The following species are specifically listed in the Order: Brewer's blackbird, red-winged blackbird, yellow-headed blackbird, bronzed cowbird, brown-headed cowbird, shiny cowbird, boat-tailed grackle, common grackle, great-tailed grackle, greater Antillean grackle, American crow, fish crow, northwestern crow, and black-billed magpie.

Although these species can be taken, the regulations state that any person or agency acting under the depredation order must:

a. Attempt to control depredation by species listed under this depredation order using non-lethal methods before using lethal control.

b. If a firearm is used to kill migratory birds under the provisions of this order, nontoxic shot or nontoxic bullets must be used in most cases. However, this prohibition does not apply to an air rifle, an air pistol, or a 22-caliber, rim-fire firearm for control of depredating birds under this order.

c. Allow any Federal, State, tribal, or territorial wildlife law enforcement officer unrestricted access at all reasonable times (including during actual operations) over the premises on which you are conducting the control. The officer must be furnished with whatever information he or she may require about the control operations.

d. Only kill birds under this order in a way that complies with all State, tribal, or territorial laws or regulations. You must have a State, tribal, or territorial permit required to conduct the activity.

e. Not sell, or offer to sell, any bird, or any part thereof, killed under this section, but you may possess, transport, and otherwise dispose of the bird or its parts.

f. Provide to the appropriate Regional Migratory Bird Permit Office an annual report for each species taken by the date that is specified on the permit.

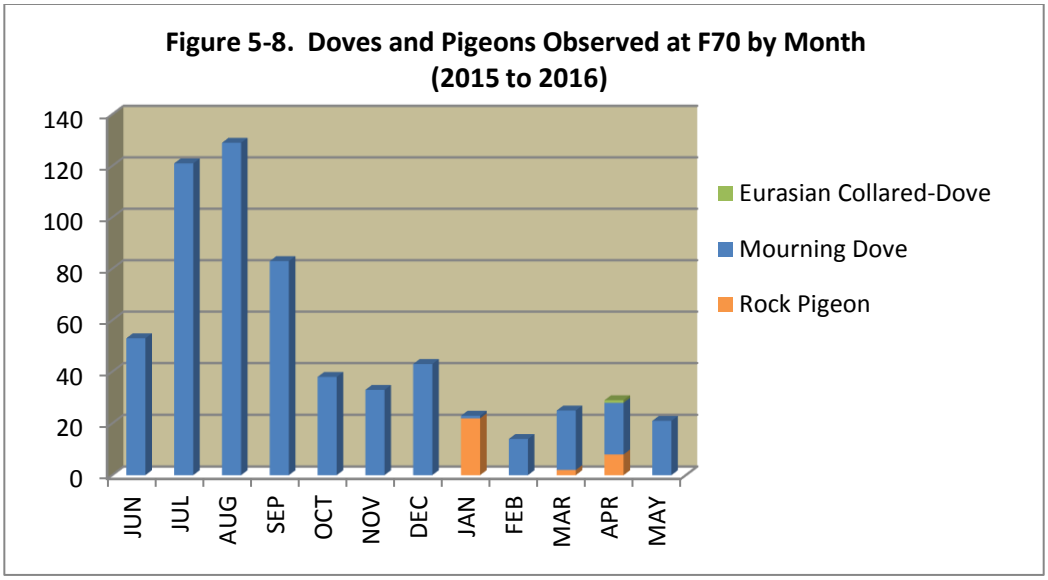
Management. Flocks of starling and blackbirds can be harassed from the airfield using pyrotechnic devices, such as screamers and bangers. Airport personnel must be persistent with these methods. Lethal reinforcement may be necessary if European starlings become habituated to pyrotechnics and become more common and in greater abundance within the AOA. A depredation permit is not required for the lethal management of starlings.

Relative Risk. Blackbirds and starlings can pose a significant hazard to aircraft because of their dense size and flocking behavior. These species have a high likelihood of being involved in strikes with aircraft. When strikes with these species occur, they usually involve multiple birds that can be ingested by aircraft engines, and the severity of strikes associated with these species is moderate. The FAA assigns a composite hazard ranking of 20 to blackbirds/starlings. Although no strikes with blackbirds or starlings have been recorded at F70, starlings and blackbirds comprised nine percent of all birds observed. Starlings and blackbirds were observed on the north end of the airfield, off-site locations, and passing through F70 airspace. The overall risk posed by species within this guild at F70 is ***moderate***.

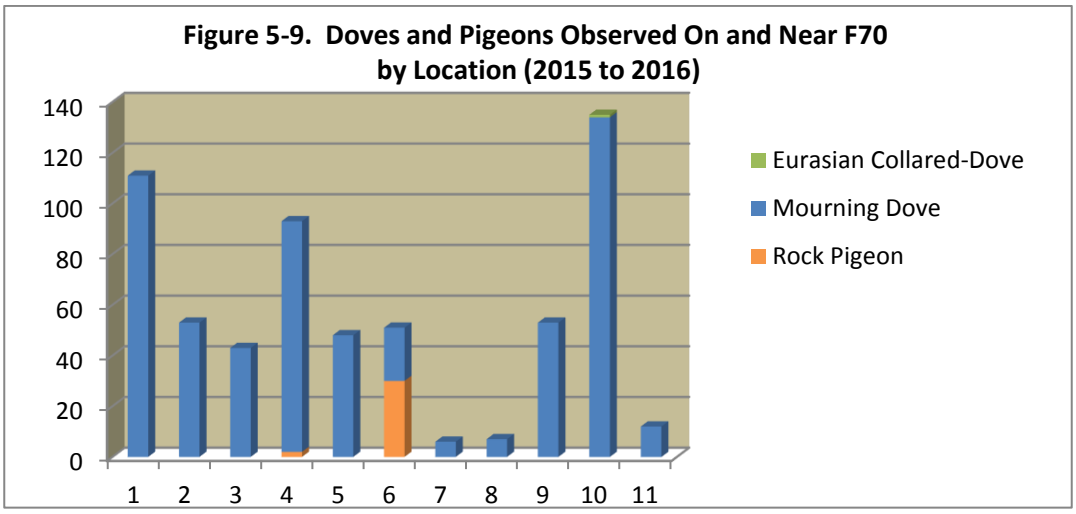
5.1.4 Doves and Pigeons

Description. Doves and pigeons are medium-sized songbirds that feed on seeds and grain and can be found in open areas. Rock pigeons and mourning doves can be found in areas that are closely associated with human activity, such as parks and agricultural operations, and they nest in manmade structures such as parking ramps, buildings, and bridges. Doves and pigeons feed on grass and weed seeds in fields, refuse, and handouts from humans. Three species of doves and pigeons were observed: mourning dove, rock pigeon, and Eurasian collared-dove. All three species can pose hazards to aircraft operations because of their abundance and flocking behavior.

Abundance. A total of 612 doves and pigeons was recorded, comprising approximately 16 percent of the total number of birds observed during the 12-month survey period. Of the three species observed, approximately 95 percent were mourning doves (**Table 5-3**). Mourning doves are year-round residents of the region, but they were observed in larger numbers from July through September (**Figure 5-8**), when they were observed foraging within the AOA.



As shown on **Figure 5-9**, doves and/or pigeons were observed from every monitoring location, but more than half were observed from points 1, 4, and 10. Point 1 was located near the northern end of the runway, and point 4 was located on the southeastern side of the runway. At both of these points, mourning doves were frequently observed loafing and foraging in the short infield grass. Point 10 was located east of the airport adjacent to Tucalota Creek with open grasslands and near a large transmission line. Mourning doves were observed loafing in the fields or perched on the transmission line.



Management and Legal Status. Mourning doves and Eurasian collared-doves are migratory game birds that are protected by the MBTA. Depredation permits from the USFWS are required for lethal management. However, doves can be hunted during defined periods in the fall with a valid hunting license. Rock pigeons were introduced to the U.S. from Europe, and they are not protected by federal or state laws. Pigeons may be taken at any time, and there are no reporting requirements.

A combination of techniques including maintaining an interim grass height (6 to 12 inches inches), harassment, and lethal removal of some individuals may reduce the number of mourning doves at F70. It is recommended that the County obtain a federal depredation permit to implement lethal control of mourning doves.

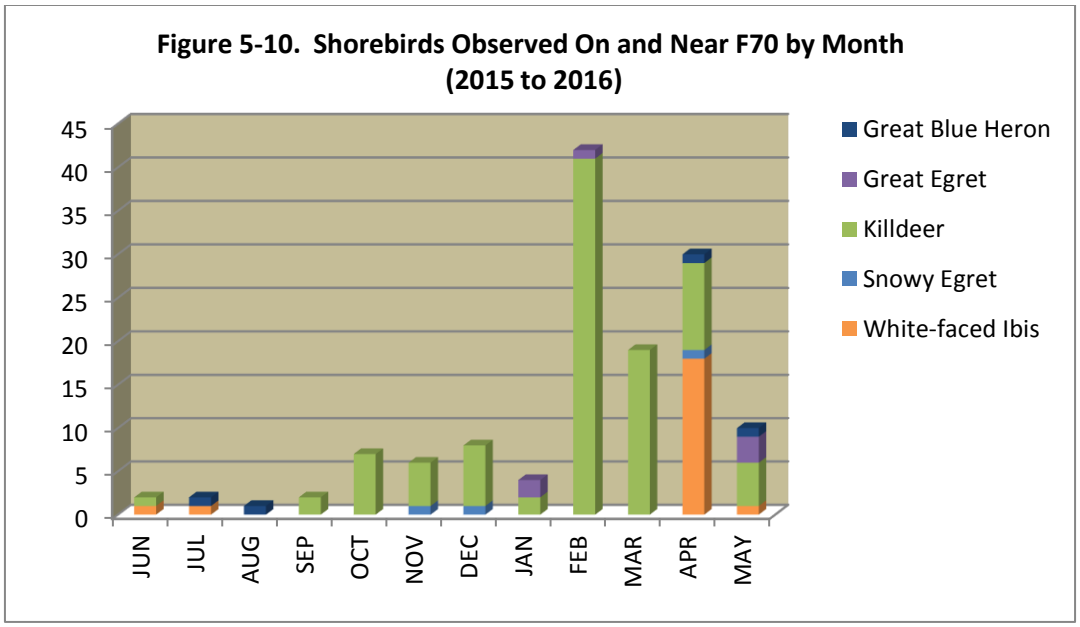
Relative Risk. Doves and pigeons show a moderate likelihood of being involved in a conflict with aircraft, and strikes with these species can result in a moderate impact on flight due to their flocking behavior. The FAA assigns a composite hazard ranking of 13 to pigeons and 18 to mourning doves out of 25 ranked species. Based on the number of doves and pigeons observed and their close proximity to aircraft movement areas, the overall risk posed by this guild is ***critical***.

5.1.5 Shorebirds

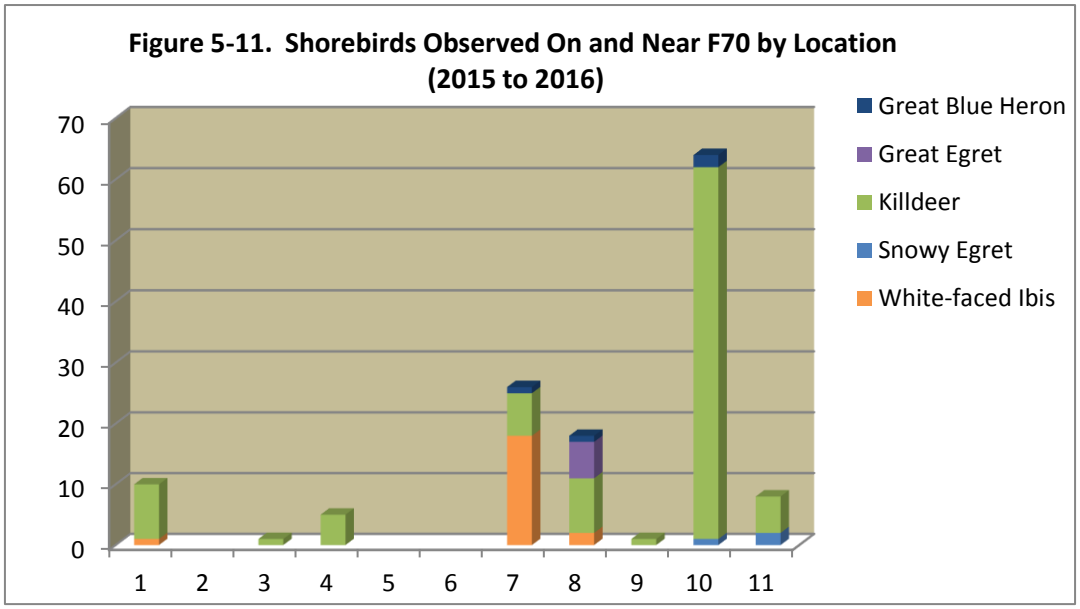
Description. Five shorebird species were observed on and near F70 during site surveys, as well as shorebirds of unidentified species. Approximately 74 percent of the shorebirds were observed were killdeer and 16 percent were white-faced ibis, while three other species comprised the remaining 10 percent of birds observed (Great blue heron, great egret, and snowy egret).

Shorebirds can vary from birds with short, stocky builds and short bills to slender birds with long legs and long bills. All seek small aquatic prey by probing on open shorelines and shallow ponds. Most of the shorebirds observed were killdeer, and white-faced ibis. Killdeer are small birds that have a large, round head, large eye, and short bill. The white-faced ibis is a large, dark wading bird with a long, down-curved bill, dark legs, and an all dark body.

Abundance. A total of 133 shorebirds was observed at F70, and shorebirds comprised only three percent of all birds observed. Shorebirds were observed during all months, but they were most abundant during the three-month period from February to April, when over two-thirds of the total number of shorebirds was observed (**Figure 5-10**). The increased number observed during this three-month period was associated with nesting killdeer.



As shown on **Figure 5-11**, the greatest number of shorebirds was observed from Point 10, which was located off site and east of the airport, adjacent to Tucalota Creek. Killdeer were observed nesting or loafing in open fields near this monitoring location. Larger shorebirds, such as the white-faced ibis, great blue heron, great blue heron, and great egret were observed near waterbodies, such as Tucalota Creek, the Rancho California golf course, and the unnamed pond located northeast of the runway.



Management and Legal Status. Shorebirds and waders are migratory birds that are protected by the MBTA. A depredation permit from the USFWS would be required for lethal management of shorebirds and waders, which is unlikely. When members of this guild are observed in the AOA, they should be harassed using pyrotechnics until they leave the AOA.

Relative Risk. Shorebirds have a high probability of being involved in a strike with aircraft, and their effect on flight can vary by species. Typically, shorebirds would create a low impact on an aircraft flight due to their solitary behavior. However, some shorebirds are quite large, while others, such as killdeer, are small but can occur in large flocks. The FAA assigns a composite hazard ranking of 19 to shorebirds out of 25 ranked species. Although the number of shorebirds observed within the AOA was relatively low, numerous killdeer were observed near aircraft movement areas. The overall wildlife hazard risk posed by shorebirds is ***moderate***.

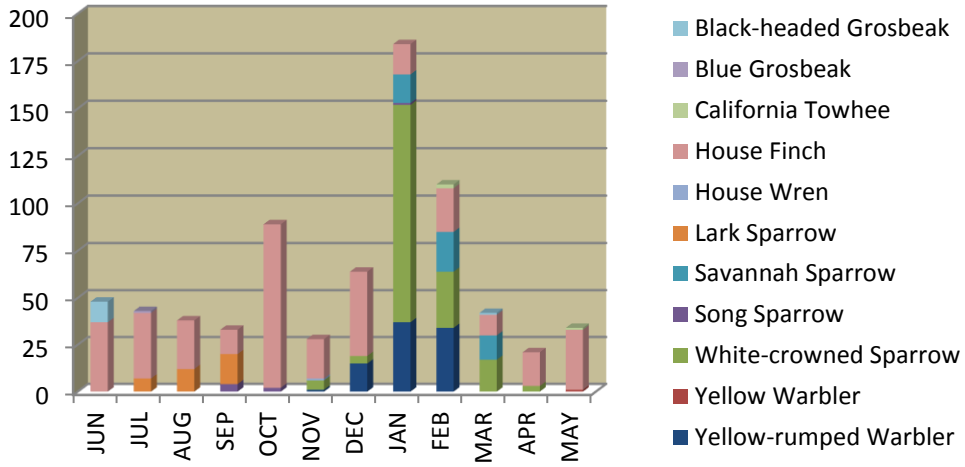
5.1.6 Sparrows, Finches, and Warblers

Guild Description. The sparrows, finches, and warblers guild is composed of small birds that are similar in size to the sparrow. Many are found singly or in small, loose flocks as they feed in open, weedy areas and grass fields. Many species within this guild prefer open, short grassland habitats, while others prefer shrub habitat or manmade resources. Eleven species of sparrows, finches, and warblers were observed, with house finches comprising approximately half of the total number of guild members observed.

Abundance. A total of 734 sparrows, finches, and warblers was recorded, comprising approximately 19 percent of the total number of birds observed. Sparrows, finches, and warblers were the most abundant guild observed during the 12-month assessment. Approximately 50 percent of the birds associated with this guild were identified as house finches, 24 percent were white-crowned sparrows, 12 percent were yellow-rumped warblers, and eight species comprised the remaining 14 percent.

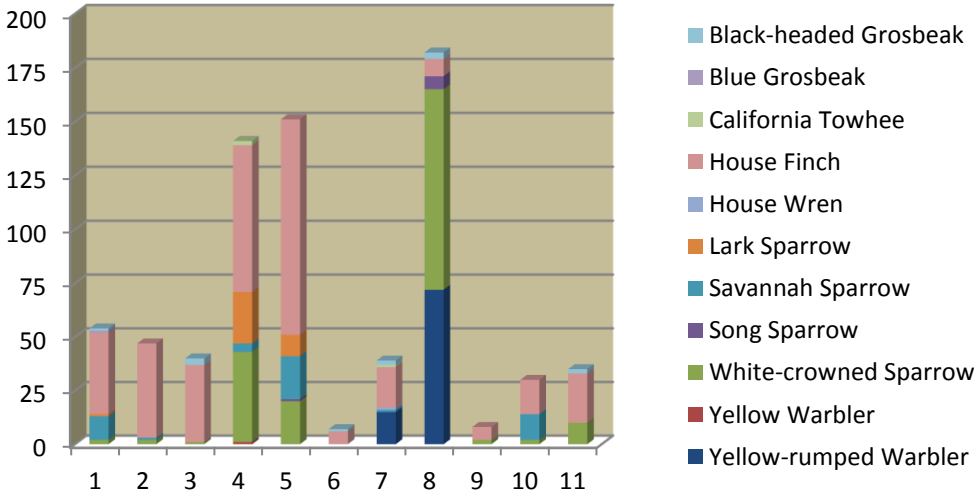
Sparrows, finches, and warblers were observed throughout the year, but were significantly more abundant during January and February, when larger flocks were observed loafing (**Figure 5-12**) in the brush along the airport perimeter fence and perched on the perimeter fence.

Figure 5-12. Sparrows, Finches, and Warblers Observed On and Near F70 by Month (2015 to 2016)



Although sparrows, finches, and warblers were observed from every location, approximately two-thirds were observed from points 4, 5, and 8 (**Figure 5-13**). The abundance of finches and sparrows at points 4 and 5 is likely due to the presence of brush that occurs along the eastern portion of the perimeter fence. This brush provides cover and nesting habitat for these species. The abundance of these species at point 8 was associated with the large cottonwood and eucalyptus trees that surround the pond.

Figure 5-13. Sparrows, Finches, and Warblers Observed On and Near F70 by Location (2015 to 2016)



Management and Legal Status. All species observed within this guild are protected by the MBTA. A depredation permit from the USFWS would be required in the unlikely event that lethal management is necessary.

It is very difficult to harass sparrows, finches, and warblers, and habitat modification is the most effective technique for ongoing species management. It is recommended that infield grass be managed at an intermediate height of 6 to 12 inches, and brush along the perimeter fence be thinned or cleared to reduce the attractive habitat for sparrows and finches.

Pyrotechnics should be used to harass sparrows, finches, and warblers when they are observed in large flocks in the AOA. Should any member of this guild become acclimated to harassment techniques, lethal reinforcement may be necessary, especially if large congregations are observed to frequent areas used by aircraft

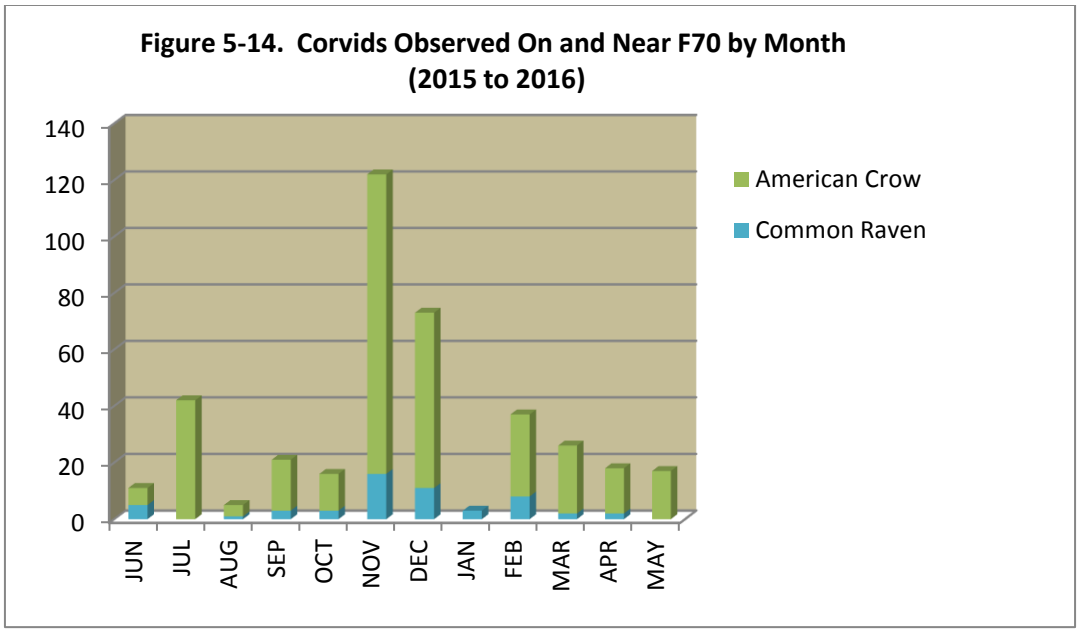
Relative Risk. The members of this guild have a moderate likelihood of being involved in a strike with aircraft, and they usually cause a low impact on flight due to their behavior. The FAA assigns a composite hazard ranking of 24 to sparrows out of 25 ranked species. Sparrows, finches, and warblers were observed frequently during the 12-month observation period, and most were observed within the AOA. Based on the location of these birds near aircraft movement areas, the overall wildlife hazard risk posed by species within this guild is ***high***.

5.1.7 Corvids

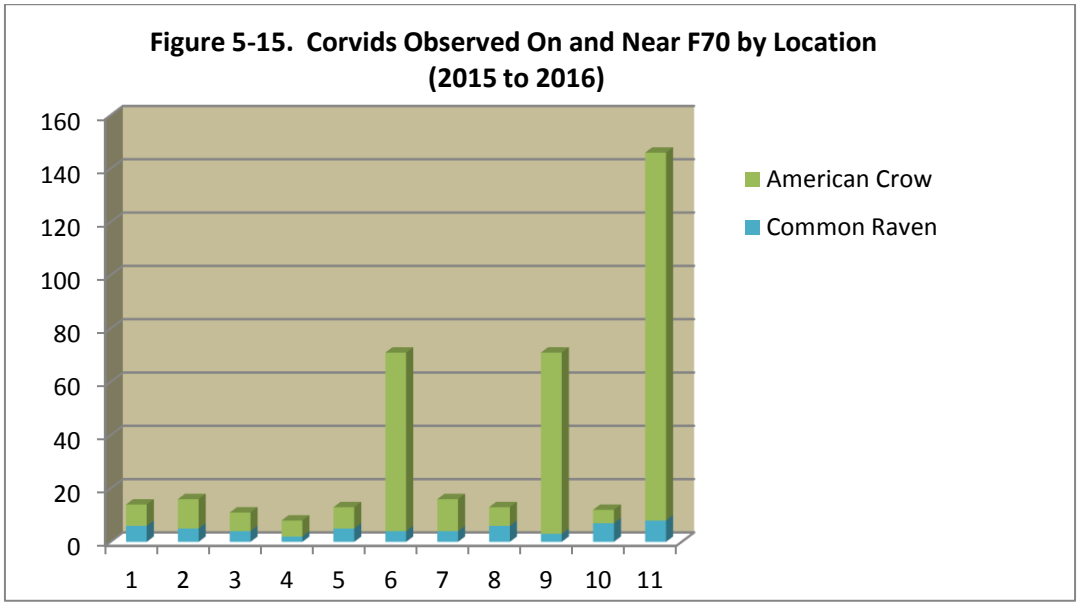
Guild Description. Both American crows and common ravens were observed during the 12-month monitoring period. Crows were more abundant, comprising 86 percent of the total number of corvids observed.

The American crow and common raven are medium- to large-sized birds that are highly intelligent, very social, and travel in small to large flocks. The crow and raven are all black and easily confused. The raven is slightly larger with a heavier bill and thicker neck. Both the crow and common raven are an omnivores that feed on a range of food items such as crops, fruit, carrion, insects, nuts, seeds, and human refuse. They also eat small animals such as lizards and young birds. Although crows and ravens are often observed at airports, they are infrequently involved in bird strikes.

Abundance. A total of 391 corvids were observed, and corvids comprised approximately 10 percent of the total number of birds observed during the 12 month monitoring period. Corvids were observed year-round, but more than half were observed during November and December, (**Figure 5-14**). Significant numbers of American crows were observed foraging near point 6 after the field had recently been mowed and tilled.



Ravens were observed from all observation points, but they were observed in greater numbers from points 6, 9, and 11, which provided views of open areas west and south of the runway and a commercial development to the north (**Figures 4-1 and 5-15**). Crows and ravens were observed flying across the airfield, but did not appear to be attracted to any specific feature in the AOA. Crows and ravens are opportunistic omnivores that will eat a variety of foods including food waste and trash.



Management and Legal Status. Both American crows and corvids are protected by the MBTA. It is recommended that a federal migratory bird depredation permit be obtained for American crows and common ravens should lethal management be warranted.

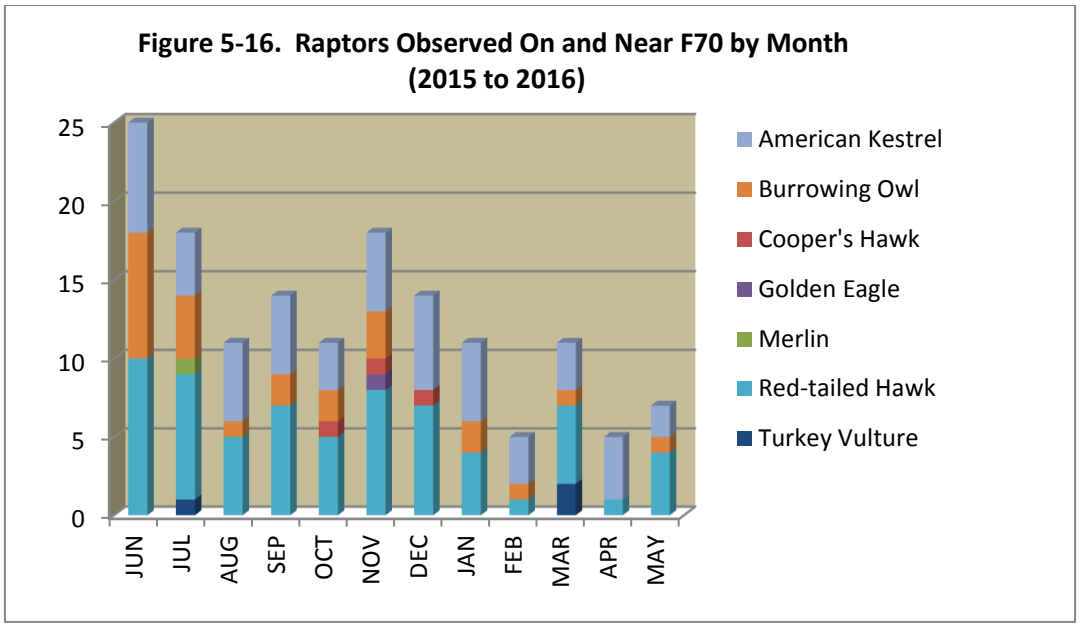
Good housekeeping practices are critical for managing corvids in the AOA. All refuse collection containers should be equipped with secure lids and emptied regularly. Refuse and carrion on airport property and on nearby roads should be removed immediately. In addition, corvids should be harassed and dispersed from the AOA whenever they are observed. Pyrotechnic devices, such as screamers and bangers, can be used to harass crows and ravens from airport property and harassment must be persistent to be successful.

Relative Risk. American crows and common ravens have a low likelihood of being involved with a wildlife strike due to their cautious behavior, but strikes with ravens can result in a moderate impact on a flight due to their size and sometimes flocking behavior. The FAA assigns a composite hazard ranking of 16 to crows/ravens out of 25 ranked species. Based on the number of corvids observed flying over or through, the overall wildlife hazard risk associated with this guild is ***moderate***.

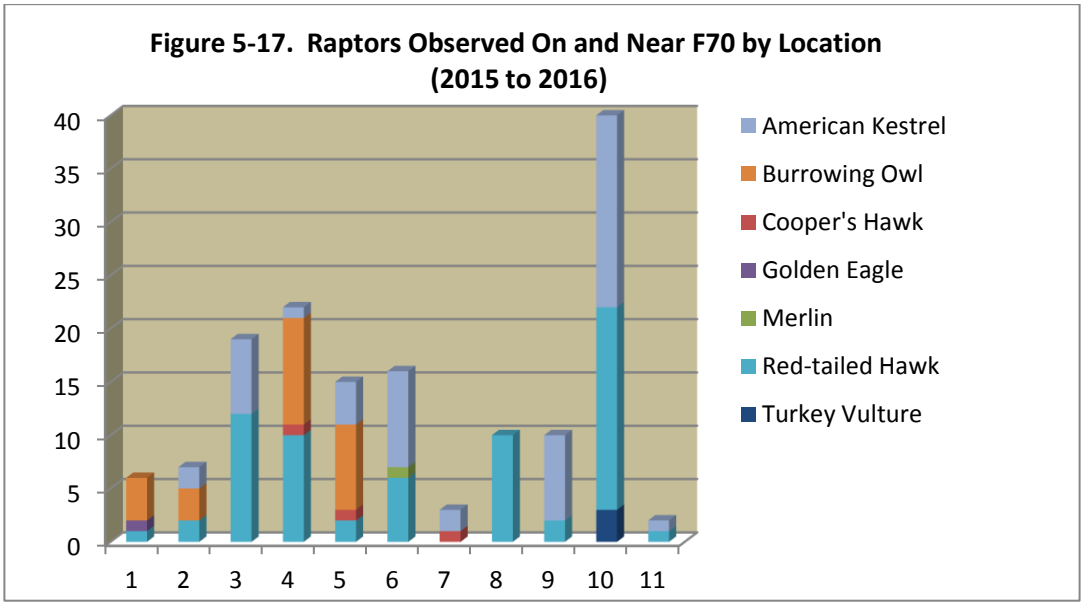
5.1.8 Raptors

Description. Raptors are predatory birds and scavengers that have hooked beaks and talons for capturing and feeding on prey. Raptors vary in size, and their diets vary among species. Raptors pose a threat to aircraft because of their large size and flight behavior. Although seven raptor species were observed, red-tailed hawks comprised approximately 43 percent of the raptors, American kestrels comprised 35 percent, and burrowing owls comprised 17 percent. Other species observed included Cooper's hawk, golden eagle, merlin, and turkey vulture.

Abundance. A total of 150 raptors was observed during standardized WHA surveys, representing approximately four percent of the total number of birds observed during the 12-month monitoring period. Raptors were observed consistently throughout the year (**Figure 5-16**) but were most abundant in June when young birds fledge the nest and are in the environment.



As shown on **Figure 5-17**, raptors were observed from all monitoring location, but more than 25 percent of the raptors were observed from point 10. The raptors observed from point 10 were perched on the transmission line in an area with a small creek and open fields. This area provides ample water and food including small mammals (e.g., rodents). Burrowing owls were also observed nesting in the AOA.



Management and Legal Status. All raptors are protected by the MBTA. In California the burrowing owl is considered a Species of Special Concern. A depredation permit from the USFWS is required to perform lethal management and to capture and relocate raptors.

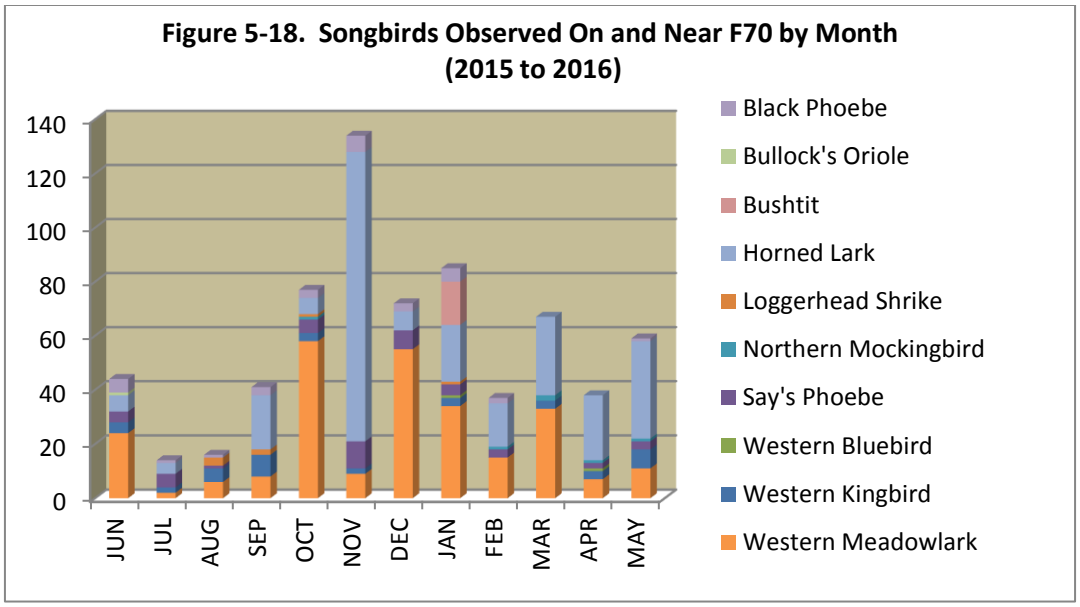
Harassment using pyrotechnic devices, such as bird bangers or screamers, is the preferred technique for discouraging raptors from using the airfield. It is recommended that a federal migratory bird depredation permit be obtained for American kestrels and red-tailed hawks. It is also recommended that the airport work with the CDFW to trap and relocate burrowing owls that are found within the AOA. These birds are located in close proximity to aircraft movement areas and can create a significant threat.

Relative Risk. Raptors have a moderate likelihood of being involved in a strike with aircraft, and they can create a high degree of impact on flight due to their size. Although burrowing owls are small, they are abundant near aircraft movement areas at F70 and fly at low altitudes. The FAA assigns a composite hazard ranking of 11 to hawks and 21 to kestrels out of 25 ranked species. Based on the presence of raptors and burrowing owls within the AOA, the overall risk posed by raptors is ***high***.

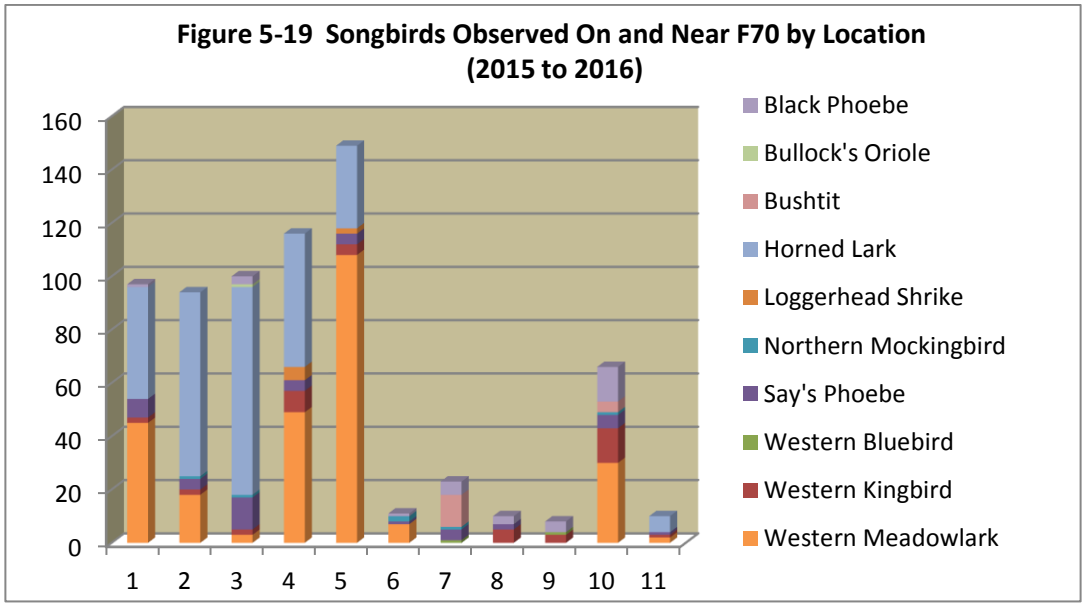
5.1.9 Songbirds

Description. Songbirds, also called passerines, include any member of the suborder *Passeri* (or *Oscines*) of the order *Passeriformes*, which includes approximately 4,000 species or nearly half the world's birds. Songbirds vary greatly in size, and their diets vary among species. Ten species of songbirds were observed, of which 40 percent were horned larks and 38 percent were western meadowlarks (**Table 5-3**). Smaller songbirds do not usually pose a threat to aircraft, but some smaller songbirds travel in large flocks, posing a comparatively greater hazard.

Abundance. A total of 684 songbirds was recorded during standardized WHA surveys, and songbirds accounted for approximately 18 percent of the total number of individuals observed. The greatest number of songbirds were observed during the month of November; however, songbirds were observed consistently throughout the year (**Figure 5-18**). The large expanses of open short grass in the infield and presence of brush along the eastern perimeter fence provides ideal habitat songbirds. Large flocks of horned larks were observed in November within the AOA.



As shown on **Figure 5-19**, the songbirds (all species combined) were most common at points 1 through 5, all of which are located on airport property. Songbirds are attracted to the short grass within the AOA for loafing, foraging, and nesting, as well as to the brush along the eastern portion of the perimeter fence.



Management and Legal Status. All songbirds are protected by the MBTA. A depredation permit from the USFWS is required to perform lethal management on songbirds. Lethal management of songbirds at F70 is unlikely given the ability to properly manage grass heights and thin/remove brush along the eastern perimeter fence.

Relative Risk. Songbirds have a moderate likelihood of being involved in a strike with aircraft, and they usually create a low degree of impact on flight due to their size. Some species, can incur greater damage than others based on their size and behavior. FAA identifies horned larks as 15th and meadowlarks as 22nd on its list of the 25 most hazardous species. Given the abundance within the AOA and the predominance of horned larks and meadowlarks observed, the overall risk posed by songbird species is ***high***.

5.1.10 Other Birds

Approximately seven other bird species and unidentified birds were observed at F70 and in its vicinity during the 12-month survey period (see **Table 5-3**); however, those species are not usually associated with bird strikes or pose a significant threat to aircraft. This group accounted for 3 percent of the total number of birds observed, and most of the birds in this guild were California quails and unidentified birds. The members of this group were either observed infrequently or have a low likelihood of being involved with an air strike and usually create a low impact on flight. However, it should be noted that all birds or groups of birds have the potential to cause a significant bird strike incident with aircraft, and it is possible that some of the strikes with unknown small birds involved birds in the guild. The overall wildlife hazard risk for species associated with this group is ***low***. A detailed discussion is not necessary for species that were identified in Table 5-3 but were not addressed within Sections 5.1.2 through 5.1.10.

5.2 Mammal Surveys

As described in Chapter 4, two small mammal monitoring events and two spotlight surveys were performed at F70 during the 12-month WHA study. A game camera was also used to document the presence of mammals within the AOA.

5.2.1 Small Mammal Survey Results

A total of 150 small mammal traps were set up in three lines or transects containing 50 live traps each, and mammals were monitored on three consecutive trap nights in November 2015 and March 2016 (see **Figure 4-2** for transect locations). For each event, one transect was placed in short grass, one in area with grass of medium height, and one along hardscape near adjacent brush. Seven mice were captured during the November trapping event, and four mice and one kangaroo rat were captured during the March trapping event.

Based on the results of the small mammal surveys it appears the rodent population is low; however, based upon the presence of California ground squirrels and other evidence of rodent activity, the airport appears to support a significant prey base for raptors or other wildlife (e.g., coyotes).

5.2.2 Spotlight Survey Results

Spotlight surveys were conducted approximately one hour after sunset in November 2015 and March 2016. During the November survey, 11 black-tailed jackrabbits, seven desert cottontails, and one coyote were observed. Eighteen black-tailed jackrabbits, 15 desert cottontails, one coyote, and one rattlesnake were spotted during the March 2016 survey.

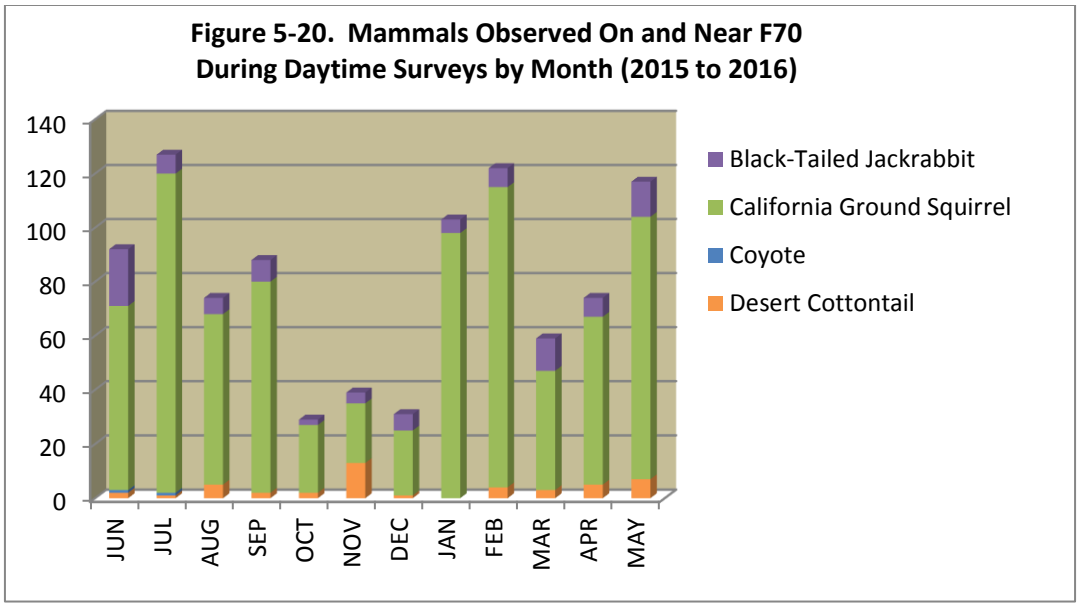
5.2.3 Game Camera Survey Results

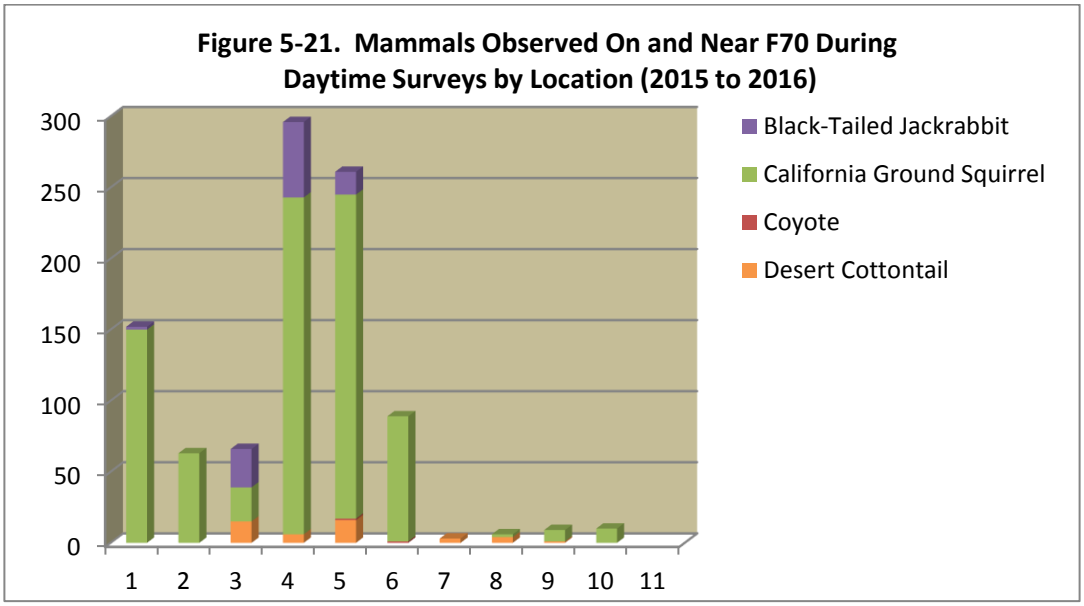
One game camera was used to monitor four on-site locations throughout the 12-month monitoring period (see **Figure 4-3**). Numerous mammals including coyotes, black-tailed jackrabbits, bobcats, and stray domestic dogs were observed in the AOA. The majority of the wildlife documented using the game cameras was observed near holes and gaps in the fence and near the culverts along the eastern portion of the perimeter fence.

Photo 9: *A bobcat was documented on site near a gap in the fence south of Point 4.*

5.2.4 Mammals Observed During Twice-Monthly Surveys

Mammals or evidence of mammals was recorded during the twice-monthly daytime surveys. California ground squirrels, black-tailed jackrabbits, desert cottontails, and coyotes were observed during the daytime surveys (**Figure 5-20**). Mammals were observed year-round at most monitoring points (**Figure 5-21**). The most prevalent mammal was the California ground squirrel, which was observed mostly at points 1, 4, and 5. These squirrels are attracted to open short grass areas where they can forage and detect predators.





Legal Status and Management. Coyotes are listed as a nuisance species in California and may be lethally removed without a special state permit if they are causing damage or are a nuisance on owned property. Lethal management is often the most efficient method for removing problem coyotes.

Ground squirrels can pose an indirect threat to aircraft operations because they can attract other predators, such as raptors and coyotes, and because they can cause damage to airfield equipment by chewing on underground wires. Given the large population of ground squirrels within the AOA, it is recommended that lethal management be initiated to reduce the population. To manage large mammals, diligent fence maintenance is necessary. Quarterly inspections and regular maintenance are necessary to fill burrows and gaps greater than 3 inches to prevent

access by coyotes or other mammals. Multiple burrows were observed throughout the 12-month survey.

The most effective method for excluding coyotes from the airfield is modification of the perimeter fence to include a buried apron. A buried apron consists of a 2-foot-wide strip of fence material that is installed at the fence base and buried at a 90-degree angle. However, the cost associated with the installation of a buried apron can be high

Relative Risk for Mammals. Coyotes have a moderate likelihood of being involved in a strike with aircraft, and they create a high degree of impact on flight due to their size. California ground squirrels also attract coyotes into the AOA as a food source. No strikes with mammals at F70 have been recorded in the FAA database. Coyotes are ranked as 17th on FAA's list of 25 most hazardous species, and they can have a significant effect on flight. Based on the presence of coyotes in the AOA and the large population of ground squirrels that serves as a food source for coyotes, the overall risk posed by mammal species, particularly coyotes and squirrels, is ***critical***.

Photo 10: *A coyote walks along the eastern side of the airport fence north of Point 4.*

Chapter 6

Conclusions and Recommendations

6.1 Overall Conclusions and General Recommendations

6.1.1 Overall Conclusions

The data obtained during the 12-month monitoring period and summarized in Chapter 5 form the foundation for the recommendations provided in Chapter 6. Based on the survey data, it appears that wildlife management measures are necessary to reduce the overall risks posed by wildlife to aircraft operations at F70, and especially the hazards posed by mourning doves, raptors, waterfowl, and mammals.

6.1.2 General Recommendations

Airport wildlife hazard management usually involves the implementation of an integrated wildlife damage management program. An integrated wildlife hazard management program is a science-based program that includes ongoing administrative and technical measures, short-term operational measures to reduce immediate or critical risks as they are observed, and long-term measures to reduce risks over time. An integrated airport wildlife hazard management program must include both on-site and off-site management measures to address the specific features that were found to attract wildlife to the airport and its critical airspace, as well as the use of targeted harassment and population-management measures to address individuals or species that do not respond to habitat modification or pose an imminent or critical threat to aircraft operations. The recommendations presented in this chapter are intended to reduce the risks posed by wildlife during air operations regardless of whether a WHMP is required by the FAA.

Four general recommendations are presented:

- Develop a wildlife hazard management plan/program that includes a management structure and designated staff;
- Develop and implement ongoing wildlife hazard management policies and procedures that can be incorporated into daily operations;
- Implement site-specific recommendations for proposed habitat modification. Such modifications identify physical changes that would make the airport environment less attractive to potentially hazardous wildlife; and
- Implement species-specific recommendations and management techniques.

6.2 Develop a Wildlife Hazard Management Plan/Program

Although the decision to prepare a WHMP resides with the FAA, it is recommended that F70 prepare a WHMP and implement a formal wildlife hazard management program to address wildlife observed during the WHA study. The WHMP and subsequent wildlife hazard management program should identify specific policies and procedures for staff and management including the following components, which are described in Sections 6.2.1 through 6.2.7:

- Establish a formal Wildlife Hazard Management Program;
- Establish a Wildlife Hazard Working Group;
- Maintain permits and supplies necessary to perform wildlife hazard management activities;
- Incorporate wildlife hazard management activities into airport planning, design and construction activities; and
- Monitor changes in land use on or near the airport.

The policies associated with wildlife hazard management would be incorporated on an ongoing basis and into nearly every aspect of airport operations including tenant lease agreements, new design and construction projects, and daily airfield inspection and maintenance procedures.

6.2.1 Establish a Formal Wildlife Hazard Management Program

Currently, most wildlife hazard management activities at F70 are performed by members of the maintenance staff, who conduct daily inspections of runway areas and wildlife harassment using vehicles. Airport management should provide support and equip staff to recognize and respond appropriately to hazardous wildlife.

The Wildlife Hazard Management Program should be overseen by a designated Wildlife Coordinator (an existing staff member), who will be responsible for implementing the recommendations set forth in the WHA, ensuring that staff receive adequate training, and alerting other staff to wildlife management policies, procedures, and activities. In addition, the Wildlife Coordinator will serve as a liaison between airport staff, tenants, pilots, and regulatory agencies when addressing issues associated with wildlife hazards and wildlife hazard management.

The Wildlife Coordinator would receive training in wildlife hazard/damage management and be knowledgeable of airport operations and the local environment. In addition, the Wildlife Coordinator should be empowered by airport management with the authority to delegate wildlife hazard management responsibilities.

The Wildlife Coordinator will carry out the recommendations set forth in the WHA report. Specifically:

- Obtain and maintain wildlife hazard management supplies;
- Maintain a database of wildlife hazard management activities, including information obtained from pilot reports, mechanical inspections, and daily observations;
- Obtain instruction for airport staff regarding wildlife hazards and wildlife hazard management policies and procedures;
- Implement wildlife management measures;
- Obtain permits associated with wildlife management; and
- Record wildlife strikes and instruct other airport staff, tenants, FBOs, and pilots in wildlife strike reporting procedures.

6.2.2 Establish a Wildlife Hazard Working Group

The Wildlife Coordinator, with the support of the Airport Manager, should establish a Wildlife Hazard Working Group (Working Group) to incorporate wildlife hazard management into airport operation, policies, and activities. The Working Group should include, but not be limited to:

- Representatives of County departments associated with airport management (administration, operations and maintenance, management);
- Local pilots;
- FBOs;
- Airport tenants; and
- FAA representatives.

All meetings should be documented, and the County should keep a record of all meetings on file to demonstrate its ongoing wildlife control and management efforts.

6.2.3 Obtain Permits to Manage Wildlife

Most of the bird species identified in the F70 vicinity are protected by the MBTA or other federal and state regulations. The USFWS is the agency authorized to provide permits for the lethal removal of specific species.

The ability to respond to hazardous situations in a prompt and efficient manner is paramount, and such responses may include the lethal removal of hazardous wildlife. Currently, F70 does not hold a federal depredation permit for the lethal control of migratory birds. It is recommend that F70 obtain a federal depredation permit for migratory birds for the following species:

- Canada goose
- Mourning dove
- American crow
- Red-tailed hawk
- Common raven
- American kestrel

Other birds that may require management, such as rock pigeons and European starlings, do not require a permit for lethal removal. It is recommended that F70 obtain a permit from the CDFW for the lethal removal of coyotes from the AOA. It is also recommended that the airport work with the CDFW to manage burrowing owls that are within the AOA, because the burrowing owl is a species of special concern in California.

6.2.4 Train Personnel in Wildlife Hazing Procedures and Species Identification

Airport staff must be trained to recognize and respond to all potential wildlife hazards in an appropriate manner, including hazing and removal. Working with Airport Management, the Wildlife Coordinator should organize and obtain training for all personnel that have wildlife hazard management duties within the AOA. Training should include the following components:

- Wildlife hazard identification;
- Species identification, with emphasis on those that are present at F70 and pose the greatest risk to air-carrier operations;
- Hazing and harassment techniques and safety procedures; and
- Reporting wildlife strikes and wildlife management actions.

6.2.5 Obtain Wildlife Hazard Management Supplies

Airfield vehicles, including maintenance vehicles, should be equipped with pyrotechnic launchers and shells, and personal protective equipment so that harassment can be performed quickly. Maintaining these supplies will enable all trained airport personnel to perform harassment and haze during their routine duties. **Table 6-1** summarizes the wildlife hazard materials that should always be available at the airport:

Table 6-1. Wildlife Hazard Management Supplies	
Supply	**Description and Quantity**
Pyrotechnic supplies	**Pistol Launchers.** The airport should maintain a supply of 15 mm pyrotechnic pistol launchers and caps. One pistol launcher should be available in each vehicle that does airfield inspections, and two spare pistols should be available.
	Screamers and Bangers. Screamers/bangers should be available in each vehicle used for airfield inspections, and should also be available in storage.
	Personal Safety Equipment. Eye and hearing protection should be maintained in each vehicle used for airfield inspections. Two set of protective eye goggles and ear protectors should be included in each vehicle, and extras should be maintained at all times.
Monitoring equipment	**Binoculars.** One pair of binoculars should be kept in each vehicle used to perform airfield inspections.
	Bird and mammal identification guides. A copy of each guide should be kept in all vehicles used to inspect the airfield, and an additional copy should be kept in the Wildlife Coordinator's office.
	Monitoring Log. A logbook/computer file should be available to document daily observations pertaining to wildlife hazards and all management activities.
Firearm/ammunition	**12-gauge shotgun and ammunition.** If lethal control is necessary, the airport should maintain a 12-gauge shotgun and non-toxic ammunition for use by appropriately trained, airport employees in addition to the AWC.
Note: Additional supplies such as distress calls, mammal traps, rotating beacons, and sirens may be necessary as specific situations arise. It is the responsibility of the airport operator to ensure that these items can be procured in a timely manner.	

6.2.6 Record and Maintain Wildlife Strike Information

The AWC or airport administration should maintain a database of wildlife strike information collected from pilot reports, mechanical inspections, and routine airfield inspections. The AWC would be responsible for ensuring that F70 personnel and pilots understand the procedures for reporting hazards and strikes to airport staff and for training staff to record wildlife strikes using the FAA wildlife strike database.

6.2.7 Review Land Use Changes On and Near the Airport

As identified in FAA AC 150/5200-33B, the area associated with wildlife hazard management extends beyond the airport property boundary. The AWC must actively monitor and participate in proposed land use changes on and near the airport that could create additional wildlife hazards. If a proposed project would attract potentially hazardous wildlife, the AWC should: consult with a qualified airport wildlife biologist; discuss the potential impact of the project with project proponents, project sponsors, and local officials; and work with project proponents to consider project modifications to avoid attracting potentially hazardous wildlife. A complete record of communication should be maintained.

6.3 Develop and Implement Ongoing Wildlife Hazard Management Policies and Procedures

The following ongoing policies and procedures should be implemented under the direction of the Wildlife Coordinator:

- Implement a wildlife reporting and communications protocol;
- Continue monitoring wildlife populations and use patterns on and near the airport;
- Adopt a zero-tolerance policy toward hazardous wildlife (as discussed in Section 6.2.3 and 6.3.3);
- Improve reporting of wildlife strikes and management actions; and
- Maintain records of reported wildlife strikes and control actions.

6.3.1 Implement a Wildlife Hazard Reporting and Communications Protocol

F70 is a non-towered airport, and airport staff should alert FBOs and pilots of any potential wildlife hazards as they arise. A clear communications protocol should be available for pilots and ground staff to report the presence of wildlife or incidents to the AWC for corrective action and documentation is critical.

6.3.1.1 Communication Protocol and Procedures Development

1) Procedures for airport staff to alert FBOs and/or pilots of potential hazards prior to takeoff or landing. If a wildlife hazard is observed by airport ground personnel, aircraft in the vicinity will be contacted by radio immediately. The location, species, number observed, activity, and potential direction of travel will be relayed so pilots can be properly informed, and appropriate action taken.

2) Procedures for alerting airport operations staff to address wildlife hazards that require immediate attention:

   a. Contact the AWC or airport staff immediately if wildlife hazards are observed.

   b. The AWC will assess the situation and designate trained personnel to address the situation.

   c. Wildlife management procedures will follow a stepped approach including:

      - Small or minor hazards – hazing through vehicle horns and lights.
      - Moderate or persistent hazards – combination of vehicle horns, lights, pyrotechnics, and lethal control.
      - Severe hazards – lethal control.

3) Documentation procedures:

   a. The AWC will log wildlife observations in a master-list for easy reference.

   b. All management procedures will be recorded (e.g., hazing, lethal control, etc.) along with the results of the procedure.

   c. All wildlife lethally controlled will be reported to the following agencies:

      - USFWS – all federally controlled species (MBTA).

      - CDFW – all state game species.

6.3.1.2 Observations and Communication

It is important for all staff members to understand the potential hazard to aviation posed by each species observed. Not all airport staff may be aware of the dangers presented by wildlife, even when a situation is observed outside of the AOA. It is imperative that all significant wildlife observations be communicated immediately between airport staff and pilots, so appropriate action can be taken. Pilot Reports (PIREPS) regarding wildlife hazards should be relayed through Automatic Terminal Information Service (ATIS)/UNICOM whenever they are received.

The ATIS should be updated and transmitted when a significant wildlife hazard is observed at F70. A NOTAM should be filed only if a wildlife hazard is observed consistently or for an extended period of time. Blanket or generic advisories should not be issued.

6.3.2 Continue to Monitor Wildlife Populations and Use Patterns

The overall intent of the 12-month WHA effort was to document general occurrence, abundance, behavior, use patterns, and population characteristics of wildlife on and near F70. The WHA also sought to identify significant wildlife attractions near F70 that could adversely affect the safety of aircraft operations. However, wildlife abundance and use patterns can be affected by numerous variables (like the drought occurring at F70 over the 12-month assessment), and the data provided during WHA monitoring efforts should be considered as a baseline for comparison in future years.

F70 should continue to monitor wildlife populations by conducting at least one monthly survey using the same on-site monitoring locations established for the WHA study, and the results should be compared to the results presented in the WHA study to identify fluctuations in wildlife presence. Continuing to monitor wildlife populations will also enable F70 to determine the effectiveness of its management efforts. Each monthly survey will require approximately 1.5

hours. To reduce bias, the same observer should conduct all surveys. Data should be maintained in a database to provide a basis for comparison over time.

6.3.3 Adopt a Zero-Tolerance Policy towards Hazardous Wildlife

A zero-tolerance policy should be adopted toward all hazardous wildlife occurring on or, in some cases, near the airfield. Zero tolerance means harassing or removing hazardous wildlife whenever it is observed in the AOA or passing through airspace above the AOA. Efforts should focus on species that were identified during the WHA study and current species listed on the depredation permit that pose the greatest risk including, but not limited to:

- Canada goose
- Mallard
- Mourning dove
- American crow
- Red-tailed hawk
- Common raven
- American kestrel
- European starling
- Coyote
- California ground squirrel

To implement an effective WHMP or Wildlife Management Program, all employees need to participate in wildlife harassment activities. All airport operations staff and management should receive training on how to take immediate action when hazardous wildlife species are encountered within the AOA. At a minimum, hazardous wildlife should be reported immediately to the Wildlife Coordinator whenever it is observed.

6.3.4 Report Wildlife Strikes and Harassment Actions

The FAA National Wildlife Strike Database was reviewed to identify whether any wildlife strikes had been documented in association with F70. No wildlife strike records were found/reported for F70. However, the FAA database must be considered with caution. The FAA estimates that only 20 percent of all strikes that occurred nationwide from 1990 to 2008 were recorded in the databased, and only 40 percent of all strikes that occurred since 2009 were recorded.

One of the purposes of the WHA was to identify the species that pose strike hazards at F70. Ongoing efforts are necessary to identify the species that pose threats to aircraft or cause wildlife strikes. Improved wildlife reporting procedures, including training for species identification, are critical to reducing wildlife strike hazards. As previously noted, the Wildlife Coordinator should ensure that all bird strikes are recorded to the species level. In addition, clear records should be maintained regarding carcasses found on or near the AOA.

If bird/mammal remains are identified within 250 feet of the runway centerline during routine inspections of the airfield, the remains should be collected and removed immediately to avoid attracting scavengers such as carrion-eating wildlife. Unless there is visible evidence to identify another cause, such as tracks made by a scavenger, the incident should be recorded as a wildlife strike in the FAA wildlife strike database.

Wildlife strikes may be submitted electronically at the FAA website, and electronic reporting encouraged. http://wildlife.faa.gov/strikenew.aspx

If remains are discovered, the species should be identified. If airport staff cannot identify remains to the species level or if only feather fragments or DNA are available, remains should be sent to the Smithsonian Institution's Feather Identification Lab for free identification. The remains should be accompanied by a copy of the strike report form and sent to:

Smithsonian Institution
Feather Identification Lab
NHB, E600, MRC 116
10th & Constitution Ave, NW
Washington, D.C. 20560-0116

Once the remains are identified, the Feather ID Lab will revise the information in the wildlife strike database. An instructional video that describes how to submit feathers or snarge, which is feathers or residue left after a bird strike, to the Feather Identification Lab is available at: http://www.faa.gov/airports/airport_safety/wildlife/smithsonian/.

6.3.5 Maintain a Record of Wildlife Management Efforts

Wildlife management is risk management, and the Wildlife Coordinator and Airport Administration should retain detailed records of wildlife harassment and management efforts. The records will provide a useful index of changes in wildlife abundance and use of the airfield over time, and the records will allow staff to monitor the effectiveness of its harassment and management activities. As shown on the observation sheet presented in **Appendix G**, the data recorded should include the following for each management activity:

- Person conducting the action,
- Date and time of the action,
- Species and number of individuals observed,
- Location on airfield, and
- Management method applied.

The Wildlife Coordinator should maintain these records in a database so that the data can be easily extracted or sorted for reporting purposes.

6.4 Implement Site-Specific Recommendations

Based on the results of the WHA, site-specific recommendations were identified that would be protective of both air operations and wildlife populations. The following recommendations were developed to represent a phased approach to management that ranges from passive techniques that discourage

wildlife from using the airport to more direct techniques. The following site-specific techniques are recommended for implementation:

- **Modify on-site features and habitat that attract potentially hazardous wildlife.** As noted in Chapters 2 and 5, specific habitats or features were observed at F70 and on airport property outside of the AOA and airport fence that attract or have the potential to support potentially hazardous wildlife. The purpose of habitat modification is to remove the features or modify the habitat that attract and support hazardous wildlife so that the wildlife will become less likely to visit the airport in the absence of such features.

  Grass and Brush. The large expanses of open short grasslands were observed to attract many hazardous species of birds, because these areas provide foraging and loafing opportunities. It is preferable maintain the grasses at an intermediate height of 6 to 12 inches and to remove the brush along the eastern perimeter fence. Doing so would encourage wildlife to feed, forage, nest, and roost elsewhere, thereby increasing the separation between aircraft and wildlife. F70 is located in a habitat-rich environment, and the habitat modification proposed in the AOA (e.g., grass management and brush removal) will not have a detrimental impact on the availability of habitat necessary to support local wildlife.

  Grass management and brush removal is the preferred method for reducing the presence of potentially hazardous wildlife at the airport. For additional information on habitat management actions, refer to Airport Cooperative Research Program (ACRP) Synthesis Report 52, *Habitat Management to Deter Wildlife at Airports* (ACRP, 2014), which is available at http://onlinepubs.trb.org/onlinepubs/acrp/acrp_syn_052.pdf.

  Pond Northeast of the AOA. A small pond is located on airport property northeast of the runway and near the runway protection zone. The pond and its associated vegetation, brush, and trees were attractive to a variety of avian species including waterfowl, shorebirds, and smaller flocking birds (sparrows, finches and warblers). The greatest number of birds observed at any location during the 12-month monitoring period was observed near Point 8, which was associated with this pond.

  Removing the trees and vegetation near this pond would make the area less attractive to flocking birds, such as blackbirds, sparrows, finches and warblers. Larger birds, such as ducks and waterfowl, were attracted to the open water provided by the pond, especially from November to March. Modifying or eliminating the pond through the creation of a narrow channel or placing the water into a culvert would make the area less attractive to waterfowl and shorebirds. Doing so will require environmental study and authorizations from regulatory agencies.

- **Monitor wildlife at nearby off-site features.** As noted in Chapters 2 and 5, specific habitats or features are present near F70 that attract or have the potential to support potentially hazardous wildlife, such as the Golf Club at Rancho California. Monitoring these features will help F70 identify and respond to the presence of hazardous wildlife, which has the potential to enter the airspace associated with F70.

- **Maintain and regularly inspect the perimeter fence.** As stated previously, the airport perimeter fence has not prevented medium-sized mammals (e.g., coyotes and bobcats) from entering the AOA. Numerous coyotes and bobcats were observed within the AOA during the 12-month assessment where they entered through gaps under the fence bottom or through the culverts that run under a section of the eastern perimeter fence. Separating aircraft and wildlife with a properly maintained perimeter fence prevents conflicts to both wildlife and the traveling public at F70. Maintenance and improvement of the perimeter fence is warranted at F70.

- **Implement species-specific controls.** Species-specific management controls include multiple techniques, including fear-provoking stimuli, exclusion, relocation, and lethal removal. Although lethal removal is the method of last resort, it is sometimes the only option for protecting the traveling public and must be considered as part of an integrated wildlife hazard management program. Staff should receive training to implement species-specific controls when hazardous wildlife is observed in the AOA.

  The proposed species-specific controls are performed when habitat modification proved to be unsuccessful or to reinforce non-lethal techniques. All active management techniques, including hazing and lethal removal, would conform to federal laws and permit requirements and be implemented by trained staff. Although ongoing lethal management may be the least desirable method of risk management, it supports the County's obligation to provide for the safety of air travelers and those living and working near the airport.

  The recommendations described in the following pages represent a phased approach to wildlife hazard management. Additional details on effective and appropriate non-lethal methods are described in ACRP Synthesis Report No. 23, Bird Harassment, Repellent, and Deterrent Techniques for Use on and Near Airports, which is available at http://onlinepubs.trb.org/onlinepubs/acrp/acrp_syn_023.pdf. The use of lethal management measures is described in ACRP Synthesis Report No. 39, Airport Wildlife Population Management, which is available at http://onlinepubs.trb.org/onlinepubs/acrp/acrp_syn_039.pdf.

6.4.1 Modify Grass Heights within the AOA

The FAA recommends maintaining intermediate grass heights of 6 to 12 inches, and this is an important element of any wildlife management plan. Most wildlife programs start with grass management as a baseline element. There are several benefits to maintaining an intermediate grass height: it disrupts visual inter-flock communication, obscures insect food sources, limits predator protection, impedes the ease at which wildlife can move, and taller grass out-competes edible, weedy vegetation and has a slower growth rate, which in turn requires less frequent mowing. Maintaining an intermediate grass height will be effective in discouraging birds and mammals from using these areas.

Grass areas throughout airport property are maintained at heights of less than 6 inches. These areas of vegetation are mowed or maintained by airport personnel. Blackbirds, corvids, mourning

doves, burrowing owls, songbirds, along with California ground squirrels were observed within these areas. Squirrels that are present within these areas provide a food source for coyotes and various raptor species. It is recommended that all turf areas within the airport property be maintained at an intermediate height of 6 to12 inches to discourage birds and squirrels from using the areas.

Control Measure/Priority. Grassy areas can harbor several species (e.g., flocking birds) that pose a high risk to airport operations. Therefore, the priority associated with maintaining grass heights at 6-12 inches across the entire AOA is ***critical.***

6.4.2 Provide Ongoing Fence Maintenance and Inspection

The perimeter fence includes numerous holes and gaps, and dense brush has grown into the eastern side of the fence. The gaps or holes in the fence allow mammals, such as coyotes and bobcats, to access the AOA. The FAA identifies medium-sized mammals, such as coyotes, as potentially hazardous because strikes with mammals can occur during sensitive takeoff and landing cycles. Numerous coyotes were observed on or near aircraft movement areas during the assessment. The airport maintenance staff should monitor the fence regularly and complete a full inspection at least weekly to identify and fill or repair gaps that occur between the fence base and the ground.

Gates with gaps are particularly attractive to coyotes. To exclude or deter entry by mammals, gaps between gates should be eliminated. To do so, one side of the gate can be equipped with a heavy rubber flap or wire mesh that overlaps the other side, or the gate frame can be lowered so that no more than a 3-inch gap remains between the bottom gate frame and the ground. The airport maintenance staff should also work to remove brush from the fence line in order to make it less attractive for coyotes to enter the fence and to make it more visible for inspection and maintenance. The culverts along the eastern portion of the fence should be retrofitted with a wire mesh or rebar grid to prevent mammals from entering the AOA through these culverts.

Control Measure/Priority. Brush should be removed from the perimeter fence and gaps and holes in the fence and gates should also be monitored and repaired. Culverts need to be retrofitted to prevent entry by mammals. The priority associated with brush removal, increased fence inspection, fence maintenance, and culvert repair is ***critical.***

6.4.3 Use Pyrotechnics for the Non-Lethal Control of Hazardous Wildlife

Currently, staff conduct limited wildlife management within the AOA. Additional measures to provide non-lethal control and harassment of wildlife through the use of pyrotechnics is warranted on airport property to disperse birds and mammals from the AOA. These activities should be performed throughout the airport property, including the pond north of Auld Road as necessary, and especially during the four month period from November to March, when the largest concentrations of waterfowl were observed. Wildlife habituate to one control/harassment method so the use of pyrotechnics will help reduce and disperse wildlife populations within the AOA.

Control Measure/Priority. Pyrotechnics should be used to disperse hazardous wildlife from the AOA. The overall priority associated with implementation of this control measure is ***critical***.

6.4.4 Review Proposed Land Use Changes in the Critical Zone

New projects or land use changes have the potential to create new wildlife attractants such as open water, architectural features that provide opportunities for nesting and roosting, or ornamental landscaping that offers food and shelter to wildlife. The Wildlife Coordinator should review or request assistance from an FAA-qualified Wildlife Hazard Biologist to review plans for all proposed projects on airport property to identify features that would be attractive to hazardous wildlife. Specific elements of the review should include, at a minimum, storm water management designs, landscape designs, and adjacent development plans.

The Wildlife Coordinator should also monitor proposed project and land use changes within the critical zone. The Wildlife Coordinator should work closely with County planners to identify proposed projects for which discretionary approvals are required, and review proposed project plans to identify whether they have the potential to attract potentially hazardous wildlife

Control Measure/Priority. Certain projects on or adjacent to the airport have the potential to attract hazardous bird species, which pose a critical hazard to aircraft operations. The overall priority associated with implementation of this control measure is ***moderate***.

6.4.5 Monitor Off-site Facilities and Locations that Attract Hazardous Wildlife (Golf Club at Rancho California)

Other off-site locations, features, and land uses within the critical zone have the potential to attract potentially hazardous wildlife through airspace associated with F70. County staff should occasionally monitor the presence of wildlife at the Golf Club at Rancho California to determine whether hazardous wildlife that utilize these locations are observed flying into F70 airspace. Large quantities of waterfowl were observed at the ponds associated with the golf course.

Control Measure/Priority. The ponds at the nearby golf course have the potential to attract hazardous wildlife into F70 airspace. Therefore, the priority associated with monitoring these locations to determine if hazardous wildlife at these locations are entering TRM airspace is ***moderate***.

6.5 Species-Specific Recommendations and Management Techniques

While the habitat modification measures recommended in Section 6.4 can substantially affect the populations or frequency of several wildlife species observed at F70, not all species will respond in the same manner and further action will be required. Therefore, an integrated approach to wildlife management is recommended.

An integrated approach includes a variety of methods to reduce wildlife conflicts. Such methods may include habitat modification, behavioral modification, and the targeted reduction of some wildlife populations through lethal means. The airport staff has initiated the use of harassment using vehicles, but the incorporation of additional non-lethal methods to further manage wildlife are recommended. The combination of lethal management activities to reinforce non-lethal techniques typically provides better results than those achieved through the use of only non-lethal techniques. In some cases, lethal management may be the only option to manage specific species.

6.5.1 Doves and Pigeons

Doves and pigeons accounted for approximately 16 percent of all birds observed, and the majority of the doves were observed in the AOA. Doves and pigeons should be harassed using pyrotechnics when they are observed in the AOA. The County should obtain a depredation permit that allows for lethal control of mourning doves. Pigeons and doves that do not respond positively from harassment efforts should be lethally removed. (A permit is not required for the lethal control of pigeons.) Maintaining an intermediate grass height of 6 to12 inches in the AOA will also help reduce dove abundance.

Management Control/Priority. Mourning doves were frequently observed in the AOA and in close proximity to the runway and can pose a moderate risk due to their flocking behavior. The priority associated with harassing doves and pigeons from the AOA is ***critical***.

6.5.2 Mammals (Coyotes and California Ground Squirrels)

The presence of coyotes in the AOA was documented using game cameras and during spotlight surveys.

Coyotes were observed to enter the AOA through holes or gaps under the perimeter fence and through gaps in fence gates. Regular fence inspections should be performed to identify and repair gaps or holes and the fence culverts should be retrofitted with a wire or rebar grid to prevent entry into the AOA by coyotes and other mammals. Mammals pose hazards to aircraft operations. If a coyote is identified on airport property, it should be removed from the AOA immediately. If coyotes cannot be removed through harassment, they should be lethally removed. The County's airport administration should obtain a permit from the CDFW or work with USDA-Wildlife Services to lethally remove persistent coyotes when they are observed in the AOA and cannot be removed through harassment.

California ground squirrels were the most abundant mammal observed during the 12-month assessment. The squirrels serve as a prey base for coyotes and raptors and can attract these species into the AOA and across runways. In addition, burrowing owls can inhabit the squirrel burrows. The County should initiate a lethal control program for squirrels to reduce the population within the AOA. The airport administration should work with USDA-Wildlife Services to lethally remove squirrels within the AOA.

Management Control/Priority. Coyotes pose a significant risk to aircraft operations, and they can have a serious effect on flight if they are struck during takeoff or landing cycles. California ground squirrels attract coyotes and raptors into the AOA as they serve as a prey base for these species. The priority associated with this control measure is ***critical***.

6.5.3 Waterfowl

Waterfowl accounted for approximately 18 percent of all birds observed. Waterfowl were observed in the greatest concentrations at the pond located on airport property north of the AOA and at off site at the nearby golf course. Waterfowl was observed flying above or across the AOA. Waterfowl, specifically geese, are attracted to short-grass habitats for foraging, such as the short-grass habitat within the AOA, and ducks were attracted to the pond located north of the AOA. Pyrotechnics should be used to immediately disperse waterfowl if they are observed in the AOA or at the nearby pond, especially during the four-month period from November to March. Note that special care must be taken when using pyrotechnics during the dry season. The County should obtain a federal migratory depredation permit for the lethal control of Canada geese in the event they become more prevalent on the airport.

Control Measure/Priority. Waterfowl populations have increased substantially nationwide and are known to pose a critical risk to airport operations. Since most waterfowl was observed off the airport but within its associated airspace, the overall priority associated with these control measures is ***high***.

6.5.4 Raptors

Raptors were observed throughout the 12-month monitoring period. Although raptors comprised only four percent of the total number of birds observed, they were observed in the AOA or flying across aircraft movement areas. The airport staff should harass and disperse raptors using pyrotechnics whenever they are present within or near the AOA. Staff should use pyrotechnics to haze raptors until they exhibit lack of fear, and perform lethal removal when necessary to reinforce non-lethal techniques. Proper grass height management would help reduce the small mammal prey base that attracts raptors to the AOA.

Although lethal control of raptors is a measure of last resort, lethal control may be required if non-lethal means are ineffective. The County should obtain a federal migratory bird depredation permit for the lethal removal of American kestrel and red-tailed hawk. The County must maintain/renew the depredation permit annually. County staff should also work with the CDFW to relocate burrowing owls that are found within the AOA.

Management Control/Priority. Raptors are known to pose a high risk to aircraft operations and were observed flying through or loafing within the AOA. The overall priority associated with implementing these recommendations is ***high***.

6.5.5 Sparrows, Finches, and Warblers

Sparrows, finches, and warblers were observed throughout the 12-month monitoring period. Guild members comprised approximately 19 percent of the total number of birds observed. The sparrows, finches and warblers guild was the most abundant guild observed, because species members are attracted to short grass within the AOA and to the brush along the eastern portion of the fence. These species were also observed in brush associated with the pond located on airport property north of the AOA. To make the airport property less attractive to sparrows and finches, the grass within the AOA should be maintained at an intermediate height of 6 to 12 inches. The brush along the eastern portion of the fence and near the pond should be cleared, and the trees located on airport property north of Auld Road should be removed.

Pyrotechnics should be used to harass sparrows and finches when large flocks are observed on airport property. Should any member of this guild become acclimated to harassment techniques, lethal reinforcement may be necessary in accordance with a federal depredation permit.

Management Control/Priority. The members of this guild have a moderate likelihood of being involved in a strike with aircraft, and they usually cause a low impact on flight due to their behavior. Sparrows and finches were abundant and observed frequently during the 12-month survey period and in close proximity to aircraft movement areas. The overall wildlife hazard risk posed by species within this guild is ***high***.

6.5.6 Blackbirds and Starlings

European starlings and blackbirds comprised approximately 9 percent of all birds observed during the assessment. European starlings were observed in and around airfield buildings and hangars where they were observed perching on these structures. They were also observed foraging within the grass areas in the infield. Many were observed from off-site monitoring locations. If flocks of starlings and blackbirds are observed using the airfield, they should be harassed and dispersed using pyrotechnic devices, such as screamers and bangers. Lethal reinforcement may be necessary if starlings and blackbirds become habituated to pyrotechnics. A depredation permit is not required for the lethal control of the European starling. A depredation permit may be required if other species were observed and require lethal control.

Management/Control Priority. Starlings and blackbirds can pose a significant hazard to aircraft because of their dense size and flocking behavior, and they have a high likelihood of being involved in strikes with aircraft. Blackbirds should be harassed from airfield structures and proper grass management will help reduce numbers within the AOA. The overall priority associated with the control of starlings and blackbirds is ***moderate***.

6.5.7 Shorebirds

Shorebirds accounted for approximately 3 percent of all bird observations during the assessment. Although many were observed from off-site monitoring locations, larger shorebirds (i.e., egrets

and herons) were also observed near Point 8, which was associated with the pond located north of the AOA and Auld Road. These species were observed within the critical zone for wildlife hazards and are likely to fly within F70 airspace. Killdeer were observed within the AOA and should be harassed with pyrotechnics when observed near aircraft movement areas.

Management Control/Priority. The members of this guild have a moderate likelihood of being involved in a strike with aircraft. The priority associated with the use of non-lethal management techniques including pyrotechnics is ***moderate***.

6.5.8 Corvids

Corvids (e.g., American crows and common ravens) accounted for approximately 10 percent of all birds observed during the 12-month assessment. They were observed foraging throughout the AOA, flying across the AOA, and in F70 airspace. Corvids should be harassed with pyrotechnics when they are observed within the AOA. The County should obtain a federal depredation permit to perform the lethal removal of American Crows and common ravens.

Management Control/Priority. Corvids pose moderate risks due to their flocking behavior. The overall priority associated with this control measure is ***moderate***.

6.5.9 Songbirds

Songbirds accounted for approximately 18 percent of the total number of birds observed. The greatest number of songbirds was observed within the brush along the eastern portion of the fence or within the short grass of the infield. When large flocks of songbirds are present on the airfield, harassment should be performed using pyrotechnic devices, such as bird bangers or screamers.

Management/Control Priority. Songbirds have a moderate likelihood of being involved in a strike with aircraft, and most species result in a low degree of impact on flight due to their size. The overall priority associated with the management of songbird species is ***moderate.***

6.6 Summary

The recommendations presented in Chapters 5 and 6 of this report are intended to build upon the airport's previous and ongoing efforts to remove attractive habitat, proactively manage wildlife hazards, and prepare for potentially new wildlife hazards that may arise. **Table 6-2** summarizes and prioritizes these recommendations so that they may be considered in subsequent revisions to the Airport's WHMP.

Table 6-2. Summary of Integrated Wildlife Hazard Management Measures for French Valley Airport

Management Measure	Description	Priority
Habitat Modification		
Modify Grass at Intermediate Heights and Remove Brush within the AOA	• Modify grass heights to 6 to 12 inches throughout the AOA to prevent hazardous wildlife from feeding or loafing within the AOA. • Remove brush on east side of the AOA	Critical
Provide ongoing fence inspections and maintenance	• Remove brush vegetation from the eastern perimeter fence to make it less attractive to birds and mammals. • Close gates securely. • Inspect fence regularly (at least weekly) to identify gaps, burrows, or holes • Fill burrows and repair holes promptly. • Reduce gaps between fence posts and gates to less than than 3 inches. • Reduce bottom gaps to less than 3 inches to prevent burrowing. • Retrofit culverts along eastern portion of the fence with wire or rebar grid to prevent entry by mammals into the AOA.	Critical
Use pyrotechnics for the non-lethal control of hazardous wildlife	• Incorporate the use of pyrotechnics to harass and disperse wildlife from the AOA and from the nearby pond north of the AOA when possible.	Critical
Modify Pond Area North of the Airfield (north of Auld Road)	• Remove trees and tall brush from airport property north of Auld Road. • Cover, reconfigure, or remove the open water feature in accordance with appropriate environmental regulations and permit authorizations.	High
Review proposed land use changes in the critical zone	• Airport Management/Wildlife Coordinator will review design plans for all on-site projects. • Work with the Riverside County's planning staff to identify proposed projects within the critical zone that may attract hazardous wildlife. • If necessary, request help from a qualified biologist to review proposed designs and construction plans for their potential to create new wildlife attractants.	Moderate

Table 6-2. Summary of Integrated Wildlife Hazard Management Measures for French Valley Airport

Management Measure	Description	Priority
Monitor off-site facilities and locations that attract hazardous wildlife to the airport vicinity	• Monitor off-site attractants to determine if hazardous wildlife at these locations has the potential to frequent or fly through the airport and its airspace, such as the pond that is just north of the airfield and the Golf Club at Rancho California golf course.	Moderate
Species-Specific Management Strategies		
Dove and Pigeons	• Maintain grass within the AOA at an intermediate height of 6 to 12 inches. • Remove on-site brush, especially dense brush along the eastern side of the perimeter fence, to make the AOA less attractive to mourning doves. • Harass doves and pigeons using pyrotechnics when they are observed in the AOA. • Use lethal techniques as reinforcement. • Obtain a federal depredation permit for mourning doves.	Critical
Mammals (Coyotes and California Ground Squirrels)	• Harass using pyrotechnics when in the AOA. • Monitor the perimeter fence weekly for the presence of gaps, holes, or burrows, and repair or fill gaps quickly. • Maintain a state depredation permit for lethal removal of coyotes. • Initiate lethal control program to reduce the population of squirrels within the AOA	Critical
Waterfowl	• Harass using pyrotechnics when in AOA or adjacent airport property. • Use lethal techniques as reinforcement. • Obtain a federal depredation permit for Canada goose. • Monitor waterfowl at the pond north of the AOA to identify changes in behavior or increased presence on or near the airport	High

Table 6-2. Summary of Integrated Wildlife Hazard Management Measures for French Valley Airport

Management Measure	Description	Priority
Raptors	• Harass using pyrotechnics when in the AOA. • Maintain an intermediate grass height in the AOA to reduce and mask prey base of small mammals. • Obtain a federal depredation permit for American kestrel and red-tailed hawk. • Coordinate with CDFW or supporting agency to relocate burrowing owls in the AOA.	High
Sparrows, Finches, and Warblers	• Maintain an intermediate grass height within the AOA. • Harass using pyrotechnics when observed in large flocks within the AOA or on adjacent airport property..	High
Blackbirds and Starlings	• Harass using pyrotechnics when in the AOA or on adjacent airport property.. • Use lethal techniques as reinforcement for European starling.	Moderate
Shorebirds	• Harass using pyrotechnics when in AOA.	Moderate
Corvids	• Harass using pyrotechnics when in the AOA. • Maintain a federal depredation permit for American crows and common ravens.	Moderate
Songbirds	• Remove brush along eastern perimeter fence. • Maintain an intermediate grass height within the AOA. • Harass using pyrotechnics when in the AOA.	Moderate

Chapter 7

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Appendix A. FAR Part 139.337, “Wildlife Hazard Management”

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(1) Two-way radio communications between each pedestrian or vehicle and the tower;

(2) An escort with two-way radio communications with the tower accompanying any pedestrian or vehicle without a radio; or

(3) Measures authorized by the Administrator for controlling pedestrians and vehicles, such as signs, signals, or guards, when it is not operationally practical to have two-way radio communications between the tower and the pedestrian, vehicle, or escort;

(d) When an air traffic control tower is not in operation, or there is no air traffic control tower, provide adequate procedures to control pedestrians and ground vehicles in movement areas or safety areas through two-way radio communications or prearranged signs or signals;

(e) Ensure that each employee, tenant, or contractor is trained on procedures required under paragraph (b) of this section, including consequences of noncompliance, prior to moving on foot, or operating a ground vehicle, in movement areas or safety areas; and

(f) Maintain the following records:

(1) A description and date of training completed after June 9, 2004 by each individual in compliance with this section. A record for each individual must be maintained for 24 consecutive months after the termination of an individual's access to movement areas and safety areas.

(2) A description and date of any accidents or incidents in the movement areas and safety areas involving air carrier aircraft, a ground vehicle or a pedestrian. Records of each accident or incident occurring after the June 9, 2004 must be maintained for 12 consecutive calendar months from the date of the accident or incident.

§ 139.331 Obstructions.

In a manner authorized by the Administrator, each certificate holder must ensure that each object in each area within its authority that has been determined by the FAA to be an obstruction is removed, marked, or lighted, unless determined to be unnecessary by an FAA aeronautical study. FAA Advisory Circulars contain methods and procedures for the lighting of obstructions that are acceptable to the Administrator.

§ 139.333 Protection of NAVAIDS.

In a manner authorized by the Administrator, each certificate holder must—

(a) Prevent the construction of facilities on its airport that, as determined by the Administrator, would derogate the operation of an electronic or visual NAVAID and air traffic control facilities on the airport;

(b) Protect—or if the owner is other than the certificate holder, assist in protecting—all NAVAIDS on its airport against vandalism and theft; and

(c) Prevent, insofar as it is within the airport's authority, interruption of visual and electronic signals of NAVAIDS.

§ 139.335 Public protection.

(a) In a manner authorized by the Administrator, each certificate holder must provide—

(1) Safeguards to prevent inadvertent entry to the movement area by unauthorized persons or vehicles; and

(2) Reasonable protection of persons and property from aircraft blast.

(b) Fencing that meets the requirements of applicable FAA and Transportation Security Administration security regulations in areas subject to these regulations is acceptable for meeting the requirements of paragraph (a)(1) of this section.

§ 139.337 Wildlife hazard management.

(a) In accordance with its Airport Certification Manual and the requirements of this section, each certificate holder must take immediate action to alleviate wildlife hazards whenever they are detected.

(b) In a manner authorized by the Administrator, each certificate holder must ensure that a wildlife hazard assessment is conducted when any of the following events occurs on or near the airport:

(1) An air carrier aircraft experiences multiple wildlife strikes;

(2) An air carrier aircraft experiences substantial damage from striking wildlife. As used in this paragraph, substantial damage means damage or

structural failure incurred by an aircraft that adversely affects the structural strength, performance, or flight characteristics of the aircraft and that would normally require major repair or replacement of the affected component;

(3) An air carrier aircraft experiences an engine ingestion of wildlife; or

(4) Wildlife of a size, or in numbers, capable of causing an event described in paragraphs (b)(1), (b)(2), or (b)(3) of this section is observed to have access to any airport flight pattern or aircraft movement area.

(c) The wildlife hazard assessment required in paragraph (b) of this section must be conducted by a wildlife damage management biologist who has professional training and/or experience in wildlife hazard management at airports or an individual working under direct supervision of such an individual. The wildlife hazard assessment must contain at least the following:

(1) An analysis of the events or circumstances that prompted the assessment.

(2) Identification of the wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences.

(3) Identification and location of features on and near the airport that attract wildlife.

(4) A description of wildlife hazards to air carrier operations.

(5) Recommended actions for reducing identified wildlife hazards to air carrier operations.

(d) The wildlife hazard assessment required under paragraph (b) of this section must be submitted to the Administrator for approval and determination of the need for a wildlife hazard management plan. In reaching this determination, the Administrator will consider—

(1) The wildlife hazard assessment;

(2) Actions recommended in the wildlife hazard assessment to reduce wildlife hazards;

(3) The aeronautical activity at the airport, including the frequency and size of air carrier aircraft;

(4) The views of the certificate holder;

(5) The views of the airport users; and

(6) Any other known factors relating to the wildlife hazard of which the Administrator is aware.

(e) When the Administrator determines that a wildlife hazard management plan is needed, the certificate holder must formulate and implement a plan using the wildlife hazard assessment as a basis. The plan must—

(1) Provide measures to alleviate or eliminate wildlife hazards to air carrier operations;

(2) Be submitted to, and approved by, the Administrator prior to implementation; and

(3) As authorized by the Administrator, become a part of the Airport Certification Manual.

(f) The plan must include at least the following:

(1) A list of the individuals having authority and responsibility for implementing each aspect of the plan.

(2) A list prioritizing the following actions identified in the wildlife hazard assessment and target dates for their initiation and completion:

(i) Wildlife population management;

(ii) Habitat modification; and

(iii) Land use changes.

(3) Requirements for and, where applicable, copies of local, State, and Federal wildlife control permits.

(4) Identification of resources that the certificate holder will provide to implement the plan.

(5) Procedures to be followed during air carrier operations that at a minimum includes—

(i) Designation of personnel responsible for implementing the procedures;

(ii) Provisions to conduct physical inspections of the aircraft movement areas and other areas critical to successfully manage known wildlife hazards before air carrier operations begin;

(iii) Wildlife hazard control measures; and

(iv) Ways to communicate effectively between personnel conducting wildlife control or observing wildlife hazards and the air traffic control tower.

(6) Procedures to review and evaluate the wildlife hazard management plan every 12 consecutive months or following an event described in paragraphs (b)(1), (b)(2), and (b)(3) of this section, including:

(i) The plan's effectiveness in dealing with known wildlife hazards on and in the airport's vicinity and

(ii) Aspects of the wildlife hazards described in the wildlife hazard assessment that should be reevaluated.

(7) A training program conducted by a qualified wildlife damage management biologist to provide airport personnel with the knowledge and skills needed to successfully carry out the wildlife hazard management plan required by paragraph (d) of this section.

(g) FAA Advisory Circulars contain methods and procedures for wildlife hazard management at airports that are acceptable to the Administrator.

§ 139.339 Airport condition reporting.

In a manner authorized by the Administrator, each certificate holder must—

(a) Provide for the collection and dissemination of airport condition information to air carriers.

(b) In complying with paragraph (a) of this section, use the NOTAM system, as appropriate, and other systems and procedures authorized by the Administrator.

(c) In complying with paragraph (a) of this section, provide information on the following airport conditions that may affect the safe operations of air carriers:

(1) Construction or maintenance activity on movement areas, safety areas, or loading ramps and parking areas.

(2) Surface irregularities on movement areas, safety areas, or loading ramps and parking areas.

(3) Snow, ice, slush, or water on the movement area or loading ramps and parking areas.

(4) Snow piled or drifted on or near movement areas contrary to §139.313.

(5) Objects on the movement area or safety areas contrary to §139.309.

(6) Malfunction of any lighting system, holding position signs, or ILS critical area signs required by §139.311.

(7) Unresolved wildlife hazards as identified in accordance with §139.337.

(8) Nonavailability of any rescue and firefighting capability required in §§139.317 or 139.319.

(9) Any other condition as specified in the Airport Certification Manual or that may otherwise adversely affect the safe operations of air carriers.

(d) Each certificate holder must prepare and keep, for at least 12 consecutive calendar months, a record of each dissemination of airport condition information to air carriers prescribed by this section.

(e) FAA Advisory Circulars contain methods and procedures for using the NOTAM system and the dissemination of airport information that are acceptable to the Administrator.

§ 139.341 Identifying, marking, and lighting construction and other unserviceable areas.

(a) In a manner authorized by the Administrator, each certificate holder must—

(1) Mark and, if appropriate, light in a manner authorized by the Administrator—

(i) Each construction area and unserviceable area that is on or adjacent to any movement area or any other area of the airport on which air carrier aircraft may be operated;

(ii) Each item of construction equipment and each construction roadway, which may affect the safe movement of aircraft on the airport; and

(iii) Any area adjacent to a NAVAID that, if traversed, could cause derogation of the signal or the failure of the NAVAID; and

(2) Provide procedures, such as a review of all appropriate utility plans prior to construction, for avoiding damage to existing utilities, cables, wires, conduits, pipelines, or other underground facilities.

(b) FAA Advisory Circulars contain methods and procedures for identifying and marking construction areas that are acceptable to the Administrator.

§ 139.343 Noncomplying conditions.

Unless otherwise authorized by the Administrator, whenever the requirements of subpart D of this part cannot be met to the extent that uncorrected unsafe conditions exist on the airport, the certificate holder must limit air carrier operations to those portions of the airport not rendered unsafe by those conditions.

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Appendix B. FAA AC 150/5200-36A, “Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports”

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U.S. Department
of Transportation
Federal Aviation Administration

Advisory Circular

Subject: Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports	**Date:** 01/31/2012 **Initiated by:** AAS-300	**AC No:** 150/5200-36A **Change:**

1. Purpose.

This Advisory Circular (AC) has two purposes. First, this AC describes the qualifications for wildlife biologists who conduct Wildlife Hazard Assessments (WHA) for airports certificated under Title 14, Code of Federal Regulations, Part 139 (14 CFR Part 139), and at non-certificated airports funded by a Federal Aviation Administration (FAA) Airport Improvement Program (AIP) or Passenger Facility Charge (PFC) Program. We recommend that airports, at a minimum, consult with a qualified airport wildlife biologist when developing a Wildlife Hazard Management Plan (WHMP). However, airports are not required to do so.

Second, this AC addresses the minimum wildlife hazard management curriculum for the initial and recurrent training of airport personnel who implement an FAA-approved WHMP.

2. Applicability.

The standards and practices in this AC for public-use airports and for those who conduct Wildlife Hazard Assessments and conduct required training are:

a. Mandatory for airports certificated under Title 14, Code of Federal Regulations, Part 139 (14 CFR Part 139).

b. Mandatory for airports that have accepted AIP or the Passenger Facility Charge (PFC) Program funds.

c. Highly recommended for all other airports that independently fund Wildlife Hazard Assessments.

See Grant Assurance No. 34, Policies, Standards, and Specifications, and PFC Assurance No. 9, Standards and Specifications.

3. Cancellation.

This AC cancels AC 150/5200-36, Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports, dated June 28, 2006.

4. Background.

Wildlife biologists conducting Wildlife Hazard Assessments or training airport personnel actively involved in implementing FAA-approved Wildlife Hazard Management Plans at certificated airports must have professional training and experience in wildlife hazard management at airports [§139.337(c) and (f)(7)]. Airport personnel actively involved in overseeing or implementing FAA-approved Wildlife Hazard Management Plans must receive initial training and recurrent training every 12 consecutive months [§139.303(c) and (e) (Personnel)].

5. Related Reading Material.

Please review the most recent versions of the following documents:

a. FAA AC 150/5200-18, Airport Safety Self-Inspection.

b. FAA AC 150/5200-32, Reporting Wildlife Aircraft Strikes.

c. FAA AC 150/5200-33, Hazardous Wildlife Attractions On or Near Airports.

d. FAA AC 150/5200-34, Construction or Establishment of Landfills Near Public Airports.

e. FAA AC 150/5210-20 Ground Vehicle Operations on Airports

f. FAA AC 150/5220-25 Airport Avian Radar Systems

g. FAA AC 150/5300-13 Airport Design

h. FAA AC 150/5340-1K Standards for Airport Markings

i. FAA AC 150/5340-18F Standards for Airport Sign Systems

j. FAA Office of Safety and Standards, Certalert no. 98-05, Grasses Attractive to Hazardous Wildlife.

k. FAA Office of Safety and Standards, Certalert no. 04-09, Relationship Between FAA and WS.

l. FAA Office of Safety and Standards, Certalert no. 04-16, Deer Hazard to Aircraft and Deer Fencing.

m. Cleary, E. C. and Archie Dickey. 2010. Guidebook for Addressing Aircraft/Wildlife Hazards at General Aviation Airports. Airport Cooperative Research Program Report #32.

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o. Dolbeer, R. A., S. E. Wright, J.R. Weller and M.J. Begier. 2009. Wildlife Strikes to Civil Aircraft in the United States, 1990 – 2008. FAA National Wildlife Aircraft Strike Database Serial Report #15.

p. Dolbeer, R. A. et al. Ranking the Hazard Level of Wildlife Species to Civil Aviation in the United States: Update #1. Special Report for the Federal Aviation Administration, July 2, 2003.

q. Report to Congress: Potential Hazards to Aircraft by Locating Waste Disposal Sites in the Vicinity of Airports, April 1996, DOT/FAA/AS/96-1.

r. Title 14, Code of Federal Regulation, Part 139, Certification of Airports.

s. Title 40, Code of Federal Regulation, Part 258, Criteria for Municipal Solid Waste Landfills.

t. FAA Grant Assurance No. 34, Policies, Standards, and Specifications

u. FAA Passenger Facility Charge (PFC) Assurance No. 9, Standards and Specifications

v. Aeronautical Information Manual (AIM)

Some of these documents and other information on wildlife management, including FAA Certalerts and guidance on siting hazardous wildlife attractants such as landfills, are available on the FAA website at http://www.faa.gov/airports/ and http://wildlife.faa.gov/.

6. Professional Qualifications of Wildlife Biologists Conducting Wildlife Hazard Assessments and Wildlife Hazard Management Training at FAA Certificated Airports.

a. Wildlife biologists conducting airport Wildlife Hazard Assessments must meet certain education, training, and experience standards.

> §139.337(c) reads: Wildlife Hazard Assessment required in paragraph (b) of this section shall be conducted by a wildlife damage management biologist who has professional training and/or experience in wildlife hazard management at airports or an individual working under direct supervision of such an individual.

b. Airports with a FAA-approved Wildlife Hazard Management Plan must provide employees the training needed to carryout the Plan.

> §139.337(f)(7) reads: A training program conducted by a qualified wildlife damage management biologist to provide airport personnel with the knowledge and skills needed to successfully carry out the Wildlife Hazard Management Plan required by paragraph (d) of this section.

c. To meet the requirements of §139.337(c) and (f)(7), a wildlife damage management biologist (from now on referred to as a "qualified airport wildlife biologist") must:

(1) Have the necessary academic coursework from accredited institutions and work experience to meet the qualifications of a GS-0486 series wildlife biologist as defined by the U.S. Office of Personnel Management classification standards (Appendix A) **or** be designated as a Certified Wildlife Biologist by The Wildlife Society (http://www.wildlife.org) **and,**

(2) Have taken and passed an airport wildlife hazard management training course acceptable to the FAA Administrator (Appendix C), **and**;

(3) While working under the direct supervision of a qualified airport wildlife biologist, have conducted at least one Wildlife Hazard Assessment acceptable to the FAA Administrator (as described in §139.337(c)). **and,**

(4) Have successfully completed at least one of the following within five years of their initial FAA approved airport wildlife hazard management training course, and every five years thereafter:

(i) An airport wildlife hazard management training course that is acceptable to the FAA Administrator (Appendix C) **or**,

(ii) Attendance, as a registered participant, at a joint Bird Strike Committee–USA/Bird Strike Committee–Canada annual meeting **or**,

(iii) Other training acceptable to the FAA Administrator.

d. Individuals who work under the direct supervision of a qualified airport wildlife biologist are allowed to conduct Wildlife Hazard Assessments if the airport sponsor and the qualified airport wildlife biologist agree in writing to determine how the qualified airport wildlife biologist will:

(1) Supervise how the individual(s) will conduct the Wildlife Hazard Assessment; and

(2) Report progress of the Wildlife Hazard Assessment; and

(3) Supervise the Wildlife Hazard Assessment report production.

e. Certificate Holders or Airport Sponsors must obtain documentation verifying the qualifications outlined in c (1) – (3) above of any person(s) conducting wildlife hazard assessments or providing requisite training

7. Initial and Recurrent Training for Airport Personnel Actively Involved in Managing Hazardous Wildlife On or Near Airports.

a. Personnel actively involved in implementing FAA-approved Wildlife Hazard Management Plans are subject to the requirements of 14 CFR Part 139.303. §139.303 requires a specific training regimen for all airport personnel. §139.303(c) and (e) require the holder of an Airport Operating Certificate issued under Part 139 to provide initial training and, every 12 months thereafter, recurrent training in wildlife hazard management to airport personnel actively involved in implementing FAA-approved Wildlife Hazard Management Plans. The required training must include "Any additional subject areas required under … §139.337" [§139.303(c)(5)] and, "As appropriate, comply with the following training requirements of this part … §139.337, Wildlife Hazard Management" [§139.303(e)(5)].

b. Appendix D outlines the minimum training requirements for airport personnel who carry out an airport's Wildlife Hazard Management Plan. Depending on local wildlife and environmental issues, additional topics or more in-depth coverage of listed topics might be needed.

c. §139.337(f)(1) requires the Wildlife Hazard Management Plan to include a list of the individuals having authority and responsibility for implementing each aspect of the plan. This list identifies the individuals who must complete the required training.

d. §139.337(f) does not prohibit holders of Airport Operating Certificates from using a "train-the-trainer" approach when providing the requisite training, provided the trainers receive and successfully complete their initial and recurrent training from a qualified airport wildlife

biologist. Trainers who are not qualified airport wildlife biologists are limited to providing training to their airport employees.

e. Holders of Airport Operating Certificates issued under Part 139 are required to make and keep records of all training for airport personnel involved in controlling wildlife hazards for at least 24 consecutive calendar months.[§139.301(b)(1) and §139.303(d)].

Michael J. O'Donnell
Director, Office of Airport Safety and Standards

Appendix A.

U.S. Office of Personnel Management Qualification Standards for GS-0486 Series Wildlife Biologists.

To be qualified as a GS-0486 series wildlife biologist, a candidate must have the following:

1. A degree in biological science that includes—

a. At least nine semester hours in such wildlife subjects as mammalogy, ornithology, animal ecology, and wildlife management or research courses in the field of wildlife biology; **and**

b. At least 12 semester hours in zoology in such subjects as general zoology, invertebrate zoology, vertebrate zoology, comparative anatomy, physiology, genetics, ecology, cellular biology, parasitology, and entomology or research courses in these subjects (excess courses in wildlife biology may be used to meet the zoology requirements where appropriate); **and**

c. At least nine semester hours in botany or the related plant sciences; **or**

2. A combination of education and experience equivalent to a major in biological science (i.e., at least 30 semester hours), with at least nine semester hours in wildlife subjects, 12 semester hours in zoology, and nine semester hours in botany or related plant science, as shown in Paragraph 1 above, plus appropriate experience or additional education; **or**

3. Be designated as a Certified Wildlife Biologist by The Wildlife Society (http://www.wildlife.org).

Appendix B.

Training Resource Requirements and Instructor Qualifications.

The following training resource requirements and instructor qualifications are for any individual wishing to:

- Provide an airport wildlife hazard management course acceptable to the FAA Administrator, for personnel conducting Wildlife Hazard Assessments; or

- Provide training to airport personnel actively involved in implementing FAA approved Wildlife Hazard Management Plans.

1. Training Resources and Requirements.

a. A list of training program providers acceptable to the FAA Administrator can be found on the FAA's wildlife strike website: http://wildlife.faa.gov/.

b. Links to the most recent versions of FAA regulations, FAA Advisory Circulars, Certalerts, and other documents relevant to wildlife hazard management issues can be found at http://www.faa.gov/airports/ and http://wildlife.faa.gov/.

c. Those proposing to establish a program to train qualified airport wildlife biologists to meet the requirements of 14 CFR §139.337 must submit a complete training syllabus and instructor resume to the FAA. The syllabus must include all lesson plans, student handouts, and graphic presentations that include as a minimum all curriculum provided in Appendix C. Submit the materials to:

FAA National Wildlife Biologist, AAS-300
Office of Airport Safety and Standards
Federal Aviation Administration,
800 Independence Ave SW
Washington DC 20591

d. The goal of the training must be to provide the knowledge, skills, and abilities needed by a GS-0486 wildlife biologist to conduct Wildlife Hazard Assessments [§139.337(c)] and to conduct wildlife hazard training [§139.337(f)(7)]. To be acceptable to the FAA, the course must be at least 24 hours in length and include the curriculum items listed in Appendix C.

2. Instructor Qualifications.

The lead instructor for the training should:

a. Be a qualified airport wildlife biologist.

b. Have academic credits in education or instructor/teaching experience.

c. Have a minimum of 2 years experience in all aspects of managing hazardous wildlife on or near airports.

Appendix C.

Training Curriculum Outline for Any Individual Wishing to Provide an Airport Wildlife Hazard Management Course Acceptable to the FAA Administrator, for Personnel Conducting Wildlife Hazard Assessments.

1. Training Curriculum Outline.

The goal of the training must be to provide the knowledge, skills, and abilities needed by a GS-0486 wildlife biologist to conduct Wildlife Hazard Assessments [§139.337(c)] and to conduct wildlife hazard training [§139.337(f)(7)]. To be acceptable to the FAA, the course must be at least 24 hours in length and include the curriculum items listed below.

- **a.** Training goals and process
- **b.** Airport familiarization
  - (1) Introduction to the National Plan of Integrated Airport Systems
  - (2) Airport design and layout (AC 150/5300-13 Airport Design)
  - (3) Navigation aids and Air Traffic Control (Aeronautical Information Manual [AIM])
  - (4) Airport operations and safety (AIM)
  - (5) Signs, marking, and lighting (AC 150/5340-1K Standards for Airport Markings and AC 150/5340-18F Standards for Airport Sign Systems)
  - (6) Ground vehicle operator communication (AC 150/5210-20 Ground Vehicle Operations on Airports)
- **c.** Aircraft familiarization
  - (1) Physics of a strike
  - (2) Aircraft nomenclature
  - (3) Civil aviation aircraft categories
  - (4) Aircraft engines
    - (a) Reciprocating
    - (b) Turbo
  - (5) Aircraft certification standards
- **d.** Preview of wildlife hazards to aviation
  - (1) History of major strikes
  - (2) Aviation losses
    - (a) Worldwide
    - (b) United States
- **e.** Controlling laws, regulations, and policies
  - (1) Migratory Bird Treaty Act of 1918, as amended

(2) Animal Damage Control Act of 1931, as amended

(3) Bald Eagle Protection Act of 1940, as amended

(4) Federal Insecticide, Fungicide, and Rodenticide Act of 1948, as amended

(5) National Environmental Policy Act of 1969, as amended

(6) Endangered Species Act of 1973, as amended

(7) Title 14, Code of Federal Regulation, Part 139, Certification of Airports

(8) Title 40, Code of Federal Regulations, Part 258, Criteria for Municipal Solid Waste Landfills

(9) Title 50, Code of Federal Regulations, Parts 1–199, Wildlife Management

(10) Wendell H. Ford Aviation Investment and Reform Act for the 21st Century, Pub. L. No. 106–181 (April 5, 2000), "Structures Interfering with Air Commerce," section 503

(11) Applicable FAA ACs in the 150/5200 series about Airport Wildlife Hazard Management

(12) Applicable FAA Airport Certalerts

(13) Applicable state and local laws, regulations, and ordinances

f. Department of Defense requirements and perspective on military/civilian joint-use airports

g. Other Federal and State agency roles and responsibilities

(1) U.S. Department of Interior, Fish and Wildlife Service

(a) Role and responsibilities related to managing problem wildlife

(b) Migratory Bird Depredation Permits

(c) Salvage Permits

(2) U.S. Department of Agriculture, Wildlife Services

(a) Role and responsibilities related to managing problem wildlife

(3) Other agencies

(a) U.S. Environmental Protection Agency

(i) Siting landfills

(ii) Pesticide registration and use

(b) U.S. Army Corps of Engineers

(i) Wetlands mitigation

(4) Multi-Federal Agency Memorandum of Agreement

(5) Applicable State wildlife regulations

h. FAA National Wildlife Aircraft Strike Database

(1) Strike reporting

(2) Species identification and feather identification

(3) Database access

i. Environmental issues—working with Federal and State agencies

(1) National Environmental Policy Act

(2) U.S. Army Corps of Engineers (wetland loss and mitigation issues)

j. Initial consultations and Wildlife Hazard Assessments (WHAs)

(1) Triggering events for WHAs

(2) Duration and contents of WHAs

(3) Wildlife surveys at airports to assess wildlife hazards

(4) Data analysis and presentation of results

(5) Writing a WHA

k. FAA review of a WHA and determination of need for a Wildlife Hazard Management Plan (WHMP)

l. Drafting and carrying out integrated WHMPs

(1) Contents of WHMPs

(2) FAA review of WHMPs

(3) Endangered Species Act compliance

(4) National Environmental Policy Act review

m. Integrated wildlife hazard management for airports; survey of basic control strategies and tactics

(1) Flight schedule modification

(2) Habitat modification and exclusion

(3) Wildlife dispersal techniques

(4) Wildlife population management

n. Addressing off-airport attractants and community planning and involvement

o. Outline of field trip (to conduct a “mini” WHA)

p. Field trip/site visit

q. Final exam

r. Post exam review

s. Course evaluation

t. Presentation of certificates

2. Recommendations.

a. Exams or tests may be oral, written, practical demonstrations, or a combination of each.

b. Passing grade/evaluation should be recorded and retained as instructor's records.

c. Instructors should retain course attendance records for a period of three years.

Appendix D.

Training Curriculum Outline for Airport Personnel Actively Involved in Implementing FAA-Approved Wildlife Hazard Management Plans.

1. Training Curriculum Outline.

The goal of the training course must be to provide the knowledge, skills, and abilities needed by airport personnel to safely, accurately, and effectively implement relevant portions of an FAA-approved Wildlife Hazard Management Plan. To be acceptable to the FAA, initial and recurrent training must include the following agenda items:

a. General survey of wildlife hazards to aviation based on the most recent annual FAA National Wildlife Strike Database Serial Report

b. Review of wildlife strikes, control actions, and observations at the airport over at least the past 12 months

c. Review of the airport's Wildlife Hazard Assessment is to include—

(1) Existing wildlife hazards and trends in wildlife abundance

(2) Status of any open or unresolved recommended action items for reducing identified wildlife hazards to air carrier operations within the past 12 months

d. Review of the airport's Wildlife Hazard Management Plan, to include the following:

(1) Airport-specific wildlife attractants, including man-made and natural features and habitat management practices of the last 12 months.

(2) Review of the airport's wildlife permits (local, State, and Federal)

(3) Review of other airport-specific items:

(a) Wildlife hazard management strategies, techniques, and tools:

(i) Flight schedule modification

(ii) Habitat modification, exclusion

(iii) Repelling methods

(iv) Wildlife population management

(b) Responsibilities of airport personnel for—

(i) Reporting wildlife strikes, control actions, and wildlife observations

(ii) Communicating with personnel who conduct wildlife control actions or who see wildlife hazards and air traffic control tower personnel and others who may require notification, such as airport operations or maintenance departments

(iii) Documenting and reporting wildlife hazards seen during patrols and inspections and follow-up control efforts

(iv) Documenting and reporting when no hazards are seen during patrols and inspections

e. Basic bird and mammal identification, stressing local hazardous and rare or endangered species of concern

f. For any airport personnel using pyrotechnic launchers or firearms, training on the following topics from a qualified individual[2]:

(1) Safety, parts, and operation of pyrotechnic launchers

(2) Fundamentals of using pyrotechnics to safely and effectively disperse wildlife

(3) Personnel protective equipment

(4) Cleaning, storage, and transport of firearms and pyrotechnic launchers

(5) Applicable local, State, and Federal regulations on firearms, pyrotechnic launchers, and pyrotechnics[3]

(6) Live fire training with pyrotechnic launchers including strategies for dispersing wildlife away from runways and aircraft movement corridors

(7) For any airport personnel using firearms, live fire training. This training is highly recommended from a qualified individual but not a requirement for this training program[2].

g. Any other training required by local, State, or Federal regulations

2. Recommendations.

a. Exams or tests may be oral, written, practical demonstrations, or a combination of all three.

b. The Trainer should retain passing grades/evaluations records.

c. The Trainer should retain course attendance records for a period of three years.

d. Airport personnel responsible for the airport's wildlife hazard management program should retain records of those to whom instruction in airport wildlife hazard management has been given for the period of time during which the employees conduct hazardous wildlife management activity on the airport and for six months after termination of employment.

---

[2] State Certificated Hunter Safety Instructors, police officers, firearms instructors and other personnel who have been professionally trained in firearms safety should be qualified to teach firearm safety and possibly the safe use of pyrotechnic launchers. Pyrotechnics are classified as high explosives by the Bureau of Alcohol Tobacco and Firearms (ATF) and as Division 1.4 explosives by the U.S. Department of Transportation. There are numerous regulations, security considerations, and ATF licensing requirements that apply to pyrotechnics.

[2] Airport personnel actively involved with the use of firearms for the mitigation of wildlife hazards should receive and maintain current firearms training from either a licensed National Rifle Association (NRA) instructor or other qualified individual. This training should include type and caliber of weapon used at the airport.

[3] Bureau of Alcohol, Tobacco and Firearms provides information on Federal explosive requirements for explosive pest control devices at: http://www.atf.gov/explosives/how-to/documents/epcd-flyer.pdf.

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Appendix C. Author Accreditation

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Qualified Wildlife Biologist

In accordance with Title 14 of the Code of Regulations (CFR) Part 139.337 (c), "Wildlife Hazard Management," the Wildlife Hazard Assessment for the French Valley Airport was performed under the supervision of Mr. Rick Jones, CWB® an FAA-qualified Airport Wildlife Biologist, who prepared the Wildlife Hazard Assessment Report.

Mr. Jones meets all requirements set forth in FAA Advisory Circular 150.5200-36A, "Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports." Mr. Jones has attended training in wildlife hazard management presented by Embry Riddle Aeronautical University and appears on the University's published "Qualified Airport Wildlife Biologist Listing."

Mr. Jones has completed numerous Wildlife Hazard Assessments, Wildlife Hazard Management Plans, and Wildlife Hazard Site Visits nationwide to the satisfaction of the Federal Aviation Administration as shown in **Table C-1.**

Table C-1
Wildlife Hazard Management Projects
Completed and FAA-Approved Projects by Rick Jones, Mead & Hunt Inc.

Alaska	
Gustavus Airport	Wildlife Hazard Site Visit (2015)
Petersburg Airport	Wildlife Hazard Site Visit (2015)
Wrangell Airport	Wildlife Hazard Site Visit (2015)
California	
Brackett Field	Wildlife Hazard Assessment (2014)
Cable Airport	Wildlife Hazard Assessment (2014)
Camarillo	Wildlife Hazard Assessment (2014)
Chino Airport	Wildlife Hazard Assessment (2014)
El Monte Airport	Wildlife Hazard Assessment (2014)
Fresno-Yosemite International Airport	Wildlife Hazard Management Plan (2013)
Fullerton Municipal Airport	Wildlife Hazard Assessment (2014)
Hawthorne Municipal Airport	Wildlife Hazard Assessment (2014)
Hayward Executive Airport	Wildlife Hazard Assessment (2014)
Livermore Municipal Airport	Wildlife Hazard Assessment (2013) Wildlife Hazard Management Plan (2014)
Los Angeles Whiteman Airport	Wildlife Hazard Assessment (2014)
Palo Alto Airport	Wildlife Hazard Assessment (2014)
Riverside Municipal Airport	Wildlife Hazard Assessment (2014)
Salinas Municipal Airport	Wildlife Hazard Assessment (2014)
San Carlos Airport	Wildlife Hazard Assessment (2014)
Watsonville Municipal Airport	Wildlife Hazard Assessment (2014)
William J. Fox Field	Wildlife Hazard Assessment (2014)
Colorado	
Cortez Municipal Airport	Wildlife Hazard Assessment (2013) Wildlife Hazard Management Plan (2013)
Pueblo Municipal Airport	Wildlife Hazard Assessment (2013) Wildlife Hazard Management Plan (2013)
Yampa Valley Regional Airport	Wildlife Hazard Assessment (2012) Wildlife Hazard Management Plan (2012)
Idaho	
Sandpoint Airport	Wildlife Hazard Site Visit (2014)
Montana	
Sherwood Airport	Wildlife Hazard Site Visit (2014)

New Mexico	
Four Corners Regional Airport	Wildlife Hazard Assessment (2012) Wildlife Hazard management Plan (2012)
Oregon	
Crater Lake – Klamath Regional Airport	Wildlife Hazard Management Plan (2014)
Scappoose Industrial Business Park/Port of St. Helens	Wildlife Hazard Site Visit (2014)
Eastern Oregon Regional Airport	Wildlife Hazard Site Visit (2015)
Texas	
Dallas Executive Airport	Wildlife Hazard Assessment (2015) Wildlife Hazard Management Plan (2015)
Denton Municipal Airport	Wildlife Hazard Assessment (2013)
Lone Star Executive Airport	Wildlife Hazard Assessment (2013)
Washington	
Auburn Municipal Airport	Wildlife Hazard Assessment (2015) Wildlife Hazard Management Plan (2015)

PRESCOTT
ARIZONA

SEARCH

Qualified Airport Wildlife Biologist Listing

Individuals appearing on these lists have satisfactorialy demonstrated to Embry-Riddle Aeronautical University they possess the required education and experience as stipulated under FAA Advisory Circular 150/5200-36A to be classified as a "qualified airport wildlife biologist".

FAA A/C 150/5200-36A

Qualified Wildlife Biologist Application

Applicants who already meet the qualifications spelled out in FAA Advisory Circular 150/5200-36A regarding educational, training, and approved FAA wildlife assessment may apply to be added to the list below. This application should NOT be submitted if any of the requirements have not been met. Application

Important Information

Embry-Riddle Aeronautical University is providing this list as a service to the Aviation Community to identify individuals that have satisfactorily demonstrated they possess the required education and experience related credentials to be classified as a "qualified airport wildlife biologist" as stipulated in FAA Advisory Circular 150/5200-36. Embry-Riddle Aeronautical University in no way endorses or recommends, implied or otherwise, any individual or business contained on this list. Only information necessary to verify credentials and basic contact information have been collected. Individuals and/or businesses appearing on this list have paid a Verification Process Application fee. No individual or business appearing on this list has been required to attend Embry-Riddle Aeronautical University or it's related training programs.

Qualified Biologists (Listed alphabetically by last name)

Amy L. **Anderson** Senior Environmental Scientist 1597 The Greens Way, Suite 200 Jacksonville Beach, FL 32250 Phone: (904) 285-1397 Email: aanderson@ersenvironmental.com Website: http://www.ersenvironmental.com	Bill (William) **Antonides** Qualified Airport Wildlife Biologist Gander Island Consulting Service, Inc. 514 N. Arch Street Aberdeen, SD 57401-2951 Phone: (605) 380-8586 Email: billantonides@gmail.com
Nick **Atwell** Aviation Wildlife Manager Portland International Airport 7200 NE Airport Way Portland, OR 97218 Phone: (503) 415-6179 (office) Cell: (503) 807-4585 Email: nick.atwell@portofportland.com	Daniel W. (Bill) **Baber**, Ph.D ICF International 317 SW Alder Street, Suite 800 Portland, OR 97204 Phone: 503-525-6167 Email: dbaber@icfi.com Website: http://www.icfi.com
Cody **Baciuska** Wildlife Biologist Loomacres Wildlife Management P.O. Box 361 Warnerville, NY 12187 Phone: (607) 760-8748 Email: cody@loomacres.com Website: http://www.airportwildlife.com	Cathy **Boyles** Wildlife Administrator Operations Department Box 619428 DFW Airport, Texas 75261 Phone: (972) 973-3122 Email: cboyles@dfwairport.com
Sarah **Brammell** SW Florida Regional Director Environmental Resource Solutions, Inc. 19607 Lake Osceola Ln Odessa FL 33556 Phone: (813) 404-3963 Email: sbrammell@ersenvironmental.com	Edward C. **Cleary** WASHMan LLC. 212 Azalea Road Colonial Beach, VA. 22443 Phone/Fax: (804) 224-6069 Email: washmaned@aol.com
Steven S. **Cramer**, CWB Environmental Scientist Jacobs Engineering Group 911 Central Parkway North, Suite 425 San Antonio, TX 78232 Phone: (210) 494-0088 Email: steven.cramer@jacobs.com	Russell P. **Defusco** BASH Incorporated 5010 Lanagan St. Colorado Spring, Co. 80919 Phone: 719-264-8420 Cell: 719-200-2252 Email: birdmanruss@aol.com
Marchelle **Dickey** 12272 W. Chenango Dr Morrison, CO 80465 Phone: (928) 925-6818 Email: fadickey@hotmail.com	Gary **Exner** Qualified Airport Wildlife Biologist Advantage Consulting LLC 410 Lake Lenelle Drive Chuluota, FL 32766 Phone: (407) 365-4662

	Email: adcons2@earthlink.net
Steven Donald **Fairaizl** Senior Biologist Airport Wildlife Consultants, LLC. 4735 E. Melanie Drive Cave Creek, AZ 85331 Phone: (480) 993-9357 Email: steveandgale@awcphx	Gino JM **Giumarro**, CWB Senior Ecologist Stantec Consulting 30 Park Drive Topsham, ME 04086 Phone: (207) 729-1199 Cell: (207) 318-0078 Email: gino.giumarro@stantec.com Website: http://www.stantec.com
Mark L. **Hudnall** Hudnall Aviation & Wildlife Consulting 106 Durham Drive Madison, AL 35758 Phone: (256) 724-0964 Email: hud@wildlifehazard.com Website: http://www.wildlifehazard.com	Amy **Johnson** Qualified Airport Wildlife Biologist Environmental Resource Solutions, Inc. 8711 Perimeter Park Blvd., Suite 1 Jacksonville, FL 32216 Phone: (904) 285-1397 Cell: (813)-966-9410 Email: ajohnson@ersenvironmental.com Website: http://www.ersenvironmental.com
Rick L. **Jones**, CWB Qualified Airport Wildlife Biologist Mead & Hunt, Inc. 1743 Wazee Street, Suite 400 Denver, CO 80202 Main: (303) 825-8844 Mobile:(720) 376-8320	Steve **Osmek** Senior Wildlife Biologist Seattle-Tacoma International Airport PO Box 68727 Seattle, WA. 98168 Phone: (206) 431-4453 (office) Cell: (206) 419-8666 Email: osmek.s@portseattle.org
Ronald P. **Peterson** P.O. Box 73 Lakeland, MN 55043 Phone:(612) 803-7667 Email: vitae42@yahoo.com	Timothy L. **Pugh** Qualified Airport Wildlife Biologist Midwest Wildlife Services, LLP P.O. Box 1102 Pierre, SD 57501 Phone:(605) 280-0704 Fax: (605) 609-0077 Email: timpugh@midconetwork.com
Jason R.**Ringler** Qualified Airport Wildlife Biologist The Louis Berger Group, Inc. 295 Promenade Street Providence, RI 02908 Phone:(401) 521-5980 Email: jringler@louisberger.com	Olivia Munzer **Schaetz** Qualified Airport Wildlife Biologist 2518 Sinclair Ave Midland, Texas 79705 Cell:(512) 970-6067 Email: Liefvir@yahoo.com

R. Stevan **Scheldt** PML Environmental 8654 View Ct. Ketchikan, Alaska 99901 Phone: (907) 617-6967 Email: kadcc@kpunet.net	Jeremy **Sheets** Qualified Airport Wildlife Biologist Cardno JFNew 708 Roosevelt Road Walkerton, IN 46574 Phone: (574) 586-3400 Cell: (574) 229-8779 Email: jeremy.sheets@cardno.com Website: http://www.cardnojfnew.com
Jodi **Taylor**, Natural Resources Manager Terracon Consultants, Inc. 25809 Interstate 30 South Bryant, Arkansas 72022 Phone: (501) 847-9292 (office) Cell: (501) 350-5522 Email: jataylor@terracon.com Offices Nationwide www.terracon.com	Tom **Unangst** Qualified Airport Wildlife Biologist Total Environmental & Wildlife Solutions (TEWS) Inc. 5906 Wolf Village Drive Colorado Springs, CO 80924 Phone: (719) 964-8473 Email: tews_inc@msn.com; etunangst@msn.com
Thomas **Wirickx**, CE Senior Environmentalist McFarland-Johnson, Inc. 49 Court Street, Metrocenter P.O. Box 1980 Binghamton, NY 13902-1980 Phone: (607) 723-9421 Fax: (607) 723-4979 Email: twirickx@mjinc.com Website: www.mjinc.com	

- FEEDBACK
- CONTACT US

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Administrative Offices: Prescott, AZ Residential Campus - 3700 Willow Creek Road,Prescott, AZ 86301-3720

CERTIFICATE OF ATTENDANCE

Awarded to

Mr. Rickey Jones

For attending the

2013 Bird Strike North America Conference

Presented by

Bird Strike Committee USA

And

Bird Strike Association of Canada

in cooperation with

American Association of Airport Executives

12-15 August 2013
Milwaukee, Wisconsin USA

Identifying and reducing hazards to aviation caused by wildlife.

John E. Ostrom
John Ostrom, Chair

Embry-Riddle Aeronautical University

The Office of Professional Education
hereby certifies that

Rick L. Jones

Has successfully completed 2.4 Continuing Education Units in the following:

SFY-3000 Airport Wildlife Hazard Management Workshop

In Witness Whereof the signatures are authorized and
the Seal of the University are hereunto affixed at Daytona Beach, Florida
this 22nd day of January 2010 Anno Domini.

Martin A. Smith
Executive Vice President, Embry-Riddle Worldwide

Albert W. Astbury
Interim Director, Office of Professional Education

The Wildlife Society

INCORPORATED IN WASHINGTON, D.C.

grants the designation

Certified Wildlife Biologist

to

Rick L. Jones

in recognition of fulfilling all the professional requirements approved by The Wildlife Society and verified by the Society's Certification Review Board. This designation is valid for 5 years, beginning the 9th day of December 2008.

Thomas M. Franklin
President, The Wildlife Society

Chairman, Certification Review Board

Executive Director, The Wildlife Society

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Appendix D. Airport Layout Plan

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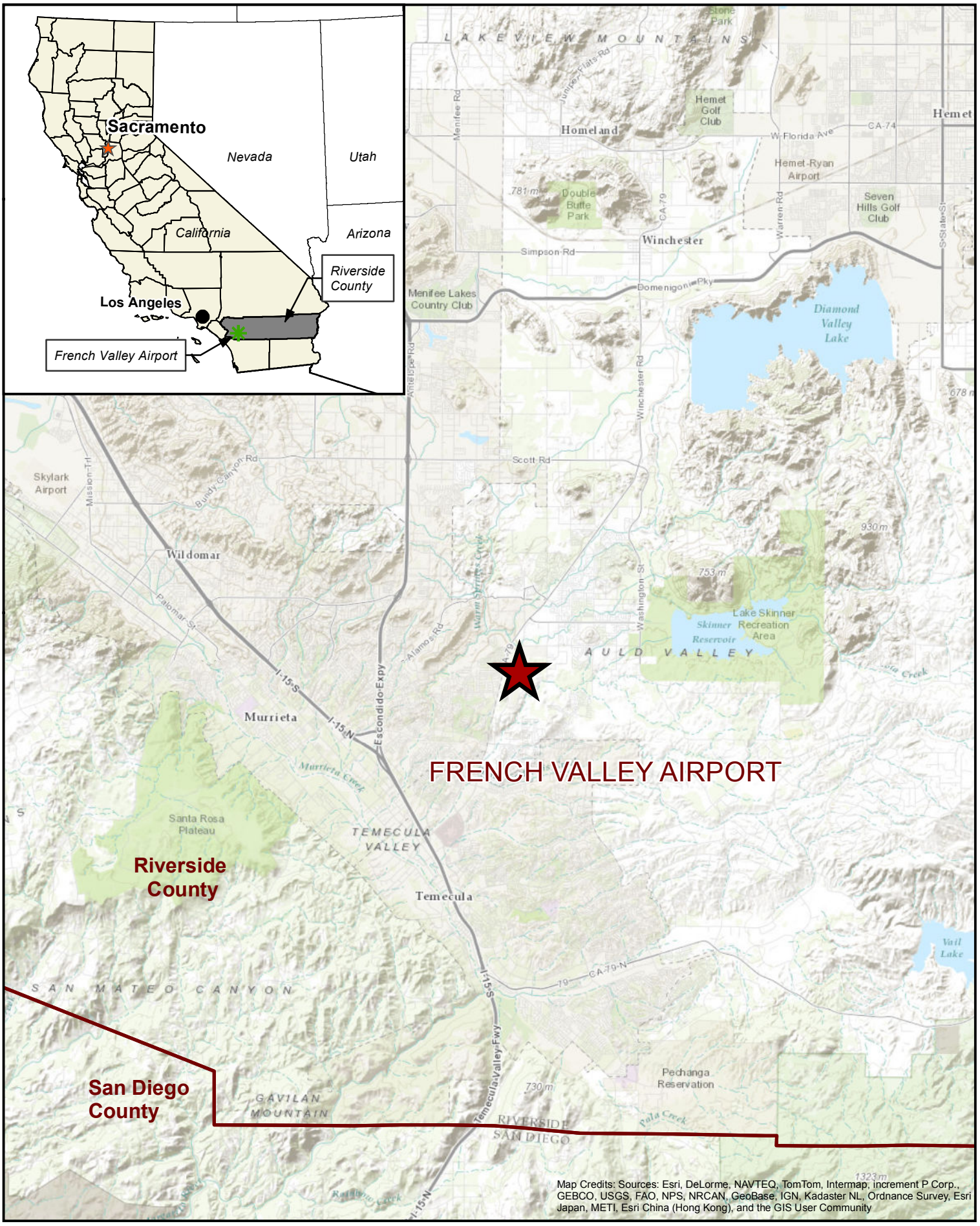

Figure 1.
Location Map

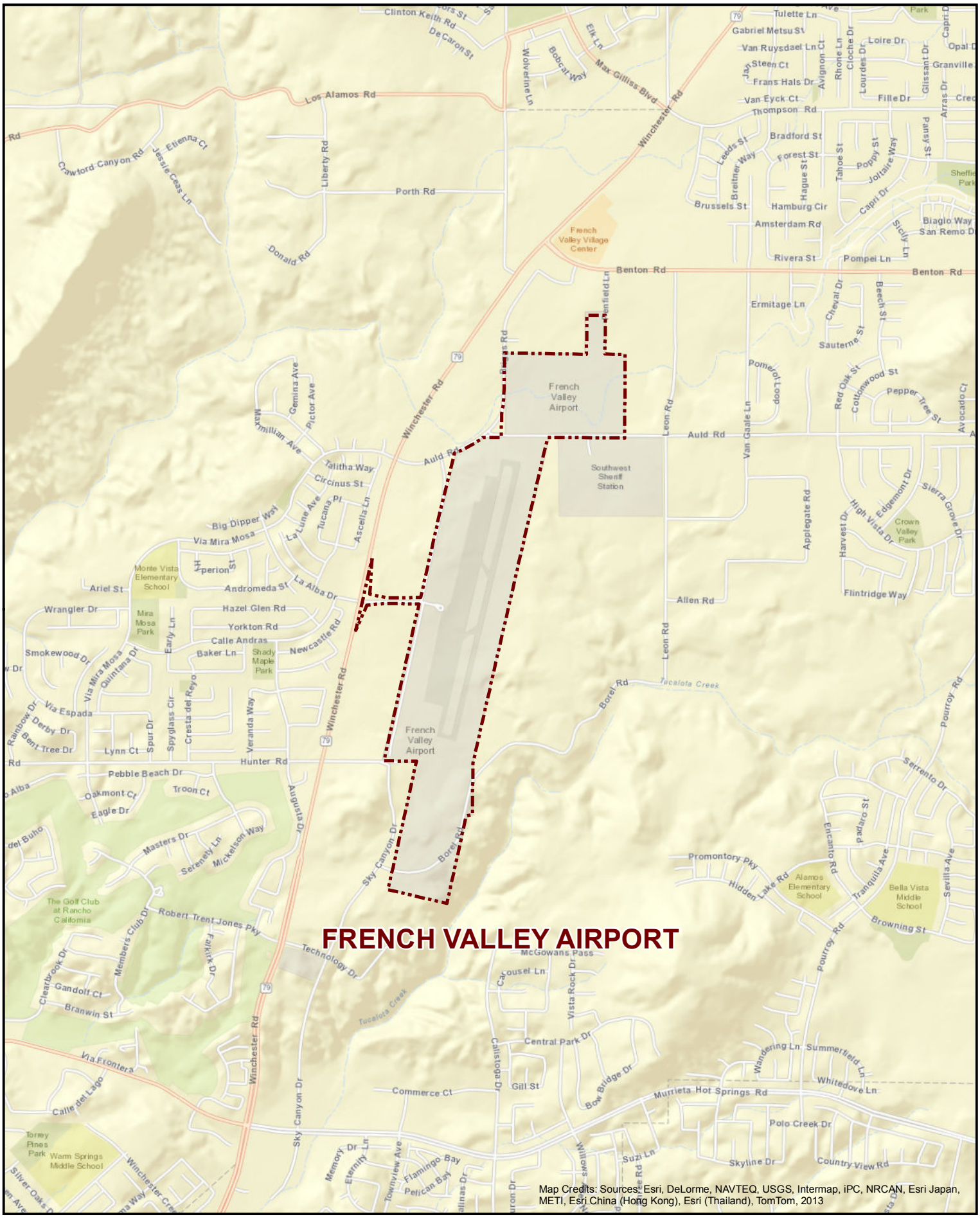

Figure 2.

Site Map

Legend

Airport Property Boundary (Approximate)

0 1,000 2,000 3,000 4,000 Feet

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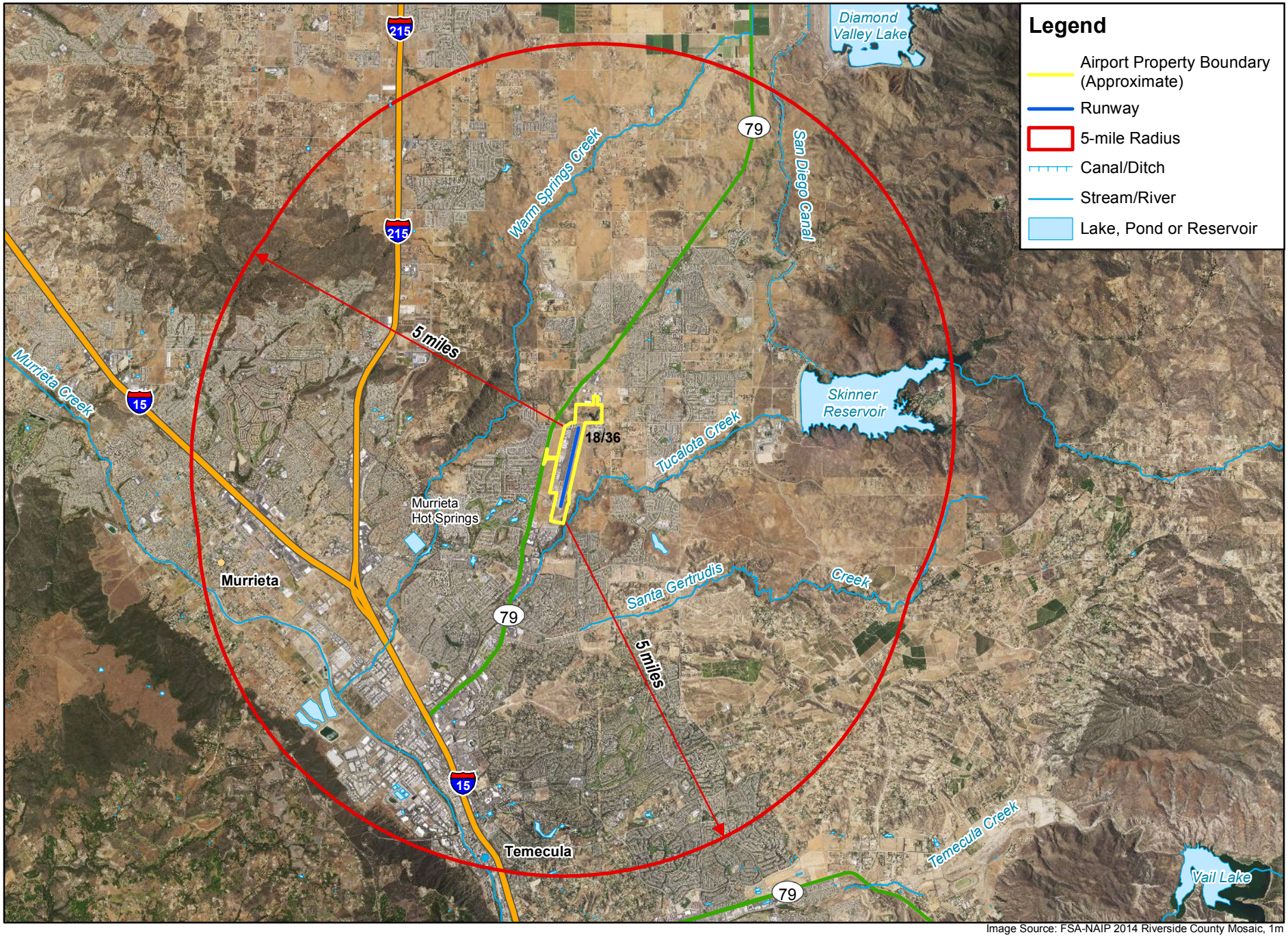

Image Source: FSA-NAIP 2014 Riverside County Mosaic, 1m
National Hydrography Dataset (NHD): HUC-8 18070302 and 18070202

Figure 3.

5-mile Radius Map

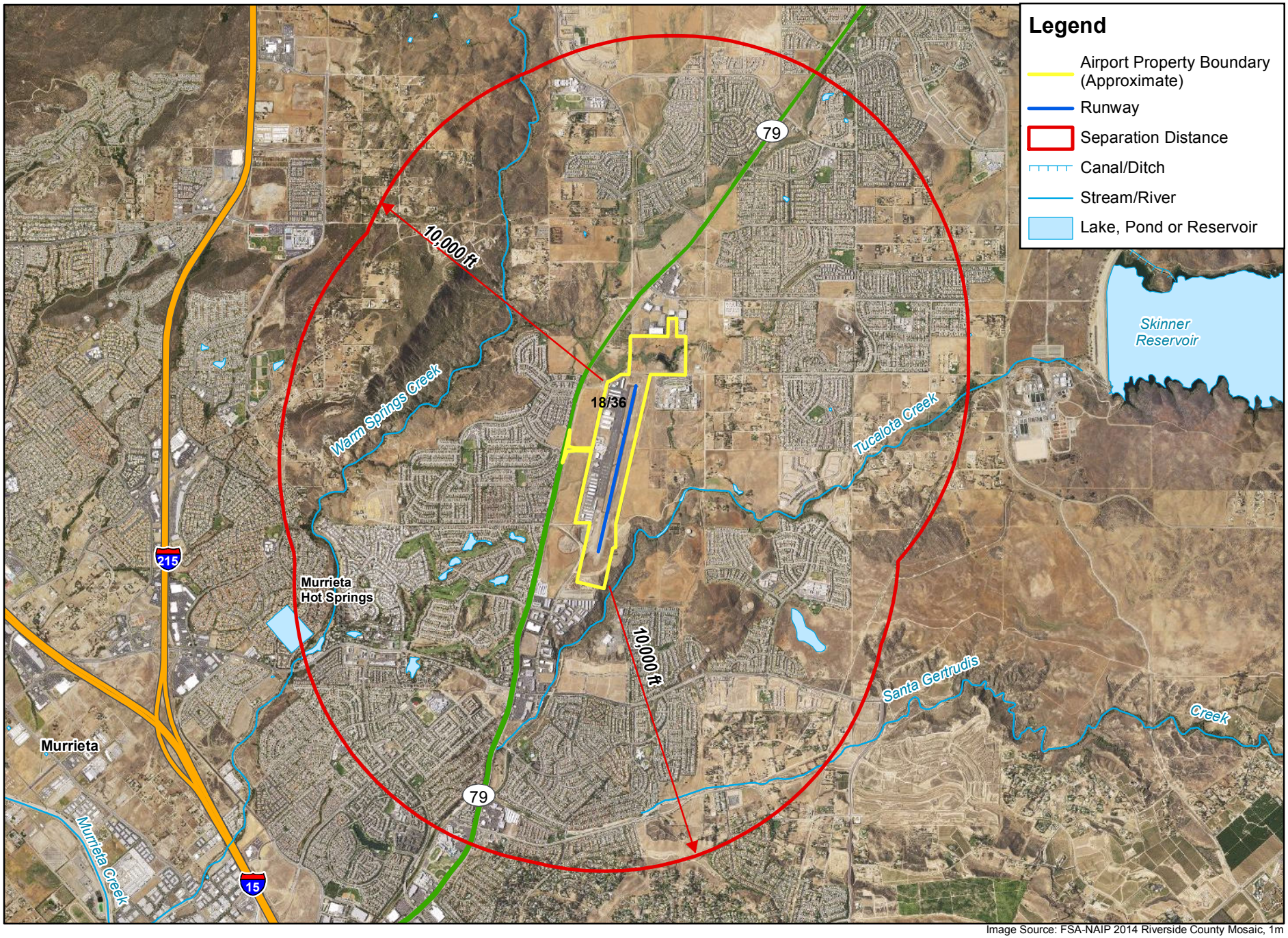

Image Source: FSA-NAIP 2014 Riverside County Mosaic, 1m
National Hydrography Dataset (NHD): HUC-8 18070302 and 18070202

Figure 4.

10,000-ft Separation Map

Image Source: FSA-NAIP 2014 Riverside County Mosaic, 1m
National Hydrography Dataset (NHD): HUC-8 18070302 and 18070202

Figure 5.

Monitoring Locations Map

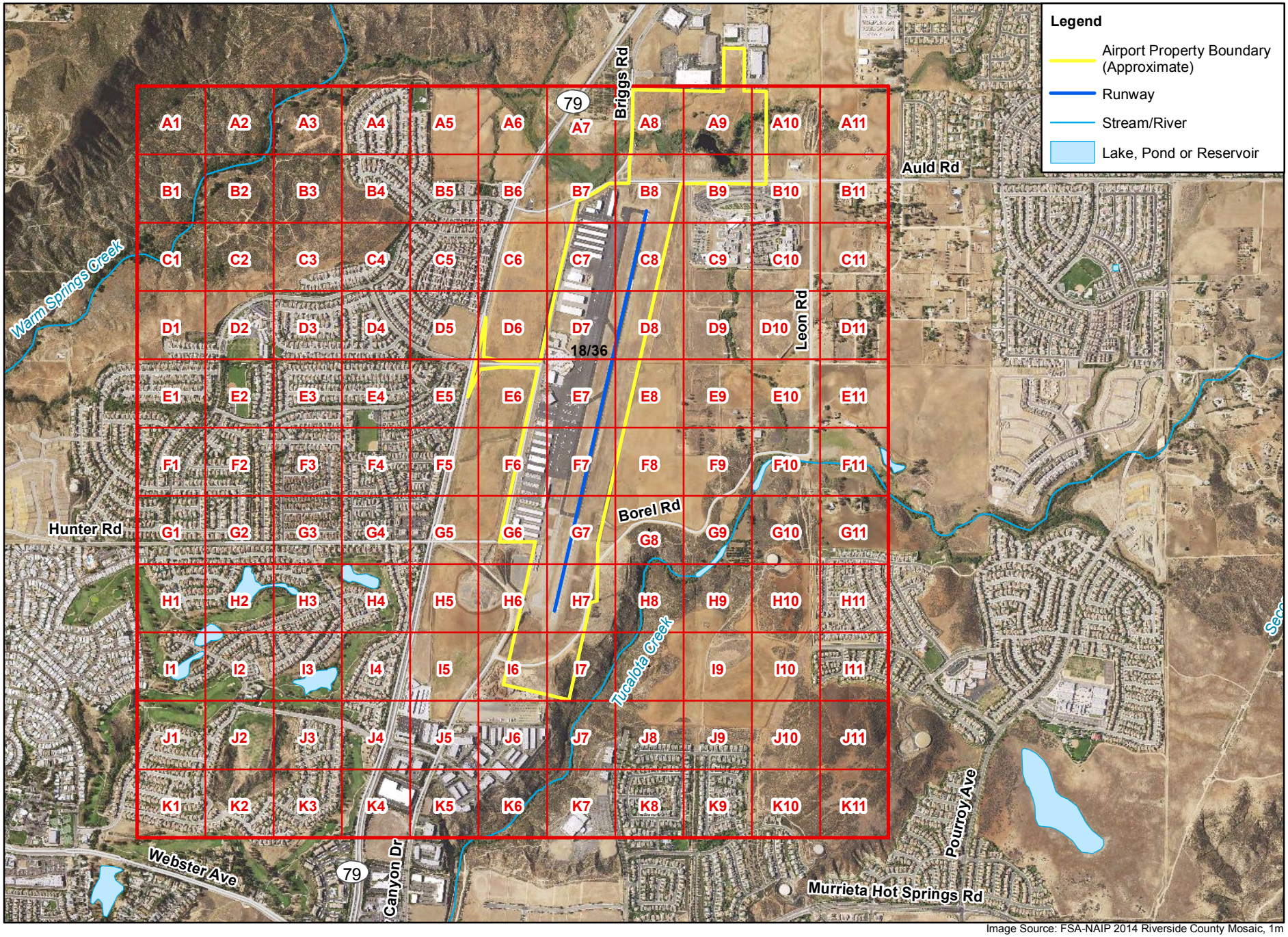

Image Source: FSA-NAIP 2014 Riverside County Mosaic, 1m
National Hydrography Dataset (NHD): HUC-8 18070302 and 18070202

Figure 6.

Wildlife Observation Grid

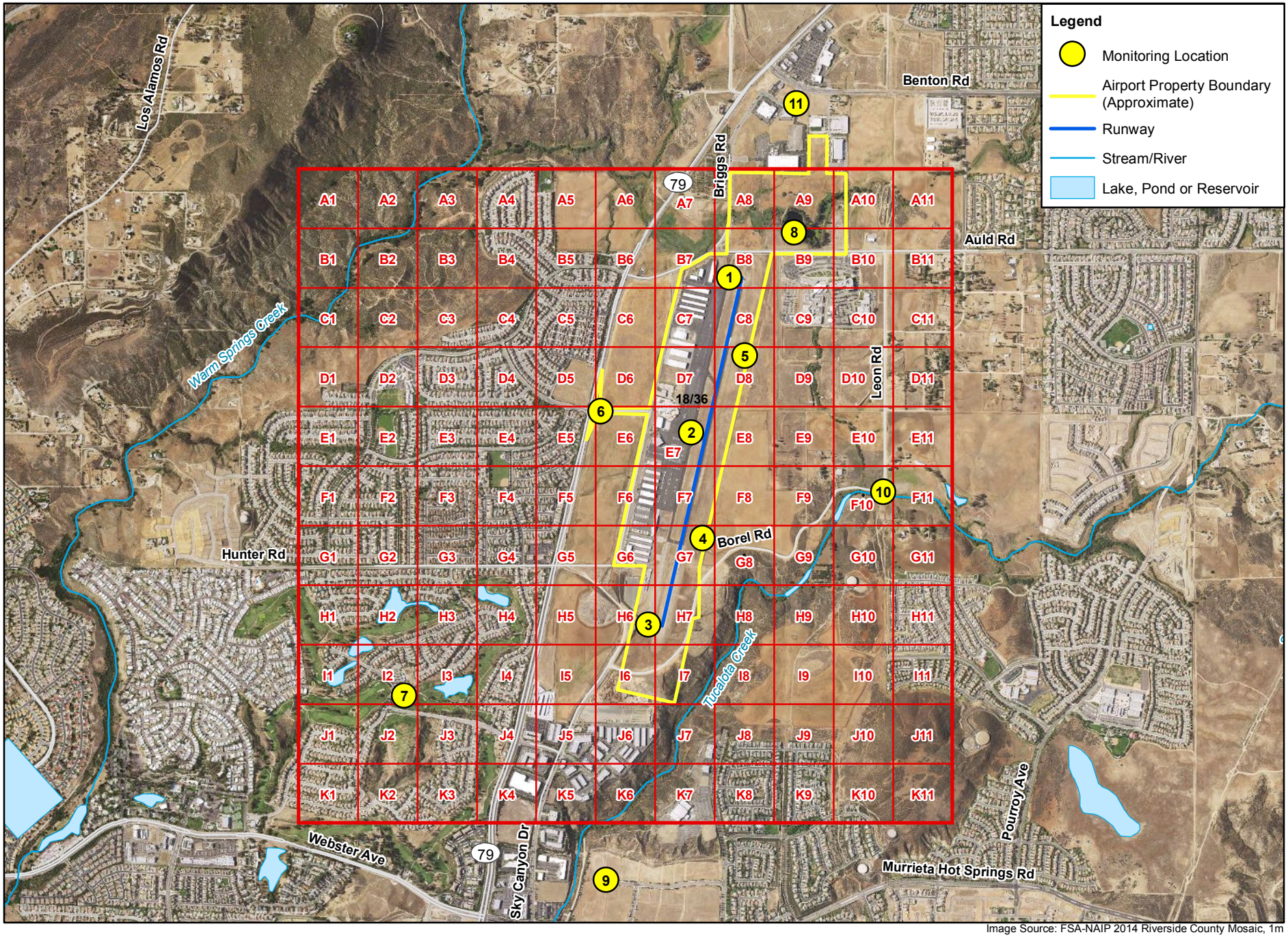

Image Source: FSA-NAIP 2014 Riverside County Mosaic, 1m
National Hydrography Dataset (NHD): HUC-8 18070302 and 18070202

Figure 6.

Wildlife Observation Grid

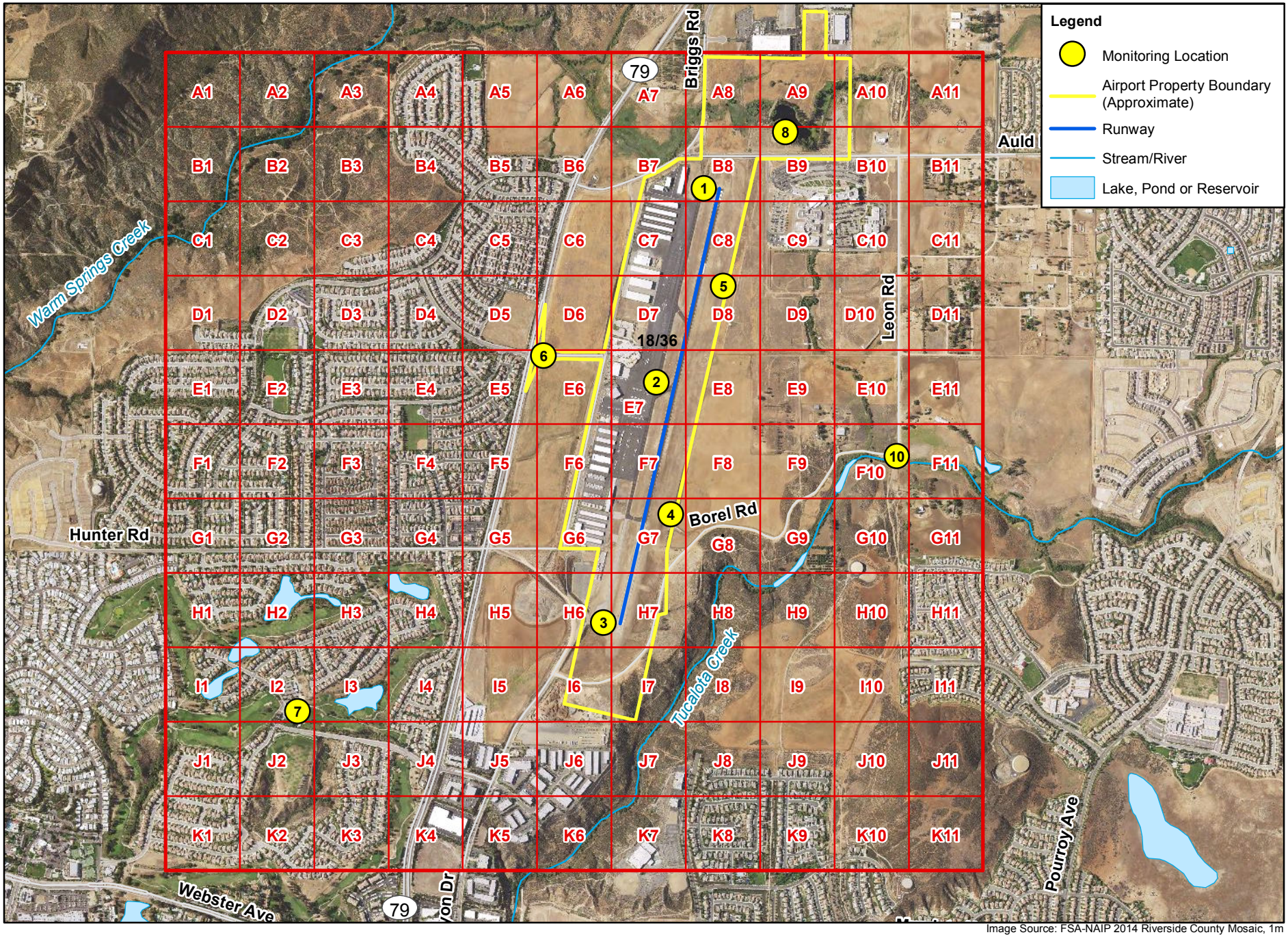

Image Source: FSA-NAIP 2014 Riverside County Mosaic, 1m
National Hydrography Dataset (NHD): HUC-8 18070302 and 18070202

Figure 6.

Wildlife Observation Grid

Appendix E. Federal- and State-listed Threatened and Endangered Species

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State of California
The Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Biogeographic Data Branch
California Natural Diversity Database

STATE & FEDERALLY LISTED ENDANGERED & THREATENED ANIMALS OF CALIFORNIA

January 2013

This is a list of animals found within California or off the coast of the State that have been classified as Endangered or Threatened by the California Fish & Game Commission (state list) or by the U.S. Secretary of the Interior or the U.S. Secretary of Commerce (federal list). The federal agencies responsible for listing are the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS).

The official California listing of Endangered and Threatened animals is contained in the California Code of Regulations, Title 14, Section 670.5. The official federal listing of Endangered and Threatened animals is published in the Federal Register, 50 CFR 17.11. The California Endangered Species Act of 1970 created the categories of "Endangered" and "Rare." The California Endangered Species Act of 1984 created the categories of "Endangered" and "Threatened." On January 1, 1985, all animal species designated as "Rare" were reclassified as "Threatened."

Also included on this list are animal "Candidates" for state listing and animals "Proposed" for federal listing; federal "Candidates" are currently not included. A state Candidate species is one that the Fish and Game Commission has formally declared a candidate species. A federal Proposed species is one that has had a published proposed rule to list in the Federal Register.

Designation		Totals as of January 2013
State listed as Endangered	SE	46
State listed as Threatened	ST	34
Federally listed as Endangered	FE	91
Federally listed as Threatened	FT	39
State Candidate (Endangered)	SCE	3
State Candidate (Threatened)	SCT	2
State Candidate (Delisting)	SCD	1
Federally proposed (Endangered)	FPE	0
Federally proposed (Threatened)	FPT	0
Federally proposed (Delisting)	FPD	2
Total number of animals listed (includes subspecies & population segments)		155
Total number of candidate/proposed animals for listing		5
Number of animals State listed only		32
Number of animals Federally listed only		75
Number of animals listed under both State & Federal Acts		50

Common and scientific names are shown as they appear on the state or federal lists. If the nomenclature differs for a species that is included on both lists, the state nomenclature is given and the federal nomenclature is shown in a footnote. Synonyms, name changes, and other clarifying points are also footnoted.

The "List Date" for **final** federal listing is the date the listing became effective. This is usually not the date of publication of the rule in the Federal Register; it is usually about 30 days after publication, but may be longer.

If an animal was previously listed or proposed for listing and no longer has any listing status, the entry has been grayed out.

For taxa that have more than one status entry, the **current status is in bold and underlined**.

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	State Listing			Federal Listing	
GASTROPODS					
Trinity bristle snail *Monadenia setosa*[1]	ST	10-02-80			
Morro shoulderband (=banded dune) snail *Helminthoglypta walkeriana*				FE	1-17-95
White abalone *Haliotis sorenseni*				FE[2] FE	11-16-05 6-28-01
Black abalone *Haliotis cracherodii*				FE[3] FE	4-13-11 2-13-09
CRUSTACEANS					
Riverside fairy shrimp *Streptocephalus woottoni*				FE	8-03-93
Conservancy fairy shrimp *Branchinecta conservatio*				FE	9-19-94
Longhorn fairy shrimp *Branchinecta longiantenna*				FE	9-19-94
Vernal pool fairy shrimp *Branchinecta lynchi*				FT	9-19-94
San Diego fairy shrimp *Branchinecta sandiegonensis*				FE	2-03-97
Vernal pool tadpole shrimp *Lepidurus packardi*				FE	9-19-94
Shasta crayfish *Pacifastacus fortis*	**SE** ST	2-26-88 10-02-80		FE	9-30-88
California freshwater shrimp *Syncaris pacifica*	SE	10-02-80		FE	10-31-88
INSECTS					
Zayante band-winged grasshopper *Trimerotropis infantilis*				FE	2-24-97
Mount Hermon June beetle *Polyphylla barbata*				FE	2-24-97
Casey's June beetle *Dinacoma caseyi*				**FE** FPE	10-24-11 7-09-09
Delta green ground beetle *Elaphrus viridis*				FT	8-08-80
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*				FPD **FT**	10-2-12 8-08-80

[1] Current taxonomy is *Monadenia infumata setosa.*
[2] Listed by NMFS in 2001 and by USFWS in 2005.
[3] Listed by NMFS in 2009 and by USFWS in 2011.

	State Listing			Federal Listing	
Ohlone tiger beetle *Cicindela ohlone*				FE	10-03-01
Kern primrose sphinx moth *Euproserpinus euterpe*				FT	4-08-80
Mission blue butterfly *Icaricia icarioides missionensis*[4]				FE	6-01-76
Lotis blue butterfly *Lycaeides argyrognomon lotis*[5]				FE	6-01-76
Palos Verdes blue butterfly *Glaucopsyche lygdamus palosverdesensis*				FE	7-02-80
El Segundo blue butterfly *Euphilotes battoides allyni*				FE	6-01-76
Smith's blue butterfly *Euphilotes enoptes smithi*				FE	6-01-76
San Bruno elfin butterfly *Callophrys mossii bayensis*				FE	6-01-76
Lange's metalmark butterfly *Apodemia mormo langei*				FE	6-01-76
Bay checkerspot butterfly *Euphydryas editha bayensis*				FT	10-18-87
Quino checkerspot butterfly *Euphydryas editha quino (=E. e. wrighti)*				FE	1-16-97
Carson wandering skipper *Pseudocopaeodes eunus obscurus*				FE	8-07-02
Laguna Mountains skipper *Pyrgus ruralis lagunae*				FE	1-16-97
Callippe silverspot butterfly *Speyeria callippe callippe*				FE	12-05-97
Behren's silverspot butterfly *Speyeria zerene behrensii*				FE	12-05-97
Oregon silverspot butterfly[6] *Speyeria zerene hippolyta*				FT	7-02-80
Myrtle's silverspot butterfly *Speyeria zerene myrtleae*				FE	6-22-92
Delhi Sands flower-loving fly *Rhaphiomidas terminatus abdominalis*				FE	9-23-93

[4] Current taxonomy is *Plebejus icarioides missionensis.*
[5] Current taxonomy is *Plebejus idas lotis.*
[6] Also known by the common name is Hippolyta fritillary.

	State Listing			Federal Listing	
FISHES					
Green sturgeon - southern DPS *Acipenser medirostris*				FT[7]	6-06-06
Mohave tui chub *Gila bicolor mohavensis*[8]	SE	6-27-71		FE	10-13-70
Owens tui chub *Gila bicolor snyderi*[9]	SE	1-10-74		FE	8-05-85
Thicktail chub (**Extinct**) *Gila crassicauda*	**Delisted** SE	10-02-80 1-10-74			
Bonytail[10] *Gila elegans*	**SE** SR	1-10-74 6-27-71		FE	4-23-80
Sacramento splittail *Pogonichthys macrolepidotus*				**Removed**[11] FT	9-22-03 3-10-99
Colorado squawfish[12] *Ptychocheilus lucius*	SE	6-27-71		FE	3-11-67
Modoc sucker *Catostomus microps*	**SE** SR	10-02-80 1-10-74		FE	6-11-85
Santa Ana sucker *Catostomus santaanae*				FT[13]	5-12-00
Shortnose sucker *Chasmistes brevirostris*	**SE** SR	1-10-74 6-27-71		FE	7-18-88
Lost River sucker *Deltistes luxatus*	**SE** SR	1-10-74 6-27-67		FE	7-18-88
Razorback sucker *Xyrauchen texanus*	**SE** SR	1-10-74 6-27-71		FE	10-23-91
Delta smelt *Hypomesus transpacificus*	**SE** ST	1-20-10 12-09-93		FT	3-05-93
Longfin smelt *Spirinchus thaleichthys*	**ST** SCE	4-09-10 2-02-08			
Pacific eulachon - southern DPS *Thaleichthys pacificus*				FT FT	4-13-11[14] 5-17-10
Lahontan cutthroat trout *Oncorhynchus clarkii henshawi*[15]				**FT** FE	7-16-75 10-13-70

[7] Includes all spawning populations south of the Eel River.
[8] Current taxonomy: *Siphateles bicolor mohavensis.*
[9] Current taxonomy: *Siphateles bicolor snyderi.*
[10] Federal common name: bonytail chub.
[11] On 23 June 2000, the Federal Eastern District Court of Calif. found the final rule to be unlawful and on 22 Sept 2000 remanded the determination back to the USFWS for a reevaluation of the final decision. After a thorough review the USFWS removed the Sacramento splittail from the list of Threatened species.
[12] Current nomenclature and federal listing: Colorado pikeminnow.
[13] Populations in the Los Angeles, San Gabriel, and Santa Ana River basins.
[14] Eulachon was listed as Threatened by the NMFS in 2010 and by the USFWS in 2011.
[15] According to the American Fisheries Society Special Publication 29 (2004), "clarkii" has two i's.

	State Listing			Federal Listing	
Paiute cutthroat trout *Oncorhynchus clarkii seleniris*				**FT** FE	7-16-75 3-11-67[16]
Coho salmon - south of Punta Gorda[17] *Oncorhynchus kisutch*	SE[18]	3-30-05		**FE**[19] FT	8-29-05 12-02-96
Coho salmon - Punta Gorda to the N. border of California[20] *Oncorhynchus kisutch*	ST[21]	3-30-05		FT[22] FT	8-29-05 6-05-97
Steelhead - Southern California DPS[23] *Oncorhynchus mykiss*				FE[24] FE	2-06-06 10-17-97
Steelhead - South-Central California Coast DPS[25] *Oncorhynchus mykiss*				FT[26] FT	2-06-06 10-17-97
Steelhead - Central California Coast DPS[27] *Oncorhynchus mykiss*				FT[28] FT	2-06-06 10-17-97
Steelhead - California Central Valley DPS[29] *Oncorhynchus mykiss*				FT[30] FT	2-06-06 5-18-98
Steelhead - Northern California DPS[31] *Oncorhynchus mykiss*				FT[32] FT	2-06-06 8-07-00
Little Kern golden trout *Oncorhynchus mykiss whitei*[33]				FT	4-13-78
Chinook salmon - Winter-run[34] *Oncorhynchus tshawytscha*	SE	9-22-89		FE[35] FE	8-29-05 2-03-94
Chinook salmon - California coastal ESU[36] *Oncorhynchus tshawytscha*				FT[37] FT	8-29-05 11-15-99

[16] All species with a list date of 03-11-67 were listed under the Endangered Species Preservation Act of October 15, 1966.
[17] The Federal listing is for Central California Coast Coho ESU and includes populations from Punta Gorda south to, and including, the San Lorenzo River as well as populations in tributaries to San Francisco Bay, excluding the Sacramento-San Joaquin River system.
[18] The Coho south of San Francisco Bay were state listed in 1995. In February 2004 the Fish and Game Commission determined that the Coho from San Francisco to Punta Gorda should also be listed as Endangered. This change was finalized by the Office of Administrative Law on March 30, 2005.
[19] The NMFS completed a comprehensive status review in 2005 reaffirming the status.
[20] The Federal listing is for Southern Oregon/Northern California Coast Coho ESU and includes populations in coastal streams between Cape Blanco, Oregon and Punta Gorda, California.
[21] The Fish and Game Commission determined that the Coho from Punta Gorda to the Oregon border should be listed as Threatened on February 25, 2004. This determination was finalized by the Office of Administrative Law on March 30, 2005.
[22] The NMFS completed a comprehensive status review in 2005 reaffirming the status.
[23] Coastal basins from the Santa Maria River (inclusive), south to the U.S.-Mexico Border.
[24] The NMFS completed a comprehensive status review in 2006 reaffirming the status.
[25] Coastal basins from the Pajaro River (inclusive) south to, but not including, the Santa Maria River.
[26] The NMFS completed a comprehensive status review in 2006 reaffirming the status.
[27] Coastal streams from the Russian River (inclusive) to Aptos Creek (inclusive), and the drainages of San Francisco, San Pablo, and Suisun Bays eastward to Chipps Island at the confluence of the Sacramento and San Joaquin Rivers; and tributary streams to Suisun Marsh including Suisun Creek, Green Valley Creek, and an unnamed tributary to Cordelia Slough (commonly referred to as Red Top Creek), exclusive of the Sacramento-San Joaquin River Basin of the California Central Valley.
[28] The NMFS completed a comprehensive status review in 2006 reaffirming the status.
[29] The Sacramento and San Joaquin Rivers and their tributaries.
[30] The NMFS completed a comprehensive status review in 2006 reaffirming the status.
[31] Naturally spawned populations residing below impassable barriers in coastal basins from Redwood Creek in Humboldt County to, and including, the Gualala River in Mendocino County.
[32] The NMFS completed a comprehensive status review in 2006 reaffirming the status.
[33] Originally listed as *Salmo aguabonita whitei*. The genus *Salmo* was reclassified as *Oncorhynchus* changing the name to *Oncorhynchus aguabonita whitei*. However, recent studies indicate this is a subspecies of rainbow trout, therefore *Oncorhynchus mykiss whitei*.
[34] The federal designation is for Chinook salmon - Sacramento River winter-run ESU and described as winter-run populations in the Sacramento River and its tributaries in California.
[35] The NMFS completed a comprehensive status review in 2005 reaffirming the status.

	State Listing			Federal Listing	
Chinook salmon - Spring-run[38] *Oncorhynchus tshawytscha*	ST	2-05-99		FT[39] FT	8-29-05 11-15-99
Bull trout *Salvelinus confluentus*	SE	10-02-80		FT	12-01-99
Desert pupfish *Cyprinodon macularius*	SE	10-02-80		FE	3-31-86
Tecopa pupfish (**Extinct)** *Cyprinodon nevadensis calidae*	**Delisted** SE	1987 6-27-71		**Delisted** FE	1-15-82 10-13-70
Owens pupfish *Cyprinodon radiosus*	SE	6-27-71		FE	3-11-67
Cottonball Marsh pupfish *Cyprinodon salinus milleri*	ST	1-10-74			
Unarmored threespine stickleback *Gasterosteus aculeatus williamsoni*	SE	6-27-71		FE	10-13-70
Rough sculpin *Cottus asperrimus*	ST	1-10-74			
Tidewater goby *Eucyclogobius newberryi*				Withdrawn FPD[40] **FE**	12-09-02 6-24-99 2-04-94
AMPHIBIANS					
California tiger salamander[41] *Ambystoma californiense*	ST[42]	8-19-10		(FE) (FT)	
California tiger salamander - central California DPS *Ambystoma californiense*	(ST)			FT[43]	9-03-04
California tiger salamander - Santa Barbara County DPS *Ambystoma californiense*	(ST)			FE[43]	9-15-00
California tiger salamander - Sonoma County DPS *Ambystoma californiense*	(ST)			FE[43]	3-19-03
Santa Cruz long-toed salamander *Ambystoma macrodactylum croceum*	SE	6-27-71		FE	3-11-67
Siskiyou Mountains salamander *Plethodon stormi*	SCD **ST**	9-30-05 6-27-71			

[36] Rivers and streams south of the Klamath River to the Russian River.
[37] The NMFS completed a comprehensive status review in 2005 reaffirming the status.
[38] The State listing is for "Spring-run chinook salmon (*Oncorhynchus tshawytscha*) of the Sacramento River drainage." The Federal listing is for Central Valley spring-run Chinook ESU and includes populations of spring-run Chinook salmon in the Sacramento River and its tributaries including the Feather River.
[39] The NMFS completed a comprehensive status review in 2005 reaffirming the status.
[40] Proposal to delist referred to populations north of Orange County only.
[41] The State listing refers to the entire range of the species.
[42] Adopted May 20, 2010. The Office of Administrative Law approved the listing on Aug 2, 2010 and the effective date of regulations is Aug 19, 2010.
[43] In 2004 the California tiger salamander was listed as Threatened statewide. The Santa Barbara County and Sonoma County Distinct Vertebrate Population Segments (DPS), formerly listed as Endangered, were reclassified to Threatened. On Aug 19 2005 U.S. District court vacated the downlisting of the Sonoma and Santa Barbara populations from Endangered to Threatened. Therefore, the Sonoma & Santa Barbara populations are once again listed as Endangered.

	State Listing			Federal Listing	
Scott Bar salamander *Plethodon asupak*	ST[44]	6-27-71			
Tehachapi slender salamander *Batrachoseps stebbinsi*	ST	6-27-71			
Kern Canyon slender salamander *Batrachoseps simatus*	ST	6-27-71			
Desert slender salamander *Batrachoseps aridus*[45]	SE	6-27-71		FE	6-04-73
Shasta salamander *Hydromantes shastae*	ST	6-27-71			
Limestone salamander *Hydromantes brunus*	ST	6-27-71			
Black toad *Bufo exsul*[46]	ST	6-27-71			
Arroyo toad *Anaxyrus californicus*[47]				FE	1-17-95
California red-legged frog *Rana aurora draytonii*[48]				FT	5-20-96
Southern mountain yellow-legged frog[49] *Rana muscosa*	SCE[50]	9-21-10		FE[51]	8-01-02
Sierra Nevada mountain yellow-legged frog *Rana sierrae*	SCT[52]	9-21-10			
REPTILES					
Desert tortoise *Gopherus agassizii*	ST	8-03-89		FT	4-02-90
Green sea turtle[53] *Chelonia mydas*				**FT** FE	7-28-78 10-13-70
Loggerhead sea turtle - North Pacific DPS[54] *Caretta caretta*				**FE** FPE FT	10-24-11 3-16-10 7-28-78

[44] Since this newly described species was formerly considered to be a subpopulation of *Plethodon stormi*, and since *Plethodon stormi* is listed as Threatened under the CESA, *Plethodon asupak* retains the Threatened designation.
[45] Current taxonomy: *Batrachoseps major aridus.*
[46] Current taxonomy: *Anaxyrus exsul.*
[47] At the time of listing, arroyo toad was known as *Bufo microscaphus californicus*, a subspecies of southwestern toad. In 2001 it was determined to be its own species, *Bufo californicus*. Since then, many species in the genus *Bufo* were changed to the genus *Anaxyrus*, and now arroyo toad is known as *Anaxyrus californicus*.
[48] Current taxonomy: *Rana draytonii.*
[49] Though the scientific name *Rana muscosa* is not disputed, the State used this common name in the 16 Oct 2012 Notice of Proposed Changes in Regulation, whereas the USFWS listing refers to the distinct population segment listed as mountain yellow-legged frog – Southern California DPS. This species is also known by the common name Sierra Madre yellow-legged frog (Vredenburg et al. 2007).
[50] Filed with the Office of Administrative Law on 16 January 2013; Effective Date of Regulation is pending.
[51] Federal listing refers to the distinct population segment (DPS) in the San Gabriel, San Jacinto, and San Bernardino Mountains only, with a recognized common name of Mountain yellow-legged frog - Southern California DPS. MYLF north of the Tehachapi Mountains are a Federal candidate.
[52] Filed with the Office of Administrative Law on 16 January 2013; Effective Date of Regulation is pending.
[53] Current nomenclature: green turtle.

	State Listing			Federal Listing	
Olive (=Pacific) ridley sea turtle *Lepidochelys olivacea*				FT	7-28-78
Leatherback sea turtle *Dermochelys coriacea*				FE	6-02-70
Barefoot banded gecko[55] *Coleonyx switaki*	ST	10-02-80			
Coachella Valley fringe-toed lizard *Uma inornata*	SE	10-02-80		FT	9-25-80
Blunt-nosed leopard lizard *Gambelia silus*[56]	SE	6-27-71		FE	3-11-67
Flat-tailed horned lizard *Phrynosoma mcallii*				**Withdrawn**[57] FPT[58]	3-15-11 11-29-93
Island night lizard *Xantusia riversiana*				FT	8-11-77
Southern rubber boa *Charina bottae umbratica*[59]	ST	6-27-71			
Alameda whipsnake *Masticophis lateralis euryxanthus*	ST	6-27-71		FT	12-05-97
San Francisco garter snake *Thamnophis sirtalis tetrataenia*	SE	6-27-71		FE	3-11-67
Giant garter snake *Thamnophis couchi gigas*[60]	ST	6-27-71		FT	10-20-93
BIRDS					
Short-tailed albatross *Phoebastria albatrus*				FE FE	8-30-00[61] 6-2-1970
California brown pelican[62] (**Recovered**) *Pelecanus occidentalis californicus*	**Delisted** SE	6-03-09 6-27-71		**Delisted** FE	12-17-09 2-20-08 10-13-70
Aleutian Canada goose **(Recovered)** *Branta canadensis leucopareia*[63]				**Delisted** FT FE	3-20-01 12-12-90 3-11-67

[54] 1978 listing was for the worldwide range of the species. The Mar 16, 2010 proposed rule and Oct 24, 2011 final rule are for the North Pacific DPS (north of the equator & south of 60 degrees north latitude).
[55] Current nomenclature: Barefoot gecko.
[56] Current taxonomy: *Gambelia sila*. Both the State and Federal recognize the common name blunt-nosed leopard lizard (SSAR), but also known as bluntnose leopard lizard (CNAH). Originally listed under the ESA as *Crotaphytus wislizenii silus*.
[57] On June 28, 2006 the USFWS determined that the proposed listing was not warranted and the proposed rule that had been reinstated on Nov 17, 2005 was withdrawn. USFWS specifically reiterated that the 29 Nov 1993 proposal to list as Threatened was withdrawn as of 15 Mar 2011.
[58] On November 17, 2005, the U. S. District Court for the District of Arizona vacated the January 3, 2003 withdrawal of the proposed rule to list the flat-tailed horned lizard and reinstated the 1993 proposed rule.
[59] Current taxonomy: *Charina umbratica.*
[60] Current taxonomy and Federal listing: *Thamnophis gigas.*
[61] Listed as Endangered in one of the original species list, but "due to an inadvertent oversight" when the 1973 ESA repealed the 1969 Act, short-tailed albatross was effectively delisted. Proposed listing to fix this error in 1980, with final rule in 2000.
[62] Federal nomenclature: Brown pelican (*Pelecanus occidentalis*).
[63] Current taxonomy: Cackling goose (*Branta hutchinsii leucopareia*).

	State Listing			Federal Listing	
California condor *Gymnogyps californianus*	SE	6-27-71		FE	3-11-67
Bald eagle *Haliaeetus leucocephalus*	**SE (**rev) SE	10-02-80 6-27-71		**Delisted**[64] FT FE (rev) FE	8-08-07 7-06-99 8-11-95 2-14-78 3-11-67
Swainson's hawk *Buteo swainsoni*	ST	4-17-83			
American peregrine falcon **(Recovered)** *Falco peregrinus anatum*	**Delisted** SE	11-04-09 6-27-71		**Delisted** FE	8-25-99 6-02-70
Arctic peregrine falcon **(Recovered)** *Falco peregrinus tundrius*				**Delisted** FT FE	10-05-94 3-20-84 6-02-70
California black rail *Laterallus jamaicensis coturniculus*	ST	6-27-71			
California clapper rail *Rallus longirostris obsoletus*	SE	6-27-71		FE	10-13-70
Light-footed clapper rail *Rallus longirostris levipes*	SE	6-27-71		FE	10-13-70
Yuma clapper rail *Rallus longirostris yumanensis*	**ST** SE	2-22-78 6-27-71		FE	3-11-67
Greater sandhill crane *Grus canadensis tabida*	ST	4-17-83			
Western snowy plover *Charadrius alexandrinus nivosus*[65]				FT[66]	4-05-93
Mountain plover *Charadrius montanus*				**Withdrawn** FPT	5-12-11 12-5-02
California least tern *Sterna antillarum browni*[67]	SE	6-27-71		FE	10-13-70
Marbled murrelet *Brachyramphus marmoratus*	SE	3-12-92		FT	9-30-92
Xantus's murrelet *Synthliboramphus hypoleucus*	ST[68]	12-22-04			
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	**SE** ST	3-26-88 6-27-71			

[64] The Post-delisting Monitoring Plan will monitor the status of the bald eagle over a 20 year period with sampling events held once every 5 years.
[65] Current taxonomy: *Charadrius nivosus nivosus* (AOU 2011).
[66] Federal status applies only to the Pacific coastal population.
[67] Current taxonomy: *Sternula antillarum browni.*
[68] The Fish and Game Commission determined that Xantus's murrelet should be listed as a Threatened species February 24, 2004. As part of the normal listing process, this decision was reviewed by the Office of Administrative Law. The listing became effective on Dec 22, 2004.

	State Listing			Federal Listing	
Elf owl *Micrathene whitneyi*	SE	10-02-80			
Northern spotted owl *Strix occidentalis caurina*				FT	6-22-90
Great gray owl *Strix nebulosa*	SE	10-02-80			
Gila woodpecker *Melanerpes uropygialis*	SE	3-17-88			
Black-backed woodpecker *Picoides arcticus*	SCE or SCT	12-27-11			
Gilded northern flicker[69] *Colaptes auratus chrysoides*	SE	3-17-88			
Willow flycatcher *Empidonax traillii*	SE[70]	1-02-91			
Southwestern willow flycatcher *Empidonax traillii extimus*	(SE)			FE	3-29-95
Bank swallow *Riparia riparia*	ST	6-11-89			
Coastal California gnatcatcher *Polioptila californica californica*				FT	3-30-93
San Clemente loggerhead shrike *Lanius ludovicianus mearnsi*				FE	8-11-77
Arizona Bell's vireo *Vireo bellii arizonae*	SE	3-17-88			
Least Bell's vireo *Vireo bellii pusillus*	SE	10-02-80		FE	5-02-86
Inyo California towhee *Pipilo crissalis eremophilus*[71]	SE	10-02-80		FT	8-03-87
San Clemente sage sparrow *Amphispiza belli clementeae*				FT	8-11-77
Belding's savannah sparrow *Passerculus sandwichensis beldingi*	SE	1-10-74			
Santa Barbara song sparrow **(Extinct)** *Melospiza melodia graminea*				**Delisted** FE	10-12-83 6-04-73
MAMMALS					
Point Arena mountain beaver *Aplodontia rufa nigra*				FE	12-12-91

[69] Current taxonomy: Gilded flicker (*Colaptes chrysoides*).
[70] State listing includes all subspecies.
[71] Current taxonomy: *Melozone crissalis eremophilus*.

	State Listing			Federal Listing	
San Joaquin antelope squirrel[72] *Ammospermophilus nelsoni*	ST	10-02-80			
Mohave ground squirrel[73] *Spermophilus mohavensis*	ST	6-27-71			
Morro Bay kangaroo rat *Dipodomys heermanni morroensis*	SE	6-27-71		FE	10-13-70
Giant kangaroo rat *Dipodomys ingens*	SE	10-02-80		FE	1-05-87
San Bernardino kangaroo rat[74] *Dipodomys merriami parvus*				FE	9-24-98
Tipton kangaroo rat *Dipodomys nitratoides nitratoides*	SE	6-11-89		FE	7-08-88
Fresno kangaroo rat *Dipodomys nitratoides exilis*	**SE** SR	10-02-80 6-27-71		FE	3-01-85
Stephens' kangaroo rat *Dipodomys stephensi*[75]	ST	6-27-71		FE	9-30-88
Pacific pocket mouse *Perognathus longimembris pacificus*				FE	9-26-94
Amargosa vole *Microtus californicus scirpensis*	SE	10-02-80		FE	11-15-84
Riparian woodrat[76] *Neotoma fuscipes riparia*				FE	3-24-00
Salt-marsh harvest mouse *Reithrodontomys raviventris*	SE	6-27-71		FE	10-13-70
American pika *Ochotona princeps*	SCT	10-26-11			
Riparian brush rabbit *Sylvilagus bachmani riparius*	SE	5-29-94		FE	3-24-00
Buena Vista Lake shrew[77] *Sorex ornatus relictus*				FE	4-05-02
Lesser long-nosed bat *Leptonycteris yerbabuenae*				FE	10-31-88
Gray wolf *Canis lupus*	SCE	10-18-12		FE[78]	4-10-78

[72] Current taxonomy: Nelson's antelope squirrel.
[73] Current taxonomy: *Xerospermophilus mohavensis.*
[74] Federal nomenclature: San Bernardino Merriam's kangaroo rat.
[75] Federal taxonomy: included *Dipodomys cascus*, an invalid junior synonym for *Dipodomys stephensi.*
[76] Federal nomenclature: Riparian (=San Joaquin Valley) woodrat.
[77] Federal nomenclature: Buena Vista Lake ornate shrew.
[78] The full species, *Canis lupus*, was listed as Endangered in 1978. Though the status of the gray wolf is being challenged in other states, any gray wolves present or dispersing into California are considered federally Endangered.

	State Listing			Federal Listing	
Island fox *Urocyon littoralis*	ST[79]	6-27-71			
San Miguel Island Fox *Urocyon littoralis littoralis*	(ST)			FE	4-05-04
Santa Catalina Island Fox *Urocyon littoralis catalinae*	(ST)			FE	4-05-04
Santa Cruz Island Fox *Urocyon littoralis santacruzae*	(ST)			FE	4-05-04
Santa Rosa Island Fox *Urocyon littoralis santarosae*	(ST)			FE	4-05-04
San Joaquin kit fox *Vulpes macrotis mutica*	ST	6-27-71		FE	3-11-67
Sierra Nevada red fox *Vulpes vulpes necator*	ST	10-02-80			
Guadalupe fur seal *Arctocephalus townsendi*	ST	6-27-71		**FT** FE	1-15-86 3-11-67
Steller sea lion - Eastern DPS *Eumetopias jubatus*				FPD **FT** FT	4-18-12 6-4-97[80] 4-05-90
Southern sea otter *Enhydra lutris nereis*				FT	1-14-77
Wolverine *Gulo gulo*	ST	6-27-71			
Fisher - West Coast DPS[81] *Martes pennant*	**Not warranted** SCT or SCE[82]	6-23-10 4-14-09			
California (=Sierra Nevada) bighorn sheep *Ovis canadensis californiana*[83]	**SE** ST	8-27-99 6-27-71		FE	1-03-00
Peninsular bighorn sheep DPS[84] *Ovis canadensis cremnobates*	ST	6-27-71		FE	3-18-98
North Pacific right whale *Eubalaena japonica*[85]				FE[86] FE	4-7-08 6-02-70

[79] State listing includes all 6 subspecies on all 6 islands. Federal listing is for only 4 subspecies on 4 islands.
[80] The NMFS reclassified Steller sea lion as two distinct population segments: western DPS west of 144 degrees longitude (Endangered), and eastern DPS east of 144 degrees longitude (Threatened).
[81] The Fish and Game Commission during their review of the fisher petitioning recognized the common name Pacific fisher. Adopted here is the common name used in the USFWS candidacy (2 Apr 2004), fisher, for the West Coast distinct population segment for California, Oregon, and Washington.
[82] The Fish and Game Commission notice of finding stated that the Pacific fisher was a candidate for listing as either an Endangered or a Threatened species. At the June 23, 2010 meeting the Commission determined that the listing was not warranted.
[83] Current & Federal taxonomy: Sierra Nevada bighorn sheep (*Ovis canadensis sierrae)*
[84] Current taxonomy: the subspecies *O.c. cremnobates* has been synonymized with *O.c. nelsoni*. Peninsular bighorn sheep are now considered to be a Distinct Vertebrate Population Segment (DPS).
[85] The scientific name was clarified in the Federal Register Vol. 68, No. 69 April 10, 2003.

	State Listing			Federal Listing	
Sei whale *Balaenoptera borealis*				FE	6-02-70
Blue whale *Balaenoptera musculus*				FE	6-02-70
Fin whale *Balaenoptera physalus*				FE	6-02-70
Humpback whale[87] *Megaptera novaeangliae*				FE	6-02-70
Gray whale **(Recovered)** *Eschrichtius robustus*				**Delisted** FE	6-15-94 6-02-70
Killer whale (Southern resident DPS) *Orcinus orca*				FE[88] FE	4-04-07 2-16-06 12-22-04
Sperm whale *Physeter macrocephalus*[89]				FE	6-02-70

[86] The NMFS completed a status review of right whales in the N. Pacific and N. Atlantic Oceans and determined the previously Endangered northern right whale (*Eubalaena* spp.) as two separate Endangered species: North Pacific right whale (*E. japonica*) and North Atlantic right whale (*E. glacialis*).
[87] Also known as Hump-backed whale.
[88] The killer whale was listed as Endangered by the NMFS on Feb 16, 2006 and by the USFWS on Apr 4, 2007.
[89] Current taxonomy: *Physeter catodon* with *P. macrocephalus* as a synonym.

ABBREVIATIONS

CESA: California Endangered Species Act

DPS: Distinct population segment

ESA: Endangered Species Act (Federal)

ESU: Evolutionarily significant unit

NMFS: National Marine Fisheries Service

NOAA: National Oceanic and Atmospheric Administration

USFWS: United States Fish and Wildlife Service

ADDITIONAL RESOURCES

The California Fish and Game Commission publishes notices relating to changes to Title 14 of the California Code of Regulations: http://www.fgc.ca.gov/

Title 14 of the California Code of Regulations can be accessed through The Office of Administrative Law: http://www.oal.ca.gov/

The U.S. Fish and Wildlife Service is responsible for protecting Endangered and Threatened species, and conserving candidate species and at-risk species so that ESA listing is not necessary: http://www.fws.gov/Endangered/

NOAA's National Marine Fisheries Service, Office of Protected Resources is responsible for protecting marine mammals and Endangered and Threatened marine life: http://www.nmfs.noaa.gov/pr/

Appendix F. FAA AC 150/5200-33B, “Hazardous Wildlife Attractants On or Near Airports”

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U.S. Department
of Transportation

Federal Aviation Administration

Advisory Circular

Subject: HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AIRPORTS	**Date:** 8/28/2007	**AC No:** 150/5200-33B
	Initiated by: AAS-300	**Change:**

1. PURPOSE. This Advisory Circular (AC) provides guidance on certain land uses that have the potential to attract hazardous wildlife on or near public-use airports. It also discusses airport development projects (including airport construction, expansion, and renovation) affecting aircraft movement near hazardous wildlife attractants. Appendix 1 provides definitions of terms used in this AC.

2. APPLICABILITY. The Federal Aviation Administration (FAA) recommends that public-use airport operators implement the standards and practices contained in this AC. The holders of Airport Operating Certificates issued under Title 14, Code of Federal Regulations (CFR), Part 139, Certification of Airports, Subpart D (Part 139), may use the standards, practices, and recommendations contained in this AC to comply with the wildlife hazard management requirements of Part 139. Airports that have received Federal grant-in-aid assistance must use these standards. The FAA also recommends the guidance in this AC for land-use planners, operators of non-certificated airports, and developers of projects, facilities, and activities on or near airports.

3. CANCELLATION. This AC cancels AC 150/5200-33A, *Hazardous Wildlife Attractants on or near Airports*, dated July 27, 2004.

4. PRINCIPAL CHANGES. This AC contains the following major changes, which are marked with vertical bars in the margin:

a. Technical changes to paragraph references.

b. Wording on storm water detention ponds.

c. Deleted paragraph 4-3.b, *Additional Coordination.*

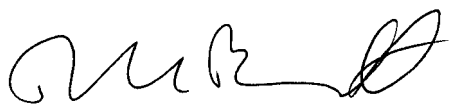
5. BACKGROUND. Information about the risks posed to aircraft by certain wildlife species has increased a great deal in recent years. Improved reporting, studies, documentation, and statistics clearly show that aircraft collisions with birds and other wildlife are a serious economic and public safety problem. While many species of wildlife can pose a threat to aircraft safety, they are not equally hazardous. Table 1

ranks the wildlife groups commonly involved in damaging strikes in the United States according to their relative hazard to aircraft. The ranking is based on the 47,212 records in the FAA National Wildlife Strike Database for the years 1990 through 2003. These hazard rankings, in conjunction with site-specific Wildlife Hazards Assessments (WHA), will help airport operators determine the relative abundance and use patterns of wildlife species and help focus hazardous wildlife management efforts on those species most likely to cause problems at an airport.

Most public-use airports have large tracts of open, undeveloped land that provide added margins of safety and noise mitigation. These areas can also present potential hazards to aviation if they encourage wildlife to enter an airport's approach or departure airspace or air operations area (AOA). Constructed or natural areas—such as poorly drained locations, detention/retention ponds, roosting habitats on buildings, landscaping, odor-causing rotting organic matter (putrescible waste) disposal operations, wastewater treatment plants, agricultural or aquaculture activities, surface mining, or wetlands—can provide wildlife with ideal locations for feeding, loafing, reproduction, and escape. Even small facilities, such as fast food restaurants, taxicab staging areas, rental car facilities, aircraft viewing areas, and public parks, can produce substantial attractions for hazardous wildlife.

During the past century, wildlife-aircraft strikes have resulted in the loss of hundreds of lives worldwide, as well as billions of dollars in aircraft damage. Hazardous wildlife attractants on and near airports can jeopardize future airport expansion, making proper community land-use planning essential. This AC provides airport operators and those parties with whom they cooperate with the guidance they need to assess and address potentially hazardous wildlife attractants when locating new facilities and implementing certain land-use practices on or near public-use airports.

6. MEMORANDUM OF AGREEMENT BETWEEN FEDERAL RESOURCE AGENCIES. The FAA, the U.S. Air Force, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and the U.S. Department of Agriculture - Wildlife Services signed a Memorandum of Agreement (MOA) in July 2003 to acknowledge their respective missions in protecting aviation from wildlife hazards. Through the MOA, the agencies established procedures necessary to coordinate their missions to address more effectively existing and future environmental conditions contributing to collisions between wildlife and aircraft (wildlife strikes) throughout the United States. These efforts are intended to minimize wildlife risks to aviation and human safety while protecting the Nation’s valuable environmental resources.



DAVID L. BENNETT
Director, Office of Airport Safety
and Standards

Table 1. Ranking of 25 species groups as to relative hazard to aircraft (1=most hazardous) based on three criteria (damage, major damage, and effect-on-flight), a composite ranking based on all three rankings, and a relative hazard score. Data were derived from the FAA National Wildlife Strike Database, January 1990–April 2003.[1]

Species group	Ranking by criteria			Composite ranking[2]	Relative hazard score[3]
	Damage[4]	Major damage[5]	Effect on flight[6]		
Deer	1	1	1	1	100
Vultures	2	2	2	2	64
Geese	3	3	6	3	55
Cormorants/pelicans	4	5	3	4	54
Cranes	7	6	4	5	47
Eagles	6	9	7	6	41
Ducks	5	8	10	7	39
Osprey	8	4	8	8	39
Turkey/pheasants	9	7	11	9	33
Herons	11	14	9	10	27
Hawks (buteos)	10	12	12	11	25
Gulls	12	11	13	12	24
Rock pigeon	13	10	14	13	23
Owls	14	13	20	14	23
H. lark/s. bunting	18	15	15	15	17
Crows/ravens	15	16	16	16	16
Coyote	16	19	5	17	14
Mourning dove	17	17	17	18	14
Shorebirds	19	21	18	19	10
Blackbirds/starling	20	22	19	20	10
American kestrel	21	18	21	21	9
Meadowlarks	22	20	22	22	7
Swallows	24	23	24	23	4
Sparrows	25	24	23	24	4
Nighthawks	23	25	25	25	1

[1] Excerpted from the *Special Report for the FAA, "Ranking the Hazard Level of Wildlife Species to Civil Aviation in the USA: Update #1, July 2, 2003".* Refer to this report for additional explanations of criteria and method of ranking.

[2] Relative rank of each species group was compared with every other group for the three variables, placing the species group with the greatest hazard rank for $\geq$ 2 of the 3 variables above the next highest ranked group, then proceeding down the list.

[3] Percentage values, from Tables 3 and 4 in Footnote 1 of the *Special Report*, for the three criteria were summed and scaled down from 100, with 100 as the score for the species group with the maximum summed values and the greatest potential hazard to aircraft.

[4] Aircraft incurred at least some damage (destroyed, substantial, minor, or unknown) from strike.

[5] Aircraft incurred damage or structural failure, which adversely affected the structure strength, performance, or flight characteristics, and which would normally require major repair or replacement of the affected component, or the damage sustained makes it inadvisable to restore aircraft to airworthy condition.

[6] Aborted takeoff, engine shutdown, precautionary landing, or other.

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SECTION 1.

GENERAL SEPARATION CRITERIA FOR HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AIRPORTS.

1-1. INTRODUCTION. When considering proposed land uses, airport operators, local planners, and developers must take into account whether the proposed land uses, including new development projects, will increase wildlife hazards. Land-use practices that attract or sustain hazardous wildlife populations on or near airports can significantly increase the potential for wildlife strikes.

The FAA recommends the minimum separation criteria outlined below for land-use practices that attract hazardous wildlife to the vicinity of airports. Please note that FAA criteria include land uses that cause movement of hazardous wildlife onto, into, or across the airport's approach or departure airspace or air operations area (AOA). (See the discussion of the synergistic effects of surrounding land uses in Section 2-8 of this AC.)

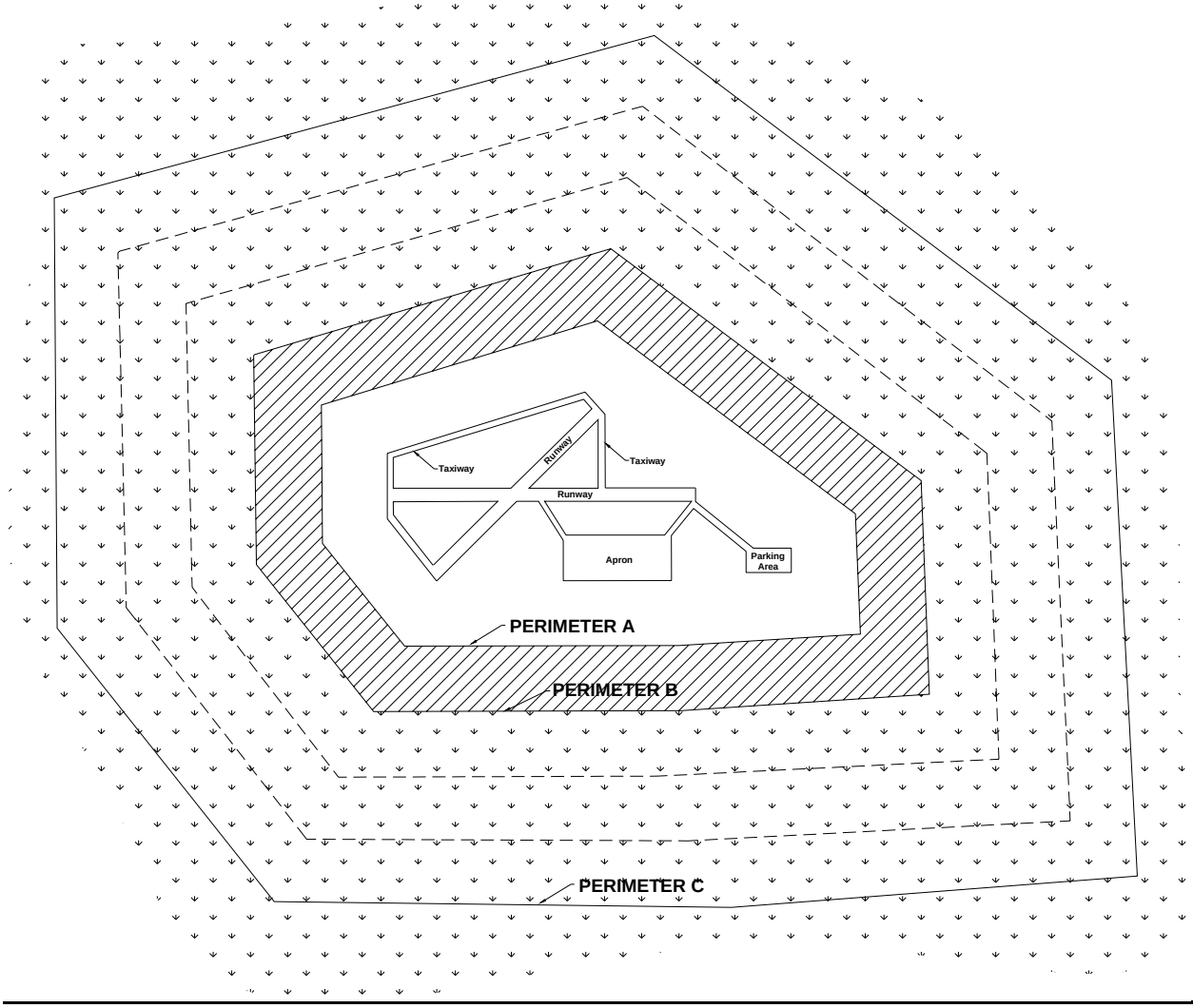
The basis for the separation criteria contained in this section can be found in existing FAA regulations. The separation distances are based on (1) flight patterns of piston-powered aircraft and turbine-powered aircraft, (2) the altitude at which most strikes happen (78 percent occur under 1,000 feet and 90 percent occur under 3,000 feet above ground level), and (3) National Transportation Safety Board (NTSB) recommendations.

1-2. AIRPORTS SERVING PISTON-POWERED AIRCRAFT. Airports that do not sell Jet-A fuel normally serve piston-powered aircraft. Notwithstanding more stringent requirements for specific land uses, the FAA recommends a separation distance of 5,000 feet at these airports for any of the hazardous wildlife attractants mentioned in Section 2 or for new airport development projects meant to accommodate aircraft movement. This distance is to be maintained between an airport's AOA and the hazardous wildlife attractant. Figure 1 depicts this separation distance measured from the nearest aircraft operations areas.

1-3. AIRPORTS SERVING TURBINE-POWERED AIRCRAFT. Airports selling Jet-A fuel normally serve turbine-powered aircraft. Notwithstanding more stringent requirements for specific land uses, the FAA recommends a separation distance of 10,000 feet at these airports for any of the hazardous wildlife attractants mentioned in Section 2 or for new airport development projects meant to accommodate aircraft movement. This distance is to be maintained between an airport's AOA and the hazardous wildlife attractant. Figure 1 depicts this separation distance from the nearest aircraft movement areas.

1-4. PROTECTION OF APPROACH, DEPARTURE, AND CIRCLING AIRSPACE. For all airports, the FAA recommends a distance of 5 statute miles between the farthest edge of the airport's AOA and the hazardous wildlife attractant if the attractant could cause hazardous wildlife movement into or across the approach or departure airspace.

Figure 1. Separation distances within which hazardous wildlife attractants should be avoided, eliminated, or mitigated.



PERIMETER A: For airports serving piston-powered aircraft, hazardous wildlife attractants must be 5,000 feet from the nearest air operations area.

PERIMETER B: For airports serving turbine-powered aircraft, hazardous wildlife attractants must be 10,000 feet from the nearest air operations area.

PERIMETER C: 5-mile range to protect approach, departure and circling airspace.

SECTION 2.

LAND-USE PRACTICES ON OR NEAR AIRPORTS THAT POTENTIALLY ATTRACT HAZARDOUS WILDLIFE.

2-1. GENERAL. The wildlife species and the size of the populations attracted to the airport environment vary considerably, depending on several factors, including land-use practices on or near the airport. This section discusses land-use practices having the potential to attract hazardous wildlife and threaten aviation safety. In addition to the specific considerations outlined below, airport operators should refer to *Wildlife Hazard Management at Airports,* prepared by FAA and U.S. Department of Agriculture (USDA) staff. (This manual is available in English, Spanish, and French. It can be viewed and downloaded free of charge from the FAA's wildlife hazard mitigation web site: http://wildlife-mitigation.tc.FAA.gov.). And, *Prevention and Control of Wildlife Damage,* compiled by the University of Nebraska Cooperative Extension Division. (This manual is available online in a periodically updated version at: ianrwww.unl.edu/wildlife/solutions/handbook/.)

2-2. WASTE DISPOSAL OPERATIONS. Municipal solid waste landfills (MSWLF) are known to attract large numbers of hazardous wildlife, particularly birds. Because of this, these operations, when located within the separations identified in the siting criteria in Sections 1-2 through 1-4, are considered incompatible with safe airport operations.

a. Siting for new municipal solid waste landfills subject to AIR 21. Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (Public Law 106-181) (AIR 21) prohibits the construction or establishment of a new MSWLF within 6 statute miles of certain public-use airports. Before these prohibitions apply, both the airport and the landfill must meet the very specific conditions described below. These restrictions do not apply to airports or landfills located within the state of Alaska.

The airport must (1) have received a Federal grant(s) under 49 U.S.C. § 47101, et. seq.; (2) be under control of a public agency; (3) serve some scheduled air carrier operations conducted in aircraft with less than 60 seats; and (4) have total annual enplanements consisting of at least 51 percent of scheduled air carrier enplanements conducted in aircraft with less than 60 passenger seats.

The proposed MSWLF must (1) be within 6 miles of the airport, as measured from airport property line to MSWLF property line, and (2) have started construction or establishment on or after April 5, 2001. Public Law 106-181 only limits the construction or establishment of some new MSWLF. It does not limit the expansion, either vertical or horizontal, of existing landfills.

NOTE: Consult the most recent version of AC 150/5200-34, *Construction or Establishment of Landfills Near Public Airports,* for a more detailed discussion of these restrictions.

b. Siting for new MSWLF not subject to AIR 21. If an airport and MSWLF do not meet the restrictions of Public Law 106-181, the FAA recommends against locating MSWLF within the separation distances identified in Sections 1-2 through 1-4. The separation distances should be measured from the closest point of the airport's AOA to the closest planned MSWLF cell.

c. Considerations for existing waste disposal facilities within the limits of separation criteria. The FAA recommends against airport development projects that would increase the number of aircraft operations or accommodate larger or faster aircraft near MSWLF operations located within the separations identified in Sections 1-2 through 1-4. In addition, in accordance with 40 CFR 258.10, owners or operators of existing MSWLF units that are located within the separations listed in Sections 1-2 through 1-4 must demonstrate that the unit is designed and operated so it does not pose a bird hazard to aircraft. (See Section 4-2(b) of this AC for a discussion of this demonstration requirement.)

d. Enclosed trash transfer stations. Enclosed waste-handling facilities that receive garbage behind closed doors; process it via compaction, incineration, or similar manner; and remove all residue by enclosed vehicles generally are compatible with safe airport operations, provided they are not located on airport property or within the Runway Protection Zone (RPZ). These facilities should not handle or store putrescible waste outside or in a partially enclosed structure accessible to hazardous wildlife. Trash transfer facilities that are open on one or more sides; that store uncovered quantities of municipal solid waste outside, even if only for a short time; that use semi-trailers that leak or have trash clinging to the outside; or that do not control odors by ventilation and filtration systems (odor masking is not acceptable) do not meet the FAA's definition of fully enclosed trash transfer stations. The FAA considers these facilities incompatible with safe airport operations if they are located closer than the separation distances specified in Sections 1-2 through 1-4.

e. Composting operations on or near airport property. Composting operations that accept only yard waste (e.g., leaves, lawn clippings, or branches) generally do not attract hazardous wildlife. Sewage sludge, woodchips, and similar material are not municipal solid wastes and may be used as compost bulking agents. The compost, however, must never include food or other municipal solid waste. Composting operations should not be located on airport property. Off-airport property composting operations should be located no closer than the greater of the following distances: 1,200 feet from any AOA or the distance called for by airport design requirements (see AC 150/5300-13, *Airport Design*). This spacing should prevent material, personnel, or equipment from penetrating any Object Free Area (OFA), Obstacle Free Zone (OFZ), Threshold Siting Surface (TSS), or Clearway. Airport operators should monitor composting operations located in proximity to the airport to ensure that steam or thermal rise does not adversely affect air traffic. On-airport disposal of compost by-products should not be conducted for the reasons stated in 2-3f.

f. Underwater waste discharges. The FAA recommends against the underwater discharge of any food waste (e.g., fish processing offal) within the separations identified in Sections 1-2 through 1-4 because it could attract scavenging hazardous wildlife.

g. Recycling centers. Recycling centers that accept previously sorted non-food items, such as glass, newspaper, cardboard, or aluminum, are, in most cases, not attractive to hazardous wildlife and are acceptable.

h. Construction and demolition (C&D) debris facilities. C&D landfills do not generally attract hazardous wildlife and are acceptable if maintained in an orderly manner, admit no putrescible waste, and are not co-located with other waste disposal operations. However, C&D landfills have similar visual and operational characteristics to putrescible waste disposal sites. When co-located with putrescible waste disposal operations, C&D landfills are more likely to attract hazardous wildlife because of the similarities between these disposal facilities. Therefore, a C&D landfill co-located with another waste disposal operation should be located outside of the separations identified in Sections 1-2 through 1-4.

i. Fly ash disposal. The incinerated residue from resource recovery power/heat-generating facilities that are fired by municipal solid waste, coal, or wood is generally not a wildlife attractant because it no longer contains putrescible matter. Landfills accepting only fly ash are generally not considered to be wildlife attractants and are acceptable as long as they are maintained in an orderly manner, admit no putrescible waste of any kind, and are not co-located with other disposal operations that attract hazardous wildlife.

Since varying degrees of waste consumption are associated with general incineration (not resource recovery power/heat-generating facilities), the FAA considers the ash from general incinerators a regular waste disposal by-product and, therefore, a hazardous wildlife attractant if disposed of within the separation criteria outlined in Sections 1-2 through 1-4.

2-3. WATER MANAGEMENT FACILITIES. Drinking water intake and treatment facilities, storm water and wastewater treatment facilities, associated retention and settling ponds, ponds built for recreational use, and ponds that result from mining activities often attract large numbers of potentially hazardous wildlife. To prevent wildlife hazards, land-use developers and airport operators may need to develop management plans, in compliance with local and state regulations, to support the operation of storm water management facilities on or near all public-use airports to ensure a safe airport environment.

a. Existing storm water management facilities. On-airport storm water management facilities allow the quick removal of surface water, including discharges related to aircraft deicing, from impervious surfaces, such as pavement and terminal/hangar building roofs. Existing on-airport detention ponds collect storm water, protect water quality, and control runoff. Because they slowly release water

after storms, they create standing bodies of water that can attract hazardous wildlife. Where the airport has developed a Wildlife Hazard Management Plan (WHMP) in accordance with Part 139, the FAA requires immediate correction of any wildlife hazards arising from existing storm water facilities located on or near airports, using appropriate wildlife hazard mitigation techniques. Airport operators should develop measures to minimize hazardous wildlife attraction in consultation with a wildlife damage management biologist.

Where possible, airport operators should modify storm water detention ponds to allow a maximum 48-hour detention period for the design storm. The FAA recommends that airport operators avoid or remove retention ponds and detention ponds featuring dead storage to eliminate standing water. Detention basins should remain totally dry between rainfalls. Where constant flow of water is anticipated through the basin, or where any portion of the basin bottom may remain wet, the detention facility should include a concrete or paved pad and/or ditch/swale in the bottom to prevent vegetation that may provide nesting habitat.

When it is not possible to drain a large detention pond completely, airport operators may use physical barriers, such as bird balls, wires grids, pillows, or netting, to deter birds and other hazardous wildlife. When physical barriers are used, airport operators must evaluate their use and ensure they will not adversely affect water rescue. Before installing any physical barriers over detention ponds on Part 139 airports, airport operators must get approval from the appropriate FAA Regional Airports Division Office.

The FAA recommends that airport operators encourage off-airport storm water treatment facility operators to incorporate appropriate wildlife hazard mitigation techniques into storm water treatment facility operating practices when their facility is located within the separation criteria specified in Sections 1-2 through 1-4.

b. New storm water management facilities. The FAA strongly recommends that off-airport storm water management systems located within the separations identified in Sections 1-2 through 1-4 be designed and operated so as not to create above-ground standing water. Stormwater detention ponds should be designed, engineered, constructed, and maintained for a maximum 48–hour detention period after the design storm and remain completely dry between storms. To facilitate the control of hazardous wildlife, the FAA recommends the use of steep-sided, rip-rap lined, narrow, linearly shaped water detention basins. When it is not possible to place these ponds away from an airport's AOA, airport operators should use physical barriers, such as bird balls, wires grids, pillows, or netting, to prevent access of hazardous wildlife to open water and minimize aircraft-wildlife interactions. When physical barriers are used, airport operators must evaluate their use and ensure they will not adversely affect water rescue. Before installing any physical barriers over detention ponds on Part 139 airports, airport operators must get approval from the appropriate FAA Regional Airports Division Office. All vegetation in or around detention basins that provide food or cover for hazardous wildlife should be eliminated. If soil conditions and other requirements allow, the FAA encourages

the use of underground storm water infiltration systems, such as French drains or buried rock fields, because they are less attractive to wildlife.

c. Existing wastewater treatment facilities. The FAA strongly recommends that airport operators immediately correct any wildlife hazards arising from existing wastewater treatment facilities located on or near the airport. Where required, a WHMP developed in accordance with Part 139 will outline appropriate wildlife hazard mitigation techniques. Accordingly, airport operators should encourage wastewater treatment facility operators to incorporate measures, developed in consultation with a wildlife damage management biologist, to minimize hazardous wildlife attractants. Airport operators should also encourage those wastewater treatment facility operators to incorporate these mitigation techniques into their standard operating practices. In addition, airport operators should consider the existence of wastewater treatment facilities when evaluating proposed sites for new airport development projects and avoid such sites when practicable.

d. New wastewater treatment facilities. The FAA strongly recommends against the construction of new wastewater treatment facilities or associated settling ponds within the separations identified in Sections 1-2 through 1-4. Appendix 1 defines wastewater treatment facility as “any devices and/or systems used to store, treat, recycle, or reclaim municipal sewage or liquid industrial wastes.” The definition includes any pretreatment involving the reduction of the amount of pollutants or the elimination of pollutants prior to introducing such pollutants into a publicly owned treatment works (wastewater treatment facility). During the site-location analysis for wastewater treatment facilities, developers should consider the potential to attract hazardous wildlife if an airport is in the vicinity of the proposed site, and airport operators should voice their opposition to such facilities if they are in proximity to the airport.

e. Artificial marshes. In warmer climates, wastewater treatment facilities sometimes employ artificial marshes and use submergent and emergent aquatic vegetation as natural filters. These artificial marshes may be used by some species of flocking birds, such as blackbirds and waterfowl, for breeding or roosting activities. The FAA strongly recommends against establishing artificial marshes within the separations identified in Sections 1-2 through 1-4.

f. Wastewater discharge and sludge disposal. The FAA recommends against the discharge of wastewater or sludge on airport property because it may improve soil moisture and quality on unpaved areas and lead to improved turf growth that can be an attractive food source for many species of animals. Also, the turf requires more frequent mowing, which in turn may mutilate or flush insects or small animals and produce straw, both of which can attract hazardous wildlife. In addition, the improved turf may attract grazing wildlife, such as deer and geese. Problems may also occur when discharges saturate unpaved airport areas. The resultant soft, muddy conditions can severely restrict or prevent emergency vehicles from reaching accident sites in a timely manner.

2-4. WETLANDS. Wetlands provide a variety of functions and can be regulated by local, state, and Federal laws. Normally, wetlands are attractive to many types of wildlife, including many which rank high on the list of hazardous wildlife species (Table 1).

NOTE: If questions exist as to whether an area qualifies as a wetland, contact the local division of the U.S. Army Corps of Engineers, the Natural Resources Conservation Service, or a wetland consultant qualified to delineate wetlands.

a. Existing wetlands on or near airport property. If wetlands are located on or near airport property, airport operators should be alert to any wildlife use or habitat changes in these areas that could affect safe aircraft operations. At public-use airports, the FAA recommends immediately correcting, in cooperation with local, state, and Federal regulatory agencies, any wildlife hazards arising from existing wetlands located on or near airports. Where required, a WHMP will outline appropriate wildlife hazard mitigation techniques. Accordingly, airport operators should develop measures to minimize hazardous wildlife attraction in consultation with a wildlife damage management biologist.

b. New airport development. Whenever possible, the FAA recommends locating new airports using the separations from wetlands identified in Sections 1-2 through 1-4. Where alternative sites are not practicable, or when airport operators are expanding an existing airport into or near wetlands, a wildlife damage management biologist, in consultation with the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, and the state wildlife management agency should evaluate the wildlife hazards and prepare a WHMP that indicates methods of minimizing the hazards.

c. Mitigation for wetland impacts from airport projects. Wetland mitigation may be necessary when unavoidable wetland disturbances result from new airport development projects or projects required to correct wildlife hazards from wetlands. Wetland mitigation must be designed so it does not create a wildlife hazard. The FAA recommends that wetland mitigation projects that may attract hazardous wildlife be sited outside of the separations identified in Sections 1-2 through 1-4.

(1) Onsite mitigation of wetland functions. The FAA may consider exceptions to locating mitigation activities outside the separations identified in Sections 1-2 through 1-4 if the affected wetlands provide unique ecological functions, such as critical habitat for threatened or endangered species or ground water recharge, which cannot be replicated when moved to a different location. Using existing airport property is sometimes the only feasible way to achieve the mitigation ratios mandated in regulatory orders and/or settlement agreements with the resource agencies. Conservation easements are an additional means of providing mitigation for project impacts. Typically the airport operator continues to own the property, and an easement is created stipulating that the property will be maintained as habitat for state or Federally listed species.

Mitigation must not inhibit the airport operator's ability to effectively control hazardous wildlife on or near the mitigation site or effectively maintain other aspects of safe airport operations. Enhancing such mitigation areas to attract hazardous wildlife must be avoided. The FAA will review any onsite mitigation proposals to determine compatibility with safe airport operations. A wildlife damage management biologist should evaluate any wetland mitigation projects that are needed to protect unique wetland functions and that must be located in the separation criteria in Sections 1-2 through 1-4 before the mitigation is implemented. A WHMP should be developed to reduce the wildlife hazards.

(2) Offsite mitigation of wetland functions. The FAA recommends that wetland mitigation projects that may attract hazardous wildlife be sited outside of the separations identified in Sections 1-2 through 1-4 unless they provide unique functions that must remain onsite (see 2-4c(1)). Agencies that regulate impacts to or around wetlands recognize that it may be necessary to split wetland functions in mitigation schemes. Therefore, regulatory agencies may, under certain circumstances, allow portions of mitigation to take place in different locations.

(3) Mitigation banking. Wetland mitigation banking is the creation or restoration of wetlands in order to provide mitigation credits that can be used to offset permitted wetland losses. Mitigation banking benefits wetland resources by providing advance replacement for permitted wetland losses; consolidating small projects into larger, better-designed and managed units; and encouraging integration of wetland mitigation projects with watershed planning. This last benefit is most helpful for airport projects, as wetland impacts mitigated outside of the separations identified in Sections 1-2 through 1-4 can still be located within the same watershed. Wetland mitigation banks meeting the separation criteria offer an ecologically sound approach to mitigation in these situations. Airport operators should work with local watershed management agencies or organizations to develop mitigation banking for wetland impacts on airport property.

2-5. DREDGE SPOIL CONTAINMENT AREAS. The FAA recommends against locating dredge spoil containment areas (also known as Confined Disposal Facilities) within the separations identified in Sections 1-2 through 1-4 if the containment area or the spoils contain material that would attract hazardous wildlife.

2-6. AGRICULTURAL ACTIVITIES. Because most, if not all, agricultural crops can attract hazardous wildlife during some phase of production, the FAA recommends against the used of airport property for agricultural production, including hay crops, within the separations identified in Sections 1-2 through 1-4. . If the airport has no financial alternative to agricultural crops to produce income necessary to maintain the viability of the airport, then the airport shall follow the crop distance guidelines listed in the table titled "Minimum Distances between Certain Airport Features and Any On-Airport Agricultural Crops" found in AC 150/5300-13, *Airport Design*, Appendix 17. The cost of wildlife control and potential accidents should be weighed against the income produced by the on-airport crops when deciding whether to allow crops on the airport.

a. Livestock production. Confined livestock operations (i.e., feedlots, dairy operations, hog or chicken production facilities, or egg laying operations) often attract flocking birds, such as starlings, that pose a hazard to aviation. Therefore, The FAA recommends against such facilities within the separations identified in Sections 1-2 through 1-4. Any livestock operation within these separations should have a program developed to reduce the attractiveness of the site to species that are hazardous to aviation safety. Free-ranging livestock must not be grazed on airport property because the animals may wander onto the AOA. Furthermore, livestock feed, water, and manure may attract birds.

b. Aquaculture. Aquaculture activities (i.e. catfish or trout production) conducted outside of fully enclosed buildings are inherently attractive to a wide variety of birds. Existing aquaculture facilities/activities within the separations listed in Sections 1-2 through 1-4 must have a program developed to reduce the attractiveness of the sites to species that are hazardous to aviation safety. Airport operators should also oppose the establishment of new aquaculture facilities/activities within the separations listed in Sections 1-2 through 1-4.

c. Alternative uses of agricultural land. Some airports are surrounded by vast areas of farmed land within the distances specified in Sections 1-2 through 1-4. Seasonal uses of agricultural land for activities such as hunting can create a hazardous wildlife situation. In some areas, farmers will rent their land for hunting purposes. Rice farmers, for example, flood their land during waterfowl hunting season and obtain additional revenue by renting out duck blinds. The duck hunters then use decoys and call in hundreds, if not thousands, of birds, creating a tremendous threat to aircraft safety. A wildlife damage management biologist should review, in coordination with local farmers and producers, these types of seasonal land uses and incorporate them into the WHMP.

2-7. GOLF COURSES, LANDSCAPING AND OTHER LAND-USE CONSIDERATIONS.

a. Golf courses. The large grassy areas and open water found on most golf courses are attractive to hazardous wildlife, particularly Canada geese and some species of gulls. These species can pose a threat to aviation safety. The FAA recommends against construction of new golf courses within the separations identified in Sections 1-2 through 1-4. Existing golf courses located within these separations must develop a program to reduce the attractiveness of the sites to species that are hazardous to aviation safety. Airport operators should ensure these golf courses are monitored on a continuing basis for the presence of hazardous wildlife. If hazardous wildlife is detected, corrective actions should be immediately implemented.

b. Landscaping and landscape maintenance. Depending on its geographic location, landscaping can attract hazardous wildlife. The FAA recommends that airport operators approach landscaping with caution and confine it to airport areas not associated with aircraft movements. A wildlife damage management biologist should review all landscaping plans. Airport operators should also monitor all landscaped areas on a continuing basis for the presence of hazardous wildlife. If

hazardous wildlife is detected, corrective actions should be immediately implemented.

Turf grass areas can be highly attractive to a variety of hazardous wildlife species. Research conducted by the USDA Wildlife Services' National Wildlife Research Center has shown that no one grass management regime will deter all species of hazardous wildlife in all situations. In cooperation with wildlife damage management biologist, airport operators should develop airport turf grass management plans on a prescription basis, depending on the airport's geographic locations and the type of hazardous wildlife likely to frequent the airport

Airport operators should ensure that plant varieties attractive to hazardous wildlife are not used on the airport. Disturbed areas or areas in need of re-vegetating should not be planted with seed mixtures containing millet or any other large-seed producing grass. For airport property already planted with seed mixtures containing millet, rye grass, or other large-seed producing grasses, the FAA recommends disking, plowing, or another suitable agricultural practice to prevent plant maturation and seed head production. Plantings should follow the specific recommendations for grass management and seed and plant selection made by the State University Cooperative Extension Service, the local office of Wildlife Services, or a qualified wildlife damage management biologist. Airport operators should also consider developing and implementing a preferred/prohibited plant species list, reviewed by a wildlife damage management biologist, which has been designed for the geographic location to reduce the attractiveness to hazardous wildlife for landscaping airport property.

c. Airports surrounded by wildlife habitat. The FAA recommends that operators of airports surrounded by woodlands, water, or wetlands refer to Section 2.4 of this AC. Operators of such airports should provide for a Wildlife Hazard Assessment (WHA) conducted by a wildlife damage management biologist. This WHA is the first step in preparing a WHMP, where required.

d. Other hazardous wildlife attractants. Other specific land uses or activities (e.g., sport or commercial fishing, shellfish harvesting, etc.), perhaps unique to certain regions of the country, have the potential to attract hazardous wildlife. Regardless of the source of the attraction, when hazardous wildlife is noted on a public-use airport, airport operators must take prompt remedial action(s) to protect aviation safety.

2-8. SYNERGISTIC EFFECTS OF SURROUNDING LAND USES. There may be circumstances where two (or more) different land uses that would not, by themselves, be considered hazardous wildlife attractants or that are located outside of the separations identified in Sections 1-2 through 1-4 that are in such an alignment with the airport as to create a wildlife corridor directly through the airport and/or surrounding airspace. An example of this situation may involve a lake located outside of the separation criteria on the east side of an airport and a large hayfield on the west side of an airport, land uses that together could create a flyway for Canada geese directly across the airspace of the airport. There are numerous examples of such situations;

therefore, airport operators and the wildlife damage management biologist must consider the entire surrounding landscape and community when developing the WHMP.

SECTION 3.

PROCEDURES FOR WILDLIFE HAZARD MANAGEMENT BY OPERATORS OF PUBLIC-USE AIRPORTS.

3.1. INTRODUCTION. In recognition of the increased risk of serious aircraft damage or the loss of human life that can result from a wildlife strike, the FAA may require the development of a Wildlife Hazard Management Plan (WHMP) when specific triggering events occur on or near the airport. Part 139.337 discusses the specific events that trigger a Wildlife Hazard Assessment (WHA) and the specific issues that a WHMP must address for FAA approval and inclusion in an Airport Certification Manual.

3.2. COORDINATION WITH USDA WILDLIFE SERVICES OR OTHER QUALIFIED WILDLIFE DAMAGE MANAGEMENT BIOLOGISTS. The FAA will use the Wildlife Hazard Assessment (WHA) conducted in accordance with Part 139 to determine if the airport needs a WHMP. Therefore, persons having the education, training, and expertise necessary to assess wildlife hazards must conduct the WHA. The airport operator may look to Wildlife Services or to qualified private consultants to conduct the WHA. When the services of a wildlife damage management biologist are required, the FAA recommends that land-use developers or airport operators contact a consultant specializing in wildlife damage management or the appropriate state director of Wildlife Services.

NOTE: Telephone numbers for the respective USDA Wildlife Services state offices can be obtained by contacting USDA Wildlife Services Operational Support Staff, 4700 River Road, Unit 87, Riverdale, MD, 20737-1234, Telephone (301) 734-7921, Fax (301) 734-5157 *(http://www.aphis.usda.gov/ws/)*.

3-3. WILDLIFE HAZARD MANAGEMENT AT AIRPORTS: A MANUAL FOR AIRPORT PERSONNEL. This manual, prepared by FAA and USDA Wildlife Services staff, contains a compilation of information to assist airport personnel in the development, implementation, and evaluation of WHMPs at airports. The manual includes specific information on the nature of wildlife strikes, legal authority, regulations, wildlife management techniques, WHAs, WHMPs, and sources of help and information. The manual is available in three languages: English, Spanish, and French. It can be viewed and downloaded free of charge from the FAA's wildlife hazard mitigation web site: http://wildlife-mitigation.tc.FAA.gov/. This manual only provides a starting point for addressing wildlife hazard issues at airports. Hazardous wildlife management is a complex discipline and conditions vary widely across the United States. Therefore, qualified wildlife damage management biologists must direct the development of a WHMP and the implementation of management actions by airport personnel.

There are many other resources complementary to this manual for use in developing and implementing WHMPs. Several are listed in the manual's bibliography.

3-4. WILDLIFE HAZARD ASSESSMENTS, TITLE 14, CODE OF FEDERAL REGULATIONS, PART 139. Part 139.337(b) requires airport operators to conduct a Wildlife Hazard Assessment (WHA) when certain events occur on or near the airport.

Part 139.337 (c) provides specific guidance as to what facts must be addressed in a WHA.

3-5. WILDLIFE HAZARD MANAGEMENT PLAN (WHMP). The FAA will consider the results of the WHA, along with the aeronautical activity at the airport and the views of the airport operator and airport users, in determining whether a formal WHMP is needed, in accordance with Part 139.337. If the FAA determines that a WHMP is needed, the airport operator must formulate and implement a WHMP, using the WHA as the basis for the plan.

The goal of an airport's Wildlife Hazard Management Plan is to minimize the risk to aviation safety, airport structures or equipment, or human health posed by populations of hazardous wildlife on and around the airport.

The WHMP must identify hazardous wildlife attractants on or near the airport and the appropriate wildlife damage management techniques to minimize the wildlife hazard. It must also prioritize the management measures.

3-6. LOCAL COORDINATION. The establishment of a Wildlife Hazards Working Group (WHWG) will facilitate the communication, cooperation, and coordination of the airport and its surrounding community necessary to ensure the effectiveness of the WHMP. The cooperation of the airport community is also necessary when new projects are considered. Whether on or off the airport, the input from all involved parties must be considered when a potentially hazardous wildlife attractant is being proposed. Airport operators should also incorporate public education activities with the local coordination efforts because some activities in the vicinity of your airport, while harmless under normal leisure conditions, can attract wildlife and present a danger to aircraft. For example, if public trails are planned near wetlands or in parks adjoining airport property, the public should know that feeding birds and other wildlife in the area may pose a risk to aircraft.

Airport operators should work with local and regional planning and zoning boards so as to be aware of proposed land-use changes, or modification of existing land uses, that could create hazardous wildlife attractants within the separations identified in Sections 1-2 through 1-4. Pay particular attention to proposed land uses involving creation or expansion of waste water treatment facilities, development of wetland mitigation sites, or development or expansion of dredge spoil containment areas. At the very least, airport operators must ensure they are on the notification list of the local planning board or equivalent review entity for all communities located within 5 miles of the airport, so they will receive notification of any proposed project and have the opportunity to review it for attractiveness to hazardous wildlife.

3-7 COORDINATION/NOTIFICATION OF AIRMEN OF WILDLIFE HAZARDS. If an existing land-use practice creates a wildlife hazard and the land-use practice or wildlife hazard cannot be immediately eliminated, airport operators must issue a Notice to Airmen (NOTAM) and encourage the land–owner or manager to take steps to control the wildlife hazard and minimize further attraction.

SECTION 4.

FAA NOTIFICATION AND REVIEW OF PROPOSED LAND-USE PRACTICE CHANGES IN THE VICINITY OF PUBLIC-USE AIRPORTS

4-1. FAA REVIEW OF PROPOSED LAND-USE PRACTICE CHANGES IN THE VICINITY OF PUBLIC-USE AIRPORTS.

a. The FAA discourages the development of waste disposal and other facilities, discussed in Section 2, located within the 5,000/10,000-foot criteria specified in Sections 1-2 through 1-4.

b. For projects that are located outside the 5,000/10,000-foot criteria but within 5 statute miles of the airport's AOA, the FAA may review development plans, proposed land-use changes, operational changes, or wetland mitigation plans to determine if such changes present potential wildlife hazards to aircraft operations. The FAA considers sensitive airport areas as those that lie under or next to approach or departure airspace. This brief examination should indicate if further investigation is warranted.

c. Where a wildlife damage management biologist has conducted a further study to evaluate a site's compatibility with airport operations, the FAA may use the study results to make a determination.

4-2. WASTE MANAGEMENT FACILITIES.

a. Notification of new/expanded project proposal. Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (Public Law 106-181) limits the construction or establishment of new MSWLF within 6 statute miles of certain public-use airports, when both the airport and the landfill meet very specific conditions. See Section 2-2 of this AC and AC 150/5200-34 for a more detailed discussion of these restrictions.

The Environmental Protection Agency (EPA) requires any MSWLF operator proposing a new or expanded waste disposal operation within 5 statute miles of a runway end to notify the appropriate FAA Regional Airports Division Office and the airport operator of the proposal (40 CFR 258, *Criteria for Municipal Solid Waste Landfills*, Section 258.10, *Airport Safety*). The EPA also requires owners or operators of new MSWLF units, or lateral expansions of existing MSWLF units, that are located within 10,000 feet of any airport runway end used by turbojet aircraft, or within 5,000 feet of any airport runway end used only by piston-type aircraft, to demonstrate successfully that such units are not hazards to aircraft. (See 4-2.b below.)

When new or expanded MSWLF are being proposed near airports, MSWLF operators must notify the airport operator and the FAA of the proposal as early as possible pursuant to 40 CFR 258.

b. Waste handling facilities within separations identified in Sections 1-2 through 1-4. To claim successfully that a waste-handling facility sited within the separations identified in Sections 1-2 through 1-4 does not attract hazardous wildlife and does not threaten aviation, the developer must establish convincingly that the facility will not handle putrescible material other than that as outlined in 2-2.d. The FAA strongly recommends against any facility other than that as outlined in 2-2.d (enclosed transfer stations). The FAA will use this information to determine if the facility will be a hazard to aviation.

c. Putrescible-Waste Facilities. In their effort to satisfy the EPA requirement, some putrescible-waste facility proponents may offer to undertake experimental measures to demonstrate that their proposed facility will not be a hazard to aircraft. To date, no such facility has been able to demonstrate an ability to reduce and sustain hazardous wildlife to levels that existed before the putrescible-waste landfill began operating. For this reason, demonstrations of experimental wildlife control measures may not be conducted within the separation identified in Sections 1-2 through 1-4.

4-3. OTHER LAND-USE PRACTICE CHANGES. As a matter of policy, the FAA encourages operators of public-use airports who become aware of proposed land use practice changes that may attract hazardous wildlife within 5 statute miles of their airports to promptly notify the FAA. The FAA also encourages proponents of such land use changes to notify the FAA as early in the planning process as possible. Advanced notice affords the FAA an opportunity (1) to evaluate the effect of a particular land-use change on aviation safety and (2) to support efforts by the airport sponsor to restrict the use of land next to or near the airport to uses that are compatible with the airport.

The airport operator, project proponent, or land-use operator may use FAA Form 7460-1, *Notice of Proposed Construction or Alteration*, or other suitable documents similar to FAA Form 7460-1 to notify the appropriate FAA Regional Airports Division Office. Project proponents can contact the appropriate FAA Regional Airports Division Office for assistance with the notification process.

It is helpful if the notification includes a 15-minute quadrangle map of the area identifying the location of the proposed activity. The land-use operator or project proponent should also forward specific details of the proposed land-use change or operational change or expansion. In the case of solid waste landfills, the information should include the type of waste to be handled, how the waste will be processed, and final disposal methods.

a. Airports that have received Federal grant-in-aid assistance. Airports that have received Federal grant-in-aid assistance are required by their grant assurances to take appropriate actions to restrict the use of land next to or near the airport to uses that are compatible with normal airport operations. The FAA recommends that airport operators to the extent practicable oppose off-airport land-use changes or practices within the separations identified in Sections 1-2 through 1-4 that may attract hazardous wildlife. Failure to do so may lead to noncompliance with applicable grant assurances. The FAA will not approve the placement of airport

development projects pertaining to aircraft movement in the vicinity of hazardous wildlife attractants without appropriate mitigating measures. Increasing the intensity of wildlife control efforts is not a substitute for eliminating or reducing a proposed wildlife hazard. Airport operators should identify hazardous wildlife attractants and any associated wildlife hazards during any planning process for new airport development projects.

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APPENDIX 1. DEFINITIONS OF TERMS USED IN THIS ADVISORY CIRCULAR.

1. **GENERAL.** This appendix provides definitions of terms used throughout this AC.

    1. **Air operations area.** Any area of an airport used or intended to be used for landing, takeoff, or surface maneuvering of aircraft. An air operations area includes such paved areas or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runway, taxiways, or apron.

    2. **Airport operator.** The operator (private or public) or sponsor of a public-use airport.

    3. **Approach or departure airspace.** The airspace, within 5 statute miles of an airport, through which aircraft move during landing or takeoff.

    4. **Bird balls.** High-density plastic floating balls that can be used to cover ponds and prevent birds from using the sites.

    5. **Certificate holder.** The holder of an Airport Operating Certificate issued under Title 14, Code of Federal Regulations, Part 139.

    6. **Construct a new MSWLF.** To begin to excavate, grade land, or raise structures to prepare a municipal solid waste landfill as permitted by the appropriate regulatory or permitting agency.

    7. **Detention ponds.** Storm water management ponds that hold storm water for short periods of time, a few hours to a few days.

    8. **Establish a new MSWLF.** When the first load of putrescible waste is received on-site for placement in a prepared municipal solid waste landfill.

    9. **Fly ash.** The fine, sand-like residue resulting from the complete incineration of an organic fuel source. Fly ash typically results from the combustion of coal or waste used to operate a power generating plant.

    10. **General aviation aircraft.** Any civil aviation aircraft not operating under 14 CFR Part 119, Certification: Air Carriers and Commercial Operators.

    11. **Hazardous wildlife.** Species of wildlife (birds, mammals, reptiles), including feral animals and domesticated animals not under control, that are associated with aircraft strike problems, are capable of causing structural damage to airport facilities, or act as attractants to other wildlife that pose a strike hazard

    12. **Municipal Solid Waste Landfill (MSWLF).** A publicly or privately owned discrete area of land or an excavation that receives household waste and that is not a land application unit, surface impoundment, injection well, or waste pile, as those terms are defined under 40 CFR § 257.2. An MSWLF may receive

other types wastes, such as commercial solid waste, non-hazardous sludge, small-quantity generator waste, and industrial solid waste, as defined under 40 CFR § 258.2. An MSWLF can consist of either a stand alone unit or several cells that receive household waste.

13. **New MSWLF.** A municipal solid waste landfill that was established or constructed after April 5, 2001.

14. **Piston-powered aircraft.** Fixed-wing aircraft powered by piston engines.

15. **Piston-use airport.** Any airport that does not sell Jet-A fuel for fixed-wing turbine-powered aircraft, and primarily serves fixed-wing, piston-powered aircraft. Incidental use of the airport by turbine-powered, fixed-wing aircraft would not affect this designation. However, such aircraft should not be based at the airport.

16. **Public agency.** A State or political subdivision of a State, a tax-supported organization, or an Indian tribe or pueblo (49 U.S.C. § 47102(19)).

17. **Public airport.** An airport used or intended to be used for public purposes that is under the control of a public agency; and of which the area used or intended to be used for landing, taking off, or surface maneuvering of aircraft is publicly owned (49 U.S.C. § 47102(20)).

18. **Public-use airport.** An airport used or intended to be used for public purposes, and of which the area used or intended to be used for landing, taking off, or surface maneuvering of aircraft may be under the control of a public agency or privately owned and used for public purposes (49 U.S.C. § 47102(21)).

19. **Putrescible waste.** Solid waste that contains organic matter capable of being decomposed by micro-organisms and of such a character and proportion as to be capable of attracting or providing food for birds (40 CFR §257.3-8).

20. **Putrescible-waste disposal operation.** Landfills, garbage dumps, underwater waste discharges, or similar facilities where activities include processing, burying, storing, or otherwise disposing of putrescible material, trash, and refuse.

21. **Retention ponds.** Storm water management ponds that hold water for several months.

22. **Runway protection zone (RPZ).** An area off the runway end to enhance the protection of people and property on the ground (see AC 150/5300-13). The dimensions of this zone vary with the airport design, aircraft, type of operation, and visibility minimum.

23. **Scheduled air carrier operation.** Any common carriage passenger-carrying operation for compensation or hire conducted by an air carrier or commercial

operator for which the air carrier, commercial operator, or their representative offers in advance the departure location, departure time, and arrival location. It does not include any operation that is conducted as a supplemental operation under 14 CFR Part 119 or as a public charter operation under 14 CFR Part 380 (14 CFR § 119.3).

24. **Sewage sludge.** Any solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment process; and a material derived from sewage sludge. Sewage does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works. (40 CFR 257.2)

25. **Sludge.** Any solid, semi-solid, or liquid waste generated form a municipal, commercial or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility or any other such waste having similar characteristics and effect. (40 CFR 257.2)

26. **Solid waste.** Any garbage, refuse, sludge, from a waste treatment plant, water supply treatment plant or air pollution control facility and other discarded material, including, solid liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved materials in domestic sewage, or solid or dissolved material in irrigation return flows or industrial discharges which are point sources subject to permits under section 402 of the Federal Water Pollution Control Act, as amended (86 Stat. 880), or source, special nuclear, or by product material as defined by the Atomic Energy Act of 1954, as amended, (68 Stat. 923). (40 CFR 257.2)

27. **Turbine-powered aircraft.** Aircraft powered by turbine engines including turbojets and turboprops but excluding turbo-shaft rotary-wing aircraft.

28. **Turbine-use airport.** Any airport that sells Jet-A fuel for fixed-wing turbine-powered aircraft.

29. **Wastewater treatment facility.** Any devices and/or systems used to store, treat, recycle, or reclaim municipal sewage or liquid industrial wastes, including Publicly Owned Treatment Works (POTW), as defined by Section 212 of the Federal Water Pollution Control Act (P.L. 92-500) as amended by the Clean Water Act of 1977 (P.L. 95-576) and the Water Quality Act of 1987 (P.L. 100-4). This definition includes any pretreatment involving the reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a POTW. (See 40 CFR Section 403.3 (q), (r), & (s)).

30. Wildlife. Any wild animal, including without limitation any wild mammal, bird, reptile, fish, amphibian, mollusk, crustacean, arthropod, coelenterate, or other invertebrate, including any part, product, egg, or offspring thereof (50 CFR 10.12, *Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants*). As used in this AC, wildlife includes feral animals and domestic animals out of the control of their owners (14 CFR Part 139, Certification of Airports).

31. Wildlife attractants. Any human-made structure, land-use practice, or human-made or natural geographic feature that can attract or sustain hazardous wildlife within the landing or departure airspace or the airport's AOA. These attractants can include architectural features, landscaping, waste disposal sites, wastewater treatment facilities, agricultural or aquaculture activities, surface mining, or wetlands.

32. Wildlife hazard. A potential for a damaging aircraft collision with wildlife on or near an airport.

33. Wildlife strike. A wildlife strike is deemed to have occurred when:

a. A pilot reports striking 1 or more birds or other wildlife;

b. Aircraft maintenance personnel identify aircraft damage as having been caused by a wildlife strike;

c. Personnel on the ground report seeing an aircraft strike 1 or more birds or other wildlife;

d. Bird or other wildlife remains, whether in whole or in part, are found within 200 feet of a runway centerline, unless another reason for the animal's death is identified;

e. The animal's presence on the airport had a significant negative effect on a flight (i.e., aborted takeoff, aborted landing, high-speed emergency stop, aircraft left pavement area to avoid collision with animal) (Transport Canada, Airports Group, *Wildlife Control Procedures Manual*, Technical Publication 11500E, 1994).

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Appendix G. Field Data Form

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FRENCH VALLEY AIRPORT WILDLIFE HAZARD OBSERVATION SHEET

Date	Observer			Weather		Page of	

Time (24 Hrs)	Station #	Wildlife Species	Number Obsrvd	Activity	Height Dirct	Covr Type	Grid	Time (24 Hrs)	Stat. #	Wildlife Species	Number Obsrvd	Activity	Height Direct	Covr Type	Grid

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Small Mammal Survey Data Sheet for F70 WHA				Date:		Page __ of ___	
Observer(s) Name(s)						Weather:	
Time (24 hrs)	Transect description	Trap sprung-no catch	Trap not sprung-bait removed	Trap sprung-catch	Species captured	Trap type	Comments

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Spotlight Data Sheet F70 - WHA								
Date	**Time (24hrs)**	**Station No.**	**Wildlife species**	**Quantity**	**Activity**	**Cover type**	**Grid**	**Comments**

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Wildlife Hazard Assessment Report
Hemet-Ryan Airport
Hemet, California

4710 W. Stetson Avenue
Hemet, CA 92545

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Administration**

Western Pacific Region
American Samoa, Arizona, California, Guam, Hawaii, Nevada

P.O. Box 92007
Los Angeles, California
90009

May 23, 2017

Mr. Tim Miller
Aviation Director
EDA Aviation Division
3403 10th Street, Suite 400
Riverside, California 92501

Dear Mr. Miller:

Wildlife Hazard Assessment
Hemet-Ryan Airport
Hemet, California

We accept the Hemet-Ryan Airport (HMT) Wildlife Hazard Assessment (WHA), which was conducted by Mead & Hunt.

In reviewing the WHA, it appears there was enough wildlife activity in the area to warrant the development of a Wildlife Hazard Management Plan (WHMP). The management techniques contained in Chapter 5 and 6 of the WHA can be used in developing the WHMP. The recommendations appear to be good sound practices.

As the WHMP is being developed, we urge you to begin the process of obtaining the necessary permits to control wildlife. The list is located on page 68 of the WHA contains the species that require a depredation permit. You and your staff will need to be trained to recognize which species do not require a permit for removal and which species are protected.

There are several critical and high priority recommended wildlife hazard management measures for your airport that you need to address. The WHA contains numerous other low to moderate items which you should also adopt. One item of concern is the target cells for conservation under the Western Riverside County Multiple Species Habitat Conversation Plan. The Airport/County is obligated through Grant Assurance No. 19 to operate the airport in a safe and serviceable condition. You should review any proposed creation of habitat within airport boundaries that can become a wildlife attractant.

Should you have any questions or comments regarding this letter, please do not hesitate to contact me at (310) 725-3636 or via email at elizabeth.louie@faa.gov.

Sincerely,

Elizabeth Louie
Airport Certification Safety Inspector

cc: Lisa Harmon, Aviation Project Manager, Mead & Hunt

Acknowledgment

Successful wildlife hazard monitoring requires cooperation from many members of the airport community. Mead & Hunt, Inc. would like to thank Vicki Powszok and the staff of the Hemet-Ryan Airport for their ongoing assistance throughout the 12-month monitoring period associated with the development of this Wildlife Hazard Assessment.

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B FAA AC 150/5200-36A, “Qualifications for Wildlife Biologists Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards at Airports”

C Author Accreditation

D Airport Layout Plan

E Federal- and State-listed Threatened and Endangered Species

F FAA AC 150/5200-33B, “Hazardous Wildlife Attractants on or Near Airports”

G Field Data Forms

H FAA CertAlert 06-07, “Requests by State Wildlife Agencies to Facilitate and Encourage Habitat for State-Listed Threatened and Endangered Species and Species of Special Concern on Airports”

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Chapter 1

Introduction

1.1 Overview of Wildlife Hazards to Aircraft

Conflicts between aircraft and wildlife have occurred since the dawn of aviation. Orville Wright was the pilot associated with the first documented bird strike in 1905 during a flight over Dayton, Ohio. The first fatality associated with a wildlife strike occurred on April 3, 1912, when Calbraith Rodgers died after his aircraft struck a gull and crashed in Long Beach, California.

Data compiled by the Federal Aviation Administration (FAA) indicates that the number of conflicts between wildlife and aircraft has continued to increase since that time. Based on data obtained from the National Wildlife Strike Database, several factors have evolved in recent years to affect the relationship between wildlife and aviation safety:

- *The use of faster and quieter aircraft.* Commercial air carriers have replaced their older three- or four-engine aircraft fleets with more efficient, faster, and quieter two-engine aircraft. In many cases, birds are less able to detect and avoid new aircraft using turbofan engines. In the event that wildlife is ingested by aircraft engines, aircraft with two engines may be more vulnerable than earlier aircraft equipped with three or four engines (FAA and USDA, 2014).

- *Increased air traffic.* The amount of military and civilian air traffic has increased substantially worldwide. Passenger enplanements in the U.S. increased from approximately 310 million in 1980 to 732 million in 2013, and commercial air traffic increased from approximately 18 million aircraft movements in 1980 to 25 million in 2013 (FAA and USDA, 2014). The growth in air traffic has increased the risk of potential conflicts between aviation and wildlife.

- *Increased wildlife populations and adaptation to urban areas.* The populations of many wildlife species commonly involved in strikes have increased markedly in the last few decades (FAA and USDA, 2014). As development has increased, the availability of natural or open areas that support these species has decreased. In addition, the size of the areas that once separated airports and nearby metropolitan areas also has decreased. As a result, the remaining open space provides habitat, shelter, and feeding areas for greater populations of wildlife.

As a result of these factors, ongoing changes in the aviation industry, and changes in land use, the number of documented wildlife strikes on and near airports continues to increase worldwide.

The FAA wildlife strike database includes records for more than 156,000 strikes during the period from January 1, 1990, through 2014, but the FAA estimates that the database represents only a portion of the actual number of bird strikes that occurred during this period (FAA and USDA, 2015). Based on FAA strike records, most wildlife strikes occurred in the immediate airport vicinity during aircraft approach or departure and more than 70 percent occur at altitudes of less than 500 feet above ground level (AGL) (FAA and USDA, 2015).

1.1.1 Safety Effects

The most recent analysis of wildlife strikes to civil aviation in the United States was performed by the FAA and the United States Department of Agriculture (USDA) Animal Plant Health Inspection Service (APHIS). The agencies reviewed data from the National Wildlife Strike Database for the 25-year period from 1990 through 2014 (FAA and USDA, 2015). Wildlife strikes to civil aircraft have resulted in human injuries and fatalities. From 1990 to 2014 a total of 388 injuries and 26 fatalities were associated with wildlife strikes. Species associated with these strikes include unidentified bird species, American white pelicans, Canada geese, white-tailed deer, brown pelicans, and turkey vultures. Sixty-seven aircraft were destroyed or damaged beyond repair. Terrestrial mammals (primarily white-tailed deer), Canada geese, and vultures were responsible for these incidents. Approximately 60 percent of the strikes that resulted in the destruction of aircraft occurred at GA airports (FAA and USDA, 2015).

1.1.2 Economic Losses

Wildlife strikes also can pose economic challenges to aircraft operators. Wildlife strikes may cause expensive structural and mechanical damage to aircraft even if they do not result in a crash (Blokpoel, 1976; Cleary and Dolbeer, 2005). Aircraft engines were the component most frequently reported as being damaged by bird strikes, and landing gear, propellers, and wing/rotors were identified as the components most often damaged by mammal strikes (FAA and USDA, 2014).

From 1990 to 2014 reported losses from bird strikes resulted in more than 981,000 hours of aircraft downtime and an estimated $707 million in direct and other monetary losses. In addition to direct monetary losses, indirect costs also were incurred as a result of lost revenue, passenger rescheduling, accommodations, and flight cancellations (FAA and USDA, 2014).

1.2 Regulatory Background

The FAA is the agency responsible for administering Federal Aviation Regulations (FARs). The FAA establishes policies to enhance public safety at air carrier airports holding certificates under Title 14 of the Code of Federal Regulations (14 CFR). Regulations associated with wildlife management are set forth at 14 CFR Part 139.337 (see **Appendix A**).

The Hemet-Ryan Airport (HMT or “the airport”) is not a certificated airport pursuant to FAR Part 139, but it is a federally obligated general aviation (GA) airport for which Riverside County (County) receives federal funds to support airport operations and undertake capital improvements. When an airport owner, such as the County, accepts funds from FAA-administered airport financial assistance programs, it must agree to certain obligations known as grant assurances. These grant assurances require an airport operator to maintain and operate its facilities safely, efficiently, and in accordance with specified conditions.

The FAA has established 37 specific grant assurances to which airport operators must adhere if they are to receive federal funds. Wildlife hazard management is associated with FAA Grant assurance No. 19, Operation and Maintenance:

> **19. Operation and Maintenance.**
>
> a. The airport and all facilities which are necessary to serve the aeronautical users of the airport, other than facilities owned or controlled by the United States, shall be operated at all times in a safe and serviceable condition and in accordance with the minimum standards as may be required or prescribed by applicable Federal, state and local agencies for maintenance and operation. It will not cause or permit any activity or action thereon which would interfere with its use for airport purposes. It will suitably operate and maintain the airport and all facilities thereon or connected therewith, with due regard to climatic and flood conditions. Any proposal to temporarily close the airport for non-aeronautical purposes must first be approved by the Secretary. In furtherance of this assurance, the sponsor will have in effect arrangements for-
>
> 1) Operating the airport's aeronautical facilities whenever required;
>
> 2) Promptly marking and lighting hazards resulting from airport conditions, including temporary conditions; and
>
> 3) Promptly notifying airmen of any condition affecting aeronautical use of the airport. Nothing contained herein shall be construed to require that the airport be operated for aeronautical use during temporary periods when snow, flood or other climatic conditions interfere with such operation and maintenance. Further, nothing herein shall be construed as requiring the maintenance, repair, restoration, or replacement of any structure or facility which is substantially damaged or destroyed due to an act of God or other condition or circumstance beyond the control of the sponsor.
>
> b. It will suitably operate and maintain noise compatibility program items that it owns or controls upon which Federal funds have been expended.

The FAA addresses wildlife hazard management in accordance with Grant Assurance No. 19 because it is a safety issue. The FAA will require the operator of a federally obligated airport to conduct a Wildlife Hazard Assessment (WHA), and if necessary, prepare a Wildlife Hazard Management Plan (WHMP).

1.2.1 Wildlife Hazard Assessment Process and Contents

The performance of a WHA is the first step in developing a more complete and site-specific understanding of wildlife hazards at an airport. The WHA must be conducted by a qualified wildlife biologist who meets the requirements of FAA Advisory Circular (AC) 150/5200-36A, "Qualifications for Wildlife Biologists Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards at Airports" (**Appendix B**). The qualifications of this report's author are included in **Appendix C**.

A WHA must be conducted in accordance with specific protocols. As described in *Wildlife Hazard Management at Airports: A Manual for Airport Personnel* (Cleary and Dolbeer, 2005), *a* WHA includes 12 months of ongoing wildlife monitoring to identify the presence of wildlife species, especially migratory birds, and seasonal fluctuations in the behaviors and abundance of species that occur at the airport and in its vicinity. Based on the results of the 12-month monitoring effort, specific measures or recommendations are formulated to reduce wildlife hazards at the airport.

As described in *Wildlife Hazard Management at Airports and FAA guidance,* a WHA must address the following:

(1) An analysis of the events or circumstances that prompted the assessment.

(2) Identification of the wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences.

(3) Identification and location of features on and near the airport that attract wildlife.

(4) A description of wildlife hazards to air carrier operations.

(5) Recommended actions for reducing identified wildlife hazards to air carrier aircraft.

As identified by FAA regulations, a WHA must address or include the following data:

- *Wildlife Strike Records and Analysis.* Each WHA must include a thorough review of available wildlife strike records associated with the airport.

- *Wildlife Populations on and Near the Airport.* Field studies associated with the WHA must be performed to determine wildlife population including such factors as: abundance, seasonal fluctuations, movement patterns, behaviors, and periods of activity, with a particular emphasis on the species most threatening to aircraft safety.

- *Wildlife Attractants and Land Use Practices. The WHA must identify potential habitat or wildlife attractants on the airport and within the airport vicinity*.

- *Wildlife Management Recommendations. The WHA must provide specific recommendations for reducing wildlife hazards to air carrier operations. The prioritized recommendations will serve as a framework for the development of a WHMP, should the FAA Administrator determine that one is necessary.*

1.2.2 Wildlife Hazard Management Plan

Based on the results of the WHA, the FAA may require an airport operator to prepare a WHMP. The FAA's decision to require the preparation of a WHMP may be based on the presence and abundance of wildlife identified in the WHA, aeronautical activity, and other pertinent factors. When required, a WHMP must be developed in accordance with 14 CFR Part 139.337, subparts (c), (d), and (e) and address the responsibilities, policies, and procedures necessary to reduce wildlife hazards.

1.3 Wildlife Hazard Strike History for the Hemet-Ryan Airport

The FAA's National Wildlife Strike Database was reviewed to obtain records for the airport. The FAA records helped to identify the species responsible for documented wildlife strikes that have occurred to date and helped to identify a site-specific WHA monitoring strategy (see Chapter 4). However, wildlife strike data must be reviewed with caution. Wildlife strike reporting is voluntary, and the data shown may not accurately reflect the number of strikes that have occurred at HMT. Prior to 2009 the FAA estimates that only 20 percent of all strikes were recorded. Since 2009 the FAA estimates that approximately 40 percent of all strikes were recorded. According to the FAA database, five bird strikes have been reported at HMT (see **Table 1-1**).

Table 1-1. Wildlife Strikes Recorded at HMT

Date	Aircraft Type	Species	Extent of Damage	Number Struck	Size	Comments from Database
4/27/2015	C-172	Unknown bird - small	N	1	Small	
2/28/2011	C-172	Unknown bird - small	N	1	Small	Small bird, approximately 2 lbs. No damage or remains found. Location reported as 1/4 NM final approach leg.
10/12/2005	BE-1900	Unknown bird - small	N	1	Small	
7/31/2000	GRUMMAN	Red-tailed hawk	M	1	Medium	5-6" dent on #2 bullring.
1/14/1992	C-172	Unknown bird - small	N	1	Small	Wing strut.

Key:
M – Minor damage to civil aircraft
N – No damage to civil aircraft

Source:
FAA Wildlife Strike Database, accessed September 2016. Available at: http://wildlife.faa.gov/database.aspx

As shown on **Table 1-1**, all five wildlife strikes records at HMT have been associated with avian species. One strike with a red-tailed hawk resulted in aircraft damage. The other four strikes were associated with small, unknown birds and resulted in no aircraft damage.

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2.1 Airport Facilities

HMT is located in California's San Jacinto Valley, between the San Jacinto Mountains to the east and the Santa Rosa Hills to the south. The Airport is in the southwestern portion of the City of Hemet, approximately 13 miles south of Interstate 10, south of State Highway 74, east of State Highway 79, and east of Interstates 15 and 210 (see **Figures 2-1** and **2-2**).

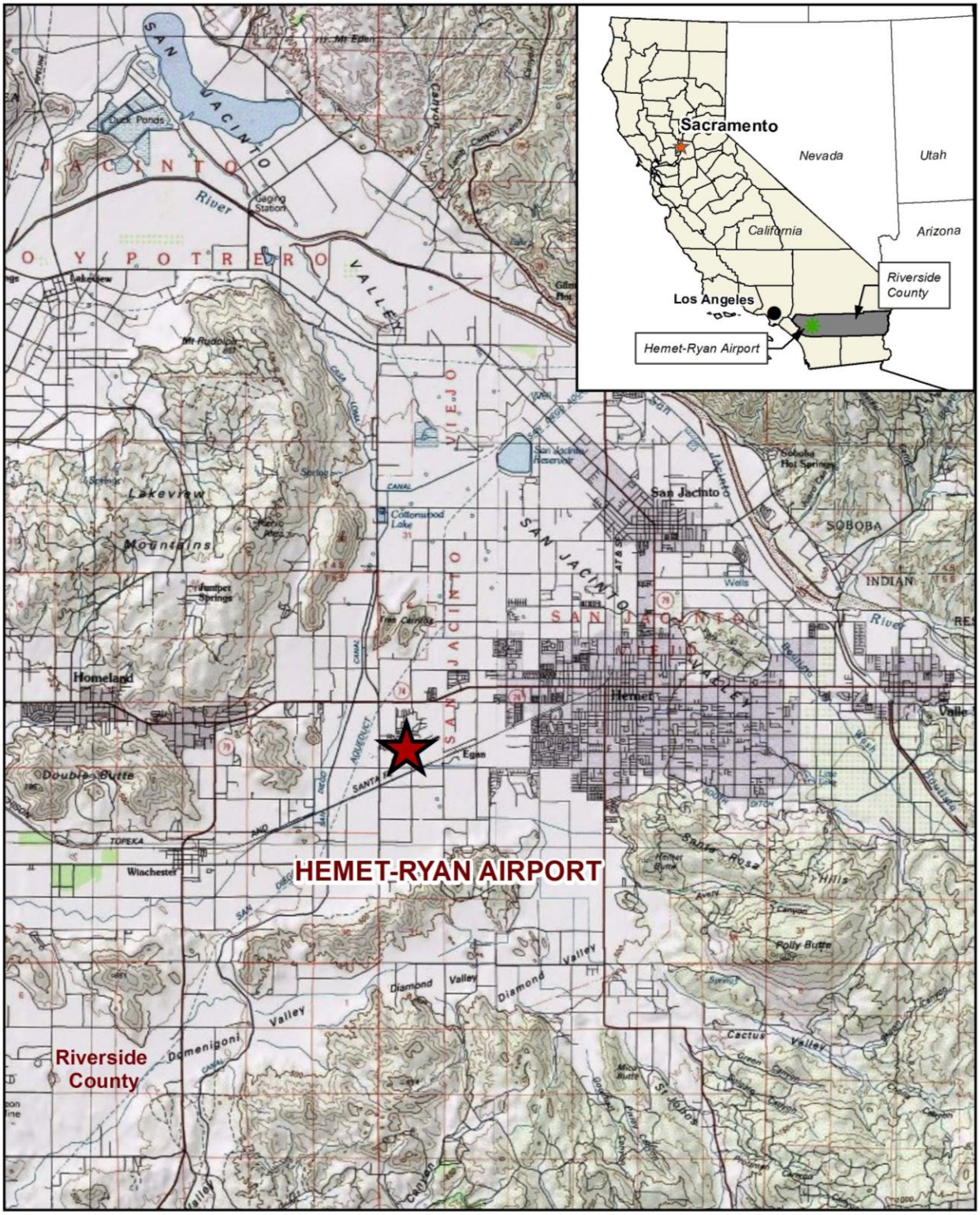
The airport was constructed in 1940 on 318 acres and commissioned in 1941 as a pilot training airfield. The airfield was deactivated in December 1944 and conveyed to Riverside County for use as a public-use, GA airport. The public-use airport is accessible 24 hours a day, seven days a week and has the capacity to accommodate a wide range of operations, including military, air cargo, corporate, and general aviation. FAA records show that HMT supported 75,555 annual operations in 2015 including GA single- and multi-engine, piston- and turbine-powered aircraft and helicopters (Airnav 2016). HMT is not equipped with an air traffic control tower.

HMT includes two nearly parallel runways:

- Runway 5-23, the primary runway, is 4,314 feet long and 100 feet wide. The runway is aligned in a northeast-southwest direction and includes medium-intensity runway edge lights. Runway 23 is marked with standard visual markings and is equipped with a two-light precision approach path indicator (PAPI).

- Runway 4-22 is restricted to glider-related operations. The runway is 2,045 feet long, 25 feet wide, and marked with basic visual markings.

HMT is served by several Fixed-Based Operators (FBOs) offering a full range of GA services including: fueling, powered aircraft and sailplane flight instruction, aircraft maintenance, aircraft storage, and aircraft interiors. The airport includes a café, which is open daily, and an aviation museum, which operates only on the weekends. For the 12-month period ending in January 2016, the HMT included 69 based aircraft and averaged more than 200 operations per day. Based aircraft included single- and multi-engine airplanes, jets, helicopters, and ultralights (Airnav 2016).



Map Credits: Copyright:© 2013 National Geographic Society, i-cubed

Figure 2-1.

Site Location Map

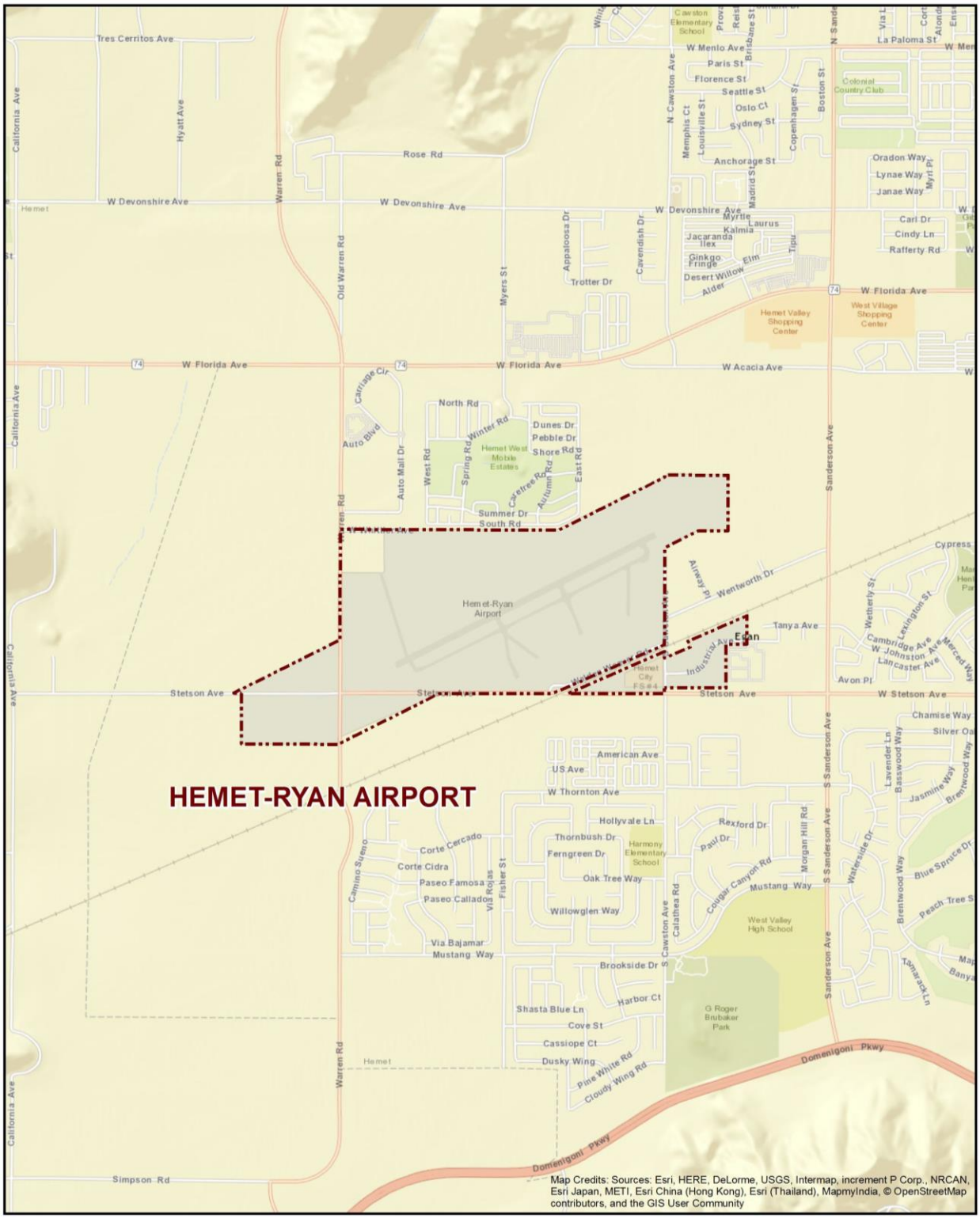


Figure 2-2.

Site Vicinity Map

Photo 1: *Aircraft taxiing at HMT.*

HMT includes two building areas. The building area north of Runway 4-22 consists of three FBOs that primarily serve sailplanes or ultralights. The building area south of Runway 5-23 includes hangars, aircraft fueling facilities, maintenance, storage, the GA apron, FBOs, a café, and a museum. A copy of the Airport Layout Plan (ALP) and WHA Study Design are provided in **Appendix D.**

Several governmental agencies operate at HMT. The Aviation Unit of the County of Riverside Sheriff's Department is housed in a large, box hangar. The Aviation Unit performs routine patrols, search and rescue operations, photo missions, and surveillance operations. The Riverside County Fire Department Inspector's office is adjacent to the Sheriff's Aviation Unit. The California Department of Forestry and Fire (CDF) operates a fire attack base at HMT, and the California Department of Fish and Wildlife bases two aircraft at HMT for anti-poaching patrol, game counts, and similar tasks.

Photo 2: *The main ramp and CDF building.*

2.2 Airport Setting

HMT is located in an area that is characterized by a desert climate, with hot dry summers and warm winters. Average temperatures range from the low 60s in degrees Fahrenheit (°F) during the winter to temperatures exceeding 100°F during the summer. The average annual precipitation is 12.5 inches. The airport is located at a surveyed elevation of 1,512 feet above mean sea level (MSL).

Surrounding land uses include a mobile home park, the Hemet West Mobile Estates, a manufactured home community adjacent to the airport's northern boundary. Agriculture and open space occur to the west, with residential, industrial, and commercial to the east, north, and south (see **Figure 2-2**).

The FAA defines the critical zone for wildlife hazards as the area within 10,000 feet of aircraft movement areas and within 5 miles of approach/departure surfaces (see **Figure 2-3**). Numerous natural and constructed water bodies occur in the critical zone including residential ponds, agricultural fields, golf courses and their associated open water features, and the San Diego Canal.

Photo 3: *Looking north across the threshold of Runway 5.*

Photo 4: *The infield is dominated by short grassland.*

Dominant landscape features within the Air Operations Area (AOA) include hardscapes and annual grasslands. Hardscapes include runways and taxiways, ramps, aprons, aircraft parking, storage areas, roads, hangars, and other airport structures (see **Photo 3**). Infield areas are characterized by annual, short grasslands (see **Photo 4**). The AOA includes lands designated as target cells for conservation under the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). The portions of the AOA that are included in the MSHCP are managed to protect vernal pool species, endemic plants, and the burrowing owl and its habitat (see below for more details on the MSHCP).

Photo 5: *Looking southeast across an area that is dominated by long grass.*

2.3 Wildlife Attractants in the Airport Vicinity

Potential wildlife attractants were observed prior to the initiation of the WHA survey effort, and these observations were used to develop the 12-month wildlife survey design (see **Figure 2-3**).

2.3.1 On-Site Wildlife Attractants

Wildlife attractants on the airport are associated with short grasslands (generally less than 6 inches in height), which are attractive to blackbirds, larks, songbirds, and prey for mammals such as coyotes. The northwestern portion of the AOA is associated with the Western Riverside County MSHCP and dominated by tall vegetation and grass, which provide foraging opportunities and attract larks, songbirds, coyotes, and raptors. Although the airport is equipped with a complete perimeter fence, coyotes are able to gain access to the AOA through holes in or gaps beneath the fence.

Several large trees are located on the north side of the airfield next to the hangars. These trees attract various species of birds, including raptors, which use the trees for perching and then disperse and fly across the AOA.

Photo 6: *Looking southeast across the AOA from the threshold of Runway 5.*

Conservation lands are present adjacent to HMT. The western half of Hemet Airport (see **Figure 2-4**) has been identified as criteria cells associated with the MSHCP, which indicates that the area meets the selection criteria for future acquisition under the Western Riverside County MSHCP. Inclusion of on-site areas in the MSHCP is not recommended however, as areas placed in a conservation easement could create an on-site wildlife attractant that could increase potential hazards at HMT. In addition, FAA discourages airport operators from establishing conservation easements on federally-obligated property (see **Appendix H**).

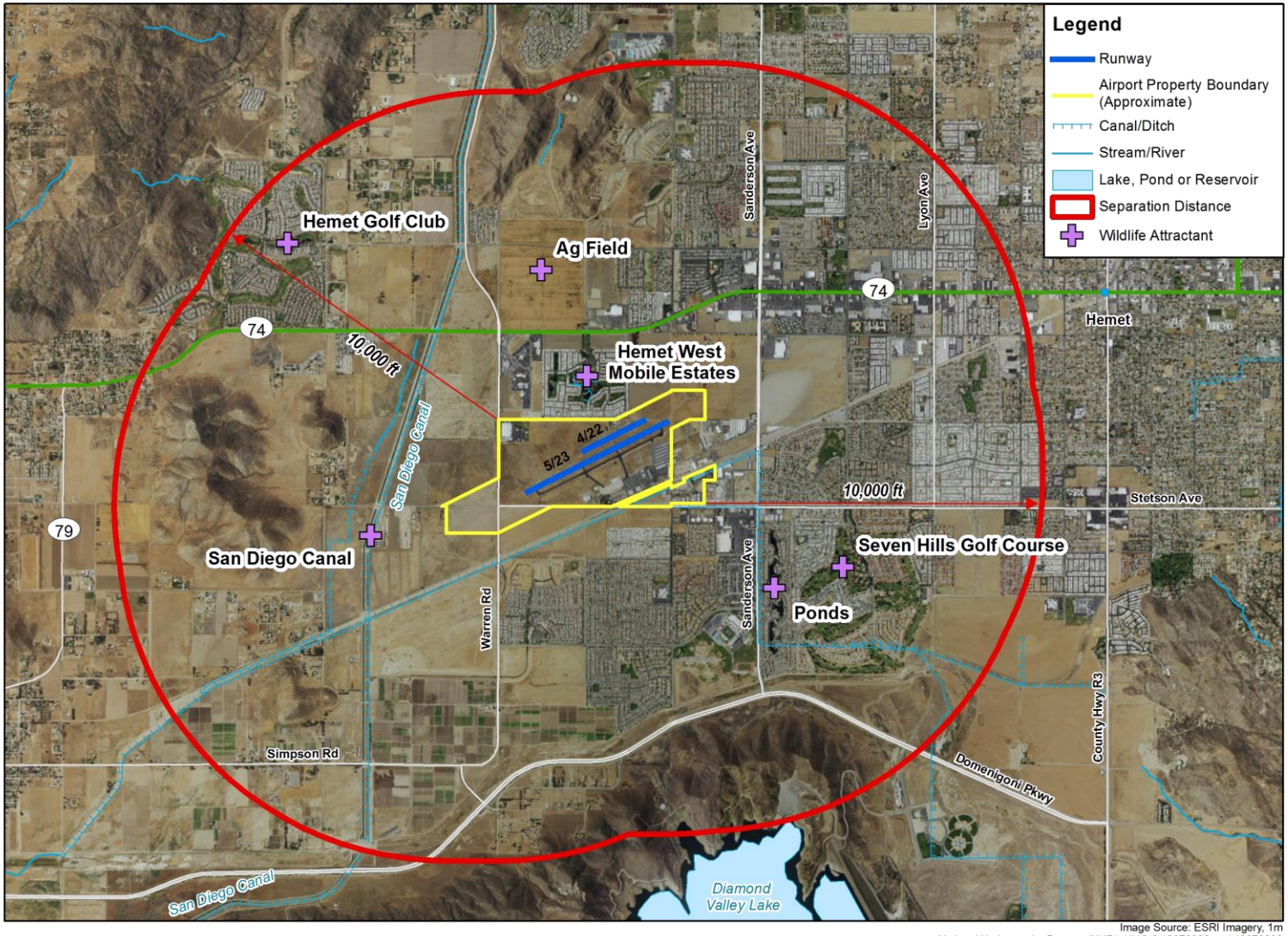


Figure 2-3.
FAA Critical Zone (10,000-ft Separation Distance) and Observed Wildlife Attractants

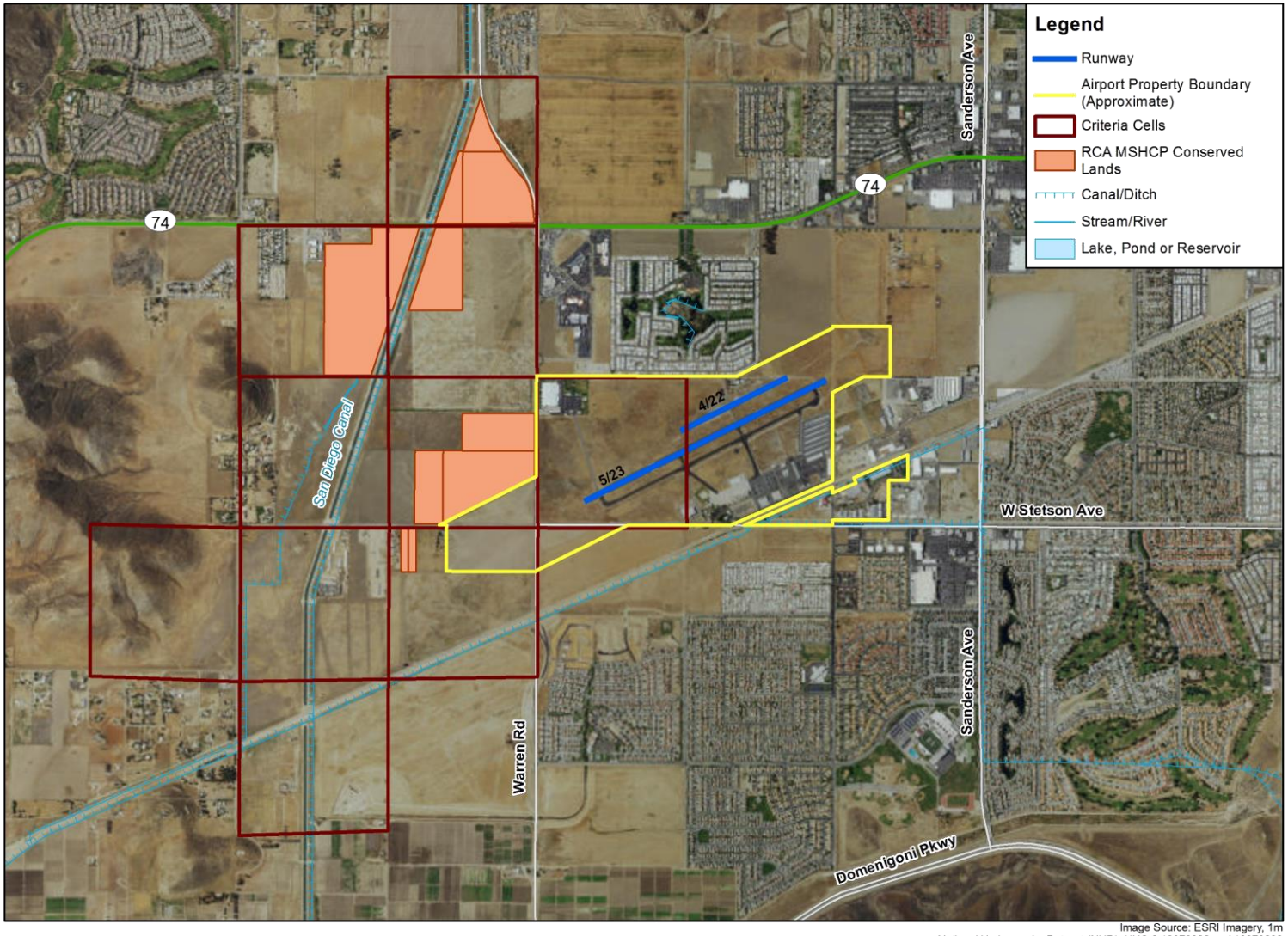


Figure 2-4.
Mulitple Species Habitat Conservation Plan (MSHCP) Lands

2.3.2 Off-Site Wildlife Attractants

Agricultural Fields

Numerous agricultural fields are present near the AOA and within the critical zone that are used for crop cultivation and livestock. Migrating birds are attracted to the cultivated areas because the crops provide an easily accessible, high-energy food source. The agricultural fields also provide wildlife with foraging and nesting opportunities; and they are considered a major wildlife attractant because they are visited frequently by flocking birds, such as starlings and blackbirds (as described in Chapter 4, monitoring point 10 was established to observe wildlife use of the agricultural fields).

Open Grasslands at Monitoring

Numerous open grasslands are present near the AOA and in the critical zone that attract various bird species. Grasslands provide a wide variety of plant and animal matter such as insects and invertebrates, fruits and seeds, native grasses, and rodents, which can be attractive to avian species from passerines to raptors. The tall vegetation associated with these grasslands provides excellent opportunities for nesting and protection (as described in Chapter 4, monitoring points 8 and 9 were established to observe wildlife use of the open grasslands).

Golf Course at Monitoring

Two public golf courses are located near the AOA: the Hemet Golf Course is located northwest of the airport, and the Seven Hills Golf course is located southeast of the airport. Golf courses are particularly attractive to wildlife, especially avian species, due to the presence of large open turf areas and numerous small ponds. The open, short grass/turf areas and ponds provide birds with plenty of foraging and feeding opportunities (as described in Chapter 4, one monitoring point was established at each golf course).

San Diego Canal

The San Diego Canal is a branch of the California Aqueduct, which carries water to many Southern California reservoirs including the Diamond Valley Lake reservoir located south of the airport. The canal provides wildlife with opportunities to forage, drink water, and nest. The canal is visited frequently by swallows and shorebirds (as described in Chapter 4, a monitoring point was established to observe wildlife activity near the canal).

Hemet West Mobile Estates

Hemet West Mobile Estates is a residential neighborhood north of and adjacent to the AOA. The neighborhood contains multiple large, manmade water features including a waterfall, and these features were observed to attract waterfowl and shorebirds because they provided water and opportunities for foraging.

2.3.3 Regional Wildlife Attractants

The airport is located approximately 2 miles north of Diamond Valley Lake Reservoir, which receives water from the San Diego Canal, is California's largest storage reservoir. The lake provides diverse wildlife species with opportunities for foraging, feeding, nesting, and protection. Diamond Valley Lake provides sanctuary near abundant high-energy food sources for birds migrating along the Pacific Flyway.

2.3.4 Wildlife Hazard Management Efforts

HMT maintenance staff members perform limited wildlife hazard management measures. Staff members harass wildlife from the runways when it is observed. Vegetation in the runway safety areas is mowed when weather and growing conditions permit. HMT staff members also report wildlife strikes in FAA's National Wildlife Strike database.

HMT includes a 6-foot, chain-link perimeter fence that is equipped with barbed-wire outriggers (see **Photo 7**). Numerous holes are present in and beneath the fence that that allow medium- to large-sized mammals to access the AOA, including coyotes (see **Photo 8**). Several gates contain large holes and gaps that allow wildlife to access the AOA. Vegetation adjacent to the fence can harbor wildlife and obstruct views of fence gaps or holes, and regular maintenance is important (see **Photo 9**).

Photo 7: *Recently trimmed vegetation along perimeter fence.*

Photo 8: *Dog or coyote burrow beneath the perimeter fence.*

Photo 9: *Vegetation builds up around the perimeter fence*

Chapter 3

Regulatory Context and Applicable Regulations

Most wildlife and their habitats are protected by one or more federal, state, and/or local laws. Before conducting any type of wildlife hazard management at HMT, whether harassment or lethal control, the legal status of all species must be determined. Many of the resource management agencies involved in wildlife management require permits to actively manage the target species, and they will generally issue permits depending on the species and management method used. The County is responsible for adhering to federal, state, and local regulations regarding wildlife management and for obtaining the appropriate permits.

3.1 Federal Regulations Pertaining to Wildlife Management

The federal government has passed several acts to protect wildlife, and the acts form the basis of most wildlife regulations included in the CFR. Federal wildlife laws are primarily administered and enforced by the U.S. Fish and Wildlife Service (USFWS) and include migratory birds and threatened and endangered species of flora and fauna.

Each of the following federal Acts has the potential to affect wildlife management activities at airports and must be considered when enacting wildlife hazard management measures:

- The Clean Water Act (CWA) (Sections 404, 402, and 401)
- The Endangered Species Act (ESA)
- The Fish and Wildlife Coordination Act (FWCA)
- The Bald and Golden Eagle Protection Act (BGEPA)
- The Migratory Bird Treaty Act (MBTA)
- The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)
- The National Environmental Policy Act (NEPA)
- Executive Order 11988, Floodplain Management

3.1.1 Clean Water Act (Sections 404, 402, and 401)

Activities that result in a discharge of dredged or fill material into waters of the United States are regulated by the U.S. Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (USACE) under Section 404 of the CWA. Discharges of dredged or fill material into waters of the United States, including wetlands, generally require a permit from USACE. However, isolated wetlands that are not hydrologically connected to waters of the United States are not regulated by USACE. If activities designed to manage wildlife hazards would result in the discharge of dredged or fill material into a jurisdictional water of the U.S., the County would need to apply for a permit from USACE before completing such activities.

Pursuant to Section 401 of the CWA, projects that require a USACE Permit for the discharge of dredge or fill material must also obtain a certificate from the appropriate state agency to confirm that the intended dredge or fill activity is consistent with the state's water quality standards and criteria.

In California, the authority to grant water quality certification is delegated by the State Water Resources Control Board to the Regional Water Quality Control Boards (RWQCBs). If wildlife hazard management activities at HMT necessitated a federal water quality permit, the County would need to cooperate with the issuing federal agency to obtain Section 401 certification.

Section 402 of the Clean Water Act prohibits the discharge of all pollutants into surface waters unless permitted under the National Pollution Discharge Elimination System (NPDES), which is administered by EPA or by a state with a federally approved control program (33 USC 1311, 1342). A General Construction Activity Storm Water Permit is a type of NPDES permit that allows stormwater waste discharges associated with construction activity into surface waters of the state. This permit is required for construction activities involving one or more acres of soil disturbance; discharges that contribute to violation of water quality standards, or are significant contributors of pollutants to receiving waters; specified industrial activities; or discharges from municipal storm drain systems serving populations of 100,000 or more. If construction activities associated with the implementation of wildlife management measures at HMT would result in the disturbance of 1 acre or more or create any non-point source discharge, the disturbance would contribute to a violation of state water quality standards. In such instances, the County would need to apply for a NPDES permit.

3.1.2 Endangered Species Act

Section 7 of the ESA (16 United States Code [USC] 1531 to 1543) requires all federal agencies, in consultation with the USFWS and National Marine Fisheries Services, to ensure that their actions do not jeopardize the continued existence of species listed as endangered or threatened, or result in the destruction or adverse modification of the critical habitat of these species. Through federal actions and the establishment of state programs, the federal ESA:

- Authorizes the determination and listing of species as endangered and threatened;
- Prohibits unauthorized taking, possession, sale, and transport of endangered species;
- Provides authority to acquire land for the conservation of listed species, using land and water conservation funds;
- Authorizes establishment of cooperative agreements and grants-in-aid to states that establish and maintain active and adequate programs for endangered and threatened wildlife and plants;
- Authorizes the assessment of civil and criminal penalties for violating the Act or regulations; and
- Authorizes the payment of rewards to anyone furnishing information leading to arrest and conviction for any violation of the Act or any regulation issued thereunder.

The Federal ESA would be applicable at HMT if any habitat management actions directed towards a species causing a threat to air traffic also affected critical habitat for a species listed as federally endangered or threatened. Compliance with the ESA also would affect abatement methods directed at a listed species that causes threats to air traffic. Activities that would affect species protected under the federal ESA were not identified during standardized wildlife surveys. A list of federal- and state-listed species are presented in **Appendix E**. If proposed wildlife management activities at HMT had the potential to affect a listed species, the FAA would be required to consult with the USFWS.

3.1.3 Fish and Wildlife Coordination Act

The FWCA requires all federal agencies to consult with the USFWS, National Oceanic and Atmospheric Administration (NOAA) Fisheries, and the California Department of Fish and Wildlife (CDFW) before they approve projects that affect, control, or modify surface waters. Although the recommendations of these agencies are not binding, federal agencies are required to "give full consideration" to measures recommended by these agencies in order to reduce impacts on wildlife and fisheries resources. Numerous wildlife species use the land and water resources in the vicinity of HMT. If wildlife management activities on HMT would affect nearby surface waters, the County would need to coordinate with USFWS, NOAA Fisheries, and the CDFW to avoid or mitigate adverse effects.

3.1.4 Bald and Golden Eagle Protection Act

The BGEPA provides for the protection of the bald eagle and the golden eagle by prohibiting, except under certain specified conditions, the taking, possession, and commerce of such birds. The Act allows take, possession, and transportation of bald and golden eagles under specified conditions, including scientific, educational, and Native American religious purposes, or in circumstances when take may be necessary to ensure the protection of wildlife, agriculture, or other interests particular to a specific locality. Before taking, possessing, or transporting any bald or golden eagle, or golden eagle nest, a permit must be obtained from USFWS. To manage wildlife hazards associated with golden eagles or their nests, the County will be required to consult with USFWS and obtain an eagle permit, as appropriate. (Refer to Chapters 5 and 6 for additional information regarding the management of eagles and other raptors.)

3.1.5 Migratory Bird Treaty Act of 1918

The MBTA is a treaty that was established with the U.S., Great Britain (for Canada), Mexico, Japan, and Russia for the protection of migratory birds. Specific provisions include the establishment of a Federal prohibition, unless permitted by regulations, to:

> …pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any

> manner, any migratory bird, included in the terms of this Convention…for the protection of migratory birds…or any part, nest, or egg of any such bird (16 U.S.C. 703).

The MBTA applies to several species that were identified during standardized wildlife surveys at HMT. To reduce the threat that species afforded protection under the MBTA, an airport operator must obtain a depredation permit from the USFWS before it can lethally remove birds and nests with eggs or young. (No permits are required from USFWS to manage habitat or harass/disperse MBTA species.)

Numerous migratory birds use habitats on HMT and in its vicinity. Since wildlife management activities could affect any of these birds, the County must consult with and obtain a migratory bird permit from the USFWS, which includes an airport depredation permit for direct lethal control if required in the interest of public aviation safety. Once procured, this permit must be renewed annually and maintained on file in the Airport Administration Office. (For more information on permits, refer to Chapters 5 and 6.)

3.1.6 Federal Insecticide, Fungicide, and Rodenticide Act

The FIFRA gives the EPA authority over the distribution, sale, and use of pesticides. All pesticides used in the United States must be registered (licensed) by the EPA. Registration ensures that pesticides will be properly labeled and that, if used in accordance with specifications, will not cause unreasonable harm to the environment. Use of each registered pesticide must be consistent with use directions contained on the label or labeling.

FIFRA applies to some ongoing and recommended wildlife hazard management measures at HMT. When the use of pesticides is included as part of an integrated wildlife management program, the property owner is responsible for ensuring that all products used to achieve the program goals are implemented according to applicable regulations and instructions.

3.1.7 National Environmental Policy Act

Under the NEPA of 1969 and its implementing regulations (40 CFR Parts 1500 to 1508), federal agencies must analyze and disclose the environmental effects of their proposed actions and a reasonable range of alternatives in the appropriate level of assessment. Specifically, NEPA is triggered when an action requires a permit, entitlement, or funding from a federal agency; when an action is jointly undertaken with a federal agency; or when an action is proposed on federal land. Since a WHA is a study, it is not subject to review under NEPA. However, the implementation of some wildlife hazard management measures identified in the WHA may be subject to NEPA.

3.1.8 Executive Order 11988, Floodplain Management

Executive Order 11988 requires that all federal agencies take actions to reduce the risk of flood loss, to restore and preserve the natural and beneficial values served by the floodplain, and to minimize the impact of floods on human safety, health, and welfare. The Order defines floodplains as "the lowland and relatively flat areas adjoining inland and coastal waters including flood prone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year" (i.e., the area that would be inundated by a 100-year flood).

If proposed, wildlife management practices would involve a federal action that could impact floodplains; the County will take appropriate actions to minimize impacts to the floodplain.

3.2 State of California Laws and Regulations

The State of California has passed many environmental laws and regulations to protect wildlife and habitat. The following laws and regulations may apply to specific wildlife hazard management measures at HMT:

- The California Endangered Species Act (CESA)
- The California Fish and Game Code (various sections)
- The Porter-Cologne Water Quality Act
- Herbicide and Pesticide Use
- The California Environmental Quality Act (CEQA)

3.2.1 California Endangered Species Act

Pursuant to the CESA and Section 2081 of the California Fish and Game Code, a permit is required from the CDFW for projects that could result in the "take" of a state-listed threatened or endangered species. Under CESA, the definition of "take" applies to an activity that would directly or indirectly kill an individual of a species. Unlike the federal ESA, the definition does not include activities that "harm" or "harass" such species. Wildlife hazard management activities at HMT that require the removal of a state-listed endangered or threatened species would be subject to CESA.

3.2.2 California Fish and Game Code, Section 3470-3472.2

The California Fish and Game Code recognizes that resources on California's public use airports must be managed in a way that is both biologically sound and in accordance with FAA regulations and policies. The code allows airport operators to protect the health, welfare, and safety of the traveling public through the performance of limited and authorized wildlife hazing, harassment, and depredation. Such activities may be performed only when they are in accordance with a current valid federal fish and wildlife depredation permit and when the following conditions are met:

(a) The taking occurs on lands owned or leased by the airport.

(b) The taking does not occur on lands owned or leased by the airport that are reserved for habitat mitigation or conservation purposes of the species being taken, including lands in a habitat conservation plan, or a natural communities conservation plan.

(c) There is no taking of a fully protected, candidate, threatened, or endangered species.

The code states that such take is authorized only to relieve or prevent injurious situations and may only be performed as part of an integrated wildlife management program that emphasizes nonlethal management techniques.

3.2.3 California Fish and Game Code – Fully Protected Species

Four sections of the California Fish and Game Code identify fully protected species: Sections 3511, 4700, 5050, and 5515. The statutes prohibit take or possession of fully protected species at any time. The CDFW is unable to authorize incidental take of fully protected species when activities are proposed in areas inhabited by those species, with the exception of specified scientific purposes. The presence of any fully protected species at HMT would require additional coordination with the CDFW. Management activities at HMT that may be subject to state codes associated with fully protected species could occur if such a species requires removal because it posed a potential hazard to public safety. White-tailed kites are identified as fully protected species and were observed during the 12-month survey at HMT.

3.2.4 California Fish and Game Code Section 1602 – Streambed Alterations

Diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California that supports wildlife resources are subject to regulation by the CDFW, pursuant to Section 1602 of the Fish and Game Code. The code identifies a stream as a body of water that flows at least periodically or intermittently through a bed or channel that has banks and supports wildlife, fish, or aquatic life. The CDFW may also have jurisdiction over altered or artificial waterways based on the value of those waterways to fish and wildlife. Section 1602 would apply to wildlife hazard management measures at HMT if the County wished to alter a stream near the airport to remove or reduce a wildlife hazard.

3.2.5 Porter-Cologne Water Quality Control Act

Pursuant to the Porter-Cologne Water Quality Control Act, waters of the state fall under the jurisdiction of RWQCBs, which must prepare and maintain water quality control plans or basin plans. Each plan identifies water quality standards for surface water and groundwater, and sets forth actions to control pollution sources to achieve the standards. Projects that affect wetlands or waters must meet the waste discharge requirements of the RWQCB.

3.2.6 Herbicide and Pesticide Use

The California Department of Pesticide Regulation (DPR) and the County Agricultural Commissioner (CAC) regulate the sale and use of pesticides and herbicides in the County of Riverside. Requirements that are specific for use in California may be associated with many pesticides approved by the EPA. Applicators of a pesticide designated as a restricted material must either be licensed by the DPR or work under the supervision of a licensed pesticide applicator. For aquatic pesticides, the applicator must hold a qualified applicator certificate with the category “aquatic.” The use of a pesticide must be reported to the CAC where required by law or by agreement with the DPR.

3.2.7 California Environmental Quality Act

The CEQA applies to proposed projects that will be undertaken by, or require the discretionary approval of, state and local agencies. An action is defined as a project under CEQA if it has the potential to cause a direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment that meets the following:

- An activity directly undertaken by any public agency.
- An activity that is supported by contracts, grants, subsidies, loans or other assistance from public agencies.
- An activity that involves the issuance of a permit, license or entitlement from public agencies.

A WHA is a study, and as such it would not be subject to CEQA. However, the implementation of any wildlife hazard management measures that could potentially cause direct or indirect changes in the environment could be subject to CEQA. Proposed wildlife hazard management measures that require compliance with the California ESA and Federal Migratory Bird Act would require CEQA compliance.

3.3 Local Regulations

The Western Riverside County MSHCP addresses a portion of Riverside County west of the San Jacinto Mountains. The MSHCP aims to conserve/preserve 500,000 acres in Western Riverside County to support 146 threatened, endangered, and sensitive species. A total of 347,000 acres of existing Public/Quasi-Public Lands have already been identified as part of the MSHCP Conservation Area. Coverage under the MSHCP allows the USFWS and CDFW to grant "take authorization" for projects that may incidentally take or harm individual species or their habitat outside of the MSHCP Conservation Area in exchange for providing land or an in-lieu fee to support the dedication of additional target lands into the MSHCP Conservation Area. Riverside County is a signatory to the MSHCP.

3.4 Legal Status of Key Species

Numerous federally listed and state-listed endangered and threatened animal species are known to occur Riverside County, and a complete species list is included in **Appendix E**. HMT is located in the Winchester quadrangle of California. **Table 3-1** presents federal- and state-listed animal species that are known to occur in the Winchester quadrangle and species of federal and state concern as listed in the California Natural Diversity Database (CNDDB).

As shown on **Table 3-1,** 20 protected or candidate birds are known to exist in the airport vicinity, and six listed bird species were observed during the 12-month survey period (see highlighted species in Table 3-1). All six of the listed species observed are addressed by the MSHCP as indicated below in **Table 3-1**.

Table 3-1. Federal and State Threatened, Endangered, and Special Concern Animal Species Winchester Quadrangle

Common Name	Scientific Name	Status
Birds		
Bald eagle	*Haliaeetus leucocephalus*	FD, SE, FP, MSHCP
Belding's savannah sparrow	*Passerculus sandwichensis beldingi*	SE
Bell's sage sparrow	*Artemisiospiza belli belli*	WL, MSHCP
Burrowing owl	*Athene cunicularia*	SSC, MSHCP
California horned lark	*Eremophila alpestris actia*	WL, MSHCP
Coastal California gnatcatcher	*Polioptila californica californica*	FT, SSC, MSHCP
Cooper's hawk	Accipiter cooperii	WL, MSHCP
Ferruginous hawk	*Buteo regalis*	WL, MSHCP
Golden eagle	*Aquila chrysaetos*	FP, WL, MSHCP
Grasshopper sparrow	*Ammodramus savannarum*	SSC, MSHCP
Loggerhead shrike	*Lanius ludovicianus*	SSC, MSHCP
Long-billed curlew	*Numenius americanus*	WL
Northern harrier	*Circus cyaneus*	SSC, MSHCP
Olive-sided flycatcher	*Contopus cooperi*	SSC
Oregon vesper sparrow	*Pooecetes gramineus affinis*	SSC
Osprey	*Pandion haliaetus*	WL, MSHCP
Southern California rufous-crowned sparrow	*Aimophila ruficeps canescens*	WL, MSHCP
White-faced ibis	*Plegadis chihi*	WL, MSHCP
White-tailed kite	*Elanus leucurus*	FP, MSHCP
Willow flycatcher	*Empidonax traillii*	SE
Mammals		
Los Angeles pocket mouse	*Perognathus longimembris brevinasus*	SSC, MSHCP
Northwestern San Diego pocket mouse	*Chaetodipus fallax fallax*	SSC, MSHCP
San Diego black-tailed jackrabbit	*Lepus californicus bennettii*	SSC, MSHCP
San Diego desert woodrat	*Neotoma lepida intermedia*	SSC, MSHCP
Stephens' kangaroo rat	*Dipodomys stephensi*	FE, ST, MSHCP
Western yellow bat	*Lasiurus xanthinus*	SSC

Table 3-1. Federal and State Threatened, Endangered, and Special Concern Animal Species Winchester Quadrangle

Common Name	Scientific Name	Status
Reptiles		
Coast horned lizard	*Phrynosoma blainvillii*	SSC, MSHCP
Orangethroat whiptail	*Aspidoscelis hyperythra*	SSC, MSHCP
Red-diamond rattlesnake	*Crotalus ruber*	SSC, MSHCP
Amphibians		
Arroyo toad	*Anaxyrus californicus*	FE, SSC, MSHCP
Western spadefoot	*Spea hammondii*	SSC, MSHCP
Crustaceans		
Riverside fairy shrimp	*Streptocephalus woottoni*	FE, MSHCP
Vernal pool fairy shrimp	*Branchinecta lynchi*	FT, MSHCP
Insects		
Quino checkerspot butterfly	*Euphydryas editha quino*	FE, MSHCP
Plants		
California Orcutt grass	*Orcuttia californica*	FE, SE, MSHCP
Munz's onion	*Allium munzii*	FE, ST, MSHCP
San Jacinto Valley crownscale	*Atriplex coronata var. notatior*	FE, MSHCP
Spreading navarretia	*Navarretia fossalis*	FT
Thread-leaved brodiaea	*Brodiaea filifolia*	FT, SE, MSHCP

Note: Highlighted species were observed during WHA field surveys.

Key:
FD = Federally Delisted Species
FE = Federally listed Endangered Species
FP = Fully Protected State Species - Identify and provide additional protection to those animals that are rare or face possible extinction
FT = Federally listed Threatened Species
SE = State-listed Endangered Species
ST = State-listed Threatened Species
SSC = State Species of Special Concern
WL = State Watch List
MSHCP = Covered in Western Riverside County MSHCP.

Source:
California Natural Diversity Database (CNDDB), 2016.

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Fieldwork for the WHA was accomplished through five tasks performed during the 12-month monitoring period that began in June 2015 and concluded in May 2016. These tasks included:

- A preliminary site reconnaissance visit on June 18, 2015;
- Twice-monthly monitoring events focusing on avian wildlife;
- Two small mammal monitoring events;
- Two nocturnal spotlight surveys; and
- Monitoring using game cameras to documents wildlife presence.

Sections 4.1 through 4.5 summarize the methods used to conduct these tasks.

4.1 Preliminary Site Reconnaissance Visit

The project team conducted a preliminary site reconnaissance visit on June 18, 2015, to identify potential wildlife attractants and appropriate monitoring locations for forthcoming project surveys. As described in FAA AC 150/5200-33B, "Hazardous Wildlife Attractants On or Near Airports" (**Appendix F**), the project team considered the area within 10,000 feet of the airport, as well as the area within 5 miles of approach departure corridors.

Based on the results of the preliminary site visit, the team identified 12 survey locations for the twice-monthly surveys and large mammal monitoring events. Seven locations (points 1 through 7) were associated with the AOA to provide visual coverage of runways, taxiways, infield turf grass/weedy vegetation and structures, ramps, hangars, and buildings (see **Table 4-1** and **Figure 4-1**). Five monitoring points (points 8 through 12) were associated with off-site locations, such as agricultural areas, golf courses, and aircraft approach/departure corridors.

Table 4-1
Summary of Wildlife Hazard Assessment Monitoring Locations
Hemet Ryan Airport

Monitoring point	Location/View
On-site Monitoring Locations	
1	Approach end of Runway 5, infield grass, taxiway, perimeter fence line, and off-site properties.
2	Runway 5/23, taxiways, runway safety areas, buildings, hangars, and ramp area.
3	Approach end of Runway 23, infield grass, taxiway, perimeter fence line, and off-site properties.
4	Runway 4/22, taxiways, runway safety areas, buildings, hangars, and adjacent mobile home park.
5	Runways, habitat conservation area, and runway safety areas.
6	Habitat conservation area, perimeter fence line, and adjacent properties.
7	Main apron/ramp, buildings, hangars, utility lines, trees, and off-site properties.

Table 4-1 Summary of Wildlife Hazard Assessment Monitoring Locations Hemet Ryan Airport	
Monitoring point	**Location/View**
Off-site Monitoring Locations	
8	Open grasslands and residential neighborhoods east of the airport.
9	Open grasslands and canal west of the airport.
10	View of agricultural fields and utility lines.
11	Hemet Golf Club.
12	Seven Hills Golf Course.

4.2 Twice-Monthly Wildlife Monitoring Surveys

Two wildlife surveys were performed for a 12-month period from June 2015 to May 2016 for a total of 24 twice-monthly survey events. The following procedures and criteria were implemented during each monitoring event:

- The time of day and order of point counts were randomized;
- Each monitoring point was surveyed for a 5-minute period. All bird and mammal species observed or heard during the 5-minute period were identified and counted, and their locations were recorded on field data forms;
- The behavior of all birds (e.g., perched, flying, loafing, etc.), as well as the approximate height of birds in flight above ground level were recorded; and
- The associated habitat type was recorded for all mammals and for all perched and foraging birds.
- Presence and evidence of non-avian species was also recorded (e.g., tracks, scat, etc.).

Project biologists recorded observations pertaining to both avian and non-avian species. The condition of the perimeter fence was monitored, and the presence of non-avian species encountered during the twice-monthly surveys was recorded based on observations, conversations with HMT staff, or other evidence. **Appendix G** presents a copy of the field data form used for each monitoring event.

4.3 Small Mammal Surveys

Two small mammals (rodent) monitoring events were performed at HMT. One was performed in December 2015 and another in March 2016. Each small mammal monitoring event was conducted over a period of three days and two nights.

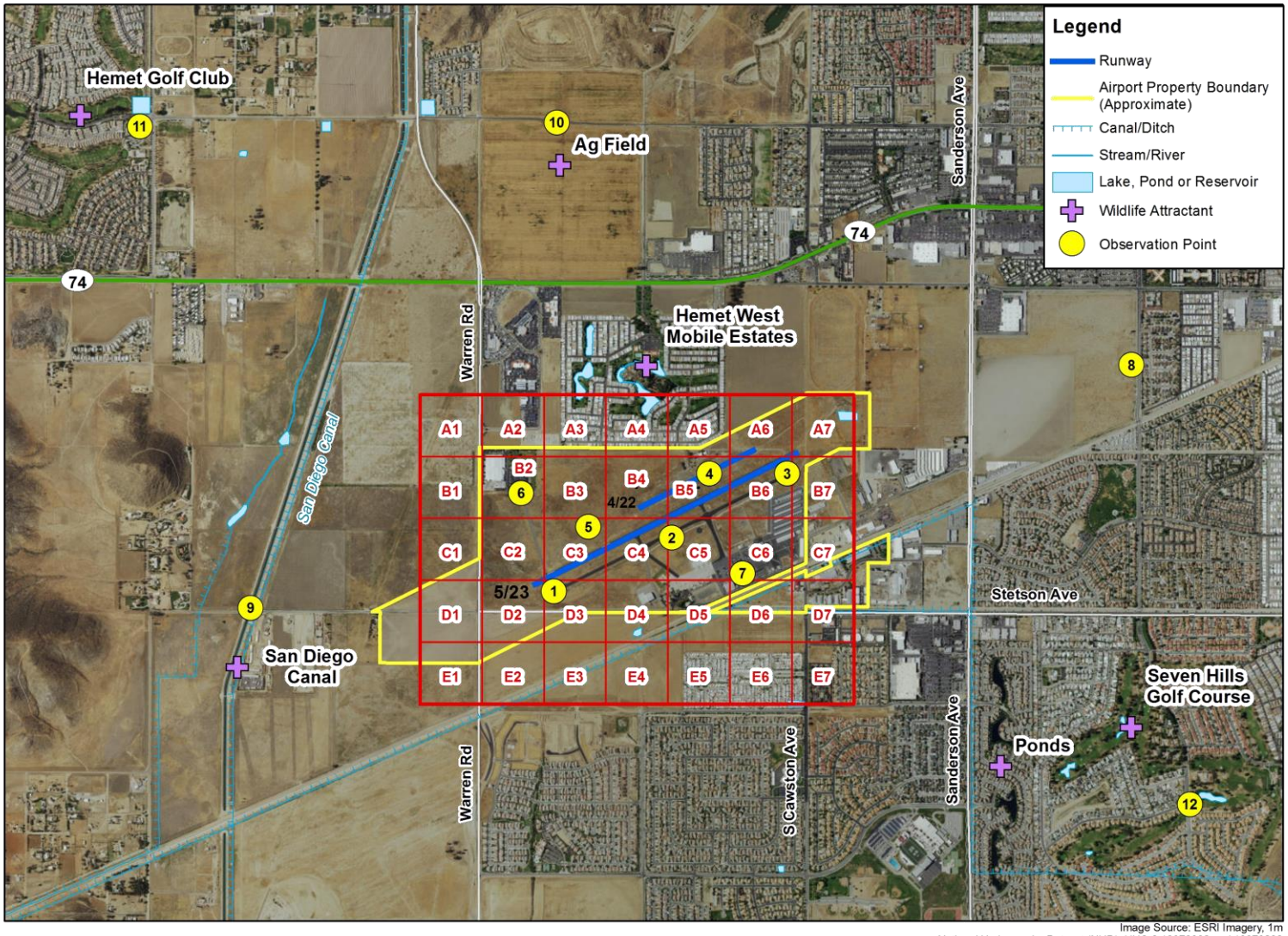


Figure 4-1.

Wildlife Observation Points with Grid

Three transects, or trap lines composed of 50 live traps, were established within the airport property for each survey. The traps were placed along each transect at approximately 30-foot intervals. Locations of the trap lines are shown in **Figure 4-2** and described by date below.

For the December survey, trap lines were placed in the following locations:

- Hardscape and short grass (3 to 6 inches) within the runway safety area along the northeast side of Runway 5/23 (Transect E on **Figure 4-2**).

- Medium-height grass (6 to 12 inches) within the Habitat Conservation Area along the east side of an unused taxiway (Transect D on **Figure 4-2**).

- Short grass (3 to 6 inches) along the southern side of the taxiway (Transect F on **Figure 4-2**).

For the March survey, trap lines were place in the following locations:

- Short grass (3 to 6 inches) along the southern side of the taxiway (Transect C on **Figure 4-2)**.

- Hardscape and short grass (3-6 inches) between the decommissioned runway and Runway 5/23 (Transect B on **Figure 4-2**).

- Medium-height grass (6 to 12 inches) within the Habitat Conservation Area (Transect A on **Figure 4-2**).

4.4 Spotlight Surveys

Two spotlight surveys were conducted during the 12-month period. One survey was performed in December 2015 and another was conducted in March 2016. The field team used the same survey locations identified for the twice-monthly monitoring events as well as driving the perimeter roads, internal roads, and along taxiways. The surveys were conducted approximately 1.5 hours after sunset.

4.5 Game Camera Surveys

One game camera was installed within the AOA to monitor mammal activity during the 12-month assessment. The locations of the game cameras were adjusted to capture conditions in different areas of the airport. Typically a game camera was moved if little wildlife activity was detected in a specific location. **Figure 4-3** illustrates the locations in which the game cameras were placed throughout the study and the following list indicates when each location was used.

- Camera Location 1 - June
- Camera Location 2 - August, November
- Camera Location 3 - September, October
- Camera Location 4 - July, December, January, February, March, April

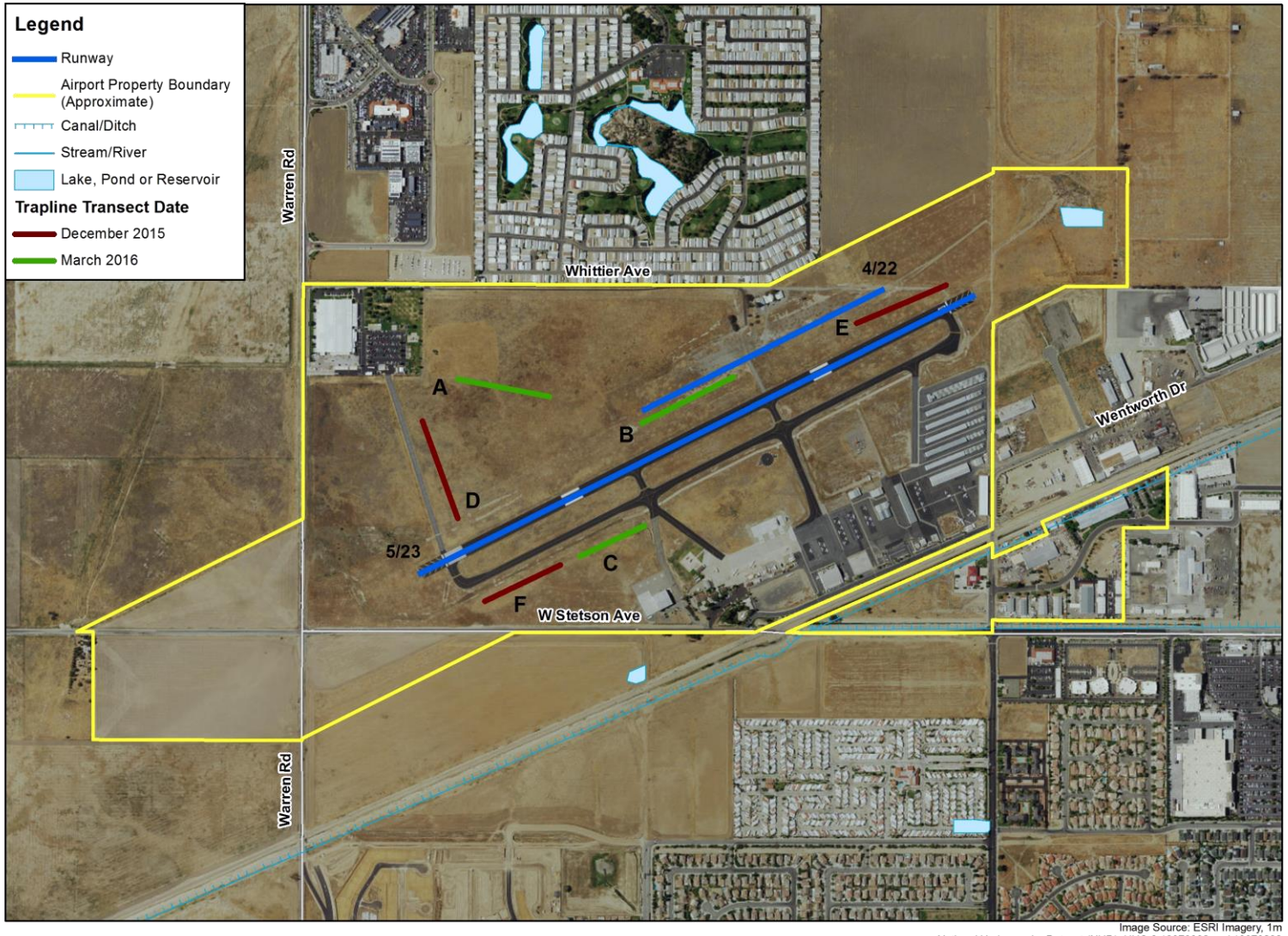


Figure 4-2.

Small Mammal Trapping Transects

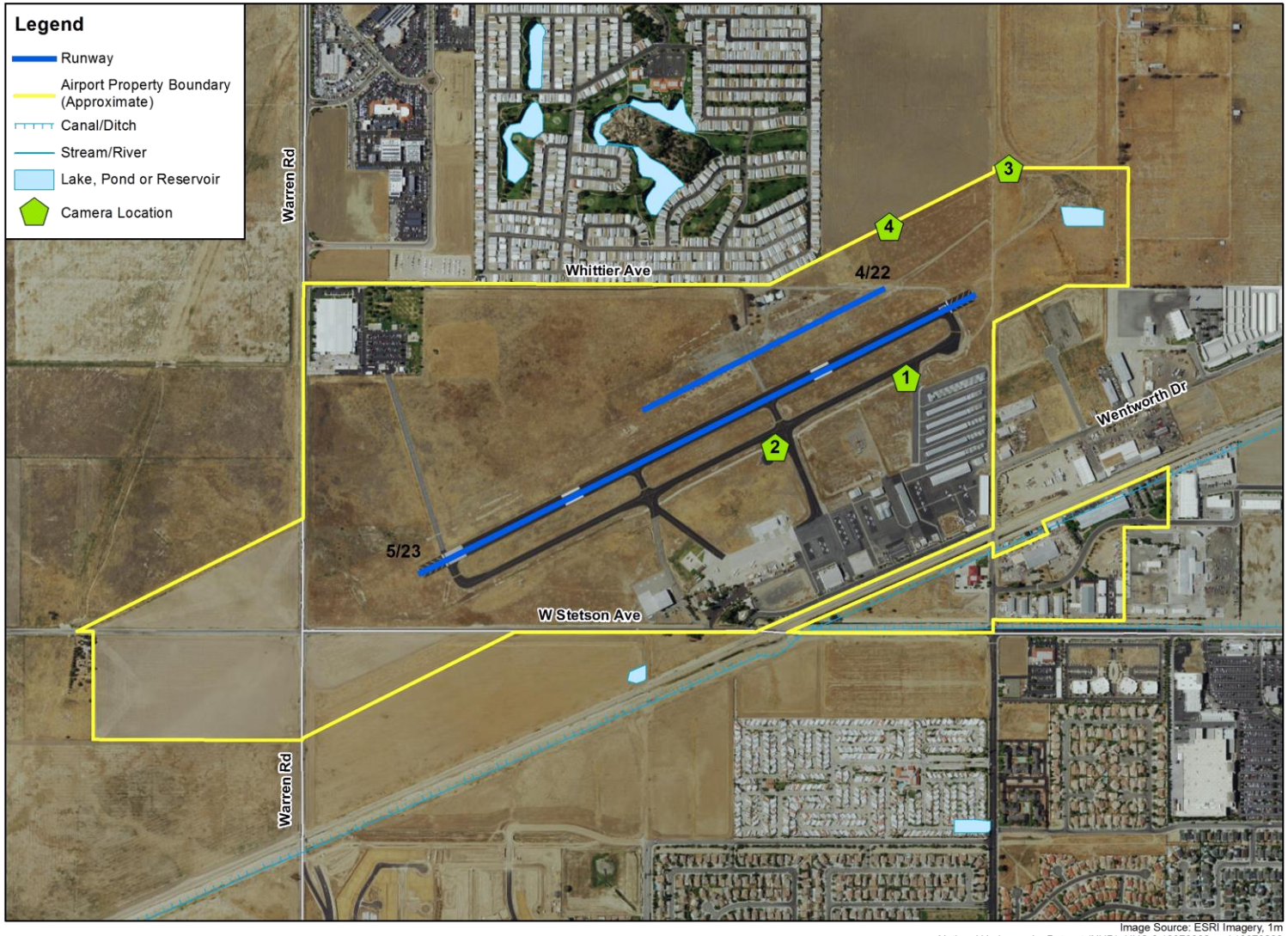


Figure 4-3.

Game Camera Locations

Chapter 5
Results and Discussion

Chapter 5 presents the results of the 12-month wildlife monitoring effort performed from June 2015 to May 2016. Section 5.1 presents the results of the twice-monthly avian surveys, and Section 5.2 presents the results of the mammal surveys.

Section 5 presents the following data for each species or avian guild identified:

- Description,
- Abundance,
- Legal status,
- Management techniques, and
- Relative risk posed by each guild or species.

One or more management techniques is presented for each species or guild identified. A guild is defined as a group of species that have similar habits or resource requirements. In some cases, the discussion will identify the likely success of a specific management technique based on past experience, industry data, or site-specific conditions. A more detailed discussion of recommended management techniques that may be implemented by Airport staff is presented in **Chapter 6**, "Conclusions and Recommendations."

In FAA AC 150/5200-33B, "Hazardous Wildlife Attractants on and Near Airports" (**Appendix F**), the FAA acknowledges that not all species pose the same risk to aircraft operations. As the FAA states, "aircraft collisions with birds and other wildlife are a serious economic and public safety problem. While many species of wildlife can pose a threat to aircraft safety, they are not equally hazardous" (FAA, 2007). Some species may pose a greater risk to aircraft operations based on their size, behavior, abundance, or proximity to the airport and its associated airspace.

The conventional guideline in assessing the threat to aviation posed by a specific species considers three priorities in descending order of severity:

- Large flocking birds, such as gulls or waterfowl;
- Small flocking birds, such as starlings; and
- Large singular birds, such as hawks or herons.

Large birds, due to their greater body mass, can strike an aircraft with greater impact and cause more damage to aircraft and affect flight. Birds that congregate in large flocks provide increased opportunities for a strike compared to solitary birds, and flocking birds have the capacity to disable more than one engine when a strike occurs.

A more detailed analysis of the comparative hazards posed by various wildlife was provided in a study by Richard A. Dolbeer, *et al.* entitled *Ranking the Hazard Level of Wildlife Species to Aviation*. The study considered the number of strikes caused by each species, the severity of damage caused by the strike,

and the resulting effect on the flight. The wildlife species that was determined to be most hazardous, deer, was assigned a hazard value of 100. All other wildlife species were then assigned a numerical value in proportion to its risk compared to that of deer. A numerical ranking of relative hazards was developed that reinforces the conventional guidelines. In general, this formula also recognizes a greater threat of large-bodied wildlife. **Table 5-1** summarizes the species and their relative ranking as provided by Dolbeer *et al.*

Table 5-1
Ranking of the Relative Hazards to Aviation of 25 Species of Wildlife

Rank/Species/Rank	Hazard Value	Species	Hazard Value
1. Deer	100	14. Owls	23
2. Vultures	63	15. Horned lark/buntings	17
3. Geese	55	16. Crows/ravens	16
4. Cormorant/pelican	54	17. Coyotes	14
5. Cranes	47	18. Mourning Dove	14
6. Eagles	41	19. Shorebirds	10
7. Ducks	39	20. Blackbirds-starlings	10
8. Osprey	39	21. American kestrels	9
9. Turkey/pheasant	33	22. Meadowlarks	7
10. Herons	27	23. Swallows	4
11. Hawks	25	24. Sparrows	4
12. Gulls	24	25. Nighthawks	1
13. Pigeons	23		

Source: Ranking the Hazard Level of Wildlife Species to Civil Aviation in the USA, R.A. Dolbeer, et al., 2000.

Throughout Chapter 5, the discussion of each guild or species observed during field studies concludes with a general statement regarding the relative risk that the species or guild poses to aircraft operations at HMT. The discussion is based on the following:

- The likelihood that the guild member or species would be involved in a wildlife strike and the potential severity of the impact (effect on flight or potential damage) (see **Table 5-2**);
- Whether the species was identified by FAA as one of the 25 species or wildlife groups commonly involved in damaging strikes in the United States (see **Table 5-2)**; and
- Whether the species or guild had been associated with a documented wildlife strike at HMT. (**Table 1-1** summarizes wildlife strike data for HMT as documented in FAA's wildlife strike database.)

Table 5-2 General Risk Assessment Matrix			
Probability/ Likelihood of Conflict:	**Severity of Impact/Effect on Flight**		
	Low	**Moderate**	**High**
High (Probable or Likely)	**Moderate**	**High**	**Critical**
Moderate	**Low**	**Moderate**	**High**
Low (Improbable or Unlikely)	**Low**	**Low**	**Moderate**

The discussion of relative hazards is provided so that the airport operator can consider this data when making decisions regarding the allocation of its resources to address wildlife hazards.

5.1 Avian Surveys

As described in Chapter 4, surveys were performed twice each month during the 12-month WHA monitoring period. Observations and evidence of birds and mammals were recorded during these surveys. Avian wildlife observations are summarized in Section 5.1, and mammal observations are summarized in Section 5.2.

Section 5.1.1 summarizes the results for all avian species observed. Ten guilds, or groups of similar species, were identified during WHA field studies. Sections 5.1.2 through 5.1.11 describe the survey results for each guild. The discussion presented for each guild presents the total number of birds observed, the abundance of each species per month, location, behavior observed, and the relative risk posed by the species within the guild.

5.1.1 All Species Combined

As shown in **Table 5-3,** a total of 48 bird species were identified during field surveys as well as birds that could not be identified to the species level. A total of 4,374 birds was recorded during the entire 12-month assessment.

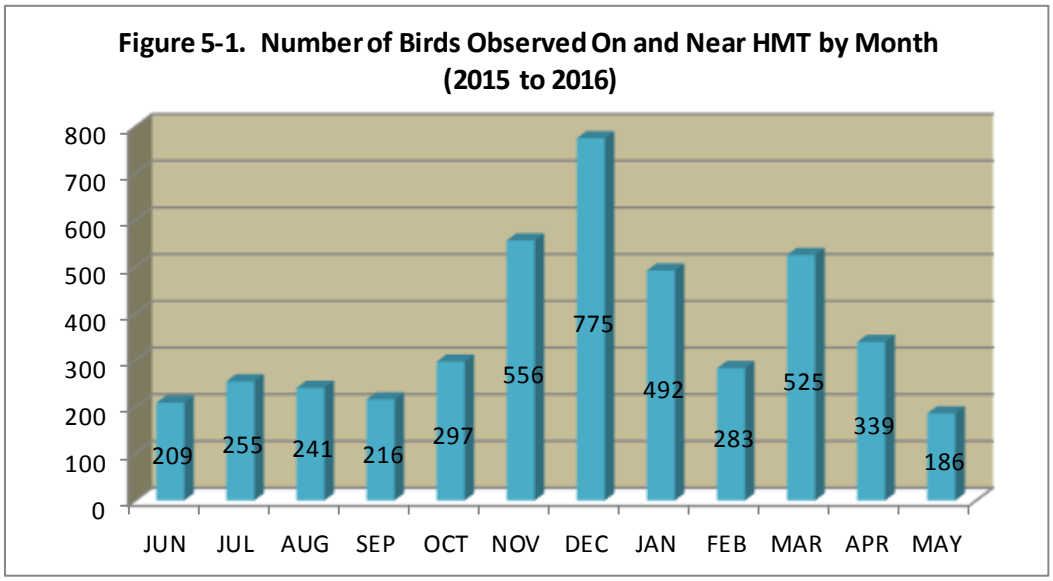
Table 5-3. Abundance of Bird Species at HMT June 2015 to May 2016			
Guild and Common Name	***Scientific Name***	**Guild and Species Abundance**	**Guild and Species Percentage of Abundance**
Waterfowl		**116**	**2.65%**
American White Pelican	*Pelecanus erythrorhynchos*	1	0.86%
Canada Goose	*Branta canadensis*	66	56.90%
Double-crested Cormorant	*Phalacrocorax auritus*	*2*	*1.72%*
Mallard	*Anas platyrhynchos*	*44*	*37.93%*
Unidentified Duck	*Anatinae (gen, sp)*	*3*	*2.59%*

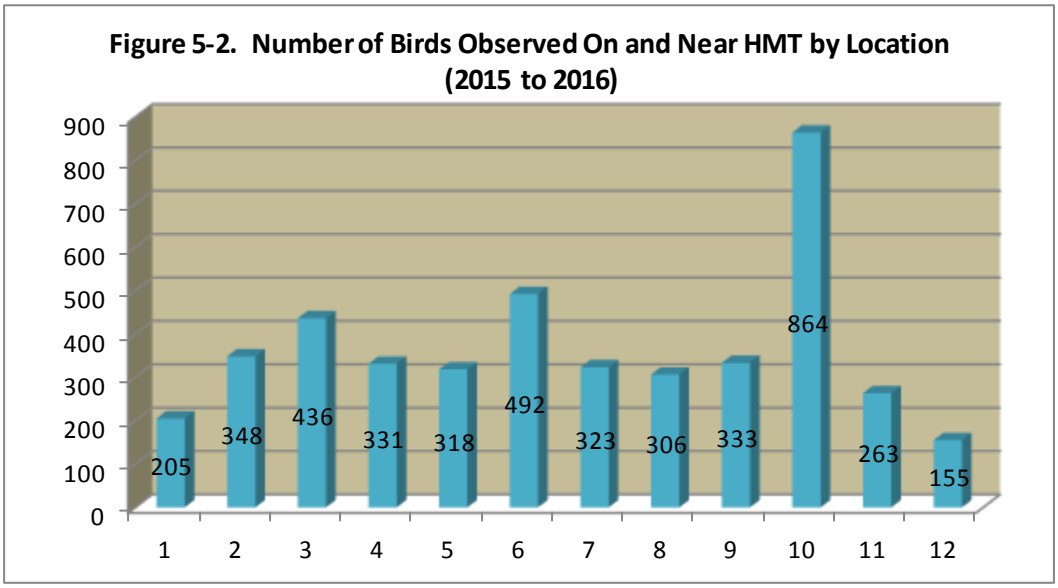
Table 5-3. Abundance of Bird Species at HMT June 2015 to May 2016			
Guild and Common Name	***Scientific Name***	**Guild and Species Abundance**	**Guild and Species Percentage of Abundance**
Blackbirds and Starlings		**869**	**19.87%**
Brewer's Blackbird	*Euphagus cyanocephalus*	5	0.58%
European Starling	*Sturnus vulgaris*	600	69.04%
Great-tailed Grackle	*Quiscalus mexicanus*	12	1.38%
Red-winged Blackbird	*Agelaius phoeniceus*	252	29.00%
Doves and Pigeons		**863**	**19.73%**
Eurasian Collared-Dove	*Streptopelia decaocto*	7	0.81%
Mourning Dove	*Zenaida macroura*	473	54.81%
Rock Pigeon	*Columba livia*	383	44.38%
Swallows		**53**	**1.21%**
Cliff Swallow	*Petrochelidon pyrrhonota*	25	47.17%
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	28	52.83%
Shorebirds		**35**	**0.80%**
Great Egret	*Ardea alba*	5	14.29%
Killdeer	*Charadrius vociferus*	13	37.14%
Snowy Egret	*Egretta thula*	3	8.57%
White-faced Ibis	*Plegadis chihi*	14	40.00%
Sparrows, Finches and Warblers		**1,262**	**28.85%**
Black-headed Grosbeak	*Pheucticus melanocephalus*	18	1.43%
California Towhee	*Melozone crissalis*	3	0.24%
House Finch	*Haemorhous mexicanus*	754	59.75%
House Sparrow	*Passer domesticus*	19	1.51%
Lark Sparrow	*Chondestes grammacus*	129	10.22%
Lesser Goldfinch	*Spinus psaltria*	13	1.03%
Orange-crowned Warbler	*Oreothlypis celata*	1	0.08%
Savannah Sparrow	*Passerculus sandwichensis*	159	12.60%
Song Sparrow	*Melospiza melodia*	15	1.19%
White-crowned Sparrow	*Zonotrichia leucophrys*	70	5.55%
Yellow-rumped Warbler	*Setophaga coronata*	21	1.66%
Unidentified Sparrow	*Emberizidae (gen, sp)*	60	4.75%
Corvids		**276**	**6.31%**
American Crow	*Corvus brachyrhynchos*	60	21.74%
Common Raven	*Corvus corax*	216	78.26%
Raptors		**258**	**5.90%**
American Kestrel	*Falco sparverius*	63	24.42%
Burrowing Owl	*Athene cunicularia*	106	41.09%
Cooper's Hawk	*Accipiter cooperii*	6	2.33%
Northern Harrier	*Circus cyaneus*	9	3.49%
Red-tailed Hawk	*Buteo jamaicensis*	68	26.36%
White-tailed Kite	*Elanus leucurus*	6	2.33%
Songbirds		**617**	**14.11%**
Black Phoebe	*Sayornis nigricans*	36	5.83%
Bullock's Oriole	*Icterus bullockii*	1	0.16%

Table 5-3. Abundance of Bird Species at HMT June 2015 to May 2016			
Guild and Common Name	***Scientific Name***	**Guild and Species Abundance**	**Guild and Species Percentage of Abundance**
Bushtit	*Psaltriparus minimus*	4	0.65%
Cassin's Kingbird	*Tyrannus vociferans*	5	0.81%
Horned Lark	*Eremophila alpestris*	132	21.39%
Northern Mockingbird	*Mimus polyglottos*	24	3.89%
Say's Phoebe	*Sayornis saya*	35	5.67%
Unidentified Songbird	*Passeri (fam, gen, sp)*	10	1.62%
Western Bluebird	*Sialia mexicana*	8	1.30%
Western Kingbird	*Tyrannus verticalis*	36	5.83%
Western Meadowlark	*Sturnella neglecta*	326	52.84%
Other		**25**	**0.57%**
Anna's Hummingbird	*Calypte anna*	17	68.00%
Downy Woodpecker	*Picoides pubescens*	1	4.00%
Unidentified Gull	*Larus* (sp)	7	28.00%
	Total (52 species)	**4,374**	**100.00%**

As shown on **Figure 5-1**, birds were generally more abundant during the six-month period from November through April, which correlates to the presence of wintering populations of birds in the region and the arrival of spring migrants. Approximately 68 percent of all birds were observed during this period. More birds were observed in December than any other month (775 birds), comprising 18 percent of the total number observed throughout the 12-month monitoring period. The abundance of birds observed in December was attributable to a large number of Canada geese, sparrows, finches, and common ravens. The fewest number of birds was observed in May (3 percent of the total number observed), and comparatively fewer birds were observed throughout the hot summer months.

As shown on **Figure 5-2**, the greatest number of birds (864 birds) was observed from point 10, which was associated with an agricultural area north of the airport (see **Figure 4-1**). Large numbers of red-winged blackbirds and European starlings were observed in the agricultural area, and large numbers of pigeons were observed from this location as they perched on nearby homes to the east and utility lines.



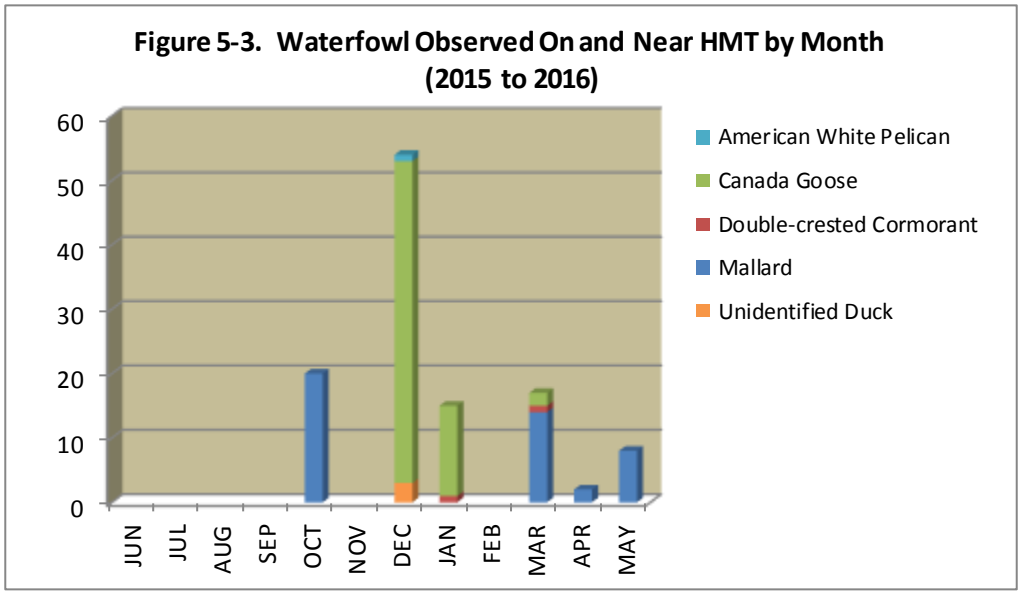


5.1.2 Waterfowl

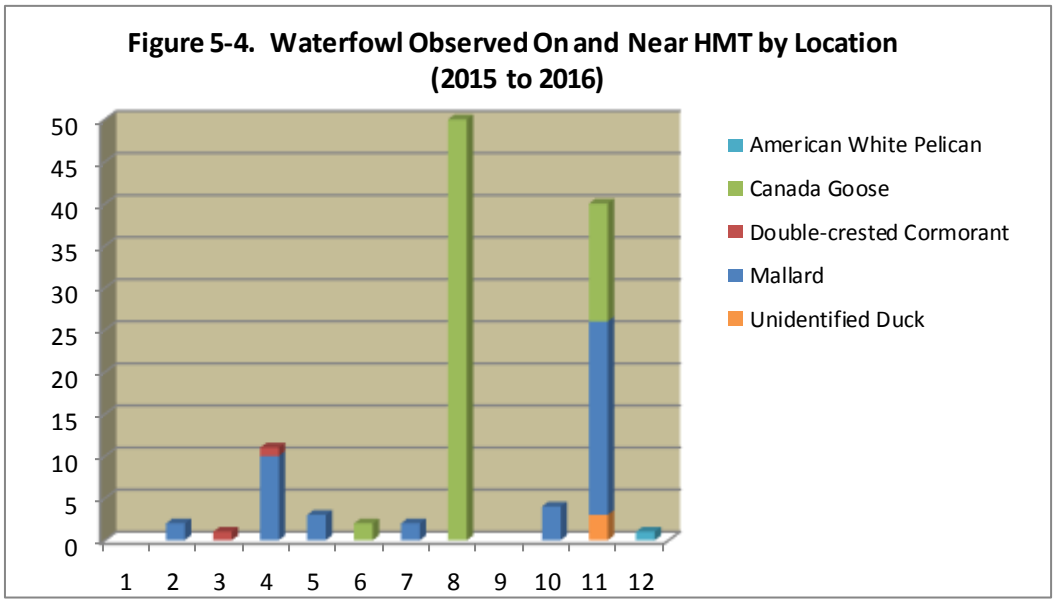
Description. Waterfowl are large aquatic birds with webbed feet and flat, heavy bills. Waterfowl pose one of the most serious threats to aircraft operations because of their abundance, size, and flocking behavior. Waterfowl species are attracted to open water ponds and basins to feed, nest, loaf, and escape predators. Geese and ducks will also frequent agricultural fields, parks, and golf courses to graze on crops and

on manicured grasses. Four species of waterfowl were observed during the 12-month monitoring period: Canada goose, mallard, double-crested cormorant, and American white pelican, as well as unidentified ducks. The Canada goose accounted for more than half of the waterfowl observed.

Abundance. Waterfowl accounted for less than 3 percent of the total number of birds observed during the assessment. Nearly half of the waterfowl were observed during December. No waterfowl were observed from June to September, November, or February. The abundance of waterfowl during the early winter is likely attributable to the presence of migrating Canada geese (**Figure 5-3**).



Waterfowl were observed from ten of the 12 monitoring locations (**Figure 5-4**), and 78 percent of the waterfowl were observed from off-site monitoring points 8 and 11. Point 8 was located in open space approximately 1 mile from the end of Runway 23, and point 11 was located at the Hemet Golf Club, which includes open grass and numerous water ponds. Waterfowl observed from on-site monitoring locations were either flying across the airport. Waterfowl (e.g., Canada geese and mallards) were often observed visiting a water feature that was associated with Hemet West Mobile Estates, which is adjacent to the airport's northern boundary.



Management and Legal Status. Waterfowl are migratory game birds that are protected by the MBTA. Depredation permits from the USFWS are required for lethal management. However, most waterfowl species can be hunted in areas where firearm discharge is legal. Hunting is permitted during defined periods of the fall and winter in accordance with a valid hunting license and federal waterfowl stamps. The hunting season corresponds with the fall migration period.

The Pacific Flyway supports huge waterfowl migrations annually, and HMT is positioned between a major flyway and a principal migration route (see **Figure 5-5**). Because the area within the flyway has been altered significantly as a result of development, migrating and resident waterfowl are attracted to the available water features, such as sanitation ponds, wetlands, stormwater management ponds and other impoundments. Waterfowl are known to pose a risk to aircraft and human health and safety. Habitat modification, harassment, and lethal reinforcement are all necessary management measures.

The greatest number of waterfowl was observed off site near areas associated with water impoundments such as the Hemet West Mobile Estates, which is adjacent to the airport's northern boundary. Waterfowl attracted to off-site features has the potential pass through its navigable airspace at low altitudes and pose a risk to airport operations. Waterfowl that is observed near aircraft movement areas can pose hazards to aviation. A Notice to Airmen (NOTAM) should be issued if/when large flocks of waterfowl are moving observed on or near HMT. All waterfowl observed on the airfield should be harassed and dispersed immediately.

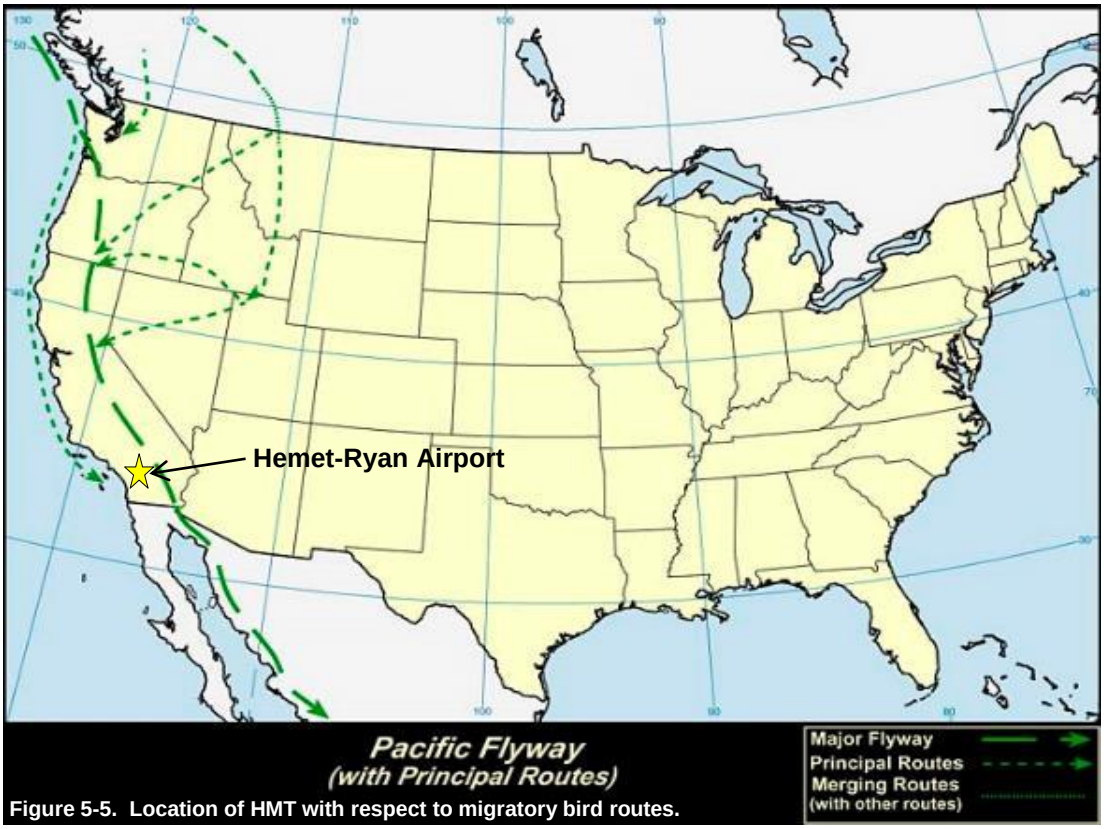


Figure 5-5. Location of HMT with respect to migratory bird routes.

Source: Nutty Birdwatcher, 2012.

Management Measures. Waterfowl can be harassed from the airfield using pyrotechnic devices, such as screamers and bangers. Airport personnel must be persistent with these methods. Lethal reinforcement may be necessary if waterfowl become habituated to pyrotechnics and become more common and in greater abundance within the AOA. Since the majority of waterfowl was observed off-site, a federal depredation permit to manage waterfowl is not warranted at this time.

Relative Risk. Waterfowl accounted for less than 3 percent of the total number of birds observed during the 12-month survey period. Waterfowl species have a high likelihood of being involved in a wildlife strike based on their size and flocking behavior. The FAA ranks geese as third in its composite ranking of hazardous wildlife species and ranks ducks as seventh. All have the potential to cause a high degree of impact on flight. No strikes with waterfowl at HMT were recorded in the FAA database. Based on the number of waterfowl observed off site and their presence flying through HMT airspace, the overall risk posed by waterfowl at HMT is ***moderate.***

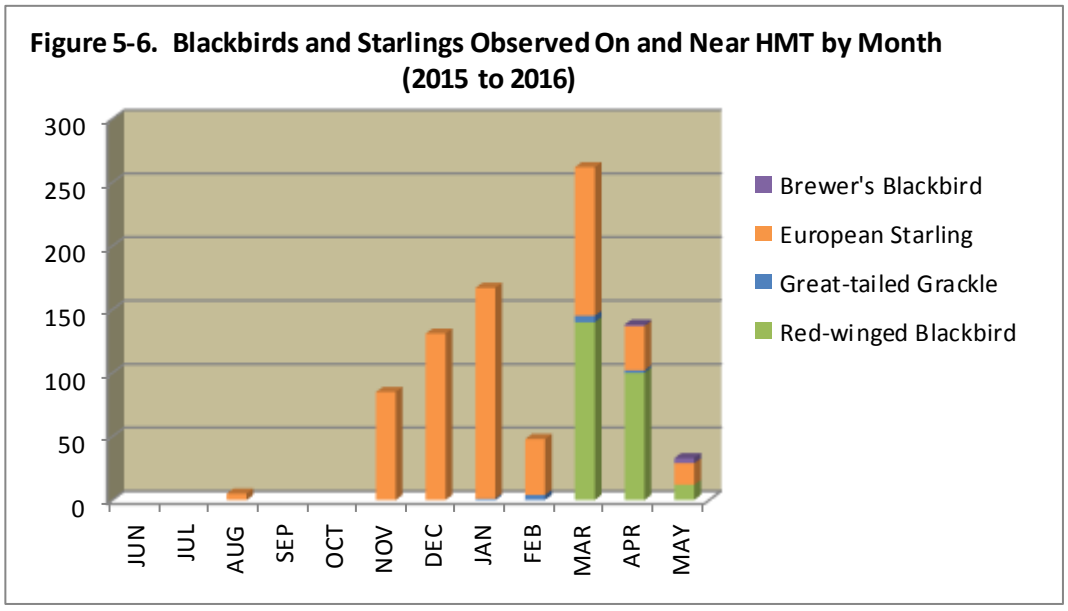
5.1.3 Blackbirds and Starlings

Description. Four species of blackbirds and starlings were observed on and near HMT: European starling, red-winged blackbird, great-tailed grackle, and Brewer's blackbird.

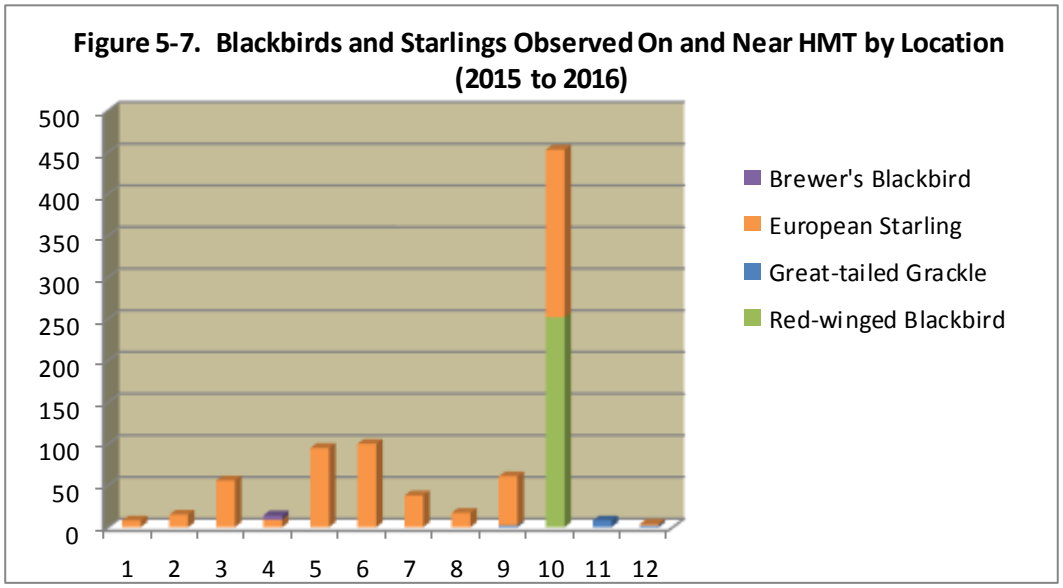
European starlings are medium-sized, chunky birds that have short tails that have a triangular shape when flying. Red-winged blackbirds are often seen roosting on cattails and on utility wires. Males are glossy black with red-and-yellow shoulder patches. Male great-tailed grackles are large, birds with iridescent black and purple and oversized tails. Females are about half the size and brown in color. Brewer's blackbirds are a small, fairly long-legged songbird with the well-proportioned look of many blackbirds. Males are glossy black with a staring yellow eye. Females are plainer brown, darkest on the wings and tail, with a dark eye

Starlings are found in a variety of habitats from urban to rural environments. Starlings are attracted to open water, to open, grassy areas in which they can forage, and to trees or buildings that contain cavities for nesting. Structures with ill-fitting doors or broken windows are readily used. In the winter, starlings and blackbirds form roosts in areas that provide cover and warmth. Red-winged blackbirds are attracted to fields with tall vegetation, and they roost and nest in areas with cattails or other tall, thick vegetation. Great-tailed grackles often spend days on suburban lawns, golf courses, fields, and marshes. In the evening, flocks of the noisy birds roost in neighborhood trees. Blackbirds are primarily granivorous, whereas starlings prefer a diet with a higher protein content that includes fruits, insects, spiders, earthworms, garbage, snails, weed seeds, and other grains.

Abundance. A total of 869 blackbirds and starlings were observed, representing approximately 20 percent of the total number of all birds observed. With the exception of a few individuals, blackbirds were observed during the seven-month period from November through May (see **Figure 5-6**). The greater number observed in late fall and early spring coincides with the formation of large flocks to exploit resources, such as foraging opportunities. Large flocks of starlings and blackbirds move around the landscape seeking productive foraging areas (e.g., agricultural fields), and their abundance can vary significantly across the region.



The greatest number of blackbirds and starlings was observed from point 10, from which approximately two-thirds of all blackbird and starlings observed (see **Figure 5-7**). Point 10 was located north of the airport near agricultural fields. The abundance of blackbirds at this location can be attributed to opportunistic feeding behavior, as blackbirds and starlings were observed foraging in the fields. Blackbirds and starlings have a highly varied diet and can easily adapt to new food sources supplied either directly or indirectly by humans. Most of the European starlings on-site were observed as they foraged in the open, short grassland.



Legal Status. The European starling is an exotic species that was introduced to the United States from Europe in 1890. The species is not protected by federal or state laws, and neither a federal nor state permit is required to take starlings. Blackbirds (tri-colored, red-winged, and Brewer's), cowbirds, and great-tailed grackles are migratory birds that are protected by the MBTA. However, pursuant to the CFR at 50 CFR 21.43, Depredation Order for Blackbirds, Cowbirds, Grackles, Crows and Magpies, these species (except for tri-colored blackbirds) can be taken any time of the year in California without a federal or state permit when they are "found committing or about to commit depredations upon ornamental or shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance." The following species are specifically listed in the Order: Brewer's blackbird, red-winged blackbird, yellow-headed blackbird, bronzed cowbird, brown-headed cowbird, shiny cowbird, boat-tailed grackle, common grackle, great-tailed grackle, greater Antillean grackle, American crow, fish crow, northwestern crow, and black-billed magpie.

Although these species can be taken, the regulations state that any person or agency acting under the depredation order must:

a. Attempt to control depredation by species listed under this depredation order using non-lethal methods before using lethal control.

b. If a firearm is used to kill migratory birds under the provisions of this order, nontoxic shot or nontoxic bullets must be used in most cases. However, this prohibition does not apply to an air rifle, an air pistol, or a 22-caliber, rim-fire firearm for control of depredating birds under this order.

c. Allow any Federal, State, tribal, or territorial wildlife law enforcement officer unrestricted access at all reasonable times (including during actual operations) over the premises on which you are conducting the control. The officer must be furnished with whatever information he or she may require about the control operations.

d. Only kill birds under this order in a way that complies with all State, tribal, or territorial laws or regulations. You must have a State, tribal, or territorial permit required to conduct the activity.

e. Not sell, or offer to sell, any bird, or any part thereof, killed under this section, but you may possess, transport, and otherwise dispose of the bird or its parts.

f. Provide to the appropriate Regional Migratory Bird Permit Office an annual report for each species taken by the date that is specified on the permit.

Management. Flocks of starling and blackbirds can be harassed from the airfield using pyrotechnic devices, such as screamers and bangers. Airport personnel must be persistent with these methods. Lethal reinforcement may be necessary if starlings and blackbirds become habituated to pyrotechnics and become more common and in greater abundance within the AOA.

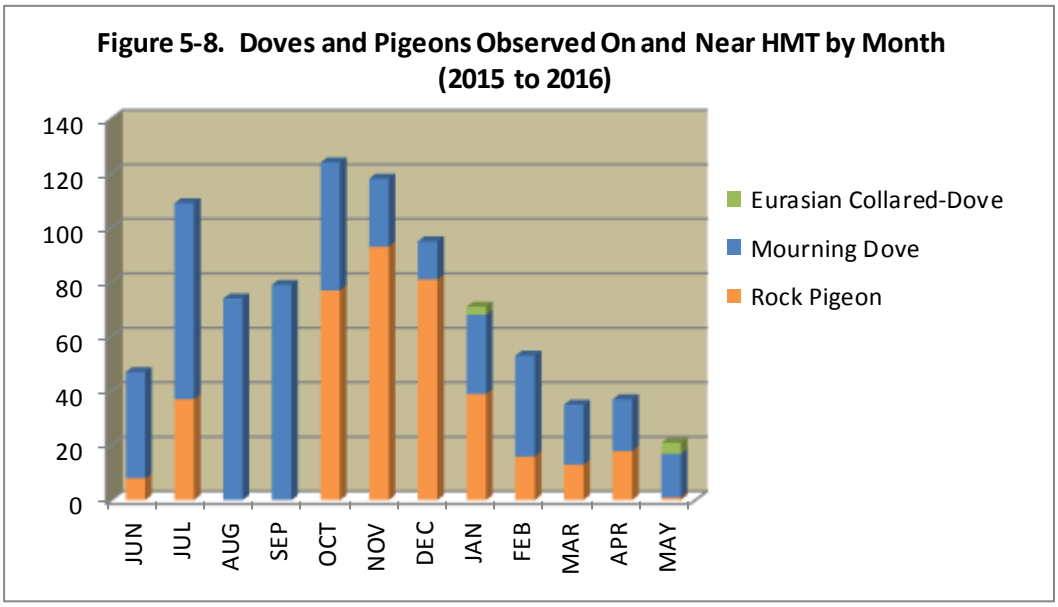
Relative Risk. Blackbirds and starlings can pose a significant hazard to aircraft because of their dense size and flocking behavior. These species have a high likelihood of being involved in strikes with aircraft given their presence near aircraft movement areas. When strikes with these

species occur, they usually involve multiple birds that can be ingested by aircraft engines, and the severity of strikes associated with these species is moderate. The FAA assigns a composite hazard ranking of 20 to blackbirds/starlings. No strikes with blackbirds or starlings at HMT were recorded in the FAA database. Starlings and blackbirds represented 20 percent of all birds observed. Although most were observed from off-site locations, they were observed passing above HMT and flying through navigable airspace. The overall risk posed by starlings and blackbirds is ***high***.

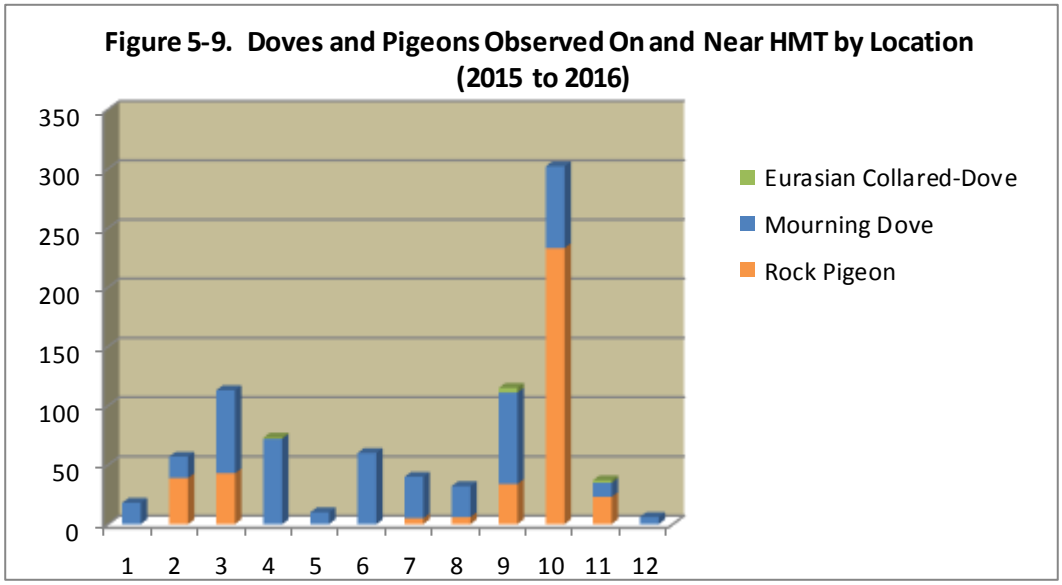
5.1.4 Doves and Pigeons

Description. Doves and pigeons are medium-sized songbirds that feed on seeds and grain and can be found in open areas. Rock pigeons and mourning doves can be found in areas that are closely associated with human activity, such as parks and agricultural operations, and they nest in structures such as parking ramps, buildings, and bridges. Doves and pigeons feed on grass and weed seeds in fields, refuse, and handouts from humans. Three species of doves and pigeons were observed: the mourning dove, rock pigeon and Eurasian collared-dove. Doves and pigeons can pose hazards to aircraft operations because of their abundance and flocking behavior.

Abundance. A total of 863 doves and pigeons was recorded, and doves and pigeons comprised approximately 20 percent of the total number of birds observed during the 12-month period. Of the three species observed, approximately 55 percent were mourning doves and 44 percent were rock pigeons (**Table 5-3**). Doves and pigeons are year-round residents of the region, and they were observed throughout the year (**Table 5-8**).



Doves and/or pigeons were observed from every monitoring location; however, nearly two-thirds were were observed from point 10 (see **Figure 5-9**). Point 10 was located north of the airport in an agricultural area and near several utility lines. Doves and pigeons were likely attracted to available food in the fields, and they were observed perched on the utility lines. Mourning doves were observed in the AOA as they foraged on the ground or flew across the airfield. Rock pigeons were observed perching or flying on and around the buildings and hangars on the south side of the AOA.



Management and Legal Status. Mourning doves and Eurasian collared-doves are migratory game birds that are protected by the MBTA. Depredation permits from the USFWS are required

for lethal management, and it is recommended that HMT obtain a depredation permit for mourning doves based on their abundance. However, doves can be hunted during defined periods in the fall with a valid state hunting license. Rock pigeons were introduced to the U.S. from Europe, and they are not protected by federal or state laws. Pigeons may be taken at any time, and there are no reporting requirements.

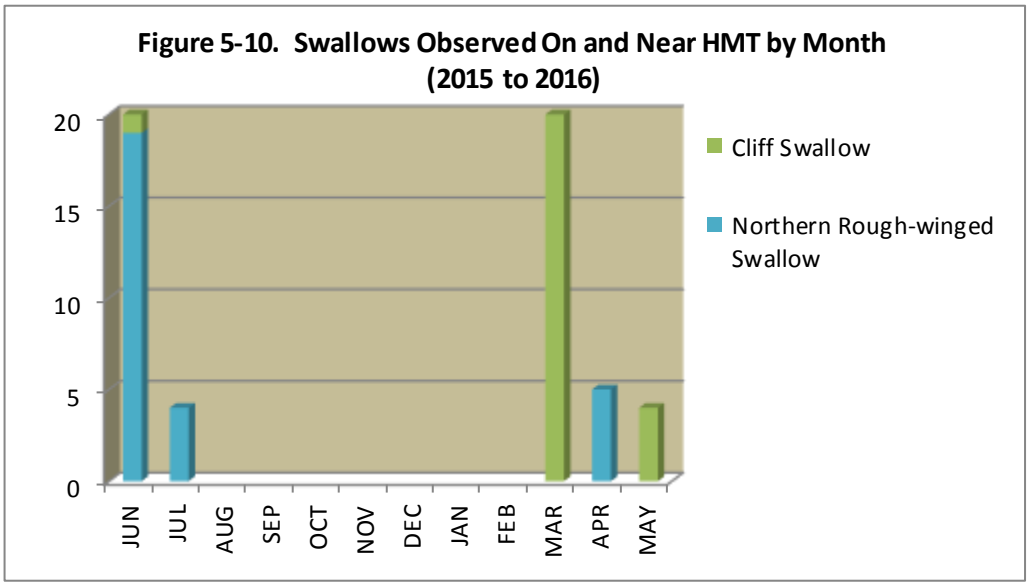
A combination of techniques can be used to manage and discourage pigeons and doves, including the use of intermediate grass heights (6 to 12 inches), ongoing harassment, and the lethal removal of some individuals. It is also recommended that the County remove the trees that are within the AOA and near the north airfield hangars. The trees provide perching opportunities and were observed to attract doves to the AOA.

Relative Risk. Doves and pigeons have a moderate likelihood of being involved in a conflict with aircraft, and strikes can result in a moderate impact on flight due to their flocking behavior. The FAA assigns a composite hazard ranking of 13 to pigeons and 18 to mourning doves out of 25 ranked species. No strikes with doves or pigeons at HMT were recorded in the FAA's Wildlife Strike Database. However, based on the number of doves and pigeons observed and their close proximity to aircraft movement areas, the overall risk posed by this guild is ***high***.

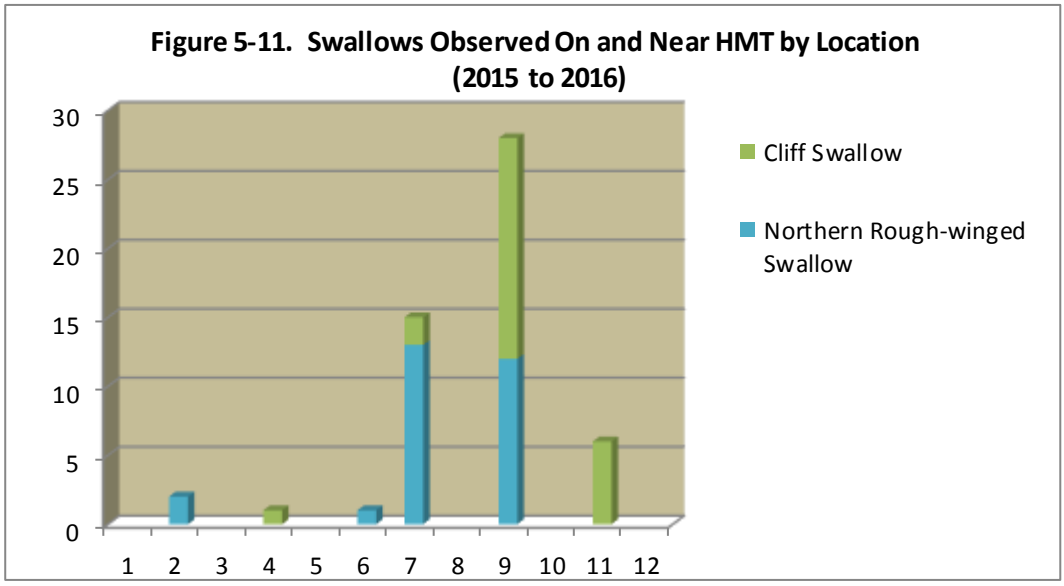
5.1.5 Swallows

Description. Swallows are slender aerialists with long, pointed wings that feed on insects as they fly. Flocks will follow mowers to capture the insects that are displaced by the machines. Swallows require water to build nests of mud, and they are frequently observed flying low over water features to capture insects. Swallows are usually absent when flying insects are unavailable or present only at low densities. Two species of swallows were observed during WHA surveys: cliff swallows and northern rough-winged swallows.

Abundance. A total of 53 swallows was observed at HMT, comprising approximately one percent of the total number of birds observed. All of the swallows were observed only during the five-month period from March to July, with the greatest number of cliff swallows observed in March and the greatest number of northern rough-winged swallows recorded in June (**Figure 5-10**). Swallows are migratory, and these observations coincide with the seasonal conditions that support populations of flying insects, which are a swallow's primary food source.



Approximately half of the swallows were observed near point 9, which was west of the airport and located along the San Diego Canal (**Figure 5-11**). The canal provides water that is necessary for nest building, and the bridge over the canal provides a suitable nesting location. Very few swallows were observed in the AOA, and those observed were foraging in the short grasslands within the infield.



Management and Legal Status. Swallows are migratory species that are protected by the MBTA. A depredation permit from the USFWS is required for lethal management, but it does not appear that lethal control is warranted at this time. Managing vegetation at an intermediate height of 6 to 12 inches would make the AOA less attractive to swallows. No swallow nests were observed on the airport during the 12-month assessment. If nests are observed on airport

property, they should be removed in accordance to state and federal regulatory requirements. If flocks of swallows are observed in the AOA, they should be dispersed using pyrotechnics.

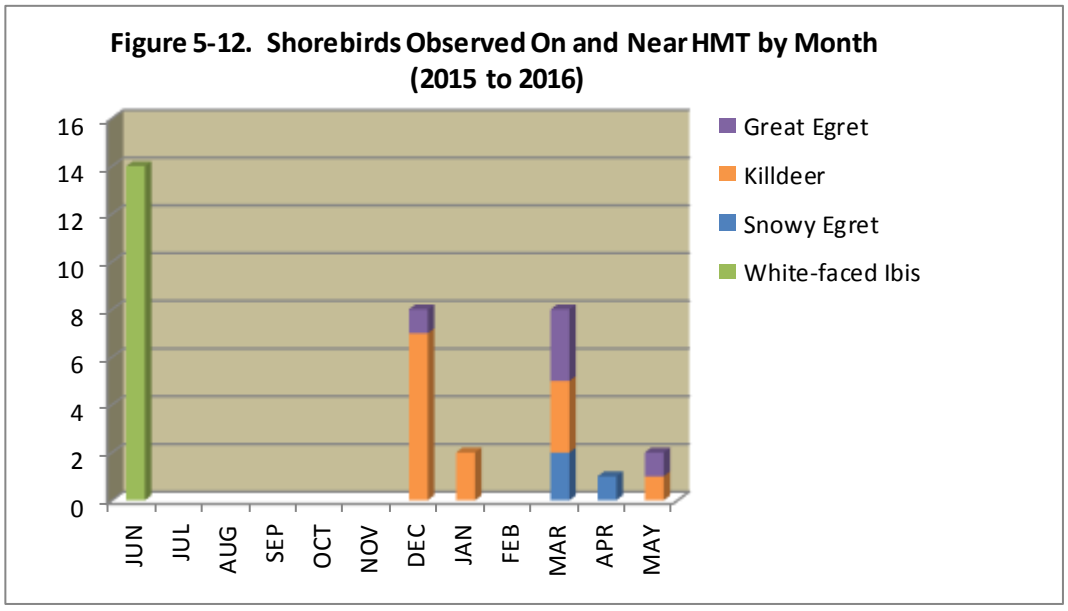
Relative Risk. Swallows accounted for approximately 1 percent of the total number of birds observed. The members of this guild have a moderate likelihood of being involved in a strike with aircraft, and they can cause a moderate impact on flight due to their flocking behavior. The FAA assigns a composite hazard rank of 23 to swallows out of 25 ranked species. No strikes with swallows are included in the FAA strike database for HMT. Relatively few swallows were observed on airport property. The overall wildlife hazard risk posed by swallows is ***low***.

5.1.6 Shorebirds and Waders

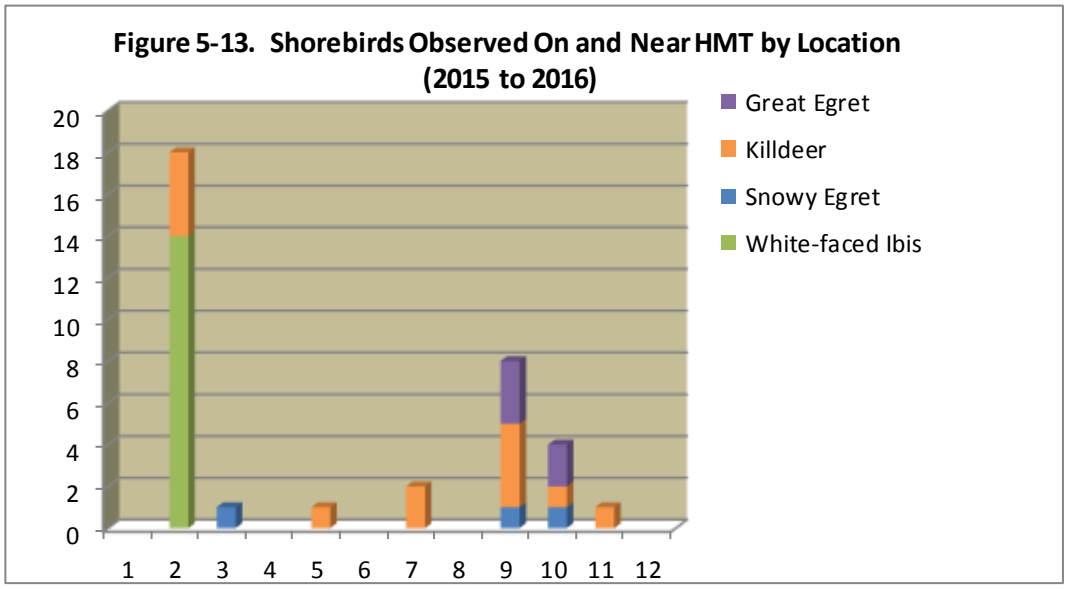
Description. Shorebird species can vary from birds with short, stocky builds and short bills to slender birds with long legs and long bills. All shorebirds seek small aquatic prey by probing on open shorelines and shallow ponds.

Three large shorebird species were observed: white-faced ibis, great egret, and snowy egret. One small shorebird species, the killdeer, was observed. Killdeer are small birds that have a large, round head, large eye, and short bill. The white-faced ibis is a large, dark wading bird with a long, down-curved bill, dark legs, and a dark body. The great egret is a tall, long-legged wading birds with long, S-curved necks and long, orange, dagger-like bills and black legs. The snowy egret is a medium-sized heron with long, thin black legs, yellow feet, and a long, slender, bill. Killdeer are small, flocking birds that are a brownish-tan on top and white below. The white chest is barred with two black bands, and the brown face is marked with black and white patches.

Abundance. Thirty-five shorebirds were observed at HMT, and they comprised less than one percent of all birds observed. The white-faced ibis and killdeer comprised 77 percent of the shorebirds observed (**Figure 5-12**). The white-faced ibis was observed only from point 2 and only during the month of June, which coincides with their northward migration. Other shorebirds were observed during winter and spring.



As shown on **Figure 5-13**, shorebirds or waders were observed from half of the monitoring points. Most shorebirds observed within the AOA were observed from point 2, from which a flock of migrating White-faced Ibis was observed. The shorebirds and waders observed from off-site points 9, 10, and 11 were likely attracted to the feeding and nesting opportunities associated with nearby water bodies and grasslands.



Management and Legal Status. Shorebirds and waders are migratory birds that are protected by the MBTA. A depredation permit from the USFWS would be required for lethal management, but lethal management does not appear to be warranted at this time. When members of this guild are observed in the AOA, they should be harassed using pyrotechnics until they leave the AOA.

A NOTAM should be issued during migratory periods or when flocks of shorebirds are observed flying across HMT or through its navigable airspace.

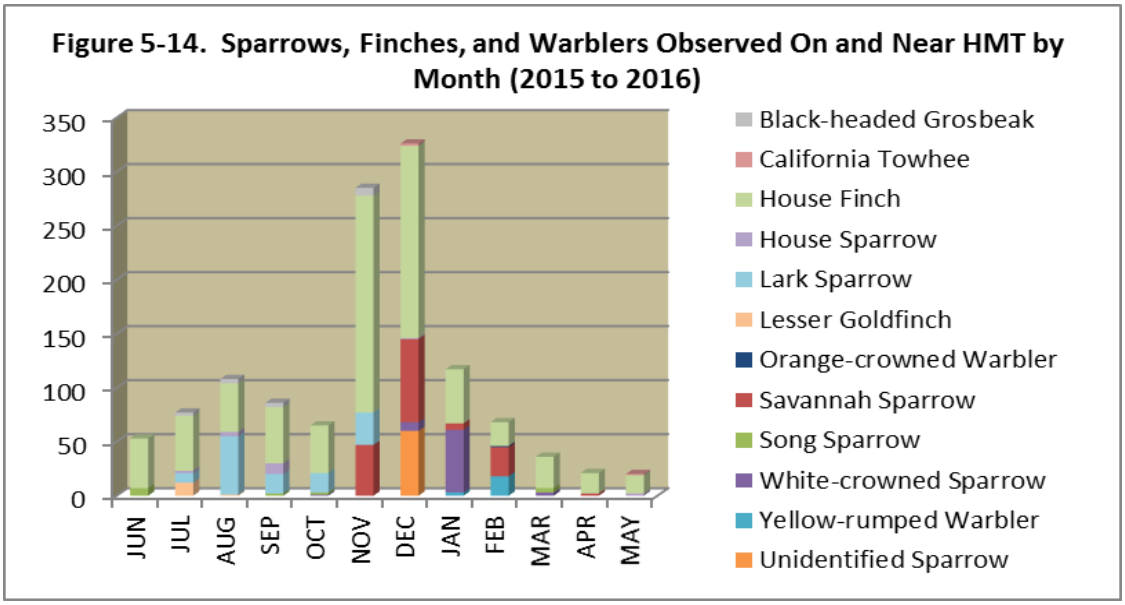
Relative Risk. Shorebirds have a high probability of being involved in a strike with aircraft, and their effect on flight can vary by species. Typically, shorebirds would create a low impact on an aircraft flight due to their solitary behavior, but many shorebirds are large. Other shorebirds, such as killdeer are small, but they can occur in large flocks. The FAA assigns a composite hazard rank of 19 to shorebirds out of 25 ranked species. No strikes with shorebirds have been recorded at HMT since 1990, and the number of shorebirds observed within the AOA was relatively low. The overall wildlife hazard risk posed by shorebirds is ***low***.

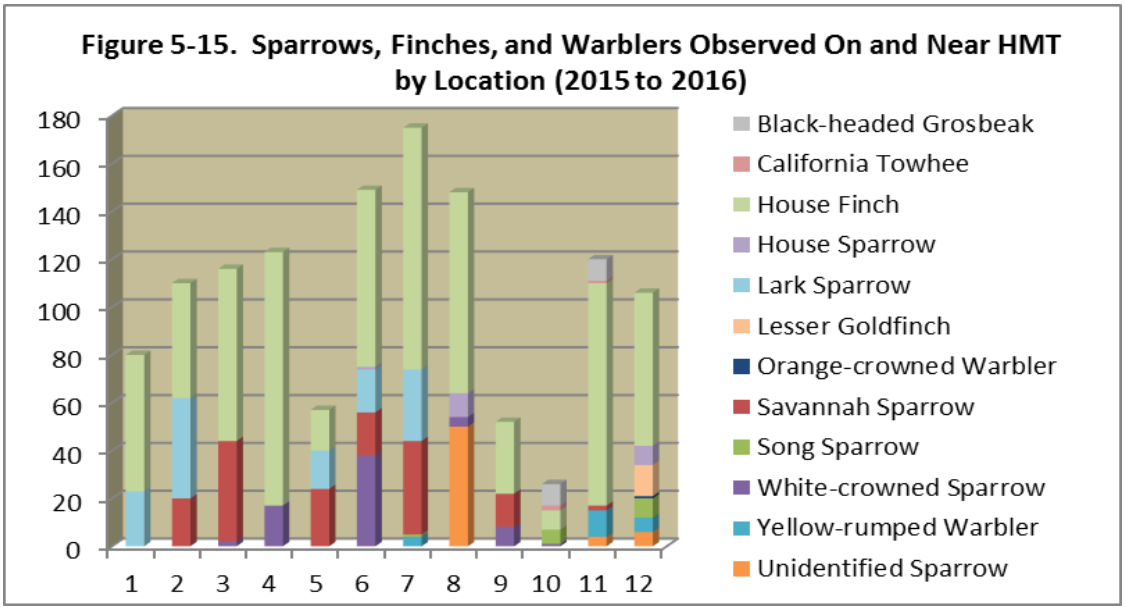
5.1.7 Sparrows, Finches, and Warblers

Guild Description. The sparrows, finches, and warblers guild is composed of small birds that are similar in size to the sparrow. Many are found singly or in small, loose flocks as they feed in open, weedy areas and grass fields. Many species within this guild prefer open, short grassland habitats, while others prefer shrub habitat or manmade resources. Eleven species of sparrows, finches and warblers were observed, as well as sparrows that could not be identified to the species level. The house finch was the most abundant species in this guild and comprised approximately 60 percent of all sparrows, finches and warblers observed. House Finches are small-bodied finches with fairly large beaks and somewhat long, flat heads. Adult males are rosy red around the face and upper breast, with streaky brown back, belly and tail. In flight, the red rump is conspicuous. Adult females are plain grayish-brown with thick, blurry streaks and an indistinctly marked face.

Abundance. A total of 1,262 sparrows, finches, and warblers was recorded, and guild members comprised nearly 29 percent of the total number of birds observed (**Table 5-3**). In addition to house finches, which comprised approximately 60 percent of the guild members identified, the most frequently observed species were savannah sparrows, which comprised13 percent, and lark sparrows, which comprised 10 percent were lark sparrows. Eight other species and unidentified sparrows comprised the remaining 17 percent of the sparrows, finches, and warblers observed.

Sparrows, finches, and warblers were observed throughout the year, but they were most abundant during November and December, when large flocks were observed on site as they foraged in short grass (**Figure 5-14**).





Sparrows, finches, and warblers were observed consistently from every location, but they were more abundant near observation points 6, 7, and 8 (**Figure 5-15**). The comparatively greater presence of these species near points 6 and 8 is likely due to the presence of brush, some of which occurs within the designated habitat criteria cells and vegetation in the open field areas, which provides cover and nesting habitat. The greater concentration of these species at point 7 is likely due to the presence of ornamental trees, power lines, and the airport perimeter fence, all of which provide perching opportunities.

Management and Legal Status. All members of this guild, with the exception of the house sparrow, are migratory species protected by the MBTA. A depredation permit from the USFWS would be required in the event that lethal management is necessary. House sparrows were

introduced to the U.S. from Europe, and they are not protected by federal or state laws. House sparrows may be taken at any time, and there are no reporting requirements.

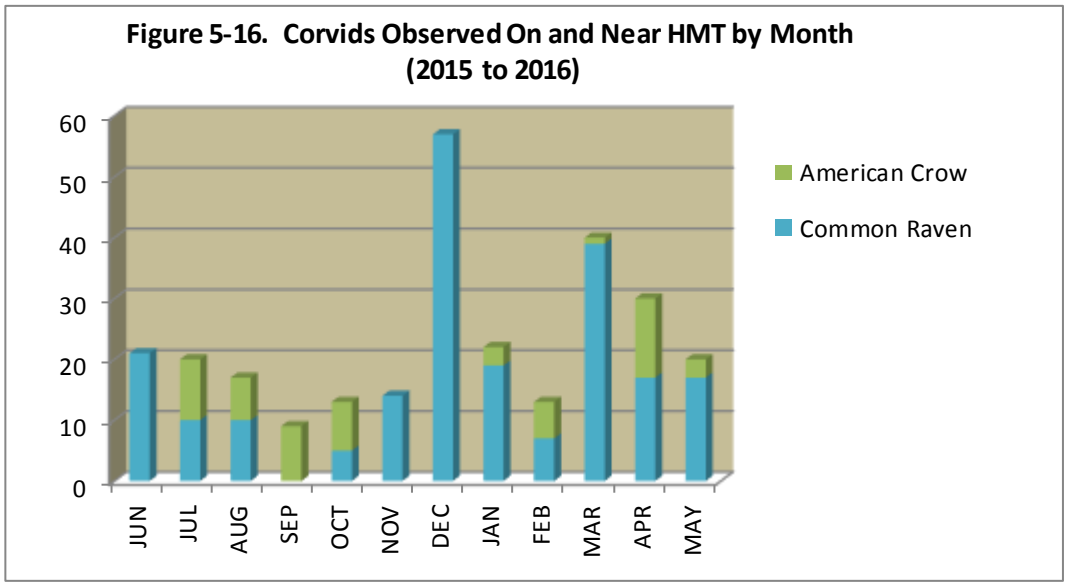
Pyrotechnics should be used to harass large flocks of sparrows and finches when they are observed in the AOA. Should guild members become acclimated to harassment techniques, lethal control may become necessary, especially if large congregations are observed to frequent aircraft movement areas and navigable airspace. It is very difficult to harass these species, and habitat modification is the most effective technique for ongoing management. It is recommended that infield short grasslands be managed at the FAA-recommended intermediate grass height of six to 12 inches.

Relative Risk. Sparrows, finches, and warblers have a moderate likelihood of being involved in a strike with aircraft, and they usually cause a low impact on flight due to their behavior. The FAA assigns a composite hazard ranking of 24 to sparrows out of 25 ranked species. No strikes with sparrows at HMT have been recorded in the FAA's Wildlife Strike Database. However, sparrows, finches, and warblers were observed frequently during the 12-month observation period, and most were observed on site as they foraged in the short grasslands of the infield. Based on the location of these birds near aircraft movement areas, the overall wildlife hazard risk posed by sparrows, finches and warblers is ***high***.

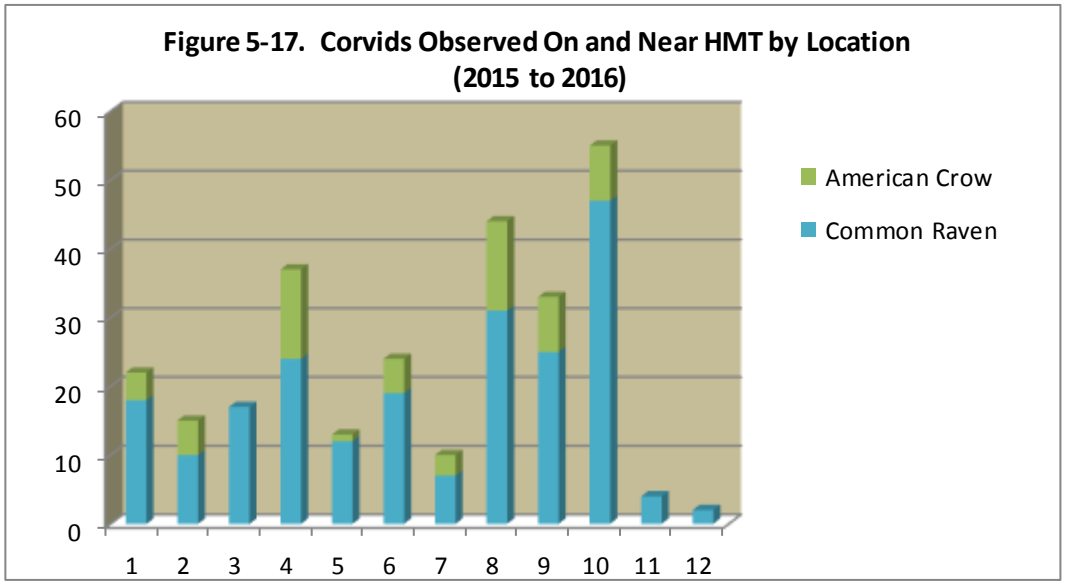
5.1.8 Corvids

Guild Description. Two species of corvids, the American crow and the common raven, were observed during the 12-month monitoring period. Both species are medium- to large-sized birds that are intelligent, very social, and travel in small to large flocks. Both are omnivores that feed on a range of food items such as crops, fruit, carrion, insects, nuts, seeds, and human refuse. Both can eat small animals, such as lizards and young birds. Although crows and ravens are frequent airport visitors, they are not usually involved in a strike.

Abundance. A total 276 corvids was observed, and corvids comprised approximately six percent of the total number of birds observed. Corvids were observed year-round, but they were more abundant in December, March, and April (**Figure 5-16**). The comparatively greater number of corvids observed in December is likely due to the presence of recently plowed fields in the area, which provide foraging opportunities. The comparatively greater number observed in March and April is likely due to the presence of new growth in these fields, which also provides foraging opportunities.



As shown on **Figure 5-17,** corvids were observed from all 12 monitoring locations. Corvids were observed to be most abundant near points 4, 8, and 10, which were associated with open areas both on and off site. These open areas provide crows and ravens with open areas with plentiful foraging opportunities.



Management and Legal Status. Corvids are attracted to refuse, and good housekeeping practices are important. All on-site refuse collection containers should be equipped with secure lids and emptied regularly. Refuse and carrion observed on and near airport property should be removed immediately. When corvids are observed in the AOA, they should be harassed and

dispersed using pyrotechnic devices, such as screamers and bangers. Harassment must be persistent to be successful. A federal depredation permit is required to perform lethal control, but lethal control of corvids does not appear to be warranted at this time.

Relative Risk. Corvids have a low likelihood of being involved with a wildlife strike due to their cautious behavior, but strikes with ravens can result in a moderate impact on a flight due to their size and sometimes flocking behavior. The FAA assigns a composite hazard ranking of 16 to crows/ravens out of 25 ranked species. No reported strikes with corvids have occurred at HMT. Based on the low number of corvids observed and its species behavior, the overall wildlife hazard risk associated with this guild is ***moderate***.

5.1.9 Raptors

Description. Raptors are predatory birds and scavengers that have hooked beaks and talons for capturing and feeding on prey. Raptors vary in size, and their diets vary among species. Raptors pose a relatively greater threat to aircraft operations compared to other guilds or species because of their large size and flight behavior, and because strikes with raptors can cause a comparatively greater impact on flight. Six raptor species were observed at HMT during the 12-month monitoring period. the burrowing owl, red-tailed hawk, American kestrel, northern harrier, Cooper's hawk, and white-tailed kite.

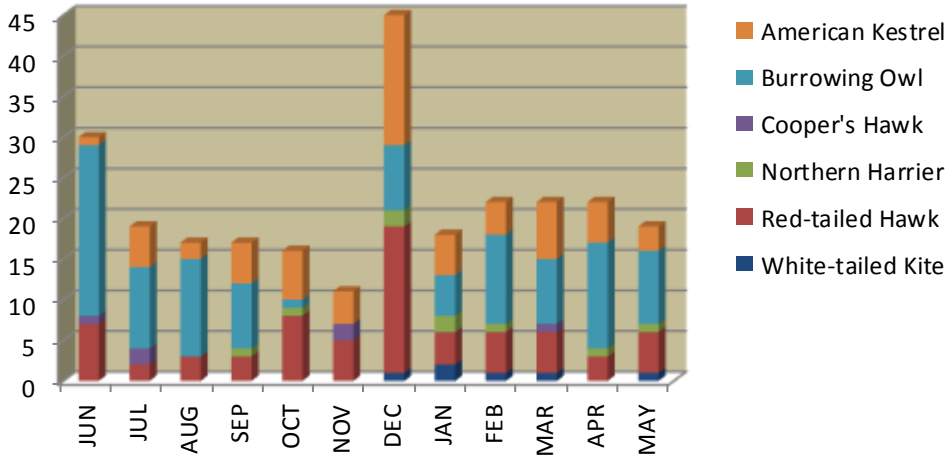
The red-tailed hawk, American kestrel, and burrowing owl were observed more frequently than the remaining three species. The red-tailed hawk is large, with broad, rounded wings and a short, wide tail. Most red-tailed hawks are rich brown above and pale below, with a streaked belly and, on the wing underside, a dark bar between shoulder and wrist. The tail is usually pale below and cinnamon-red above, though in young birds it is brown and banded. The slender American kestrel is approximately the size and shape of a mourning dove, although it has a larger head; longer, narrow wings; and long, square-tipped tail. In flight, the wings are often bent and the wingtips swept back. The burrowing owl is a small, sandy colored owl with bright-yellow eyes. Burrowing owls live in underground burrows that they may dig or in burrows prairie dogs, ground squirrels, or tortoises. Burrowing owls live in grasslands, deserts, and other open habitats, where they hunt insects and rodents. Although they are small in size, burrowing owls can pose a hazard to aircraft operation based on their proximity to the AOA and the low altitudes at which they fly.

Abundance. A total of 258 raptors was recorded during the 12-month monitoring period, and raptors comprised approximately 6 percent of the total number of birds observed. Burrowing owls comprised approximately 41 percent of the raptors observed, red-tailed hawks comprised 26 percent, and American kestrels comprised 24 percent.

Raptors were observed throughout the year (**Figure 5-18**), but a substantially greater number was observed in December, when greater numbers of red-tailed hawks and American kestrels

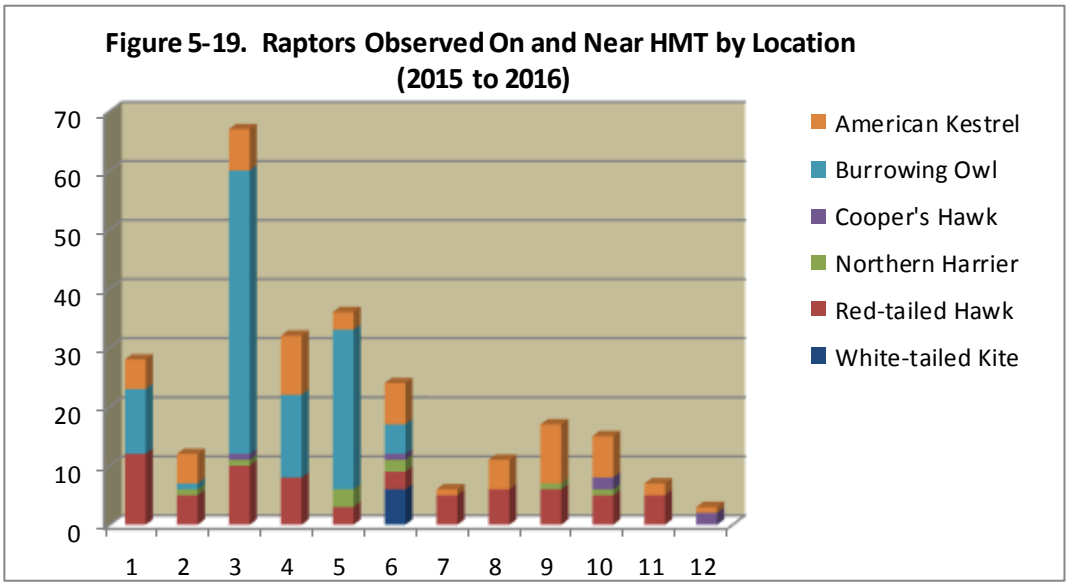
were observed. Raptors were observed foraging in airfield grass, perching on airfield structures and in the trees north of the airfield. Burrowing owls were observed in the northern portion of the airfield.

Figure 5-18. Raptors Observed On and Near HMT by Month (2015 to 2016)



Although raptors were observed from all monitoring locations, the greatest number was observed from point 3, which was located on site near the eastern end of the runway (**Figure 5-19**). The comparatively greater number of raptors observed near point 3 was largely attributable to the presence of the burrowing owls, which occupy burrows in short grass. Although burrowing owls are predators that feed on mice, voles, and other small mammals, they are also prey for other species such as owls, hawks, coyotes, foxes, weasels, and badgers.

Photo 10: *Burrowing owls were present on site throughout the 12-month monitoring period and were observed nesting in the AOA.*

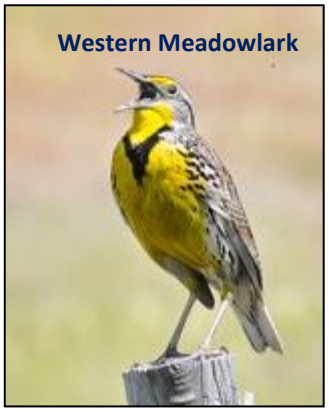


Management and Legal Status. All raptors are protected by the MBTA. In addition, the State of California identifies the burrowing owl and northern harrier as Species of Special Concern. The burrowing owl is also listed in the MSHCP as needing habitat protection in areas that occur on HMT property. A depredation permit from the USFWS is required to perform lethal management of raptors and a state permit is needed to capture and relocate raptors.

Harassment using pyrotechnic devices, such as shell crackers, bird bangers, or screamers, is the preferred technique for discouraging raptors from using the airfield. The County should coordinate with the CDFW to trap and relocate the burrowing owls from the AOA. Further, it is recommended that the County obtain a federal depredation for the lethal management of red-tailed hawks and American kestrels, which may be drawn to the airfield by the presence of small mammals and burrowing owls. To eliminate perching opportunities, the County should remove trees located in the AOA and near the north airfield hangars.

Relative Risk. Raptors have a moderate likelihood of being involved in a strike with aircraft, and large raptors can create a high degree of impact on flight. Although burrowing owls are small, they are abundant near aircraft movement areas and fly at low altitudes. The FAA assigns a composite hazard ranking of 11 to hawks and 21 to kestrels out of 25 ranked species. The FAA database includes one strike record associated with a red-tailed hawk at HMT, and the strike resulted in minor aircraft damage. Based on the presence of burrowing owls adjacent to the runways the presence of hawks, which were observed perched on infield structures and foraging near aircraft movement areas, the overall risk posed by raptors is ***critical***.

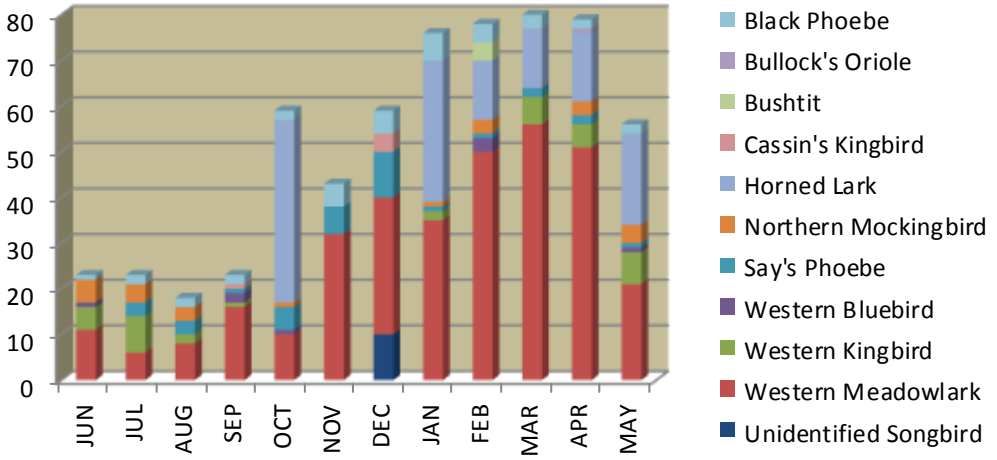
5.1.10 Songbirds



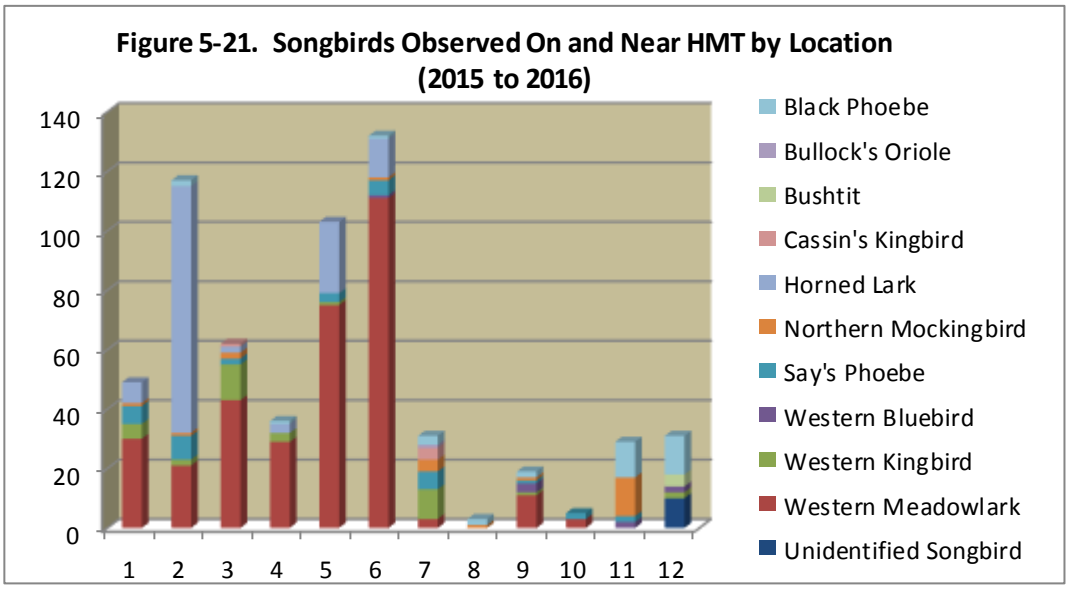
Description. Songbirds, also called passerines, include any member of the suborder *Passeri* (or *Oscines*) of the order *Passeriformes*, which includes approximately 4,000 species or nearly half the world's birds. Songbirds vary greatly in size, and their diets vary among species. Smaller songbirds do not usually pose a threat to aircraft, but some smaller songbirds travel in large flocks, thereby posing a comparatively greater hazard. Ten songbird species and unidentified songbirds were observed during the 12-month monitoring period (**Table 5-3**).

Abundance. A total of 617 songbirds was recorded during standardized WHA surveys, and songbirds comprised approximately 14 percent of the total number of birds observed. Western meadowlarks comprised approximately 53 percent of the songbirds observed, and horned larks comprised approximately 21 percent of the songbirds. Songbirds were observed throughout the year, but in much greater numbers in the winter and spring (**Figure 5-20**). The spike in winter and spring months is likely attributed to the presence of recently tilled fields and new growth in the areas adjacent to the AOA.

Figure 5-20. Songbirds Observed On and Near HMT by Month (2015 to 2016)



As shown on **Figure 5-21**, the greatest number of songbirds (all species combined) was recorded at point 6, which is located on the northwest corner of the airport property near habitat conservation land and in a criteria cell (i.e., area designated as future conservation land). The medium to-high grass and thick brush in this area provides opportunities for foraging, nesting and loafing. Songbirds were observed in greater numbers from on-site monitoring locations.



Management and Legal Status. To reduce the presence of songbirds, infield grasslands should be maintained at the FAA-recommended intermediate height of 6 to 12 inches. Songbirds observed on site should be harassed using pyrotechnics. All songbirds are protected by the MBTA, and a depredation permit from the USFWS is required to perform lethal management on songbirds. However, lethal management of songbirds at HMT is not warranted at this time.

Relative Risk. Songbirds have a moderate likelihood of being involved in a strike with aircraft, and they usually create a low degree of impact on flight due to their size. The FAA ranks the western meadowlark as 22 in its list of the 25 ranked species, and western meadowlarks comprised more than half of the songbirds observed. Based on the number located within the AOA, the overall risk posed by songbird species is ***moderate***.

5.1.11 Other Birds

Other bird species were observed at HMT and in the airport vicinity during the survey period (see **Table 5-3**); however, those species are not usually associated with bird strikes or pose a significant threat to aircraft. Other birds accounted for less than one percent of the total number of birds observed, and included Anna's hummingbirds and a single downy woodpecker. The members of this group have a low likelihood of being involved with an air strike and usually create a low impact on the flight. However, it should be noted that all birds or groups of birds have the potential to cause a significant bird strike incident with aircraft, and it is possible that some of the strikes with unknown small birds involved birds in the guild. The overall wildlife hazard risk for species associated with this group is ***low***.

A detailed discussion is not necessary for species that were identified in **Table 5-3** but were not addressed within Sections 5.1.2 through 5.1.11.

5.2 Mammal Surveys

As described in Chapter 4, two small mammal monitoring events and two spotlight surveys were performed at HMT during the 12-month WHA study. Game cameras were also used to document the presence of mammals within the AOA.

5.2.1 Small Mammal Survey Results

A total of 150 small mammal traps were set up in three lines or transects containing 50 live traps, and mammals were monitored on three consecutive trap nights in December 2015 and March 2016 (see **Figure 4-2** for transect locations). For each event, one transect was placed in short grass, one in medium grass, and one along hardscape near brush line No small mammals were captured. However, evidence of small mammals, such as burrows in the airfield and the presence of foraging raptors and coyotes on the airfield, suggest that a small mammal population is present despite.

5.2.2 Night Spotlight Survey Results

Spotlight surveys were conducted approximately one hour after sunset in December 2015 and March 2016. One coyote was observed during the December 2015 survey, and one coyote, three burrowing owls, and two desert cottontails were spotted during the March 2016 survey. Coyotes were observed entering the AOA through holes or gaps, in the perimeter fence and they can pose a significant hazard to aircraft.

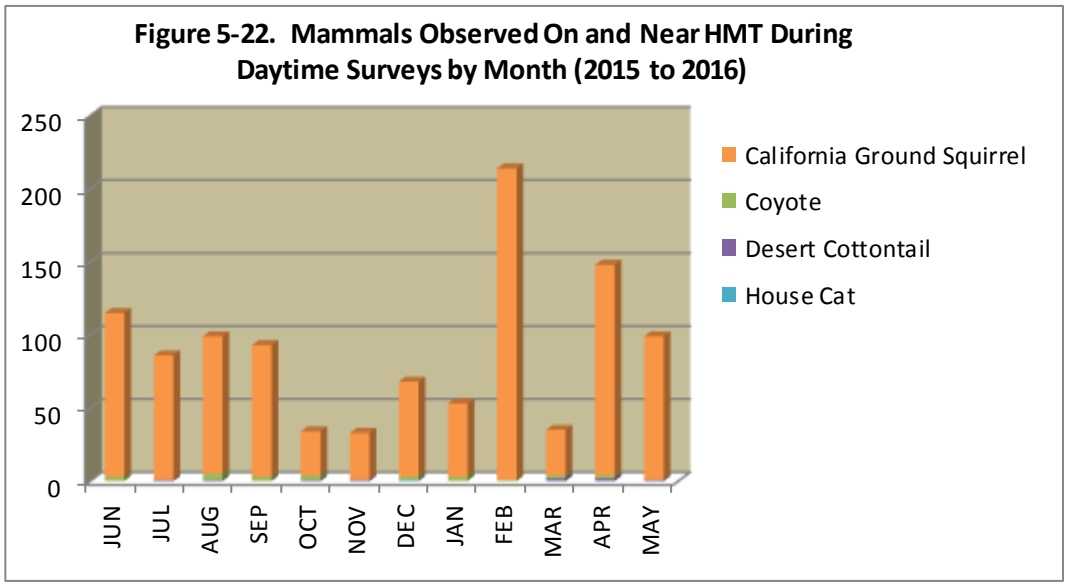
5.2.3 Game Camera Survey Results

One game camera was used to monitor four on-site locations throughout the 12-month monitoring period (see **Figure 4-3**). The game cameras photographed numerous mammals within the AOA including coyotes, ground squirrels, and stray domestic dogs.

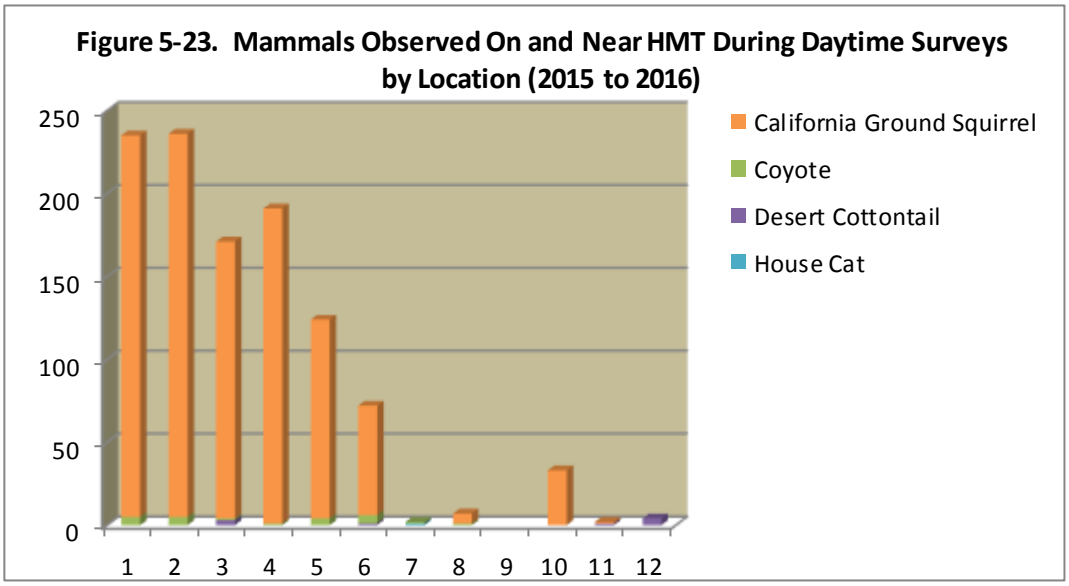
Photo 11: *Coyotes were observed frequently in the AOA and crossing runways.*

5.2.4 Mammals Observed During Twice-Monthly Surveys

Mammals or evidence of mammals was recorded during the twice-monthly daytime surveys. Over 1,000 California ground squirrels were observed during the daytime surveys (**Figure 5-22**). Mammals were observed throughout the year, and most were observed from on-site monitoring



points 1 through 5 (**Figure 5-23**).



Legal Status and Management. Coyotes are listed as a nuisance species in California, and a property owner may lethally remove a coyote without a special state permit if they are causing damage or are a nuisance on the owned property. Lethal management is often the most efficient method for removing problem coyotes. Foot-hold traps or cable-restraints can be used to capture

coyotes but would require a special permit from the State of California. However, these devices are specialized equipment and should only be applied by an individual that is familiar with their operation and is knowledgeable of California trapping regulations, such as the United States Department of Agriculture, Wildlife Services.

To exclude coyotes from the AOA, fence maintenance should be performed that includes weekly inspections to address burrows and gaps greater than 3 inches. Multiple burrows were observed throughout the 12-month survey. The ideal method for excluding coyotes would include the modification of the perimeter fence to include a buried apron at the airfield boundary. A buried apron consists of a 2-foot-wide strip of fence that is attached at the fence base at a perpendicular angle and buried. However, the cost associated with the installation of a buried apron can be high.

The most effective method to manage California ground squirrels is lethal control. Given the significant abundance of squirrels observed within the AOA, it is recommended that the County initiate a lethal control program to reduce the population. California ground squirrels are a significant food source for raptors and coyotes and will continue to attract both to the AOA.

Relative Risk for Mammals. Mammals have a moderate likelihood of being involved in a strike with aircraft, and they create a high degree of impact on flight due to their size, especially strikes with deer and coyotes. Although no mammal strikes at HMT have been recorded in the FAA database, FAA ranks coyotes are ranked as 17th in its list of 25 most hazardous species because they can cause a significant effect on flight. Based on the presence of coyotes and California ground squirrels in the AOA and their proximity to aircraft movement areas, the overall risk posed by mammal species, particularly coyotes and squirrels, is ***critical***.

Chapter 6

Conclusions and Recommendations

6.1 Overall Conclusions and General Recommendations

6.1.1 Overall Conclusions

The data obtained during the 12-month monitoring period and summarized in Chapter 5 form the foundation for the recommendations provided in Chapter 6. Based on the survey data, it appears that wildlife management measures are necessary to reduce the overall risk posed by wildlife to aircraft operations at HMT, and especially the hazards posed by mammals, raptors, doves and pigeons, blackbirds, and sparrows.

6.1.2 General Recommendations

Airport wildlife hazard management involves the implementation of an integrated wildlife damage management program. An integrated wildlife hazard management program is a science-based program that includes ongoing administrative and technical measures, as well as short-term operational measures to reduce immediate or critical risks as they are observed and long-term measures to reduce risks over time. An integrated airport wildlife hazard management program must include both on-site and off-site habitat modification measures to address the specific features that were found to attract wildlife to the airport and its critical airspace, as well as the use of targeted harassment and population-management measures to address individuals or species that do not respond to habitat modification or pose an imminent or critical threat to aircraft operations. The recommendations presented in this chapter are intended to reduce the risks posed by wildlife during air operations regardless of whether a WHMP is required by the FAA.

Four general recommendations are presented:

- Develop a wildlife hazard management plan/program that includes a management structure and designated staff;
- Develop and implement ongoing wildlife hazard management policies and procedures that can be incorporated into daily operations;
- Implement site-specific recommendations for proposed habitat modification. Such modifications identify physical changes that would make the airport environment less attractive to potentially hazardous wildlife; and
- Implement species-specific recommendations and management techniques.

6.2 Develop a Wildlife Hazard Management Plan/Program

Although the decision to prepare a WHMP resides with the FAA, it is recommended that the County prepare a WHMP and implement a formal wildlife hazard management program to address potentially hazardous wildlife observed during the WHA study. The WHMP and subsequent wildlife hazard management program should identify specific policies and procedures for staff and management including the following components, which are described in Sections 6.2.1 through 6.2.7:

- Establish a formal Wildlife Hazard Management Program;
- Establish a Wildlife Hazard Working Group;
- Maintain permits and supplies necessary to perform wildlife hazard management activities;
- Incorporate wildlife hazard management activities into airport planning, design and construction activities; and
- Monitor changes in land use on or near the airport.

The policies associated with wildlife hazard management would be incorporated on an ongoing basis and into nearly every aspect of airport operations including tenant lease agreements, new design and construction projects, and daily airfield inspection and maintenance procedures.

6.2.1 Establish a Formal Wildlife Hazard Management Program

Currently, most wildlife hazard management activities at HMT are performed by members of the maintenance staff, who conduct daily inspections of runway areas and wildlife harassment using vehicles. Airport management should provide support and equip staff to recognize and respond appropriately to hazardous wildlife.

The Wildlife Hazard Management Program should be overseen by a designated Wildlife Coordinator (an existing staff member), who will be responsible for implementing the recommendations set forth in the WHA, ensuring that staff receive adequate training, and alerting other staff to wildlife management policies, procedures, and activities. In addition, the Wildlife Coordinator will serve as a liaison between airport staff, tenants, pilots, and regulatory agencies when addressing issues associated with wildlife hazards and wildlife hazard management.

The Wildlife Coordinator would receive training in wildlife hazard/damage management and be knowledgeable of airport operations and the local environment. In addition, the Wildlife Coordinator should be empowered by airport management with the authority to delegate wildlife hazard management responsibilities.

The Wildlife Coordinator will carry out the recommendations set forth in the WHA report. Specifically:

- Obtain and maintain wildlife hazard management supplies;
- Maintain a database of wildlife hazard management activities, including information obtained from pilot reports, mechanical inspections, and daily observations;
- Obtain instruction for airport staff regarding wildlife hazards and wildlife hazard management policies and procedures;
- Implement wildlife management measures;
- Obtain permits associated with wildlife management; and
- Continue to record wildlife strikes and instruct other airport staff, tenants, FBOs, and pilots in wildlife strike reporting procedures.

6.2.2 Establish a Wildlife Hazard Working Group

The Wildlife Coordinator, with the support of the Airport Manager, should establish a Wildlife Hazard Working Group (Working Group) to incorporate wildlife hazard management into airport operation, policies, and activities. The Working Group should include, but not be limited to:

- Representatives of County departments associated with airport management (administration, operations and maintenance, management);
- Local pilots;
- FBOs;
- Airport Tenants; and
- FAA representatives.

All meetings should be documented to demonstrate the airport's ongoing wildlife control and management efforts.

6.2.3 Obtain Permits to Manage Wildlife

Most of the bird species identified in the HMT vicinity are protected by the MBTA or other federal and state regulations. The USFWS is the agency authorized to provide permits for the lethal removal of specific species.

The ability to respond to hazardous situations in a prompt and efficient manner is paramount, and such responses may include the lethal removal of hazardous wildlife. Currently HMT does not hold a federal depredation permit for the lethal control of migratory birds. It is recommend that HMT obtain a federal depredation permit for migratory birds for the following species:

- Red-tailed hawk
- American kestrel
- Mourning dove

Other birds that may require management, such as rock pigeons and European starlings, do not require a permit for lethal removal. It is also recommended that the airport work with the CDFW to manage burrowing owls that are within the AOA, because the burrowing owl is a species of special concern in California. It is also recommend that the airport work with the CDFW on the management of coyotes and California ground squirrels within the AOA, given they are considered nuisance species in the state.

6.2.4 Train Personnel in Wildlife Hazing Procedures and Species Identification

Airport staff must be trained to recognize and respond to all potential wildlife hazards in an appropriate manner, including hazing and removal. Working with Airport Management, the Wildlife Coordinator should organize and obtain training for all personnel that have wildlife hazard management duties within the AOA. Training should include the following components:

- Wildlife hazard identification;
- Species identification, with emphasis on those that are present at HMT and pose the greatest risk to air-carrier operations;
- Hazing and harassment techniques and safety procedures; and
- Reporting wildlife strikes and wildlife management actions.

6.2.5 Obtain Wildlife Hazard Management Supplies

Airfield vehicles, including maintenance vehicles, should be equipped with pyrotechnic launchers and shells, and personal protective equipment so that harassment can be performed quickly. Maintaining these supplies will enable all trained airport personnel to perform harassment and haze during their routine duties. Table 6-1 summarizes the wildlife hazard materials that should always be available at the airport:

Table 6-1. Wildlife Hazard Management Supplies	
Supply	**Description and Quantity**
Pyrotechnic supplies	**Pistol Launchers.** The airport should maintain a supply of 15 mm pyrotechnic pistol launchers and caps. One pistol launcher should be available in each vehicle that does airfield inspections, and two spare pistols should be available.
	Screamers and Bangers. Screamers/bangers should be available in each vehicle used for airfield inspections, and should also be available in storage.
	Personal Safety Equipment. Eye and hearing protection should be maintained in each vehicle used for airfield inspections. Two set of protective eye goggles and ear protectors should be included in each vehicle, and extras should be maintained at all times.
Monitoring equipment	**Binoculars.** One pair of binoculars should be kept in each vehicle used to perform airfield inspections.
	Bird and mammal identification guides. A copy of each guide should be kept in all vehicles used to inspect the airfield, and an additional copy should be kept in the Wildlife Coordinator's office.
	Monitoring Log. A logbook/computer file should be available to document daily observations pertaining to wildlife hazards and all management activities.
Firearm/ammunition	**12-gauge shotgun and ammunition.** If lethal control is necessary, the airport should maintain a 12-gauge shotgun and non-toxic ammunition for use by appropriately trained, airport employees in addition to the AWC.
Note: Additional supplies such as distress calls, mammal traps, rotating beacons, and sirens may be necessary as specific situations arise. The airport operator must ensure that these items can be procured in a timely manner.	

6.2.6 Continue to Record and Maintain Wildlife Strike Information

The AWC or airport administration should maintain a database of wildlife strike information collected from pilot reports, mechanical inspections, and routine airfield inspections. The AWC would be responsible for ensuring that HMT personnel and pilots understand the procedures for reporting hazards and strikes to airport staff and for training staff to record wildlife strikes using the FAA wildlife strike database.

6.2.7 Continue to Review Land Use Changes On and Near the Airport

As identified in FAA AC 150/5200-33B,"Wildlife Attractants On and Near Airports," the area associated with wildlife hazard management extends beyond the airport property boundary. The AWC must actively monitor and participate in proposed projects and land use changes on and near the airport that could create additional wildlife hazards. If a proposed project would attract potentially hazardous wildlife, the AWC should: consult with a qualified airport wildlife biologist; discuss the potential impact of the project with project proponents, project sponsors, and local officials; work with project proponents to modify the project so that it does not attract potentially hazardous wildlife; and maintain a record of the communication.

The airport includes areas that are identified in the County's MSHCP as "criteria cells", or areas in which conservation easements are desired for the protection of specific species. FAA CertAlert No. 06-07, "Requests by State Wildlife Agencies to Facilitate and Encourage Habitat for State-Listed Threatened and Endangered Species and Species of Special Concern on Airports", advises airport operators to decline the use of habitat management techniques that could jeopardize aviation safety and warns against the creation of conservation areas on federally-obligated airport property. Efforts to manage airport property for the protection of some state-listed species and habitats identified in the MSHCP, such as the burrowing owl, would be contrary to FAA's position as stated in the CertAlert.

6.3 Develop and Implement Ongoing Wildlife Hazard Management Policies and Procedures

The following ongoing policies and procedures should be implemented under the direction of the Wildlife Coordinator:

- Implement a wildlife reporting and communications protocol;
- Continue monitoring wildlife populations and use patterns on and near the airfield;
- Adopt a zero-tolerance policy toward hazardous wildlife (as discussed in Section 6.2.3 and 6.3.3);
- Improve reporting of wildlife strikes and management actions; and
- Maintain records of reported wildlife strikes and control actions.

6.3.1 Implement a Wildlife Hazard Reporting and Communications Protocol

HMT is a non-towered airport and thus airport staff should continue to be vigilant and alert FBOs and pilots of any potential wildlife hazards as they arise. A clear communications protocol should be available for pilots and ground staff to report the presence of wildlife or incidents to the AWC for corrective action and documentation is critical.

6.3.1.1 Communication Protocol and Procedures Development

1) Procedures for airport staff to alert FBOs and/or pilots of potential hazards prior to takeoff or landing. If a wildlife hazard is observed by airport ground personnel, aircraft in the vicinity will be contacted by radio immediately. The location, species, number observed, activity, and potential direction of travel will be relayed so pilots can be properly informed, and appropriate action taken.

2) Procedures for alerting airport operations staff to address wildlife hazards that require immediate attention:

   a. The AWC or airport staff will be contacted immediately if wildlife hazards are observed.

b. The AWC will assess the situation and designate trained personnel to address the situation.

c. Wildlife management procedures will follow a stepped approach including:

- Small or minor hazards – hazing through car horns and lights.
- Moderate or persistent hazards – combination or car horns, lights, pyrotechnics, and lethal control.
- Severe hazards – lethal control.

3) Documentation procedures:

a. The AWC will log wildlife observations in a master-list for easy reference.

b. All management procedures will be recorded (e.g., hazing, lethal control, etc.) along with the results of the procedure.

c. All wildlife lethally controlled will be reported to the following agencies:

- USFWS – all federally controlled species (MBTA).
- CDFW – all state game species.

6.3.1.2 Observations and Communication

It is important for all staff members to understand the potential hazard to aviation posed by each species observed. Not all airport staff may be aware of the dangers presented by wildlife, even when a situation is observed outside of the AOA. It is imperative all significant wildlife observations be communicated immediately between airport staff and pilots, so appropriate action can be taken. Pilot Reports (PIREPS) regarding wildlife hazards should be relayed through Automatic Terminal Information Service (ATIS)/UNICOM whenever they are received.

The ATIS should be updated and transmitted when a significant wildlife hazard is observed at HMT. A NOTAM should be filed only if a wildlife hazard is observed consistently or for an extended period of time. Blanket or generic advisories should not be issued.

6.3.2 Continue to Monitor Wildlife Populations and Use Patterns

The overall intent of the 12-month survey effort was to document general occurrence, abundance, behavior, use patterns, and population characteristics of wildlife on and near HMT. The WHA

also sought to identify significant wildlife attractions near HMT that could adversely affect the safety of aircraft operations. However, wildlife abundance and use patterns can be affected by numerous variables (like the extreme drought occurring at HMT over the 12-month assessment), and the data provided during WHA monitoring efforts should be considered as a baseline for comparison in future years.

The County should continue to monitor wildlife populations by conducting at least one monthly survey using the same on-site monitoring locations established for the WHA study, and the results should be compared to the results presented in the WHA study to identify fluctuations in wildlife presence. Continuing to monitor wildlife populations will also enable HMT to determine the effectiveness of its management efforts. Each monthly survey will require approximately 1.5 to 2 hours. To reduce bias, the same observer should conduct all surveys. Data should be maintained in a database to provide a basis for comparison over time.

6.3.3 Adopt a Zero-Tolerance Policy towards Hazardous Wildlife

A zero-tolerance policy should be adopted toward all hazardous wildlife occurring on or, in some cases, near the airfield. Zero tolerance means harassing or removing hazardous wildlife whenever it is observed in the AOA or passing through airspace above the AOA. Efforts should focus on species that were identified during the WHA study and current species listed on the depredation permit that pose the greatest risk including, but not limited to:

- Red-tailed hawk
- American kestrel
- Mourning dove
- Coyote
- Ground squirrels

To implement an effective WHMP or Wildlife Management Program, all employees need to participate in wildlife harassment activities. All airport maintenance staff and management should receive training on how to take immediate action when hazardous wildlife species are encountered within the AOA. At a minimum, hazardous wildlife should be reported immediately to the Wildlife Coordinator whenever it is observed.

6.3.4 Continue the Reporting of Wildlife Strikes and Harassment Actions and Wildlife Strikes

According to the FAA's National Wildlife Strike Database, five strikes have been reported at HMT since 1990. Four of the strikes were reported to have occurred with an unknown small bird and one with a red-tailed hawk. The red-tailed hawk strike caused minor damage to the aircraft.

One of the purposes of the WHA was to identify the species that pose strike hazards at HMT. Ongoing efforts are necessary to identify the species that pose threats to aircraft or cause wildlife

strikes. Improved wildlife reporting procedures, including training for species identification, are critical to reducing wildlife strike hazards. As previously noted, the Wildlife Coordinator should ensure that all bird strikes are recorded to the species level. In addition, clear records should be maintained regarding carcasses found on or near the AOA.

If bird/mammal remains are identified within 250 feet of the runway centerline during routine inspections of the airfield, the remains should be collected and removed immediately to avoid attracting scavengers such as carrion-eating wildlife. Unless there is visible evidence to identify another cause, such as tracks made by a scavenger, the incident should be recorded as a wildlife strike in the FAA wildlife strike database (http://wildlife.faa.gov/strikenew.aspx).

If remains are discovered, the species should be identified. If airport staff cannot identify remains to the species level or if only feather fragments or DNA are available, remains should be sent to the Smithsonian Institution's Feather Identification Lab for free identification. The remains should be accompanied by FAA Form 5200-7 and sent to:

Smithsonian Institution
Feather Identification Lab
NHB, E600, MRC 116
10th & Constitution Ave, NW
Washington, D.C. 20560-0116

Once the remains are identified, the information should be included in the wildlife strike database. An instructional video that describes how to submit feathers or snarge, which is feathers or residue left after a bird strike, to the Feather Identification Lab is available at: http://www.faa.gov/airports/airport_safety/wildlife/smithsonian/.

6.3.5 Maintain Records of Wildlife Management Efforts

Wildlife management is risk management, and the Wildlife Coordinator and Airport Administration should retain detailed records of wildlife harassment and management efforts. The records will provide a useful index of changes in wildlife abundance and use of the airfield over time, and the records will allow staff to monitor the effectiveness of its harassment and management activities. As shown on the observation sheet presented in **Appendix G**, the data recorded should include the following for each management activity:

- Person conducting the action,
- Date and time of the action,
- Species and number of individuals observed,
- Location on airfield, and
- Management method applied.

The Wildlife Coordinator should maintain these records in a database so that the data can be easily extracted or sorted for reporting purposes.

6.4 Implement Site-Specific Recommendations

Based on the results of the WHA, site-specific recommendations were identified that would be protective of both air operations and wildlife populations. The following recommendations were developed to represent a phased approach to management that ranges from passive techniques that discourage wildlife from using the airport to more direct techniques. The following site-specific techniques are recommended for implementation:

- **Modify on-site features and habitat that attract potentially hazardous wildlife.** As noted in Chapters 2 and 5, specific habitats or features were observed at HMT that attract or have the potential to support potentially hazardous wildlife. The purpose of habitat modification is to remove the features or habitat that attract and support hazardous wildlife so that the wildlife will become less likely to visit the airport in the absence of such features. It is preferable to modify the grass heights and remove the trees on airport property and encourage wildlife to feed, forage, nest, and roost elsewhere, thereby increasing the separation between aircraft and wildlife. For additional information on habitat management actions, refer to Airport Cooperative Research Program (ACRP) Synthesis Report 52, *Habitat Management to Deter Wildlife at Airports* (ACRP, 2014), which is available at http://onlinepubs.trb.org/onlinepubs/acrp/acrp_syn_052.pdf.

- **Monitor wildlife at nearby off-site features.** As noted in Chapters 2 and 5, specific habitats or features are present near HMT that attract or have the potential to support potentially hazardous wildlife (residential ponds, golf courses, San Diego Canal, and agricultural areas). Monitoring these off-site features help HMT identify the presence of hazardous wildlife at these locations and their potential effect on wildlife in the AOA or the airspace associated HMT.

- **Maintain and regularly inspect the perimeter fence.** Separating aircraft and wildlife using a properly maintained perimeter fence prevents conflicts to both wildlife and the traveling public. As stated previously, the airport perimeter fence has not prevented medium-sized mammals from entering the AOA. Numerous coyotes and domestic dogs were observed in the AOA and on aircraft movement areas during the 12-month assessment. Fence maintenance and improvements are warranted.

- **Implement species-specific controls.** Species-specific management controls include multiple techniques, including fear-provoking stimuli, exclusion, relocation, and lethal removal. Although lethal removal is the method of last resort, it is sometimes the only option for protecting the traveling public and must be considered as part of an integrated wildlife hazard management program. Staff should receive training to implement species-specific controls when hazardous wildlife is observed in the AOA.

  The proposed species-specific controls are performed when habitat modification proved to be unsuccessful or to reinforce non-lethal techniques. All active management techniques, including

hazing and lethal removal, would conform to federal laws and permit requirements and be implemented by trained staff. Although ongoing lethal management may be the least desirable method of risk management, it supports the County's obligation to provide for the safety of air travelers and those living and working near the airport.

The recommendations described in the following pages represent a phased approach to wildlife hazard management. Additional details on effective and appropriate non-lethal methods are described in (ACRP Synthesis Report No. 23, *Bird Harassment, Repellent, and Deterrent Techniques for Use on and Near Airports,* which is available at http://onlinepubs.trb.org/onlinepubs/acrp/acrp_syn_023.pdf. The use of lethal management measures is described in ACRP Synthesis Report No. 39, *Airport Wildlife Population Management,* which is available at http://onlinepubs.trb.org/onlinepubs/acrp/acrp_syn_039.pdf.

6.4.1 Modify Grass Heights within the AOA

Most wildlife management programs start with grass/vegetation management as a baseline element. The FAA recommends maintaining grass heights of 6 to 12 inches, because this intermediate height disrupts inter-flock communication, obscures the presence insect food sources and the presence of rodents, limits predator protection, and impedes the ease at which wildlife can move. Because taller grass can out-compete edible, weedy vegetation and has a slower growth rate, mowing is required less frequently. Intermediate grass heights been proven to be effective in discouraging birds and mammals from using infield grass areas.

Grass areas throughout the airport, with the exception of conservation areas, are maintained at a height of less than 6 inches. These areas are mowed or maintained by airport personnel. Blackbirds, corvids, mourning doves, burrowing owls, songbirds, along with California ground squirrels were observed within these areas. Squirrels that are present within these areas provide a food source for coyotes and various raptor species. It is recommended that all turf areas within the airport property be maintained at an intermediate height of 6 to12 inches to discourage birds and squirrels from using the areas.

Control Measure/Priority. Vegetation can harbor several species (e.g., flocking birds) that pose a high risk to airport operations. Therefore, the priority associated with maintaining grass heights at 6-12 inches across the entire AOA is ***critical.***

6.4.2 Provide Ongoing Fence Maintenance and Inspection

The perimeter fence includes numerous holes and gaps, and dense brush has grown into the fence. The condition of the fence allows mammals, such as coyotes, to gain access to the AOA. The FAA identifies medium-sized mammals, such as coyotes, as potentially hazardous because strikes with mammals can occur during sensitive takeoff and landing cycles. Large numbers of coyotes were observed on or near aircraft movement areas during the assessment.

The airport maintenance staff should monitor the current fence regularly and complete a full fence inspection at least weekly to identify and fill or repair gaps that occur between the fence base and the ground or gaps adjacent to gates. Fence gates can be equipped with a heavy rubber flap or wire mesh that overlaps the other side, or the gate frames can be lowered so that a gap of no more than 3 inches remains between the bottom of gate frame and the ground. The airport maintenance staff should continue to remove brush from the fence line to provide for easier inspection and to make the fence line less attractive to coyotes.

The County should consider equipping the fence with a buried apron to prevent burrowing by mammals. The apron would be attached to the fence and buried on the outside boundary to prevent burrowing. However, the installation of a buried apron can prove to be expensive, and it would likely require both Federal funding NEPA review.

Control Measure Priority. Gaps and holes in the perimeter fence and gates should also be monitored and repaired. The priority associated with increased fence inspection and fence maintenance is ***critical.***

6.4.3 Use Pyrotechnics to Perform Non-Lethal Control of Hazardous Wildlife

Currently, staff provide limited wildlife management. Additional non-lethal wildlife control measures are warranted, such as the use of pyrotechnics on airport property to disperse birds and mammals from the AOA. Wildlife habituate to one control/harassment method so the use of pyrotechnics will help to reduce and disperse wildlife populations within the AOA.

Staff training will be required prior to implementation, and care must be taken during use in the dry season. Training is available from the USDA and various wildlife hazard management training sessions that have been approved by the FAA.

Control Measure/Priority. Use pyrotechnics to disperse hazardous wildlife from the AOA. The overall priority associated with implementation of this control measure is ***high***.

6.4.4 Remove On-Site Trees that Attract Hazardous Wildlife

Several large trees are also located on the north side of the airfield next to the north hangars. These trees attract various species of birds, including raptors and flocking birds, which use the trees for perching. The birds fly across the AOA and aircraft movement areas as they move to and from the trees.

Control Measure/Priority. Remove trees within the AOA to make the airport less attractive to potentially hazardous wildlife. The overall priority associated with implementation of this control measure is ***high***.

6.4.5 Review Proposed Projects and Land Use Changes in the Critical Zone

Projects or land use changes that are proposed on or near the airport have the potential to create new wildlife attractants, such as open water opportunities for nesting and roosting, or ornamental landscaping that offers food and shelter to wildlife. The Wildlife Coordinator should review or request assistance from an FAA-qualified Wildlife Hazard Biologist to review plans for all proposed projects on airport property to identify features that would be attractive to hazardous wildlife. Specific elements of the review should include, at a minimum, storm water management designs, landscape designs, and proposed development plans.

The Wildlife Coordinator should also monitor proposed project and land use changes within the critical zone, which includes the City of Hemet and unincorporated areas of Riverside County. The Wildlife Coordinator should work closely with local planners to identify proposed projects for which discretionary approvals are required, and review the project plans to identify whether they have the potential to attract potentially hazardous wildlife. If potential conflicts are identified, the AWC should work with local planning staff to identify specific features that require revision.

The western portion of the Airport is identified as a criteria cell that is targeted for inclusion in the Western Riverside County MSHCP. Areas that are included as conservation areas under the MSHCP are subject to management activities implemented by the individual reserve managers to conserve habitats and covered species identified in the plan. However, management to encourage or attract wildlife species within HMT AOA could increase wildlife hazards. CertAlert No. 06-07, “Requests by State Wildlife Agencies to Facilitate and Encourage Habitat for State-Listed Threatened and Endangered Species and Species of Special Concern on Airports, warns against the use of management practices that encourage the presence of or attract wildlife species, even if the species are state-listed or of special concern. Pursuant to its grant assurances, HMT must manage the airport for the purpose of safe airport operations, and the criteria cells should not be encumbered with conservation easements or practices that could inhibit safe airport operation.

The Airport administration should consult with County staff responsible for HSHCP administration to discuss the constraints associated with the establishment of state or local conservation easements on federally-obligated property, especially those easements associated with the establishment of habitat for raptors, including the burrowing owl, and mammals that are known to pose hazards to aircraft operations (see **Appendix H**).

Control Measure/Priority. Certain projects on or adjacent to the airport have the potential to attract hazardous bird species, which pose a critical hazard to aircraft operations. The overall priority associated with implementation of this control measure is ***moderate***.

6.4.6 Monitor Off-site Facilities that Attract Wildlife to the Airport Vicinity

Other off-site features and land uses within the FAA defined critical zone have the potential to attract potentially hazardous wildlife to the airport and its critical airspace, such as residential

ponds, golf courses, the San Diego Canal and agricultural fields. Features and land uses observed to attract wildlife to the airport vicinity include residential ponds, golf courses, the San Diego Canal, and nearby agricultural fields. Of these locations, the pond and fountain at the adjacent Hemet West Mobile Estates could pose the greatest concern for HMT, as waterfowl are attracted to it. Waterfowl are known to pose a risk to airport operations, and those frequenting the Hemet West Mobile Estates have the potential to visit the airport and pass through its critical airspace.

HMT staff should occasionally monitor water features at the Hemet West Mobile Estates to determine whether hazardous wildlife that utilizes the features will visit the airport or pass through its airspace. HMT management and the Wildlife Coordinator should present the monitoring results to the operators of these facility and ask for assistance to reduce potential hazards through habitat modification or harassment. All outreach to these facilities should be documented to demonstrate ongoing risk management efforts. It should be noted that birds dispersing to and from nearby agricultural areas have the potential to enter pass through HMT as its associated airspace.

Control Measure/Priority. Nearby land uses, specifically the pond/water features at the adjacent Hemet West Mobile Estates, all have the potential to attract hazardous wildlife into HMT airspace. Therefore, the priority associated with monitoring these locations to determine if hazardous wildlife at these locations are entering HMT airspace is ***moderate***.

6.5 Species-Specific Recommendations and Management Techniques

While the habitat modification measures recommended in Section 6.4 can substantially affect and reduce the populations or frequency of several wildlife species observed at HMT, not all species will respond in the same manner and further action will be required. Therefore, an integrated approach to wildlife management is recommended.

An integrated approach includes a variety of methods to reduce wildlife conflicts. Such methods may include the alteration of agricultural practices, habitat modification, behavioral modification, and the targeted reduction of some wildlife populations through lethal means. The airport staff has initiated the use of harassment using vehicles to harass wildlife species. The incorporation of lethal management activities to reinforce non-lethal techniques typically provides better results than those achieved through the use of only non-lethal techniques. In some cases, lethal management may be the only option to manage specific species.

6.5.1 Mammals (Coyotes and California Ground Squirrels)

The presence of coyotes in the AOA was documented using game cameras and during spotlight surveys. Coyotes were observed to enter the AOA through holes or gaps under the perimeter fence and through gaps in fence gates. Regular fence inspections must be performed to identify and repair gaps or holes to prevent entry into the AOA by coyotes and other mammals.

Coyotes are known to pose hazards to aircraft operations. If a coyote is identified on the airport, it should be removed immediately. If coyotes cannot be removed through harassment, they should be removed lethally. The County's airport administration should work with the USDA-Wildlife Services to lethally remove persistent coyotes when they are observed in the AOA or work with the California Department of Fish and Wildlife to obtain a permit to remove persistent coyotes that cannot be managed through harassment measures.

California ground squirrels were the most abundant mammal observed during the 12-month assessment. The squirrels serve as a prey base for coyotes and raptors and attract both to the AOA. In addition, burrowing owls are known to inhabit the squirrel burrows. The County should initiate a lethal control program for squirrels to reduce the population within the AOA. The airport administration should work with USDA-Wildlife Services to lethally manage ground squirrels in the AOA.

Management Control/Priority. Coyotes pose a significant risk to aircraft operations, and they can have a serious effect on flight if they are struck during takeoff or landing cycles. California ground squirrels attract coyotes and raptors into the AOA as they serve as a prey base for these species. The priority associated with this control measure is ***critical***.

6.5.2 Raptors

Although raptors comprised only 6 percent of all birds observed, they were observed throughout the 12-month monitoring period. Raptors were observed perching or foraging within the AOA or flying across aircraft movement areas. The airport staff should harass and disperse raptors using pyrotechnics whenever they are present within or near the AOA. Staff should use pyrotechnics to haze raptors until they exhibit lack of fear, and perform lethal removal when necessary to reinforce non-lethal techniques. Managing infield grasses at intermediate heights will help to obscure the small mammal prey base that attracts raptors to the AOA.

Although lethal control of raptors is a measure of last resort, lethal control may be required if non-lethal means are ineffective. The County should obtain a federal migratory bird depredation permit for the lethal removal of a limited number of American kestrels and red-tailed hawks and renew the depredation permit annually.

Burrowing owls were observed on airfield property and in locations near aircraft movement areas. Burrowing owls can pose hazards to aircraft operation based on their location near aircraft movement areas and their low level of flight. In addition to eliminating ground squirrels, which provide habitat for burrowing owls, the County should work with the CDFW to relocate burrowing owls that are found within the AOA.

Management Control/Priority. One strike with a red-tailed hawk was reported in the FAA wildlife strike database for HMT. This strike caused minor damage to the aircraft. Raptors are known to pose a high risk to aircraft operations and were observed flying through or loafing within

the AOA. The overall priority associated with implementing or continuing these recommendations is ***critical***.

6.5.3 Doves and Pigeons

Doves and pigeons were the third most abundant guild observed during the assessment, comprising approximately 20 percent of the total number of birds observed. Doves and pigeons were observed throughout the airport property; doves were observed foraging and loafing in the infield grass, and pigeons were observed perching on utility lines and structures.

Maintaining infield grass at an intermediate height of 6 to 12 inches will make the airfield less attractive to doves and pigeons. To supplement habitat modification, doves and pigeons should be harassed using pyrotechnics when they are observed in the AOA. Pigeons and doves that do not respond positively from harassment efforts should be lethally removed. The County should obtain a federal depredation permit to provide lethal control of mourning doves. A permit is not required for the lethal control of pigeons.

Management Control/Priority. Pigeons and doves are present at the airport in close proximity to the runway and can pose a moderate risk due to their flocking behavior. No strikes at HMT were attributed to doves or pigeon. The priority associated with harassing doves and pigeons from the AOA is ***high***.

6.5.4 Starlings and Blackbirds

European starlings and blackbirds comprised approximately 20 percent of all birds observed. Starlings and blackbird species were observed in and around airfield structures and in the open grass areas adjacent to the AOA. Nearly all were observed during the six-month period from November through May.

If flocks of starlings and blackbirds are observed using the airfield, they should be harassed and dispersed using pyrotechnic devices, such as screamers and bangers. Lethal reinforcement may be necessary if starlings become habituated to pyrotechnics. A depredation permit is not required for the lethal control of the European starling, great-tailed grackle, and Brewer's blackbird. A depredation permit may be required if other blackbird species, such as red-winged blackbirds, require lethal control.

Management/Control Priority. Starlings and blackbirds can pose a significant hazard to aircraft because of their dense size and flocking behavior, and they have a high likelihood of being involved in strikes with aircraft. No strikes with starlings or blackbirds have been reported at HMT, but starlings and blackbirds were abundant on and near the airport. The overall priority associated with the control of starlings and blackbirds is ***high***.

6.5.5 Sparrows, Finches, and Warblers

Sparrows, finches, and warblers were observed throughout the 12-month monitoring period and comprised approximately 29 percent of the total number of birds observed. Members of this guild were observed near aircraft movement areas and in the short grass in the AOA. To make the airport less attractive to sparrows and finches, the grass should be maintained at an intermediate height of 6 to 12 inches. Pyrotechnics should be used to harass sparrows and finches when they are observed on the airport in and large flocks. Should any member of this guild become acclimated to harassment techniques, lethal reinforcement may be necessary in accordance with a federal depredation permit.

Management Control/Priority. The members of this guild have a moderate likelihood of being involved in a strike with aircraft and they usually cause a low impact on flight due to their behavior. However, sparrows and finches were abundant and observed frequently during the 12-month survey period and in close proximity to aircraft movement areas. No strikes with this group have been reported at HMT, but four strikes with unidentified small birds have been reported. The overall wildlife hazard risk posed by species within this guild is ***high***.

6.5.6 Waterfowl

Waterfowl accounted for approximately 3 percent of all birds observed, and the majority of the waterfowl was observed at off-site locations and at the adjacent residential pond at the Hemet West Mobile Estates. However, some waterfowl were observed flying across the AOA and critical airspace.

Waterfowl, specifically geese, are attracted to short-grass habitats for foraging and to long grass areas for nesting, such as vegetation observed near the residential ponds and agricultural areas. However, on-site vegetation must also be managed to discourage use by waterfowl. Maintaining an intermediate grass height of 6 to 12 inches can make the airfield less attractive to waterfowl. Pyrotechnics should be used to disperse waterfowl when it is observed on the airfield. If flocks of waterfowl are observed, a NOTAM should be issued for a defined period to alert aviators.

Control Measure/Priority. Waterfowl populations have increased substantially nationwide and are known to pose a critical risk to airport operations. No strikes with waterfowl have been reported at HMT, but waterfowl are known to pose a risk to airport operations. Any waterfowl observed within the AOA should be harassed immediately. The overall priority associated with these control measures is ***moderate***.

6.5.7 Songbirds

Songbirds accounted for approximately 14 percent of the total number of birds observed. The greatest number of songbirds was observed in the short vegetation that is located throughout the AOA. When large flocks of songbirds are present on the airfield, harassment should be performed using pyrotechnic devices, such as bird bangers or screamers. Maintaining grass

heights at an intermediate height of 6 to 12 inches would help reduce the presence of songbirds within the AOA.

Management/Control Priority. Songbirds have a moderate likelihood of being involved in a strike with aircraft, and most result in a low degree of impact on flight due to their size. No strikes have been reported with songbirds at HMT. The overall priority associated with the management of songbird species is ***moderate.***

6.5.8 Corvids

Corvids (crows and ravens) were observed foraging and flying throughout the AOA and near the airport. Corvids are attracted to refuse and carrion, and good housekeeping practices are essential. To prevent corvids from being attracted to the airport, all refuse should remain covered and removed regularly, and any carcasses or carrion should be removed immediately. Corvids should be harassed with pyrotechnics when they are observed within the AOA.

Management Control/Priority. Corvids pose moderate risks to aircraft operations due to their flocking behavior. No strikes with corvids have been reported at HMT. The overall priority associated with this control measure is ***moderate***.

6.5.9 Shorebirds

Shorebirds accounted for less than 1 percent of all birds observed during the assessment. Although most were observed from off-site monitoring locations, the shorebirds in these locations occur within the critical zone for wildlife hazards and are likely to pass through critical airspace. However, killdeer were observed within the AOA, and they should be harassed using pyrotechnics when observed.

Management Control/Priority. Shorebirds have a moderate likelihood of being involved in a strike with aircraft. No strikes with shorebirds have been reported at HMT. The priority with addressing their presence by harassment and removal techniques is ***low***.

6.5.10 Swallows

Swallows accounted for approximately one percent of the total number of birds observed. Most swallows were observed from off-site monitoring locations, but some were observed flying across aircraft movement areas and in the AOA. When large flocks of swallows are observed within the AOA, they should be dispersed using pyrotechnics. Any swallow nests observed on site should be removed in accordance with federal and state guidelines.

Control Measure/Priority. The members of this guild have a moderate likelihood of being involved in a strike with aircraft, and they can cause a moderate impact on flight due to their flocking behavior. No strikes with swallows have been recorded at HMT. The overall wildlife hazard risk posed by swallows is ***low.***

6.6 Summary

The recommendations presented in Chapters 5 and 6 of this report are intended to build upon the airport's ongoing efforts to manage wildlife hazards. **Table 6-2** summarizes and prioritizes these recommendations so that they may be considered in subsequent revisions to the Airport's WHMP.

Table 6-2. Summary of Integrated Wildlife Hazard Management Measures for Hemet-Ryan Airport

Management Measure	Description	Priority
Habitat Modification Measures		
Maintain on-site grass at an intermediate height	• Modify grass heights to 6 to 12 inches throughout the AOA to discourage hazardous wildlife from feeding or loafing within the AOA.	Critical
Provide ongoing fence maintenance and inspection	• Close gates securely. • Inspect fence regularly (at least weekly) to identify gaps, burrows, or holes. • Fill burrows and repair holes promptly. • Reduce gaps between fence posts and gates that are greater than 3 inches. • Reduce bottom gaps to less than 3 inches to prevent burrowing. • Consider installation of a buried skirt.	Critical
Use pyrotechnics for the non-lethal control of hazardous wildlife	• Obtain staff training to use pyrotechnic devices on airport property. • Incorporate the use of pyrotechnics to harass and disperse wildlife from the AOA.	High
Remove trees within the AOA	• Remove trees near the north hangars as they serve as an attractant to various species of birds.	High

Table 6-2. Summary of Integrated Wildlife Hazard Management Measures for Hemet-Ryan Airport

Management Measure	Description	Priority
View proposed projects and land use changes in the critical zone	• Airport Management/Wildlife Coordinator will review design plans for all on-site projects. • Work with City of Hemet and Riverside County Planning/Development staff to identify proposed projects that may attract hazardous wildlife to the airport vicinity. • If necessary, request help from a qualified biologist to review proposed designs and construction plans for their potential to create new wildlife attractants. • Consult with Riverside County MSHCP to explain obligations that prevent the creation of habitat conservation areas within airport boundaries.	Moderate
Monitor off-site facilities that attract hazardous wildlife to the airport vicinity	• Monitor off-site attractants to determine if hazardous wildlife at these locations has the potential to frequent or fly through the airport and associated airspace, such as the residential pond at the Hemet West Mobile Estates. • If attractants are identified, provide evidence to facility operators and consider feasible measures to reduce the presence of hazardous wildlife.	Moderate
Species-Specific Management Measures		
Mammals (Coyotes and California Ground Squirrels)	• Monitor the perimeter fence weekly for the presence of gaps, holes, or burrows, and repair or fill gaps quickly. • Harass using pyrotechnics when in the AOA. • Obtain a depredation permit from the California Department of Fish and Wildlife for the lethal management of coyotes. • Work with USDA-WS to initiate a lethal control program for ground squirrels and coyotes.	Critical

Table 6-2. Summary of Integrated Wildlife Hazard Management Measures for Hemet-Ryan Airport

Management Measure	Description	Priority
Raptors	• Harass using pyrotechnics when in the AOA. • Maintain intermediate grass heights to reduce prey base of small mammals. • Maintain federal depredation permit for American kestrel and red-tailed hawk. • Consult and work with USDA-Wildlife Services and USFWS, as necessary, to relocate burrowing owls from the AOA.	Critical
Dove and Pigeons	• Maintain an intermediate grass height of 6 to 12 inches to make the AOA less attractive to mourning doves. • Harass doves and pigeons using pyrotechnics when they are observed in the AOA. • Obtain a federal depredation permit for mourning doves. • Use lethal techniques as reinforcement. • Remove trees within the AOA (see habitat modification measures).	High
Starlings and Blackbirds	• Harass using pyrotechnics when in the AOA. • Use lethal control as reinforcement to manage European starlings.	High
Sparrows, Finches, and Warblers	• Maintaining intermediate grass heights will make AOA less attractive to sparrows and finches. • Harass using pyrotechnics when observed in large flocks within the AOA.	High
Waterfowl	• Harass using pyrotechnics when in AOA. • Issue NOTAM when large flocks are observed near the airport.	Moderate
Songbirds	• Maintain an intermediate grass height of 6 to 12 inches to make AOA less attractive to songbirds. • Harass using pyrotechnics when in the AOA.	Moderate
Corvids	• Securely cover waste collection containers and empty regularly. • Remove carrion on and near the airport as quickly as possible. • Harass using pyrotechnics when observed in the AOA.	Moderate

Table 6-2. Summary of Integrated Wildlife Hazard Management Measures for Hemet-Ryan Airport

Management Measure	Description	Priority
Shorebirds	• Harass using pyrotechnics when observed in AOA. • Issue a NOTAM during migratory periods or when shorebirds are observed on or near the airfield.	Low
Swallows	• Harass using pyrotechnics when observed in large flocks within the AOA. • Remove on-site nests in accordance with federal and state regulations.	Low

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Chapter 7

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Appendix A. FAR Part 139.337, “Wildlife Hazard Management”

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(1) Two-way radio communications between each pedestrian or vehicle and the tower;

(2) An escort with two-way radio communications with the tower accompanying any pedestrian or vehicle without a radio; or

(3) Measures authorized by the Administrator for controlling pedestrians and vehicles, such as signs, signals, or guards, when it is not operationally practical to have two-way radio communications between the tower and the pedestrian, vehicle, or escort;

(d) When an air traffic control tower is not in operation, or there is no air traffic control tower, provide adequate procedures to control pedestrians and ground vehicles in movement areas or safety areas through two-way radio communications or prearranged signs or signals;

(e) Ensure that each employee, tenant, or contractor is trained on procedures required under paragraph (b) of this section, including consequences of noncompliance, prior to moving on foot, or operating a ground vehicle, in movement areas or safety areas; and

(f) Maintain the following records:

(1) A description and date of training completed after June 9, 2004 by each individual in compliance with this section. A record for each individual must be maintained for 24 consecutive months after the termination of an individual's access to movement areas and safety areas.

(2) A description and date of any accidents or incidents in the movement areas and safety areas involving air carrier aircraft, a ground vehicle or a pedestrian. Records of each accident or incident occurring after the June 9, 2004 must be maintained for 12 consecutive calendar months from the date of the accident or incident.

§ 139.331 Obstructions.

In a manner authorized by the Administrator, each certificate holder must ensure that each object in each area within its authority that has been determined by the FAA to be an obstruction is removed, marked, or lighted, unless determined to be unnecessary by an FAA aeronautical study. FAA Advisory Circulars contain methods and procedures for the lighting of obstructions that are acceptable to the Administrator.

§ 139.333 Protection of NAVAIDS.

In a manner authorized by the Administrator, each certificate holder must—

(a) Prevent the construction of facilities on its airport that, as determined by the Administrator, would derogate the operation of an electronic or visual NAVAID and air traffic control facilities on the airport;

(b) Protect—or if the owner is other than the certificate holder, assist in protecting—all NAVAIDS on its airport against vandalism and theft; and

(c) Prevent, insofar as it is within the airport's authority, interruption of visual and electronic signals of NAVAIDS.

§ 139.335 Public protection.

(a) In a manner authorized by the Administrator, each certificate holder must provide—

(1) Safeguards to prevent inadvertent entry to the movement area by unauthorized persons or vehicles; and

(2) Reasonable protection of persons and property from aircraft blast.

(b) Fencing that meets the requirements of applicable FAA and Transportation Security Administration security regulations in areas subject to these regulations is acceptable for meeting the requirements of paragraph (a)(l) of this section.

§ 139.337 Wildlife hazard management.

(a) In accordance with its Airport Certification Manual and the requirements of this section, each certificate holder must take immediate action to alleviate wildlife hazards whenever they are detected.

(b) In a manner authorized by the Administrator, each certificate holder must ensure that a wildlife hazard assessment is conducted when any of the following events occurs on or near the airport:

(1) An air carrier aircraft experiences multiple wildlife strikes;

(2) An air carrier aircraft experiences substantial damage from striking wildlife. As used in this paragraph, substantial damage means damage or

structural failure incurred by an aircraft that adversely affects the structural strength, performance, or flight characteristics of the aircraft and that would normally require major repair or replacement of the affected component;

(3) An air carrier aircraft experiences an engine ingestion of wildlife; or

(4) Wildlife of a size, or in numbers, capable of causing an event described in paragraphs (b)(1), (b)(2), or (b)(3) of this section is observed to have access to any airport flight pattern or aircraft movement area.

(c) The wildlife hazard assessment required in paragraph (b) of this section must be conducted by a wildlife damage management biologist who has professional training and/or experience in wildlife hazard management at airports or an individual working under direct supervision of such an individual. The wildlife hazard assessment must contain at least the following:

(1) An analysis of the events or circumstances that prompted the assessment.

(2) Identification of the wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences.

(3) Identification and location of features on and near the airport that attract wildlife.

(4) A description of wildlife hazards to air carrier operations.

(5) Recommended actions for reducing identified wildlife hazards to air carrier operations.

(d) The wildlife hazard assessment required under paragraph (b) of this section must be submitted to the Administrator for approval and determination of the need for a wildlife hazard management plan. In reaching this determination, the Administrator will consider—

(1) The wildlife hazard assessment;

(2) Actions recommended in the wildlife hazard assessment to reduce wildlife hazards;

(3) The aeronautical activity at the airport, including the frequency and size of air carrier aircraft;

(4) The views of the certificate holder;

(5) The views of the airport users; and

(6) Any other known factors relating to the wildlife hazard of which the Administrator is aware.

(e) When the Administrator determines that a wildlife hazard management plan is needed, the certificate holder must formulate and implement a plan using the wildlife hazard assessment as a basis. The plan must—

(1) Provide measures to alleviate or eliminate wildlife hazards to air carrier operations;

(2) Be submitted to, and approved by, the Administrator prior to implementation; and

(3) As authorized by the Administrator, become a part of the Airport Certification Manual.

(f) The plan must include at least the following:

(1) A list of the individuals having authority and responsibility for implementing each aspect of the plan.

(2) A list prioritizing the following actions identified in the wildlife hazard assessment and target dates for their initiation and completion:

(i) Wildlife population management;

(ii) Habitat modification; and

(iii) Land use changes.

(3) Requirements for and, where applicable, copies of local, State, and Federal wildlife control permits.

(4) Identification of resources that the certificate holder will provide to implement the plan.

(5) Procedures to be followed during air carrier operations that at a minimum includes—

(i) Designation of personnel responsible for implementing the procedures;

(ii) Provisions to conduct physical inspections of the aircraft movement areas and other areas critical to successfully manage known wildlife hazards before air carrier operations begin;

(iii) Wildlife hazard control measures; and

(iv) Ways to communicate effectively between personnel conducting wildlife control or observing wildlife hazards and the air traffic control tower.

(6) Procedures to review and evaluate the wildlife hazard management plan every 12 consecutive months or following an event described in paragraphs (b)(1), (b)(2), and (b)(3) of this section, including:

(i) The plan's effectiveness in dealing with known wildlife hazards on and in the airport's vicinity and

(ii) Aspects of the wildlife hazards described in the wildlife hazard assessment that should be reevaluated.

(7) A training program conducted by a qualified wildlife damage management biologist to provide airport personnel with the knowledge and skills needed to successfully carry out the wildlife hazard management plan required by paragraph (d) of this section.

(g) FAA Advisory Circulars contain methods and procedures for wildlife hazard management at airports that are acceptable to the Administrator.

§ 139.339 Airport condition reporting.

In a manner authorized by the Administrator, each certificate holder must—

(a) Provide for the collection and dissemination of airport condition information to air carriers.

(b) In complying with paragraph (a) of this section, use the NOTAM system, as appropriate, and other systems and procedures authorized by the Administrator.

(c) In complying with paragraph (a) of this section, provide information on the following airport conditions that may affect the safe operations of air carriers:

(1) Construction or maintenance activity on movement areas, safety areas, or loading ramps and parking areas.

(2) Surface irregularities on movement areas, safety areas, or loading ramps and parking areas.

(3) Snow, ice, slush, or water on the movement area or loading ramps and parking areas.

(4) Snow piled or drifted on or near movement areas contrary to §139.313.

(5) Objects on the movement area or safety areas contrary to §139.309.

(6) Malfunction of any lighting system, holding position signs, or ILS critical area signs required by §139.311.

(7) Unresolved wildlife hazards as identified in accordance with §139.337.

(8) Nonavailability of any rescue and firefighting capability required in §§139.317 or 139.319.

(9) Any other condition as specified in the Airport Certification Manual or that may otherwise adversely affect the safe operations of air carriers.

(d) Each certificate holder must prepare and keep, for at least 12 consecutive calendar months, a record of each dissemination of airport condition information to air carriers prescribed by this section.

(e) FAA Advisory Circulars contain methods and procedures for using the NOTAM system and the dissemination of airport information that are acceptable to the Administrator.

§ 139.341 Identifying, marking, and lighting construction and other unserviceable areas.

(a) In a manner authorized by the Administrator, each certificate holder must—

(1) Mark and, if appropriate, light in a manner authorized by the Administrator—

(i) Each construction area and unserviceable area that is on or adjacent to any movement area or any other area of the airport on which air carrier aircraft may be operated;

(ii) Each item of construction equipment and each construction roadway, which may affect the safe movement of aircraft on the airport; and

(iii) Any area adjacent to a NAVAID that, if traversed, could cause derogation of the signal or the failure of the NAVAID; and

(2) Provide procedures, such as a review of all appropriate utility plans prior to construction, for avoiding damage to existing utilities, cables, wires, conduits, pipelines, or other underground facilities.

(b) FAA Advisory Circulars contain methods and procedures for identifying and marking construction areas that are acceptable to the Administrator.

§ 139.343 Noncomplying conditions.

Unless otherwise authorized by the Administrator, whenever the requirements of subpart D of this part cannot be met to the extent that uncorrected unsafe conditions exist on the airport, the certificate holder must limit air carrier operations to those portions of the airport not rendered unsafe by those conditions.

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Appendix B. FAA AC 150/5200-36A, “Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports”

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U.S. Department
of Transportation
Federal Aviation Administration

Advisory Circular

Subject: Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports

Date: 01/31/2012 **AC No:** 150/5200-36A
Initiated by: AAS-300 **Change:**

1. Purpose.

This Advisory Circular (AC) has two purposes. First, this AC describes the qualifications for wildlife biologists who conduct Wildlife Hazard Assessments (WHA) for airports certificated under Title 14, Code of Federal Regulations, Part 139 (14 CFR Part 139), and at non-certificated airports funded by a Federal Aviation Administration (FAA) Airport Improvement Program (AIP) or Passenger Facility Charge (PFC) Program. We recommend that airports, at a minimum, consult with a qualified airport wildlife biologist when developing a Wildlife Hazard Management Plan (WHMP). However, airports are not required to do so.

Second, this AC addresses the minimum wildlife hazard management curriculum for the initial and recurrent training of airport personnel who implement an FAA-approved WHMP.

2. Applicability.

The standards and practices in this AC for public-use airports and for those who conduct Wildlife Hazard Assessments and conduct required training are:

a. Mandatory for airports certificated under Title 14, Code of Federal Regulations, Part 139 (14 CFR Part 139).

b. Mandatory for airports that have accepted AIP or the Passenger Facility Charge (PFC) Program funds.

c. Highly recommended for all other airports that independently fund Wildlife Hazard Assessments.

See Grant Assurance No. 34, Policies, Standards, and Specifications, and PFC Assurance No. 9, Standards and Specifications.

3. Cancellation.

This AC cancels AC 150/5200-36, Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports, dated June 28, 2006.

4. Background.

Wildlife biologists conducting Wildlife Hazard Assessments or training airport personnel actively involved in implementing FAA-approved Wildlife Hazard Management Plans at certificated airports must have professional training and experience in wildlife hazard management at airports [§139.337(c) and (f)(7)]. Airport personnel actively involved in overseeing or implementing FAA-approved Wildlife Hazard Management Plans must receive initial training and recurrent training every 12 consecutive months [§139.303(c) and (e) (Personnel)].

5. Related Reading Material.

Please review the most recent versions of the following documents:

a. FAA AC 150/5200-18, Airport Safety Self-Inspection.

b. FAA AC 150/5200-32, Reporting Wildlife Aircraft Strikes.

c. FAA AC 150/5200-33, Hazardous Wildlife Attractions On or Near Airports.

d. FAA AC 150/5200-34, Construction or Establishment of Landfills Near Public Airports.

e. FAA AC 150/5210-20 Ground Vehicle Operations on Airports

f. FAA AC 150/5220-25 Airport Avian Radar Systems

g. FAA AC 150/5300-13 Airport Design

h. FAA AC 150/5340-1K Standards for Airport Markings

i. FAA AC 150/5340-18F Standards for Airport Sign Systems

j. FAA Office of Safety and Standards, Certalert no. 98-05, Grasses Attractive to Hazardous Wildlife.

k. FAA Office of Safety and Standards, Certalert no. 04-09, Relationship Between FAA and WS.

l. FAA Office of Safety and Standards, Certalert no. 04-16, Deer Hazard to Aircraft and Deer Fencing.

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q. Report to Congress: Potential Hazards to Aircraft by Locating Waste Disposal Sites in the Vicinity of Airports, April 1996, DOT/FAA/AS/96-1.

r. Title 14, Code of Federal Regulation, Part 139, Certification of Airports.

s. Title 40, Code of Federal Regulation, Part 258, Criteria for Municipal Solid Waste Landfills.

t. FAA Grant Assurance No. 34, Policies, Standards, and Specifications

u. FAA Passenger Facility Charge (PFC) Assurance No. 9, Standards and Specifications

v. Aeronautical Information Manual (AIM)

Some of these documents and other information on wildlife management, including FAA Certalerts and guidance on siting hazardous wildlife attractants such as landfills, are available on the FAA website at http://www.faa.gov/airports/ and http://wildlife.faa.gov/.

6. Professional Qualifications of Wildlife Biologists Conducting Wildlife Hazard Assessments and Wildlife Hazard Management Training at FAA Certificated Airports.

a. Wildlife biologists conducting airport Wildlife Hazard Assessments must meet certain education, training, and experience standards.

> §139.337(c) reads: Wildlife Hazard Assessment required in paragraph (b) of this section shall be conducted by a wildlife damage management biologist who has professional training and/or experience in wildlife hazard management at airports or an individual working under direct supervision of such an individual.

b. Airports with a FAA-approved Wildlife Hazard Management Plan must provide employees the training needed to carryout the Plan.

> §139.337(f)(7) reads: A training program conducted by a qualified wildlife damage management biologist to provide airport personnel with the knowledge and skills needed to successfully carry out the Wildlife Hazard Management Plan required by paragraph (d) of this section.

c. To meet the requirements of §139.337(c) and (f)(7), a wildlife damage management biologist (from now on referred to as a "qualified airport wildlife biologist") must:

(1) Have the necessary academic coursework from accredited institutions and work experience to meet the qualifications of a GS-0486 series wildlife biologist as defined by the U.S. Office of Personnel Management classification standards (Appendix A) **or** be designated as a Certified Wildlife Biologist by The Wildlife Society (http://www.wildlife.org) **and,**

(2) Have taken and passed an airport wildlife hazard management training course acceptable to the FAA Administrator (Appendix C), **and**;

(3) While working under the direct supervision of a qualified airport wildlife biologist, have conducted at least one Wildlife Hazard Assessment acceptable to the FAA Administrator (as described in §139.337(c)). **and,**

(4) Have successfully completed at least one of the following within five years of their initial FAA approved airport wildlife hazard management training course, and every five years thereafter:

(i) An airport wildlife hazard management training course that is acceptable to the FAA Administrator (Appendix C) **or**,

(ii) Attendance, as a registered participant, at a joint Bird Strike Committee–USA/Bird Strike Committee–Canada annual meeting **or**,

(iii) Other training acceptable to the FAA Administrator.

d. Individuals who work under the direct supervision of a qualified airport wildlife biologist are allowed to conduct Wildlife Hazard Assessments if the airport sponsor and the qualified airport wildlife biologist agree in writing to determine how the qualified airport wildlife biologist will:

(1) Supervise how the individual(s) will conduct the Wildlife Hazard Assessment; and

(2) Report progress of the Wildlife Hazard Assessment; and

(3) Supervise the Wildlife Hazard Assessment report production.

e. Certificate Holders or Airport Sponsors must obtain documentation verifying the qualifications outlined in c (1) – (3) above of any person(s) conducting wildlife hazard assessments or providing requisite training

7. Initial and Recurrent Training for Airport Personnel Actively Involved in Managing Hazardous Wildlife On or Near Airports.

a. Personnel actively involved in implementing FAA-approved Wildlife Hazard Management Plans are subject to the requirements of 14 CFR Part 139.303. §139.303 requires a specific training regimen for all airport personnel. §139.303(c) and (e) require the holder of an Airport Operating Certificate issued under Part 139 to provide initial training and, every 12 months thereafter, recurrent training in wildlife hazard management to airport personnel actively involved in implementing FAA-approved Wildlife Hazard Management Plans. The required training must include "Any additional subject areas required under … §139.337" [§139.303(c)(5)] and, "As appropriate, comply with the following training requirements of this part … §139.337, Wildlife Hazard Management" [§139.303(e)(5)].

b. Appendix D outlines the minimum training requirements for airport personnel who carry out an airport's Wildlife Hazard Management Plan. Depending on local wildlife and environmental issues, additional topics or more in-depth coverage of listed topics might be needed.

c. §139.337(f)(1) requires the Wildlife Hazard Management Plan to include a list of the individuals having authority and responsibility for implementing each aspect of the plan. This list identifies the individuals who must complete the required training.

d. §139.337(f) does not prohibit holders of Airport Operating Certificates from using a "train-the-trainer" approach when providing the requisite training, provided the trainers receive and successfully complete their initial and recurrent training from a qualified airport wildlife

biologist. Trainers who are not qualified airport wildlife biologists are limited to providing training to their airport employees.

e. Holders of Airport Operating Certificates issued under Part 139 are required to make and keep records of all training for airport personnel involved in controlling wildlife hazards for at least 24 consecutive calendar months.[§139.301(b)(1) and §139.303(d)].

Michael J. O'Donnell
Director, Office of Airport Safety and Standards

Appendix A.

U.S. Office of Personnel Management Qualification Standards for GS-0486 Series Wildlife Biologists.

To be qualified as a GS-0486 series wildlife biologist, a candidate must have the following:

1. A degree in biological science that includes—

a. At least nine semester hours in such wildlife subjects as mammalogy, ornithology, animal ecology, and wildlife management or research courses in the field of wildlife biology; **and**

b. At least 12 semester hours in zoology in such subjects as general zoology, invertebrate zoology, vertebrate zoology, comparative anatomy, physiology, genetics, ecology, cellular biology, parasitology, and entomology or research courses in these subjects (excess courses in wildlife biology may be used to meet the zoology requirements where appropriate); **and**

c. At least nine semester hours in botany or the related plant sciences; **or**

2. A combination of education and experience equivalent to a major in biological science (i.e., at least 30 semester hours), with at least nine semester hours in wildlife subjects, 12 semester hours in zoology, and nine semester hours in botany or related plant science, as shown in Paragraph 1 above, plus appropriate experience or additional education; **or**

3. Be designated as a Certified Wildlife Biologist by The Wildlife Society (http://www.wildlife.org).

Appendix B.

Training Resource Requirements and Instructor Qualifications.

The following training resource requirements and instructor qualifications are for any individual wishing to:

- Provide an airport wildlife hazard management course acceptable to the FAA Administrator, for personnel conducting Wildlife Hazard Assessments; or

- Provide training to airport personnel actively involved in implementing FAA approved Wildlife Hazard Management Plans.

1. Training Resources and Requirements.

a. A list of training program providers acceptable to the FAA Administrator can be found on the FAA's wildlife strike website: http://wildlife.faa.gov/.

b. Links to the most recent versions of FAA regulations, FAA Advisory Circulars, Certalerts, and other documents relevant to wildlife hazard management issues can be found at http://www.faa.gov/airports/ and http://wildlife.faa.gov/.

c. Those proposing to establish a program to train qualified airport wildlife biologists to meet the requirements of 14 CFR §139.337 must submit a complete training syllabus and instructor resume to the FAA. The syllabus must include all lesson plans, student handouts, and graphic presentations that include as a minimum all curriculum provided in Appendix C. Submit the materials to:

FAA National Wildlife Biologist, AAS-300
Office of Airport Safety and Standards
Federal Aviation Administration,
800 Independence Ave SW
Washington DC 20591

d. The goal of the training must be to provide the knowledge, skills, and abilities needed by a GS-0486 wildlife biologist to conduct Wildlife Hazard Assessments [§139.337(c)] and to conduct wildlife hazard training [§139.337(f)(7)]. To be acceptable to the FAA, the course must be at least 24 hours in length and include the curriculum items listed in Appendix C.

2. Instructor Qualifications.

The lead instructor for the training should:

a. Be a qualified airport wildlife biologist.

b. Have academic credits in education or instructor/teaching experience.

c. Have a minimum of 2 years experience in all aspects of managing hazardous wildlife on or near airports.

Appendix C.

Training Curriculum Outline for Any Individual Wishing to Provide an Airport Wildlife Hazard Management Course Acceptable to the FAA Administrator, for Personnel Conducting Wildlife Hazard Assessments.

1. Training Curriculum Outline.

The goal of the training must be to provide the knowledge, skills, and abilities needed by a GS-0486 wildlife biologist to conduct Wildlife Hazard Assessments [§139.337(c)] and to conduct wildlife hazard training [§139.337(f)(7)]. To be acceptable to the FAA, the course must be at least 24 hours in length and include the curriculum items listed below.

- **a.** Training goals and process
- **b.** Airport familiarization
  - (1) Introduction to the National Plan of Integrated Airport Systems
  - (2) Airport design and layout (AC 150/5300-13 Airport Design)
  - (3) Navigation aids and Air Traffic Control (Aeronautical Information Manual [AIM])
  - (4) Airport operations and safety (AIM)
  - (5) Signs, marking, and lighting (AC 150/5340-1K Standards for Airport Markings and AC 150/5340-18F Standards for Airport Sign Systems)
  - (6) Ground vehicle operator communication (AC 150/5210-20 Ground Vehicle Operations on Airports)
- **c.** Aircraft familiarization
  - (1) Physics of a strike
  - (2) Aircraft nomenclature
  - (3) Civil aviation aircraft categories
  - (4) Aircraft engines
    - (a) Reciprocating
    - (b) Turbo
  - (5) Aircraft certification standards
- **d.** Preview of wildlife hazards to aviation
  - (1) History of major strikes
  - (2) Aviation losses
    - (a) Worldwide
    - (b) United States
- **e.** Controlling laws, regulations, and policies
  - (1) Migratory Bird Treaty Act of 1918, as amended

(2) Animal Damage Control Act of 1931, as amended

(3) Bald Eagle Protection Act of 1940, as amended

(4) Federal Insecticide, Fungicide, and Rodenticide Act of 1948, as amended

(5) National Environmental Policy Act of 1969, as amended

(6) Endangered Species Act of 1973, as amended

(7) Title 14, Code of Federal Regulation, Part 139, Certification of Airports

(8) Title 40, Code of Federal Regulations, Part 258, Criteria for Municipal Solid Waste Landfills

(9) Title 50, Code of Federal Regulations, Parts 1–199, Wildlife Management

(10) Wendell H. Ford Aviation Investment and Reform Act for the 21st Century, Pub. L. No. 106–181 (April 5, 2000), "Structures Interfering with Air Commerce," section 503

(11) Applicable FAA ACs in the 150/5200 series about Airport Wildlife Hazard Management

(12) Applicable FAA Airport Certalerts

(13) Applicable state and local laws, regulations, and ordinances

f. Department of Defense requirements and perspective on military/civilian joint-use airports

g. Other Federal and State agency roles and responsibilities

(1) U.S. Department of Interior, Fish and Wildlife Service

(a) Role and responsibilities related to managing problem wildlife

(b) Migratory Bird Depredation Permits

(c) Salvage Permits

(2) U.S. Department of Agriculture, Wildlife Services

(a) Role and responsibilities related to managing problem wildlife

(3) Other agencies

(a) U.S. Environmental Protection Agency

(i) Siting landfills

(ii) Pesticide registration and use

(b) U.S. Army Corps of Engineers

(i) Wetlands mitigation

(4) Multi-Federal Agency Memorandum of Agreement

(5) Applicable State wildlife regulations

h. FAA National Wildlife Aircraft Strike Database

(1) Strike reporting

(2) Species identification and feather identification

(3) Database access

i. Environmental issues—working with Federal and State agencies

(1) National Environmental Policy Act

(2) U.S. Army Corps of Engineers (wetland loss and mitigation issues)

j. Initial consultations and Wildlife Hazard Assessments (WHAs)

(1) Triggering events for WHAs

(2) Duration and contents of WHAs

(3) Wildlife surveys at airports to assess wildlife hazards

(4) Data analysis and presentation of results

(5) Writing a WHA

k. FAA review of a WHA and determination of need for a Wildlife Hazard Management Plan (WHMP)

l. Drafting and carrying out integrated WHMPs

(1) Contents of WHMPs

(2) FAA review of WHMPs

(3) Endangered Species Act compliance

(4) National Environmental Policy Act review

m. Integrated wildlife hazard management for airports; survey of basic control strategies and tactics

(1) Flight schedule modification

(2) Habitat modification and exclusion

(3) Wildlife dispersal techniques

(4) Wildlife population management

n. Addressing off-airport attractants and community planning and involvement

o. Outline of field trip (to conduct a “mini” WHA)

p. Field trip/site visit

q. Final exam

r. Post exam review

s. Course evaluation

t. Presentation of certificates

2. Recommendations.

a. Exams or tests may be oral, written, practical demonstrations, or a combination of each.

b. Passing grade/evaluation should be recorded and retained as instructor's records.

c. Instructors should retain course attendance records for a period of three years.

Appendix D.

Training Curriculum Outline for Airport Personnel Actively Involved in Implementing FAA-Approved Wildlife Hazard Management Plans.

1. Training Curriculum Outline.

The goal of the training course must be to provide the knowledge, skills, and abilities needed by airport personnel to safely, accurately, and effectively implement relevant portions of an FAA-approved Wildlife Hazard Management Plan. To be acceptable to the FAA, initial and recurrent training must include the following agenda items:

a. General survey of wildlife hazards to aviation based on the most recent annual FAA National Wildlife Strike Database Serial Report

b. Review of wildlife strikes, control actions, and observations at the airport over at least the past 12 months

c. Review of the airport's Wildlife Hazard Assessment is to include—

(1) Existing wildlife hazards and trends in wildlife abundance

(2) Status of any open or unresolved recommended action items for reducing identified wildlife hazards to air carrier operations within the past 12 months

d. Review of the airport's Wildlife Hazard Management Plan, to include the following:

(1) Airport-specific wildlife attractants, including man-made and natural features and habitat management practices of the last 12 months.

(2) Review of the airport's wildlife permits (local, State, and Federal)

(3) Review of other airport-specific items:

(a) Wildlife hazard management strategies, techniques, and tools:

(i) Flight schedule modification

(ii) Habitat modification, exclusion

(iii) Repelling methods

(iv) Wildlife population management

(b) Responsibilities of airport personnel for—

(i) Reporting wildlife strikes, control actions, and wildlife observations

(ii) Communicating with personnel who conduct wildlife control actions or who see wildlife hazards and air traffic control tower personnel and others who may require notification, such as airport operations or maintenance departments

(iii) Documenting and reporting wildlife hazards seen during patrols and inspections and follow-up control efforts

(iv) Documenting and reporting when no hazards are seen during patrols and inspections

e. Basic bird and mammal identification, stressing local hazardous and rare or endangered species of concern

f. For any airport personnel using pyrotechnic launchers or firearms, training on the following topics from a qualified individual[2]:

(1) Safety, parts, and operation of pyrotechnic launchers

(2) Fundamentals of using pyrotechnics to safely and effectively disperse wildlife

(3) Personnel protective equipment

(4) Cleaning, storage, and transport of firearms and pyrotechnic launchers

(5) Applicable local, State, and Federal regulations on firearms, pyrotechnic launchers, and pyrotechnics[3]

(6) Live fire training with pyrotechnic launchers including strategies for dispersing wildlife away from runways and aircraft movement corridors

(7) For any airport personnel using firearms, live fire training. This training is highly recommended from a qualified individual but not a requirement for this training program[2].

g. Any other training required by local, State, or Federal regulations

2. Recommendations.

a. Exams or tests may be oral, written, practical demonstrations, or a combination of all three.

b. The Trainer should retain passing grades/evaluations records.

c. The Trainer should retain course attendance records for a period of three years.

d. Airport personnel responsible for the airport's wildlife hazard management program should retain records of those to whom instruction in airport wildlife hazard management has been given for the period of time during which the employees conduct hazardous wildlife management activity on the airport and for six months after termination of employment.

---

[2] State Certificated Hunter Safety Instructors, police officers, firearms instructors and other personnel who have been professionally trained in firearms safety should be qualified to teach firearm safety and possibly the safe use of pyrotechnic launchers. Pyrotechnics are classified as high explosives by the Bureau of Alcohol Tobacco and Firearms (ATF) and as Division 1.4 explosives by the U.S. Department of Transportation. There are numerous regulations, security considerations, and ATF licensing requirements that apply to pyrotechnics.

[2] Airport personnel actively involved with the use of firearms for the mitigation of wildlife hazards should receive and maintain current firearms training from either a licensed National Rifle Association (NRA) instructor or other qualified individual. This training should include type and caliber of weapon used at the airport.

[3] Bureau of Alcohol, Tobacco and Firearms provides information on Federal explosive requirements for explosive pest control devices at: http://www.atf.gov/explosives/how-to/documents/epcd-flyer.pdf.

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Appendix C. Author Accreditation

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Qualified Wildlife Biologist

In accordance with Title 14 of the Code of Regulations (CFR) Part 139.337 (c), "Wildlife Hazard Management," the Wildlife Hazard Assessment for the Jacqueline Cochran Regional Airport was performed under the supervision of Mr. Rick Jones, CWB® an FAA-qualified Airport Wildlife Biologist, who prepared the Wildlife Hazard Assessment Report.

Mr. Jones meets all requirements set forth in FAA Advisory Circular 150.5200-36A, "Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports." Mr. Jones has attended training in wildlife hazard management presented by Embry Riddle Aeronautical University and appears on the University's published "Qualified Airport Wildlife Biologist Listing."

Mr. Jones has completed numerous Wildlife Hazard Assessments, Wildlife Hazard Management Plans, and Wildlife Hazard Site Visits nationwide to the satisfaction of the Federal Aviation Administration as shown in **Table C-1.**

Table C-1
Wildlife Hazard Management Projects
Completed and FAA-Approved Projects by Rick Jones, Mead & Hunt Inc.

Alaska	
Gustavus Airport	Wildlife Hazard Site Visit (2015)
Petersburg Airport	Wildlife Hazard Site Visit (2015)
Wrangell Airport	Wildlife Hazard Site Visit (2015)
California	
Brackett Field	Wildlife Hazard Assessment (2014)
Cable Airport	Wildlife Hazard Assessment (2014)
Camarillo	Wildlife Hazard Assessment (2014)
Chino Airport	Wildlife Hazard Assessment (2014)
El Monte Airport	Wildlife Hazard Assessment (2014)
Fresno-Yosemite International Airport	Wildlife Hazard Management Plan (2013)
Fullerton Municipal Airport	Wildlife Hazard Assessment (2014)
Hawthorne Municipal Airport	Wildlife Hazard Assessment (2014)
Hayward Executive Airport	Wildlife Hazard Assessment (2014)
Livermore Municipal Airport	Wildlife Hazard Assessment (2013) Wildlife Hazard Management Plan (2014)
Los Angeles Whiteman Airport	Wildlife Hazard Assessment (2014)
Palo Alto Airport	Wildlife Hazard Assessment (2014)
Riverside Municipal Airport	Wildlife Hazard Assessment (2014)
Salinas Municipal Airport	Wildlife Hazard Assessment (2014)
San Carlos Airport	Wildlife Hazard Assessment (2014)
Watsonville Municipal Airport	Wildlife Hazard Assessment (2014)
William J. Fox Field	Wildlife Hazard Assessment (2014)
Colorado	
Cortez Municipal Airport	Wildlife Hazard Assessment (2013) Wildlife Hazard Management Plan (2013)
Pueblo Municipal Airport	Wildlife Hazard Assessment (2013) Wildlife Hazard Management Plan (2013)
Yampa Valley Regional Airport	Wildlife Hazard Assessment (2012) Wildlife Hazard Management Plan (2012)
Idaho	
Sandpoint Airport	Wildlife Hazard Site Visit (2014)
Montana	
Sherwood Airport	Wildlife Hazard Site Visit (2014)

New Mexico	
Four Corners Regional Airport	Wildlife Hazard Assessment (2012) Wildlife Hazard management Plan (2012)
Oregon	
Crater Lake – Klamath Regional Airport	Wildlife Hazard Management Plan (2014)
Scappoose Industrial Business Park/Port of St. Helens	Wildlife Hazard Site Visit (2014)
Eastern Oregon Regional Airport	Wildlife Hazard Site Visit (2015)
Texas	
Dallas Executive Airport	Wildlife Hazard Assessment (2015) Wildlife Hazard Management Plan (2015)
Denton Municipal Airport	Wildlife Hazard Assessment (2013)
Lone Star Executive Airport	Wildlife Hazard Assessment (2013)
Washington	
Auburn Municipal Airport	Wildlife Hazard Assessment (2015) Wildlife Hazard Management Plan (2015)

PRESCOTT
ARIZONA

SEARCH

Qualified Airport Wildlife Biologist Listing

Individuals appearing on these lists have satisfactorialy demonstrated to Embry-Riddle Aeronautical University they possess the required education and experience as stipulated under FAA Advisory Circular 150/5200-36A to be classified as a "qualified airport wildlife biologist".

FAA A/C 150/5200-36A

Qualified Wildlife Biologist Application

Applicants who already meet the qualifications spelled out in FAA Advisory Circular 150/5200-36A regarding educational, training, and approved FAA wildlife assessment may apply to be added to the list below. This application should NOT be submitted if any of the requirements have not been met. Application

Important Information

Embry-Riddle Aeronautical University is providing this list as a service to the Aviation Community to identify individuals that have satisfactorily demonstrated they possess the required education and experience related credentials to be classified as a "qualified airport wildlife biologist" as stipulated in FAA Advisory Circular 150/5200-36. Embry-Riddle Aeronautical University in no way endorses or recommends, implied or otherwise, any individual or business contained on this list. Only information necessary to verify credentials and basic contact information have been collected. Individuals and/or businesses appearing on this list have paid a Verification Process Application fee. No individual or business appearing on this list has been required to attend Embry-Riddle Aeronautical University or it's related training programs.

Qualified Biologists (Listed alphabetically by last name)

Amy L. **Anderson** Senior Environmental Scientist 1597 The Greens Way, Suite 200 Jacksonville Beach, FL 32250 Phone: (904) 285-1397 Email: aanderson@ersenvironmental.com Website: http://www.ersenvironmental.com	Bill (William) **Antonides** Qualified Airport Wildlife Biologist Gander Island Consulting Service, Inc. 514 N. Arch Street Aberdeen, SD 57401-2951 Phone: (605) 380-8586 Email: billantonides@gmail.com
Nick **Atwell** Aviation Wildlife Manager Portland International Airport 7200 NE Airport Way Portland, OR 97218 Phone: (503) 415-6179 (office) Cell: (503) 807-4585 Email: nick.atwell@portofportland.com	Daniel W. (Bill) **Baber**, Ph.D ICF International 317 SW Alder Street, Suite 800 Portland, OR 97204 Phone: 503-525-6167 Email: dbaber@icfi.com Website: http://www.icfi.com
Cody **Baciuska** Wildlife Biologist Loomacres Wildlife Management P.O. Box 361 Warnerville, NY 12187 Phone: (607) 760-8748 Email: cody@loomacres.com Website: http://www.airportwildlife.com	Cathy **Boyles** Wildlife Administrator Operations Department Box 619428 DFW Airport, Texas 75261 Phone: (972) 973-3122 Email: cboyles@dfwairport.com
Sarah **Brammell** SW Florida Regional Director Environmental Resource Solutions, Inc. 19607 Lake Osceola Ln Odessa FL 33556 Phone: (813) 404-3963 Email: sbrammell@ersenvironmental.com	Edward C. **Cleary** WASHMan LLC. 212 Azalea Road Colonial Beach, VA. 22443 Phone/Fax: (804) 224-6069 Email: washmaned@aol.com
Steven S. **Cramer**, CWB Environmental Scientist Jacobs Engineering Group 911 Central Parkway North, Suite 425 San Antonio, TX 78232 Phone: (210) 494-0088 Email: steven.cramer@jacobs.com	Russell P. **Defusco** BASH Incorporated 5010 Lanagan St. Colorado Spring, Co. 80919 Phone: 719-264-8420 Cell: 719-200-2252 Email: birdmanruss@aol.com
Marchelle **Dickey** 12272 W. Chenango Dr Morrison, CO 80465 Phone: (928) 925-6818 Email: fadickey@hotmail.com	Gary **Exner** Qualified Airport Wildlife Biologist Advantage Consulting LLC 410 Lake Lenelle Drive Chuluota, FL 32766 Phone: (407) 365-4662

	Email: adcons2@earthlink.net
Steven Donald **Fairaizl** Senior Biologist Airport Wildlife Consultants, LLC. 4735 E. Melanie Drive Cave Creek, AZ 85331 Phone: (480) 993-9357 Email: steveandgale@awcphx	Gino JM **Giumarro**, CWB Senior Ecologist Stantec Consulting 30 Park Drive Topsham, ME 04086 Phone: (207) 729-1199 Cell: (207) 318-0078 Email: gino.giumarro@stantec.com Website: http://www.stantec.com
Mark L. **Hudnall** Hudnall Aviation & Wildlife Consulting 106 Durham Drive Madison, AL 35758 Phone: (256) 724-0964 Email: hud@wildlifehazard.com Website: http://www.wildlifehazard.com	Amy **Johnson** Qualified Airport Wildlife Biologist Environmental Resource Solutions, Inc. 8711 Perimeter Park Blvd., Suite 1 Jacksonville, FL 32216 Phone: (904) 285-1397 Cell: (813)-966-9410 Email: ajohnson@ersenvironmental.com Website: http://www.ersenvironmental.com
Rick L. **Jones**, CWB Qualified Airport Wildlife Biologist Mead & Hunt, Inc. 1743 Wazee Street, Suite 400 Denver, CO 80202 Main: (303) 825-8844 Mobile:(720) 376-8320	Steve **Osmek** Senior Wildlife Biologist Seattle-Tacoma International Airport PO Box 68727 Seattle, WA. 98168 Phone: (206) 431-4453 (office) Cell: (206) 419-8666 Email: osmek.s@portseattle.org
Ronald P. **Peterson** P.O. Box 73 Lakeland, MN 55043 Phone:(612) 803-7667 Email: vitae42@yahoo.com	Timothy L. **Pugh** Qualified Airport Wildlife Biologist Midwest Wildlife Services, LLP P.O. Box 1102 Pierre, SD 57501 Phone:(605) 280-0704 Fax: (605) 609-0077 Email: timpugh@midconetwork.com
Jason R.**Ringler** Qualified Airport Wildlife Biologist The Louis Berger Group, Inc. 295 Promenade Street Providence, RI 02908 Phone:(401) 521-5980 Email: jringler@louisberger.com	Olivia Munzer **Schaetz** Qualified Airport Wildlife Biologist 2518 Sinclair Ave Midland, Texas 79705 Cell:(512) 970-6067 Email: Liefvir@yahoo.com

R. Stevan **Scheldt** PML Environmental 8654 View Ct. Ketchikan, Alaska 99901 Phone: (907) 617-6967 Email: kadcc@kpunet.net	Jeremy **Sheets** Qualified Airport Wildlife Biologist Cardno JFNew 708 Roosevelt Road Walkerton, IN 46574 Phone: (574) 586-3400 Cell: (574) 229-8779 Email: jeremy.sheets@cardno.com Website: http://www.cardnojfnew.com
Jodi **Taylor**, Natural Resources Manager Terracon Consultants, Inc. 25809 Interstate 30 South Bryant, Arkansas 72022 Phone: (501) 847-9292 (office) Cell: (501) 350-5522 Email: jataylor@terracon.com Offices Nationwide www.terracon.com	Tom **Unangst** Qualified Airport Wildlife Biologist Total Environmental & Wildlife Solutions (TEWS) Inc. 5906 Wolf Village Drive Colorado Springs, CO 80924 Phone: (719) 964-8473 Email: tews_inc@msn.com; etunangst@msn.com
Thomas **Wirickx**, CE Senior Environmentalist McFarland-Johnson, Inc. 49 Court Street, Metrocenter P.O. Box 1980 Binghamton, NY 13902-1980 Phone: (607) 723-9421 Fax: (607) 723-4979 Email: twirickx@mjinc.com Website: www.mjinc.com	

- FEEDBACK
- CONTACT US

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Administrative Offices: Prescott, AZ Residential Campus - 3700 Willow Creek Road,Prescott, AZ 86301-3720

CERTIFICATE OF ATTENDANCE

Awarded to

Mr. Rickey Jones

For attending the

2013 Bird Strike North America Conference

Presented by

Bird Strike Committee USA

And

Bird Strike Association of Canada

in cooperation with

American Association of Airport Executives

12-15 August 2013
Milwaukee, Wisconsin USA

Identifying and reducing hazards to aviation caused by wildlife.

John E. Ostrom
John Ostrom, Chair

Embry-Riddle Aeronautical University

The Office of Professional Education
hereby certifies that

Rick L. Jones

Has successfully completed 2.4 Continuing Education Units in the following:

SFY-3000 Airport Wildlife Hazard Management Workshop

In Witness Whereof the signatures are authorized and
the Seal of the University are hereunto affixed at Daytona Beach, Florida
this 22nd day of January 2010 Anno Domini.

Martin A. Smith
Executive Vice President, Embry-Riddle Worldwide

Albert W. Astbury
Interim Director, Office of Professional Education

The Wildlife Society

INCORPORATED IN WASHINGTON, D.C.

grants the designation

Certified Wildlife Biologist

to

Rick L. Jones

in recognition of fulfilling all the professional requirements approved by The Wildlife Society and verified by the Society's Certification Review Board. This designation is valid for 5 years, beginning the 9th day of December 2008.

Thomas M. Franklin
President, The Wildlife Society

Chairman, Certification Review Board

Executive Director, The Wildlife Society

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Appendix D. Airport Layout Plan

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NOTES

(a) Airport coordinates data source: field survey by County of Riverside (1995). Airport elevations from survey by Krieger and Steward (1999) using National Geodetic survey monument "Ryan" (DX3753). Coordinates are NAD83 and elevations are NAVD88.

(b) Road segment to be abandoned.

(c) The BRL, APL, and OFA depicted on the ALP indicate the future limits of these functional lines. They are depicted as "existing" except beyond the physical limits of the existing airfield.

(d) Critical aircraft is in ARC B-II. However, Runway 5-23 and its safety area were constructed to ARC B-III standards. Therefore, the higher standards will be retained where possible.

(e) When Taxiway Z is constructed Runway 4-22 will be closed.

(f) The separation between Runways 5-23 and 4-22 is 350'. The standard for simultaneous VFR operations is 700'. Therefore, simultaneous VFR operations are not permitted.

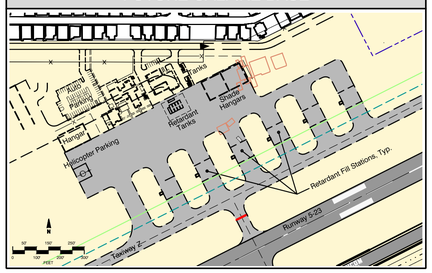
DEVIATIONS FROM DESIGN STANDARDS

NONSTANDARD CONDITION	PROPOSED DISPOSITION
The OFAs of the two runways overlap.	Remain in place based on Part 16 decision of Docket No. 16-09-13. Ultimately, Runway 4-22 will be closed to permit development of a parallel taxiway and aviation-related develpment on the north side of the Airport
The two parallel runways are separated by 350 feet. The standard for simultaneous VFR landings and take-offs is 700 feet.	Runways to remain. Simultaneous VFR operations on the two runways are not authorized.

MONUMENTS

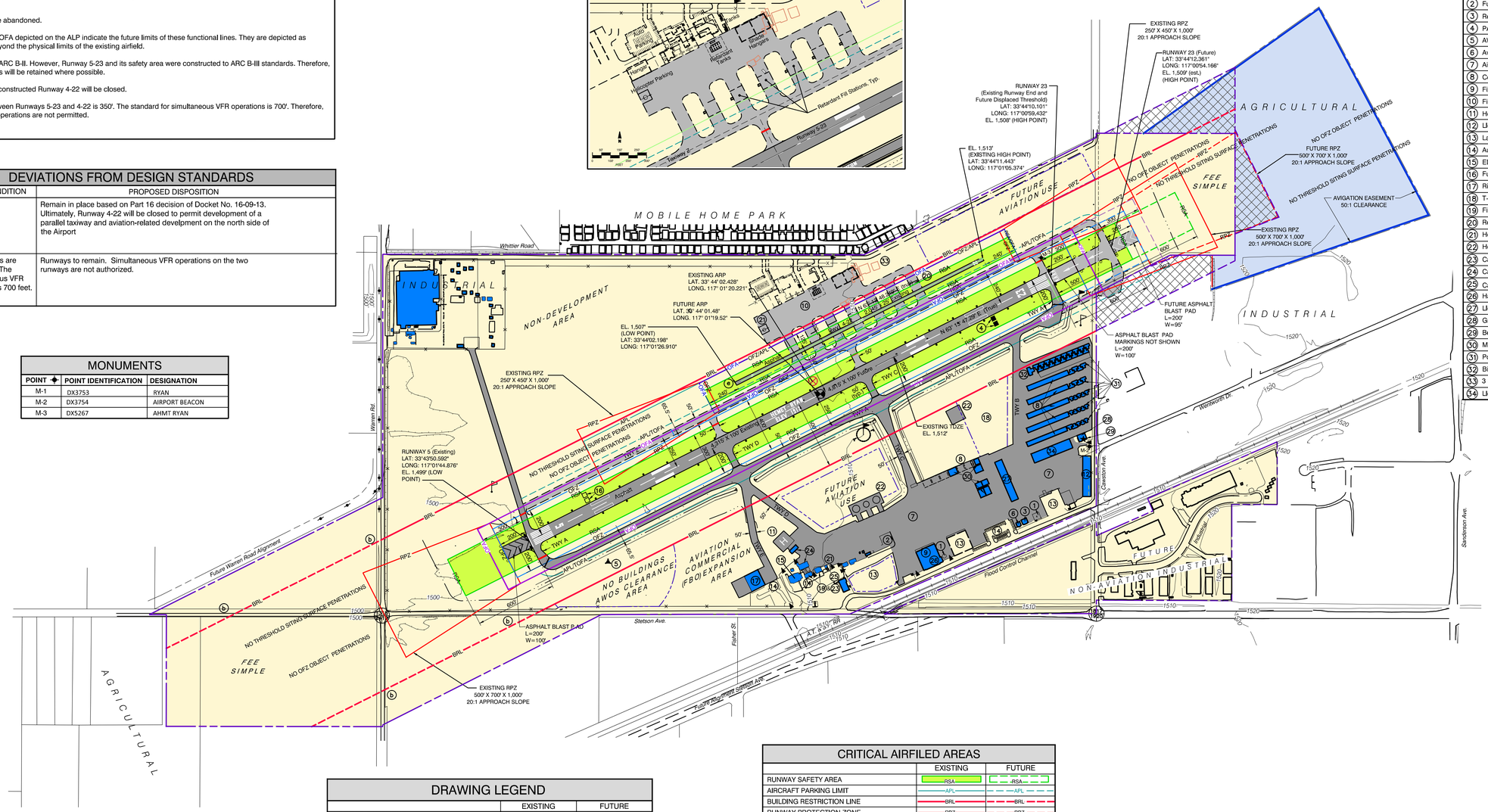
POINT	POINT IDENTIFICATION	DESIGNATION
M-1	DX3753	RYAN
M-2	DX3754	AIRPORT BEACON
M-3	DX5267	AHMT RYAN

FUTURE CALFIRE BASE



BUILDING & FACILITIES LEGEND

	BUILDING/FACILITY	ELEVATION
1	Wash Rack	N/A
2	Fuel Island	N/A
3	Restaurant	1523'
4	PAPI	N/A
5	AWOS Antenna	N/A
6	Aviation Museum	1523'
7	Aircraft Tiedowns	N/A
8	County Hangar Rows	1524'
9	Fixed Base Operators	N/A
10	Fire Attack Base (Future Site)	N/A
11	Helipad	N/A
12	Lloyds Row of Hangars by Beacon (North to South)	1538'
13	Large Aircraft Hangars - (Future Site)	N/A
14	Auto Parking	N/A
15	EDA/Airport Office	1516'
16	Future PAPI	N/A
17	Riverside County Sheriffs Aviation Unit	1533'
18	T-Hangars (Future Site)	N/A
19	Fire Attack Base (Future FBO or Large Hangars)	N/A
20	Retardant Fill Station (Future)	N/A
21	Helicopter Parking (Future)	N/A
22	Helicopter Parking	N/A
23	Calfire Office and Pilot Lounge	1516'
24	Calfire Mess and Heli Support	1518'
25	Calfire Tower	1544'
26	Hangar 5	1535'
27	Lloyds T-Hangars (North to South Row)	1522'
28	Grismers Box Hangar	1526'
29	Beacon Tower	1558
30	Medore/Mervyn Box Hangars	1524'
31	Porta Ports	1520'
32	Big Porta Port Northwest Corner of Porta Ports	1524'
33	3 Box Hangars (North Side of Airport)	1527'
34	Lloyds Row of Hangars (East to West)	1528'



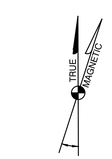
CRITICAL AIRFILED AREAS

	EXISTING	FUTURE
RUNWAY SAFETY AREA	RSA	RSA
AIRCRAFT PARKING LIMIT	APL	APL
BUILDING RESTRICTION LINE	BRL	BRL
RUNWAY PROTECTION ZONE	RPZ	RPZ
OBJECT FREE AREA 5-23	OFA	OFA
OBJECT FREE AREA 4-22	OFA	OFA
OBSTACLE FREE ZONE	OFZ	OFZ

DRAWING LEGEND

	EXISTING	FUTURE
AIRFIELD PAVEMENT		
GRAVEL SHOULDER/ROAD		SAME
AIRPORT PROPERTY LINE		
INTERNAL BOUNDARY	N/A	
OTHER PROPERTY LINES		
AVIGATION EASEMENT		SAME
BUILDINGS		
BUILDINGS (To be removed)		SAME
FENCE		SAME
VEHICLE GATE		SAME
WIND CONE	F	F
HELIPAD	H	SAME
PAPI	■■	□□
RUNWAY EDGE LIGHTS	● / ●●●●	○ / ○○○○
ROTATING BEACON	★	SAME
AIRPORT REFERENCE POINT		
TOPOGRAPHIC CONTOURS	XXX	SAME
WATERWAY/CULVERT/CHANNEL		SAME
POWER LINE		SAME
SURVEY MONUMENT	M-1	SAME
SECTION CORNER	1 6 12 7	SAME

* APL - Aircraft Parking Limits
BRL - Building Restriction Line
RSA - Runway Safety Area
OFA - Object Free Area
OFZ - Obstacle Free Zone
RPZ - Runway Protection Zone



DECLINATION
12° 28' E
November 2009
ANNUAL RATE OF CHANGE
0° 5' W

400
0 FEET 800
1" = 400'

SUBMITTED BY:
County of Riverside

By _____ Date _____

FAA Approval Space

NO.	REVISION	REVISED BY	DATE
7	Master Plan Update	Mead & Hunt, Inc.	9/4/15
6	Add Extension to Runway 5-23	Mead & Hunt, Inc.	6/6/12
5	Add Runway 4-22 and Helicopter Parking	Mead & Hunt, Inc.	9/1/11
4	Remove Runway Extension and Add Fire Attack Base	Mead & Hunt, Inc.	7/30/10
3	Modify Runway 5-23 Extension and Remove Runway 4-22	Mead & Hunt, Inc.	11/1/09
2	Revision per FAA Comments	Mead & Hunt, Inc.	6/16/06
1	Airport Master Plan Update	Mead & Hunt, Inc.	4/11/05

HEMET-RYAN AIRPORT

HEMET, CALIFORNIA

AIRPORT LAYOUT PLAN

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Fax (707) 526-9721
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County of Riverside

DESIGN: DD | DRAWN: TE | DATE: November 2009 | SHEET 1 OF 3

The contents of this plan do not necessarily reflect the official views or policy of the FAA. Acceptance of these documents by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted herein nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public laws.

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Appendix E. Federal- and State-listed Threatened and Endangered Species

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State of California
The Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Biogeographic Data Branch
California Natural Diversity Database

STATE & FEDERALLY LISTED ENDANGERED & THREATENED ANIMALS OF CALIFORNIA

January 2013

This is a list of animals found within California or off the coast of the State that have been classified as Endangered or Threatened by the California Fish & Game Commission (state list) or by the U.S. Secretary of the Interior or the U.S. Secretary of Commerce (federal list). The federal agencies responsible for listing are the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS).

The official California listing of Endangered and Threatened animals is contained in the California Code of Regulations, Title 14, Section 670.5. The official federal listing of Endangered and Threatened animals is published in the Federal Register, 50 CFR 17.11. The California Endangered Species Act of 1970 created the categories of "Endangered" and "Rare." The California Endangered Species Act of 1984 created the categories of "Endangered" and "Threatened." On January 1, 1985, all animal species designated as "Rare" were reclassified as "Threatened."

Also included on this list are animal "Candidates" for state listing and animals "Proposed" for federal listing; federal "Candidates" are currently not included. A state Candidate species is one that the Fish and Game Commission has formally declared a candidate species. A federal Proposed species is one that has had a published proposed rule to list in the Federal Register.

Designation		Totals as of January 2013
State listed as Endangered	SE	46
State listed as Threatened	ST	34
Federally listed as Endangered	FE	91
Federally listed as Threatened	FT	39
State Candidate (Endangered)	SCE	3
State Candidate (Threatened)	SCT	2
State Candidate (Delisting)	SCD	1
Federally proposed (Endangered)	FPE	0
Federally proposed (Threatened)	FPT	0
Federally proposed (Delisting)	FPD	2
Total number of animals listed (includes subspecies & population segments)		155
Total number of candidate/proposed animals for listing		5
Number of animals State listed only		32
Number of animals Federally listed only		75
Number of animals listed under both State & Federal Acts		50

Common and scientific names are shown as they appear on the state or federal lists. If the nomenclature differs for a species that is included on both lists, the state nomenclature is given and the federal nomenclature is shown in a footnote. Synonyms, name changes, and other clarifying points are also footnoted.

The "List Date" for **final** federal listing is the date the listing became effective. This is usually not the date of publication of the rule in the Federal Register; it is usually about 30 days after publication, but may be longer.

If an animal was previously listed or proposed for listing and no longer has any listing status, the entry has been grayed out.

For taxa that have more than one status entry, the **current status is in bold and underlined**.

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	State Listing			Federal Listing	
GASTROPODS					
Trinity bristle snail *Monadenia setosa*[1]	ST	10-02-80			
Morro shoulderband (=banded dune) snail *Helminthoglypta walkeriana*				FE	1-17-95
White abalone *Haliotis sorenseni*				FE[2] FE	11-16-05 6-28-01
Black abalone *Haliotis cracherodii*				FE[3] FE	4-13-11 2-13-09
CRUSTACEANS					
Riverside fairy shrimp *Streptocephalus woottoni*				FE	8-03-93
Conservancy fairy shrimp *Branchinecta conservatio*				FE	9-19-94
Longhorn fairy shrimp *Branchinecta longiantenna*				FE	9-19-94
Vernal pool fairy shrimp *Branchinecta lynchi*				FT	9-19-94
San Diego fairy shrimp *Branchinecta sandiegonensis*				FE	2-03-97
Vernal pool tadpole shrimp *Lepidurus packardi*				FE	9-19-94
Shasta crayfish *Pacifastacus fortis*	**SE** ST	2-26-88 10-02-80		FE	9-30-88
California freshwater shrimp *Syncaris pacifica*	SE	10-02-80		FE	10-31-88
INSECTS					
Zayante band-winged grasshopper *Trimerotropis infantilis*				FE	2-24-97
Mount Hermon June beetle *Polyphylla barbata*				FE	2-24-97
Casey's June beetle *Dinacoma caseyi*				**FE** FPE	10-24-11 7-09-09
Delta green ground beetle *Elaphrus viridis*				FT	8-08-80
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*				FPD **FT**	10-2-12 8-08-80

[1] Current taxonomy is *Monadenia infumata setosa.*
[2] Listed by NMFS in 2001 and by USFWS in 2005.
[3] Listed by NMFS in 2009 and by USFWS in 2011.

	State Listing			Federal Listing	
Ohlone tiger beetle *Cicindela ohlone*				FE	10-03-01
Kern primrose sphinx moth *Euproserpinus euterpe*				FT	4-08-80
Mission blue butterfly *Icaricia icarioides missionensis*[4]				FE	6-01-76
Lotis blue butterfly *Lycaeides argyrognomon lotis*[5]				FE	6-01-76
Palos Verdes blue butterfly *Glaucopsyche lygdamus palosverdesensis*				FE	7-02-80
El Segundo blue butterfly *Euphilotes battoides allyni*				FE	6-01-76
Smith's blue butterfly *Euphilotes enoptes smithi*				FE	6-01-76
San Bruno elfin butterfly *Callophrys mossii bayensis*				FE	6-01-76
Lange's metalmark butterfly *Apodemia mormo langei*				FE	6-01-76
Bay checkerspot butterfly *Euphydryas editha bayensis*				FT	10-18-87
Quino checkerspot butterfly *Euphydryas editha quino (=E. e. wrighti)*				FE	1-16-97
Carson wandering skipper *Pseudocopaeodes eunus obscurus*				FE	8-07-02
Laguna Mountains skipper *Pyrgus ruralis lagunae*				FE	1-16-97
Callippe silverspot butterfly *Speyeria callippe callippe*				FE	12-05-97
Behren's silverspot butterfly *Speyeria zerene behrensii*				FE	12-05-97
Oregon silverspot butterfly[6] *Speyeria zerene hippolyta*				FT	7-02-80
Myrtle's silverspot butterfly *Speyeria zerene myrtleae*				FE	6-22-92
Delhi Sands flower-loving fly *Rhaphiomidas terminatus abdominalis*				FE	9-23-93

[4] Current taxonomy is *Plebejus icarioides missionensis.*
[5] Current taxonomy is *Plebejus idas lotis.*
[6] Also known by the common name is Hippolyta fritillary.

	State Listing			Federal Listing	
FISHES					
Green sturgeon - southern DPS *Acipenser medirostris*				FT[7]	6-06-06
Mohave tui chub *Gila bicolor mohavensis*[8]	SE	6-27-71		FE	10-13-70
Owens tui chub *Gila bicolor snyderi*[9]	SE	1-10-74		FE	8-05-85
Thicktail chub (**Extinct**) *Gila crassicauda*	**Delisted** SE	10-02-80 1-10-74			
Bonytail[10] *Gila elegans*	**SE** SR	1-10-74 6-27-71		FE	4-23-80
Sacramento splittail *Pogonichthys macrolepidotus*				**Removed**[11] FT	9-22-03 3-10-99
Colorado squawfish[12] *Ptychocheilus lucius*	SE	6-27-71		FE	3-11-67
Modoc sucker *Catostomus microps*	**SE** SR	10-02-80 1-10-74		FE	6-11-85
Santa Ana sucker *Catostomus santaanae*				FT[13]	5-12-00
Shortnose sucker *Chasmistes brevirostris*	**SE** SR	1-10-74 6-27-71		FE	7-18-88
Lost River sucker *Deltistes luxatus*	**SE** SR	1-10-74 6-27-67		FE	7-18-88
Razorback sucker *Xyrauchen texanus*	**SE** SR	1-10-74 6-27-71		FE	10-23-91
Delta smelt *Hypomesus transpacificus*	**SE** ST	1-20-10 12-09-93		FT	3-05-93
Longfin smelt *Spirinchus thaleichthys*	**ST** SCE	4-09-10 2-02-08			
Pacific eulachon - southern DPS *Thaleichthys pacificus*				FT FT	4-13-11[14] 5-17-10
Lahontan cutthroat trout *Oncorhynchus clarkii henshawi*[15]				**FT** FE	7-16-75 10-13-70

[7] Includes all spawning populations south of the Eel River.
[8] Current taxonomy: *Siphateles bicolor mohavensis.*
[9] Current taxonomy: *Siphateles bicolor snyderi.*
[10] Federal common name: bonytail chub.
[11] On 23 June 2000, the Federal Eastern District Court of Calif. found the final rule to be unlawful and on 22 Sept 2000 remanded the determination back to the USFWS for a reevaluation of the final decision. After a thorough review the USFWS removed the Sacramento splittail from the list of Threatened species.
[12] Current nomenclature and federal listing: Colorado pikeminnow.
[13] Populations in the Los Angeles, San Gabriel, and Santa Ana River basins.
[14] Eulachon was listed as Threatened by the NMFS in 2010 and by the USFWS in 2011.
[15] According to the American Fisheries Society Special Publication 29 (2004), "clarkii" has two i's.

	State Listing			Federal Listing	
Paiute cutthroat trout *Oncorhynchus clarkii seleniris*				**FT** FE	7-16-75 3-11-67[16]
Coho salmon - south of Punta Gorda[17] *Oncorhynchus kisutch*	SE[18]	3-30-05		**FE**[19] FT	8-29-05 12-02-96
Coho salmon - Punta Gorda to the N. border of California[20] *Oncorhynchus kisutch*	ST[21]	3-30-05		FT[22] FT	8-29-05 6-05-97
Steelhead - Southern California DPS[23] *Oncorhynchus mykiss*				FE[24] FE	2-06-06 10-17-97
Steelhead - South-Central California Coast DPS[25] *Oncorhynchus mykiss*				FT[26] FT	2-06-06 10-17-97
Steelhead - Central California Coast DPS[27] *Oncorhynchus mykiss*				FT[28] FT	2-06-06 10-17-97
Steelhead - California Central Valley DPS[29] *Oncorhynchus mykiss*				FT[30] FT	2-06-06 5-18-98
Steelhead - Northern California DPS[31] *Oncorhynchus mykiss*				FT[32] FT	2-06-06 8-07-00
Little Kern golden trout *Oncorhynchus mykiss whitei*[33]				FT	4-13-78
Chinook salmon - Winter-run[34] *Oncorhynchus tshawytscha*	SE	9-22-89		FE[35] FE	8-29-05 2-03-94
Chinook salmon - California coastal ESU[36] *Oncorhynchus tshawytscha*				FT[37] FT	8-29-05 11-15-99

[16] All species with a list date of 03-11-67 were listed under the Endangered Species Preservation Act of October 15, 1966.
[17] The Federal listing is for Central California Coast Coho ESU and includes populations from Punta Gorda south to, and including, the San Lorenzo River as well as populations in tributaries to San Francisco Bay, excluding the Sacramento-San Joaquin River system.
[18] The Coho south of San Francisco Bay were state listed in 1995. In February 2004 the Fish and Game Commission determined that the Coho from San Francisco to Punta Gorda should also be listed as Endangered. This change was finalized by the Office of Administrative Law on March 30, 2005.
[19] The NMFS completed a comprehensive status review in 2005 reaffirming the status.
[20] The Federal listing is for Southern Oregon/Northern California Coast Coho ESU and includes populations in coastal streams between Cape Blanco, Oregon and Punta Gorda, California.
[21] The Fish and Game Commission determined that the Coho from Punta Gorda to the Oregon border should be listed as Threatened on February 25, 2004. This determination was finalized by the Office of Administrative Law on March 30, 2005.
[22] The NMFS completed a comprehensive status review in 2005 reaffirming the status.
[23] Coastal basins from the Santa Maria River (inclusive), south to the U.S.-Mexico Border.
[24] The NMFS completed a comprehensive status review in 2006 reaffirming the status.
[25] Coastal basins from the Pajaro River (inclusive) south to, but not including, the Santa Maria River.
[26] The NMFS completed a comprehensive status review in 2006 reaffirming the status.
[27] Coastal streams from the Russian River (inclusive) to Aptos Creek (inclusive), and the drainages of San Francisco, San Pablo, and Suisun Bays eastward to Chipps Island at the confluence of the Sacramento and San Joaquin Rivers; and tributary streams to Suisun Marsh including Suisun Creek, Green Valley Creek, and an unnamed tributary to Cordelia Slough (commonly referred to as Red Top Creek), exclusive of the Sacramento-San Joaquin River Basin of the California Central Valley.
[28] The NMFS completed a comprehensive status review in 2006 reaffirming the status.
[29] The Sacramento and San Joaquin Rivers and their tributaries.
[30] The NMFS completed a comprehensive status review in 2006 reaffirming the status.
[31] Naturally spawned populations residing below impassable barriers in coastal basins from Redwood Creek in Humboldt County to, and including, the Gualala River in Mendocino County.
[32] The NMFS completed a comprehensive status review in 2006 reaffirming the status.
[33] Originally listed as *Salmo aguabonita whitei*. The genus *Salmo* was reclassified as *Oncorhynchus* changing the name to *Oncorhynchus aguabonita whitei*. However, recent studies indicate this is a subspecies of rainbow trout, therefore *Oncorhynchus mykiss whitei*.
[34] The federal designation is for Chinook salmon - Sacramento River winter-run ESU and described as winter-run populations in the Sacramento River and its tributaries in California.
[35] The NMFS completed a comprehensive status review in 2005 reaffirming the status.

	State Listing			Federal Listing	
Chinook salmon - Spring-run[38] *Oncorhynchus tshawytscha*	ST	2-05-99		FT[39] FT	8-29-05 11-15-99
Bull trout *Salvelinus confluentus*	SE	10-02-80		FT	12-01-99
Desert pupfish *Cyprinodon macularius*	SE	10-02-80		FE	3-31-86
Tecopa pupfish (**Extinct)** *Cyprinodon nevadensis calidae*	**Delisted** SE	1987 6-27-71		**Delisted** FE	1-15-82 10-13-70
Owens pupfish *Cyprinodon radiosus*	SE	6-27-71		FE	3-11-67
Cottonball Marsh pupfish *Cyprinodon salinus milleri*	ST	1-10-74			
Unarmored threespine stickleback *Gasterosteus aculeatus williamsoni*	SE	6-27-71		FE	10-13-70
Rough sculpin *Cottus asperrimus*	ST	1-10-74			
Tidewater goby *Eucyclogobius newberryi*				Withdrawn FPD[40] **FE**	12-09-02 6-24-99 2-04-94
AMPHIBIANS					
California tiger salamander[41] *Ambystoma californiense*	ST[42]	8-19-10		(FE) (FT)	
California tiger salamander - central California DPS *Ambystoma californiense*	(ST)			FT[43]	9-03-04
California tiger salamander - Santa Barbara County DPS *Ambystoma californiense*	(ST)			FE[43]	9-15-00
California tiger salamander - Sonoma County DPS *Ambystoma californiense*	(ST)			FE[43]	3-19-03
Santa Cruz long-toed salamander *Ambystoma macrodactylum croceum*	SE	6-27-71		FE	3-11-67
Siskiyou Mountains salamander *Plethodon stormi*	SCD **ST**	9-30-05 6-27-71			

[36] Rivers and streams south of the Klamath River to the Russian River.
[37] The NMFS completed a comprehensive status review in 2005 reaffirming the status.
[38] The State listing is for "Spring-run chinook salmon (*Oncorhynchus tshawytscha*) of the Sacramento River drainage." The Federal listing is for Central Valley spring-run Chinook ESU and includes populations of spring-run Chinook salmon in the Sacramento River and its tributaries including the Feather River.
[39] The NMFS completed a comprehensive status review in 2005 reaffirming the status.
[40] Proposal to delist referred to populations north of Orange County only.
[41] The State listing refers to the entire range of the species.
[42] Adopted May 20, 2010. The Office of Administrative Law approved the listing on Aug 2, 2010 and the effective date of regulations is Aug 19, 2010.
[43] In 2004 the California tiger salamander was listed as Threatened statewide. The Santa Barbara County and Sonoma County Distinct Vertebrate Population Segments (DPS), formerly listed as Endangered, were reclassified to Threatened. On Aug 19 2005 U.S. District court vacated the downlisting of the Sonoma and Santa Barbara populations from Endangered to Threatened. Therefore, the Sonoma & Santa Barbara populations are once again listed as Endangered.

	State Listing			Federal Listing	
Scott Bar salamander *Plethodon asupak*	ST[44]	6-27-71			
Tehachapi slender salamander *Batrachoseps stebbinsi*	ST	6-27-71			
Kern Canyon slender salamander *Batrachoseps simatus*	ST	6-27-71			
Desert slender salamander *Batrachoseps aridus*[45]	SE	6-27-71		FE	6-04-73
Shasta salamander *Hydromantes shastae*	ST	6-27-71			
Limestone salamander *Hydromantes brunus*	ST	6-27-71			
Black toad *Bufo exsul*[46]	ST	6-27-71			
Arroyo toad *Anaxyrus californicus*[47]				FE	1-17-95
California red-legged frog *Rana aurora draytonii*[48]				FT	5-20-96
Southern mountain yellow-legged frog[49] *Rana muscosa*	SCE[50]	9-21-10		FE[51]	8-01-02
Sierra Nevada mountain yellow-legged frog *Rana sierrae*	SCT[52]	9-21-10			
REPTILES					
Desert tortoise *Gopherus agassizii*	ST	8-03-89		FT	4-02-90
Green sea turtle[53] *Chelonia mydas*				**FT** FE	7-28-78 10-13-70
Loggerhead sea turtle - North Pacific DPS[54] *Caretta caretta*				**FE** FPE FT	10-24-11 3-16-10 7-28-78

[44] Since this newly described species was formerly considered to be a subpopulation of *Plethodon stormi,* and since *Plethodon stormi* is listed as Threatened under the CESA, *Plethodon asupak* retains the Threatened designation.
[45] Current taxonomy: *Batrachoseps major aridus.*
[46] Current taxonomy: *Anaxyrus exsul.*
[47] At the time of listing, arroyo toad was known as *Bufo microscaphus californicus,* a subspecies of southwestern toad. In 2001 it was determined to be its own species, *Bufo californicus*. Since then, many species in the genus *Bufo* were changed to the genus *Anaxyrus*, and now arroyo toad is known as *Anaxyrus californicus*.
[48] Current taxonomy: *Rana draytonii.*
[49] Though the scientific name *Rana muscosa* is not disputed, the State used this common name in the 16 Oct 2012 Notice of Proposed Changes in Regulation, whereas the USFWS listing refers to the distinct population segment listed as mountain yellow-legged frog – Southern California DPS. This species is also known by the common name Sierra Madre yellow-legged frog (Vredenburg et al. 2007).
[50] Filed with the Office of Administrative Law on 16 January 2013; Effective Date of Regulation is pending.
[51] Federal listing refers to the distinct population segment (DPS) in the San Gabriel, San Jacinto, and San Bernardino Mountains only, with a recognized common name of Mountain yellow-legged frog - Southern California DPS. MYLF north of the Tehachapi Mountains are a Federal candidate.
[52] Filed with the Office of Administrative Law on 16 January 2013; Effective Date of Regulation is pending.
[53] Current nomenclature: green turtle.

	State Listing			Federal Listing	
Olive (=Pacific) ridley sea turtle *Lepidochelys olivacea*				FT	7-28-78
Leatherback sea turtle *Dermochelys coriacea*				FE	6-02-70
Barefoot banded gecko[55] *Coleonyx switaki*	ST	10-02-80			
Coachella Valley fringe-toed lizard *Uma inornata*	SE	10-02-80		FT	9-25-80
Blunt-nosed leopard lizard *Gambelia silus*[56]	SE	6-27-71		FE	3-11-67
Flat-tailed horned lizard *Phrynosoma mcallii*				**Withdrawn**[57] FPT[58]	3-15-11 11-29-93
Island night lizard *Xantusia riversiana*				FT	8-11-77
Southern rubber boa *Charina bottae umbratica*[59]	ST	6-27-71			
Alameda whipsnake *Masticophis lateralis euryxanthus*	ST	6-27-71		FT	12-05-97
San Francisco garter snake *Thamnophis sirtalis tetrataenia*	SE	6-27-71		FE	3-11-67
Giant garter snake *Thamnophis couchi gigas*[60]	ST	6-27-71		FT	10-20-93
BIRDS					
Short-tailed albatross *Phoebastria albatrus*				FE FE	8-30-00[61] 6-2-1970
California brown pelican[62] (**Recovered**) *Pelecanus occidentalis californicus*	**Delisted** SE	6-03-09 6-27-71		**Delisted** FE	12-17-09 2-20-08 10-13-70
Aleutian Canada goose **(Recovered)** *Branta canadensis leucopareia*[63]				**Delisted** FT FE	3-20-01 12-12-90 3-11-67

[54] 1978 listing was for the worldwide range of the species. The Mar 16, 2010 proposed rule and Oct 24, 2011 final rule are for the North Pacific DPS (north of the equator & south of 60 degrees north latitude).
[55] Current nomenclature: Barefoot gecko.
[56] Current taxonomy: *Gambelia sila*. Both the State and Federal recognize the common name blunt-nosed leopard lizard (SSAR), but also known as bluntnose leopard lizard (CNAH). Originally listed under the ESA as *Crotaphytus wislizenii silus*.
[57] On June 28, 2006 the USFWS determined that the proposed listing was not warranted and the proposed rule that had been reinstated on Nov 17, 2005 was withdrawn. USFWS specifically reiterated that the 29 Nov 1993 proposal to list as Threatened was withdrawn as of 15 Mar 2011.
[58] On November 17, 2005, the U. S. District Court for the District of Arizona vacated the January 3, 2003 withdrawal of the proposed rule to list the flat-tailed horned lizard and reinstated the 1993 proposed rule.
[59] Current taxonomy: *Charina umbratica.*
[60] Current taxonomy and Federal listing: *Thamnophis gigas.*
[61] Listed as Endangered in one of the original species list, but "due to an inadvertent oversight" when the 1973 ESA repealed the 1969 Act, short-tailed albatross was effectively delisted. Proposed listing to fix this error in 1980, with final rule in 2000.
[62] Federal nomenclature: Brown pelican (*Pelecanus occidentalis*).
[63] Current taxonomy: Cackling goose (*Branta hutchinsii leucopareia*).

	State Listing			Federal Listing	
California condor *Gymnogyps californianus*	SE	6-27-71		FE	3-11-67
Bald eagle *Haliaeetus leucocephalus*	**SE (**rev) SE	10-02-80 6-27-71		**Delisted**[64] FT FE (rev) FE	8-08-07 7-06-99 8-11-95 2-14-78 3-11-67
Swainson's hawk *Buteo swainsoni*	ST	4-17-83			
American peregrine falcon **(Recovered)** *Falco peregrinus anatum*	**Delisted** SE	11-04-09 6-27-71		**Delisted** FE	8-25-99 6-02-70
Arctic peregrine falcon **(Recovered)** *Falco peregrinus tundrius*				**Delisted** FT FE	10-05-94 3-20-84 6-02-70
California black rail *Laterallus jamaicensis coturniculus*	ST	6-27-71			
California clapper rail *Rallus longirostris obsoletus*	SE	6-27-71		FE	10-13-70
Light-footed clapper rail *Rallus longirostris levipes*	SE	6-27-71		FE	10-13-70
Yuma clapper rail *Rallus longirostris yumanensis*	**ST** SE	2-22-78 6-27-71		FE	3-11-67
Greater sandhill crane *Grus canadensis tabida*	ST	4-17-83			
Western snowy plover *Charadrius alexandrinus nivosus*[65]				FT[66]	4-05-93
Mountain plover *Charadrius montanus*				**Withdrawn** FPT	5-12-11 12-5-02
California least tern *Sterna antillarum browni*[67]	SE	6-27-71		FE	10-13-70
Marbled murrelet *Brachyramphus marmoratus*	SE	3-12-92		FT	9-30-92
Xantus's murrelet *Synthliboramphus hypoleucus*	ST[68]	12-22-04			
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	**SE** ST	3-26-88 6-27-71			

[64] The Post-delisting Monitoring Plan will monitor the status of the bald eagle over a 20 year period with sampling events held once every 5 years.
[65] Current taxonomy: *Charadrius nivosus nivosus* (AOU 2011).
[66] Federal status applies only to the Pacific coastal population.
[67] Current taxonomy: *Sternula antillarum browni.*
[68] The Fish and Game Commission determined that Xantus's murrelet should be listed as a Threatened species February 24, 2004. As part of the normal listing process, this decision was reviewed by the Office of Administrative Law. The listing became effective on Dec 22, 2004.

	State Listing			Federal Listing	
Elf owl *Micrathene whitneyi*	SE	10-02-80			
Northern spotted owl *Strix occidentalis caurina*				FT	6-22-90
Great gray owl *Strix nebulosa*	SE	10-02-80			
Gila woodpecker *Melanerpes uropygialis*	SE	3-17-88			
Black-backed woodpecker *Picoides arcticus*	SCE or SCT	12-27-11			
Gilded northern flicker[69] *Colaptes auratus chrysoides*	SE	3-17-88			
Willow flycatcher *Empidonax traillii*	SE[70]	1-02-91			
Southwestern willow flycatcher *Empidonax traillii extimus*	(SE)			FE	3-29-95
Bank swallow *Riparia riparia*	ST	6-11-89			
Coastal California gnatcatcher *Polioptila californica californica*				FT	3-30-93
San Clemente loggerhead shrike *Lanius ludovicianus mearnsi*				FE	8-11-77
Arizona Bell's vireo *Vireo bellii arizonae*	SE	3-17-88			
Least Bell's vireo *Vireo bellii pusillus*	SE	10-02-80		FE	5-02-86
Inyo California towhee *Pipilo crissalis eremophilus*[71]	SE	10-02-80		FT	8-03-87
San Clemente sage sparrow *Amphispiza belli clementeae*				FT	8-11-77
Belding's savannah sparrow *Passerculus sandwichensis beldingi*	SE	1-10-74			
Santa Barbara song sparrow **(Extinct)** *Melospiza melodia graminea*				**Delisted** FE	10-12-83 6-04-73
MAMMALS					
Point Arena mountain beaver *Aplodontia rufa nigra*				FE	12-12-91

[69] Current taxonomy: Gilded flicker (*Colaptes chrysoides*).
[70] State listing includes all subspecies.
[71] Current taxonomy: *Melozone crissalis eremophilus.*

	State Listing			Federal Listing	
San Joaquin antelope squirrel[72] *Ammospermophilus nelsoni*	ST	10-02-80			
Mohave ground squirrel[73] *Spermophilus mohavensis*	ST	6-27-71			
Morro Bay kangaroo rat *Dipodomys heermanni morroensis*	SE	6-27-71		FE	10-13-70
Giant kangaroo rat *Dipodomys ingens*	SE	10-02-80		FE	1-05-87
San Bernardino kangaroo rat[74] *Dipodomys merriami parvus*				FE	9-24-98
Tipton kangaroo rat *Dipodomys nitratoides nitratoides*	SE	6-11-89		FE	7-08-88
Fresno kangaroo rat *Dipodomys nitratoides exilis*	**SE** SR	10-02-80 6-27-71		FE	3-01-85
Stephens' kangaroo rat *Dipodomys stephensi*[75]	ST	6-27-71		FE	9-30-88
Pacific pocket mouse *Perognathus longimembris pacificus*				FE	9-26-94
Amargosa vole *Microtus californicus scirpensis*	SE	10-02-80		FE	11-15-84
Riparian woodrat[76] *Neotoma fuscipes riparia*				FE	3-24-00
Salt-marsh harvest mouse *Reithrodontomys raviventris*	SE	6-27-71		FE	10-13-70
American pika *Ochotona princeps*	SCT	10-26-11			
Riparian brush rabbit *Sylvilagus bachmani riparius*	SE	5-29-94		FE	3-24-00
Buena Vista Lake shrew[77] *Sorex ornatus relictus*				FE	4-05-02
Lesser long-nosed bat *Leptonycteris yerbabuenae*				FE	10-31-88
Gray wolf *Canis lupus*	SCE	10-18-12		FE[78]	4-10-78

[72] Current taxonomy: Nelson's antelope squirrel.
[73] Current taxonomy: *Xerospermophilus mohavensis.*
[74] Federal nomenclature: San Bernardino Merriam's kangaroo rat.
[75] Federal taxonomy: included *Dipodomys cascus*, an invalid junior synonym for *Dipodomys stephensi.*
[76] Federal nomenclature: Riparian (=San Joaquin Valley) woodrat.
[77] Federal nomenclature: Buena Vista Lake ornate shrew.
[78] The full species, *Canis lupus*, was listed as Endangered in 1978. Though the status of the gray wolf is being challenged in other states, any gray wolves present or dispersing into California are considered federally Endangered.

	State Listing			Federal Listing	
Island fox *Urocyon littoralis*	ST[79]	6-27-71			
San Miguel Island Fox *Urocyon littoralis littoralis*	(ST)			FE	4-05-04
Santa Catalina Island Fox *Urocyon littoralis catalinae*	(ST)			FE	4-05-04
Santa Cruz Island Fox *Urocyon littoralis santacruzae*	(ST)			FE	4-05-04
Santa Rosa Island Fox *Urocyon littoralis santarosae*	(ST)			FE	4-05-04
San Joaquin kit fox *Vulpes macrotis mutica*	ST	6-27-71		FE	3-11-67
Sierra Nevada red fox *Vulpes vulpes necator*	ST	10-02-80			
Guadalupe fur seal *Arctocephalus townsendi*	ST	6-27-71		**FT** FE	1-15-86 3-11-67
Steller sea lion - Eastern DPS *Eumetopias jubatus*				FPD **FT** FT	4-18-12 6-4-97[80] 4-05-90
Southern sea otter *Enhydra lutris nereis*				FT	1-14-77
Wolverine *Gulo gulo*	ST	6-27-71			
Fisher - West Coast DPS[81] *Martes pennant*	**Not warranted** SCT or SCE[82]	6-23-10 4-14-09			
California (=Sierra Nevada) bighorn sheep *Ovis canadensis californiana*[83]	**SE** ST	8-27-99 6-27-71		FE	1-03-00
Peninsular bighorn sheep DPS[84] *Ovis canadensis cremnobates*	ST	6-27-71		FE	3-18-98
North Pacific right whale *Eubalaena japonica*[85]				FE[86] FE	4-7-08 6-02-70

[79] State listing includes all 6 subspecies on all 6 islands. Federal listing is for only 4 subspecies on 4 islands.
[80] The NMFS reclassified Steller sea lion as two distinct population segments: western DPS west of 144 degrees longitude (Endangered), and eastern DPS east of 144 degrees longitude (Threatened).
[81] The Fish and Game Commission during their review of the fisher petitioning recognized the common name Pacific fisher. Adopted here is the common name used in the USFWS candidacy (2 Apr 2004), fisher, for the West Coast distinct population segment for California, Oregon, and Washington.
[82] The Fish and Game Commission notice of finding stated that the Pacific fisher was a candidate for listing as either an Endangered or a Threatened species. At the June 23, 2010 meeting the Commission determined that the listing was not warranted.
[83] Current & Federal taxonomy: Sierra Nevada bighorn sheep (*Ovis canadensis sierrae)*
[84] Current taxonomy: the subspecies *O.c. cremnobates* has been synonymized with *O.c. nelsoni*. Peninsular bighorn sheep are now considered to be a Distinct Vertebrate Population Segment (DPS).
[85] The scientific name was clarified in the Federal Register Vol. 68, No. 69 April 10, 2003.

	State Listing			Federal Listing	
Sei whale *Balaenoptera borealis*				FE	6-02-70
Blue whale *Balaenoptera musculus*				FE	6-02-70
Fin whale *Balaenoptera physalus*				FE	6-02-70
Humpback whale[87] *Megaptera novaeangliae*				FE	6-02-70
Gray whale **(Recovered)** *Eschrichtius robustus*				**Delisted** FE	6-15-94 6-02-70
Killer whale (Southern resident DPS) *Orcinus orca*				FE[88] FE	4-04-07 2-16-06 12-22-04
Sperm whale *Physeter macrocephalus*[89]				FE	6-02-70

[86] The NMFS completed a status review of right whales in the N. Pacific and N. Atlantic Oceans and determined the previously Endangered northern right whale (*Eubalaena* spp.) as two separate Endangered species: North Pacific right whale (*E. japonica*) and North Atlantic right whale (*E. glacialis*).
[87] Also known as Hump-backed whale.
[88] The killer whale was listed as Endangered by the NMFS on Feb 16, 2006 and by the USFWS on Apr 4, 2007.
[89] Current taxonomy: *Physeter catodon* with *P. macrocephalus* as a synonym.

ABBREVIATIONS

CESA: California Endangered Species Act

DPS: Distinct population segment

ESA: Endangered Species Act (Federal)

ESU: Evolutionarily significant unit

NMFS: National Marine Fisheries Service

NOAA: National Oceanic and Atmospheric Administration

USFWS: United States Fish and Wildlife Service

ADDITIONAL RESOURCES

The California Fish and Game Commission publishes notices relating to changes to Title 14 of the California Code of Regulations: http://www.fgc.ca.gov/

Title 14 of the California Code of Regulations can be accessed through The Office of Administrative Law: http://www.oal.ca.gov/

The U.S. Fish and Wildlife Service is responsible for protecting Endangered and Threatened species, and conserving candidate species and at-risk species so that ESA listing is not necessary: http://www.fws.gov/Endangered/

NOAA's National Marine Fisheries Service, Office of Protected Resources is responsible for protecting marine mammals and Endangered and Threatened marine life: http://www.nmfs.noaa.gov/pr/

Appendix F. FAA AC 150/5200-33B, “Hazardous Wildlife Attractants On or Near Airports”

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U.S. Department
of Transportation

Federal Aviation Administration

Advisory Circular

Subject: HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AIRPORTS	**Date:** 8/28/2007	**AC No:** 150/5200-33B
	Initiated by: AAS-300	**Change:**

1. PURPOSE. This Advisory Circular (AC) provides guidance on certain land uses that have the potential to attract hazardous wildlife on or near public-use airports. It also discusses airport development projects (including airport construction, expansion, and renovation) affecting aircraft movement near hazardous wildlife attractants. Appendix 1 provides definitions of terms used in this AC.

2. APPLICABILITY. The Federal Aviation Administration (FAA) recommends that public-use airport operators implement the standards and practices contained in this AC. The holders of Airport Operating Certificates issued under Title 14, Code of Federal Regulations (CFR), Part 139, Certification of Airports, Subpart D (Part 139), may use the standards, practices, and recommendations contained in this AC to comply with the wildlife hazard management requirements of Part 139. Airports that have received Federal grant-in-aid assistance must use these standards. The FAA also recommends the guidance in this AC for land-use planners, operators of non-certificated airports, and developers of projects, facilities, and activities on or near airports.

3. CANCELLATION. This AC cancels AC 150/5200-33A, *Hazardous Wildlife Attractants on or near Airports*, dated July 27, 2004.

4. PRINCIPAL CHANGES. This AC contains the following major changes, which are marked with vertical bars in the margin:

a. Technical changes to paragraph references.

b. Wording on storm water detention ponds.

c. Deleted paragraph 4-3.b, *Additional Coordination.*

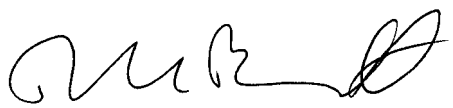
5. BACKGROUND. Information about the risks posed to aircraft by certain wildlife species has increased a great deal in recent years. Improved reporting, studies, documentation, and statistics clearly show that aircraft collisions with birds and other wildlife are a serious economic and public safety problem. While many species of wildlife can pose a threat to aircraft safety, they are not equally hazardous. Table 1

ranks the wildlife groups commonly involved in damaging strikes in the United States according to their relative hazard to aircraft. The ranking is based on the 47,212 records in the FAA National Wildlife Strike Database for the years 1990 through 2003. These hazard rankings, in conjunction with site-specific Wildlife Hazards Assessments (WHA), will help airport operators determine the relative abundance and use patterns of wildlife species and help focus hazardous wildlife management efforts on those species most likely to cause problems at an airport.

Most public-use airports have large tracts of open, undeveloped land that provide added margins of safety and noise mitigation. These areas can also present potential hazards to aviation if they encourage wildlife to enter an airport's approach or departure airspace or air operations area (AOA). Constructed or natural areas—such as poorly drained locations, detention/retention ponds, roosting habitats on buildings, landscaping, odor-causing rotting organic matter (putrescible waste) disposal operations, wastewater treatment plants, agricultural or aquaculture activities, surface mining, or wetlands—can provide wildlife with ideal locations for feeding, loafing, reproduction, and escape. Even small facilities, such as fast food restaurants, taxicab staging areas, rental car facilities, aircraft viewing areas, and public parks, can produce substantial attractions for hazardous wildlife.

During the past century, wildlife-aircraft strikes have resulted in the loss of hundreds of lives worldwide, as well as billions of dollars in aircraft damage. Hazardous wildlife attractants on and near airports can jeopardize future airport expansion, making proper community land-use planning essential. This AC provides airport operators and those parties with whom they cooperate with the guidance they need to assess and address potentially hazardous wildlife attractants when locating new facilities and implementing certain land-use practices on or near public-use airports.

6. MEMORANDUM OF AGREEMENT BETWEEN FEDERAL RESOURCE AGENCIES. The FAA, the U.S. Air Force, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and the U.S. Department of Agriculture - Wildlife Services signed a Memorandum of Agreement (MOA) in July 2003 to acknowledge their respective missions in protecting aviation from wildlife hazards. Through the MOA, the agencies established procedures necessary to coordinate their missions to address more effectively existing and future environmental conditions contributing to collisions between wildlife and aircraft (wildlife strikes) throughout the United States. These efforts are intended to minimize wildlife risks to aviation and human safety while protecting the Nation’s valuable environmental resources.



DAVID L. BENNETT
Director, Office of Airport Safety
and Standards

Table 1. Ranking of 25 species groups as to relative hazard to aircraft (1=most hazardous) based on three criteria (damage, major damage, and effect-on-flight), a composite ranking based on all three rankings, and a relative hazard score. Data were derived from the FAA National Wildlife Strike Database, January 1990–April 2003.[1]

Species group	Ranking by criteria			Composite ranking[2]	Relative hazard score[3]
	Damage[4]	Major damage[5]	Effect on flight[6]		
Deer	1	1	1	1	100
Vultures	2	2	2	2	64
Geese	3	3	6	3	55
Cormorants/pelicans	4	5	3	4	54
Cranes	7	6	4	5	47
Eagles	6	9	7	6	41
Ducks	5	8	10	7	39
Osprey	8	4	8	8	39
Turkey/pheasants	9	7	11	9	33
Herons	11	14	9	10	27
Hawks (buteos)	10	12	12	11	25
Gulls	12	11	13	12	24
Rock pigeon	13	10	14	13	23
Owls	14	13	20	14	23
H. lark/s. bunting	18	15	15	15	17
Crows/ravens	15	16	16	16	16
Coyote	16	19	5	17	14
Mourning dove	17	17	17	18	14
Shorebirds	19	21	18	19	10
Blackbirds/starling	20	22	19	20	10
American kestrel	21	18	21	21	9
Meadowlarks	22	20	22	22	7
Swallows	24	23	24	23	4
Sparrows	25	24	23	24	4
Nighthawks	23	25	25	25	1

[1] Excerpted from the *Special Report for the FAA, "Ranking the Hazard Level of Wildlife Species to Civil Aviation in the USA: Update #1, July 2, 2003".* Refer to this report for additional explanations of criteria and method of ranking.

[2] Relative rank of each species group was compared with every other group for the three variables, placing the species group with the greatest hazard rank for $\geq$ 2 of the 3 variables above the next highest ranked group, then proceeding down the list.

[3] Percentage values, from Tables 3 and 4 in Footnote 1 of the *Special Report*, for the three criteria were summed and scaled down from 100, with 100 as the score for the species group with the maximum summed values and the greatest potential hazard to aircraft.

[4] Aircraft incurred at least some damage (destroyed, substantial, minor, or unknown) from strike.

[5] Aircraft incurred damage or structural failure, which adversely affected the structure strength, performance, or flight characteristics, and which would normally require major repair or replacement of the affected component, or the damage sustained makes it inadvisable to restore aircraft to airworthy condition.

[6] Aborted takeoff, engine shutdown, precautionary landing, or other.

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SECTION 1.

GENERAL SEPARATION CRITERIA FOR HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AIRPORTS.

1-1. INTRODUCTION. When considering proposed land uses, airport operators, local planners, and developers must take into account whether the proposed land uses, including new development projects, will increase wildlife hazards. Land-use practices that attract or sustain hazardous wildlife populations on or near airports can significantly increase the potential for wildlife strikes.

The FAA recommends the minimum separation criteria outlined below for land-use practices that attract hazardous wildlife to the vicinity of airports. Please note that FAA criteria include land uses that cause movement of hazardous wildlife onto, into, or across the airport's approach or departure airspace or air operations area (AOA). (See the discussion of the synergistic effects of surrounding land uses in Section 2-8 of this AC.)

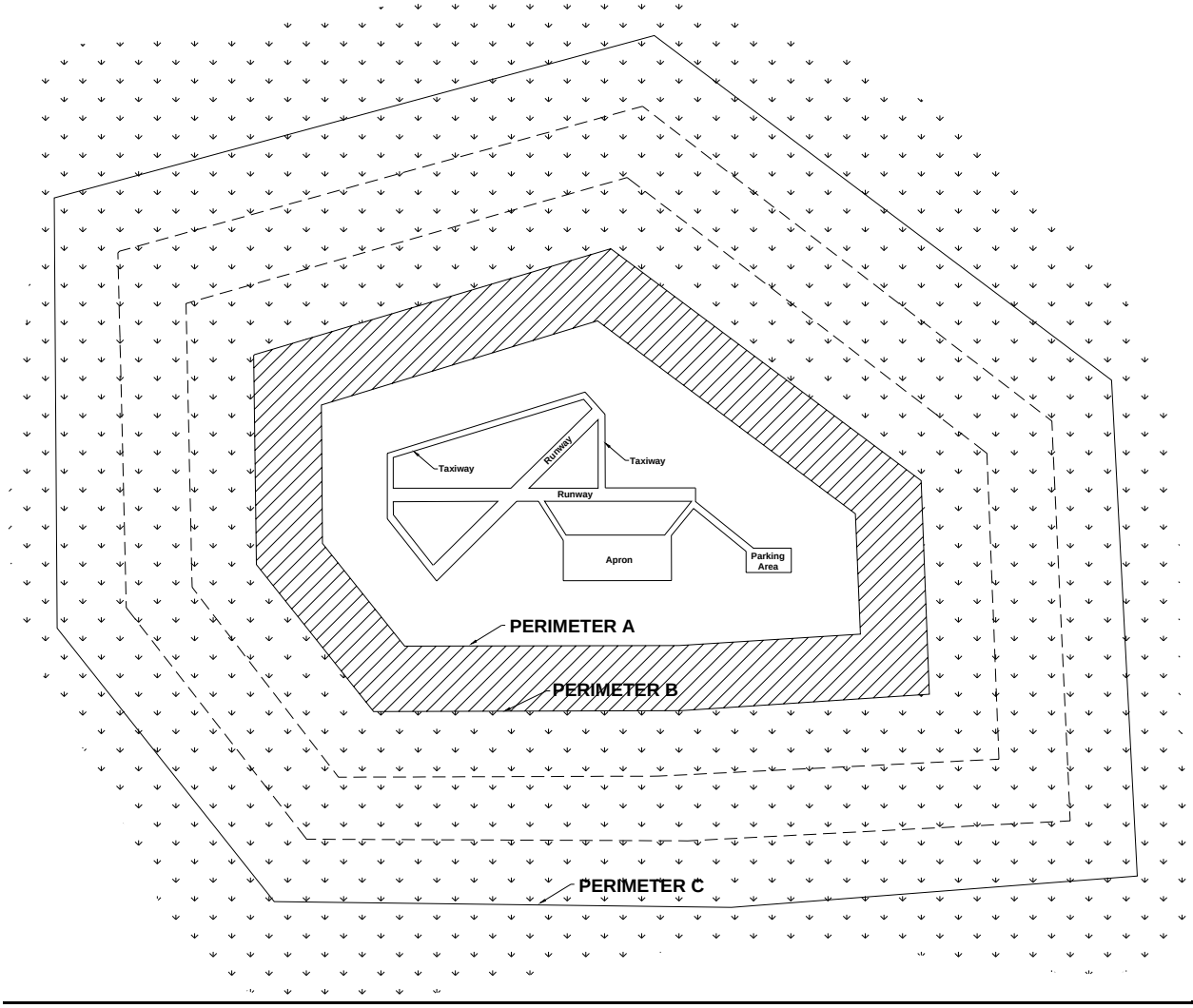
The basis for the separation criteria contained in this section can be found in existing FAA regulations. The separation distances are based on (1) flight patterns of piston-powered aircraft and turbine-powered aircraft, (2) the altitude at which most strikes happen (78 percent occur under 1,000 feet and 90 percent occur under 3,000 feet above ground level), and (3) National Transportation Safety Board (NTSB) recommendations.

1-2. AIRPORTS SERVING PISTON-POWERED AIRCRAFT. Airports that do not sell Jet-A fuel normally serve piston-powered aircraft. Notwithstanding more stringent requirements for specific land uses, the FAA recommends a separation distance of 5,000 feet at these airports for any of the hazardous wildlife attractants mentioned in Section 2 or for new airport development projects meant to accommodate aircraft movement. This distance is to be maintained between an airport's AOA and the hazardous wildlife attractant. Figure 1 depicts this separation distance measured from the nearest aircraft operations areas.

1-3. AIRPORTS SERVING TURBINE-POWERED AIRCRAFT. Airports selling Jet-A fuel normally serve turbine-powered aircraft. Notwithstanding more stringent requirements for specific land uses, the FAA recommends a separation distance of 10,000 feet at these airports for any of the hazardous wildlife attractants mentioned in Section 2 or for new airport development projects meant to accommodate aircraft movement. This distance is to be maintained between an airport's AOA and the hazardous wildlife attractant. Figure 1 depicts this separation distance from the nearest aircraft movement areas.

1-4. PROTECTION OF APPROACH, DEPARTURE, AND CIRCLING AIRSPACE. For all airports, the FAA recommends a distance of 5 statute miles between the farthest edge of the airport's AOA and the hazardous wildlife attractant if the attractant could cause hazardous wildlife movement into or across the approach or departure airspace.

Figure 1. Separation distances within which hazardous wildlife attractants should be avoided, eliminated, or mitigated.



PERIMETER A: For airports serving piston-powered aircraft, hazardous wildlife attractants must be 5,000 feet from the nearest air operations area.

PERIMETER B: For airports serving turbine-powered aircraft, hazardous wildlife attractants must be 10,000 feet from the nearest air operations area.

PERIMETER C: 5-mile range to protect approach, departure and circling airspace.

SECTION 2.

LAND-USE PRACTICES ON OR NEAR AIRPORTS THAT POTENTIALLY ATTRACT HAZARDOUS WILDLIFE.

2-1. GENERAL. The wildlife species and the size of the populations attracted to the airport environment vary considerably, depending on several factors, including land-use practices on or near the airport. This section discusses land-use practices having the potential to attract hazardous wildlife and threaten aviation safety. In addition to the specific considerations outlined below, airport operators should refer to *Wildlife Hazard Management at Airports,* prepared by FAA and U.S. Department of Agriculture (USDA) staff. (This manual is available in English, Spanish, and French. It can be viewed and downloaded free of charge from the FAA's wildlife hazard mitigation web site: http://wildlife-mitigation.tc.FAA.gov.). And, *Prevention and Control of Wildlife Damage,* compiled by the University of Nebraska Cooperative Extension Division. (This manual is available online in a periodically updated version at: ianrwww.unl.edu/wildlife/solutions/handbook/.)

2-2. WASTE DISPOSAL OPERATIONS. Municipal solid waste landfills (MSWLF) are known to attract large numbers of hazardous wildlife, particularly birds. Because of this, these operations, when located within the separations identified in the siting criteria in Sections 1-2 through 1-4, are considered incompatible with safe airport operations.

a. Siting for new municipal solid waste landfills subject to AIR 21. Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (Public Law 106-181) (AIR 21) prohibits the construction or establishment of a new MSWLF within 6 statute miles of certain public-use airports. Before these prohibitions apply, both the airport and the landfill must meet the very specific conditions described below. These restrictions do not apply to airports or landfills located within the state of Alaska.

The airport must (1) have received a Federal grant(s) under 49 U.S.C. § 47101, et. seq.; (2) be under control of a public agency; (3) serve some scheduled air carrier operations conducted in aircraft with less than 60 seats; and (4) have total annual enplanements consisting of at least 51 percent of scheduled air carrier enplanements conducted in aircraft with less than 60 passenger seats.

The proposed MSWLF must (1) be within 6 miles of the airport, as measured from airport property line to MSWLF property line, and (2) have started construction or establishment on or after April 5, 2001. Public Law 106-181 only limits the construction or establishment of some new MSWLF. It does not limit the expansion, either vertical or horizontal, of existing landfills.

NOTE: Consult the most recent version of AC 150/5200-34, *Construction or Establishment of Landfills Near Public Airports,* for a more detailed discussion of these restrictions.

b. Siting for new MSWLF not subject to AIR 21. If an airport and MSWLF do not meet the restrictions of Public Law 106-181, the FAA recommends against locating MSWLF within the separation distances identified in Sections 1-2 through 1-4. The separation distances should be measured from the closest point of the airport's AOA to the closest planned MSWLF cell.

c. Considerations for existing waste disposal facilities within the limits of separation criteria. The FAA recommends against airport development projects that would increase the number of aircraft operations or accommodate larger or faster aircraft near MSWLF operations located within the separations identified in Sections 1-2 through 1-4. In addition, in accordance with 40 CFR 258.10, owners or operators of existing MSWLF units that are located within the separations listed in Sections 1-2 through 1-4 must demonstrate that the unit is designed and operated so it does not pose a bird hazard to aircraft. (See Section 4-2(b) of this AC for a discussion of this demonstration requirement.)

d. Enclosed trash transfer stations. Enclosed waste-handling facilities that receive garbage behind closed doors; process it via compaction, incineration, or similar manner; and remove all residue by enclosed vehicles generally are compatible with safe airport operations, provided they are not located on airport property or within the Runway Protection Zone (RPZ). These facilities should not handle or store putrescible waste outside or in a partially enclosed structure accessible to hazardous wildlife. Trash transfer facilities that are open on one or more sides; that store uncovered quantities of municipal solid waste outside, even if only for a short time; that use semi-trailers that leak or have trash clinging to the outside; or that do not control odors by ventilation and filtration systems (odor masking is not acceptable) do not meet the FAA's definition of fully enclosed trash transfer stations. The FAA considers these facilities incompatible with safe airport operations if they are located closer than the separation distances specified in Sections 1-2 through 1-4.

e. Composting operations on or near airport property. Composting operations that accept only yard waste (e.g., leaves, lawn clippings, or branches) generally do not attract hazardous wildlife. Sewage sludge, woodchips, and similar material are not municipal solid wastes and may be used as compost bulking agents. The compost, however, must never include food or other municipal solid waste. Composting operations should not be located on airport property. Off-airport property composting operations should be located no closer than the greater of the following distances: 1,200 feet from any AOA or the distance called for by airport design requirements (see AC 150/5300-13, *Airport Design*). This spacing should prevent material, personnel, or equipment from penetrating any Object Free Area (OFA), Obstacle Free Zone (OFZ), Threshold Siting Surface (TSS), or Clearway. Airport operators should monitor composting operations located in proximity to the airport to ensure that steam or thermal rise does not adversely affect air traffic. On-airport disposal of compost by-products should not be conducted for the reasons stated in 2-3f.

f. Underwater waste discharges. The FAA recommends against the underwater discharge of any food waste (e.g., fish processing offal) within the separations identified in Sections 1-2 through 1-4 because it could attract scavenging hazardous wildlife.

g. Recycling centers. Recycling centers that accept previously sorted non-food items, such as glass, newspaper, cardboard, or aluminum, are, in most cases, not attractive to hazardous wildlife and are acceptable.

h. Construction and demolition (C&D) debris facilities. C&D landfills do not generally attract hazardous wildlife and are acceptable if maintained in an orderly manner, admit no putrescible waste, and are not co-located with other waste disposal operations. However, C&D landfills have similar visual and operational characteristics to putrescible waste disposal sites. When co-located with putrescible waste disposal operations, C&D landfills are more likely to attract hazardous wildlife because of the similarities between these disposal facilities. Therefore, a C&D landfill co-located with another waste disposal operation should be located outside of the separations identified in Sections 1-2 through 1-4.

i. Fly ash disposal. The incinerated residue from resource recovery power/heat-generating facilities that are fired by municipal solid waste, coal, or wood is generally not a wildlife attractant because it no longer contains putrescible matter. Landfills accepting only fly ash are generally not considered to be wildlife attractants and are acceptable as long as they are maintained in an orderly manner, admit no putrescible waste of any kind, and are not co-located with other disposal operations that attract hazardous wildlife.

Since varying degrees of waste consumption are associated with general incineration (not resource recovery power/heat-generating facilities), the FAA considers the ash from general incinerators a regular waste disposal by-product and, therefore, a hazardous wildlife attractant if disposed of within the separation criteria outlined in Sections 1-2 through 1-4.

2-3. WATER MANAGEMENT FACILITIES. Drinking water intake and treatment facilities, storm water and wastewater treatment facilities, associated retention and settling ponds, ponds built for recreational use, and ponds that result from mining activities often attract large numbers of potentially hazardous wildlife. To prevent wildlife hazards, land-use developers and airport operators may need to develop management plans, in compliance with local and state regulations, to support the operation of storm water management facilities on or near all public-use airports to ensure a safe airport environment.

a. Existing storm water management facilities. On-airport storm water management facilities allow the quick removal of surface water, including discharges related to aircraft deicing, from impervious surfaces, such as pavement and terminal/hangar building roofs. Existing on-airport detention ponds collect storm water, protect water quality, and control runoff. Because they slowly release water

after storms, they create standing bodies of water that can attract hazardous wildlife. Where the airport has developed a Wildlife Hazard Management Plan (WHMP) in accordance with Part 139, the FAA requires immediate correction of any wildlife hazards arising from existing storm water facilities located on or near airports, using appropriate wildlife hazard mitigation techniques. Airport operators should develop measures to minimize hazardous wildlife attraction in consultation with a wildlife damage management biologist.

Where possible, airport operators should modify storm water detention ponds to allow a maximum 48-hour detention period for the design storm. The FAA recommends that airport operators avoid or remove retention ponds and detention ponds featuring dead storage to eliminate standing water. Detention basins should remain totally dry between rainfalls. Where constant flow of water is anticipated through the basin, or where any portion of the basin bottom may remain wet, the detention facility should include a concrete or paved pad and/or ditch/swale in the bottom to prevent vegetation that may provide nesting habitat.

When it is not possible to drain a large detention pond completely, airport operators may use physical barriers, such as bird balls, wires grids, pillows, or netting, to deter birds and other hazardous wildlife. When physical barriers are used, airport operators must evaluate their use and ensure they will not adversely affect water rescue. Before installing any physical barriers over detention ponds on Part 139 airports, airport operators must get approval from the appropriate FAA Regional Airports Division Office.

The FAA recommends that airport operators encourage off-airport storm water treatment facility operators to incorporate appropriate wildlife hazard mitigation techniques into storm water treatment facility operating practices when their facility is located within the separation criteria specified in Sections 1-2 through 1-4.

b. New storm water management facilities. The FAA strongly recommends that off-airport storm water management systems located within the separations identified in Sections 1-2 through 1-4 be designed and operated so as not to create above-ground standing water. Stormwater detention ponds should be designed, engineered, constructed, and maintained for a maximum 48–hour detention period after the design storm and remain completely dry between storms. To facilitate the control of hazardous wildlife, the FAA recommends the use of steep-sided, rip-rap lined, narrow, linearly shaped water detention basins. When it is not possible to place these ponds away from an airport's AOA, airport operators should use physical barriers, such as bird balls, wires grids, pillows, or netting, to prevent access of hazardous wildlife to open water and minimize aircraft-wildlife interactions. When physical barriers are used, airport operators must evaluate their use and ensure they will not adversely affect water rescue. Before installing any physical barriers over detention ponds on Part 139 airports, airport operators must get approval from the appropriate FAA Regional Airports Division Office. All vegetation in or around detention basins that provide food or cover for hazardous wildlife should be eliminated. If soil conditions and other requirements allow, the FAA encourages

the use of underground storm water infiltration systems, such as French drains or buried rock fields, because they are less attractive to wildlife.

c. Existing wastewater treatment facilities. The FAA strongly recommends that airport operators immediately correct any wildlife hazards arising from existing wastewater treatment facilities located on or near the airport. Where required, a WHMP developed in accordance with Part 139 will outline appropriate wildlife hazard mitigation techniques. Accordingly, airport operators should encourage wastewater treatment facility operators to incorporate measures, developed in consultation with a wildlife damage management biologist, to minimize hazardous wildlife attractants. Airport operators should also encourage those wastewater treatment facility operators to incorporate these mitigation techniques into their standard operating practices. In addition, airport operators should consider the existence of wastewater treatment facilities when evaluating proposed sites for new airport development projects and avoid such sites when practicable.

d. New wastewater treatment facilities. The FAA strongly recommends against the construction of new wastewater treatment facilities or associated settling ponds within the separations identified in Sections 1-2 through 1-4. Appendix 1 defines wastewater treatment facility as “any devices and/or systems used to store, treat, recycle, or reclaim municipal sewage or liquid industrial wastes.” The definition includes any pretreatment involving the reduction of the amount of pollutants or the elimination of pollutants prior to introducing such pollutants into a publicly owned treatment works (wastewater treatment facility). During the site-location analysis for wastewater treatment facilities, developers should consider the potential to attract hazardous wildlife if an airport is in the vicinity of the proposed site, and airport operators should voice their opposition to such facilities if they are in proximity to the airport.

e. Artificial marshes. In warmer climates, wastewater treatment facilities sometimes employ artificial marshes and use submergent and emergent aquatic vegetation as natural filters. These artificial marshes may be used by some species of flocking birds, such as blackbirds and waterfowl, for breeding or roosting activities. The FAA strongly recommends against establishing artificial marshes within the separations identified in Sections 1-2 through 1-4.

f. Wastewater discharge and sludge disposal. The FAA recommends against the discharge of wastewater or sludge on airport property because it may improve soil moisture and quality on unpaved areas and lead to improved turf growth that can be an attractive food source for many species of animals. Also, the turf requires more frequent mowing, which in turn may mutilate or flush insects or small animals and produce straw, both of which can attract hazardous wildlife. In addition, the improved turf may attract grazing wildlife, such as deer and geese. Problems may also occur when discharges saturate unpaved airport areas. The resultant soft, muddy conditions can severely restrict or prevent emergency vehicles from reaching accident sites in a timely manner.

2-4. WETLANDS. Wetlands provide a variety of functions and can be regulated by local, state, and Federal laws. Normally, wetlands are attractive to many types of wildlife, including many which rank high on the list of hazardous wildlife species (Table 1).

NOTE: If questions exist as to whether an area qualifies as a wetland, contact the local division of the U.S. Army Corps of Engineers, the Natural Resources Conservation Service, or a wetland consultant qualified to delineate wetlands.

a. Existing wetlands on or near airport property. If wetlands are located on or near airport property, airport operators should be alert to any wildlife use or habitat changes in these areas that could affect safe aircraft operations. At public-use airports, the FAA recommends immediately correcting, in cooperation with local, state, and Federal regulatory agencies, any wildlife hazards arising from existing wetlands located on or near airports. Where required, a WHMP will outline appropriate wildlife hazard mitigation techniques. Accordingly, airport operators should develop measures to minimize hazardous wildlife attraction in consultation with a wildlife damage management biologist.

b. New airport development. Whenever possible, the FAA recommends locating new airports using the separations from wetlands identified in Sections 1-2 through 1-4. Where alternative sites are not practicable, or when airport operators are expanding an existing airport into or near wetlands, a wildlife damage management biologist, in consultation with the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, and the state wildlife management agency should evaluate the wildlife hazards and prepare a WHMP that indicates methods of minimizing the hazards.

c. Mitigation for wetland impacts from airport projects. Wetland mitigation may be necessary when unavoidable wetland disturbances result from new airport development projects or projects required to correct wildlife hazards from wetlands. Wetland mitigation must be designed so it does not create a wildlife hazard. The FAA recommends that wetland mitigation projects that may attract hazardous wildlife be sited outside of the separations identified in Sections 1-2 through 1-4.

(1) Onsite mitigation of wetland functions. The FAA may consider exceptions to locating mitigation activities outside the separations identified in Sections 1-2 through 1-4 if the affected wetlands provide unique ecological functions, such as critical habitat for threatened or endangered species or ground water recharge, which cannot be replicated when moved to a different location. Using existing airport property is sometimes the only feasible way to achieve the mitigation ratios mandated in regulatory orders and/or settlement agreements with the resource agencies. Conservation easements are an additional means of providing mitigation for project impacts. Typically the airport operator continues to own the property, and an easement is created stipulating that the property will be maintained as habitat for state or Federally listed species.

Mitigation must not inhibit the airport operator's ability to effectively control hazardous wildlife on or near the mitigation site or effectively maintain other aspects of safe airport operations. Enhancing such mitigation areas to attract hazardous wildlife must be avoided. The FAA will review any onsite mitigation proposals to determine compatibility with safe airport operations. A wildlife damage management biologist should evaluate any wetland mitigation projects that are needed to protect unique wetland functions and that must be located in the separation criteria in Sections 1-2 through 1-4 before the mitigation is implemented. A WHMP should be developed to reduce the wildlife hazards.

(2) Offsite mitigation of wetland functions. The FAA recommends that wetland mitigation projects that may attract hazardous wildlife be sited outside of the separations identified in Sections 1-2 through 1-4 unless they provide unique functions that must remain onsite (see 2-4c(1)). Agencies that regulate impacts to or around wetlands recognize that it may be necessary to split wetland functions in mitigation schemes. Therefore, regulatory agencies may, under certain circumstances, allow portions of mitigation to take place in different locations.

(3) Mitigation banking. Wetland mitigation banking is the creation or restoration of wetlands in order to provide mitigation credits that can be used to offset permitted wetland losses. Mitigation banking benefits wetland resources by providing advance replacement for permitted wetland losses; consolidating small projects into larger, better-designed and managed units; and encouraging integration of wetland mitigation projects with watershed planning. This last benefit is most helpful for airport projects, as wetland impacts mitigated outside of the separations identified in Sections 1-2 through 1-4 can still be located within the same watershed. Wetland mitigation banks meeting the separation criteria offer an ecologically sound approach to mitigation in these situations. Airport operators should work with local watershed management agencies or organizations to develop mitigation banking for wetland impacts on airport property.

2-5. DREDGE SPOIL CONTAINMENT AREAS. The FAA recommends against locating dredge spoil containment areas (also known as Confined Disposal Facilities) within the separations identified in Sections 1-2 through 1-4 if the containment area or the spoils contain material that would attract hazardous wildlife.

2-6. AGRICULTURAL ACTIVITIES. Because most, if not all, agricultural crops can attract hazardous wildlife during some phase of production, the FAA recommends against the used of airport property for agricultural production, including hay crops, within the separations identified in Sections 1-2 through 1-4. . If the airport has no financial alternative to agricultural crops to produce income necessary to maintain the viability of the airport, then the airport shall follow the crop distance guidelines listed in the table titled "Minimum Distances between Certain Airport Features and Any On-Airport Agricultural Crops" found in AC 150/5300-13, *Airport Design*, Appendix 17. The cost of wildlife control and potential accidents should be weighed against the income produced by the on-airport crops when deciding whether to allow crops on the airport.

a. Livestock production. Confined livestock operations (i.e., feedlots, dairy operations, hog or chicken production facilities, or egg laying operations) often attract flocking birds, such as starlings, that pose a hazard to aviation. Therefore, The FAA recommends against such facilities within the separations identified in Sections 1-2 through 1-4. Any livestock operation within these separations should have a program developed to reduce the attractiveness of the site to species that are hazardous to aviation safety. Free-ranging livestock must not be grazed on airport property because the animals may wander onto the AOA. Furthermore, livestock feed, water, and manure may attract birds.

b. Aquaculture. Aquaculture activities (i.e. catfish or trout production) conducted outside of fully enclosed buildings are inherently attractive to a wide variety of birds. Existing aquaculture facilities/activities within the separations listed in Sections 1-2 through 1-4 must have a program developed to reduce the attractiveness of the sites to species that are hazardous to aviation safety. Airport operators should also oppose the establishment of new aquaculture facilities/activities within the separations listed in Sections 1-2 through 1-4.

c. Alternative uses of agricultural land. Some airports are surrounded by vast areas of farmed land within the distances specified in Sections 1-2 through 1-4. Seasonal uses of agricultural land for activities such as hunting can create a hazardous wildlife situation. In some areas, farmers will rent their land for hunting purposes. Rice farmers, for example, flood their land during waterfowl hunting season and obtain additional revenue by renting out duck blinds. The duck hunters then use decoys and call in hundreds, if not thousands, of birds, creating a tremendous threat to aircraft safety. A wildlife damage management biologist should review, in coordination with local farmers and producers, these types of seasonal land uses and incorporate them into the WHMP.

2-7. GOLF COURSES, LANDSCAPING AND OTHER LAND-USE CONSIDERATIONS.

a. Golf courses. The large grassy areas and open water found on most golf courses are attractive to hazardous wildlife, particularly Canada geese and some species of gulls. These species can pose a threat to aviation safety. The FAA recommends against construction of new golf courses within the separations identified in Sections 1-2 through 1-4. Existing golf courses located within these separations must develop a program to reduce the attractiveness of the sites to species that are hazardous to aviation safety. Airport operators should ensure these golf courses are monitored on a continuing basis for the presence of hazardous wildlife. If hazardous wildlife is detected, corrective actions should be immediately implemented.

b. Landscaping and landscape maintenance. Depending on its geographic location, landscaping can attract hazardous wildlife. The FAA recommends that airport operators approach landscaping with caution and confine it to airport areas not associated with aircraft movements. A wildlife damage management biologist should review all landscaping plans. Airport operators should also monitor all landscaped areas on a continuing basis for the presence of hazardous wildlife. If

hazardous wildlife is detected, corrective actions should be immediately implemented.

Turf grass areas can be highly attractive to a variety of hazardous wildlife species. Research conducted by the USDA Wildlife Services' National Wildlife Research Center has shown that no one grass management regime will deter all species of hazardous wildlife in all situations. In cooperation with wildlife damage management biologist, airport operators should develop airport turf grass management plans on a prescription basis, depending on the airport's geographic locations and the type of hazardous wildlife likely to frequent the airport

Airport operators should ensure that plant varieties attractive to hazardous wildlife are not used on the airport. Disturbed areas or areas in need of re-vegetating should not be planted with seed mixtures containing millet or any other large-seed producing grass. For airport property already planted with seed mixtures containing millet, rye grass, or other large-seed producing grasses, the FAA recommends disking, plowing, or another suitable agricultural practice to prevent plant maturation and seed head production. Plantings should follow the specific recommendations for grass management and seed and plant selection made by the State University Cooperative Extension Service, the local office of Wildlife Services, or a qualified wildlife damage management biologist. Airport operators should also consider developing and implementing a preferred/prohibited plant species list, reviewed by a wildlife damage management biologist, which has been designed for the geographic location to reduce the attractiveness to hazardous wildlife for landscaping airport property.

c. Airports surrounded by wildlife habitat. The FAA recommends that operators of airports surrounded by woodlands, water, or wetlands refer to Section 2.4 of this AC. Operators of such airports should provide for a Wildlife Hazard Assessment (WHA) conducted by a wildlife damage management biologist. This WHA is the first step in preparing a WHMP, where required.

d. Other hazardous wildlife attractants. Other specific land uses or activities (e.g., sport or commercial fishing, shellfish harvesting, etc.), perhaps unique to certain regions of the country, have the potential to attract hazardous wildlife. Regardless of the source of the attraction, when hazardous wildlife is noted on a public-use airport, airport operators must take prompt remedial action(s) to protect aviation safety.

2-8. SYNERGISTIC EFFECTS OF SURROUNDING LAND USES. There may be circumstances where two (or more) different land uses that would not, by themselves, be considered hazardous wildlife attractants or that are located outside of the separations identified in Sections 1-2 through 1-4 that are in such an alignment with the airport as to create a wildlife corridor directly through the airport and/or surrounding airspace. An example of this situation may involve a lake located outside of the separation criteria on the east side of an airport and a large hayfield on the west side of an airport, land uses that together could create a flyway for Canada geese directly across the airspace of the airport. There are numerous examples of such situations;

therefore, airport operators and the wildlife damage management biologist must consider the entire surrounding landscape and community when developing the WHMP.

SECTION 3.

PROCEDURES FOR WILDLIFE HAZARD MANAGEMENT BY OPERATORS OF PUBLIC-USE AIRPORTS.

3.1. INTRODUCTION. In recognition of the increased risk of serious aircraft damage or the loss of human life that can result from a wildlife strike, the FAA may require the development of a Wildlife Hazard Management Plan (WHMP) when specific triggering events occur on or near the airport. Part 139.337 discusses the specific events that trigger a Wildlife Hazard Assessment (WHA) and the specific issues that a WHMP must address for FAA approval and inclusion in an Airport Certification Manual.

3.2. COORDINATION WITH USDA WILDLIFE SERVICES OR OTHER QUALIFIED WILDLIFE DAMAGE MANAGEMENT BIOLOGISTS. The FAA will use the Wildlife Hazard Assessment (WHA) conducted in accordance with Part 139 to determine if the airport needs a WHMP. Therefore, persons having the education, training, and expertise necessary to assess wildlife hazards must conduct the WHA. The airport operator may look to Wildlife Services or to qualified private consultants to conduct the WHA. When the services of a wildlife damage management biologist are required, the FAA recommends that land-use developers or airport operators contact a consultant specializing in wildlife damage management or the appropriate state director of Wildlife Services.

NOTE: Telephone numbers for the respective USDA Wildlife Services state offices can be obtained by contacting USDA Wildlife Services Operational Support Staff, 4700 River Road, Unit 87, Riverdale, MD, 20737-1234, Telephone (301) 734-7921, Fax (301) 734-5157 *(http://www.aphis.usda.gov/ws/)*.

3-3. WILDLIFE HAZARD MANAGEMENT AT AIRPORTS: A MANUAL FOR AIRPORT PERSONNEL. This manual, prepared by FAA and USDA Wildlife Services staff, contains a compilation of information to assist airport personnel in the development, implementation, and evaluation of WHMPs at airports. The manual includes specific information on the nature of wildlife strikes, legal authority, regulations, wildlife management techniques, WHAs, WHMPs, and sources of help and information. The manual is available in three languages: English, Spanish, and French. It can be viewed and downloaded free of charge from the FAA's wildlife hazard mitigation web site: http://wildlife-mitigation.tc.FAA.gov/. This manual only provides a starting point for addressing wildlife hazard issues at airports. Hazardous wildlife management is a complex discipline and conditions vary widely across the United States. Therefore, qualified wildlife damage management biologists must direct the development of a WHMP and the implementation of management actions by airport personnel.

There are many other resources complementary to this manual for use in developing and implementing WHMPs. Several are listed in the manual's bibliography.

3-4. WILDLIFE HAZARD ASSESSMENTS, TITLE 14, CODE OF FEDERAL REGULATIONS, PART 139. Part 139.337(b) requires airport operators to conduct a Wildlife Hazard Assessment (WHA) when certain events occur on or near the airport.

Part 139.337 (c) provides specific guidance as to what facts must be addressed in a WHA.

3-5. WILDLIFE HAZARD MANAGEMENT PLAN (WHMP). The FAA will consider the results of the WHA, along with the aeronautical activity at the airport and the views of the airport operator and airport users, in determining whether a formal WHMP is needed, in accordance with Part 139.337. If the FAA determines that a WHMP is needed, the airport operator must formulate and implement a WHMP, using the WHA as the basis for the plan.

The goal of an airport's Wildlife Hazard Management Plan is to minimize the risk to aviation safety, airport structures or equipment, or human health posed by populations of hazardous wildlife on and around the airport.

The WHMP must identify hazardous wildlife attractants on or near the airport and the appropriate wildlife damage management techniques to minimize the wildlife hazard. It must also prioritize the management measures.

3-6. LOCAL COORDINATION. The establishment of a Wildlife Hazards Working Group (WHWG) will facilitate the communication, cooperation, and coordination of the airport and its surrounding community necessary to ensure the effectiveness of the WHMP. The cooperation of the airport community is also necessary when new projects are considered. Whether on or off the airport, the input from all involved parties must be considered when a potentially hazardous wildlife attractant is being proposed. Airport operators should also incorporate public education activities with the local coordination efforts because some activities in the vicinity of your airport, while harmless under normal leisure conditions, can attract wildlife and present a danger to aircraft. For example, if public trails are planned near wetlands or in parks adjoining airport property, the public should know that feeding birds and other wildlife in the area may pose a risk to aircraft.

Airport operators should work with local and regional planning and zoning boards so as to be aware of proposed land-use changes, or modification of existing land uses, that could create hazardous wildlife attractants within the separations identified in Sections 1-2 through 1-4. Pay particular attention to proposed land uses involving creation or expansion of waste water treatment facilities, development of wetland mitigation sites, or development or expansion of dredge spoil containment areas. At the very least, airport operators must ensure they are on the notification list of the local planning board or equivalent review entity for all communities located within 5 miles of the airport, so they will receive notification of any proposed project and have the opportunity to review it for attractiveness to hazardous wildlife.

3-7 COORDINATION/NOTIFICATION OF AIRMEN OF WILDLIFE HAZARDS. If an existing land-use practice creates a wildlife hazard and the land-use practice or wildlife hazard cannot be immediately eliminated, airport operators must issue a Notice to Airmen (NOTAM) and encourage the land–owner or manager to take steps to control the wildlife hazard and minimize further attraction.

SECTION 4.

FAA NOTIFICATION AND REVIEW OF PROPOSED LAND-USE PRACTICE CHANGES IN THE VICINITY OF PUBLIC-USE AIRPORTS

4-1. FAA REVIEW OF PROPOSED LAND-USE PRACTICE CHANGES IN THE VICINITY OF PUBLIC-USE AIRPORTS.

a. The FAA discourages the development of waste disposal and other facilities, discussed in Section 2, located within the 5,000/10,000-foot criteria specified in Sections 1-2 through 1-4.

b. For projects that are located outside the 5,000/10,000-foot criteria but within 5 statute miles of the airport's AOA, the FAA may review development plans, proposed land-use changes, operational changes, or wetland mitigation plans to determine if such changes present potential wildlife hazards to aircraft operations. The FAA considers sensitive airport areas as those that lie under or next to approach or departure airspace. This brief examination should indicate if further investigation is warranted.

c. Where a wildlife damage management biologist has conducted a further study to evaluate a site's compatibility with airport operations, the FAA may use the study results to make a determination.

4-2. WASTE MANAGEMENT FACILITIES.

a. Notification of new/expanded project proposal. Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (Public Law 106-181) limits the construction or establishment of new MSWLF within 6 statute miles of certain public-use airports, when both the airport and the landfill meet very specific conditions. See Section 2-2 of this AC and AC 150/5200-34 for a more detailed discussion of these restrictions.

The Environmental Protection Agency (EPA) requires any MSWLF operator proposing a new or expanded waste disposal operation within 5 statute miles of a runway end to notify the appropriate FAA Regional Airports Division Office and the airport operator of the proposal (40 CFR 258, *Criteria for Municipal Solid Waste Landfills*, Section 258.10, *Airport Safety*). The EPA also requires owners or operators of new MSWLF units, or lateral expansions of existing MSWLF units, that are located within 10,000 feet of any airport runway end used by turbojet aircraft, or within 5,000 feet of any airport runway end used only by piston-type aircraft, to demonstrate successfully that such units are not hazards to aircraft. (See 4-2.b below.)

When new or expanded MSWLF are being proposed near airports, MSWLF operators must notify the airport operator and the FAA of the proposal as early as possible pursuant to 40 CFR 258.

b. Waste handling facilities within separations identified in Sections 1-2 through 1-4. To claim successfully that a waste-handling facility sited within the separations identified in Sections 1-2 through 1-4 does not attract hazardous wildlife and does not threaten aviation, the developer must establish convincingly that the facility will not handle putrescible material other than that as outlined in 2-2.d. The FAA strongly recommends against any facility other than that as outlined in 2-2.d (enclosed transfer stations). The FAA will use this information to determine if the facility will be a hazard to aviation.

c. Putrescible-Waste Facilities. In their effort to satisfy the EPA requirement, some putrescible-waste facility proponents may offer to undertake experimental measures to demonstrate that their proposed facility will not be a hazard to aircraft. To date, no such facility has been able to demonstrate an ability to reduce and sustain hazardous wildlife to levels that existed before the putrescible-waste landfill began operating. For this reason, demonstrations of experimental wildlife control measures may not be conducted within the separation identified in Sections 1-2 through 1-4.

4-3. OTHER LAND-USE PRACTICE CHANGES. As a matter of policy, the FAA encourages operators of public-use airports who become aware of proposed land use practice changes that may attract hazardous wildlife within 5 statute miles of their airports to promptly notify the FAA. The FAA also encourages proponents of such land use changes to notify the FAA as early in the planning process as possible. Advanced notice affords the FAA an opportunity (1) to evaluate the effect of a particular land-use change on aviation safety and (2) to support efforts by the airport sponsor to restrict the use of land next to or near the airport to uses that are compatible with the airport.

The airport operator, project proponent, or land-use operator may use FAA Form 7460-1, *Notice of Proposed Construction or Alteration*, or other suitable documents similar to FAA Form 7460-1 to notify the appropriate FAA Regional Airports Division Office. Project proponents can contact the appropriate FAA Regional Airports Division Office for assistance with the notification process.

It is helpful if the notification includes a 15-minute quadrangle map of the area identifying the location of the proposed activity. The land-use operator or project proponent should also forward specific details of the proposed land-use change or operational change or expansion. In the case of solid waste landfills, the information should include the type of waste to be handled, how the waste will be processed, and final disposal methods.

a. Airports that have received Federal grant-in-aid assistance. Airports that have received Federal grant-in-aid assistance are required by their grant assurances to take appropriate actions to restrict the use of land next to or near the airport to uses that are compatible with normal airport operations. The FAA recommends that airport operators to the extent practicable oppose off-airport land-use changes or practices within the separations identified in Sections 1-2 through 1-4 that may attract hazardous wildlife. Failure to do so may lead to noncompliance with applicable grant assurances. The FAA will not approve the placement of airport

development projects pertaining to aircraft movement in the vicinity of hazardous wildlife attractants without appropriate mitigating measures. Increasing the intensity of wildlife control efforts is not a substitute for eliminating or reducing a proposed wildlife hazard. Airport operators should identify hazardous wildlife attractants and any associated wildlife hazards during any planning process for new airport development projects.

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APPENDIX 1. DEFINITIONS OF TERMS USED IN THIS ADVISORY CIRCULAR.

1. **GENERAL.** This appendix provides definitions of terms used throughout this AC.

    1. **Air operations area.** Any area of an airport used or intended to be used for landing, takeoff, or surface maneuvering of aircraft. An air operations area includes such paved areas or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runway, taxiways, or apron.

    2. **Airport operator.** The operator (private or public) or sponsor of a public-use airport.

    3. **Approach or departure airspace.** The airspace, within 5 statute miles of an airport, through which aircraft move during landing or takeoff.

    4. **Bird balls.** High-density plastic floating balls that can be used to cover ponds and prevent birds from using the sites.

    5. **Certificate holder.** The holder of an Airport Operating Certificate issued under Title 14, Code of Federal Regulations, Part 139.

    6. **Construct a new MSWLF.** To begin to excavate, grade land, or raise structures to prepare a municipal solid waste landfill as permitted by the appropriate regulatory or permitting agency.

    7. **Detention ponds.** Storm water management ponds that hold storm water for short periods of time, a few hours to a few days.

    8. **Establish a new MSWLF.** When the first load of putrescible waste is received on-site for placement in a prepared municipal solid waste landfill.

    9. **Fly ash.** The fine, sand-like residue resulting from the complete incineration of an organic fuel source. Fly ash typically results from the combustion of coal or waste used to operate a power generating plant.

    10. **General aviation aircraft.** Any civil aviation aircraft not operating under 14 CFR Part 119, Certification: Air Carriers and Commercial Operators.

    11. **Hazardous wildlife.** Species of wildlife (birds, mammals, reptiles), including feral animals and domesticated animals not under control, that are associated with aircraft strike problems, are capable of causing structural damage to airport facilities, or act as attractants to other wildlife that pose a strike hazard

    12. **Municipal Solid Waste Landfill (MSWLF).** A publicly or privately owned discrete area of land or an excavation that receives household waste and that is not a land application unit, surface impoundment, injection well, or waste pile, as those terms are defined under 40 CFR § 257.2. An MSWLF may receive

other types wastes, such as commercial solid waste, non-hazardous sludge, small-quantity generator waste, and industrial solid waste, as defined under 40 CFR § 258.2. An MSWLF can consist of either a stand alone unit or several cells that receive household waste.

13. **New MSWLF.** A municipal solid waste landfill that was established or constructed after April 5, 2001.

14. **Piston-powered aircraft.** Fixed-wing aircraft powered by piston engines.

15. **Piston-use airport.** Any airport that does not sell Jet-A fuel for fixed-wing turbine-powered aircraft, and primarily serves fixed-wing, piston-powered aircraft. Incidental use of the airport by turbine-powered, fixed-wing aircraft would not affect this designation. However, such aircraft should not be based at the airport.

16. **Public agency.** A State or political subdivision of a State, a tax-supported organization, or an Indian tribe or pueblo (49 U.S.C. § 47102(19)).

17. **Public airport.** An airport used or intended to be used for public purposes that is under the control of a public agency; and of which the area used or intended to be used for landing, taking off, or surface maneuvering of aircraft is publicly owned (49 U.S.C. § 47102(20)).

18. **Public-use airport.** An airport used or intended to be used for public purposes, and of which the area used or intended to be used for landing, taking off, or surface maneuvering of aircraft may be under the control of a public agency or privately owned and used for public purposes (49 U.S.C. § 47102(21)).

19. **Putrescible waste.** Solid waste that contains organic matter capable of being decomposed by micro-organisms and of such a character and proportion as to be capable of attracting or providing food for birds (40 CFR §257.3-8).

20. **Putrescible-waste disposal operation.** Landfills, garbage dumps, underwater waste discharges, or similar facilities where activities include processing, burying, storing, or otherwise disposing of putrescible material, trash, and refuse.

21. **Retention ponds.** Storm water management ponds that hold water for several months.

22. **Runway protection zone (RPZ).** An area off the runway end to enhance the protection of people and property on the ground (see AC 150/5300-13). The dimensions of this zone vary with the airport design, aircraft, type of operation, and visibility minimum.

23. **Scheduled air carrier operation.** Any common carriage passenger-carrying operation for compensation or hire conducted by an air carrier or commercial

operator for which the air carrier, commercial operator, or their representative offers in advance the departure location, departure time, and arrival location. It does not include any operation that is conducted as a supplemental operation under 14 CFR Part 119 or as a public charter operation under 14 CFR Part 380 (14 CFR § 119.3).

24. **Sewage sludge.** Any solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment process; and a material derived from sewage sludge. Sewage does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works. (40 CFR 257.2)

25. **Sludge.** Any solid, semi-solid, or liquid waste generated form a municipal, commercial or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility or any other such waste having similar characteristics and effect. (40 CFR 257.2)

26. **Solid waste.** Any garbage, refuse, sludge, from a waste treatment plant, water supply treatment plant or air pollution control facility and other discarded material, including, solid liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved materials in domestic sewage, or solid or dissolved material in irrigation return flows or industrial discharges which are point sources subject to permits under section 402 of the Federal Water Pollution Control Act, as amended (86 Stat. 880), or source, special nuclear, or by product material as defined by the Atomic Energy Act of 1954, as amended, (68 Stat. 923). (40 CFR 257.2)

27. **Turbine-powered aircraft.** Aircraft powered by turbine engines including turbojets and turboprops but excluding turbo-shaft rotary-wing aircraft.

28. **Turbine-use airport.** Any airport that sells Jet-A fuel for fixed-wing turbine-powered aircraft.

29. **Wastewater treatment facility.** Any devices and/or systems used to store, treat, recycle, or reclaim municipal sewage or liquid industrial wastes, including Publicly Owned Treatment Works (POTW), as defined by Section 212 of the Federal Water Pollution Control Act (P.L. 92-500) as amended by the Clean Water Act of 1977 (P.L. 95-576) and the Water Quality Act of 1987 (P.L. 100-4). This definition includes any pretreatment involving the reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a POTW. (See 40 CFR Section 403.3 (q), (r), & (s)).

30. Wildlife. Any wild animal, including without limitation any wild mammal, bird, reptile, fish, amphibian, mollusk, crustacean, arthropod, coelenterate, or other invertebrate, including any part, product, egg, or offspring thereof (50 CFR 10.12, *Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants*). As used in this AC, wildlife includes feral animals and domestic animals out of the control of their owners (14 CFR Part 139, Certification of Airports).

31. Wildlife attractants. Any human-made structure, land-use practice, or human-made or natural geographic feature that can attract or sustain hazardous wildlife within the landing or departure airspace or the airport's AOA. These attractants can include architectural features, landscaping, waste disposal sites, wastewater treatment facilities, agricultural or aquaculture activities, surface mining, or wetlands.

32. Wildlife hazard. A potential for a damaging aircraft collision with wildlife on or near an airport.

33. Wildlife strike. A wildlife strike is deemed to have occurred when:

a. A pilot reports striking 1 or more birds or other wildlife;

b. Aircraft maintenance personnel identify aircraft damage as having been caused by a wildlife strike;

c. Personnel on the ground report seeing an aircraft strike 1 or more birds or other wildlife;

d. Bird or other wildlife remains, whether in whole or in part, are found within 200 feet of a runway centerline, unless another reason for the animal's death is identified;

e. The animal's presence on the airport had a significant negative effect on a flight (i.e., aborted takeoff, aborted landing, high-speed emergency stop, aircraft left pavement area to avoid collision with animal) (Transport Canada, Airports Group, *Wildlife Control Procedures Manual*, Technical Publication 11500E, 1994).

2. RESERVED.

Appendix G. Field Data Forms

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TRM WILDLIFE HAZARD OBSERVATION SHEET

Date			Observer					Weather						Page of	
Time (24 Hrs)	Station #	Species	No. Obs	Activity	Height	Cover Type	Grid	Time (24 Hrs)	Station #	Species	No. Obs	Activity	Height, Dirctn	Cover Type	Grid

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Appendix H. FAA CertAlert 06-07, “Requests by State Wildlife Agencies to Facilitate and Encourage Habitat for State-Listed Threatened and Endangered Species and Species of Special Concern on Airports”

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CERTALERT

ADVISORY CAUTIONARY NON-DIRECTIVE
AIRPORT SAFETY AND OPERATIONS DIVISION AAS-300

FOR INFORMATION, CONTACT Ed Cleary, AAS-300, (202) 267-3389

Date: **11/21/2006** **No. 06-07**

To: **Airport Operators, FAA Airport Certification Safety Inspectors**

Topic: **Requests by State Wildlife Agencies to Facilitate and Encourage Habitat for State-Listed Threatened and Endangered Species and Species of Special Concern on Airports**

PURPOSE:

This Certalert describes procedures for responding to requests by state wildlife agencies to facilitate and encourage habitats for state-listed threatened and endangered species or species of special concern that occur on airports and may pose a threat to aviation safety. This Certalert does not apply to federally listed threatened and endangered species. Federal Aviation Administration (FAA) guidance on dealing with federally listed threatened and endangered species can be found in FAA Order 1050.1E, *Environmental Impacts - Policies and Procedures*, Appendix A, Section 8.

BACKGROUND:

An airport's air operations area (AOA) is an artificial environment that has been created and maintained for aircraft operations. Because an AOA can be markedly different from the surrounding native landscapes, it may attract wildlife species that do not normally occur, or that occur only in low numbers in the area. Some of the grassland species attracted to an airport's AOA are at the edge of their natural ranges, but are attracted to habitat features found in the airport environment. Also, some wildlife species may occur on the airport in higher numbers than occur naturally in the region because the airport offers habitat features the species prefer. Some of these wildlife species are state-listed threatened and endangered species or have been designated by state resource agencies as species of special concern.

Many state wildlife agencies have requested that airport operators facilitate and encourage habitat on airports for state-listed threatened and endangered species or species of special concern. Airport operators should exercise great caution in adopting new management techniques; new techniques may increase wildlife hazards and be inconsistent with safe airport operations. Managing the on-airport environment to facilitate or encourage the presence of hazardous wildlife species can create conditions that are incompatible with, or pose a threat to, aviation safety.

DISCUSSION:

Hazardous wildlife are those species of wildlife (50 CFR 10.12), including feral animals and domesticated animals not under control (14 CFR 139.5, Definitions), that are associated with aircraft strike problems, are capable of causing structural damage to airport facilities, or act as attractants to other wildlife that pose a strike hazard. (FAA Advisory Circular 150/5200-33A, *Hazardous Wildlife Attractants on or Near Airports*, July 27, 2004.) Not all state-listed threatened and endangered species or species of concern pose a direct threat to aviation safety. However, these species may pose an indirect threat and be hazardous because they attract other wildlife species or support prey species attractive to other species that are directly hazardous. Also, the habitat management practices that benefit these state-listed threatened and endangered species and species of special concern may attract other hazardous wildlife species. For example, the grassland habitat preferred by grasshopper sparrows, which are listed as threatened in New York[1], also supports a wide variety of insects and small mammals. These insects and small mammals are an indirect threat to aviation safety because they are very attractive to hawks, owls, gulls and other birds. It is these large birds that can pose a direct threat to aviation safety. On-airport habitat and wildlife management practices designed to benefit wildlife that directly or indirectly create safety hazard where none existed before are incompatible with safe airport operations.

Airport operators must decline to adopt habitat management techniques that jeopardize aviation safety. Adopting such techniques could place them in violation of their obligations and subject to an FAA enforcement action and possible civil penalties under 49 U.S.C. §44706, as implemented by 14 CFR § 139.337. In particular, an airport operator that has received federal grant-in-aid assistance is obligated through its grant assurances to maintain compatible land uses. Failure to do so may lead to noncompliance with its grant obligations. Further, airports that serve commercial air carriers are required to be certificated under 49 U.S.C. §44706, as implemented by 14 CFR Part 139. Title 14 CFR § 139.337(a) requires airport operators holding a Part 139 certificate to "take immediate action to alleviate wildlife hazards whenever they are detected." Accordingly, Part 139-certificated airport operators should make state wildlife agencies aware of the airport's FAA-approved Wildlife Hazard Management Plan (WHMP), AC 150/5200-33A, and the joint FAA-Wildlife Services manual, *Wildlife Hazard Management at Airports* (6/05) (joint FAA/WS manual). Before making any changes in land management practices, the airport operator should carefully review the above documents to assure that any changes are consistent with its obligations under federal law to control wildlife hazards and attractants in the AOA. For ease of reference, the key land management practices bearing upon aviation safety are summarized and highlighted below:

RECOMMENDATIONS:

1. Adhere to the turf, landscaping, and habitat management practices described in the airport's WHMP, AC 150/5200-33A, and the joint FAA/WS manual. Do not change these practices specifically to encourage the presence of, or to attract hazardous wildlife species even if the species are state-listed or of special concern.

    a. Do not deliberately preserve or develop on-airport wildlife habitats such as wetlands, forest, brush, or native grasslands having characteristics that attract

[1] Those species listed by states as threatened, endangered, or species of special concern vary from state to state. For information on state listed species, contact the appropriate state wildlife management Agency.

hazardous wildlife (See the airport's WHMP, AC 150/5200-33A, and the joint FAA/WS Manual.)

b. Manage the airport's AOA vegetation as recommended in the airport's WHMP, AC 150/5200-33A, and the joint FAA/WS manual.

2. Adhere to the wildlife harassment and repellant techniques described in the airport's WHMP, AC 150/5200-33A, and the joint FAA/WS manual to prevent hazardous wildlife species from becoming established and complicating the ability to adhere to prescribed habitat management practices.

3. Do not allow hazardous state-listed threatened and endangered species or species of special concern to remain on the airport if it requires managing the airport environment contrary to FAA recommendations.

4. Reevaluate existing and evaluate future agreements with federal, state, or local wildlife agencies where the terms of the agreements are or may be contrary to federal obligations concerning hazardous wildlife on or near public-use airports and aviation safety.

5. Whenever practicable, wetland mitigation for state-listed threatened and endangered species or species of special concern should be sited off-airport (see AC 150/5200-33A, §2-4.c (1)).

OSB — 11/21/2006

Ben Castellano, Manager
Airport Safety & Operations Division — Date

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Final

Wildlife Hazard Assessment Report
Jacqueline Cochran Regional Airport
Thermal, California

Prepared for:

Riverside County Department of Aviation
3403 10th Street, Suite 400
Riverside, California 92501

January 2017

Prepared by:

Mead & Hunt

With assistance from:

CBC
CASKEY BIOLOGICAL CONSULTING

U.S. Department
of Transportation
**Federal Aviation
Administration**

Western Pacific Region
American Samoa, Arizona, California, Guam, Hawaii, Nevada

P.O. Box 92007
Los Angeles, California
90009

January 31, 2017

Mr. Tim Miller
Aviation Director
EDA Aviation Division
3403 10th Street, Suite 400
Riverside, California 92501

Dear Mr. Miller:

Wildlife Hazard Assessment
Jacqueline Cochran Regional Airport
Riverside, California

We accept the Jacqueline Cochran Regional Airport (TRM) Wildlife Hazard Assessment (WHA), which was conducted by Mead & Hunt.

In reviewing the WHA, it appears there was enough wildlife activity in the area to warrant the development of a Wildlife Hazard Management Plan (WHMP). The management techniques contained in Chapter 5 and 6 of the WHA can be used in developing the WHMP. The recommendations appear to be good sound practices.

As the WHMP is being developed, we urge you to begin the process of obtaining the necessary permits to control wildlife. The list is located on page 86 of the WHA contains the species that require a depredation permit. You and your staff will need to be trained to recognize which species do not require a permit for removal and which species are protected.

There are several critical and high priority recommended wildlife hazard management measures for your airport that you need to address. The WHA contains numerous other low to moderate items which you should also adopt.

Should you have any questions or comments regarding this letter, please do not hesitate to contact me at (310) 725-3636 or via email at elizabeth.louie@faa.gov.

Sincerely,

Elizabeth Louie
Airport Certification Safety Inspector

cc: Lisa Harmon, Aviation Project Manager, Mead & Hunt

Acknowledgment

Successful wildlife hazard monitoring requires cooperation from many members of the airport community. Mead & Hunt, Inc. would like to thank Riverside County and the staff of the Jacqueline Cochran Regional Airport for their ongoing assistance throughout the 12-month monitoring period associated with the development of this Wildlife Hazard Assessment.

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C Author Accreditation

D Airport Layout Plan and Study Design

E Federal- and State-listed Threatened and Endangered Species

F FAA AC 150/5200-33B, “Hazardous Wildlife Attractants on or Near Airports”

G Field Data Forms

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Chapter 1

Introduction

1.1 Overview of Wildlife Hazards to Aircraft

Conflicts between aircraft and wildlife have occurred since the dawn of aviation. Orville Wright was the pilot associated with the first documented bird strike in 1905 during a flight over Dayton, Ohio. The first fatality associated with a wildlife strike occurred on April 3, 1912, when Calbraith Rodgers died after his aircraft struck a gull and crashed in Long Beach, California.

Data compiled by the Federal Aviation Administration (FAA) indicates that the number of conflicts between wildlife and aircraft has continued to increase since that time. Based on data obtained from the National Wildlife Strike Database, several factors have evolved in recent years to affect the relationship between wildlife and aviation safety:

- *The use of faster and quieter aircraft.* Commercial air carriers have replaced their older three- or four-engine aircraft fleets with more efficient, faster, and quieter two-engine aircraft. In many cases, birds are less able to detect and avoid new aircraft using turbofan engines. In the event that wildlife is ingested by aircraft engines, aircraft with two engines may be more vulnerable than earlier aircraft equipped with three or four engines (FAA and United States Department of Agriculture [USDA], 2014).

- *Increased air traffic.* The amount of military and civilian air traffic has increased substantially worldwide. Passenger enplanements in the U.S. increased from approximately 310 million in 1980 to 732 million in 2013, and commercial air traffic increased from approximately 18 million aircraft movements in 1980 to 25 million in 2013 (FAA and USDA, 2014). The growth in air traffic has increased the risk of potential conflicts between aviation and wildlife.

- *Increased wildlife populations and adaptation to urban areas.* The populations of many wildlife species commonly involved in strikes have increased markedly in the last few decades (FAA and USDA, 2014). As development has increased, the availability of natural or open areas that support these species has decreased. In addition, the size of the areas that once separated airports and nearby metropolitan areas also has decreased. As a result, the remaining open space provides habitat, shelter, and feeding areas for greater populations of wildlife.

As a result of these factors, ongoing changes in the aviation industry, and changes in land use, the number of documented wildlife strikes on and near airports continues to increase worldwide.

The FAA wildlife strike database includes records for more than 156,000 strikes during the period from January 1, 1990, through 2014, but the FAA estimates that the database represents only a portion of the actual number of bird strikes that occurred during this period (FAA and USDA, 2015). Based on FAA strike records, most wildlife strikes occurred in the immediate airport vicinity during aircraft approach or departure and more than 70 percent occur at altitudes of less than 500 feet above ground level (AGL) (FAA and USDA, 2015).

1.1.1 Safety Effects

The most recent analysis of wildlife strikes to civil aviation in the United States was performed by the FAA and the USDA) Animal Plant Health Inspection Service (APHIS). The agencies reviewed data from the National Wildlife Strike Database for the 25-year period from 1990 through 2014 (FAA and USDA, 2015). Wildlife strikes to civil aircraft have resulted in human injuries and fatalities. From 1990 to 2014 a total of 388 injuries and 26 fatalities were associated with wildlife strikes. Species associated with these strikes include unidentified bird species, American white pelicans, Canada geese, white-tailed deer, brown pelicans, and turkey vultures. Sixty-seven aircraft were destroyed or damaged beyond repair. Terrestrial mammals (primarily white-tailed deer), Canada geese, and vultures were responsible for these incidents. Approximately 60 percent of the strikes that resulted in the destruction of aircraft occurred at general aviation (GA) airports (FAA and USDA, 2015).

1.1.2 Economic Losses

Wildlife strikes also can pose economic challenges to aircraft operators. Wildlife strikes may cause expensive structural and mechanical damage to aircraft even if they do not result in a crash (Blokpoel, 1976; Cleary and Dolbeer, 2005). Aircraft engines were the component most frequently reported as being damaged by bird strikes, and landing gear, propellers, and wing/rotors were identified as the components most often damaged by mammal strikes (FAA and USDA, 2014).

From 1990 to 2014 reported losses from bird strikes resulted in more than 981,000 hours of aircraft downtime and an estimated $707 million in direct and other monetary losses. In addition to direct monetary losses, indirect costs also were incurred as a result of lost revenue, passenger rescheduling, accommodations, and flight cancellations (FAA and USDA, 2014).

1.2 Regulatory Background

The FAA is the agency responsible for administering Federal Aviation Regulations (FARs). The FAA establishes policies to enhance public safety at air carrier airports holding certificates under Title 14 of the Code of Federal Regulations (14 CFR). Regulations associated with wildlife management are set forth at 14 CFR Part 139.337 (see **Appendix A**).

The Jacqueline Cochran Airport (TRM or “the airport”) is not a certificated airport pursuant to FAR Part 139, but it is a federally obligated GA airport for which Riverside County (County) receives federal funds to support airport operations and undertake capital improvements. When an airport owner, such as the County, accepts funds from FAA-administered airport financial assistance programs, it must agree to certain obligations known as grant assurances. These grant assurance require an airport operator to maintain and operate its facilities safely, efficiently, and in accordance with specified conditions.

The FAA has established 37 specific grant assurances to which airport operators must adhere if they are to receive federal funds. Wildlife hazard management is associated with FAA Grant assurance No. 19, Operation and Maintenance:

> **19. Operation and Maintenance.**
>
> a. The airport and all facilities which are necessary to serve the aeronautical users of the airport, other than facilities owned or controlled by the United States, shall be operated at all times in a safe and serviceable condition and in accordance with the minimum standards as may be required or prescribed by applicable Federal, state and local agencies for maintenance and operation. It will not cause or permit any activity or action thereon which would interfere with its use for airport purposes. It will suitably operate and maintain the airport and all facilities thereon or connected therewith, with due regard to climatic and flood conditions. Any proposal to temporarily close the airport for non-aeronautical purposes must first be approved by the Secretary. In furtherance of this assurance, the sponsor will have in effect arrangements for-
>
> 1) Operating the airport's aeronautical facilities whenever required;
>
> 2) Promptly marking and lighting hazards resulting from airport conditions, including temporary conditions; and
>
> 3) Promptly notifying airmen of any condition affecting aeronautical use of the airport. Nothing contained herein shall be construed to require that the airport be operated for aeronautical use during temporary periods when snow, flood or other climatic conditions interfere with such operation and maintenance. Further, nothing herein shall be construed as requiring the maintenance, repair, restoration, or replacement of any structure or facility which is substantially damaged or destroyed due to an act of God or other condition or circumstance beyond the control of the sponsor.
>
> b. It will suitably operate and maintain noise compatibility program items that it owns or controls upon which Federal funds have been expended.

The FAA addresses wildlife hazard management in accordance with Grant Assurance No. 19 because it is a safety issue. The FAA will require the operator of a federally obligated airport to conduct a Wildlife Hazard Assessment (WHA), and if necessary, prepare a Wildlife Hazard Management Plan (WHMP).

1.2.1 Wildlife Hazard Assessment Process and Contents

The performance of a WHA is the first step in developing a more complete and site-specific understanding of wildlife hazards at an airport. The WHA must be conducted by a qualified wildlife biologist who meets the requirements of FAA Advisory Circular (AC) 150/5200-36A, "Qualifications for Wildlife Biologists Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards at Airports" (**Appendix B**). The qualifications of this report's author are included in **Appendix C**.

A WHA must be conducted in accordance with specific protocols. As described in *Wildlife Hazard Management at Airports: A Manual for Airport Personnel* (Cleary and Dolbeer, 2005), *a* WHA includes 12 months of ongoing wildlife monitoring to identify the presence of wildlife species, especially migratory birds, and seasonal fluctuations in the behaviors and abundance of species that occur at the airport and in its vicinity. Based on the results of the 12-month monitoring effort, specific measures or recommendations are formulated to reduce wildlife hazards at the airport.

As described in *Wildlife Hazard Management at Airports and FAA guidance,* a WHA must address the following:

(1) An analysis of the events or circumstances that prompted the assessment.

(2) Identification of the wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences.

(3) Identification and location of features on and near the airport that attract wildlife.

(4) A description of wildlife hazards to air carrier operations.

(5) Recommended actions for reducing identified wildlife hazards to air carrier aircraft.

As identified by FAA regulations, a WHA must address or include the following data:

- *Wildlife Strike Records and Analysis.* Each WHA must include a thorough review of available wildlife strike records associated with the airport.

- *Wildlife Populations on and Near the Airport.* Field studies associated with the WHA must be performed to determine wildlife population including such factors as: abundance, seasonal fluctuations, movement patterns, behaviors, and periods of activity, with a particular emphasis on the species most threatening to aircraft safety.

- *Wildlife Attractants and Land Use Practices.* The WHA must identify potential habitat or wildlife attractants on the airport and within the airport vicinity.

  Wildlife Management Recommendations. The WHA must provide specific recommendations for reducing wildlife hazards to air carrier operations. The prioritized recommendations will serve as a framework for the development of a WHMP, should the FAA Administrator determine that one is necessary.

1.2.2 Wildlife Hazard Management Plan

Based on the results of the WHA, the FAA may require an airport operator to prepare a WHMP. The FAA's decision to require the preparation of a WHMP may be based on the presence and abundance of wildlife identified in the WHA, aeronautical activity, and other pertinent factors. When required, a WHMP must be developed in accordance with 14 CFR Part 139.337, subparts (c), (d), and (e) and address the responsibilities, policies, and procedures necessary to reduce wildlife hazards.

1.3 Wildlife Hazard Strike History for the Jacqueline Cochran Regional Airport

The FAA's National Wildlife Strike Database was reviewed to obtain records for the airport. The FAA records helped to identify the species responsible for documented wildlife strikes that have occurred to date and helped to identify a site-specific WHA monitoring strategy (see Chapter 4). However, wildlife strike data must be reviewed with caution. Wildlife strike reporting is voluntary, and the data shown may not accurately reflect the number of strikes that have occurred at TRM. Prior to 2009 the FAA estimates that only 20 percent of all strikes were recorded. Since 2009 the FAA estimates that approximately 40 percent of all strikes were recorded. According to the FAA database, four bird strikes have been reported at TRM (see **Table 1-1**).

Table 1-1. Wildlife Strikes Recorded
Jacqueline Cochran Regional Airport (TRM)

Date	Aircraft Type	Species	Extent of Damage	Number Struck	Size	Comments from Database
10/17/2013	C-340	Geese	S	1	Large	Damage to left and right side of aircraft nose. Nose cone smashed. Damage to fuselage behind nose cone at attach point. Additional damage lower on left side of nose lower under nose cone. Photo (2).
3/27/2006	MU-300	California gull	S	1	Medium	Bird was ingested. Appears to have damaged some of the compressor stators. Engine is being torn down for further evaluation. Identified by Smithsonian, FAA 1436. Engine was repaired and put back in service only to find more damage. Engine removed again. Estimated repairs about $100,000 at this time. (8/8/06). Final cost received 2/7/07. $176,948. Company missed a total of 40 hrs of missed flight time due to repairs. They used loaner engines.
2/22/2004	GULFAERO IV	Canada goose	M?	11-100	Large	A sky of birds hit the aircraft, number in the thousands. Damage to forward bulkhead skin. Flaps. 19 strikes mostly on belly and flaps
4/16/2002	HAWKER 800	Unknown bird - medium	N	1	Medium	Main strike on lower left part of radome. No evident damage.

Key:
S – Substantial damage to civil aircraft.
M? – Uncertain level of damage to civil aircraft.
N – No damage to civil aircraft reported/ No damage or damage less than $50,000 for military aircraft reported.

Source:
FAA Wildlife Strike Database, accessed June 2016. Available at: http://wildlife.faa.gov/database.aspx

As shown on **Table 1-1**, all four wildlife strikes records at TRM have been associated with avian species, and three of the four strikes resulted in aircraft damage. Two strikes were associated with a geese; one goose strike resulted in substantial aircraft damage, and another resulted in minor aircraft damage. A strike with a California gull also resulted in substantial aircraft damage.

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2.1 Airport Facilities

TRM is located approximately 1 mile west of the unincorporated community of Thermal in central Riverside County, California, approximately 6 miles south of Interstate 10, west of State Highways 86 and 111 (see **Figures 2-1** and **2-2**). TRM is located in the lower Coachella Valley, between the San Jacinto Mountains to the southwest and the San Bernardino Mountains to the northeast. The airport resides in the Desert Resorts Region of California near the city of Palm Springs and the communities of Coachella, Indio, and La Quinta.

The 1,752-acre airport was constructed in 1942 to support operations by the U.S. Army and U.S. Navy during World War II. TRM was conveyed to Riverside County in 1948, and the County operates TRM as a public-use airport. The airfield is accessible 24 hours a day, seven days a week. TRM has the capacity to accommodate a wide range of operations, including military, air cargo, corporate, and GA flights. FAA records show that TRM supported 76,500 annual operations in 2014 including charter, corporate, military, and GA single- and multi-engine, piston- and turbine-powered aircraft and helicopters (Airnav, 2016).

TRM includes two runways:

- Runway 17-35, the airport's primary runway, is 8,500 feet long and 150 feet wide and aligned in a north-south direction. Runway 35 is a non-precision runway equipped with a four-light precision approach path indicator (PAPI) and a medium-intensity approach runway light system. Runway 17 is marked with standard visual markings and a two-box Visual Approach Slope Indicator (VASI). Both ends of the runway are equipped with Runway End Identifier Lights (REILs).

- Runway 12-30, the secondary crosswind runway, is a non-precision runway that is 4,995 feet long and 100 feet wide. The runway is aligned in a northwest-southeast direction and incudes standard visual markings.

TRM is served by three Fixed-Based Operators (FBOs). For the 12-month period ending in February 2015, the TRM include 47 based aircraft and averaged more than 200 operations per day. Based aircraft included single- and multi-engine airplanes, jets, helicopters, and ultralights (Airnav 2016).

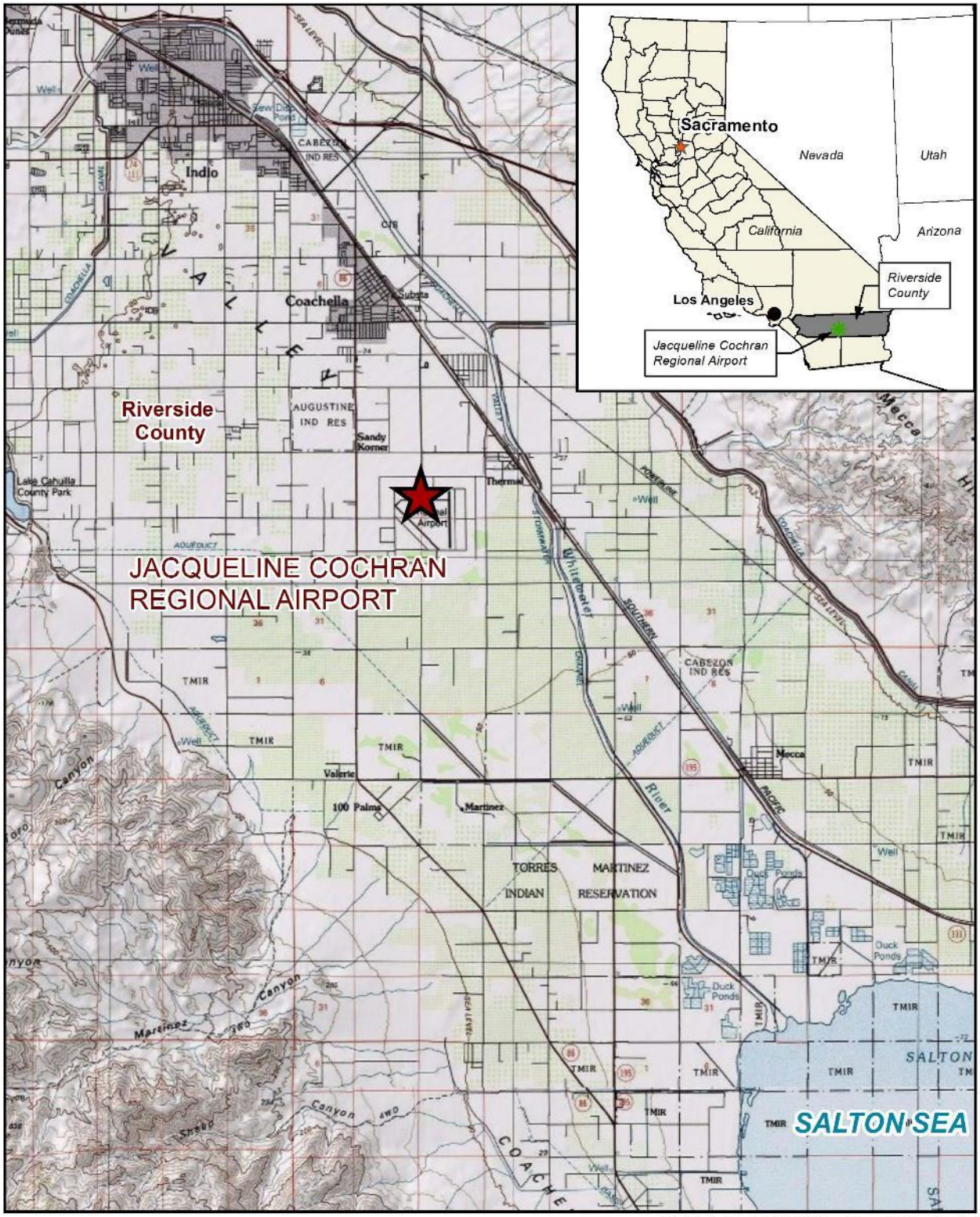

Figure 2-1.
Location Map

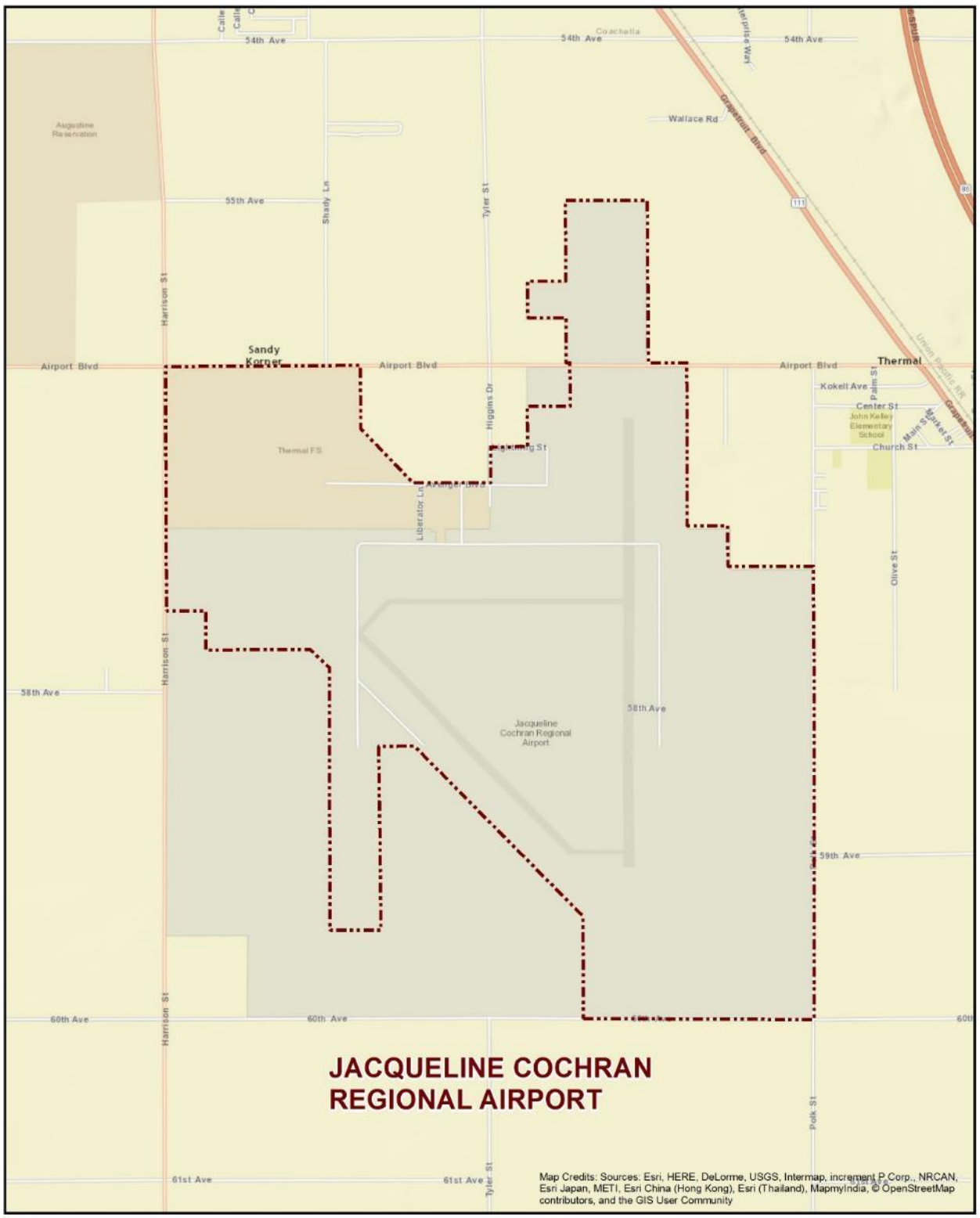

Figure 2-2.

Vicinity Map

Legend

Airport Property Boundary (Approximate)

0 1,000 2,000 3,000 4,000 Feet

N

Photo 1: *Jet parked at FBO.*

The primary building area at TRM is on the north side of the airfield, which includes aircraft fueling facilities, maintenance, storage, the general aviation apron, and the FBOs. The Riverside County Fire Department (RCFD), the Riverside County Sheriff's Department, and the California Highway Patrol (CHP) also operate at TRM. RCFD Fire Station 39 is located on the north side of the airport at Vic Higgins Drive and Avenger Boulevard, but is not an air rescue and firefighting (ARFF) facility. The CHP office is located in a hangar used to store its helicopter at Million Air La Quinta, and the Sheriff's Department operates out of an office in the Million Air terminal building. A copy of the Airport Layout Plan (ALP) and WHA Study Design are provided in **Appendix D**.

Photo 2: *Looking east at Landmark Aviation (FBO).*

2.2 Airport Setting

TRM is located in central Riverside County along State Highway 111 approximately halfway between the community of Indio and the Salton Sea (see **Figure 2-1**). The airport is surrounded by agricultural land with some low-density residential development to the northeast and the planned community of Kohl Ranch to the south (see **Figure 2-2**). The city of Coachella is located approximately 1 mile north of the airport

The Coachella Valley is home to world-class spas, PGA-rated golf courses, and tennis resorts. The airport area includes numerous vineyards and other agritourism. The area is characterized by a desert climate, with hot dry summers and warm winters. Average temperatures range from the mid-50s in degrees Fahrenheit (°F) during the winter months to temperatures exceeding 100 °F during the summer. The average annual precipitation is 3.5 inches. The airport is located at a surveyed elevation of approximately 115 feet below mean sea level (MSL).

The FAA defines as the critical zone for wildlife hazards as the area within 10,000 feet of aircraft movement areas and within 5 miles of approach/departure surfaces (see **Figure 2-3**). Numerous natural and constructed water bodies occur in the critical zone including agricultural ponds, irrigation canals, sewage treatment ponds, and the Whitewater River and its tributaries.

Photo 3: *The infield is dominated by short grass and large expanses of brush including salt cedar.*

Photo 4: *Looking south on the taxiway that parallels Runway 17-35.*

Dominant landscape features within the Airport Operations Area (AOA) include hardscapes and annual grassland. Hardscapes include runways and taxiways, aircraft parking, storage areas, roads, hangars, and other airport structures. Infield areas are characterized by annual grasslands, weedy vegetation, palm trees, cottonwoods, and salt cedar.

Photo 5: *Large and dense brush, such as salt cedar, dominate the infield and areas along the perimeter fence.*

2.3 Wildlife Attractants in the Airport Vicinity

Some wildlife attractants were observed prior to the initiation of the WHA survey effort, and these observations were used to develop the 12-month wildlife survey design (see **Figure 2-3**).

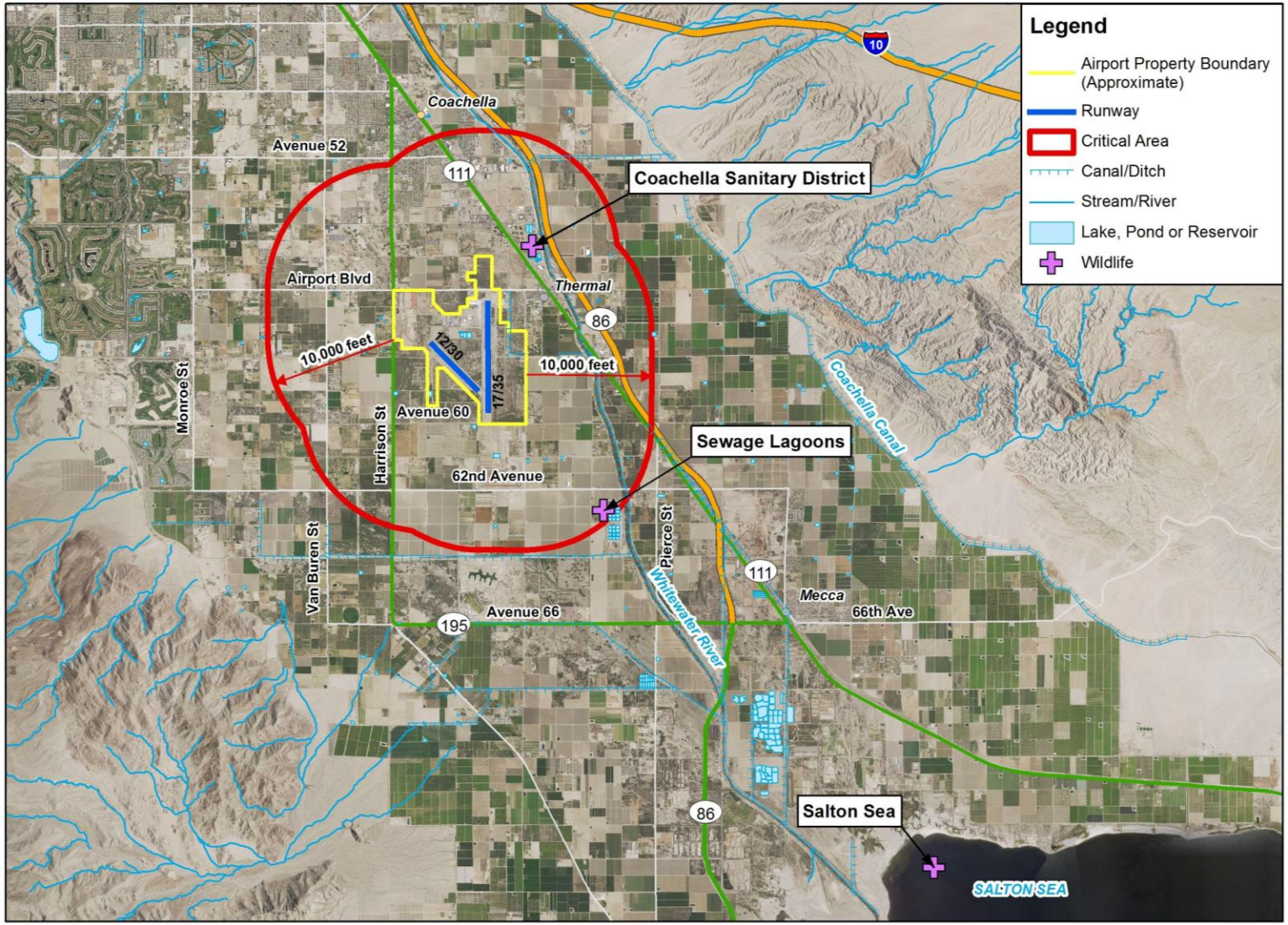

Figure 2-3.

FAA Critical Zone and Observed Wildlife Attractants

Image Source: FSA-NAIP 2014 Riverside County Mosaic, 1m
National Hydrography Dataset (NHD): HUC-8 18100201

2.3.1 On-site Wildlife Attractants

Wildlife attractants on the airport are associated with the limited short grass areas along Runway 17-35 and the brushy vegetation (e.g., salt cedar) that exists in the infield area and along the airport boundaries. Although the airport is equipped with a perimeter fence, coyotes and dogs gain access to the AOA through holes in the fence or gaps beneath the fence. A small area between the Runways 30 and 35 includes a depressional area that holds stormwater following rain events. The accumulated storm water can attract waterfowl and shorebirds and serve as a water source for coyotes and dogs.

Photo 6: *Stormwater collects in a detention pond between Runways 30 and 35.*

2.3.2 Off-site Wildlife Attractants

Sanitation Ponds

Coachella Valley Water District treatment ponds are located northeast and southeast of the airport boundary (site monitoring points 10 and 11 were established near the ponds). These combined facilities include 57 acres of oxidation ponds that receive wastewater from the unincorporated community of Thermal and other unincorporated areas of Riverside County. The oxidation ponds were observed to attract a variety of hazardous wildlife species including waterfowl, wading and diving birds, and gulls.

Agricultural Fields

Numerous agricultural fields surround the AOA that are used for crops, orchards, and livestock paddocks. Birds migrating from nearby Salton Sea may find the cultivated areas especially attractive as they provide an easy, high-energy food source. The agricultural fields provide wildlife with foraging and nesting opportunities; they are considered a major wildlife attractant because they are visited frequently by large flocking birds such as starlings and blackbirds.

Whitewater River

The Whitewater River is a river in western Riverside County that discharges into the Salton Sea was dry a majority of this study due to the drought. The Whitewater River provides all necessary elements for wildlife to forage, drink water, and nest. The river is visited frequently by a variety of species including swallows and shorebirds such as herons and egrets (monitoring point 12 was established near the river).

Irrigation Canal

An unnamed, mapped irrigation canal is adjacent to the AOA near monitoring point 14. This flowing canal provides foraging and nesting opportunities for wildlife in the area. The irrigation canal is visited frequently by shorebirds, doves, and flycatchers.

2.3.3 Regional Wildlife Attractants

The airport is located approximately 9 miles northwest of the Salton Sea, one of the most important winter stops for birds migrating along the Pacific Flyway. The Salton Sea, which is California's largest lake, provides sanctuary to diverse wildlife. The sea supports abundant fish that support hazardous avian species such as herons, egrets, pelicans, gulls, and others. The adjacent fields and wetlands support large flocks of waterfowl and shorebirds such as geese, ducks, cranes, and others. Migrating birds use the Salton Sea and travel throughout the region to nest, roost, and forage, and these resources can influence bird activity and populations in the region. Although the Salton Sea is located outside of the critical area, wildlife that frequents or visits the Salton Sea has the potential to enter TRM airspace and pose hazards to aircraft operations.

2.3.4 Wildlife Hazard Management Efforts

TRM maintenance staff conduct limited wildlife hazard management efforts. Staff harass wildlife from the runways when it is observed. Vegetation within runway safety areas is mowed when weather and growing conditions permit. TRM staff members also report wildlife strikes in FAA's National Wildlife Strike database.

Photo 7: *Airport maintenance staff occasionally mow weedy vegetation within runway safety areas.*

TRM includes a 6-foot chain-link perimeter fence that is equipped with barbed wire outriggers. Dense vegetation has grown adjacent to the fence that provides suitable nesting habitat for birds. Numerous holes are present in and beneath the fence that that allow medium- to large-sized mammals to access the AOA (e.g., coyotes and stray dogs). Several gates contain sizeable large holes and gaps that also provide wildlife with access to the AOA.

Photo 8: *Dense vegetation grows along the perimeter fence.*

Photo 9: *Evidence of burrowing beneath the perimeter fence by coyotes and dogs. The burrows and holes provide access to the AOA.*

Photo 10: *Some gaps beneath the perimeter fence gates have been addressed, but these temporary repairs are not successful at excluding coyotes and dogs.*

Chapter 3

Regulatory Context and Applicable Regulations

Most wildlife and their habitats are protected by one or more federal, state, and/or local laws. Before conducting any type of wildlife hazard management at TRM, whether harassment or lethal control, the legal status of all species must be determined. Many of the resource management agencies involved in wildlife management require permits to actively manage the target species, and they will generally issue permits depending on the species and management method used. The County is responsible for adhering to federal, state, and local regulations regarding wildlife management and for obtaining the appropriate permits.

3.1 Federal Regulations Pertaining to Wildlife Management

The federal government has passed several acts to protect wildlife, and the acts form the basis of most wildlife regulations included in the Code of Federal Regulations. Federal wildlife laws are primarily administered and enforced by the U.S. Fish & Wildlife Service (USFWS) and include migratory birds and threatened and endangered species of flora and fauna.

Each of the following federal Acts has the potential to affect wildlife management activities at airports and must be considered when enacting wildlife hazard management measures:

- The Clean Water Act (Sections 404, 402, and 401)
- The Endangered Species Act (ESA)
- The Fish and Wildlife Coordination Act (FWCA)
- The Bald and Golden Eagle Protection Act (BGEPA)
- The Migratory Bird Treaty Act (MBTA)
- The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)
- The National Environmental Policy Act (NEPA)
- Executive Order 11988, Floodplain Management

3.1.1 Clean Water Act (Sections 404, 402, and 401)

Activities that result in a discharge of dredged or fill material into waters of the United States are regulated by the U.S. Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA). Discharges of dredged or fill material into waters of the United States, including wetlands, generally require a permit from USACE. However, isolated wetlands that are not hydrologically connected to waters of the United States are not regulated by USACE. If activities designed to manage wildlife hazards would result in the discharge of dredged or fill material into a jurisdictional water of the U.S., the County would need to apply for a permit from USACE before completing such activities.

Pursuant to Section 401 of the CWA, projects that require a USACE Permit for the discharge of dredge or fill material must also obtain a certificate from the appropriate state agency to confirm that the intended dredge or fill activity is consistent with the state's water quality standards and criteria. In California, the authority to grant water quality certification is delegated by the State Water Resources Control Board (SWRCB) to the Regional Water Quality Control Boards (RWQCBs). If wildlife hazard management activities at TRM necessitated a federal water quality permit, the County would need to cooperate with the issuing federal agency to obtain Section 401 certification.

Section 402 of the Clean Water Act prohibits the discharge of all pollutants into surface waters unless permitted under the National Pollution Discharge Elimination System (NPDES), which is administered by EPA or by a state with a federally approved control program (33 USC 1311, 1342). A General Construction Activity Storm Water Permit is a type of NPDES permit that allows stormwater waste discharges associated with construction activity into surface waters of the state. This permit is required for construction activities involving one or more acres of soil disturbance; discharges that contribute to violation of water quality standards, or are significant contributors of pollutants to receiving waters; specified industrial activities; or discharges from municipal storm drain systems serving populations of 100,000 or more. If construction activities associated with the implementation of wildlife management measures at TRM would result in the disturbance of 1 acre or more or create any non-point source discharge, the disturbance would contribute to a violation of state water quality standards. In such instances, the County would need to apply for a NPDES permit.

3.1.2 Endangered Species Act

Section 7 of the Endangered Species Act (ESA) (16 United States Code [USC] 1531 to 1543) requires all federal agencies, in consultation with the USFWS and National Marine Fisheries Services (NMFS), to ensure that their actions do not jeopardize the continued existence of species listed as endangered or threatened, or result in the destruction or adverse modification of the critical habitat of these species. Through federal actions and the establishment of state programs, the federal ESA:

- Authorizes the determination and listing of species as endangered and threatened;
- Prohibits unauthorized taking, possession, sale, and transport of endangered species;
- Provides authority to acquire land for the conservation of listed species, using land and water conservation funds;
- Authorizes establishment of cooperative agreements and grants-in-aid to states that establish and maintain active and adequate programs for endangered and threatened wildlife and plants;

- Authorizes the assessment of civil and criminal penalties for violating the Act or regulations; and

- Authorizes the payment of rewards to anyone furnishing information leading to arrest and conviction for any violation of the Act or any regulation issued thereunder.

The federal ESA would be applicable at TRM if any habitat management actions directed towards a species causing a threat to air traffic also affected critical habitat for a species listed as federally endangered or threatened. Compliance with the ESA also would affect abatement methods directed at a listed species that causes threats to air traffic. Activities that would affect species protected under the federal ESA were not identified during standardized wildlife surveys. A list of federal- and state-listed species are presented in **Appendix E**. If proposed wildlife management activities at TRM had the potential to affect a listed species, the FAA would be required to consult with the USFWS.

3.1.3 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA) requires all federal agencies to consult with the USFWS, National Oceanic and Atmospheric Administration (NOAA Fisheries), and the California Department of Fish and Wildlife (CDFW) before they approve projects that affect, control, or modify surface waters. Although the recommendations of these agencies are not binding, federal agencies are required to "give full consideration" to measures recommended by these agencies in order to reduce impacts on wildlife and fisheries resources. Numerous wildlife species use the land and water resources in the vicinity of TRM. If wildlife management activities on TRM would affect nearby surface waters, the County would need to coordinate with USFWS, NOAA Fisheries, and the CDFW to avoid or mitigate adverse effects.

3.1.4 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) provides for the protection of the bald eagle and the golden eagle by prohibiting, except under certain specified conditions, the taking, possession, and commerce of such birds. The Act allows take, possession, and transportation of bald and golden eagles under specified conditions, including scientific, educational, and Native American religious purposes, or in circumstances when take may be necessary to ensure the protection of wildlife, agriculture, or other interests particular to a specific locality. Before taking, possessing, or transporting any bald or golden eagle, or golden eagle nest, a permit must be obtained from USFWS. To manage wildlife hazards associated with golden eagles or their nests, the County will be required to consult with USFWS and obtain an eagle permit, as appropriate. (Refer to Chapters 5 and 6 for additional information regarding the management of eagles and other raptors.)

3.1.5 Migratory Bird Treaty Act of 1918

The MBTA is a treaty that was established with the U.S., Great Britain (for Canada), Mexico, Japan, and Russia for the protection of migratory birds. Specific provisions include the establishment of a Federal prohibition, unless permitted by regulations, to:

> …pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention…for the protection of migratory birds…or any part, nest, or egg of any such bird (16 U.S.C. 703).

The MBTA applies to several species that were identified during standardized wildlife surveys at TRM. To reduce the threat that species afforded protection under the MBTA, an airport operator must obtain a depredation permit from the USFWS before it can lethally remove birds and nests with eggs or young. (No permits are required from USFWS to manage habitat or harass/disperse MBTA species.)

Numerous migratory birds use habitats on TRM and in its vicinity. Since wildlife management activities could affect any of these birds, the County must consult with and obtain a migratory bird permit from the USFWS, which includes an airport depredation permit for direct lethal control if required in the interest of public aviation safety. Once procured, this permit must be renewed annually and maintained on file in the Airport Administration Office. (For more information on permits, refer to Chapters 5 and 6.)

3.1.6 Federal Insecticide, Fungicide, and Rodenticide Act

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) gives the Environmental Protection Agency (EPA) authority over the distribution, sale, and use of pesticides. All pesticides used in the United States must be registered (licensed) by the EPA. Registration ensures that pesticides will be properly labeled and that, if used in accordance with specifications, will not cause unreasonable harm to the environment. Use of each registered pesticide must be consistent with use directions contained on the label or labeling.

FIFRA applies to some ongoing and recommended wildlife hazard management measures at TRM. When the use of pesticides is included as part of an integrated wildlife management program, the property owner is responsible for ensuring that all products used to achieve the program goals are implemented according to applicable regulations and instructions.

3.1.7 National Environmental Policy Act

Under the National Environmental Policy Act of 1969 (NEPA) and its implementing regulations (40 CFR Parts 1500 to 1508), federal agencies must analyze and disclose the environmental effects of their proposed actions and a reasonable range of alternatives in the appropriate level of

assessment. Specifically, NEPA is triggered when an action requires a permit, entitlement, or funding from a federal agency; when an action is jointly undertaken with a federal agency; or when an action is proposed on federal land. Since a WHA is a study, it is not subject to review under NEPA. However, the implementation of some wildlife hazard management measures identified in the WHA may be subject to NEPA.

3.1.8 Executive Order 11988, Floodplain Management

Executive Order 11988 requires that all federal agencies take actions to reduce the risk of flood loss, to restore and preserve the natural and beneficial values served by the floodplain, and to minimize the impact of floods on human safety, health, and welfare. The Order defines floodplains as "the lowland and relatively flat areas adjoining inland and coastal waters including flood prone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year" (i.e., the area that would be inundated by a 100-year flood).

If proposed, wildlife management practices would involve a federal action that could impact floodplains, the County will take appropriate actions to minimize impacts to the floodplain.

3.2 State of California Laws and Regulations

The State of California has passed many environmental laws and regulations to protect wildlife and habitat. The following laws and regulations may apply to specific wildlife hazard management measures at TRM:

- The California Endangered Species Act
- The California Fish and Game Code (various sections)
- The Porter-Cologne Water Quality Act
- Herbicide and Pesticide Use
- The California Environmental Quality Act

3.2.1 California Endangered Species Act

Pursuant to the California Endangered Species Act (CESA) and Section 2081 of the California Fish and Game Code (FGC), a permit is required from the CDFW for projects that could result in the "take" of a state-listed threatened or endangered species. Under CESA, the definition of "take" applies to an activity that would directly or indirectly kill an individual of a species. Unlike the federal ESA, the definition does not include activities that "harm" or "harass" such species. Wildlife hazard management activities at TRM that require the removal of a state-listed endangered or threatened species would be subject to CESA.

3.2.2 California Fish and Game Code, Section 3470-3472.2

The California Fish and Game Code recognizes that resources on California's public use airports must be managed in a way that is both biologically sound and in accordance with FAA regulations and policies. The code allows airport operators to protect the health, welfare, and safety of the traveling public through the performance of limited and authorized wildlife hazing, harassment, and depredation. Such activities may be performed only when they are in accordance with a current valid federal fish and wildlife depredation permit and when the following conditions are met:

(a) The taking occurs on lands owned or leased by the airport.

(b) The taking does not occur on lands owned or leased by the airport that are reserved for habitat mitigation or conservation purposes of the species being taken, including lands in a habitat conservation plan, or a natural communities conservation plan.

(c) There is no taking of a fully protected, candidate, threatened, or endangered species.

The code states that such take is authorized only to relieve or prevent injurious situations and may only be performed as part of an integrated wildlife management program that emphasizes nonlethal management techniques.

3.2.3 California Fish and Game Code – Fully Protected Species

Four sections of the California Fish and Game Code identify fully protected species: Sections 3511, 4700, 5050, and 5515. The statutes prohibit take or possession of fully protected species at any time. The CDFW is unable to authorize incidental take of fully protected species when activities are proposed in areas inhabited by those species, with the exception of specified scientific purposes. The presence of any fully protected species at TRM would require additional coordination with the CDFW. Management activities at TRM that may be subject to state codes associated with fully protected species could occur if such a species requires removal because it posed a potential hazard to public safety. White-tailed kites are identified as fully protected species and were observed during the 12-month survey at TRM.

3.2.4 California Fish and Game Code Section 1602 – Streambed Alternations

Diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California that supports wildlife resources are subject to regulation by the CDFW, pursuant to Section 1602 of the Fish and Game Code. The code identifies a stream as a body of water that flows at least periodically or intermittently through a bed or channel that has banks and supports wildlife, fish, or aquatic life. The CDFW may also have jurisdiction over altered or artificial waterways based on the value of those waterways to fish and wildlife. Section 1602 would apply to wildlife hazard management measures at TRM if the County wished to alter a stream near the airport to remove or reduce a wildlife hazard.

3.2.5 Porter-Cologne Water Quality Control Act

Pursuant to the Porter-Cologne Water Quality Control Act, waters of the state fall under the jurisdiction of RWQCBs, which must prepare and maintain water quality control plans or basin plans. Each plan identifies water quality standards for surface water and groundwater, and sets forth actions to control pollution sources to achieve the standards. Projects that affect wetlands or waters must meet the waste discharge requirements of the RWQCB.

3.2.6 Herbicide and Pesticide Use

The California Department of Pesticide Regulation (DPR) and the County Agricultural Commissioner (CAC) regulate the sale and use of pesticides and herbicides in the County of Riverside. Requirements that are specific for use in California may be associated with many pesticides approved by the EPA. Applicators of a pesticide designated as a restricted material must either be licensed by the DPR or work under the supervision of a licensed pesticide applicator. For aquatic pesticides, the applicator must hold a qualified applicator certificate with the category “aquatic.” The use of a pesticide must be reported to the CAC where required by law or by agreement with the DPR.

3.2.7 California Environmental Quality Act

The California Environmental Quality Act (CEQA) applies to proposed projects that will be undertaken by, or require the discretionary approval of, state and local agencies. An action is defined as a project under CEQA if it has the potential to cause a direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment that meets the following:

- An activity directly undertaken by any public agency.
- An activity that is supported by contracts, grants, subsidies, loans or other assistance from public agencies.
- An activity that involves the issuance of a permit, license or entitlement from public agencies.

A WHA is a study, and as such it would not be subject to CEQA. However, the implementation of any wildlife hazard management measures that could potentially cause direct or indirect changes in the environment could be subject to CEQA. Proposed wildlife hazard management measures that require compliance with the California ESA and Federal Migratory Bird Act would require CEQA compliance.

3.3 Legal Status of Key Species

Numerous federally listed and state-listed endangered and threatened animal species are known to occur Riverside County, California, and a complete species list is included in **Appendix E**. The Coachella Valley and TRM are located in the Indio and Valerie quadrangles of California. **Table 3-1** presents federal- and state-listed animal species that are known to occur in the Indio and Valerie quadrangles and species of federal and state concern as listed in the California Natural Diversity Database (CNDDB).

Several protected species, candidate species, or state watch list species are present in the airport vicinity. Eight of 25 listed, candidate, or watch list bird species were observed during the 12-month survey period, and these species are highlighted in **Table 3-1**.

Table 3-1. Federal and State Threatened, Endangered, and Special Concern Animal Species in the Indio and Valerie Quadrangles

Common Name	Scientific Name	Status
Birds		
American peregrine falcon	*Falco peregrinus anatum*	FD, SD, FP
Black tern	*Chlidonias niger*	SSC
Black-tailed gnatcatcher	*Polioptila melanura*	WL
Burrowing owl	*Athene cunicularia*	SSC
California gull	*Larus californicus*	WL
California horned lark	*Eremophila alpestris actia*	WL
Cooper's hawk	*Accipiter cooperii*	WL
Crissal thrasher	*Toxostoma crissale*	SSC
Ferruginous hawk	*Buteo regalis*	WL
Large-billed savannah sparrow	*Passerculus sandwichensis rostratus*	SSC
Le Conte's thrasher	*Toxostoma lecontei*	SSC
Loggerhead shrike	*Lanius ludovicianus*	SSC
Long-billed curlew	*Numenius americanus*	WL
Long-eared owl	*Asio otus*	SSC
Lucy's warbler	*Oreothlypis luciae*	SSC
Mountain plover	*Charadrius montanus*	SSC
Northern harrier	*Circus cyaneus*	SSC
Prairie falcon	*Falco mexicanus*	WL
Sharp-shinned hawk	*Accipiter striatus*	WL
Summer tanager	*Piranga rubra*	SSC
Vaux's swift	*Chaetura vauxi*	SSC
Vermilion flycatcher	*Pyrocephalus rubinus*	SSC
Yellow warbler	*Setophaga petechia*	SSC
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*	SSC
Yuma clapper rail	*Rallus longirostris yumanensis*	FE, ST, FP
Mammals		
American badger	*Taxidea taxus*	SSC
Palm Springs pocket mouse	*Perognathus longimembris bangsi*	SSC
Palm Springs round-tailed ground squirrel	*Xerospermophilus tereticaudus chlorus*	SSC
Peninsular bighorn sheep DPS	*Ovis canadensis nelsoni pop. 2*	FE, ST, FP
Western mastiff bat	*Eumops perotis californicus*	SSC
Western yellow bat	*Lasiurus xanthinus*	SSC
Reptiles		

Table 3-1. Federal and State Threatened, Endangered, and Special Concern Animal Species in the Indio and Valerie Quadrangles		
Coachella Valley fringe-toed lizard	*Uma inornata*	FT, SE
Desert tortoise	*Gopherus agassizii*	FT, ST
Flat-tailed horned lizard	*Phrynosoma mcallii*	SC, SSC
Amphibians		
Lowland leopard Frog	*Lithobates yavapaiensis*	SSC
Plants		
Coachella Valley milk-vetch	*Astragalus lentiginosus var. coachellae*	FE

Note: Highlighted species were observed during WHA field surveys.

Key:
FE = Federally listed Endangered Species
FT = Federally listed Threatened Species
FD = Federally Delisted Species
SE = State-listed Endangered Species
ST = State-listed Threatened Species
SC = State Candidate Species
SD = State Delisted Species
FP = Fully Protected State Species - Identify and provide additional protection to those animals that are rare or face possible extinction
SSC = State Species of Special Concern
WL = State Watch List

Source: California Natural Diversity Database (CNDDB), 2017.

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Fieldwork for the WHA was accomplished through five tasks performed during the 12-month monitoring that began in May 2015 and concluded in April 2016. These tasks included:

- A preliminary site reconnaissance visit on May 14, 2015;
- Twice-monthly monitoring events focusing on avian wildlife;
- Two small mammal monitoring events;
- Two nocturnal spotlight surveys; and
- Monitoring using game cameras to documents wildlife presence.

Sections 4.1 through 4.5 summarize the methods used to conduct these tasks.

4.1 Preliminary Site Reconnaissance Visit

The project team conducted a preliminary site reconnaissance visit on May 14, 2015. The preliminary site visit was performed to identify potential wildlife attractants and monitoring locations for project surveys. As described in FAA AC 150/5200-33B, "Hazardous Wildlife Attractants On or Near Airports" (**Appendix F**), the project team considered the area within 10,000 feet of the airport, as well as the area within 5 miles of approach departure corridors when identifying monitoring locations for the surveys.

Based on the results of the preliminary site visit, the team identified 15 survey locations for the twice-monthly surveys and large mammal monitoring events. Nine locations (points 1 through 9) were associated with the AOA to provide visual coverage of runways, taxiways, infield turf grass/weedy vegetation and structures, ramps, hangars, and buildings (see **Table 4-1** and **Figure 4-1**). Six monitoring points (points 10 through 15) were associated with off-site locations, such as agricultural areas, Coachella Valley Water District sanitation ponds, and aircraft approach/departure corridors.

Table 4-1
Summary of Wildlife Hazard Assessment Monitoring Locations
Jacqueline Cochran Regional Airport

Monitoring point	Location/View
On-site Monitoring Locations	
1	View of infield vegetation, ramp area, and surrounding buildings and hangars.
2	View of Runway 17/35, taxiways, runway safety areas, and FBO ramp area.
3	View of north end of Runway 17/35, taxiways, runway safety areas, and adjacent vegetation.
4	View of south end of Runway 17/35, taxiways, runway safety areas, and adjacent vegetation.
5	View of Runway 17/35, runway safety areas, adjacent vegetation, and off-site areas to the south.
6	View of infield vegetation and brush.

Table 4-1 Summary of Wildlife Hazard Assessment Monitoring Locations Jacqueline Cochran Regional Airport	
Monitoring point	**Location/View**
7	View of approach end of Runway 30, taxiways, runway safety areas, and adjacent vegetation.
8	View of central part of Runway 12/30, taxiways, runway safety areas, and adjacent vegetation.
9	View of the approach end of Runway 12, taxiways, runway safety areas, and adjacent vegetation.
Off-site Monitoring Locations	
10	View of the Coachella Sanitary District Facility
11	View of Coachella Valley Water District sanitation ponds
12	View of agricultural lands and the Whitewater River
13	View of desert vegetation, trees, powerlines, and buildings.
14	View of water within the irrigation canal.
15	View of agricultural lands and a horse farm.

4.2 Twice-Monthly Wildlife Monitoring Surveys

Two wildlife surveys were performed for a 12-month period that began in May 2015 and ended in April 2016 for a total of 24 survey events. The following procedures and criteria were implemented during each monitoring event:

- The time of day and order of point counts were randomized;
- Each monitoring point was surveyed for a 5-minute period. All bird and mammal species observed or heard during the 5-minute period were identified and counted, and their locations were recorded on field data forms;
- The behavior of all birds (e.g., perched, flying, loafing, etc.), as well as the approximate height of birds in flight above ground level were recorded; and
- The associated habitat type was recorded for all mammal and for all perched and foraging birds.

Project biologists recorded observations pertaining to both avian and non-avian species. The condition of the perimeter fence was monitored, and the presence of other non-avian species encountered during the twice-monthly surveys was recorded based on observations, conversations with TRM staff, or other evidence (e.g., scat, tracks, etc.). **Appendix G** presents a copy of the field data form used for each monitoring event.

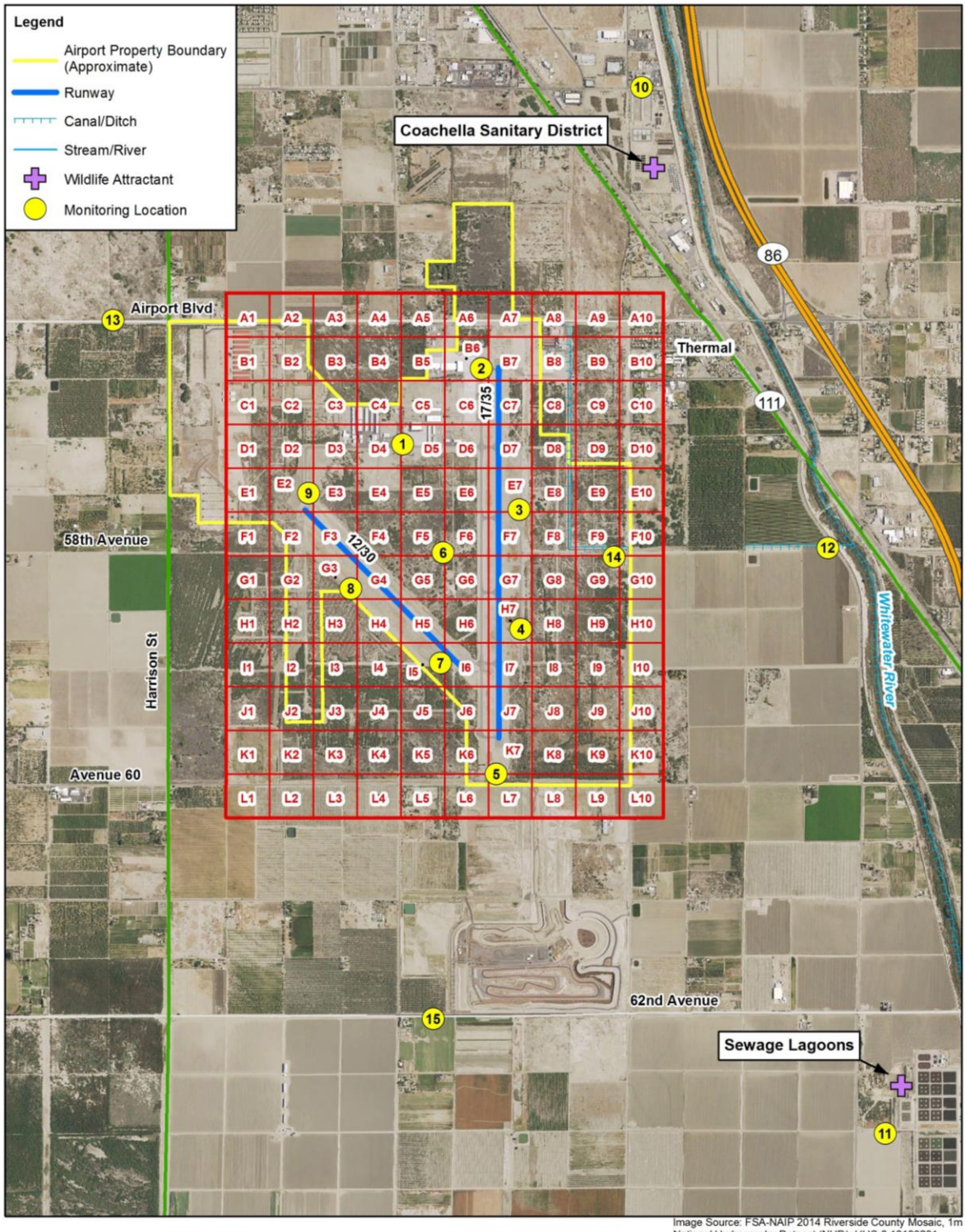


Figure 4-1.

WHA Observation Points with Grid

4.3 Small Mammal Surveys

Two small mammals (rodent) monitoring events were performed at TRM. One was performed in October 2015 and another in February 2016. Each small mammal monitoring event was conducted over a period of three days and two nights.

Three transects, or trap lines composed of 50 live traps, were established within the airport property for each survey. The traps were placed along each transect at approximately 30-foot intervals. Locations of the trap lines are shown in **Figure 4-2** and described by date below.

For the October survey, trap lines were placed in the following locations:

- Hardscape ground and shrub scrub along the south side of taxiway (Transect E on Figure 4-2)
- Medium-height grass (6 to 12 inches) within the runway safety area along the south side of Runway 12/30 (Transect D on Figure 4-2)
- Short grass (3 to 6 inches) within the runway safety area along the eastern side of Runway 17-35 (Transect F on Figure 4-2)

For the February survey, trap lines were place in the following locations:

- Edge of hardscape access road and shrub scrub within the infield of the AOA (Transect C on Figure 4-2).
- Short grass (3-6 inches) and shrub scrub along the north side of the taxiway for Runway 12/30 (Transect B on Figure 4-2).
- Adjacent to stormwater detention pond near the intersection of Runways 12/30 and 17/35 (Transect A on Figure 4-2).

4.4 Spotlight Surveys

Two spotlight surveys were conducted during the 12-month period. One survey was performed in October 2015 and another was conducted in February 2016. The field team used the same survey locations identified for the twice-monthly monitoring events as well as driving the perimeter roads, internal roads, and along taxiways. The surveys were conducted approximately 1.5 hours after sunset.

4.5 Game Camera Surveys

Initially, one game camera was installed within the AOA to monitor mammal activity during the 12-month assessment. Based on the extensive mammal activity recorded, a second game camera was installed in January 2016. The locations of the game cameras were adjusted to capture conditions in different areas of the airport. Typically a game camera was moved if little wildlife activity was detected in a specific location. **Figure 4-3** illustrates the locations in which the game cameras were placed throughout the study. The letter associated with each game camera corresponds to the consecutive placement of the camera over the course of the study. One game camera malfunctioned during the October monitoring period.

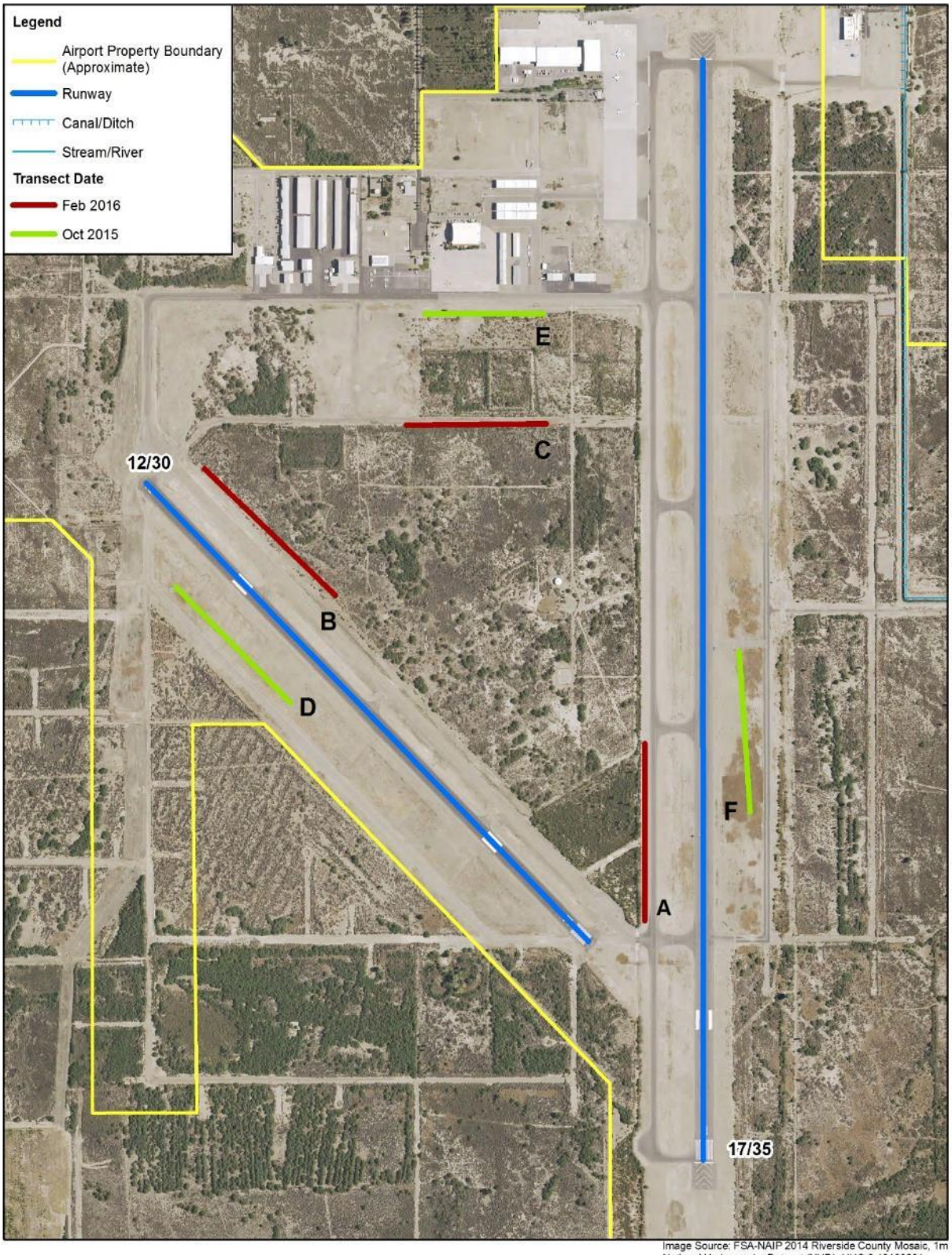
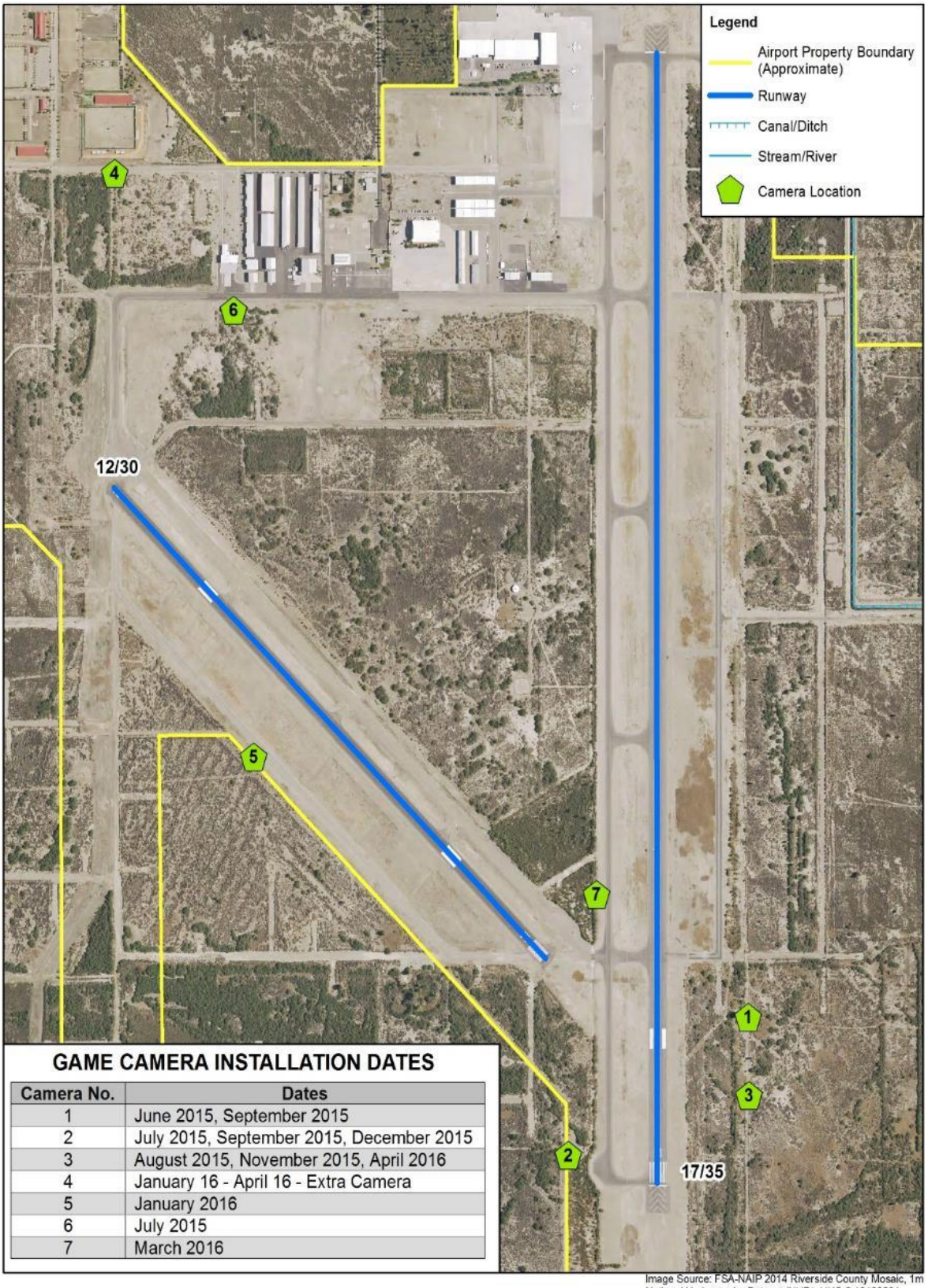


Figure 4-2.

Small Mammal Trapping Transects



GAME CAMERA INSTALLATION DATES

Camera No.	Dates
1	June 2015, September 2015
2	July 2015, September 2015, December 2015
3	August 2015, November 2015, April 2016
4	January 16 - April 16 - Extra Camera
5	January 2016
6	July 2015
7	March 2016

Figure 4-3.

Game Camera Locations

Chapter 5

Results and Discussion

Chapter 5 presents the results of the 12-month wildlife monitoring effort performed from May 2015 to April 2016. Section 5.1 presents the results of the twice-monthly avian surveys, and Section 5.2 presents the results of the mammal surveys.

Section 5 presents the following data for each species or avian guild identified:

- Description,
- Abundance,
- Legal status,
- Management techniques, and
- Relative risk posed by each guild or species.

One or more management techniques is presented for each species or guild identified. A guild is defined as a group of species that have similar habits or resource requirements. In some cases, the discussion will identify the likely success of a specific management technique based on past experience, industry data, or site-specific conditions. A more detailed discussion of recommended management techniques that may be implemented by Airport staff is presented in **Chapter 6**, "Conclusions and Recommendations."

In FAA AC 150/5200-33B, "Hazardous Wildlife Attractants on and Near Airports" (**Appendix F**), the FAA acknowledges that not all species pose the same risk to aircraft operations. As the FAA states, "aircraft collisions with birds and other wildlife are a serious economic and public safety problem. While many species of wildlife can pose a threat to aircraft safety, they are not equally hazardous" (FAA, 2007). Some species may pose a greater risk to aircraft operations based on their size, behavior, abundance, or proximity to the airport and its associated airspace.

The conventional guideline in assessing the threat to aviation posed by a specific species considers three priorities in descending order of severity:

- Large flocking birds, such as gulls or waterfowl;
- Small flocking birds, such as starlings; and
- Large singular birds, such as hawks or herons.

Large birds, due to their greater body mass, can strike an aircraft with greater impact and cause more damage to aircraft and affect flight. Birds that congregate in large flocks provide increased opportunities for a strike compared to solitary birds, and flocking birds have the capacity to disable more than one engine when a strike occurs.

A more detailed analysis of the comparative hazards posed by various wildlife was provided in a study by Richard A. Dolbeer, *et al.* entitled *Ranking the Hazard Level of Wildlife Species to Aviation*. The study considered the number of strikes caused by each species, the severity of damage caused by the strike,

and the resulting effect on the flight. The wildlife species that was determined to be most hazardous, deer, was assigned a hazard value of 100. All other wildlife species were then assigned a numerical value in proportion to its risk compared to that of deer. A numerical ranking of relative hazards was developed that reinforces the conventional guidelines. In general, this formula also recognizes a greater threat of large-bodied wildlife. **Table 5-1** summarizes the species and their relative ranking as provided by Dolbeer *et al.*

Table 5-1
Ranking of the Relative Hazards to Aviation of 25 Species of Wildlife

Species	Hazard Value	Species	Hazard Value
1. Deer	100	14. Owls	23
2. Vultures	63	15. Horned lark/buntings	17
3. Geese	55	16. Crows/ravens	16
4. Cormorant/pelican	54	17. Coyotes	14
5. Cranes	47	18. Mourning Dove	14
6. Eagles	41	19. Shorebirds	10
7. Ducks	39	20. Blackbirds-starlings	10
8. Osprey	39	21. American kestrels	9
9. Turkey/pheasant	33	22. Meadowlarks	7
10. Herons	27	23. Swallows	4
11. Hawks	25	24. Sparrows	4
12. Gulls	24	25. Nighthawks	1
13. Pigeons	23		

Source: Ranking the Hazard Level of Wildlife Species to Civil Aviation in the USA, R.A. Dolbeer, et al., 2000.

Throughout Chapter 5, the discussion of each guild or species observed during field studies concludes with a general statement regarding the relative risk that the species or guild poses to aircraft operations at TRM. The discussion is based on the following:

- The likelihood that the guild member or species would be involved in a wildlife strike and the potential severity of the impact (effect on flight or potential damage) (see **Table 5-2**);
- Whether the species was identified by FAA as one of the 25 species or wildlife groups commonly involved in damaging strikes in the United States (see **Table 5-2)**; and
- Whether the species or guild had been associated with a documented wildlife strike at TRM. (**Table 1-1** summarizes wildlife strike data for TRM as documented in FAA's wildlife strike database.)

Table 5-2 General Risk Assessment Matrix			
Probability/ Likelihood of Conflict:	**Severity of Impact/Effect on Flight**		
	Low	**Moderate**	**High**
High (Probable or Likely)	**Moderate**	**High**	**Critical**
Moderate	**Low**	**Moderate**	**High**
Low (Improbable or Unlikely)	**Low**	**Low**	**Moderate**

The discussion of relative hazards is provided so that the airport operator can consider this data when making decisions regarding the allocation of its resources to address wildlife hazards.

5.1 Avian Surveys

As described in Chapter 4, surveys were performed twice each month during the 12-month WHA monitoring period. Observations and evidence of birds and mammals were recorded during these surveys. Avian wildlife observations are summarized in Section 5.1, and mammal observations are summarized in Section 5.2.

Section 5.1.1 summarizes the results for all avian species observed. Ten guilds, or groups of similar species, were identified during WHA field studies. Sections 5.1.2 through 5.1.11 describe the survey results for each guild. The discussion presented for each guild presents the total number of birds observed, the abundance of each species per month, location, behavior observed, and the relative risk posed by the species within the guild.

5.1.1 All Species Combined

As shown in **Table 5-3,** a total of 64 bird species were identified during field surveys as well as birds that could not be identified to the species level. Nearly 4,900 birds were observed.

Table 5-3. Bird Species and Abundance at Jacqueline Cochran Regional Airport (TRM) May 2015 to April 2016			
Guild and Common Name	***Scientific Name***	**Guild and Species Abundance**	**Guild and Species Percentage of Abundance**
Waterfowl		**639**	**13.17%**
American Coot	*Fulica americana*	78	12.21%
Canada Goose	*Branta canadensis*	129	20.19%
Double-crested Cormorant	*Phalacrocorax auritus*	304	47.57%
Lesser Scaup	*Aythya affinis*	6	0.94%
Mallard	*Anas platyrhynchos*	40	6.26%
Western Grebe	*Aechmophorus occidentalis*	30	4.69%
Unidentified Waterfowl	*Anatidae (gen, sp)*	52	8.14%

Table 5-3. Bird Species and Abundance at Jacqueline Cochran Regional Airport (TRM) May 2015 to April 2016			
Guild and Common Name	***Scientific Name***	**Guild and Species Abundance**	**Guild and Species Percentage of Abundance**
Blackbirds and Starlings		**841**	**17.33%**
Brewer's Blackbird	*Euphagus cyanocephalus*	34	4.04%
European Starling	*Sturnus vulgaris*	555	65.99%
Great-tailed Grackle	*Quiscalus mexicanus*	252	29.96%
Doves and Pigeons		**1,051**	**21.66%**
Eurasian Collared-Dove	*Streptopelia decaocto*	20	0.19%
Mourning Dove	*Zenaida macroura*	757	72.03%
Rock Pigeon	*Columba livia*	190	18.08%
White-winged Dove	*Zenaida asiatica*	84	0.79%
Gulls		**539**	**11.11%**
Unidentified Gull	*Laridae (gen, sp)*	539	100.00%
Swallows		**434**	**8.94%**
Cliff Swallow	*Petrochelidon pyrrhonota*	223	51.38%
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	211	48.62%
Shorebirds		**196**	**4.04%**
American White Pelican	*Pelecanus erythrorhynchos*	13	6.63%
Black-necked Stilt	*Himantopus mexicanus*	10	5.10%
Cattle Egret	*Bubulcus ibis*	64	32.65%
Great Blue Heron	*Ardea herodias*	3	1.53%
Great Egret	*Ardea alba*	16	8.16%
Greater Yellowlegs	*Tringa melanoleuca*	1	0.51%
Killdeer	*Charadrius vociferus*	35	17.86%
Snowy Egret	*Egretta thula*	8	4.08%
White-faced Ibis	*Plegadis chihi*	37	18.88%
Wilson's Snipe	*Gallinago delicata*	3	1.53%
Unidentified Shorebirds	*Charadriiformes (fam, gen, sp)*	6	3.06%
Sparrows, Finches and Warblers		**597**	**12.30%**
Abert's Towhee	*Melozone aberti*	2	0.34%
California Towhee	*Pipilo crissalis*	42	7.04%
Common Yellowthroat	*Geothlypis trichas*	12	2.01%
House Finch	*Haemorhous mexicanus*	454	76.05%
House Sparrow	*Passer domesticus*	5	0.84%
Orange-crowned Warbler	*Oreothlypis celata*	1	0.17%
White-crowned Sparrow	*Zonotrichia leucophrys*	72	12.06%
Yellow-rumped Warbler	*Setophaga coronata*	9	1.51%
Corvids		**79**	**1.63%**
Common Raven	*Corvus corax*	79	100.00%

Table 5-3. Bird Species and Abundance at Jacqueline Cochran Regional Airport (TRM) May 2015 to April 2016

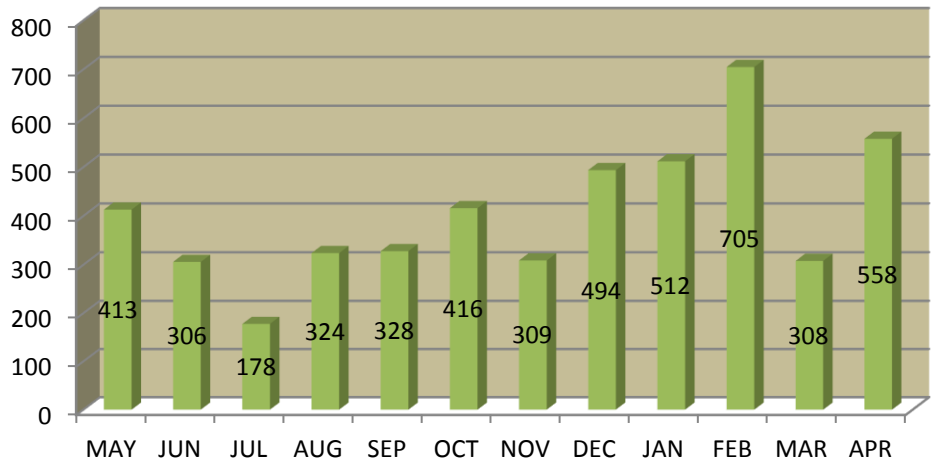
Guild and Common Name	*Scientific Name*	Guild and Species Abundance	Guild and Species Percentage of Abundance
Raptors		**107**	**2.21%**
American Kestrel	*Falco sparverius*	25	23.36%
Burrowing Owl	*Athene cunicularia*	59	55.14%
Cooper's Hawk	*Accipiter cooperii*	1	0.93%
Ferruginous Hawk	*Buteo regalis*	4	3.74%
Northern Harrier	*Circus cyaneus*	2	1.87%
Peregrine Falcon	*Falco peregrinus*	1	0.93%
Red-tailed Hawk	*Buteo jamaicensis*	15	14.02%
Songbirds		**247**	**5.09%**
Bewick's Wren	*Thryomanes bewickii*	1	0.40%
Black Phoebe	*Sayornis nigricans*	21	8.50%
Black-tailed Gnatcatcher	*Polioptila melanura*	3	1.21%
Blue-gray Gnatcatcher	*Polioptila caerulea*	10	4.05%
Bushtit	*Psaltriparus minimus*	5	2.02%
Cactus Wren	*Campylorhynchus brunneicapillus*	1	0.40%
California Thrasher	*Toxostoma redivivum*	1	0.40%
Horned Lark	*Eremophila alpestris*	4	1.62%
Loggerhead Shrike	*Lanius ludovicianus*	7	2.83%
Northern Mockingbird	*Mimus polyglottos*	100	40.49%
Phainopepla	*Phainopepla nitens*	4	1.62%
Say's Phoebe	*Sayornis saya*	26	10.53%
Verdin	*Auriparus flaviceps*	3	1.21%
Vermilion Flycatcher	*Pyrocephalus rubinus*	1	0.40%
Western Kingbird	*Tyrannus verticalis*	42	17.00%
Western Meadowlark	*Sturnella neglecta*	13	5.26%
Western Wood-Pewee	*Contopus sordidulus*	1	0.40%
Unidentified Songbird		4	1.62%
Other		**122**	**2.51%**
Anna's Hummingbird	*Calypte anna*	10	8.20%
Gambel's Quail	*Callipepla gambelii*	84	68.85%
Greater Roadrunner	*Geococcyx californianus*	15	12.30%
Ladder-backed Woodpecker	*Picoides scalaris*	1	0.82%
Lesser Nighthawk	*Chordeiles acutipennis*	8	6.56%
Northern Flicker	*Colaptes auratus*	4	3.28%
	Total (68 species)	**4,852**	**100.00%**

As shown on **Figure 5-1**, birds were generally more abundant during the three-month period from December through February, which correlates to the wintering populations of birds in the region. Approximately 35 percent of all birds were observed during this period. More birds were observed in February than any other month (705 birds), comprising 15 percent of the total

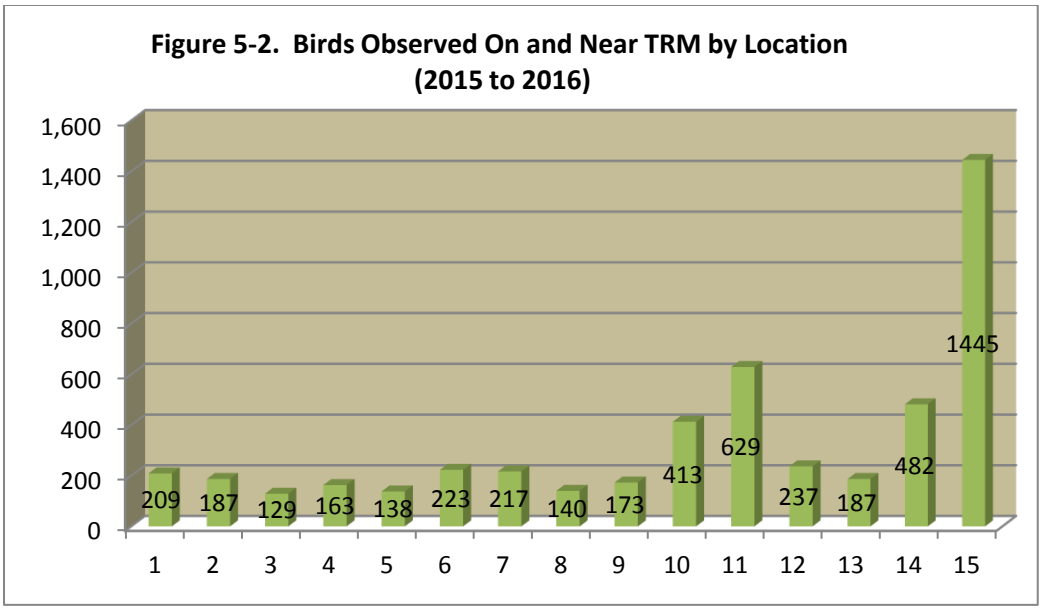
number observed throughout the 12-month monitoring period. The abundance of birds observed in February was attributable to the large number of double-crested cormorants that were observed near point 15 as they migrated from Salton Sea. Birds were also abundant in April, when large numbers of gulls were observed flying near the airport.

The fewest bird number of birds was observed in July (3 percent of the total number observed), when summer temperatures exceeded 100° F.

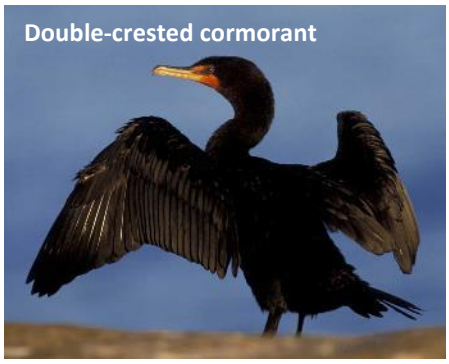
Figure 5-1. Birds Observed On and Near TRM by Month (2015 to 2016)



As shown on **Figure 5-2**, the greatest number of birds (1,445 birds) was observed from point 15, which was located off site and south of Runway 35 (see **Figure 4-1**). Point 15 was located next to a horse farm/agricultural area where large numbers of waterfowl, blackbirds and starlings, and swallows were observed. Large numbers of birds were also observed from points 11 (629 birds) and 14 (482 birds). Point 11 was located near sanitation ponds, and point 14 was locate near an irrigation canal. These water sources served as an attractant for large numbers of waterfowl and shorebirds. These two points together with point 15 accounted for over 50% of the total number of observations over the twelve month monitoring period.



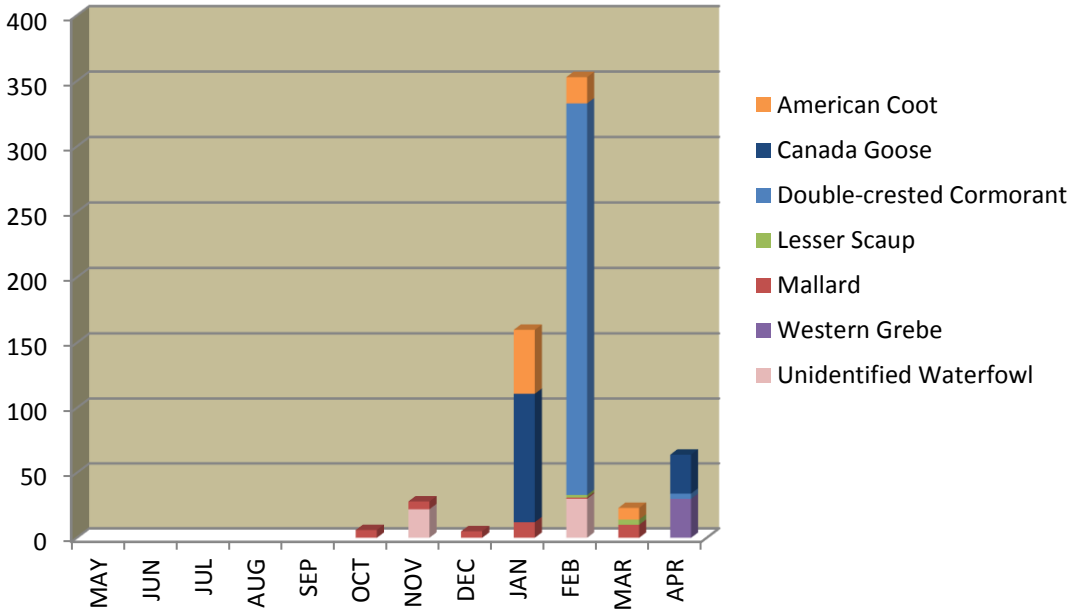
5.1.2 Waterfowl



Description. Waterfowl are large aquatic birds with webbed feet and flat, heavy bills. Waterfowl pose one of the most serious threats to aircraft operations because of their abundance, size, and flocking behavior. Waterfowl species are attracted to open water ponds and basins to feed, nest, loaf, and escape predators. Geese and ducks will also frequent agricultural fields, parks, and golf courses to graze on the manicured grasses. Six species of waterfowl were observed during the 12-month monitoring period, as well as unidentified waterfowl. The double-crested cormorant accounted for nearly half of the waterfowl observed.

Abundance. Waterfowl accounted for approximately 13% of the total number of birds observed during the assessment. Waterfowl were observed only during the seven-month period from October through April and were significantly more abundant in January and February. The abundance of waterfowl during the early winter is likely attributable to the presence of overwintering populations (**Figure 5-3**).

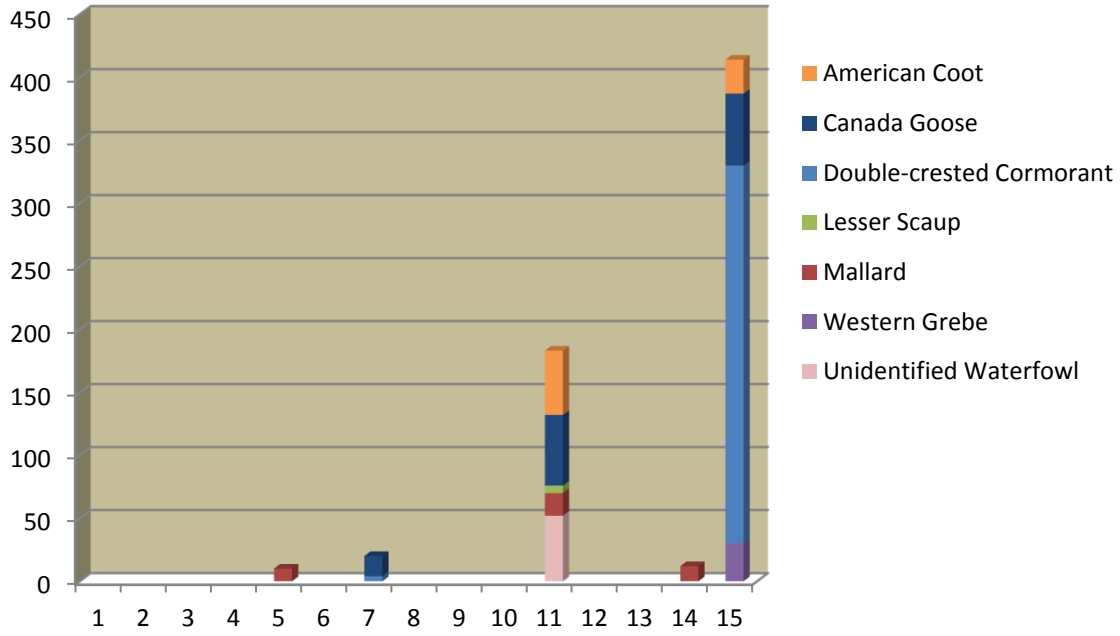
Figure 5-3. Waterfowl Observed On and Near TRM by Month (2015 to 2016)



Waterfowl were observed from only five monitoring locations. Most waterfowl was observed from off-site monitoring points 11 and 15 (**Figure 5-4**), which were located south of the airport and accounted for 85 percent of all waterfowl observed. Point 11 was located near the Coachella Valley Water District sewage lagoons, and point 15 was located next to a horse farm/agricultural area where large numbers of waterfowl were observed foraging in grass and near temporary accumulations of standing stormwater/irrigation water. The second largest breeding site in the United States for double-crested cormorants is at the Salton Sea, along the Pacific Flyway, 9 miles southeast of TRM. During their spring migration, large flocks were observed flying south of the AOA near point 15.

Waterfowl was observed on site from monitoring points 5, 7 and 14. Points 5 and 7 were located on the airfield, and waterfowl was observed flying in or out of the water detention area near the approach end of Runway 30. Point 14 was located near an irrigation canal that attracted mallards.

Figure 5-4. Waterfowl Observed On and Near TRM by Location (2015 to 2016)



Management and Legal Status. Waterfowl are migratory game birds that are protected by the MBTA. Depredation permits from the USFWS are required for lethal management. However, most waterfowl species can be hunted in areas where firearm discharge is legal during defined periods of the fall and winter in accordance with a valid hunting license and federal waterfowl stamps. The hunting season corresponds with the fall migration period.

The Pacific Flyway supports huge waterfowl migrations annually. TRM is positioned near a major flyway (see **Figure 5-5**). Because the area has been altered significantly as a result of development, migrating and resident waterfowl are attracted to the available water features, such as sanitation ponds, wetlands, and marshes. Waterfowl are known to pose a risk to aircraft and human health and safety. Habitat modification, harassment, and lethal reinforcement are all necessary in the TRM wildlife hazard management program.

Waterfowl were observed frequently near TRM during the four month period from January through April. The greatest number of waterfowl was observed near areas associated with water impoundments or temporary standing water. However, even waterfowl attracted to off-site features has the potential to pass through the area at low altitudes and pose a risk to airport operations. Large flocks of double-crested cormorants were observed flying within TRM airspace that could affect local aircraft operations. A Notice to Airmen (NOTAM) should be issued when large flocks of shorebirds are moving through or near the airspace

Although comparatively few waterfowl were observed on-site, all waterfowl observed on the airfield should be harassed and dispersed when it is observed. Waterfowl that is observed near aircraft movement areas can pose hazards to aviation.

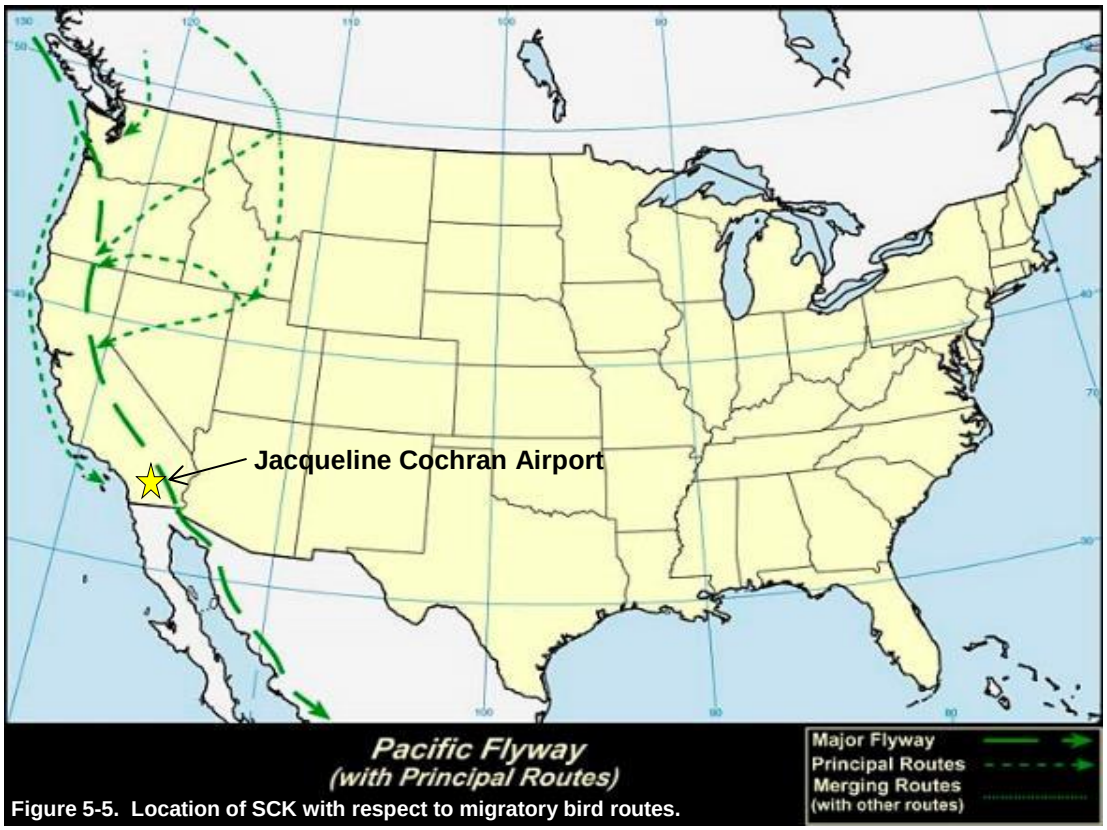


Figure 5-5. Location of SCK with respect to migratory bird routes.

Source: Nutty Birdwatcher, 2012.

Management Measures. Waterfowl can be harassed from the airfield using pyrotechnic devices, such as screamers and bangers. Airport personnel must be persistent with these methods. Lethal reinforcement may be necessary if waterfowl become habituated to pyrotechnics and become more common and in greater abundance within the AOA. The depressional area on the southern end of the airfield should also been monitored for the presence of waterfowl.

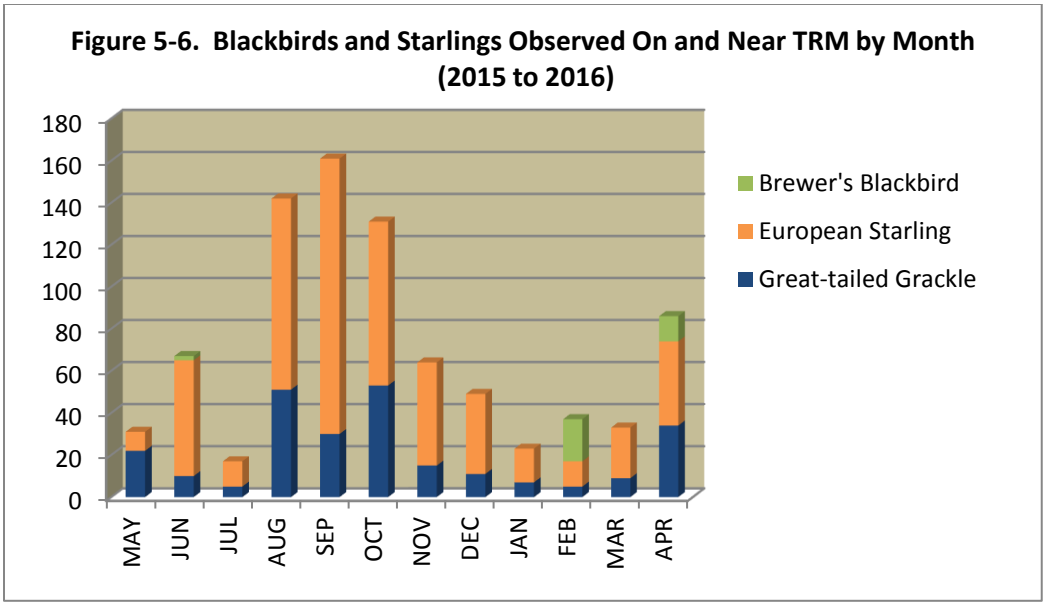
Relative Risk. The members of the waterfowl guild have a high likelihood of being involved in a wildlife strike based on their size and flocking behavior. The FAA ranks geese as third in its composite ranking of hazardous wildlife species and ducks as seventh. All have the potential to cause a high degree of impact on flight. Two documented wildlife strikes with Canada geese have occurred at TRM, one of which caused substantial aircraft damage. Based on the number of waterfowl observed on and off site and two documented strikes, the overall risk posed by waterfowl at TRM is ***critical.***

5.1.3 Blackbirds and Starlings

Description. Three species of blackbirds and starlings were observed on and near TRM: European starlings, great-tailed grackles, and Brewer's blackbirds. European starlings are medium-sized, chunky birds that have short tails that have a triangular shape when flying. During the breeding season, the bills of both male and female starlings are yellow. Male great-tailed grackles are large, birds with iridescent black and purple and oversized tails. Females are about half the size and brown in color. The Brewer's blackbird is a small, fairly long-legged blackbird. Males are glossy black all over with a staring yellow eye and a blue sheen on the head grading to greenish iridescence on the body. Females are plainer brown, darkest on the wings and tail, with a dark eye.

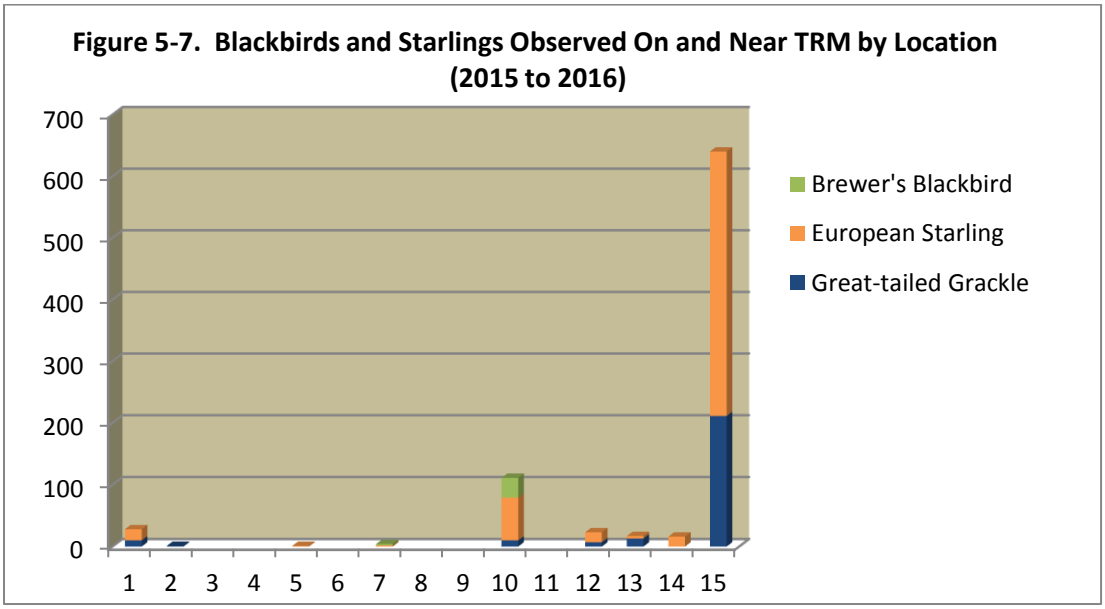
Starlings are found in a variety of habitats from urban to rural environments. Starlings are attracted to water and to open, grassy areas in which they can forage. They are also attracted to trees or buildings that contain cavities for nesting. Structures with ill-fitting doors or broken windows are readily used. In the winter, these species form roosts in areas where cover and warmth are provided. Great-tailed grackles often spend days on suburban lawns, golf courses, fields, and marshes. In the evening, flocks of the noisy birds roost in neighborhood trees. Brewer's blackbirds feed on open ground or in parks and busy areas. Brewer's blackbirds eat grain and weed seeds throughout most of the year, while insects are their predominant food source during nesting season. Blackbirds are primarily granivorous, whereas starlings prefer a diet with a higher protein content that includes fruits, insects, spiders, earthworms, garbage, snails, weed seeds, and other grains.

Abundance. A total of 841 blackbirds and starlings were observed, representing approximately 17 percent of the total number of all birds observed. Starlings and grackles were observed during all months of the year, though more than half were observed during the late summer and fall months from August through October (see **Figure 5-6**). The higher number observed in late fall and early winter likely coincides with the increased concentrations that occur as starlings form large flocks to exploit resources, such as food. Large flocks of starlings and blackbirds move around the landscape seeking productive foraging areas, and their abundance can vary significantly.



The greatest number of blackbirds and starlings was observed from point 15, which accounted for 76 percent of all blackbird and starlings observed (see **Figure 5-7**). Point 15 was located south of the airport near a horse farm and agricultural areas. The abundance of blackbirds at this location can be attributed to opportunistic feeding behavior as blackbirds and starlings were observed foraging in open grassland areas.

Blackbirds and starlings have a highly varied diet and can easily adapt to new food sources supplied either directly or indirectly by humans. Few blackbirds and starlings were observed within the AOA. The blackbirds and starlings that were observed within the AOA, from point 1, were observed perching on buildings, hangars, and utility lines in and around main ramp area.



Legal Status. The European starling is an exotic species that was introduced to the United States from Europe in 1890. The species is not protected by federal or state laws, and neither a federal nor state permit is required to take starlings. Blackbirds (tri-colored, red-winged, and Brewer's), cowbirds, and great-tailed grackles are migratory birds that are protected by the MBTA. However, pursuant to the CFR at 50 CFR 21.43, Depredation Order for Blackbirds, Cowbirds, Grackles, Crows and Magpies, these species (except for tri-colored blackbirds) can be taken any time of the year in California without a federal or state permit when they are "found committing or about to commit depredations upon ornamental or shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance." The following species are specifically listed in the Order: Brewer's blackbird, red-winged blackbird, yellow-headed blackbird, bronzed cowbird, brown-headed cowbird, shiny cowbird, boat-tailed grackle, common grackle, great-tailed grackle, greater Antillean grackle, American crow, fish crow, northwestern crow, and black-billed magpie.

Although these species can be taken, the regulations state that any person or agency acting under the depredation order must:

a. Attempt to control depredation by species listed under this depredation order using non-lethal methods before using lethal control.

b. If a firearm is used to kill migratory birds under the provisions of this order, nontoxic shot or nontoxic bullets must be used in most cases. However, this prohibition does not apply to an air rifle, an air pistol, or a 22-caliber, rim-fire firearm for control of depredating birds under this order.

c. Allow any Federal, State, tribal, or territorial wildlife law enforcement officer unrestricted access at all reasonable times (including during actual operations) over the premises on which you are conducting the control. The officer must be furnished with whatever information he or she may require about the control operations.

d. Only kill birds under this order in a way that complies with all State, tribal, or territorial laws or regulations. You must have a State, tribal, or territorial permit required to conduct the activity.

e. Not sell, or offer to sell, any bird, or any part thereof, killed under this section, but you may possess, transport, and otherwise dispose of the bird or its parts.

f. Provide to the appropriate Regional Migratory Bird Permit Office an annual report for each species taken by the date that is specified on the permit.

Management. Flocks of starling and blackbirds can be harassed from the airfield using pyrotechnic devices, such as screamers and bangers. Airport personnel must be persistent with these methods. Lethal reinforcement may be necessary if starlings and blackbirds become habituated to pyrotechnics and become more common and in greater abundance within the AOA.

Relative Risk. Blackbirds and starlings can pose a significant hazard to aircraft because of their dense size and flocking behavior. These species have a high likelihood of being involved in strikes with aircraft. When strikes with these species occur, they usually involve multiple birds that can be ingested by aircraft engines, and the severity of strikes associated with these species is moderate. The FAA assigns a composite hazard ranking of 20 to blackbirds/starlings. No

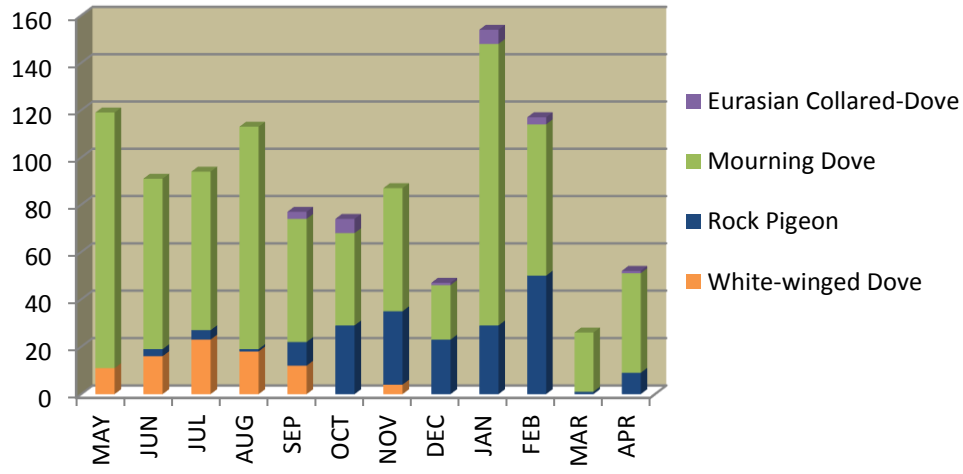
strikes with blackbirds or starlings at TRM were recorded in the FAA database. Starlings and blackbirds represented 17 percent of all birds observed, and they were observed in large numbers at off-site locations and passing through TRM airspace. The overall risk posed by species within this guild at TRM is ***moderate***.

5.1.4 Doves and Pigeons

Description. Doves and pigeons are medium-sized songbirds that feed on seeds and grain and can be found in open areas. Rock pigeons and mourning doves can be found in areas that are closely associated with human activity, such as parks and agricultural operations, and they nest in manmade structures such as parking ramps, buildings, and bridges. Doves and pigeons feed on grass and weed seeds in fields, refuse, and handouts from humans. Four species of doves and pigeons were observed: Eurasian collared-dove, mourning dove, white-winged dove, and rock pigeons. These species can pose hazards to aircraft operations because of their abundance and flocking behavior.

Abundance. A total of 1,051 doves and pigeons was recorded, comprising 22 percent of the total number of birds observed during the 12-month survey period. Of the four species observed, approximately 72 percent were mourning doves and 18 percent were rock pigeons (**Table 5-3**). Doves and pigeons were present at TRM throughout the year (**Figure 5-8**) as they are both year-round residents of the region.

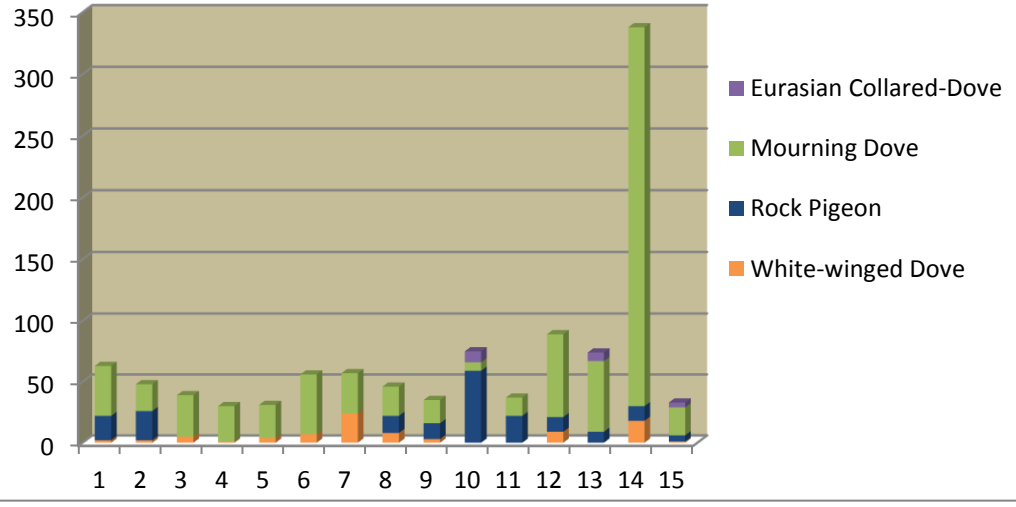
Figure 5-8. Doves and Pigeons Observed On and Near TRM by Month (2015 to 2016)



As shown on **Figure 5-9**, doves and/or pigeons were observed from every monitoring location; however, nearly one-third were observed from point 14, which was located on the eastern side of

the airport and near the fire department facility. Doves and pigeons were likely attracted to available water in the nearby irrigation canal and utility lines, where mourning doves were observed perched on the wire. Mourning doves were observed in the AOA where they were foraging on the ground, perching on infield brush, or flying across the airfield. Rock pigeons were observed perching or flying on and around the buildings and hangars in the AOA.

Figure 5-9. Doves and Pigeons Observed On and Near TRM by Location (2015 to 2016)



Management and Legal Status. Mourning doves and Eurasian collared-doves are migratory game birds that are protected by the MBTA. Depredation permits from the USFWS are required for lethal management. However, doves can be hunted during defined periods in the fall with a valid hunting license. Rock pigeons were introduced to the U.S. from Europe, and they are not protected by federal or state laws. Pigeons may be taken at any time, and there are no reporting requirements.

A combination of techniques including brush management, harassment, and lethal removal of some individuals may reduce the number of doves at TRM. Brush modification would include managing the on-site brush vegetation that is present within the infield and along the airport boundaries. This brush provides cover and perching/nesting opportunities for mourning doves along with numerous other bird species.

Relative Risk. The species associated with this guild show a moderate likelihood of being involved in a conflict with aircraft, and strikes with these species can result in a moderate impact on flight due to their flocking behavior. The FAA assigns a composite hazard ranking of 13 to pigeons and 18 to mourning doves out of 25 ranked species. No strikes with doves or pigeons were recorded in the FAA's Wildlife Strike Database for TRM. Based on the

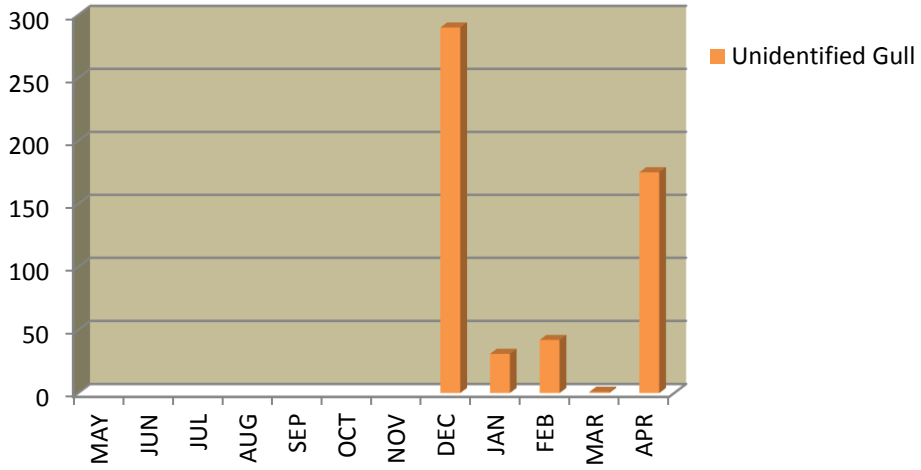
number of observations, the close proximity of doves and pigeons to aircraft movement areas, the overall risk posed by this guild is ***critical***.

5.1.5 Gulls

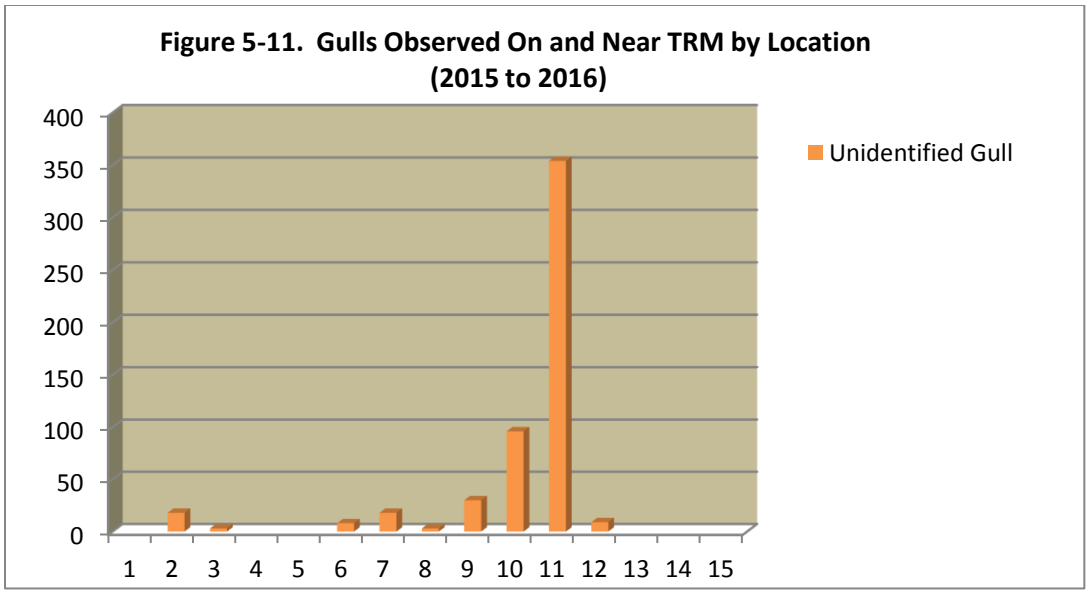
Description. Gulls are large birds with webbed feet, long wings, and hooked beaks. Adult gulls are white with gray and black on their backs and wings. Juveniles have a mottled brown appearance. Gulls can pose a severe hazard to aircraft based on their abundance, size, and flocking behavior. Gulls forage along lakes, lawns, pastures, garbage dumps, parking lots, and open water. A gull's diet consists of fish, insects, earthworms, small mammals, grain, garbage, fruit, and invertebrates. The gulls observed on and near TRM could not be identified to the species level.

Abundance. A total of 539 gulls was observed during site surveys, and gulls accounted for 11 percent of all birds observed. Gulls were present only during the five-month period from December through April, and more than half of the gulls were observed during December (**Figure 5-10**). Gulls are most abundant during these months when wintering birds are present in the region. Gulls move widely over the landscape during the winter, seeking productive foraging areas such as water bodies, agricultural areas, or flooded fields.

Figure 5-10. Gulls Observed On and Near TRM by Month (2015 to 2016)



Two-thirds of the gulls were observed from point 11, near the Coachella Valley Water District sanitation ponds southeast of the airport (**Figure 5-11**). Gulls were also observed, though they were much less abundant, from point 10, which was located near the Coachella Sanitary District ponds. Some gulls were observed flying across the airfield or loafing (rarely) in the infield. Most gulls were observed flying across TRM from off-site monitoring locations.



Management and Legal Status. Gulls are migratory birds that are protected by the MBTA. A depredation permit from the USFWS is required for lethal management. Pyrotechnics devices should be used to harass gulls if they are observed on airport property, and lethal controls may be required to remove persistent birds. If flocks of gulls are observed loafing and feeding in the AOA, they should be examined to determine why the gulls are attracted to the site. The sites should be modified based on these findings. Trash also attracts gulls, and trash receptacles should be appropriately placed in landside areas, covered, and emptied frequently to prevent gulls from identifying trash as an available on-site food source.

Relative Risk. Gulls have a moderate likelihood of being involved in a wildlife strike and can cause a moderate to high degree of impact on aircraft flight. The FAA assigns gulls a composite ranking of 12 in its list of 25 ranked species associated with wildlife strikes. One strike with a gull at TRM was recorded in the FAA database, and the strike resulted in substantial damage to the aircraft. Gulls comprised 11 percent of all birds observed. They were observed regularly at off-site monitoring locations and flying across TRM, but they were observed only occasionally in the AOA. Based on these factors, the overall risk posed by species within this guild is ***high***.

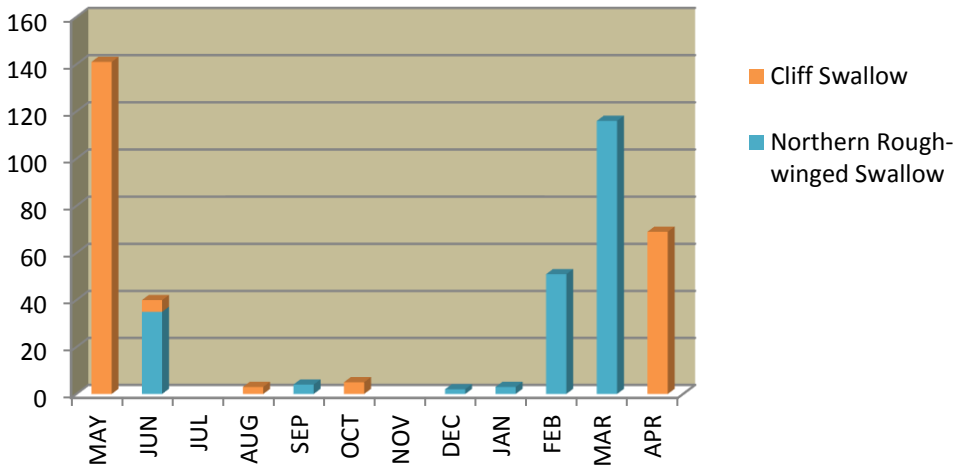
5.1.6 Swallows

Description. Swallows are slender aerialists with long, pointed wings that feed on insects as they fly. Swallows have notched tails and broader, shorter wings than swifts. Flocks will follow mowers to capture the insects that are displaced by the machines. They are frequently observed flying low over water features to capture insects. Swallows require water to build nests of mud. They are typically absent during the period of the year when flying insects are absent or at low densities. Barn

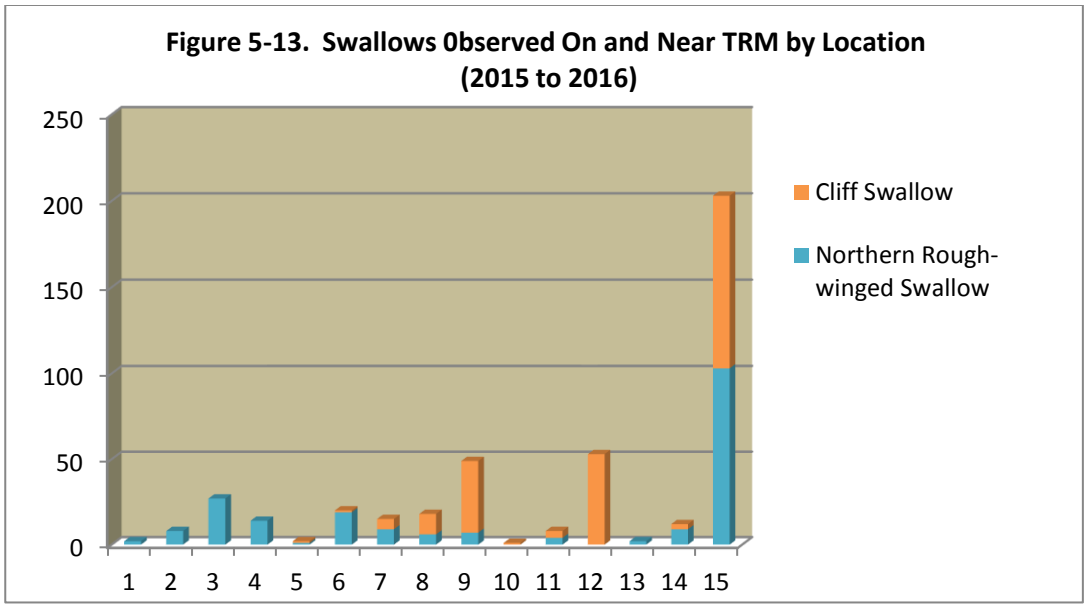
swallows and Northern rough-winged swallows were observed during WHA surveys, as well as swallows that could not be identified to the species level.

Abundance. A total of 434 swallows was observed at TRM, comprising approximately 9% percent of the total number of birds observed. Most aerial foragers were observed during the five-month period from February to June, with the greatest number recorded in May. Few swallows were observed during the summer and fall months (**Figure 5-12**). Some swallows were observed during other months; swallows are migratory, and these observations coincide with the arrival of weather conditions that support populations of flying insects.

Figure 5-12. Swallows Observed On and Near TRM by Month (2015 to 2016)



Approximately half of the swallows were observed near point 15, which was south of the airport and located near a horse farm and agricultural areas (**Figure 5-13**). The swallows were observed foraging over grass fields and open pastures. Swallow were also observed near point 12, which was located near the Whitewater River. Foraging opportunities and abundant nesting locations made this site particularly attractive to swallows.



Management and Legal Status. Swallows are migratory species that are protected by the MBTA. A depredation permit from the USFWS is required for lethal management. Management of swallows can be difficult because their presence is closely tied to a feeding source. The most effective method of dispersing swallows involves the removal of their food source. Spraying to reduce insect densities can be expensive, and it is only feasible if an outbreak of insects attracts an unusually high number of swallows to a specific location on the airfield. That is not anticipated to occur at TRM. No swallow mud nests were observed during the 12-month assessment. If airport staff observes mud nests on airport property, they should be removed in accordance to state and federal regulatory requirements.

Relative Risk. The members of this guild have a moderate likelihood of being involved in a strike with aircraft, and they can cause a moderate impact on flight due to their flocking behavior. The FAA assigns a composite hazard ranking of 23 to swallows out of 25 ranked species. No strikes with swallows are included in the FAA strike database for TRM. As relatively few swallows were observed on airport property, the overall wildlife hazard risk posed by swallows is ***low***.

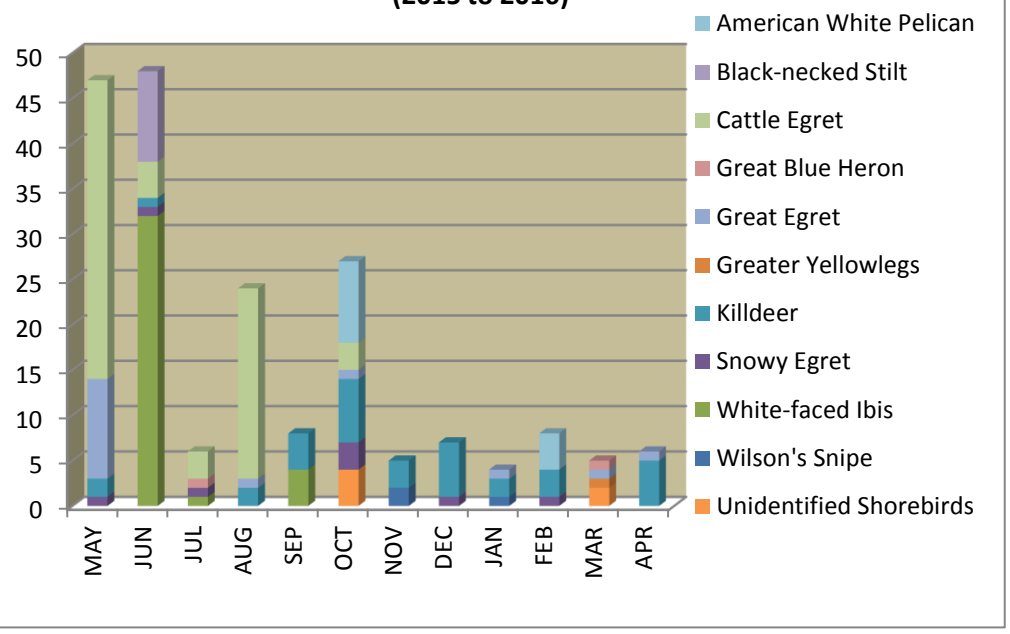
5.1.7 Shorebirds and Waders

Description. Ten shorebird species were observed on and near TRM during site surveys, as well as shorebirds of unidentified species. Shorebirds can vary from birds with short, stocky builds and short bills to slender birds with long legs and long bills. All seek small aquatic prey by probing on open shorelines and shallow ponds. The top three shorebirds observed were cattle egrets, killdeer, and white-faced ibis. Cattle egrets are noticeably small and compact. They have relatively short legs, a short, thick neck, and medium-length, broad, rounded wings. Killdeer are small birds that have a large, round head, large

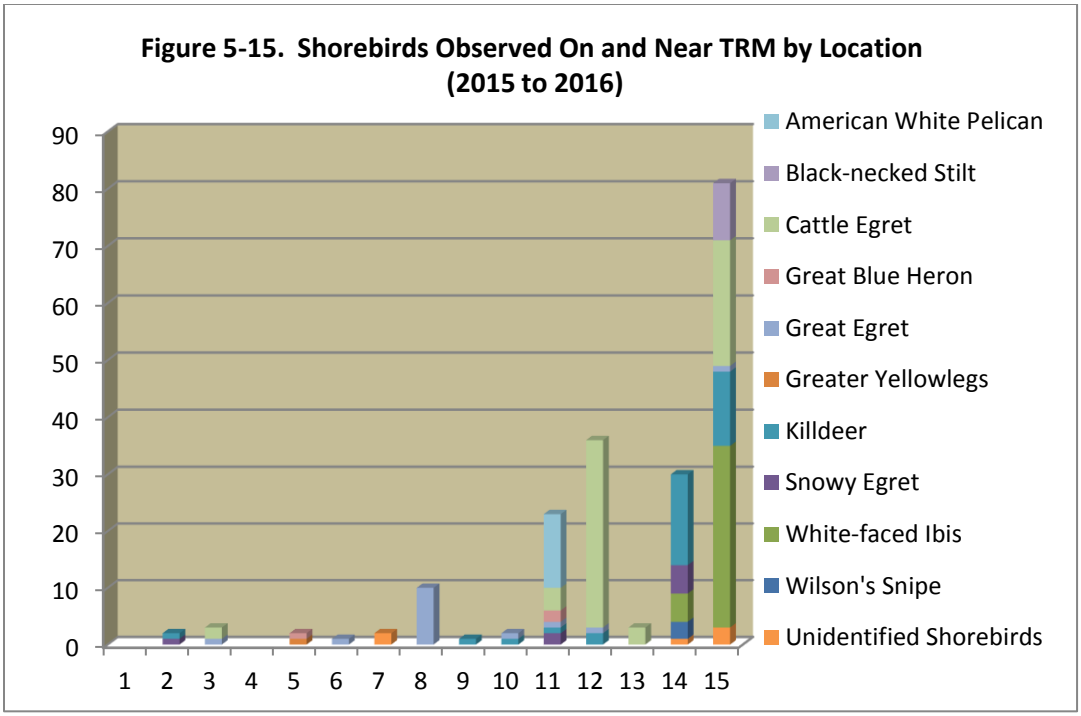
eye, and short bill. The white-faced ibis is a large, dark wading bird with a long, down-curved bill, dark legs, and an all dark body.

Abundance. A total of 196 shorebirds was observed at TRM, and shorebirds comprised only four percent of all birds observed. Approximately 69 percent of the shorebirds were cattle egrets, white-faced ibises, and killdeer, while seven other species and unidentified shorebirds comprised the remaining 31 percent of birds observed from this guild (**Figure 5-14**). Shorebirds were observed during all months, but they were most abundant during the three-month period from May to June, when nearly half of the total number of shorebirds was observed. A relatively greater number of shorebirds was also observed during August and October, comprising 23 percent of total number observed. Although shorebirds are migratory birds, the combination of the Coachella Valley climate coupled with numerous agricultural areas and ponds supports the year-around presence of many shorebird species.

Figure 5-14. Shorebirds Observed On and Near TRM by Month (2015 to 2016)



As shown on **Figure 5-15**, shorebirds or waders were observed from most monitoring points. Most shorebirds observed within the AOA were observed flying across the airfield as they traveled through the area. Killdeer were observed loafing in and around gravel and on airfield ramps. However, the majority of the shorebirds were observed from points 11, 12, 14, and 15. Points 11, 12, and 14 were located near open water sources that provided feeding opportunities. Point 15 was located next to a horse farm/agricultural area where large numbers of killdeer were observed foraging in short grass and near temporary standing stormwater/irrigation water.



Management and Legal Status. Shorebirds and waders are migratory birds that are protected by the MBTA. A depredation permit from the USFWS would be required for lethal management, should it be warranted, which is unlikely at TRM. When members of this guild are observed in the AOA, they should be harassed using pyrotechnics until they leave the AOA. It should be noted that large flying flocks of shorebirds were observed flying within TRM airspace and may pose hazards to local aircraft. A NOTAM should be issued when large flocks of shorebirds are observed on or near TRM.

Relative Risk. Shorebirds have a high probability of being involved in a strike with aircraft, and their effect on flight can vary by species. Typically, shorebirds would create a low impact on an aircraft flight due to their solitary behavior. However, some shorebirds are quite large, and others, such as killdeer, are small but can occur in large flocks. The FAA assigns a composite hazard ranking of 19 to shorebirds out of 25 ranked species. No strikes with shorebirds have been recorded at TRM since 1990. Although the number of shorebirds observed within the AOA was relatively low, numerous shorebirds were observed near TRM and flying above the airport and through its airspace. The overall wildlife hazard risk posed by shorebirds is ***moderate***.

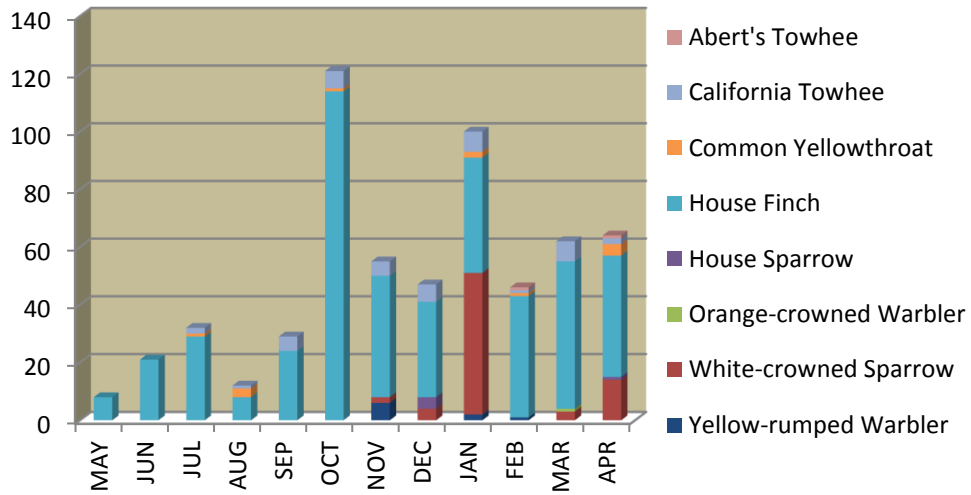
5.1.8 Sparrows and Finches

Guild Description. The sparrows and finches guild is composed of small birds that are similar in size to the sparrow. Many are found singly or in small loose flocks as they feed in open, weedy areas and grass fields. Many species within this guild prefer open, short grassland habitats, while others prefer shrub habitat or manmade resources.

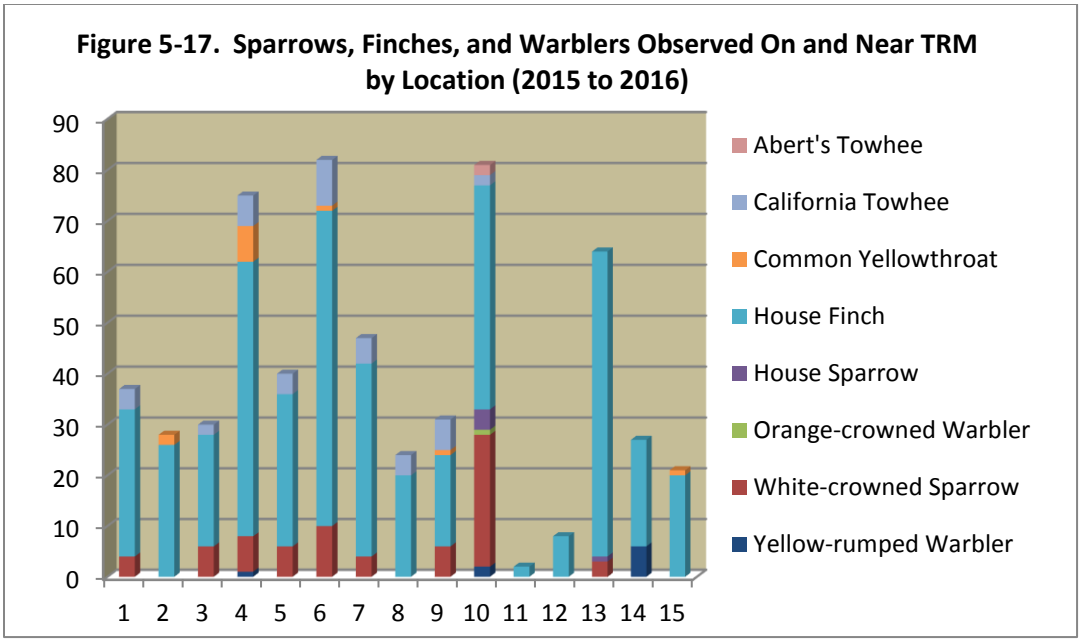
Abundance. Eight species of sparrows and finches were observed. A total of 597 sparrows, finches, and warblers was recorded, comprising approximately 12 percent of the total number of birds observed. Approximately 76 percent of the birds associated with this guild were identified as house finches, 12 percent were white-crowned sparrows, and six species comprised the remaining 12 percent.

Sparrows and finches were observed throughout the year, but in much greater numbers during the months of October and January, when larger flocks were observed (**Figure 5-16**) in the infield brush and perched on the perimeter fence.

Figure 5-16. Sparrows, Finches, and Warblers Observed On and Near TRM by Month (2015 to 2016)



Although finches and sparrows were observed from every location, approximately half were observed from on-site points 4 and 6 and off-site points 10 and 13 (**Figure 5-17**). The abundance of finches and sparrows at points 4 and 6 is likely due to thick foliage (salt cedar) that provides protective cover and nesting locations. Additionally, finches and sparrows were likely attracted to point 10 and 13 due to nearby vegetation that is attractive to this species.



Management and Legal Status. All members of this guild, with the exception of the house sparrow, are migratory species protected by the MBTA. A depredation permit from the USFWS would be required in the unlikely event that lethal management is necessary. House sparrows were introduced to the U.S. from Europe, and they are not protected by federal or state laws. House sparrows may be taken at any time, and there are no reporting requirements.

Pyrotechnics should be used to harass sparrows and finches when they are observed in large flocks in the AOA. Should any member of this guild become acclimated to harassment techniques, lethal reinforcement may be necessary, especially if large congregations are observed to frequent areas used by aircraft. It is very difficult to harass these species, and habitat modification is the most effective technique for ongoing species management. It is recommended that areas of infield brush be thinned or cleared to reduce the attractive habitat for sparrows and finches. This habitat modification will also reduce the presence of other bird species.

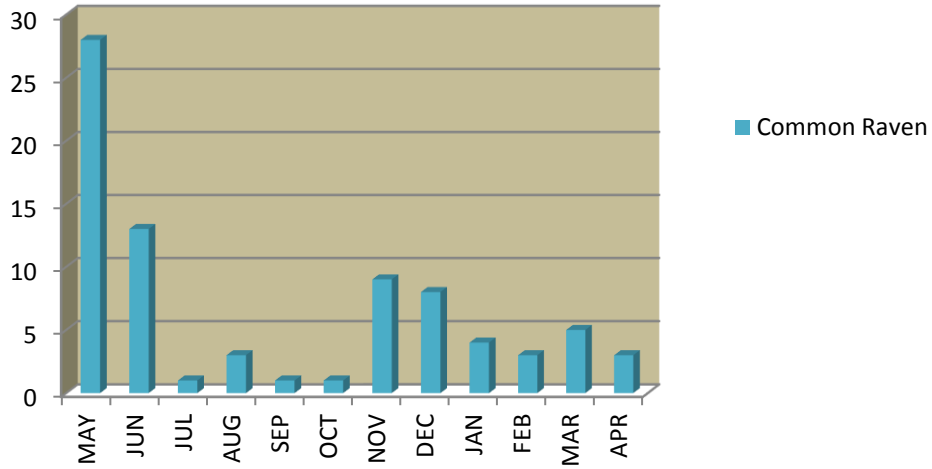
Relative Risk. The members of this guild have a moderate likelihood of being involved in a strike with aircraft, and they usually cause a low impact on flight due to their behavior. The FAA assigns a composite hazard ranking of 24 to sparrows out of 25 ranked species. No strikes with sparrows at TRM have been recorded in the FAA's Wildlife Strike Database. Sparrows and finches were observed frequently during the 12-month observation period, and most were observed at or near locations that included dense brush. Based on the location of these birds near aircraft movement areas, the overall wildlife hazard risk posed by species within this guild is ***moderate***.

5.1.9 Corvids

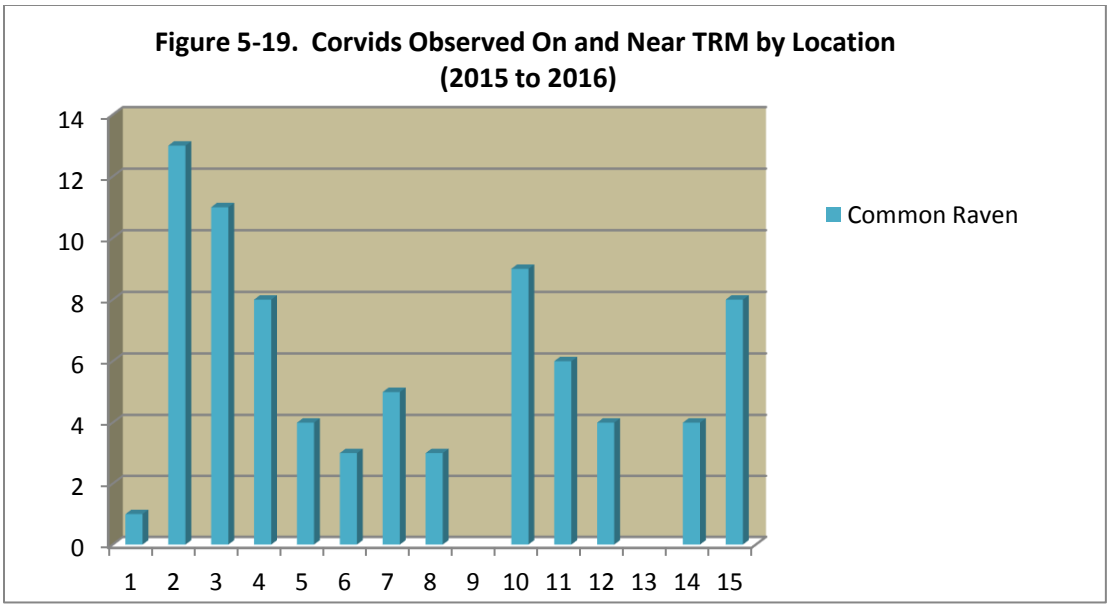
Guild Description. The common raven was the only corvid species observed during the 12-month monitoring period. The common raven is a medium- to large-sized bird that is highly intelligent, very social, and travels in small to large flocks. The common raven is an omnivore that feeds on a range of food items such as crops, fruit, carrion, insects, nuts, seeds, and human refuse. It also eats small animals such as lizards and young birds. Although ravens are often observed at airports, they are infrequently involved in bird strikes.

Abundance. Seventy-nine ravens were observed and represented approximately two percent of the total number of birds observed. Corvids were observed year-round, but over half were observed during May and June, when juveniles fledge from their nests and are present in the environment (**Figure 5-18**).

Figure 5-18. Corvids Observed On and Near TRM by Month (2015 to 2016)



Ravens were observed from 13 of 15 observation points. They were observed in slightly greater numbers from on-site points 2 and 3, which are located in the northeast portion of the airfield. Ravens were observed flying across the airfield at these locations, and they did not appear to be attracted to any specific feature on the AOA. Ravens are opportunistic omnivores that will eat a variety of foods including food waste and trash.



Management and Legal Status. The number of corvids at TRM can be reduced through good housekeeping procedures, and they should be harassed and dispersed from the AOA. All refuse collection containers should be equipped with secure lids and emptied regularly. Refuse and carrion on airport property and on nearby roads should be removed immediately. Pyrotechnic devices, such as screamers and bangers, can be used to harass ravens from airport property, but the use of these devices must be persistent to be successful.

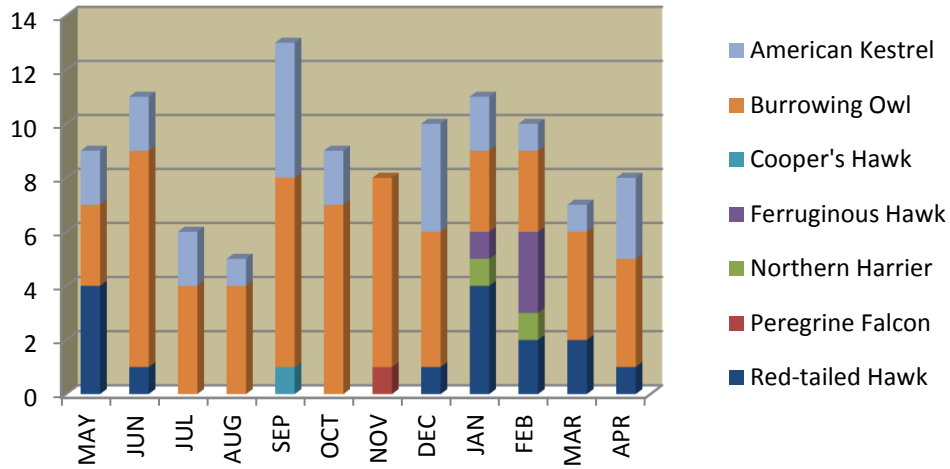
Relative Risk. Common ravens have a low likelihood of being involved with a wildlife strike due to their cautious behavior, but strikes with ravens can result in a moderate impact on a flight due to their size and sometimes flocking behavior. The FAA assigns a composite hazard ranking of 16 to crows/ravens out of 25 ranked species. No reported strikes with corvids have occurred at TRM. Based on the low number of corvids observed and its species behavior, the overall wildlife hazard risk associated with this guild is ***low***.

5.1.10 Raptors

Description. Raptors are predatory birds and scavengers that have hooked beaks and talons for capturing and feeding on prey. Raptors vary in size, and their diets vary among species. Raptors pose a threat to aircraft because of their large size and flight behavior. Although seven raptor species were observed, burrowing owls comprised more than half of the total number of raptors observed. Red-tailed hawks and American kestrels were also more abundant than the remaining four species observed (ferruginous hawk, northern harrier, peregrine falcon, and Cooper's hawk).

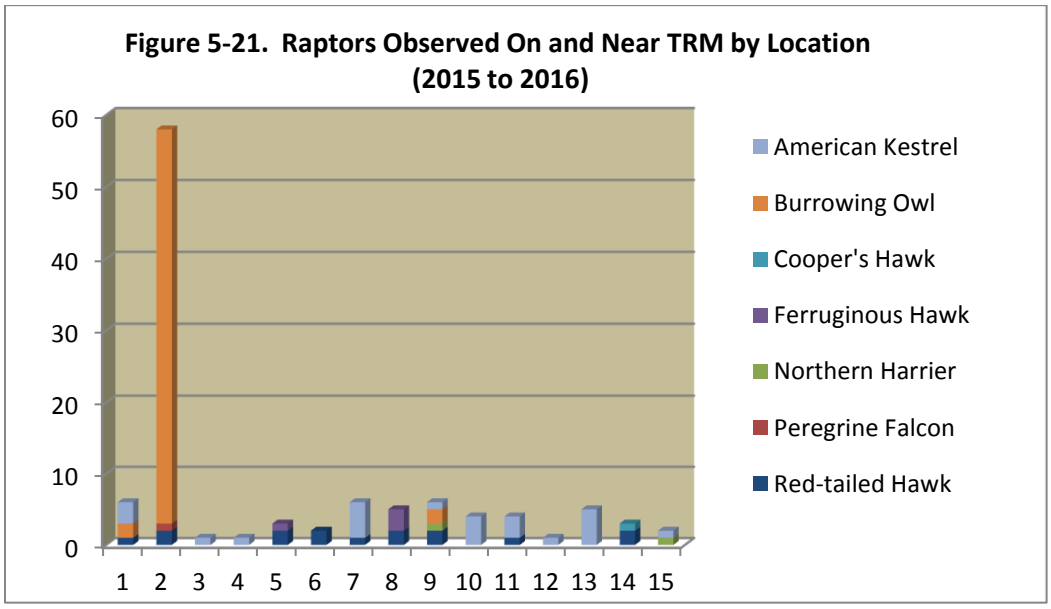
Abundance. A total of 107 raptors was observed during standardized WHA surveys, representing approximately two percent of the total number of birds observed. Raptors were observed consistently throughout the year (**Figure 5-20**), but fewer were observed during the hottest summer months and increased during the fall/winter months.

Figure 5-20. Raptors Observed at TRM by Month (2015 to 2016)



As shown on **Figure 5-21**, the greatest number of raptors was observed from point 2, though raptors were observed from all monitoring locations. The high number at point 2 was attributable to the presence of burrowing owls, which were observed nesting and loafing in a large depression/washout hole alongside of the taxiway and in burrows in between the taxiway and Runway 17. Individual raptors from other species were observed flying in and near the AOA. On occasion, hawks were observed loafing or foraging in areas between taxiways and runways.

Photo 11: *Burrowing owls were observed throughout the 12-month monitoring period and were observed nesting near the taxiway for Runway 17-35.*



Management and Legal Status. All raptors are protected by the MBTA. In California the burrowing owl and northern harrier are considered Species of Special Concern. A depredation permit from the USFWS is required to perform lethal management and to capture and relocate raptors. Harassment using pyrotechnic devices, such as shell crackers, bird bangers, or screamers, is the preferred technique for discouraging raptors from using the airfield.

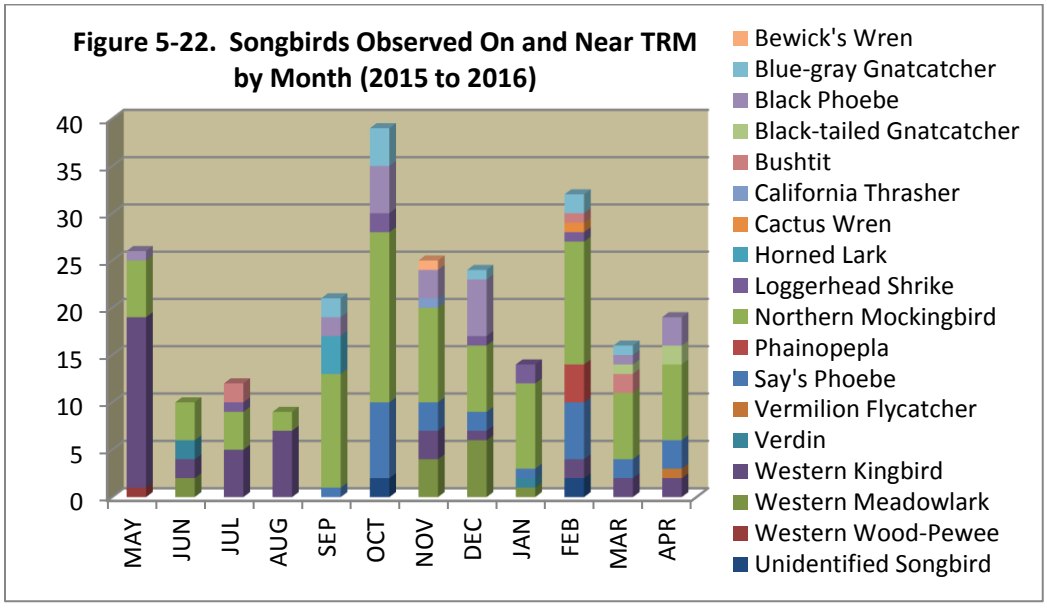
Relative Risk. Raptors have a moderate likelihood of being involved in a strike with aircraft, and they can create a high degree of impact on flight due to their size. Although burrowing owls are

small, they are abundant near aircraft movement areas at TRM and fly at low altitudes. The FAA assigns a composite hazard ranking of 11 to hawks and 21 to kestrels out of 25 ranked species. No strikes with raptors at TRM have been recorded in the FAA database. Based on the presence of burrowing owls adjacent to Runway 17 and because hawks were observed loafing on the ground near aircraft movement areas, the overall risk posed by raptors is ***high***.

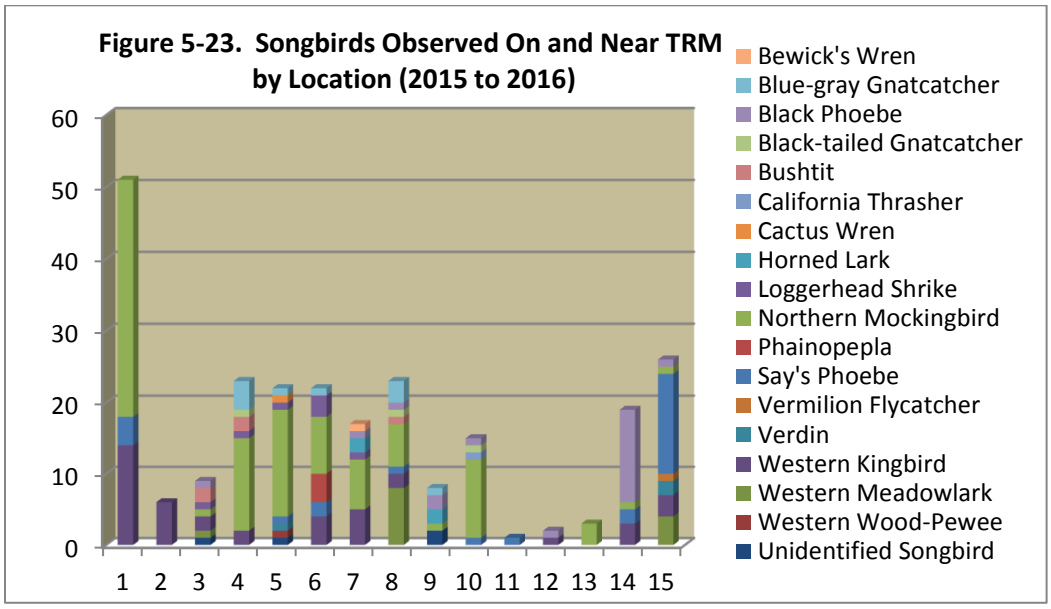
5.1.11 Songbirds

Description. Songbirds, also called passerines, include any member of the suborder *Passeri* (or *Oscines*) of the order *Passeriformes*, which includes approximately 4,000 species or nearly half the world's birds. Songbirds vary greatly in size, and their diets vary among species. Smaller songbirds do not usually pose a threat to aircraft, but some smaller songbirds travel in large flocks, posing a comparatively greater hazard. Seventeen songbird species and unidentified songbirds were observed during the 12-month monitoring period (**Table 5-3**).

Abundance. A total of 247 songbirds was recorded during standardized WHA surveys, and songbirds accounted for approximately 5 percent of the total number of individuals observed. Northern mockingbirds comprised approximately 80 percent of the songbirds. The greatest number of songbirds were observed during the month of October; however, songbirds were observed consistently throughout the year (**Figure 5-22**). The presence of brush in the infield brush areas and along the perimeter fence provides ideal habitat songbirds.



As shown on **Figure 5-23**, the greatest number of songbirds (all species combined) was recorded at point 1, which is located on the north ramp near large buildings, hangars, and palm trees as well as the infield brushy areas. Observations at the other airfield monitoring locations can be attributed to the presence of brush in the infield and along the perimeter fence.



Management and Legal Status. All songbirds are protected by the MBTA. A depredation permit from the USFWS is required to perform lethal management on songbirds. Lethal management of songbirds at TRM is unlikely due to the relatively low numbers of songbirds. Brush removal would greatly reduce the number of songbirds within the AOA.

Relative Risk. Songbirds have a moderate likelihood of being involved in a strike with aircraft, and they usually create a low degree of impact on flight due to their size. No strikes with songbirds have been recorded in the FAA database for TRM. The overall risk posed by songbird species is ***low***.

5.1.12 Other Birds

Other bird species were observed at TRM and in its vicinity during the survey period (see **Table 5-3**); however, those species are not usually associated with bird strikes or pose a significant threat to aircraft. This group accounted for 2.5 percent of the total number of birds observed, and most of the other birds were Gambel's quails and California roadrunners. The members of this group have a low likelihood of being involved with an air strike and usually create a low impact on the flight. However, it should be noted that all birds or groups of birds have the potential to cause a significant bird strike incident with aircraft, and it is possible that some of the strikes with unknown small birds involved birds in the guild. The overall wildlife hazard risk for species associated with this group is ***low***. A detailed discussion is not necessary for species that were identified in Table 5-3 but were not addressed within Sections 5.1.2 through 5.1.11.

5.2 Mammal Surveys

As described in Chapter 4, two small mammal monitoring events and two spotlight surveys were performed at TRM during the 12-month WHA study. Game cameras were also used to document the presence of mammals within the AOA.

5.2.1 Small Mammal Survey Results

A total of 150 small mammal traps were set up in three lines or transects containing 50 live traps each, and mammals were monitored on three consecutive trap nights in October 2015 and February 2016 (see **Figure 4-2** for transect locations). For each event, one transect was placed in short grass, one in medium grass, and one along hardscape near brush line or detention pond Two mice were caught in October and eight were caught during the February trapping event. Based on the results of the small mammal surveys, the airport does not appear to provide a significant prey base for raptors or other wildlife.

5.2.2 Night Spotlight Survey Results

Spotlight surveys were conducted approximately one hour after sunset in October 2015 and February 2016. During the October survey, a coyote, great horned owl, and unidentified bat were observed. Six black-tailed jackrabbits were spotted during the February survey.

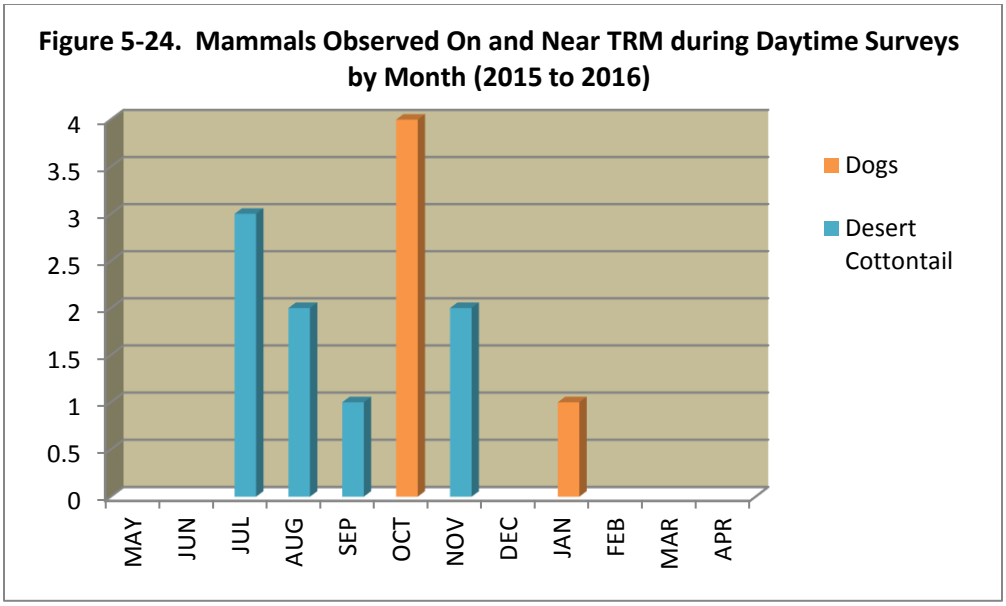
5.2.3 Game Camera Survey Results

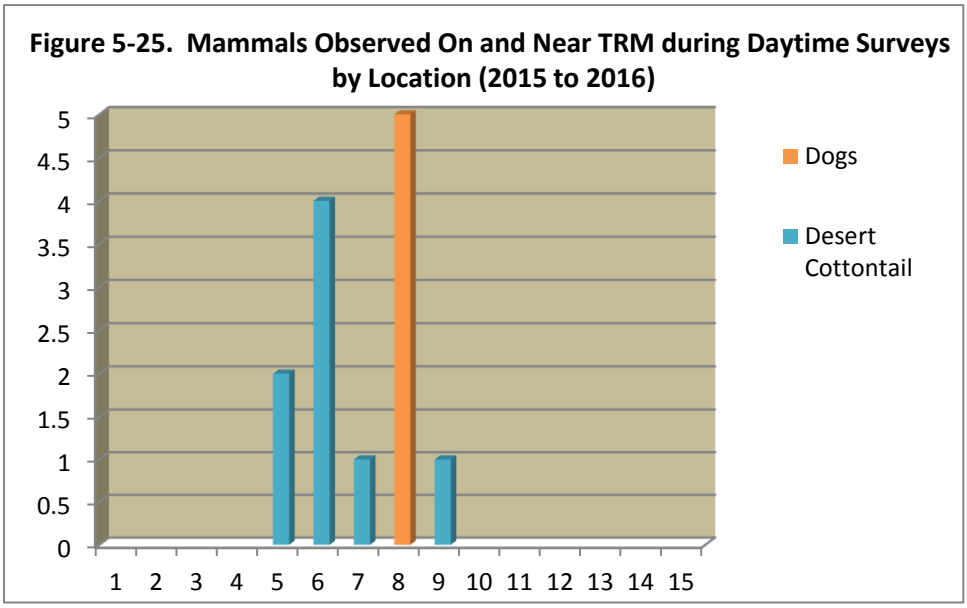
Two game cameras were used to monitor seven on-site locations throughout the 12-month monitoring period (see **Figure 4-3**). Numerous mammals including coyotes, black-tailed jackrabbits, desert cottontails, and stray domestic dogs were observed in the AOA. Coyotes, black-tailed jackrabbits, desert cottontail, and an unidentified mouse were photographed by the game cameras. Greater roadrunners and California quails were also documented using the game cameras. The majority of game camera observations came near holes and gaps in the fence. Mammals were also documented using the game camera near temporary water sources, such as the depressional area near points 6 and 7.

Photo 12: *Three coyotes that were observed walking along the road adjacent to the eastern perimeter fence.*

5.2.4 Mammals Observed During Twice-Monthly Surveys

Mammals or evidence of mammals was recorded during the twice-monthly daytime surveys. Dogs and desert cottontails were observed during the daytime surveys (**Figure 5-24**). Mammals were observed mostly in the summer and fall at five of the 15 monitoring points (**Figure 5-25**).





Legal Status and Management. Coyotes are listed as a nuisance species in California and may be lethally removed without a special state permit if they are causing damage or are a nuisance on owned property. Lethal management is often the most efficient method for removing problem coyotes. Foot-hold traps or cable-restraints can be used to capture coyotes but would require a special permit from the state. However, these devices are specialized equipment and should only be applied by an individual that is familiar with their operation and is knowledgeable of California trapping regulations.

Fence maintenance that includes quarterly inspections and regular maintenance to address dig-outs and gaps greater than 3 inches would make it more difficult for coyotes to gain access. Multiple dig-outs were observed throughout the 12-month survey. The ideal method for excluding

coyotes would include the modification of the perimeter fence that has a buried apron at the airfield boundary. A buried apron consists of a 2-foot-wide strip of fence that is attached at the fence base and at a perpendicular angle and buried under ground. However, the cost associated with the installation of a buried apron can be high or even prohibitive.

Relative Risk for Mammals. Mammals have a moderate likelihood of being involved in a strike with aircraft, and they create a high degree of impact on flight due to their size, especially strikes with deer and coyotes. No strikes with mammals at TRM have been recorded in the FAA database. However, dogs and coyotes were documented on the airfield using game cameras, and staff have reported seeing coyotes. Coyotes are ranked as 17th on FAA's list of 25 most hazardous species, and they can have a significant effect on flight. Based on the presence of coyotes and dogs in the AOA and their proximity to aircraft movement areas, the overall risk posed by mammal species, particularly coyotes and dogs, is ***critical***.

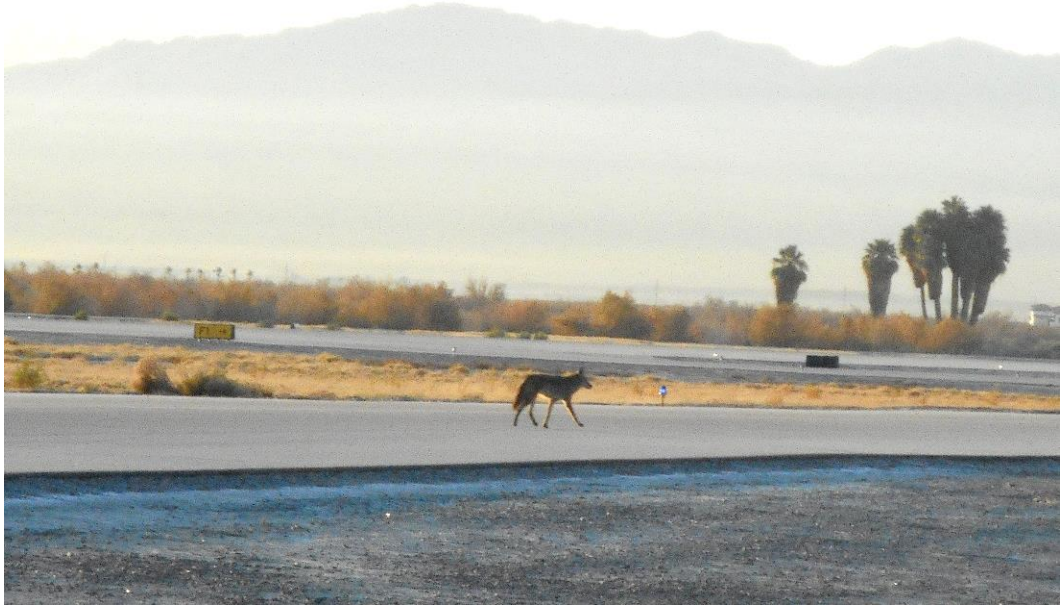


Photo 13: *A coyote walks along the southern portion of taxiway toward Runway 17-35.*

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6.1 Overall Conclusions and General Recommendations

6.1.1 Overall Conclusions

The data obtained during the 12-month monitoring period and summarized in Chapter 5 form the foundation for the recommendations provided in Chapter 6. Based on the survey data, it appears that wildlife management measures are necessary to reduce the overall risk posed by wildlife to aircraft operations at TRM, and especially the hazards posed by waterfowl, doves and pigeons, raptors, and mammals.

6.1.2 General Recommendations

Airport wildlife hazard management usually involves the implementation of an integrated wildlife damage management program. An integrated wildlife hazard management program is a science-based program that includes ongoing administrative and technical measures, as well as short-term operational measures to reduce immediate or critical risks as they are observed and long-term measures to reduce risks over time. An integrated airport wildlife hazard management program must include both on-site and off-site habitat modification measures to address the specific features that were found to attract wildlife to the airport and its critical airspace, as well as the use of targeted harassment and population-management measures to address individuals or species that do not respond to habitat modification or pose an imminent or critical threat to aircraft operations. The recommendations presented in this chapter are intended to reduce the risks posed by wildlife during air operations regardless of whether a WHMP is required by the FAA.

Four general recommendations are presented:

- Develop a wildlife hazard management plan/program that includes a management structure and designated staff;
- Develop and implement ongoing wildlife hazard management policies and procedures that can be incorporated into daily operations;
- Implement site-specific recommendations for proposed habitat modification. Such modifications identify physical changes that would make the airport environment less attractive to potentially hazardous wildlife; and
- Implement species-specific recommendations and management techniques.

6.2 Develop a Wildlife Hazard Management Plan/Program

Although the decision to prepare a WHMP resides with the FAA, it is recommended that TRM prepare a WHMP and implement a formal wildlife hazard management program to address wildlife observed during the WHA study. The WHMP and subsequent wildlife hazard management program should identify specific policies and procedures for staff and management including the following components, which are described in Sections 6.2.1 through 6.2.7:

- Establish a formal Wildlife Hazard Management Program;
- Establish a Wildlife Hazard Working Group;
- Maintain permits and supplies necessary to perform wildlife hazard management activities;
- Incorporate wildlife hazard management activities into airport planning, design and construction activities; and
- Monitor changes in land use on or near the airport.

The policies associated with wildlife hazard management would be incorporated on an ongoing basis and into nearly every aspect of airport operations including tenant lease agreements, new design and construction projects, and daily airfield inspection and maintenance procedures.

6.2.1 Establish a Formal Wildlife Hazard Management Program

Currently, most wildlife hazard management activities at TRM are performed by members of the maintenance staff, who conduct daily inspections of runway areas and wildlife harassment using vehicles. Airport management should provide support and equip staff to recognize and respond appropriately to hazardous wildlife.

The Wildlife Hazard Management Program should be overseen by a designated Wildlife Coordinator (an existing staff member), who will be responsible for implementing the recommendations set forth in the WHA, ensuring that staff receive adequate training, and alerting other staff to wildlife management policies, procedures, and activities. In addition, the Wildlife Coordinator will serve as a liaison between airport staff, tenants, pilots, and regulatory agencies when addressing issues associated with wildlife hazards and wildlife hazard management.

The Wildlife Coordinator would receive training in wildlife hazard/damage management and be knowledgeable of airport operations and the local environment. In addition, the Wildlife Coordinator should be empowered by airport management with the authority to delegate wildlife hazard management responsibilities.

The Wildlife Coordinator will carry out the recommendations set forth in the WHA report. Specifically:

- Obtain and maintain wildlife hazard management supplies;
- Maintain a database of wildlife hazard management activities, including information obtained from pilot reports, mechanical inspections, and daily observations;
- Obtain instruction for airport staff regarding wildlife hazards and wildlife hazard management policies and procedures;
- Implement wildlife management measures;
- Obtain permits associated with wildlife management; and
- Continue to record wildlife strikes and instruct other airport staff, tenants, FBOs, and pilots in wildlife strike reporting procedures.

6.2.2 Establish a Wildlife Hazard Working Group

The Wildlife Coordinator, with the support of the Airport Manager, should establish a Wildlife Hazard Working Group (Working Group) to incorporate wildlife hazard management into airport operation, policies, and activities. The Working Group should include, but not be limited to:

- Representatives of County departments associated with airport management (administration, operations and maintenance, management);
- Local pilots;
- Fixed-based operators (FBOs);
- Airport Tenants; and
- FAA representatives.

All meetings should be documented to demonstrate the airport's ongoing wildlife control and management efforts.

6.2.3 Obtain Permits to Manage Wildlife

Most of the bird species identified in the TRM vicinity are protected by the MBTA or other federal and state regulations. The USFWS is the agency authorized to provide permits for the lethal removal of specific species.

The ability to respond to hazardous situations in a prompt and efficient manner is paramount, and such responses may include the lethal removal of hazardous wildlife. Currently TRM does not hold a federal depredation permit for the lethal control of migratory birds. It is recommend that TRM obtain a federal depredation permit for migratory birds for the following species:

- Canada goose
- California gull
- Red-tailed hawk
- Common raven
- American kestrel
- Mourning dove
- House finch

Other birds that may require management, such as rock pigeons and European starlings, do not require a permit for lethal removal. It is recommended that TRM obtain a state permit for the lethal removal of coyotes from the AOA. It is also recommended that the airport work with the CDFW to manage burrowing owls that are within the AOA, because the burrowing owl is a species of special concern in California.

6.2.4 Train Personnel in Wildlife Hazing Procedures and Species Identification

Airport staff must be trained to recognize and respond to all potential wildlife hazards in an appropriate manner, including hazing and removal. Working with Airport Management, the Wildlife Coordinator should organize and obtain training for all personnel that have wildlife hazard management duties within the AOA. Training should include the following components:

- Wildlife hazard identification;
- Species identification, with emphasis on those that are present at TRM and pose the greatest risk to air-carrier operations;
- Hazing and harassment techniques and safety procedures; and
- Reporting wildlife strikes and wildlife management actions.

6.2.5 Obtain Wildlife Hazard Management Supplies

Airfield vehicles, including maintenance vehicles, should be equipped with pyrotechnic launchers and shells, and personal protective equipment so that harassment can be performed quickly. Maintaining these supplies will enable all trained airport personnel to perform harassment and haze during their routine duties. **Table 6-1** summarizes the wildlife hazard materials that should always be available at the airport:

Table 6-1. Wildlife Hazard Management Supplies	
Supply	**Description and Quantity**
Pyrotechnic supplies	**Pistol Launchers.** The airport should maintain a supply of 15 mm pyrotechnic pistol launchers and caps. One pistol launcher should be available in each vehicle that does airfield inspections, and two spare pistols should be available.
	Screamers and Bangers. Screamers/bangers should be available in each vehicle used for airfield inspections, and should also be available in storage.
	Personal Safety Equipment. Eye and hearing protection should be maintained in each vehicle used for airfield inspections. Two set of protective eye goggles and ear protectors should be included in each vehicle, and extras should be maintained at all times.
Monitoring equipment	**Binoculars.** One pair of binoculars should be kept in each vehicle used to perform airfield inspections.
	Bird and mammal identification guides. A copy of each guide should be kept in all vehicles used to inspect the airfield, and an additional copy should be kept in the Wildlife Coordinator's office.
	Monitoring Log. A logbook/computer file should be available to document daily observations pertaining to wildlife hazards and all management activities.
Firearm/ammunition	**12-gauge shotgun and ammunition.** If lethal control is necessary, the airport should maintain a 12-gauge shotgun and non-toxic ammunition for use by appropriately trained, airport employees in addition to the AWC.
Note: Additional supplies such as distress calls, mammal traps, rotating beacons, and sirens may be necessary as specific situations arise. It is the responsibility of the airport operator to ensure that these items can be procured in a timely manner.	

6.2.6 Continue to Record and Maintain Wildlife Strike Information

The AWC or airport administration should maintain a database of wildlife strike information collected from pilot reports, mechanical inspections, and routine airfield inspections. The AWC would be responsible for ensuring that TRM personnel and pilots understand the procedures for reporting hazards and strikes to airport staff and for training staff to record wildlife strikes using the FAA wildlife strike database.

6.2.7 Continue to Review Land Use Changes On and Near the Airport

As identified in FAA AC 150/5200-33B, the area associated with wildlife hazard management extends beyond the airport property boundary. The AWC must actively monitor and participate in proposed projects and land use changes on and near the airport that could create additional wildlife hazards. If a proposed project would attract potentially hazardous wildlife, the AWC should: consult with a qualified airport wildlife biologist; discuss the potential impact of the project with project proponents, project sponsors, and local officials; work with project proponents to modify the project so that it does not attract potentially hazardous wildlife; and maintain a record of the communication.

6.3 Develop and Implement Ongoing Wildlife Hazard Management Policies and Procedures

The following ongoing policies and procedures should be implemented under the direction of the Wildlife Coordinator:

- Implement a wildlife reporting and communications protocol;
- Continue monitoring wildlife populations and use patterns on and near the airfield;
- Adopt a zero-tolerance policy toward hazardous wildlife (as discussed in Section 6.2.3 and 6.3.3);
- Improve reporting of wildlife strikes and management actions; and
- Maintain records of reported wildlife strikes and control actions.

6.3.1 Implement a Wildlife Hazard Reporting and Communications Protocol

TRM is a non-towered airport and thus airport staff should continue to be vigilant and alert FBOs and pilots of any potential wildlife hazards as they arise. A clear communications protocol should be available for pilots and ground staff to report the presence of wildlife or incidents to the AWC for corrective action and documentation is critical.

6.3.1.1 Communication Protocol and Procedures Development

1) Procedures for airport staff to alert FBOs and/or pilots of potential hazards prior to takeoff or landing. If a wildlife hazard is observed by airport ground personnel, aircraft in the vicinity will be contacted by radio immediately. The location, species, number observed, activity, and potential direction of travel will be relayed so pilots can be properly informed, and appropriate action taken.

2) Procedures for alerting airport operations staff to address wildlife hazards that require immediate attention:

   a. The AWC or airport staff will be contacted immediately if wildlife hazards are observed.

   b. The AWC will assess the situation and designate trained personnel to address the situation.

   c. Wildlife management procedures will follow a stepped approach including:

      - Small or minor hazards – hazing through car horns and lights.
      - Moderate or persistent hazards – combination or car horns, lights, pyrotechnics, and lethal control.
      - Severe hazards – lethal control.

3) Documentation procedures:

   a. The AWC will log wildlife observations in a master-list for easy reference.

   b. All management procedures will be recorded (e.g., hazing, lethal control, etc.) along with the results of the procedure.

   c. All wildlife lethally controlled will be reported to the following agencies:

      - USFWS – all federally controlled species (MBTA).

      - CDFW – all state game species.

6.3.1.2 Observations and Communication

It is important for all staff members to understand the potential hazard to aviation posed by each species observed. Not all airport staff may be aware of the dangers presented by wildlife, even when a situation is observed outside of the AOA. It is imperative all significant wildlife observations be communicated immediately between airport staff and pilots, so appropriate action can be taken. Pilot Reports (PIREPS) regarding wildlife hazards should be relayed through Automatic Terminal Information Service (ATIS)/UNICOM whenever they are received.

The ATIS should be updated and transmitted when a significant wildlife hazard is observed at TRM. A NOTAM should be filed only if a wildlife hazard is observed consistently or for an extended period of time. Blanket or generic advisories should not be issued.

6.3.2 Continue to Monitor Wildlife Populations and Use Patterns

The overall intent of the 12-month WHA effort was to document general occurrence, abundance, behavior, use patterns, and population characteristics of wildlife on and near TRM. The WHA also sought to identify significant wildlife attractions near TRM that could adversely affect the safety of aircraft operations. However, wildlife abundance and use patterns can be affected by numerous variables (like the extreme drought occurring at TRM over the 12-month assessment), and the data provided during WHA monitoring efforts should be considered as a baseline for comparison in future years.

TRM should continue to monitor wildlife populations by conducting at least one monthly survey using the same on-site monitoring locations established for the WHA study, and the results should be compared to the results presented in the WHA study to identify fluctuations in wildlife presence. Continuing to monitor wildlife populations will also enable TRM to determine the effectiveness of its management efforts. Each monthly surveys will require approximately 1.5 to 2

hours. To reduce bias, the same observer should conduct all surveys. Data should be maintained in a database to provide a basis for comparison over time.

6.3.3 Adopt a Zero-Tolerance Policy towards Hazardous Wildlife

A zero-tolerance policy should be adopted toward all hazardous wildlife occurring on or, in some cases, near the airfield. Zero tolerance means harassing or removing hazardous wildlife whenever it is observed in the AOA or passing through airspace above the AOA. Efforts should focus on species that were identified during the WHA study and current species listed on the depredation permit that pose the greatest risk including, but not limited to:

- Canada goose
- California gull
- Red-tailed hawk
- Common raven
- American kestrel
- Mourning dove
- House finch
- Coyote

To implement an effective WHMP, all employees need to participate in wildlife harassment activities. All airport operations staff and management should receive training on how to take immediate action when hazardous wildlife species are encountered within the AOA. At a minimum, hazardous wildlife should be reported immediately to the Wildlife Coordinator whenever it is observed.

6.3.4 Continue the Reporting of Wildlife Strikes and Harassment Actions and Wildlife Strikes

According to the FAA National Wildlife Strike Database, four strikes have been reported at TRM since 1990. Two of the strikes have involved Canada geese, one with a California gull, and one with an unknown bird. Two of the four strikes have caused substantial damage to the aircraft.

One of the purposes of the WHA was to identify the species that pose strike hazards at TRM. Ongoing efforts are necessary to identify the species that pose threats to aircraft or cause wildlife strikes. Improved wildlife reporting procedures, including training for species identification, are critical to reducing wildlife strike hazards. As previously noted, the Wildlife Coordinator should ensure that all bird strikes are recorded to the species level. In addition, clear records should be maintained regarding carcasses found on or near the AOA.

If bird/mammal remains are identified within 250 feet of the runway centerline during routine inspections of the airfield, the remains should be collected and removed immediately to avoid attracting scavengers such as carrion-eating wildlife. Unless there is visible evidence to identify

another cause, such as tracks made by a scavenger, the incident should be recorded as a wildlife strike in the FAA wildlife strike database.

If remains are discovered, the species should be identified. If airport staff cannot identify remains to the species level or if only feather fragments or DNA are available, remains should be sent to the Smithsonian Institution's Feather Identification Lab for free identification. The remains should be accompanied by FAA Form 5200-7 and sent to:

Smithsonian Institution
Feather Identification Lab
NHB, E600, MRC 116
10th & Constitution Ave, NW
Washington, D.C. 20560-0116

Once the remains are identified, the information should be included in the wildlife strike database. An instructional video that describes how to submit feathers or snarge, which is feathers or residue left after a bird strike, to the Feather Identification Lab is available at: http://www.faa.gov/airports/airport_safety/wildlife/smithsonian/.

6.3.5 Maintain Records of Wildlife Management Efforts

Wildlife management is risk management, and the Wildlife Coordinator and Airport Administration should retain detailed records of wildlife harassment and management efforts. The records will provide a useful index of changes in wildlife abundance and use of the airfield over time, and the records will allow staff to monitor the effectiveness of its harassment and management activities. As shown on the observation sheet presented in **Appendix G**, the data recorded should include the following for each management activity:

- Person conducting the action,
- Date and time of the action,
- Species and number of individuals observed,
- Location on airfield, and
- Management method applied.

The Wildlife Coordinator should maintain these records in a database so that the data can be easily extracted or sorted for reporting purposes.

6.4 Implement Site-Specific Recommendations

Based on the results of the WHA, site-specific recommendations were identified that would be protective of both air operations and wildlife populations. The following recommendations were developed to represent a phased approach to management that ranges from passive techniques that discourage

wildlife from using the airport to more direct techniques. The following site-specific techniques are recommended for implementation:

- **Modify on-site features and habitat that attract potentially hazardous wildlife.** As noted in Chapters 2 and 5, specific habitats or features were observed at TRM that attract or have the potential to support potentially hazardous wildlife. The purpose of habitat modification is to remove the features or habitat that attract and support hazardous wildlife so that the wildlife will become less likely to visit the airport in the absence of such features.

  The large expanses of brush at TRM were observed to attract many hazardous species. It is preferable to modify/remove the brush habitat on airport property and encourage wildlife to feed, forage, nest, and roost elsewhere, thereby increasing the separation between aircraft and wildlife. TRM is located in a habitat rich environment, and the habitat modification proposed in the AOA (e.g., brush removal) will not have a detrimental impact on the availability of habitat necessary to support local wildlife. Brush removal is the preferred method for reducing the presence of potentially hazardous wildlife at the airport. For additional information on habitat management actions, refer to Airport Cooperative Research Program (ACRP) Synthesis Report 52, *Habitat Management to Deter Wildlife at Airports* (ACRP, 2014), which is available at http://onlinepubs.trb.org/onlinepubs/acrp/acrp_syn_052.pdf.

- **Monitor wildlife at nearby off-site features.** As noted in Chapters 2 and 5, specific habitats or features are present near TRM that attract or have the potential to support potentially hazardous wildlife (County Sanitation Ponds and agricultural areas). Monitoring these off-site features help TRM identify the presence of hazardous wildlife at these locations and their potential effect on wildlife in the AOA or the airspace associated TRM.

- **Maintain and regularly inspect the perimeter fence.** As stated previously, the airport perimeter fence has not prevented medium–sized mammals (coyotes and dogs) from entering the AOA. Numerous coyotes and dogs were observed within the AOA during the 12-month assessment. Separating aircraft and wildlife with a properly maintained perimeter fence prevents conflicts to both wildlife and the traveling public at TRM. Maintenance and improvement of the perimeter fence is warranted at TRM.

- **Implement species-specific controls.** Species-specific management controls include multiple techniques, including fear-provoking stimuli, exclusion, relocation, and lethal removal. Although lethal removal is the method of last resort, it is sometimes the only option for protecting the traveling public and must be considered as part of an integrated wildlife hazard management program. Staff should receive training to implement species-specific controls when hazardous wildlife is observed in the AOA.

  The proposed species-specific controls are performed when habitat modification proved to be unsuccessful or to reinforce non-lethal techniques. All active management techniques, including hazing and lethal removal, would conform to federal laws and permit requirements and be implemented by trained staff. Although ongoing lethal management may be the least desirable

method of risk management, it supports the County's obligation to provide for the safety of air travelers and those living and working near the airport.

The recommendations described in the following pages represent a phased approach to wildlife hazard management. Additional details on effective and appropriate non-lethal methods are described in (ACRP Synthesis Report No. 23, Bird Harassment, Repellent, and Deterrent Techniques for Use on and Near Airports, which is available at http://onlinepubs.trb.org/onlinepubs/acrp/acrp_syn_023.pdf. The use of lethal management measures is described in ACRP Synthesis Report No. 39, Airport Wildlife Population Management, which is available at http://onlinepubs.trb.org/onlinepubs/acrp/acrp_syn_039.pdf.

6.4.1 Remove Brush (Salt Cedar) from the AOA

The greatest wildlife attractant observed on TRM was large expanses of brush on and adjacent to the AOA. This brush is attractive to various species of hazardous birds and provides cover for coyotes and dogs. It is preferable to modify/remove the brush habitat on airport property and encourage wildlife to feed, forage, nest, and roost elsewhere, thereby increasing the separation between aircraft and wildlife. The dense brush obscures potentially hazardous birds and mammals from the view of airport staff and the removal or clearing of the brush will make hazardous wildlife more visible to maintenance staff and aircraft. Brush removal is a necessary measure for preventing or reducing potential conflicts between wildlife and aircraft operations at TRM.

Control Measure/Priority. The dense brush can significantly affect several species that pose a critical or high risk to airport operations, including blackbirds, raptors, their prey, coyotes, and dogs. Therefore, the priority associated with brush removal throughout the entire AOA is ***critical***.

6.4.2 Provide Ongoing Fence Maintenance and Inspection

The perimeter fence includes numerous holes and gaps, and dense brush has grown into the fence. The condition of the fence allows mammals, such as coyotes and dogs, to gain access to the AOA. The FAA identifies medium-sized mammals, such as coyotes, as potentially hazardous because strikes with mammals can occur during sensitive takeoff and landing cycles. Large numbers of coyotes and dogs were observed on or near aircraft movement areas during the assessment.

The airport maintenance staff should monitor the current fence regularly and complete a full perimeter inspection at least weekly to identify and fill or repair gaps that occur between the fence base and the ground. Gates with gaps are particularly attractive to coyotes. To exclude or deter entry by mammals, gaps between gates should be eliminated. To do so, one side of the gate can be equipped with a heavy rubber flap or wire mesh that overlaps the other side, or the gate frame can be lowered so that no more than a 3-inch gap remains between the bottom gate frame and the ground. The airport maintenance staff should also work to remove brush from the fence line

in order to make it less attractive for coyotes to enter the fence and to make it more visible for inspection and maintenance.

Control Measure Priority. Brush should be removed from the perimeter fence and gaps and holes in the fence and gates should also be monitored and repaired. The priority associated with brush removal, increased fence inspection, and fence maintenance is ***critical.***

6.4.3 Use Pyrotechnics for the Non-Lethal Control of Hazardous Wildlife

Currently, staff provide limited wildlife management. Additional measures to provide non-lethal control and harassment of wildlife through the use of pyrotechnics is warranted on airport property to disperse birds and mammals from the AOA. Wildlife habituate to one control/harassment method so the use of pyrotechnics will help reduce and disperse wildlife populations within the AOA.

Control Measure/Priority. Pyrotechnics should be used to disperse hazardous wildlife from the AOA. The overall priority associated with implementation of this control measure is ***high***.

6.4.4 Monitor On-site Water Depressional Area for the Presence of Hazardous Wildlife

A small area of the airport near the southern ends of runways 30 and 35 collects stormwater after rain events and supports dense brush and vegetation. This area was observed to attract waterfowl and shorebirds and provide water and cover for mammals, such as coyotes and dogs.

Control Measure/Priority. FAA guidance set forth in AC 150/5200-33B states that open water should be avoided within the AOA, and detention ponds within the critical area for wildlife hazards should drain within 24 to 48 hours of a 10-year storm event. As a long-term measure, the depressional area should be improved or retrofitted to drain more quickly. In the short-term, the area should be monitored regularly for the presence of hazardous wildlife, and wildlife should be harassed and dispersed from the depressional area as necessary. The overall priority associated with implementation of this control measure is ***high***.

6.4.5 Review Proposed Projects and Land Use Changes in the Critical Zone

New projects or land use changes have the potential to create new wildlife attractants such as open water, architectural features that provide opportunities for nesting and roosting, or ornamental landscaping that offers food and shelter to wildlife. The Wildlife Coordinator should review or request assistance from an FAA-qualified Wildlife Hazard Biologist to review plans for all proposed projects on airport property to identify features that would be attractive to hazardous wildlife. Specific elements of the review should include, at a minimum, storm water management designs, landscape designs, and adjacent development plans.

The Wildlife Coordinator should also monitor proposed project and land use changes within the critical zone. The Wildlife Coordinator should work closely with County planners to identify

proposed projects for which discretionary approvals are required, and review proposed project plans to identify whether they have the potential to attract potentially hazardous wildlife

Control Measure/Priority. Certain projects on or adjacent to the airport have the potential to attract hazardous bird species, which pose a critical hazard to aircraft operations. The overall priority associated with implementation of this control measure is ***moderate***.

6.4.6 Monitor Other Off-site Facilities and Locations (County Sanitation Ponds and Agricultural Areas)

Other off-site locations, features, and land uses within the FAA's identified critical zone have the potential to attract potentially hazardous wildlife through airspace associated with TRM. TRM staff should occasionally monitor the presence of wildlife at the County Sanitation Ponds to determine whether hazardous wildlife that utilize these locations are observed in the AOA or flying across TRM. Large quantities of waterfowl, blackbirds, and gulls were documented at these locations.

The wastewater facilities are operated by the City of Coachella. TRM management and the Wildlife Coordinator should present the monitoring results to the operators of these facilities and ask for assistance to reduce potential hazards through harassment. All outreach to these facilities should be documented to demonstrate ongoing risk management efforts. It should be noted that birds dispersing to and from nearby agricultural areas have the potential to enter pass through TRM as its associated airspace.

Control Measure/Priority. The County Sanitation Ponds, agricultural areas, and the Salton Sea all have the potential to attract hazardous wildlife into TRM airspace. Therefore, the priority associated with monitoring these locations to determine if hazardous wildlife at these locations are entering TRM airspace is ***moderate***.

6.5 Species-Specific Recommendations and Management Techniques

While the habitat modification measures recommended in Section 6.4 can substantially affect the populations or frequency of several wildlife species observed at TRM, not all species will respond in the same manner and further action will be required. Therefore, an integrated approach to wildlife management is recommended.

An integrated approach includes a variety of methods to reduce wildlife conflicts. Such methods may include the alteration of agricultural practices, habitat modification, behavioral modification, and the targeted reduction of some wildlife populations through lethal means. The airport staff has initiated the use of harassment using vehicles and pyrotechnics to manage wildlife species. The incorporation of lethal management activities to reinforce non-lethal techniques typically provides better results than those achieved through the use of only non-lethal techniques. In some cases, lethal management may be the only option to manage specific species.

6.5.1 Waterfowl

Waterfowl accounted for approximately 13 percent of all birds observed, and the majority of the waterfowl was observed at off-site locations. However, some waterfowl was observed on site near the detention pond and near a ditch located on the east side of the airport.

Waterfowl, specifically geese, are attracted to short-grass habitats for foraging and to long grass areas for nesting, like near the agricultural areas that are off-site. Pyrotechnics should be used to disperse waterfowl when it is observed on the airfield or in the on-site detention pond. The County should obtain a federal migratory depredation permit for the lethal control of Canada geese in the event they become a problem at the airport.

Control Measure/Priority. Waterfowl populations have increased substantially nationwide and are known to pose a critical risk to airport operations. Two strikes with Canada geese have been reported at TRM and both caused aircraft damage. The overall priority associated with these control measures is ***critical***.

6.5.2 Doves and Pigeons

Doves and pigeons were the most abundant guild observed during the assessment, comprising approximately 22 percent of the total birds observed. Although the greatest number of doves was associated with the wastewater management ponds south of the airport, doves and pigeons were also observed throughout the airport. Doves and pigeons should be harassed using pyrotechnics when they are observed in the AOA. The County should obtain a depredation permit that allows for lethal control of mourning doves. Pigeons and doves that do not respond positively from harassment efforts should be lethally removed. A permit is not required for the lethal control of pigeons. The removal on infield brush will also help reduce dove populations at the airport.

Management Control/Priority. Pigeons and doves are present at the airport in close proximity to the runway and can pose a moderate risk due to their flocking behavior. No strikes at TRM were attributed to doves or pigeon. The priority associated with harassing doves and pigeons from the AOA is ***critical***.

6.5.3 Coyotes and Dogs

The presence of coyotes in the AOA was documented frequently using game cameras throughout the 12-month assessment, and domestic dogs were observed during field surveys. Both coyotes and dogs were observed to enter the AOA through holes or gaps under the perimeter fence and through gaps in fence gates. Regular fence inspections should be performed to identify and repair gaps or holes.

Mammals pose hazards to aircraft operations. If a coyote or dog is identified on airport property, it should be removed from the AOA immediately. If coyotes cannot be removed through harassment, they should be lethally removed. Dogs should be removed by the local animal

control department. The airport administration should obtain permit from the CDFW or work with USDA to lethally remove problematic coyotes when they are observed in the AOA and cannot be removed through harassment.

Management Control/Priority. Coyotes and dogs pose a significant risk to aircraft operations, and they can have a serious effect on flight if they are struck during takeoff or landing cycles. The priority associated with this control measure is ***critical***.

6.5.4 Raptors

Raptors were observed throughout the 12-month monitoring period. Although raptors comprised less than two percent of the total number of birds observed, they were observed within the AOA or flying across aircraft movement areas. The airport staff should harass and disperse raptors using pyrotechnics whenever they are present within or near the AOA. Staff should use pyrotechnics to haze raptors until they exhibit lack of fear, and perform lethal removal when necessary to reinforce non-lethal techniques. Brush removal within the AOA would help reduce the small mammal prey base that attracts raptors to the AOA.

Although lethal control of raptors is a measure of last resort, lethal control may be required if non-lethal means are ineffective. The County should obtain a federal migratory bird depredation permit for the lethal removal of American kestrel and red-tailed hawk. The County must maintain/renew the depredation permit annually. TRM should also work with the CDFW for the relocation of burrowing owls that are found within the AOA.

Management Control/Priority. No strikes with raptors at TRM have been recorded in the FAA's wildlife hazard database. Raptors are known to pose a high risk to aircraft operations and were observed flying through or loafing within the AOA. The overall priority associated with implementing or continuing these recommendations is ***high***.

6.5.5 Gulls

Gulls were observed in large numbers off site and accounted for approximately 11 percent of the total number of birds observed. If gulls are observed on or near the AOA, they should be dispersed with pyrotechnics. Harassment is especially important when gulls try to congregate on the surface of the runways and taxiways. When the gulls are located within the AOA and exhibit a lack of fear, the staff should lethally remove several gulls to reinforce non-lethal management techniques. The County should obtain a federal migratory bird depredation permit for California gulls.

Control Measure/Priority. Gulls have been reported in one strike at TRM. Due to the high likelihood of damaging strikes from gulls, a previously reported gull strike, their abundance in the critical zone, and the moderate impact they can have on flight, the overall priority associated with implementing this control measure is ***high***.

6.5.6 Starlings and Blackbirds

European starlings and blackbirds comprised approximately 17 percent of all birds observed during the assessment and were the second most abundant bird group. Starlings and blackbirds were observed in and around airfield buildings and hangars and in the dense brush around the AOA. However, the vast majority of observations were from off-site monitoring locations. If flocks of starlings and blackbirds are observed using the airfield, they should be harassed and dispersed using pyrotechnic devices, such as screamers and bangers. Lethal reinforcement may be necessary if starlings and blackbirds become habituated to pyrotechnics. A depredation permit is not required for the lethal control of the European starling, great-tailed grackle, and Brewer's blackbird. A depredation permit may be required if other species were observed and required lethal control.

Management/Control Priority. Starlings and blackbirds can pose a significant hazard to aircraft because of their dense size and flocking behavior, and they have a high likelihood of being involved in strikes with aircraft. No reported strikes with starlings or blackbirds have occurred at TRM. The overall priority associated with the control of starlings and blackbirds is ***moderate***.

6.5.7 Shorebirds

Shorebirds accounted for approximately 4 percent of all bird observations during the assessment. Although most were observed from off-site monitoring locations, the shorebirds in these locations occur within the critical zone for wildlife hazards and are likely to fly within TRM airspace. However, some shorebirds were observed within the AOA and should be harassed with pyrotechnics when observed. The removal of open or standing water (e.g., the depressional area) will make the AOA less attractive to shorebirds.

Management Control/Priority. The members of this guild have a moderate likelihood of being involved in a strike with aircraft. No strikes with shorebirds have been reported at TRM. The priority with addressing their presence by harassment and removal techniques is ***moderate***.

6.5.8 Sparrows, Finches, and Warblers

Sparrows, finches, and warblers were observed throughout the 12-month monitoring period and comprised approximately 12 percent of the total number of birds observed. Guild members were close to aircraft movement areas in long grass areas. To make the airport less attractive to sparrows and finches, the brush within the AOA should be cleared. Pyrotechnics should be used to harass sparrows and finches when they are observed on the airport in and large flocks. Should any member of this guild (e.g., house finch) become acclimated to harassment techniques, lethal reinforcement may be necessary in accordance with a federal depredation permit.

Management Control/Priority. The members of this guild have a moderate likelihood of being involved in a strike with aircraft, and they usually cause a low impact on flight due to their

behavior. Sparrows and finches were abundant and observed frequently during the 12-month survey period and in close proximity to aircraft movement areas. No strikes with this group have been reported at TRM. The overall wildlife hazard risk posed by species within this guild is ***moderate***.

6.5.9 Swallows

Swallows accounted for approximately 9 percent of the total number of birds observed during the assessment. Swallows are migratory and their presence during site surveys coincides with the arrival of migrants and weather conditions that support populations of flying insects into the early spring and early summer. Most swallows were observed from off-site monitoring locations, but some also observed flying across aircraft movement areas and in the AOA. When large flocks of swallows are observed within the AOA, they should be dispersed using pyrotechnics. Any swallow nests observed within the AOA should be removed in accordance with federal and state guidelines.

Control Measure/Priority. The members of this guild have a moderate likelihood of being involved in a strike with aircraft, and they can cause a moderate impact on flight due to their flocking behavior. No strikes with swallows have been recorded at TRM. The overall wildlife hazard risk posed by swallows is ***low.***

6.5.10 Corvids

Corvids (i.e., common ravens) accounted for less than 2 percent of all birds observed. They were observed foraging throughout the AOA, flying across the AOA, and near the airport. Corvids should be harassed with pyrotechnics when they are observed within the AOA.

Management Control/Priority. Corvids pose moderate risks due to their flocking behavior. No strikes with corvids have been reported at TRM. The overall priority associated with this control measure is ***low***.

6.5.11 Songbirds

Songbirds accounted for approximately 5 percent of the total number of birds observed. The greatest number of songbirds was observed within the dense brush vegetation that is located throughout the AOA. When large flocks of songbirds are present on the airfield, harassment should be performed using pyrotechnic devices, such as bird bangers or screamers.

Management/Control Priority. Songbirds have a moderate likelihood of being involved in a strike with aircraft, and most result in a low degree of impact on flight due to their size. No strikes have been reported with songbirds at TRM. The overall priority associated with the management of songbird species is ***low.***

6.6 Summary

The recommendations presented in Chapters 5 and 6 of this report are intended to build upon the airport's previous and ongoing efforts to remove attractive habitat, proactively manage wildlife hazards, and prepare for potentially new wildlife hazards that may arise. **Table 6-2** summarizes and prioritizes these recommendations so that they may be considered in subsequent revisions to the Airport's WHMP.

Table 6-2. Summary of Integrated Wildlife Hazard Management Measures for Jacqueline Cochran Airport

Management Measure	Description	Priority
Habitat Modification		
Remove brush from the AOA	• Remove brush and other dense vegetation from the AOA to make it less attractive to birds and mammals.	Critical
Provide ongoing fence maintenance and inspection	• Close gates securely. • Inspect fence regularly (at least weekly) to identify gaps, burrows, or holes • Fill burrows and repair holes promptly. • Reduce gaps between fence posts and gates that are greater than 3 inches. • Reduce bottom gaps to less than 3 inches to prevent burrowing. • Remove brush/vegetation from growing into and along the perimeter fence. A 5-foot corridor that is clear of vegetation should be provided on either side of the fence.	Critical
Use pyrotechnics for the non-lethal control of hazardous wildlife	• Incorporate the use of pyrotechnics to harass and disperse wildlife from the AOA.	High
Monitor on-site water depressional area	• Monitor the on-site detention pond for the presence of hazardous wildlife. • Wildlife from the detention pond. •	High
Review proposed projects and land use changes in the critical zone	• Airport Management/Wildlife Coordinator will review design plans for all on-site projects. • Work with the Riverside County's planning staff to identify proposed projects near TRM that may attract hazardous wildlife. • If necessary, request help from a qualified biologist to review proposed designs and construction plans for their potential to create new wildlife attractants.	Moderate

Table 6-2. Summary of Integrated Wildlife Hazard Management Measures for Jacqueline Cochran Airport

Management Measure	Description	Priority
Monitor off-site facilities that attract hazardous wildlife to the airport vicinity	• Monitor off-site attractants to determine if hazardous wildlife at these locations has the potential to frequent or fly through the airport and associated airspace, such as the Coachella Water District Ponds and nearby agricultural areas. • If attractants are identified, provide evidence to facility operators and consider feasible measures to reduce the presence of hazardous wildlife.	Moderate
Species-Specific Management Strategies		
Waterfowl	• Harass using pyrotechnics when in AOA or on the on-site detention pond. • Use lethal techniques as reinforcement. • Maintain federal depredation permit for Canada goose.	Critical
Dove and Pigeons	• Remove on-site brush to make the AOA less attractive to mourning doves. • Harass doves and pigeons using pyrotechnics when they are observed in the AOA. • Use lethal techniques as reinforcement. • Maintain federal depredation permit for mourning doves.	Critical
Coyotes and Dogs	• Harass using pyrotechnics when in the AOA. • Monitor the perimeter fence weekly for the presence of gaps, holes, or burrows, and repair or fill gaps quickly. • Maintain a state depredation permit for lethal removal of coyotes. • Contact local animal control for the removal of dogs within the AOA.	Critical
Raptors	• Harass using pyrotechnics when in the AOA. • Remove brush to reduce prey base of small mammals. • Maintain federal depredation permit for American kestrel and red-tailed hawk. • Work with CDFW or supporting agency to relocate burrowing owls in the AOA.	High
Gulls	• Harass using pyrotechnics when in the AOA. • Maintain federal depredation permit for California gull. • Use lethal techniques as reinforcement.	High

Table 6-2. Summary of Integrated Wildlife Hazard Management Measures for Jacqueline Cochran Airport

Management Measure	Description	Priority
Starlings and Blackbirds	• Harass using pyrotechnics when in the AOA. • Use lethal techniques as reinforcement for European starling.	Moderate
Shorebirds	• Harass using pyrotechnics when in AOA and at on-site detention pond. • Remove brush near the on-site detention pond.	Moderate
Sparrows, Finches, and Warblers	• Removal of brush (salt cedar) will make AOA less attractive to sparrows and finches. • Harass using pyrotechnics when observed in large flocks within the AOA. • Maintain federal depredation permit for lethal control of house finch.	Moderate
Swallows	• Removal of brush (salt cedar) will make AOA less attractive to swallows. • Harass using pyrotechnics when observed in large flocks within the AOA.	Low
Corvids	• Harass using pyrotechnics when in the AOA.	Low
Songbirds	• Removal of brush will make AOA less attractive to songbirds. • Harass using pyrotechnics when in the AOA.	Low

Chapter 7

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Appendix A. FAR Part 139.337, “Wildlife Hazard Management”

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(1) Two-way radio communications between each pedestrian or vehicle and the tower;

(2) An escort with two-way radio communications with the tower accompanying any pedestrian or vehicle without a radio; or

(3) Measures authorized by the Administrator for controlling pedestrians and vehicles, such as signs, signals, or guards, when it is not operationally practical to have two-way radio communications between the tower and the pedestrian, vehicle, or escort;

(d) When an air traffic control tower is not in operation, or there is no air traffic control tower, provide adequate procedures to control pedestrians and ground vehicles in movement areas or safety areas through two-way radio communications or prearranged signs or signals;

(e) Ensure that each employee, tenant, or contractor is trained on procedures required under paragraph (b) of this section, including consequences of noncompliance, prior to moving on foot, or operating a ground vehicle, in movement areas or safety areas; and

(f) Maintain the following records:

(1) A description and date of training completed after June 9, 2004 by each individual in compliance with this section. A record for each individual must be maintained for 24 consecutive months after the termination of an individual's access to movement areas and safety areas.

(2) A description and date of any accidents or incidents in the movement areas and safety areas involving air carrier aircraft, a ground vehicle or a pedestrian. Records of each accident or incident occurring after the June 9, 2004 must be maintained for 12 consecutive calendar months from the date of the accident or incident.

§ 139.331 Obstructions.

In a manner authorized by the Administrator, each certificate holder must ensure that each object in each area within its authority that has been determined by the FAA to be an obstruction is removed, marked, or lighted, unless determined to be unnecessary by an FAA aeronautical study. FAA Advisory Circulars contain methods and procedures for the lighting of obstructions that are acceptable to the Administrator.

§ 139.333 Protection of NAVAIDS.

In a manner authorized by the Administrator, each certificate holder must—

(a) Prevent the construction of facilities on its airport that, as determined by the Administrator, would derogate the operation of an electronic or visual NAVAID and air traffic control facilities on the airport;

(b) Protect—or if the owner is other than the certificate holder, assist in protecting—all NAVAIDS on its airport against vandalism and theft; and

(c) Prevent, insofar as it is within the airport's authority, interruption of visual and electronic signals of NAVAIDS.

§ 139.335 Public protection.

(a) In a manner authorized by the Administrator, each certificate holder must provide—

(1) Safeguards to prevent inadvertent entry to the movement area by unauthorized persons or vehicles; and

(2) Reasonable protection of persons and property from aircraft blast.

(b) Fencing that meets the requirements of applicable FAA and Transportation Security Administration security regulations in areas subject to these regulations is acceptable for meeting the requirements of paragraph (a)(l) of this section.

§ 139.337 Wildlife hazard management.

(a) In accordance with its Airport Certification Manual and the requirements of this section, each certificate holder must take immediate action to alleviate wildlife hazards whenever they are detected.

(b) In a manner authorized by the Administrator, each certificate holder must ensure that a wildlife hazard assessment is conducted when any of the following events occurs on or near the airport:

(1) An air carrier aircraft experiences multiple wildlife strikes;

(2) An air carrier aircraft experiences substantial damage from striking wildlife. As used in this paragraph, substantial damage means damage or

structural failure incurred by an aircraft that adversely affects the structural strength, performance, or flight characteristics of the aircraft and that would normally require major repair or replacement of the affected component;

(3) An air carrier aircraft experiences an engine ingestion of wildlife; or

(4) Wildlife of a size, or in numbers, capable of causing an event described in paragraphs (b)(1), (b)(2), or (b)(3) of this section is observed to have access to any airport flight pattern or aircraft movement area.

(c) The wildlife hazard assessment required in paragraph (b) of this section must be conducted by a wildlife damage management biologist who has professional training and/or experience in wildlife hazard management at airports or an individual working under direct supervision of such an individual. The wildlife hazard assessment must contain at least the following:

(1) An analysis of the events or circumstances that prompted the assessment.

(2) Identification of the wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences.

(3) Identification and location of features on and near the airport that attract wildlife.

(4) A description of wildlife hazards to air carrier operations.

(5) Recommended actions for reducing identified wildlife hazards to air carrier operations.

(d) The wildlife hazard assessment required under paragraph (b) of this section must be submitted to the Administrator for approval and determination of the need for a wildlife hazard management plan. In reaching this determination, the Administrator will consider—

(1) The wildlife hazard assessment;

(2) Actions recommended in the wildlife hazard assessment to reduce wildlife hazards;

(3) The aeronautical activity at the airport, including the frequency and size of air carrier aircraft;

(4) The views of the certificate holder;

(5) The views of the airport users; and

(6) Any other known factors relating to the wildlife hazard of which the Administrator is aware.

(e) When the Administrator determines that a wildlife hazard management plan is needed, the certificate holder must formulate and implement a plan using the wildlife hazard assessment as a basis. The plan must—

(1) Provide measures to alleviate or eliminate wildlife hazards to air carrier operations;

(2) Be submitted to, and approved by, the Administrator prior to implementation; and

(3) As authorized by the Administrator, become a part of the Airport Certification Manual.

(f) The plan must include at least the following:

(1) A list of the individuals having authority and responsibility for implementing each aspect of the plan.

(2) A list prioritizing the following actions identified in the wildlife hazard assessment and target dates for their initiation and completion:

(i) Wildlife population management;

(ii) Habitat modification; and

(iii) Land use changes.

(3) Requirements for and, where applicable, copies of local, State, and Federal wildlife control permits.

(4) Identification of resources that the certificate holder will provide to implement the plan.

(5) Procedures to be followed during air carrier operations that at a minimum includes—

(i) Designation of personnel responsible for implementing the procedures;

(ii) Provisions to conduct physical inspections of the aircraft movement areas and other areas critical to successfully manage known wildlife hazards before air carrier operations begin;

(iii) Wildlife hazard control measures; and

(iv) Ways to communicate effectively between personnel conducting wildlife control or observing wildlife hazards and the air traffic control tower.

(6) Procedures to review and evaluate the wildlife hazard management plan every 12 consecutive months or following an event described in paragraphs (b)(1), (b)(2), and (b)(3) of this section, including:

(i) The plan's effectiveness in dealing with known wildlife hazards on and in the airport's vicinity and

(ii) Aspects of the wildlife hazards described in the wildlife hazard assessment that should be reevaluated.

(7) A training program conducted by a qualified wildlife damage management biologist to provide airport personnel with the knowledge and skills needed to successfully carry out the wildlife hazard management plan required by paragraph (d) of this section.

(g) FAA Advisory Circulars contain methods and procedures for wildlife hazard management at airports that are acceptable to the Administrator.

§ 139.339 Airport condition reporting.

In a manner authorized by the Administrator, each certificate holder must—

(a) Provide for the collection and dissemination of airport condition information to air carriers.

(b) In complying with paragraph (a) of this section, use the NOTAM system, as appropriate, and other systems and procedures authorized by the Administrator.

(c) In complying with paragraph (a) of this section, provide information on the following airport conditions that may affect the safe operations of air carriers:

(1) Construction or maintenance activity on movement areas, safety areas, or loading ramps and parking areas.

(2) Surface irregularities on movement areas, safety areas, or loading ramps and parking areas.

(3) Snow, ice, slush, or water on the movement area or loading ramps and parking areas.

(4) Snow piled or drifted on or near movement areas contrary to §139.313.

(5) Objects on the movement area or safety areas contrary to §139.309.

(6) Malfunction of any lighting system, holding position signs, or ILS critical area signs required by §139.311.

(7) Unresolved wildlife hazards as identified in accordance with §139.337.

(8) Nonavailability of any rescue and firefighting capability required in §§139.317 or 139.319.

(9) Any other condition as specified in the Airport Certification Manual or that may otherwise adversely affect the safe operations of air carriers.

(d) Each certificate holder must prepare and keep, for at least 12 consecutive calendar months, a record of each dissemination of airport condition information to air carriers prescribed by this section.

(e) FAA Advisory Circulars contain methods and procedures for using the NOTAM system and the dissemination of airport information that are acceptable to the Administrator.

§ 139.341 Identifying, marking, and lighting construction and other unserviceable areas.

(a) In a manner authorized by the Administrator, each certificate holder must—

(1) Mark and, if appropriate, light in a manner authorized by the Administrator—

(i) Each construction area and unserviceable area that is on or adjacent to any movement area or any other area of the airport on which air carrier aircraft may be operated;

(ii) Each item of construction equipment and each construction roadway, which may affect the safe movement of aircraft on the airport; and

(iii) Any area adjacent to a NAVAID that, if traversed, could cause derogation of the signal or the failure of the NAVAID; and

(2) Provide procedures, such as a review of all appropriate utility plans prior to construction, for avoiding damage to existing utilities, cables, wires, conduits, pipelines, or other underground facilities.

(b) FAA Advisory Circulars contain methods and procedures for identifying and marking construction areas that are acceptable to the Administrator.

§ 139.343 Noncomplying conditions.

Unless otherwise authorized by the Administrator, whenever the requirements of subpart D of this part cannot be met to the extent that uncorrected unsafe conditions exist on the airport, the certificate holder must limit air carrier operations to those portions of the airport not rendered unsafe by those conditions.

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Appendix B. FAA AC 150/5200-36A, “Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports”

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U.S. Department
of Transportation
Federal Aviation Administration

Advisory Circular

Subject: Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports

Date: 01/31/2012 **AC No:** 150/5200-36A
Initiated by: AAS-300 **Change:**

1. Purpose.

This Advisory Circular (AC) has two purposes. First, this AC describes the qualifications for wildlife biologists who conduct Wildlife Hazard Assessments (WHA) for airports certificated under Title 14, Code of Federal Regulations, Part 139 (14 CFR Part 139), and at non-certificated airports funded by a Federal Aviation Administration (FAA) Airport Improvement Program (AIP) or Passenger Facility Charge (PFC) Program. We recommend that airports, at a minimum, consult with a qualified airport wildlife biologist when developing a Wildlife Hazard Management Plan (WHMP). However, airports are not required to do so.

Second, this AC addresses the minimum wildlife hazard management curriculum for the initial and recurrent training of airport personnel who implement an FAA-approved WHMP.

2. Applicability.

The standards and practices in this AC for public-use airports and for those who conduct Wildlife Hazard Assessments and conduct required training are:

a. Mandatory for airports certificated under Title 14, Code of Federal Regulations, Part 139 (14 CFR Part 139).

b. Mandatory for airports that have accepted AIP or the Passenger Facility Charge (PFC) Program funds.

c. Highly recommended for all other airports that independently fund Wildlife Hazard Assessments.

See Grant Assurance No. 34, Policies, Standards, and Specifications, and PFC Assurance No. 9, Standards and Specifications.

3. Cancellation.

This AC cancels AC 150/5200-36, Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports, dated June 28, 2006.

4. Background.

Wildlife biologists conducting Wildlife Hazard Assessments or training airport personnel actively involved in implementing FAA-approved Wildlife Hazard Management Plans at certificated airports must have professional training and experience in wildlife hazard management at airports [§139.337(c) and (f)(7)]. Airport personnel actively involved in overseeing or implementing FAA-approved Wildlife Hazard Management Plans must receive initial training and recurrent training every 12 consecutive months [§139.303(c) and (e) (Personnel)].

5. Related Reading Material.

Please review the most recent versions of the following documents:

a. FAA AC 150/5200-18, Airport Safety Self-Inspection.

b. FAA AC 150/5200-32, Reporting Wildlife Aircraft Strikes.

c. FAA AC 150/5200-33, Hazardous Wildlife Attractions On or Near Airports.

d. FAA AC 150/5200-34, Construction or Establishment of Landfills Near Public Airports.

e. FAA AC 150/5210-20 Ground Vehicle Operations on Airports

f. FAA AC 150/5220-25 Airport Avian Radar Systems

g. FAA AC 150/5300-13 Airport Design

h. FAA AC 150/5340-1K Standards for Airport Markings

i. FAA AC 150/5340-18F Standards for Airport Sign Systems

j. FAA Office of Safety and Standards, Certalert no. 98-05, Grasses Attractive to Hazardous Wildlife.

k. FAA Office of Safety and Standards, Certalert no. 04-09, Relationship Between FAA and WS.

l. FAA Office of Safety and Standards, Certalert no. 04-16, Deer Hazard to Aircraft and Deer Fencing.

m. Cleary, E. C. and Archie Dickey. 2010. Guidebook for Addressing Aircraft/Wildlife Hazards at General Aviation Airports. Airport Cooperative Research Program Report #32.

n. Cleary, E. C. and R. A. Dolbeer. 2005. Wildlife Hazard Management at Airports: A Manual for Airport Personnel. 2nd Ed. FAA, Office of Airport Safety and Standards, Washington, DC.

o. Dolbeer, R. A., S. E. Wright, J.R. Weller and M.J. Begier. 2009. Wildlife Strikes to Civil Aircraft in the United States, 1990 – 2008. FAA National Wildlife Aircraft Strike Database Serial Report #15.

p. Dolbeer, R. A. et al. Ranking the Hazard Level of Wildlife Species to Civil Aviation in the United States: Update #1. Special Report for the Federal Aviation Administration, July 2, 2003.

q. Report to Congress: Potential Hazards to Aircraft by Locating Waste Disposal Sites in the Vicinity of Airports, April 1996, DOT/FAA/AS/96-1.

r. Title 14, Code of Federal Regulation, Part 139, Certification of Airports.

s. Title 40, Code of Federal Regulation, Part 258, Criteria for Municipal Solid Waste Landfills.

t. FAA Grant Assurance No. 34, Policies, Standards, and Specifications

u. FAA Passenger Facility Charge (PFC) Assurance No. 9, Standards and Specifications

v. Aeronautical Information Manual (AIM)

Some of these documents and other information on wildlife management, including FAA Certalerts and guidance on siting hazardous wildlife attractants such as landfills, are available on the FAA website at http://www.faa.gov/airports/ and http://wildlife.faa.gov/.

6. Professional Qualifications of Wildlife Biologists Conducting Wildlife Hazard Assessments and Wildlife Hazard Management Training at FAA Certificated Airports.

a. Wildlife biologists conducting airport Wildlife Hazard Assessments must meet certain education, training, and experience standards.

> §139.337(c) reads: Wildlife Hazard Assessment required in paragraph (b) of this section shall be conducted by a wildlife damage management biologist who has professional training and/or experience in wildlife hazard management at airports or an individual working under direct supervision of such an individual.

b. Airports with a FAA-approved Wildlife Hazard Management Plan must provide employees the training needed to carryout the Plan.

> §139.337(f)(7) reads: A training program conducted by a qualified wildlife damage management biologist to provide airport personnel with the knowledge and skills needed to successfully carry out the Wildlife Hazard Management Plan required by paragraph (d) of this section.

c. To meet the requirements of §139.337(c) and (f)(7), a wildlife damage management biologist (from now on referred to as a "qualified airport wildlife biologist") must:

(1) Have the necessary academic coursework from accredited institutions and work experience to meet the qualifications of a GS-0486 series wildlife biologist as defined by the U.S. Office of Personnel Management classification standards (Appendix A) **or** be designated as a Certified Wildlife Biologist by The Wildlife Society (http://www.wildlife.org) **and,**

(2) Have taken and passed an airport wildlife hazard management training course acceptable to the FAA Administrator (Appendix C), **and**;

(3) While working under the direct supervision of a qualified airport wildlife biologist, have conducted at least one Wildlife Hazard Assessment acceptable to the FAA Administrator (as described in §139.337(c)). **and,**

(4) Have successfully completed at least one of the following within five years of their initial FAA approved airport wildlife hazard management training course, and every five years thereafter:

(i) An airport wildlife hazard management training course that is acceptable to the FAA Administrator (Appendix C) **or**,

(ii) Attendance, as a registered participant, at a joint Bird Strike Committee–USA/Bird Strike Committee–Canada annual meeting **or**,

(iii) Other training acceptable to the FAA Administrator.

d. Individuals who work under the direct supervision of a qualified airport wildlife biologist are allowed to conduct Wildlife Hazard Assessments if the airport sponsor and the qualified airport wildlife biologist agree in writing to determine how the qualified airport wildlife biologist will:

(1) Supervise how the individual(s) will conduct the Wildlife Hazard Assessment; and

(2) Report progress of the Wildlife Hazard Assessment; and

(3) Supervise the Wildlife Hazard Assessment report production.

e. Certificate Holders or Airport Sponsors must obtain documentation verifying the qualifications outlined in c (1) – (3) above of any person(s) conducting wildlife hazard assessments or providing requisite training

7. Initial and Recurrent Training for Airport Personnel Actively Involved in Managing Hazardous Wildlife On or Near Airports.

a. Personnel actively involved in implementing FAA-approved Wildlife Hazard Management Plans are subject to the requirements of 14 CFR Part 139.303. §139.303 requires a specific training regimen for all airport personnel. §139.303(c) and (e) require the holder of an Airport Operating Certificate issued under Part 139 to provide initial training and, every 12 months thereafter, recurrent training in wildlife hazard management to airport personnel actively involved in implementing FAA-approved Wildlife Hazard Management Plans. The required training must include "Any additional subject areas required under … §139.337" [§139.303(c)(5)] and, "As appropriate, comply with the following training requirements of this part … §139.337, Wildlife Hazard Management" [§139.303(e)(5)].

b. Appendix D outlines the minimum training requirements for airport personnel who carry out an airport's Wildlife Hazard Management Plan. Depending on local wildlife and environmental issues, additional topics or more in-depth coverage of listed topics might be needed.

c. §139.337(f)(1) requires the Wildlife Hazard Management Plan to include a list of the individuals having authority and responsibility for implementing each aspect of the plan. This list identifies the individuals who must complete the required training.

d. §139.337(f) does not prohibit holders of Airport Operating Certificates from using a "train-the-trainer" approach when providing the requisite training, provided the trainers receive and successfully complete their initial and recurrent training from a qualified airport wildlife

biologist. Trainers who are not qualified airport wildlife biologists are limited to providing training to their airport employees.

e. Holders of Airport Operating Certificates issued under Part 139 are required to make and keep records of all training for airport personnel involved in controlling wildlife hazards for at least 24 consecutive calendar months.[§139.301(b)(1) and §139.303(d)].

Michael J. O'Donnell
Director, Office of Airport Safety and Standards

Appendix A.

U.S. Office of Personnel Management Qualification Standards for GS-0486 Series Wildlife Biologists.

To be qualified as a GS-0486 series wildlife biologist, a candidate must have the following:

1. A degree in biological science that includes—

a. At least nine semester hours in such wildlife subjects as mammalogy, ornithology, animal ecology, and wildlife management or research courses in the field of wildlife biology; **and**

b. At least 12 semester hours in zoology in such subjects as general zoology, invertebrate zoology, vertebrate zoology, comparative anatomy, physiology, genetics, ecology, cellular biology, parasitology, and entomology or research courses in these subjects (excess courses in wildlife biology may be used to meet the zoology requirements where appropriate); **and**

c. At least nine semester hours in botany or the related plant sciences; **or**

2. A combination of education and experience equivalent to a major in biological science (i.e., at least 30 semester hours), with at least nine semester hours in wildlife subjects, 12 semester hours in zoology, and nine semester hours in botany or related plant science, as shown in Paragraph 1 above, plus appropriate experience or additional education; **or**

3. Be designated as a Certified Wildlife Biologist by The Wildlife Society (http://www.wildlife.org).

Appendix B.

Training Resource Requirements and Instructor Qualifications.

The following training resource requirements and instructor qualifications are for any individual wishing to:

- Provide an airport wildlife hazard management course acceptable to the FAA Administrator, for personnel conducting Wildlife Hazard Assessments; or

- Provide training to airport personnel actively involved in implementing FAA approved Wildlife Hazard Management Plans.

1. Training Resources and Requirements.

a. A list of training program providers acceptable to the FAA Administrator can be found on the FAA's wildlife strike website: http://wildlife.faa.gov/.

b. Links to the most recent versions of FAA regulations, FAA Advisory Circulars, Certalerts, and other documents relevant to wildlife hazard management issues can be found at http://www.faa.gov/airports/ and http://wildlife.faa.gov/.

c. Those proposing to establish a program to train qualified airport wildlife biologists to meet the requirements of 14 CFR §139.337 must submit a complete training syllabus and instructor resume to the FAA. The syllabus must include all lesson plans, student handouts, and graphic presentations that include as a minimum all curriculum provided in Appendix C. Submit the materials to:

FAA National Wildlife Biologist, AAS-300
Office of Airport Safety and Standards
Federal Aviation Administration,
800 Independence Ave SW
Washington DC 20591

d. The goal of the training must be to provide the knowledge, skills, and abilities needed by a GS-0486 wildlife biologist to conduct Wildlife Hazard Assessments [§139.337(c)] and to conduct wildlife hazard training [§139.337(f)(7)]. To be acceptable to the FAA, the course must be at least 24 hours in length and include the curriculum items listed in Appendix C.

2. Instructor Qualifications.

The lead instructor for the training should:

a. Be a qualified airport wildlife biologist.

b. Have academic credits in education or instructor/teaching experience.

c. Have a minimum of 2 years experience in all aspects of managing hazardous wildlife on or near airports.

Appendix C.

Training Curriculum Outline for Any Individual Wishing to Provide an Airport Wildlife Hazard Management Course Acceptable to the FAA Administrator, for Personnel Conducting Wildlife Hazard Assessments.

1. Training Curriculum Outline.

The goal of the training must be to provide the knowledge, skills, and abilities needed by a GS-0486 wildlife biologist to conduct Wildlife Hazard Assessments [§139.337(c)] and to conduct wildlife hazard training [§139.337(f)(7)]. To be acceptable to the FAA, the course must be at least 24 hours in length and include the curriculum items listed below.

- **a.** Training goals and process
- **b.** Airport familiarization
  - (1) Introduction to the National Plan of Integrated Airport Systems
  - (2) Airport design and layout (AC 150/5300-13 Airport Design)
  - (3) Navigation aids and Air Traffic Control (Aeronautical Information Manual [AIM])
  - (4) Airport operations and safety (AIM)
  - (5) Signs, marking, and lighting (AC 150/5340-1K Standards for Airport Markings and AC 150/5340-18F Standards for Airport Sign Systems)
  - (6) Ground vehicle operator communication (AC 150/5210-20 Ground Vehicle Operations on Airports)
- **c.** Aircraft familiarization
  - (1) Physics of a strike
  - (2) Aircraft nomenclature
  - (3) Civil aviation aircraft categories
  - (4) Aircraft engines
    - (a) Reciprocating
    - (b) Turbo
  - (5) Aircraft certification standards
- **d.** Preview of wildlife hazards to aviation
  - (1) History of major strikes
  - (2) Aviation losses
    - (a) Worldwide
    - (b) United States
- **e.** Controlling laws, regulations, and policies
  - (1) Migratory Bird Treaty Act of 1918, as amended

(2) Animal Damage Control Act of 1931, as amended

(3) Bald Eagle Protection Act of 1940, as amended

(4) Federal Insecticide, Fungicide, and Rodenticide Act of 1948, as amended

(5) National Environmental Policy Act of 1969, as amended

(6) Endangered Species Act of 1973, as amended

(7) Title 14, Code of Federal Regulation, Part 139, Certification of Airports

(8) Title 40, Code of Federal Regulations, Part 258, Criteria for Municipal Solid Waste Landfills

(9) Title 50, Code of Federal Regulations, Parts 1–199, Wildlife Management

(10) Wendell H. Ford Aviation Investment and Reform Act for the 21st Century, Pub. L. No. 106–181 (April 5, 2000), "Structures Interfering with Air Commerce," section 503

(11) Applicable FAA ACs in the 150/5200 series about Airport Wildlife Hazard Management

(12) Applicable FAA Airport Certalerts

(13) Applicable state and local laws, regulations, and ordinances

f. Department of Defense requirements and perspective on military/civilian joint-use airports

g. Other Federal and State agency roles and responsibilities

(1) U.S. Department of Interior, Fish and Wildlife Service

(a) Role and responsibilities related to managing problem wildlife

(b) Migratory Bird Depredation Permits

(c) Salvage Permits

(2) U.S. Department of Agriculture, Wildlife Services

(a) Role and responsibilities related to managing problem wildlife

(3) Other agencies

(a) U.S. Environmental Protection Agency

(i) Siting landfills

(ii) Pesticide registration and use

(b) U.S. Army Corps of Engineers

(i) Wetlands mitigation

(4) Multi-Federal Agency Memorandum of Agreement

(5) Applicable State wildlife regulations

h. FAA National Wildlife Aircraft Strike Database

(1) Strike reporting

(2) Species identification and feather identification

(3) Database access

i. Environmental issues—working with Federal and State agencies

(1) National Environmental Policy Act

(2) U.S. Army Corps of Engineers (wetland loss and mitigation issues)

j. Initial consultations and Wildlife Hazard Assessments (WHAs)

(1) Triggering events for WHAs

(2) Duration and contents of WHAs

(3) Wildlife surveys at airports to assess wildlife hazards

(4) Data analysis and presentation of results

(5) Writing a WHA

k. FAA review of a WHA and determination of need for a Wildlife Hazard Management Plan (WHMP)

l. Drafting and carrying out integrated WHMPs

(1) Contents of WHMPs

(2) FAA review of WHMPs

(3) Endangered Species Act compliance

(4) National Environmental Policy Act review

m. Integrated wildlife hazard management for airports; survey of basic control strategies and tactics

(1) Flight schedule modification

(2) Habitat modification and exclusion

(3) Wildlife dispersal techniques

(4) Wildlife population management

n. Addressing off-airport attractants and community planning and involvement

o. Outline of field trip (to conduct a “mini” WHA)

p. Field trip/site visit

q. Final exam

r. Post exam review

s. Course evaluation

t. Presentation of certificates

2. Recommendations.

a. Exams or tests may be oral, written, practical demonstrations, or a combination of each.

b. Passing grade/evaluation should be recorded and retained as instructor's records.

c. Instructors should retain course attendance records for a period of three years.

Appendix D.

Training Curriculum Outline for Airport Personnel Actively Involved in Implementing FAA-Approved Wildlife Hazard Management Plans.

1. Training Curriculum Outline.

The goal of the training course must be to provide the knowledge, skills, and abilities needed by airport personnel to safely, accurately, and effectively implement relevant portions of an FAA-approved Wildlife Hazard Management Plan. To be acceptable to the FAA, initial and recurrent training must include the following agenda items:

a. General survey of wildlife hazards to aviation based on the most recent annual FAA National Wildlife Strike Database Serial Report

b. Review of wildlife strikes, control actions, and observations at the airport over at least the past 12 months

c. Review of the airport's Wildlife Hazard Assessment is to include—

(1) Existing wildlife hazards and trends in wildlife abundance

(2) Status of any open or unresolved recommended action items for reducing identified wildlife hazards to air carrier operations within the past 12 months

d. Review of the airport's Wildlife Hazard Management Plan, to include the following:

(1) Airport-specific wildlife attractants, including man-made and natural features and habitat management practices of the last 12 months.

(2) Review of the airport's wildlife permits (local, State, and Federal)

(3) Review of other airport-specific items:

(a) Wildlife hazard management strategies, techniques, and tools:

(i) Flight schedule modification

(ii) Habitat modification, exclusion

(iii) Repelling methods

(iv) Wildlife population management

(b) Responsibilities of airport personnel for—

(i) Reporting wildlife strikes, control actions, and wildlife observations

(ii) Communicating with personnel who conduct wildlife control actions or who see wildlife hazards and air traffic control tower personnel and others who may require notification, such as airport operations or maintenance departments

(iii) Documenting and reporting wildlife hazards seen during patrols and inspections and follow-up control efforts

(iv) Documenting and reporting when no hazards are seen during patrols and inspections

e. Basic bird and mammal identification, stressing local hazardous and rare or endangered species of concern

f. For any airport personnel using pyrotechnic launchers or firearms, training on the following topics from a qualified individual[2]:

(1) Safety, parts, and operation of pyrotechnic launchers

(2) Fundamentals of using pyrotechnics to safely and effectively disperse wildlife

(3) Personnel protective equipment

(4) Cleaning, storage, and transport of firearms and pyrotechnic launchers

(5) Applicable local, State, and Federal regulations on firearms, pyrotechnic launchers, and pyrotechnics[3]

(6) Live fire training with pyrotechnic launchers including strategies for dispersing wildlife away from runways and aircraft movement corridors

(7) For any airport personnel using firearms, live fire training. This training is highly recommended from a qualified individual but not a requirement for this training program[2].

g. Any other training required by local, State, or Federal regulations

2. Recommendations.

a. Exams or tests may be oral, written, practical demonstrations, or a combination of all three.

b. The Trainer should retain passing grades/evaluations records.

c. The Trainer should retain course attendance records for a period of three years.

d. Airport personnel responsible for the airport's wildlife hazard management program should retain records of those to whom instruction in airport wildlife hazard management has been given for the period of time during which the employees conduct hazardous wildlife management activity on the airport and for six months after termination of employment.

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[2] State Certificated Hunter Safety Instructors, police officers, firearms instructors and other personnel who have been professionally trained in firearms safety should be qualified to teach firearm safety and possibly the safe use of pyrotechnic launchers. Pyrotechnics are classified as high explosives by the Bureau of Alcohol Tobacco and Firearms (ATF) and as Division 1.4 explosives by the U.S. Department of Transportation. There are numerous regulations, security considerations, and ATF licensing requirements that apply to pyrotechnics.

[2] Airport personnel actively involved with the use of firearms for the mitigation of wildlife hazards should receive and maintain current firearms training from either a licensed National Rifle Association (NRA) instructor or other qualified individual. This training should include type and caliber of weapon used at the airport.

[3] Bureau of Alcohol, Tobacco and Firearms provides information on Federal explosive requirements for explosive pest control devices at: http://www.atf.gov/explosives/how-to/documents/epcd-flyer.pdf.

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Appendix C. Author Accreditation

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Qualified Wildlife Biologist

In accordance with Title 14 of the Code of Regulations (CFR) Part 139.337 (c), "Wildlife Hazard Management," the Wildlife Hazard Assessment for the Jacqueline Cochran Regional Airport was performed under the supervision of Mr. Rick Jones, CWB® an FAA-qualified Airport Wildlife Biologist, who prepared the Wildlife Hazard Assessment Report.

Mr. Jones meets all requirements set forth in FAA Advisory Circular 150.5200-36A, "Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports." Mr. Jones has attended training in wildlife hazard management presented by Embry Riddle Aeronautical University and appears on the University's published "Qualified Airport Wildlife Biologist Listing."

Mr. Jones has completed numerous Wildlife Hazard Assessments, Wildlife Hazard Management Plans, and Wildlife Hazard Site Visits nationwide to the satisfaction of the Federal Aviation Administration as shown in **Table C-1.**

Table C-1
Wildlife Hazard Management Projects
Completed and FAA-Approved Projects by Rick Jones, Mead & Hunt Inc.

Alaska	
Gustavus Airport	Wildlife Hazard Site Visit (2015)
Petersburg Airport	Wildlife Hazard Site Visit (2015)
Wrangell Airport	Wildlife Hazard Site Visit (2015)
California	
Brackett Field	Wildlife Hazard Assessment (2014)
Cable Airport	Wildlife Hazard Assessment (2014)
Camarillo	Wildlife Hazard Assessment (2014)
Chino Airport	Wildlife Hazard Assessment (2014)
El Monte Airport	Wildlife Hazard Assessment (2014)
Fresno-Yosemite International Airport	Wildlife Hazard Management Plan (2013)
Fullerton Municipal Airport	Wildlife Hazard Assessment (2014)
Hawthorne Municipal Airport	Wildlife Hazard Assessment (2014)
Hayward Executive Airport	Wildlife Hazard Assessment (2014)
Livermore Municipal Airport	Wildlife Hazard Assessment (2013) Wildlife Hazard Management Plan (2014)
Los Angeles Whiteman Airport	Wildlife Hazard Assessment (2014)
Palo Alto Airport	Wildlife Hazard Assessment (2014)
Riverside Municipal Airport	Wildlife Hazard Assessment (2014)
Salinas Municipal Airport	Wildlife Hazard Assessment (2014)
San Carlos Airport	Wildlife Hazard Assessment (2014)
Watsonville Municipal Airport	Wildlife Hazard Assessment (2014)
William J. Fox Field	Wildlife Hazard Assessment (2014)
Colorado	
Cortez Municipal Airport	Wildlife Hazard Assessment (2013) Wildlife Hazard Management Plan (2013)
Pueblo Municipal Airport	Wildlife Hazard Assessment (2013) Wildlife Hazard Management Plan (2013)
Yampa Valley Regional Airport	Wildlife Hazard Assessment (2012) Wildlife Hazard Management Plan (2012)
Idaho	
Sandpoint Airport	Wildlife Hazard Site Visit (2014)
Montana	
Sherwood Airport	Wildlife Hazard Site Visit (2014)

New Mexico	
Four Corners Regional Airport	Wildlife Hazard Assessment (2012) Wildlife Hazard management Plan (2012)
Oregon	
Crater Lake – Klamath Regional Airport	Wildlife Hazard Management Plan (2014)
Scappoose Industrial Business Park/Port of St. Helens	Wildlife Hazard Site Visit (2014)
Eastern Oregon Regional Airport	Wildlife Hazard Site Visit (2015)
Texas	
Dallas Executive Airport	Wildlife Hazard Assessment (2015) Wildlife Hazard Management Plan (2015)
Denton Municipal Airport	Wildlife Hazard Assessment (2013)
Lone Star Executive Airport	Wildlife Hazard Assessment (2013)
Washington	
Auburn Municipal Airport	Wildlife Hazard Assessment (2015) Wildlife Hazard Management Plan (2015)

PRESCOTT
ARIZONA

SEARCH

Qualified Airport Wildlife Biologist Listing

Individuals appearing on these lists have satisfactorialy demonstrated to Embry-Riddle Aeronautical University they possess the required education and experience as stipulated under FAA Advisory Circular 150/5200-36A to be classified as a "qualified airport wildlife biologist".

FAA A/C 150/5200-36A

Qualified Wildlife Biologist Application

Applicants who already meet the qualifications spelled out in FAA Advisory Circular 150/5200-36A regarding educational, training, and approved FAA wildlife assessment may apply to be added to the list below. This application should NOT be submitted if any of the requirements have not been met. Application

Important Information

Embry-Riddle Aeronautical University is providing this list as a service to the Aviation Community to identify individuals that have satisfactorily demonstrated they possess the required education and experience related credentials to be classified as a "qualified airport wildlife biologist" as stipulated in FAA Advisory Circular 150/5200-36. Embry-Riddle Aeronautical University in no way endorses or recommends, implied or otherwise, any individual or business contained on this list. Only information necessary to verify credentials and basic contact information have been collected. Individuals and/or businesses appearing on this list have paid a Verification Process Application fee. No individual or business appearing on this list has been required to attend Embry-Riddle Aeronautical University or it's related training programs.

Qualified Biologists (Listed alphabetically by last name)

Amy L. **Anderson** Senior Environmental Scientist 1597 The Greens Way, Suite 200 Jacksonville Beach, FL 32250 Phone: (904) 285-1397 Email: aanderson@ersenvironmental.com Website: http://www.ersenvironmental.com	Bill (William) **Antonides** Qualified Airport Wildlife Biologist Gander Island Consulting Service, Inc. 514 N. Arch Street Aberdeen, SD 57401-2951 Phone: (605) 380-8586 Email: billantonides@gmail.com
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Mark L. **Hudnall** Hudnall Aviation & Wildlife Consulting 106 Durham Drive Madison, AL 35758 Phone: (256) 724-0964 Email: hud@wildlifehazard.com Website: http://www.wildlifehazard.com	Amy **Johnson** Qualified Airport Wildlife Biologist Environmental Resource Solutions, Inc. 8711 Perimeter Park Blvd., Suite 1 Jacksonville, FL 32216 Phone: (904) 285-1397 Cell: (813)-966-9410 Email: ajohnson@ersenvironmental.com Website: http://www.ersenvironmental.com
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Jodi **Taylor**, Natural Resources Manager Terracon Consultants, Inc. 25809 Interstate 30 South Bryant, Arkansas 72022 Phone: (501) 847-9292 (office) Cell: (501) 350-5522 Email: jataylor@terracon.com Offices Nationwide www.terracon.com	Tom **Unangst** Qualified Airport Wildlife Biologist Total Environmental & Wildlife Solutions (TEWS) Inc. 5906 Wolf Village Drive Colorado Springs, CO 80924 Phone: (719) 964-8473 Email: tews_inc@msn.com; etunangst@msn.com
Thomas **Wirickx**, CE Senior Environmentalist McFarland-Johnson, Inc. 49 Court Street, Metrocenter P.O. Box 1980 Binghamton, NY 13902-1980 Phone: (607) 723-9421 Fax: (607) 723-4979 Email: twirickx@mjinc.com Website: www.mjinc.com	

- FEEDBACK
- CONTACT US

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Administrative Offices: Prescott, AZ Residential Campus - 3700 Willow Creek Road,Prescott, AZ 86301-3720

CERTIFICATE OF ATTENDANCE

Awarded to

Mr. Rickey Jones

For attending the

2013 Bird Strike North America Conference

Presented by

Bird Strike Committee USA

And

Bird Strike Association of Canada

in cooperation with

American Association of Airport Executives

12-15 August 2013
Milwaukee, Wisconsin USA

Identifying and reducing hazards to aviation caused by wildlife.

John E. Ostrom
John Ostrom, Chair

Embry-Riddle Aeronautical University

The Office of Professional Education
hereby certifies that

Rick L. Jones

Has successfully completed 2.4 Continuing Education Units in the following:

SFY-3000 Airport Wildlife Hazard Management Workshop

In Witness Whereof the signatures are authorized and
the Seal of the University are hereunto affixed at Daytona Beach, Florida
this 22nd day of January 2010 Anno Domini.

Martin A. Smith
Executive Vice President, Embry-Riddle Worldwide

Albert W. Astbury
Interim Director, Office of Professional Education

The Wildlife Society

INCORPORATED IN WASHINGTON, D.C.

grants the designation

Certified Wildlife Biologist

to

Rick L. Jones

in recognition of fulfilling all the professional requirements approved by The Wildlife Society and verified by the Society's Certification Review Board. This designation is valid for 5 years, beginning the 9th day of December 2008.

Thomas M. Franklin
President, The Wildlife Society

Chairman, Certification Review Board

Executive Director, The Wildlife Society

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Appendix D. Airport Layout Plan and Study Design

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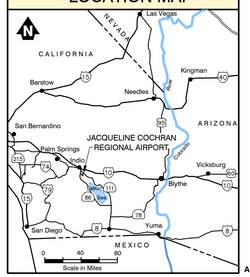
LOCATION MAP



AIRPORT DATA

		EXISTING	FUTURE
AIRPORT SERVICE LEVEL (NPIAS)		Transport	No Change
AIRPORT REFERENCE CODE		C-III	C-IV
CRITICAL AIRCRAFT		Boeing BusJet 2	Boeing-767-300
AIRPORT REFERENCE POINT (a)	Latitude	33° 37' 35.999" N	33° 37' 31.339" N
	Longitude	116° 09' 34.751" W	116° 09' 33.585" W
AIRPORT ELEVATION (Above Mean Sea Level)		-114'	-115'
MEAN MAX. TEMP. (Hottest Month)		108° F (July)	No Change
AIRPORT AND TERMINAL NAVIGATIONAL AIDS		GPS/VORTAC	No Change
GPS APPROACH ESTABLISHED		Yes	No Change
AIRPORT ACREAGE	Fee Simple	1743.50	1880.50
	Easement	0	No Change
AIRCRAFT PARKING SPACES	Tiedowns	43	133
	Hangars	50	184
	Box Hangars	33	56
	Helicopter Spaces	0	4

DRAWING LEGEND

	EXISTING	FUTURE
ACTIVE AIRFIELD PAVEMENT		
GRAVEL ROAD		N/A
PAVED ROAD		
AIRPORT PROPERTY		
SURPLUS AIRPORT PROPERTY		N/A
OTHER PROPERTY LINES		
AVIGATION EASEMENT		
INTERNAL BOUNDARY (lease, R.O.W., etc.)		
RUNWAY SAFETY AREA	RSA	RSA
AIRCRAFT PARKING LIMIT	APL	APL
BUILDING RESTRICTION LINE	BRL	BRL
RUNWAY PROTECTION ZONE	RPZ	RPZ
OBJECT FREE AREA	OFA	OFA
OBSTACLE FREE ZONE	OFZ	OFZ
THRESHOLD SITING SURFACE	TSS	N/A
BUILDING		
BUILDING TO BE REMOVED	N/A	
BUILDING TO BE RELOCATED	N/A	
FENCE		
VEHICLE GATE/PEDESTRIAN GATE		N/A
WIND CONE		N/A
AIRFIELD LIGHTS: SINGLE/GROUP/FLASHING		
BEACON		N/A
UTILITY POLE		
TOPOGRAPHIC CONTOURS	XXX	N/A
MONUMENT		N/A
WATERWAY / CULVERT		
CHANNEL		N/A
AIRPORT REFERENCE POINT		
SECTION CORNER	20 | 29 / 19 | 30	N/A

MONUMENTS

NO.	DESCRIPTION	ELEVATION
1	BRASS DISC S-753	-114.51

BUILDING AND FACILITY LEGEND

1. Future Passenger Terminal Site
2. FBO
3. Riverside County - Fire Station 39
4. VASI
5. Future Air Cargo Site
6. PAPI
7. Hangars (7) Hangar (Future)
8. REILS
9. Detention Basin
10. Fuel Facilities
11. Segmented Circle/ Wind Cone (to be relocated)
12. Electric Vault
13. Maintenance Building
14. GA Tiedown Apron
15. Future MRO Site (Concept Only)
16. Sewer Lift Station
17. Water District Property (Not a part)
18. Future Localizer Location
19. Future Glide Slope Antenna
20. Future Executive Hangars
21. Future FBO/Specialty Aviation Site
22. Future Helicopter Operations Area
23. Relocated Segmented Circle/ Wind Cone
24. Future Detention Basin
25. Future PAPI
26. Automated Surface Observing Station (ASOS)
27. Historic Palm Tree Cluster
28. Hazardous Materials Area
29. Future Fire Station
30. Future Passenger Terminal Automobile Parking

SUBMITTED BY:
Robert Field,
Assistant County Executive Officer EDA/FM
County of Riverside

By _____ Date

FAA Approval Space

NO.	REVISION	SPONSOR	DATE
5	Add recent construction areas and updates	Mead & Hunt Inc.	11/08
4	Update (add new construction / revise data blocks)	Mead & Hunt Inc.	5/05
3	AMP Update Study	Mead & Hunt Inc.	5/04
2	Property Release; Runway 17-35 Phase 1 Extension	Coffman Associates	1/99
1	Recent Construction; Proposed Property Release	Coffman Associates	4/98

JACQUELINE COCHRAN REGIONAL AIRPORT
THERMAL, CALIFORNIA

AIRPORT LAYOUT PLAN

MEAD & HUNT
133 Aviation Boulevard, Suite 100
Santa Rosa, California 95403
(707) 526-5010
Fax (707) 526-9721
www.meadhunt.com

RIVERSIDE COUNTY Economic Development Agency

DESIGN:	MM/CB	DRAWN:	BE	DATE: November 18, 2008	SHEET 1 OF 10

The preparation of these documents was financed in part through a planning grant from the Federal Aviation Administration as provided under Section 505 of the Airport and Airway Improvement Act of 1982, as amended. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of these documents by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted herein nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public laws.

C:\Users\870tme\appdata\local\temp\AcPublish_4840\TRMALP09-Submitted.dwg Mar 07, 2012 - 8:15am

Study Design

Wildlife Hazard Assessment
Jacqueline Cochran Airport

Thermal, Riverside County, California

Prepared by

Mead & Hunt

www.meadhunt.com

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1. Introduction

Beginning in May 2015, Riverside County undertook a Wildlife Hazard Assessment (WHA) at the Jacqueline Cochran Airport (TRM), which is located in the City of Thermal, Riverside County, California. The WHA is being conducted through a grant from the Federal Aviation Administration (FAA) and in accordance with Federal Aviation Regulation (FAR) Part 139.337.

1.1 Project Location

TRM is located in the Town of Thermal, California, approximately 0.75-miles southwest of downtown Thermal and 1.5-miles west of State Highway 86. The 1,850-acre general aviation airport is bound to the north by Airport Road, to the east by Polk Street, to the south by 60th Avenue, and west by Harrison Street (see **Figures 1 and 2**).

TRM is owned and operated by Riverside County as a general aviation airport. The airport supports approximately 76,500 annual operations and has 42 based aircraft. The Airport supports general aviation, recreational, and business aircraft.

TRM includes two runways (see **Figure 3**):

- Runway 12/30 is 4,995 feet long by 100 feet wide
- Runway 17/35 is 8,500 feet long by 150 feet wide

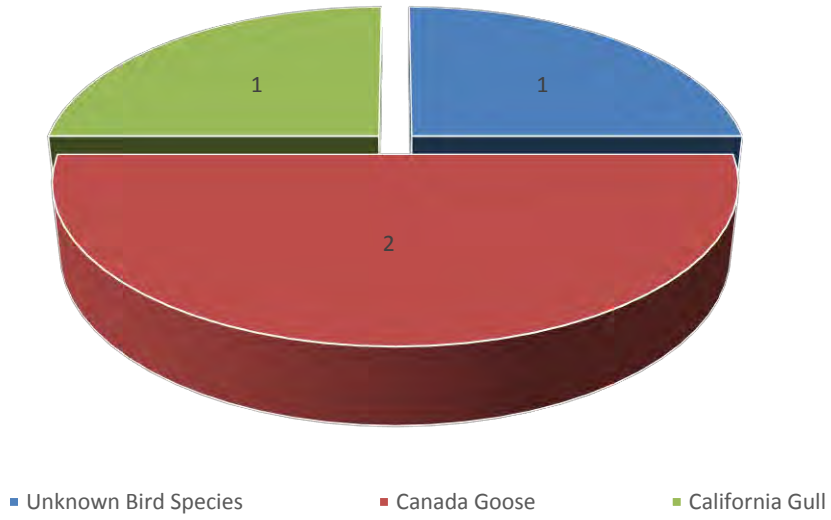
The Airport offers a complete range of services including fueling, avionics repair, maintenance, parts, aircraft rentals, a pilot shop and a restaurant. TRM has three fixed-based operators including Thermal Aviation, Landmark Aviation, and Signature Flight Service. TRM also supports operations by the California Highway Patrol.

TRM is located in an area that includes both undeveloped land along with commercial and residential development associated with the City of Thermal and County of Riverside. This mixed landscape influences the presence and abundance of various species of birds and mammals. Local features on TRM that may contribute to wildlife presence in the area include shrubs, trees, and various structures throughout the airfield that provide perching opportunities for birds.

1.2 Project Purpose

Pursuant to FAR Part 139, the FAA requires airport operators to identify potential wildlife hazards at their airport. As shown in **Table 1**, 4 wildlife strikes have been recorded in the FAA wildlife strike database at TRM since 1990 in association with a variety of bird and mammal species.

Table 1. Wildlife Strikes at TRM that were Reported to FAA.



Of the 4 wildlife strikes recorded in the FAA Wildlife Strike database, two were associated with Canada geese, one California gull, and one strike with unknown bird species. Three strikes have caused damage to aircraft with two of those causing substantial damage to the aircraft and one causing minor damage. The primary goal of the WHA is to review available data and conduct field studies identify the features, habitats, and species that are most likely to cause hazards to aircraft operations and to provide recommendations for reducing such hazards.

1.2.1 Current Wildlife Hazard Management Activities at TRM

TRM conducts some passive and active wildlife management activities. The airport is equipped with an 8-foot perimeter chain-link fence that surrounds the AOA. Coyotes have been observed within the AOA that are gaining access to the AOA from digging under the perimeter fence or through areas where there are gaps in the fence or gates. When wildlife is observed in the AOA, the aircraft operations staff performs harassment using vehicles and pyrotechnics. The airport does not maintain a federal migratory bird depredation permit for the lethal control of migratory birds or a state depredation for the lethal control of coyotes.

FAA policies require that the runway environment be kept clear of vegetation that might obscure runway or taxiway lights, contribute sources of fuel in the event of a fire, hinder access by emergency responders, block line-of-sight for pilots or security staff, or increase the severity of aircraft accidents off of the runway. The majority of the airfield safety area is dominated with Tamarisk and contains very little native grass given the dry desert environment.

2. Project Team and Methodology

2.1 Project Team

The FAA requires that a WHA be performed by, or under the supervision of, an FAA-qualified airport wildlife biologist. Qualifications for an airport wildlife biologist are set forth by the FAA in Advisory Circular 150/5200-36A, "Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports." The wildlife damage management biologist's primary responsibilities throughout the WHA are to:

- Provide information on the wildlife attractants that have been identified on or near the airport;
- Identify wildlife management techniques; and
- Prioritize appropriate mitigation measures.

Mr. Rick Jones, an FAA-qualified airport wildlife biologist with Mead & Hunt, Inc. (Mead & Hunt), will be responsible for ensuring that all data and deliverables comply with FAA regulations and guidance. He will oversee all field activities and data collection efforts, and participate in selected field activities during the 12-month monitoring period. Mr. Jason Caskey, a local biologist with Caskey Biological Consulting, will assist with site monitoring during the 12-month assessment.

2.2 Method

The Mead & Hunt team will implement the following study methods and activities to gather the data required for the WHA.

2.2.1 Preliminary Site Reconnaissance Visit

The study team performed an initial reconnaissance visit on May 13, 2015, that included an inspection of the AOA and other areas within the airport vicinity to identify existing features, habitats, and wildlife presence, and to identify potential locations for regular monitoring (point count locations).

The study area associated with the WHA includes the entire AOA and areas within a 5-mile radius of the AOA (see **Figure 3**). FAR Part 139 requires airport operators to identify potential wildlife hazards within 10,000 feet of the AOA (see **Figure** 4) for airports that support turbine-powered aircraft, as well as areas within 5 miles of approach and departure surfaces. As shown on **Figure 5**, a total of fifteen monitoring locations were identified: nine locations (monitoring points) were identified within the AOA, and six were identified outside of the AOA. The monitoring locations were selected because they provide an opportunity to observe different cover types within the AOA (i.e. runways, taxiways, ramp areas, and airfield structures) and to look at off-site approach/departure zones and off-site wildlife attractants, such as agriculture land and irrigation ponds.

2.2.2 Habitat Delineation

All habitats within the study area will be categorized for the purpose of associating wildlife use with specific habitat types. Habitats on and near the airport include: short-grass, long-grass,

sagebrush, and trees. Habitat types will be identified during field visits and mapped and described in the final monitoring reports.

2.2.3 Wildlife Monitoring

Wildlife monitoring was initiated in May 2015 and will be performed twice per month through April 2015. Each monitoring event includes 5-minute point counts at the locations shown on **Figure 5**. Wildlife observations will be recorded using the grid map that is depicted in **Figure 6**. Monitoring is conducted using the following procedures and criteria:

- The time of day and order of point counts will be randomized.
- All species seen or heard during the 5-minute point count at each location will be identified and counted, and their presence and locations will be recorded on field data forms. Observations will be recorded using a 1,000-foot grid overlay.
- The behaviors of all birds and other wildlife (e.g., feeding, flying, loafing, etc.) will be recorded on the data sheet.
- The habitat type associated with observed wildlife will be recorded.

2.2.4 Nighttime Mammal Surveys

Two nighttime mammal surveys (i.e. spotlight surveys) will be completed after dusk to identify the presence of mammals and to observe nocturnal wildlife activity near and within the AOA. Spotlights and other appropriate equipment will be used to identify nocturnal wildlife activity.

2.2.5 Small Mammal Monitoring

Two small mammal monitoring events will be conducted during the 12-month monitoring period to identify the potential prey base present at the airport. During each monitoring event, biologists will place approximately 150 live traps within diverse locations within the AOA for two-three consecutive nights. The traps will be monitored each morning to determine whether the airport supports small mammals that might serve as a prey base for potentially hazardous wildlife, such as raptors and larger mammals.

2.2.6 Data Analysis

All data and photographic documentation obtained during field visits will be uploaded to a secure, project-specific SharePoint site so that it can be reviewed by team members and airport staff as necessary. Using the survey data, the team's FAA- qualified airport wildlife biologist will analyze the data and categorize the species observed. The species will be grouped into logical guilds, and a comparative analysis will be performed to describe the use of the airport by the species observed and identify habitats and wildlife attractants within the study area.

3. Wildlife Hazard Assessment Report

The FAA-qualified airport wildlife biologist will review all data collected during the 12-month reporting period and formulate recommendations for the airport operator to manage, modify, or eliminate potential wildlife attractions observed. If the FAA determines that a Wildlife Hazard Management Plan is necessary, the results of the WHA Study serve as the direct input to and foundation for the Wildlife Hazard Management Plan.

FAR Part 139.337 (c) (1–5) provides specific guidance regarding WHA contents. As described in the FAA/USDA *Wildlife Hazard Management Manual for Airport Operators,* the WHA must contain the items included on the following table:

Wildlife Hazard Assessment Report Components (FAR Part 139.337)	
Requirement	**Description**
Analysis of the event or circumstances that prompted the study.	Who, what, when, and where the WHA is required, including a description of triggering events or site-specific conditions that pose concern.
Identification of the wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences.	Description of wildlife species that have access to the airport including their: ▪ Legal status, ▪ Movement patterns, and ▪ Seasonal patterns. A description of the degree of risk posed by each species (e.g., observed behavior, hazard ranking per FAA guidance).
Identification and location of features on and near the airport that attract wildlife.	Description of features on or near the airport that attract wildlife, such as large open areas where they can loaf in relative safety; abundant food or water; and escape, loafing, or nesting cover. Each attractant shall be identified and evaluated, and the person or agency responsible for its operation should be identified (e.g., airport tenant, local agency, etc.)
Description of the wildlife hazards to air carrier operations.	The Wildlife Hazard Damage biologist must identify the wildlife that poses the greatest hazards to aircraft.
Recommended actions for reducing identified wildlife hazards to air carrier operations.	The biologist preparing the WHA must provide prioritized recommendations for mitigating the hazardous wildlife attractants identified.

The Mead & Hunt team will prepare a WHA Report that complies with FAR Part 139 requirements and industry guidance and research. We will provide an administrative draft version of the report for its review within eight weeks of survey completion. In addition to the items identified in the table, the report will contain a description of the following:

- The legal framework and need for the study;
- Study design and survey process;
- Survey area, including maps and photographic data;
- Tables to describe habitat distribution and variations in their numbers, locations, movement, etc.;
- Recommendations and priorities for reducing potential wildlife strike hazard; and
- Appropriate appendices, including pertinent regulatory data, background data, and copies of all survey reports.

Mead & Hunt will review the administrative draft report with the client, incorporate substantive comments, and provide a draft report to the airport operator for submission to the FAA. Mead & Hunt anticipates delivery of the WHA report to the County and TRM in June 2016.

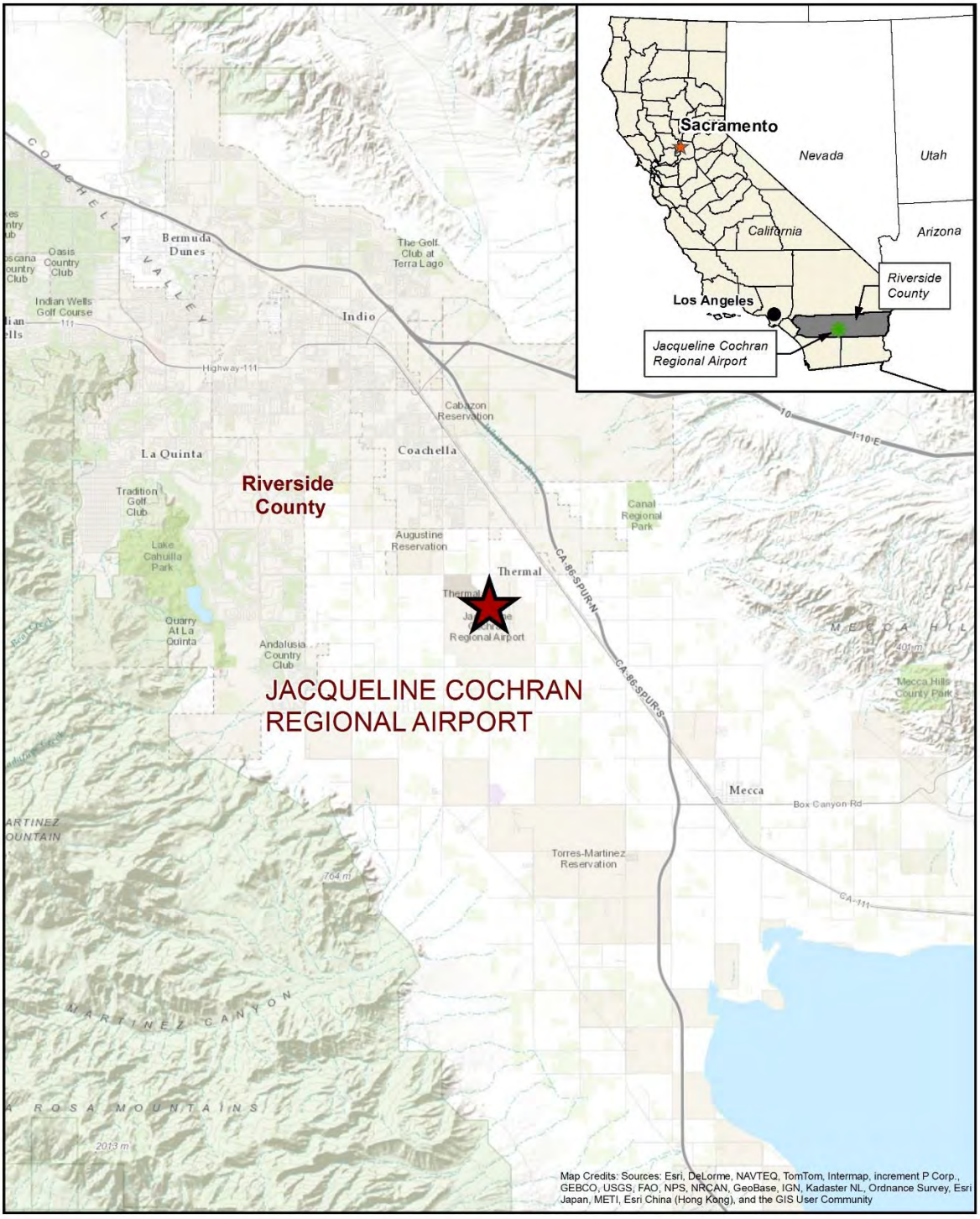


Figure 1.
Location Map

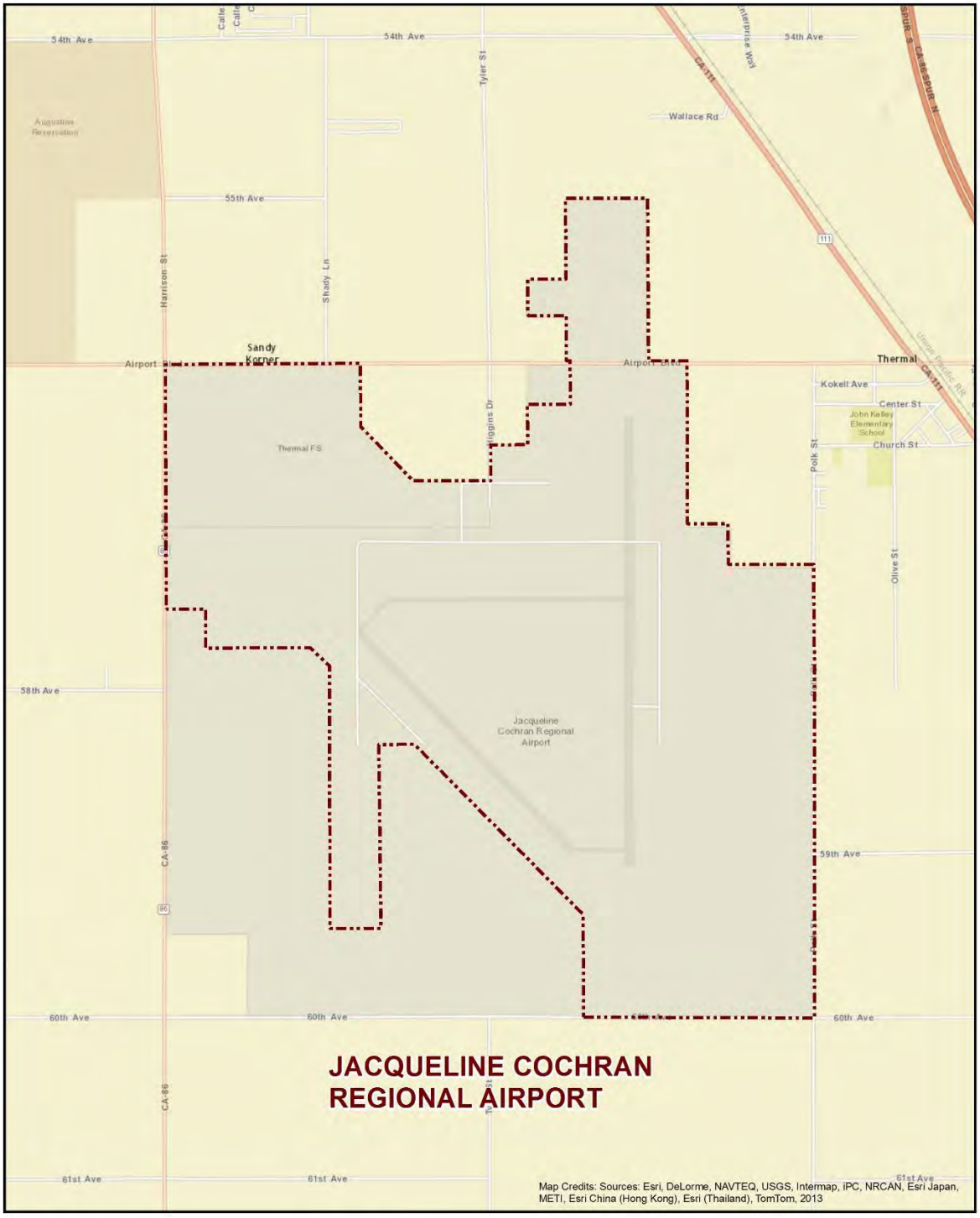


Figure 2.

Site Map

Legend

Airport Property Boundary (Approximate)

0 1,000 2,000 3,000 4,000 Feet

N

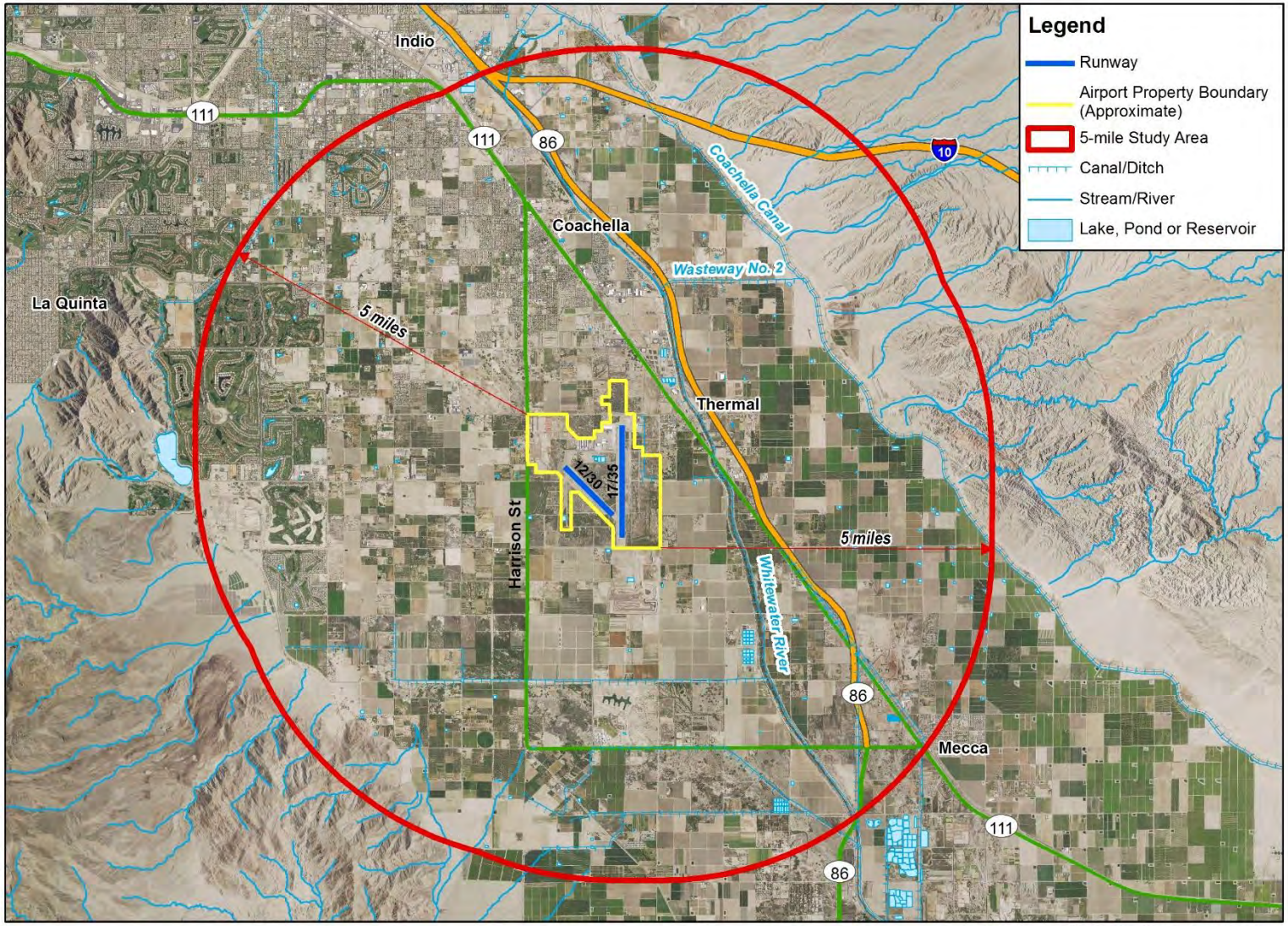


Image Source: FSA-NAIP 2014 Riverside County Mosaic, 1m
National Hydrography Dataset (NHD): HUC-8 18100201

Figure 3.

5-mile Radius Map

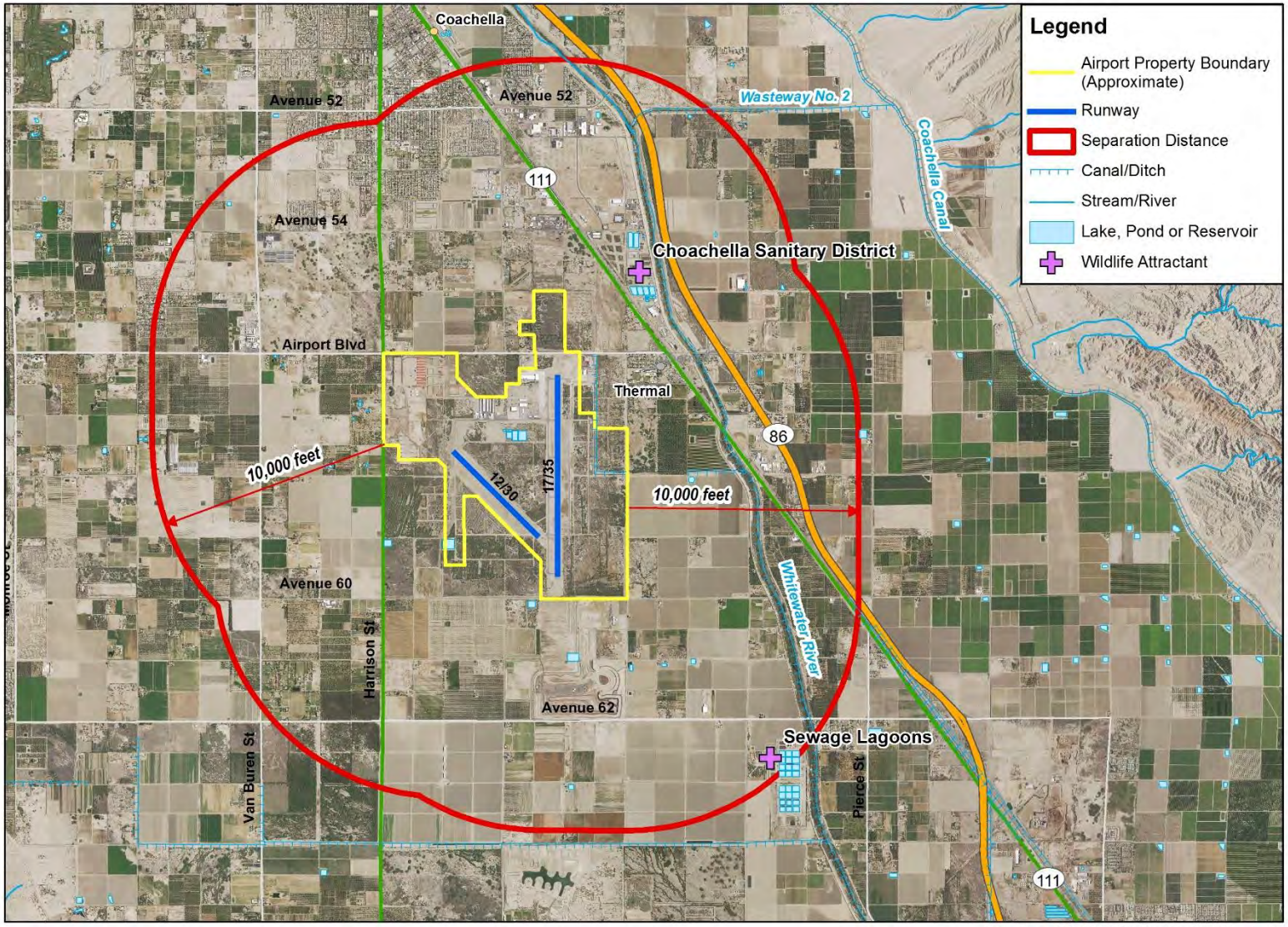


Image Source: FSA-NAIP 2014 Riverside County Mosaic, 1m
National Hydrography Dataset (NHD): HUC-8 18100201

Figure 4.

10,000-foot Separation Map

0 0.35 0.7 1.4 2.1 2.8 Miles

N

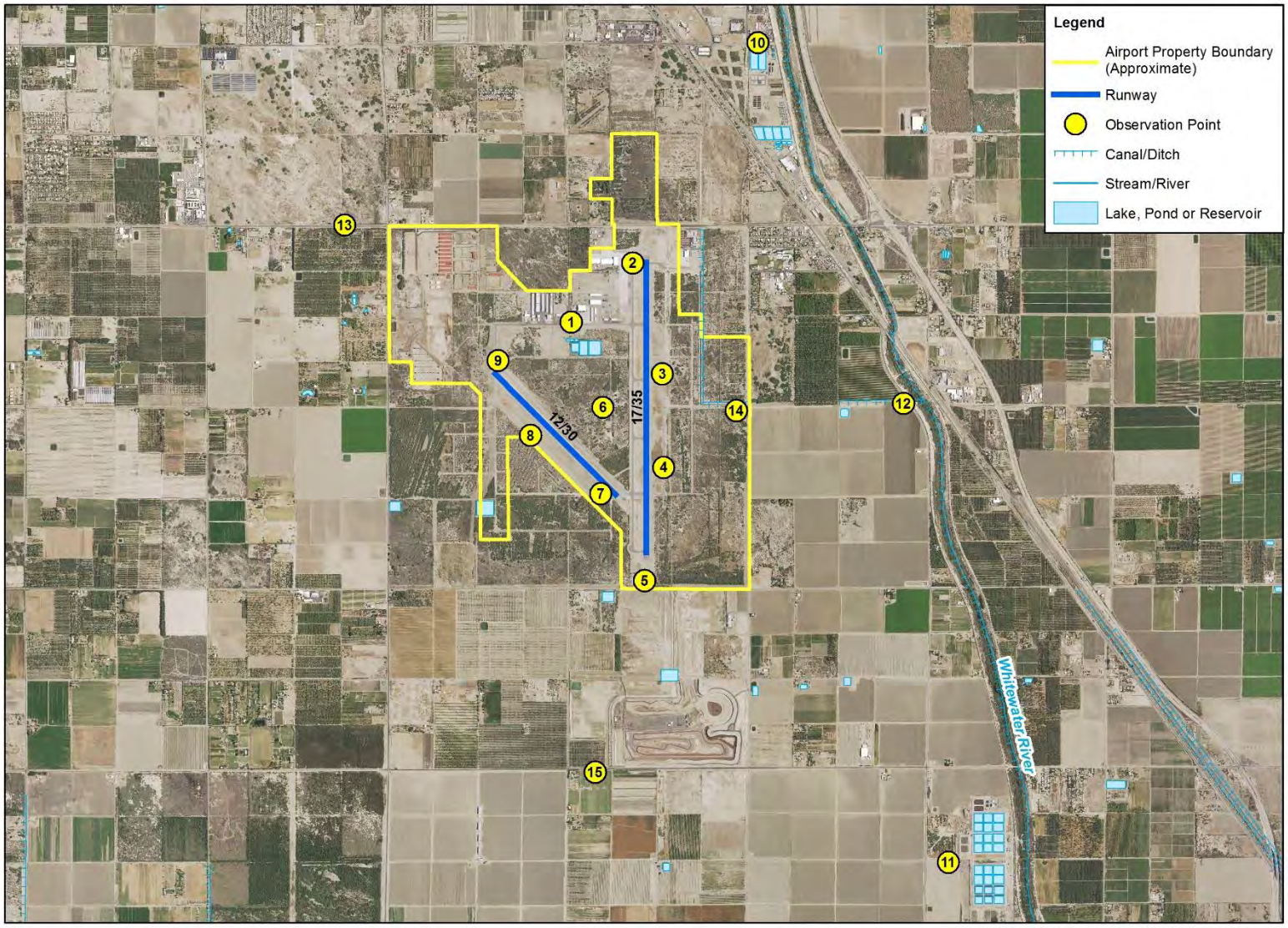


Image Source: FSA-NAIP 2014 Riverside County Mosaic, 1m
National Hydrography Dataset (NHD): HUC-8 18100201

Figure 5.
Monitoring Locations Map

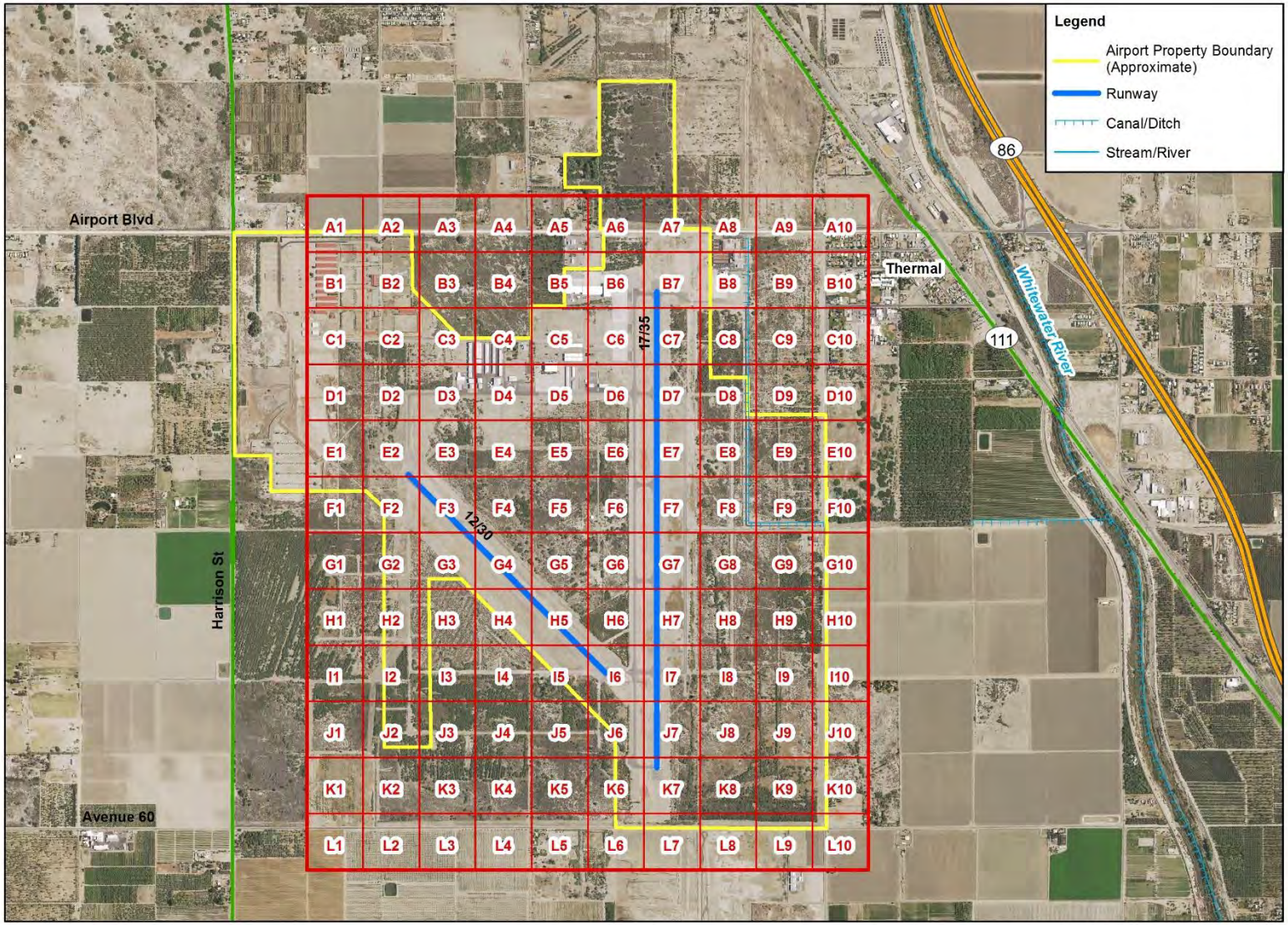


Image Source: FSA-NAIP 2014 Riverside County Mosaic, 1m
National Hydrography Dataset (NHD): HUC-8 18100201

Figure 6.
Wildlife Observation Grid

Appendix E. Federal- and State-listed Threatened and Endangered Species

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State of California
The Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Biogeographic Data Branch
California Natural Diversity Database

STATE & FEDERALLY LISTED ENDANGERED & THREATENED ANIMALS OF CALIFORNIA

January 2013

This is a list of animals found within California or off the coast of the State that have been classified as Endangered or Threatened by the California Fish & Game Commission (state list) or by the U.S. Secretary of the Interior or the U.S. Secretary of Commerce (federal list). The federal agencies responsible for listing are the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS).

The official California listing of Endangered and Threatened animals is contained in the California Code of Regulations, Title 14, Section 670.5. The official federal listing of Endangered and Threatened animals is published in the Federal Register, 50 CFR 17.11. The California Endangered Species Act of 1970 created the categories of "Endangered" and "Rare." The California Endangered Species Act of 1984 created the categories of "Endangered" and "Threatened." On January 1, 1985, all animal species designated as "Rare" were reclassified as "Threatened."

Also included on this list are animal "Candidates" for state listing and animals "Proposed" for federal listing; federal "Candidates" are currently not included. A state Candidate species is one that the Fish and Game Commission has formally declared a candidate species. A federal Proposed species is one that has had a published proposed rule to list in the Federal Register.

Designation		Totals as of January 2013
State listed as Endangered	SE	46
State listed as Threatened	ST	34
Federally listed as Endangered	FE	91
Federally listed as Threatened	FT	39
State Candidate (Endangered)	SCE	3
State Candidate (Threatened)	SCT	2
State Candidate (Delisting)	SCD	1
Federally proposed (Endangered)	FPE	0
Federally proposed (Threatened)	FPT	0
Federally proposed (Delisting)	FPD	2
Total number of animals listed (includes subspecies & population segments)		155
Total number of candidate/proposed animals for listing		5
Number of animals State listed only		32
Number of animals Federally listed only		75
Number of animals listed under both State & Federal Acts		50

Common and scientific names are shown as they appear on the state or federal lists. If the nomenclature differs for a species that is included on both lists, the state nomenclature is given and the federal nomenclature is shown in a footnote. Synonyms, name changes, and other clarifying points are also footnoted.

The "List Date" for **final** federal listing is the date the listing became effective. This is usually not the date of publication of the rule in the Federal Register; it is usually about 30 days after publication, but may be longer.

If an animal was previously listed or proposed for listing and no longer has any listing status, the entry has been grayed out.

For taxa that have more than one status entry, the **current status is in bold and underlined**.

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Additional Resources 14

	State Listing			Federal Listing	
GASTROPODS					
Trinity bristle snail *Monadenia setosa*[1]	ST	10-02-80			
Morro shoulderband (=banded dune) snail *Helminthoglypta walkeriana*				FE	1-17-95
White abalone *Haliotis sorenseni*				FE[2] FE	11-16-05 6-28-01
Black abalone *Haliotis cracherodii*				FE[3] FE	4-13-11 2-13-09
CRUSTACEANS					
Riverside fairy shrimp *Streptocephalus woottoni*				FE	8-03-93
Conservancy fairy shrimp *Branchinecta conservatio*				FE	9-19-94
Longhorn fairy shrimp *Branchinecta longiantenna*				FE	9-19-94
Vernal pool fairy shrimp *Branchinecta lynchi*				FT	9-19-94
San Diego fairy shrimp *Branchinecta sandiegonensis*				FE	2-03-97
Vernal pool tadpole shrimp *Lepidurus packardi*				FE	9-19-94
Shasta crayfish *Pacifastacus fortis*	**SE** ST	2-26-88 10-02-80		FE	9-30-88
California freshwater shrimp *Syncaris pacifica*	SE	10-02-80		FE	10-31-88
INSECTS					
Zayante band-winged grasshopper *Trimerotropis infantilis*				FE	2-24-97
Mount Hermon June beetle *Polyphylla barbata*				FE	2-24-97
Casey's June beetle *Dinacoma caseyi*				**FE** FPE	10-24-11 7-09-09
Delta green ground beetle *Elaphrus viridis*				FT	8-08-80
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*				FPD **FT**	10-2-12 8-08-80

[1] Current taxonomy is *Monadenia infumata setosa.*
[2] Listed by NMFS in 2001 and by USFWS in 2005.
[3] Listed by NMFS in 2009 and by USFWS in 2011.

	State Listing			Federal Listing	
Ohlone tiger beetle *Cicindela ohlone*				FE	10-03-01
Kern primrose sphinx moth *Euproserpinus euterpe*				FT	4-08-80
Mission blue butterfly *Icaricia icarioides missionensis*[4]				FE	6-01-76
Lotis blue butterfly *Lycaeides argyrognomon lotis*[5]				FE	6-01-76
Palos Verdes blue butterfly *Glaucopsyche lygdamus palosverdesensis*				FE	7-02-80
El Segundo blue butterfly *Euphilotes battoides allyni*				FE	6-01-76
Smith's blue butterfly *Euphilotes enoptes smithi*				FE	6-01-76
San Bruno elfin butterfly *Callophrys mossii bayensis*				FE	6-01-76
Lange's metalmark butterfly *Apodemia mormo langei*				FE	6-01-76
Bay checkerspot butterfly *Euphydryas editha bayensis*				FT	10-18-87
Quino checkerspot butterfly *Euphydryas editha quino (=E. e. wrighti)*				FE	1-16-97
Carson wandering skipper *Pseudocopaeodes eunus obscurus*				FE	8-07-02
Laguna Mountains skipper *Pyrgus ruralis lagunae*				FE	1-16-97
Callippe silverspot butterfly *Speyeria callippe callippe*				FE	12-05-97
Behren's silverspot butterfly *Speyeria zerene behrensii*				FE	12-05-97
Oregon silverspot butterfly[6] *Speyeria zerene hippolyta*				FT	7-02-80
Myrtle's silverspot butterfly *Speyeria zerene myrtleae*				FE	6-22-92
Delhi Sands flower-loving fly *Rhaphiomidas terminatus abdominalis*				FE	9-23-93

[4] Current taxonomy is *Plebejus icarioides missionensis.*
[5] Current taxonomy is *Plebejus idas lotis.*
[6] Also known by the common name is Hippolyta fritillary.

	State Listing			Federal Listing	
FISHES					
Green sturgeon - southern DPS *Acipenser medirostris*				FT[7]	6-06-06
Mohave tui chub *Gila bicolor mohavensis*[8]	SE	6-27-71		FE	10-13-70
Owens tui chub *Gila bicolor snyderi*[9]	SE	1-10-74		FE	8-05-85
Thicktail chub (**Extinct**) *Gila crassicauda*	**Delisted** SE	10-02-80 1-10-74			
Bonytail[10] *Gila elegans*	**SE** SR	1-10-74 6-27-71		FE	4-23-80
Sacramento splittail *Pogonichthys macrolepidotus*				**Removed**[11] FT	9-22-03 3-10-99
Colorado squawfish[12] *Ptychocheilus lucius*	SE	6-27-71		FE	3-11-67
Modoc sucker *Catostomus microps*	**SE** SR	10-02-80 1-10-74		FE	6-11-85
Santa Ana sucker *Catostomus santaanae*				FT[13]	5-12-00
Shortnose sucker *Chasmistes brevirostris*	**SE** SR	1-10-74 6-27-71		FE	7-18-88
Lost River sucker *Deltistes luxatus*	**SE** SR	1-10-74 6-27-67		FE	7-18-88
Razorback sucker *Xyrauchen texanus*	**SE** SR	1-10-74 6-27-71		FE	10-23-91
Delta smelt *Hypomesus transpacificus*	**SE** ST	1-20-10 12-09-93		FT	3-05-93
Longfin smelt *Spirinchus thaleichthys*	**ST** SCE	4-09-10 2-02-08			
Pacific eulachon - southern DPS *Thaleichthys pacificus*				FT FT	4-13-11[14] 5-17-10
Lahontan cutthroat trout *Oncorhynchus clarkii henshawi*[15]				**FT** FE	7-16-75 10-13-70

[7] Includes all spawning populations south of the Eel River.
[8] Current taxonomy: *Siphateles bicolor mohavensis.*
[9] Current taxonomy: *Siphateles bicolor snyderi.*
[10] Federal common name: bonytail chub.
[11] On 23 June 2000, the Federal Eastern District Court of Calif. found the final rule to be unlawful and on 22 Sept 2000 remanded the determination back to the USFWS for a reevaluation of the final decision. After a thorough review the USFWS removed the Sacramento splittail from the list of Threatened species.
[12] Current nomenclature and federal listing: Colorado pikeminnow.
[13] Populations in the Los Angeles, San Gabriel, and Santa Ana River basins.
[14] Eulachon was listed as Threatened by the NMFS in 2010 and by the USFWS in 2011.
[15] According to the American Fisheries Society Special Publication 29 (2004), "clarkii" has two i's.

	State Listing			Federal Listing	
Paiute cutthroat trout *Oncorhynchus clarkii seleniris*				**FT** FE	7-16-75 3-11-67[16]
Coho salmon - south of Punta Gorda[17] *Oncorhynchus kisutch*	SE[18]	3-30-05		**FE**[19] FT	8-29-05 12-02-96
Coho salmon - Punta Gorda to the N. border of California[20] *Oncorhynchus kisutch*	ST[21]	3-30-05		FT[22] FT	8-29-05 6-05-97
Steelhead - Southern California DPS[23] *Oncorhynchus mykiss*				FE[24] FE	2-06-06 10-17-97
Steelhead - South-Central California Coast DPS[25] *Oncorhynchus mykiss*				FT[26] FT	2-06-06 10-17-97
Steelhead - Central California Coast DPS[27] *Oncorhynchus mykiss*				FT[28] FT	2-06-06 10-17-97
Steelhead - California Central Valley DPS[29] *Oncorhynchus mykiss*				FT[30] FT	2-06-06 5-18-98
Steelhead - Northern California DPS[31] *Oncorhynchus mykiss*				FT[32] FT	2-06-06 8-07-00
Little Kern golden trout *Oncorhynchus mykiss whitei*[33]				FT	4-13-78
Chinook salmon - Winter-run[34] *Oncorhynchus tshawytscha*	SE	9-22-89		FE[35] FE	8-29-05 2-03-94
Chinook salmon - California coastal ESU[36] *Oncorhynchus tshawytscha*				FT[37] FT	8-29-05 11-15-99

[16] All species with a list date of 03-11-67 were listed under the Endangered Species Preservation Act of October 15, 1966.
[17] The Federal listing is for Central California Coast Coho ESU and includes populations from Punta Gorda south to, and including, the San Lorenzo River as well as populations in tributaries to San Francisco Bay, excluding the Sacramento-San Joaquin River system.
[18] The Coho south of San Francisco Bay were state listed in 1995. In February 2004 the Fish and Game Commission determined that the Coho from San Francisco to Punta Gorda should also be listed as Endangered. This change was finalized by the Office of Administrative Law on March 30, 2005.
[19] The NMFS completed a comprehensive status review in 2005 reaffirming the status.
[20] The Federal listing is for Southern Oregon/Northern California Coast Coho ESU and includes populations in coastal streams between Cape Blanco, Oregon and Punta Gorda, California.
[21] The Fish and Game Commission determined that the Coho from Punta Gorda to the Oregon border should be listed as Threatened on February 25, 2004. This determination was finalized by the Office of Administrative Law on March 30, 2005.
[22] The NMFS completed a comprehensive status review in 2005 reaffirming the status.
[23] Coastal basins from the Santa Maria River (inclusive), south to the U.S.-Mexico Border.
[24] The NMFS completed a comprehensive status review in 2006 reaffirming the status.
[25] Coastal basins from the Pajaro River (inclusive) south to, but not including, the Santa Maria River.
[26] The NMFS completed a comprehensive status review in 2006 reaffirming the status.
[27] Coastal streams from the Russian River (inclusive) to Aptos Creek (inclusive), and the drainages of San Francisco, San Pablo, and Suisun Bays eastward to Chipps Island at the confluence of the Sacramento and San Joaquin Rivers; and tributary streams to Suisun Marsh including Suisun Creek, Green Valley Creek, and an unnamed tributary to Cordelia Slough (commonly referred to as Red Top Creek), exclusive of the Sacramento-San Joaquin River Basin of the California Central Valley.
[28] The NMFS completed a comprehensive status review in 2006 reaffirming the status.
[29] The Sacramento and San Joaquin Rivers and their tributaries.
[30] The NMFS completed a comprehensive status review in 2006 reaffirming the status.
[31] Naturally spawned populations residing below impassable barriers in coastal basins from Redwood Creek in Humboldt County to, and including, the Gualala River in Mendocino County.
[32] The NMFS completed a comprehensive status review in 2006 reaffirming the status.
[33] Originally listed as *Salmo aguabonita whitei*. The genus *Salmo* was reclassified as *Oncorhynchus* changing the name to *Oncorhynchus aguabonita whitei*. However, recent studies indicate this is a subspecies of rainbow trout, therefore *Oncorhynchus mykiss whitei*.
[34] The federal designation is for Chinook salmon - Sacramento River winter-run ESU and described as winter-run populations in the Sacramento River and its tributaries in California.
[35] The NMFS completed a comprehensive status review in 2005 reaffirming the status.

	State Listing			Federal Listing	
Chinook salmon - Spring-run[38] *Oncorhynchus tshawytscha*	ST	2-05-99		FT[39] FT	8-29-05 11-15-99
Bull trout *Salvelinus confluentus*	SE	10-02-80		FT	12-01-99
Desert pupfish *Cyprinodon macularius*	SE	10-02-80		FE	3-31-86
Tecopa pupfish (**Extinct)** *Cyprinodon nevadensis calidae*	**Delisted** SE	1987 6-27-71		**Delisted** FE	1-15-82 10-13-70
Owens pupfish *Cyprinodon radiosus*	SE	6-27-71		FE	3-11-67
Cottonball Marsh pupfish *Cyprinodon salinus milleri*	ST	1-10-74			
Unarmored threespine stickleback *Gasterosteus aculeatus williamsoni*	SE	6-27-71		FE	10-13-70
Rough sculpin *Cottus asperrimus*	ST	1-10-74			
Tidewater goby *Eucyclogobius newberryi*				Withdrawn FPD[40] **FE**	12-09-02 6-24-99 2-04-94
AMPHIBIANS					
California tiger salamander[41] *Ambystoma californiense*	ST[42]	8-19-10		(FE) (FT)	
California tiger salamander - central California DPS *Ambystoma californiense*	(ST)			FT[43]	9-03-04
California tiger salamander - Santa Barbara County DPS *Ambystoma californiense*	(ST)			FE[43]	9-15-00
California tiger salamander - Sonoma County DPS *Ambystoma californiense*	(ST)			FE[43]	3-19-03
Santa Cruz long-toed salamander *Ambystoma macrodactylum croceum*	SE	6-27-71		FE	3-11-67
Siskiyou Mountains salamander *Plethodon stormi*	SCD **ST**	9-30-05 6-27-71			

[36] Rivers and streams south of the Klamath River to the Russian River.
[37] The NMFS completed a comprehensive status review in 2005 reaffirming the status.
[38] The State listing is for "Spring-run chinook salmon (*Oncorhynchus tshawytscha*) of the Sacramento River drainage." The Federal listing is for Central Valley spring-run Chinook ESU and includes populations of spring-run Chinook salmon in the Sacramento River and its tributaries including the Feather River.
[39] The NMFS completed a comprehensive status review in 2005 reaffirming the status.
[40] Proposal to delist referred to populations north of Orange County only.
[41] The State listing refers to the entire range of the species.
[42] Adopted May 20, 2010. The Office of Administrative Law approved the listing on Aug 2, 2010 and the effective date of regulations is Aug 19, 2010.
[43] In 2004 the California tiger salamander was listed as Threatened statewide. The Santa Barbara County and Sonoma County Distinct Vertebrate Population Segments (DPS), formerly listed as Endangered, were reclassified to Threatened. On Aug 19 2005 U.S. District court vacated the downlisting of the Sonoma and Santa Barbara populations from Endangered to Threatened. Therefore, the Sonoma & Santa Barbara populations are once again listed as Endangered.

	State Listing			Federal Listing	
Scott Bar salamander *Plethodon asupak*	ST[44]	6-27-71			
Tehachapi slender salamander *Batrachoseps stebbinsi*	ST	6-27-71			
Kern Canyon slender salamander *Batrachoseps simatus*	ST	6-27-71			
Desert slender salamander *Batrachoseps aridus*[45]	SE	6-27-71		FE	6-04-73
Shasta salamander *Hydromantes shastae*	ST	6-27-71			
Limestone salamander *Hydromantes brunus*	ST	6-27-71			
Black toad *Bufo exsul*[46]	ST	6-27-71			
Arroyo toad *Anaxyrus californicus*[47]				FE	1-17-95
California red-legged frog *Rana aurora draytonii*[48]				FT	5-20-96
Southern mountain yellow-legged frog[49] *Rana muscosa*	SCE[50]	9-21-10		FE[51]	8-01-02
Sierra Nevada mountain yellow-legged frog *Rana sierrae*	SCT[52]	9-21-10			
REPTILES					
Desert tortoise *Gopherus agassizii*	ST	8-03-89		FT	4-02-90
Green sea turtle[53] *Chelonia mydas*				**FT** FE	7-28-78 10-13-70
Loggerhead sea turtle - North Pacific DPS[54] *Caretta caretta*				**FE** FPE FT	10-24-11 3-16-10 7-28-78

[44] Since this newly described species was formerly considered to be a subpopulation of *Plethodon stormi,* and since *Plethodon stormi* is listed as Threatened under the CESA, *Plethodon asupak* retains the Threatened designation.
[45] Current taxonomy: *Batrachoseps major aridus.*
[46] Current taxonomy: *Anaxyrus exsul.*
[47] At the time of listing, arroyo toad was known as *Bufo microscaphus californicus,* a subspecies of southwestern toad. In 2001 it was determined to be its own species, *Bufo californicus*. Since then, many species in the genus *Bufo* were changed to the genus *Anaxyrus*, and now arroyo toad is known as *Anaxyrus californicus*.
[48] Current taxonomy: *Rana draytonii.*
[49] Though the scientific name *Rana muscosa* is not disputed, the State used this common name in the 16 Oct 2012 Notice of Proposed Changes in Regulation, whereas the USFWS listing refers to the distinct population segment listed as mountain yellow-legged frog – Southern California DPS. This species is also known by the common name Sierra Madre yellow-legged frog (Vredenburg et al. 2007).
[50] Filed with the Office of Administrative Law on 16 January 2013; Effective Date of Regulation is pending.
[51] Federal listing refers to the distinct population segment (DPS) in the San Gabriel, San Jacinto, and San Bernardino Mountains only, with a recognized common name of Mountain yellow-legged frog - Southern California DPS. MYLF north of the Tehachapi Mountains are a Federal candidate.
[52] Filed with the Office of Administrative Law on 16 January 2013; Effective Date of Regulation is pending.
[53] Current nomenclature: green turtle.

	State Listing			Federal Listing	
Olive (=Pacific) ridley sea turtle *Lepidochelys olivacea*				FT	7-28-78
Leatherback sea turtle *Dermochelys coriacea*				FE	6-02-70
Barefoot banded gecko[55] *Coleonyx switaki*	ST	10-02-80			
Coachella Valley fringe-toed lizard *Uma inornata*	SE	10-02-80		FT	9-25-80
Blunt-nosed leopard lizard *Gambelia silus*[56]	SE	6-27-71		FE	3-11-67
Flat-tailed horned lizard *Phrynosoma mcallii*				**Withdrawn**[57] FPT[58]	3-15-11 11-29-93
Island night lizard *Xantusia riversiana*				FT	8-11-77
Southern rubber boa *Charina bottae umbratica*[59]	ST	6-27-71			
Alameda whipsnake *Masticophis lateralis euryxanthus*	ST	6-27-71		FT	12-05-97
San Francisco garter snake *Thamnophis sirtalis tetrataenia*	SE	6-27-71		FE	3-11-67
Giant garter snake *Thamnophis couchi gigas*[60]	ST	6-27-71		FT	10-20-93
BIRDS					
Short-tailed albatross *Phoebastria albatrus*				FE FE	8-30-00[61] 6-2-1970
California brown pelican[62] (**Recovered**) *Pelecanus occidentalis californicus*	**Delisted** SE	6-03-09 6-27-71		**Delisted** FE	12-17-09 2-20-08 10-13-70
Aleutian Canada goose **(Recovered)** *Branta canadensis leucopareia*[63]				**Delisted** FT FE	3-20-01 12-12-90 3-11-67

[54] 1978 listing was for the worldwide range of the species. The Mar 16, 2010 proposed rule and Oct 24, 2011 final rule are for the North Pacific DPS (north of the equator & south of 60 degrees north latitude).
[55] Current nomenclature: Barefoot gecko.
[56] Current taxonomy: *Gambelia sila*. Both the State and Federal recognize the common name blunt-nosed leopard lizard (SSAR), but also known as bluntnose leopard lizard (CNAH). Originally listed under the ESA as *Crotaphytus wislizenii silus*.
[57] On June 28, 2006 the USFWS determined that the proposed listing was not warranted and the proposed rule that had been reinstated on Nov 17, 2005 was withdrawn. USFWS specifically reiterated that the 29 Nov 1993 proposal to list as Threatened was withdrawn as of 15 Mar 2011.
[58] On November 17, 2005, the U. S. District Court for the District of Arizona vacated the January 3, 2003 withdrawal of the proposed rule to list the flat-tailed horned lizard and reinstated the 1993 proposed rule.
[59] Current taxonomy: *Charina umbratica.*
[60] Current taxonomy and Federal listing: *Thamnophis gigas.*
[61] Listed as Endangered in one of the original species list, but "due to an inadvertent oversight" when the 1973 ESA repealed the 1969 Act, short-tailed albatross was effectively delisted. Proposed listing to fix this error in 1980, with final rule in 2000.
[62] Federal nomenclature: Brown pelican (*Pelecanus occidentalis*).
[63] Current taxonomy: Cackling goose (*Branta hutchinsii leucopareia*).

	State Listing			Federal Listing	
California condor *Gymnogyps californianus*	SE	6-27-71		FE	3-11-67
Bald eagle *Haliaeetus leucocephalus*	**SE (**rev) SE	10-02-80 6-27-71		**Delisted**[64] FT FE (rev) FE	8-08-07 7-06-99 8-11-95 2-14-78 3-11-67
Swainson's hawk *Buteo swainsoni*	ST	4-17-83			
American peregrine falcon **(Recovered)** *Falco peregrinus anatum*	**Delisted** SE	11-04-09 6-27-71		**Delisted** FE	8-25-99 6-02-70
Arctic peregrine falcon **(Recovered)** *Falco peregrinus tundrius*				**Delisted** FT FE	10-05-94 3-20-84 6-02-70
California black rail *Laterallus jamaicensis coturniculus*	ST	6-27-71			
California clapper rail *Rallus longirostris obsoletus*	SE	6-27-71		FE	10-13-70
Light-footed clapper rail *Rallus longirostris levipes*	SE	6-27-71		FE	10-13-70
Yuma clapper rail *Rallus longirostris yumanensis*	**ST** SE	2-22-78 6-27-71		FE	3-11-67
Greater sandhill crane *Grus canadensis tabida*	ST	4-17-83			
Western snowy plover *Charadrius alexandrinus nivosus*[65]				FT[66]	4-05-93
Mountain plover *Charadrius montanus*				**Withdrawn** FPT	5-12-11 12-5-02
California least tern *Sterna antillarum browni*[67]	SE	6-27-71		FE	10-13-70
Marbled murrelet *Brachyramphus marmoratus*	SE	3-12-92		FT	9-30-92
Xantus's murrelet *Synthliboramphus hypoleucus*	ST[68]	12-22-04			
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	**SE** ST	3-26-88 6-27-71			

[64] The Post-delisting Monitoring Plan will monitor the status of the bald eagle over a 20 year period with sampling events held once every 5 years.
[65] Current taxonomy: *Charadrius nivosus nivosus* (AOU 2011).
[66] Federal status applies only to the Pacific coastal population.
[67] Current taxonomy: *Sternula antillarum browni.*
[68] The Fish and Game Commission determined that Xantus's murrelet should be listed as a Threatened species February 24, 2004. As part of the normal listing process, this decision was reviewed by the Office of Administrative Law. The listing became effective on Dec 22, 2004.

	State Listing			Federal Listing	
Elf owl *Micrathene whitneyi*	SE	10-02-80			
Northern spotted owl *Strix occidentalis caurina*				FT	6-22-90
Great gray owl *Strix nebulosa*	SE	10-02-80			
Gila woodpecker *Melanerpes uropygialis*	SE	3-17-88			
Black-backed woodpecker *Picoides arcticus*	SCE or SCT	12-27-11			
Gilded northern flicker[69] *Colaptes auratus chrysoides*	SE	3-17-88			
Willow flycatcher *Empidonax traillii*	SE[70]	1-02-91			
Southwestern willow flycatcher *Empidonax traillii extimus*	(SE)			FE	3-29-95
Bank swallow *Riparia riparia*	ST	6-11-89			
Coastal California gnatcatcher *Polioptila californica californica*				FT	3-30-93
San Clemente loggerhead shrike *Lanius ludovicianus mearnsi*				FE	8-11-77
Arizona Bell's vireo *Vireo bellii arizonae*	SE	3-17-88			
Least Bell's vireo *Vireo bellii pusillus*	SE	10-02-80		FE	5-02-86
Inyo California towhee *Pipilo crissalis eremophilus*[71]	SE	10-02-80		FT	8-03-87
San Clemente sage sparrow *Amphispiza belli clementeae*				FT	8-11-77
Belding's savannah sparrow *Passerculus sandwichensis beldingi*	SE	1-10-74			
Santa Barbara song sparrow **(Extinct)** *Melospiza melodia graminea*				**Delisted** FE	10-12-83 6-04-73
MAMMALS					
Point Arena mountain beaver *Aplodontia rufa nigra*				FE	12-12-91

[69] Current taxonomy: Gilded flicker (*Colaptes chrysoides*).
[70] State listing includes all subspecies.
[71] Current taxonomy: *Melozone crissalis eremophilus.*

	State Listing			Federal Listing	
San Joaquin antelope squirrel[72] *Ammospermophilus nelsoni*	ST	10-02-80			
Mohave ground squirrel[73] *Spermophilus mohavensis*	ST	6-27-71			
Morro Bay kangaroo rat *Dipodomys heermanni morroensis*	SE	6-27-71		FE	10-13-70
Giant kangaroo rat *Dipodomys ingens*	SE	10-02-80		FE	1-05-87
San Bernardino kangaroo rat[74] *Dipodomys merriami parvus*				FE	9-24-98
Tipton kangaroo rat *Dipodomys nitratoides nitratoides*	SE	6-11-89		FE	7-08-88
Fresno kangaroo rat *Dipodomys nitratoides exilis*	**SE** SR	10-02-80 6-27-71		FE	3-01-85
Stephens' kangaroo rat *Dipodomys stephensi*[75]	ST	6-27-71		FE	9-30-88
Pacific pocket mouse *Perognathus longimembris pacificus*				FE	9-26-94
Amargosa vole *Microtus californicus scirpensis*	SE	10-02-80		FE	11-15-84
Riparian woodrat[76] *Neotoma fuscipes riparia*				FE	3-24-00
Salt-marsh harvest mouse *Reithrodontomys raviventris*	SE	6-27-71		FE	10-13-70
American pika *Ochotona princeps*	SCT	10-26-11			
Riparian brush rabbit *Sylvilagus bachmani riparius*	SE	5-29-94		FE	3-24-00
Buena Vista Lake shrew[77] *Sorex ornatus relictus*				FE	4-05-02
Lesser long-nosed bat *Leptonycteris yerbabuenae*				FE	10-31-88
Gray wolf *Canis lupus*	SCE	10-18-12		FE[78]	4-10-78

[72] Current taxonomy: Nelson's antelope squirrel.
[73] Current taxonomy: *Xerospermophilus mohavensis.*
[74] Federal nomenclature: San Bernardino Merriam's kangaroo rat.
[75] Federal taxonomy: included *Dipodomys cascus*, an invalid junior synonym for *Dipodomys stephensi.*
[76] Federal nomenclature: Riparian (=San Joaquin Valley) woodrat.
[77] Federal nomenclature: Buena Vista Lake ornate shrew.
[78] The full species, *Canis lupus*, was listed as Endangered in 1978. Though the status of the gray wolf is being challenged in other states, any gray wolves present or dispersing into California are considered federally Endangered.

	State Listing			Federal Listing	
Island fox *Urocyon littoralis*	ST[79]	6-27-71			
San Miguel Island Fox *Urocyon littoralis littoralis*	(ST)			FE	4-05-04
Santa Catalina Island Fox *Urocyon littoralis catalinae*	(ST)			FE	4-05-04
Santa Cruz Island Fox *Urocyon littoralis santacruzae*	(ST)			FE	4-05-04
Santa Rosa Island Fox *Urocyon littoralis santarosae*	(ST)			FE	4-05-04
San Joaquin kit fox *Vulpes macrotis mutica*	ST	6-27-71		FE	3-11-67
Sierra Nevada red fox *Vulpes vulpes necator*	ST	10-02-80			
Guadalupe fur seal *Arctocephalus townsendi*	ST	6-27-71		**FT** FE	1-15-86 3-11-67
Steller sea lion - Eastern DPS *Eumetopias jubatus*				FPD **FT** FT	4-18-12 6-4-97[80] 4-05-90
Southern sea otter *Enhydra lutris nereis*				FT	1-14-77
Wolverine *Gulo gulo*	ST	6-27-71			
Fisher - West Coast DPS[81] *Martes pennant*	**Not warranted** SCT or SCE[82]	6-23-10 4-14-09			
California (=Sierra Nevada) bighorn sheep *Ovis canadensis californiana*[83]	**SE** ST	8-27-99 6-27-71		FE	1-03-00
Peninsular bighorn sheep DPS[84] *Ovis canadensis cremnobates*	ST	6-27-71		FE	3-18-98
North Pacific right whale *Eubalaena japonica*[85]				FE[86] FE	4-7-08 6-02-70

[79] State listing includes all 6 subspecies on all 6 islands. Federal listing is for only 4 subspecies on 4 islands.
[80] The NMFS reclassified Steller sea lion as two distinct population segments: western DPS west of 144 degrees longitude (Endangered), and eastern DPS east of 144 degrees longitude (Threatened).
[81] The Fish and Game Commission during their review of the fisher petitioning recognized the common name Pacific fisher. Adopted here is the common name used in the USFWS candidacy (2 Apr 2004), fisher, for the West Coast distinct population segment for California, Oregon, and Washington.
[82] The Fish and Game Commission notice of finding stated that the Pacific fisher was a candidate for listing as either an Endangered or a Threatened species. At the June 23, 2010 meeting the Commission determined that the listing was not warranted.
[83] Current & Federal taxonomy: Sierra Nevada bighorn sheep (*Ovis canadensis sierrae)*
[84] Current taxonomy: the subspecies *O.c. cremnobates* has been synonymized with *O.c. nelsoni*. Peninsular bighorn sheep are now considered to be a Distinct Vertebrate Population Segment (DPS).
[85] The scientific name was clarified in the Federal Register Vol. 68, No. 69 April 10, 2003.

	State Listing			Federal Listing	
Sei whale *Balaenoptera borealis*				FE	6-02-70
Blue whale *Balaenoptera musculus*				FE	6-02-70
Fin whale *Balaenoptera physalus*				FE	6-02-70
Humpback whale[87] *Megaptera novaeangliae*				FE	6-02-70
Gray whale **(Recovered)** *Eschrichtius robustus*				**Delisted** FE	6-15-94 6-02-70
Killer whale (Southern resident DPS) *Orcinus orca*				FE[88] FE	4-04-07 2-16-06 12-22-04
Sperm whale *Physeter macrocephalus*[89]				FE	6-02-70

[86] The NMFS completed a status review of right whales in the N. Pacific and N. Atlantic Oceans and determined the previously Endangered northern right whale (*Eubalaena* spp.) as two separate Endangered species: North Pacific right whale (*E. japonica*) and North Atlantic right whale (*E. glacialis*).
[87] Also known as Hump-backed whale.
[88] The killer whale was listed as Endangered by the NMFS on Feb 16, 2006 and by the USFWS on Apr 4, 2007.
[89] Current taxonomy: *Physeter catodon* with *P. macrocephalus* as a synonym.

ABBREVIATIONS

CESA: California Endangered Species Act

DPS: Distinct population segment

ESA: Endangered Species Act (Federal)

ESU: Evolutionarily significant unit

NMFS: National Marine Fisheries Service

NOAA: National Oceanic and Atmospheric Administration

USFWS: United States Fish and Wildlife Service

ADDITIONAL RESOURCES

The California Fish and Game Commission publishes notices relating to changes to Title 14 of the California Code of Regulations: http://www.fgc.ca.gov/

Title 14 of the California Code of Regulations can be accessed through The Office of Administrative Law: http://www.oal.ca.gov/

The U.S. Fish and Wildlife Service is responsible for protecting Endangered and Threatened species, and conserving candidate species and at-risk species so that ESA listing is not necessary: http://www.fws.gov/Endangered/

NOAA's National Marine Fisheries Service, Office of Protected Resources is responsible for protecting marine mammals and Endangered and Threatened marine life: http://www.nmfs.noaa.gov/pr/

Appendix F. FAA AC 150/5200-33B, “Hazardous Wildlife Attractants On or Near Airports”

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U.S. Department
of Transportation

Federal Aviation Administration

Advisory Circular

Subject: HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AIRPORTS	**Date:** 8/28/2007	**AC No:** 150/5200-33B
	Initiated by: AAS-300	**Change:**

1. PURPOSE. This Advisory Circular (AC) provides guidance on certain land uses that have the potential to attract hazardous wildlife on or near public-use airports. It also discusses airport development projects (including airport construction, expansion, and renovation) affecting aircraft movement near hazardous wildlife attractants. Appendix 1 provides definitions of terms used in this AC.

2. APPLICABILITY. The Federal Aviation Administration (FAA) recommends that public-use airport operators implement the standards and practices contained in this AC. The holders of Airport Operating Certificates issued under Title 14, Code of Federal Regulations (CFR), Part 139, Certification of Airports, Subpart D (Part 139), may use the standards, practices, and recommendations contained in this AC to comply with the wildlife hazard management requirements of Part 139. Airports that have received Federal grant-in-aid assistance must use these standards. The FAA also recommends the guidance in this AC for land-use planners, operators of non-certificated airports, and developers of projects, facilities, and activities on or near airports.

3. CANCELLATION. This AC cancels AC 150/5200-33A, *Hazardous Wildlife Attractants on or near Airports*, dated July 27, 2004.

4. PRINCIPAL CHANGES. This AC contains the following major changes, which are marked with vertical bars in the margin:

a. Technical changes to paragraph references.

b. Wording on storm water detention ponds.

c. Deleted paragraph 4-3.b, *Additional Coordination.*

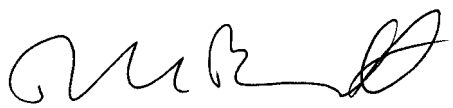
5. BACKGROUND. Information about the risks posed to aircraft by certain wildlife species has increased a great deal in recent years. Improved reporting, studies, documentation, and statistics clearly show that aircraft collisions with birds and other wildlife are a serious economic and public safety problem. While many species of wildlife can pose a threat to aircraft safety, they are not equally hazardous. Table 1

ranks the wildlife groups commonly involved in damaging strikes in the United States according to their relative hazard to aircraft. The ranking is based on the 47,212 records in the FAA National Wildlife Strike Database for the years 1990 through 2003. These hazard rankings, in conjunction with site-specific Wildlife Hazards Assessments (WHA), will help airport operators determine the relative abundance and use patterns of wildlife species and help focus hazardous wildlife management efforts on those species most likely to cause problems at an airport.

Most public-use airports have large tracts of open, undeveloped land that provide added margins of safety and noise mitigation. These areas can also present potential hazards to aviation if they encourage wildlife to enter an airport's approach or departure airspace or air operations area (AOA). Constructed or natural areas—such as poorly drained locations, detention/retention ponds, roosting habitats on buildings, landscaping, odor-causing rotting organic matter (putrescible waste) disposal operations, wastewater treatment plants, agricultural or aquaculture activities, surface mining, or wetlands—can provide wildlife with ideal locations for feeding, loafing, reproduction, and escape. Even small facilities, such as fast food restaurants, taxicab staging areas, rental car facilities, aircraft viewing areas, and public parks, can produce substantial attractions for hazardous wildlife.

During the past century, wildlife-aircraft strikes have resulted in the loss of hundreds of lives worldwide, as well as billions of dollars in aircraft damage. Hazardous wildlife attractants on and near airports can jeopardize future airport expansion, making proper community land-use planning essential. This AC provides airport operators and those parties with whom they cooperate with the guidance they need to assess and address potentially hazardous wildlife attractants when locating new facilities and implementing certain land-use practices on or near public-use airports.

6. MEMORANDUM OF AGREEMENT BETWEEN FEDERAL RESOURCE AGENCIES. The FAA, the U.S. Air Force, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and the U.S. Department of Agriculture - Wildlife Services signed a Memorandum of Agreement (MOA) in July 2003 to acknowledge their respective missions in protecting aviation from wildlife hazards. Through the MOA, the agencies established procedures necessary to coordinate their missions to address more effectively existing and future environmental conditions contributing to collisions between wildlife and aircraft (wildlife strikes) throughout the United States. These efforts are intended to minimize wildlife risks to aviation and human safety while protecting the Nation’s valuable environmental resources.



DAVID L. BENNETT
Director, Office of Airport Safety
and Standards

Table 1. Ranking of 25 species groups as to relative hazard to aircraft (1=most hazardous) based on three criteria (damage, major damage, and effect-on-flight), a composite ranking based on all three rankings, and a relative hazard score. Data were derived from the FAA National Wildlife Strike Database, January 1990–April 2003.[1]

Species group	Ranking by criteria			Composite ranking[2]	Relative hazard score[3]
	Damage[4]	Major damage[5]	Effect on flight[6]		
Deer	1	1	1	1	100
Vultures	2	2	2	2	64
Geese	3	3	6	3	55
Cormorants/pelicans	4	5	3	4	54
Cranes	7	6	4	5	47
Eagles	6	9	7	6	41
Ducks	5	8	10	7	39
Osprey	8	4	8	8	39
Turkey/pheasants	9	7	11	9	33
Herons	11	14	9	10	27
Hawks (buteos)	10	12	12	11	25
Gulls	12	11	13	12	24
Rock pigeon	13	10	14	13	23
Owls	14	13	20	14	23
H. lark/s. bunting	18	15	15	15	17
Crows/ravens	15	16	16	16	16
Coyote	16	19	5	17	14
Mourning dove	17	17	17	18	14
Shorebirds	19	21	18	19	10
Blackbirds/starling	20	22	19	20	10
American kestrel	21	18	21	21	9
Meadowlarks	22	20	22	22	7
Swallows	24	23	24	23	4
Sparrows	25	24	23	24	4
Nighthawks	23	25	25	25	1

[1] Excerpted from the *Special Report for the FAA, "Ranking the Hazard Level of Wildlife Species to Civil Aviation in the USA: Update #1, July 2, 2003".* Refer to this report for additional explanations of criteria and method of ranking.

[2] Relative rank of each species group was compared with every other group for the three variables, placing the species group with the greatest hazard rank for $\geq$ 2 of the 3 variables above the next highest ranked group, then proceeding down the list.

[3] Percentage values, from Tables 3 and 4 in Footnote 1 of the *Special Report*, for the three criteria were summed and scaled down from 100, with 100 as the score for the species group with the maximum summed values and the greatest potential hazard to aircraft.

[4] Aircraft incurred at least some damage (destroyed, substantial, minor, or unknown) from strike.

[5] Aircraft incurred damage or structural failure, which adversely affected the structure strength, performance, or flight characteristics, and which would normally require major repair or replacement of the affected component, or the damage sustained makes it inadvisable to restore aircraft to airworthy condition.

[6] Aborted takeoff, engine shutdown, precautionary landing, or other.

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SECTION 1.

GENERAL SEPARATION CRITERIA FOR HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AIRPORTS.

1-1. INTRODUCTION. When considering proposed land uses, airport operators, local planners, and developers must take into account whether the proposed land uses, including new development projects, will increase wildlife hazards. Land-use practices that attract or sustain hazardous wildlife populations on or near airports can significantly increase the potential for wildlife strikes.

The FAA recommends the minimum separation criteria outlined below for land-use practices that attract hazardous wildlife to the vicinity of airports. Please note that FAA criteria include land uses that cause movement of hazardous wildlife onto, into, or across the airport's approach or departure airspace or air operations area (AOA). (See the discussion of the synergistic effects of surrounding land uses in Section 2-8 of this AC.)

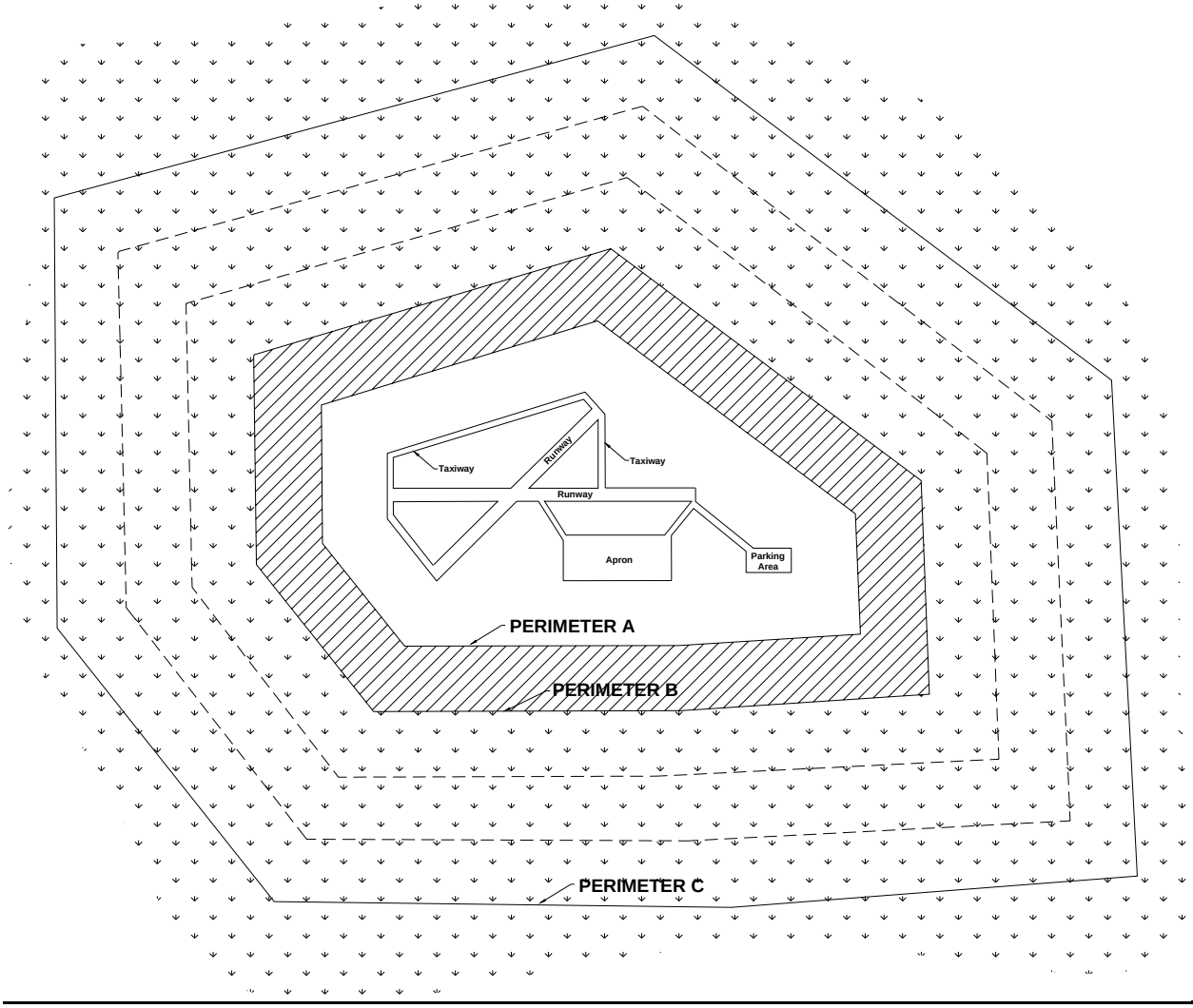
The basis for the separation criteria contained in this section can be found in existing FAA regulations. The separation distances are based on (1) flight patterns of piston-powered aircraft and turbine-powered aircraft, (2) the altitude at which most strikes happen (78 percent occur under 1,000 feet and 90 percent occur under 3,000 feet above ground level), and (3) National Transportation Safety Board (NTSB) recommendations.

1-2. AIRPORTS SERVING PISTON-POWERED AIRCRAFT. Airports that do not sell Jet-A fuel normally serve piston-powered aircraft. Notwithstanding more stringent requirements for specific land uses, the FAA recommends a separation distance of 5,000 feet at these airports for any of the hazardous wildlife attractants mentioned in Section 2 or for new airport development projects meant to accommodate aircraft movement. This distance is to be maintained between an airport's AOA and the hazardous wildlife attractant. Figure 1 depicts this separation distance measured from the nearest aircraft operations areas.

1-3. AIRPORTS SERVING TURBINE-POWERED AIRCRAFT. Airports selling Jet-A fuel normally serve turbine-powered aircraft. Notwithstanding more stringent requirements for specific land uses, the FAA recommends a separation distance of 10,000 feet at these airports for any of the hazardous wildlife attractants mentioned in Section 2 or for new airport development projects meant to accommodate aircraft movement. This distance is to be maintained between an airport's AOA and the hazardous wildlife attractant. Figure 1 depicts this separation distance from the nearest aircraft movement areas.

1-4. PROTECTION OF APPROACH, DEPARTURE, AND CIRCLING AIRSPACE. For all airports, the FAA recommends a distance of 5 statute miles between the farthest edge of the airport's AOA and the hazardous wildlife attractant if the attractant could cause hazardous wildlife movement into or across the approach or departure airspace.

Figure 1. Separation distances within which hazardous wildlife attractants should be avoided, eliminated, or mitigated.



PERIMETER A: For airports serving piston-powered aircraft, hazardous wildlife attractants must be 5,000 feet from the nearest air operations area.

PERIMETER B: For airports serving turbine-powered aircraft, hazardous wildlife attractants must be 10,000 feet from the nearest air operations area.

PERIMETER C: 5-mile range to protect approach, departure and circling airspace.

SECTION 2.

LAND-USE PRACTICES ON OR NEAR AIRPORTS THAT POTENTIALLY ATTRACT HAZARDOUS WILDLIFE.

2-1. GENERAL. The wildlife species and the size of the populations attracted to the airport environment vary considerably, depending on several factors, including land-use practices on or near the airport. This section discusses land-use practices having the potential to attract hazardous wildlife and threaten aviation safety. In addition to the specific considerations outlined below, airport operators should refer to *Wildlife Hazard Management at Airports,* prepared by FAA and U.S. Department of Agriculture (USDA) staff. (This manual is available in English, Spanish, and French. It can be viewed and downloaded free of charge from the FAA's wildlife hazard mitigation web site: http://wildlife-mitigation.tc.FAA.gov.). And, *Prevention and Control of Wildlife Damage,* compiled by the University of Nebraska Cooperative Extension Division. (This manual is available online in a periodically updated version at: ianrwww.unl.edu/wildlife/solutions/handbook/.)

2-2. WASTE DISPOSAL OPERATIONS. Municipal solid waste landfills (MSWLF) are known to attract large numbers of hazardous wildlife, particularly birds. Because of this, these operations, when located within the separations identified in the siting criteria in Sections 1-2 through 1-4, are considered incompatible with safe airport operations.

a. Siting for new municipal solid waste landfills subject to AIR 21. Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (Public Law 106-181) (AIR 21) prohibits the construction or establishment of a new MSWLF within 6 statute miles of certain public-use airports. Before these prohibitions apply, both the airport and the landfill must meet the very specific conditions described below. These restrictions do not apply to airports or landfills located within the state of Alaska.

The airport must (1) have received a Federal grant(s) under 49 U.S.C. § 47101, et. seq.; (2) be under control of a public agency; (3) serve some scheduled air carrier operations conducted in aircraft with less than 60 seats; and (4) have total annual enplanements consisting of at least 51 percent of scheduled air carrier enplanements conducted in aircraft with less than 60 passenger seats.

The proposed MSWLF must (1) be within 6 miles of the airport, as measured from airport property line to MSWLF property line, and (2) have started construction or establishment on or after April 5, 2001. Public Law 106-181 only limits the construction or establishment of some new MSWLF. It does not limit the expansion, either vertical or horizontal, of existing landfills.

NOTE: Consult the most recent version of AC 150/5200-34, *Construction or Establishment of Landfills Near Public Airports,* for a more detailed discussion of these restrictions.

b. Siting for new MSWLF not subject to AIR 21. If an airport and MSWLF do not meet the restrictions of Public Law 106-181, the FAA recommends against locating MSWLF within the separation distances identified in Sections 1-2 through 1-4. The separation distances should be measured from the closest point of the airport's AOA to the closest planned MSWLF cell.

c. Considerations for existing waste disposal facilities within the limits of separation criteria. The FAA recommends against airport development projects that would increase the number of aircraft operations or accommodate larger or faster aircraft near MSWLF operations located within the separations identified in Sections 1-2 through 1-4. In addition, in accordance with 40 CFR 258.10, owners or operators of existing MSWLF units that are located within the separations listed in Sections 1-2 through 1-4 must demonstrate that the unit is designed and operated so it does not pose a bird hazard to aircraft. (See Section 4-2(b) of this AC for a discussion of this demonstration requirement.)

d. Enclosed trash transfer stations. Enclosed waste-handling facilities that receive garbage behind closed doors; process it via compaction, incineration, or similar manner; and remove all residue by enclosed vehicles generally are compatible with safe airport operations, provided they are not located on airport property or within the Runway Protection Zone (RPZ). These facilities should not handle or store putrescible waste outside or in a partially enclosed structure accessible to hazardous wildlife. Trash transfer facilities that are open on one or more sides; that store uncovered quantities of municipal solid waste outside, even if only for a short time; that use semi-trailers that leak or have trash clinging to the outside; or that do not control odors by ventilation and filtration systems (odor masking is not acceptable) do not meet the FAA's definition of fully enclosed trash transfer stations. The FAA considers these facilities incompatible with safe airport operations if they are located closer than the separation distances specified in Sections 1-2 through 1-4.

e. Composting operations on or near airport property. Composting operations that accept only yard waste (e.g., leaves, lawn clippings, or branches) generally do not attract hazardous wildlife. Sewage sludge, woodchips, and similar material are not municipal solid wastes and may be used as compost bulking agents. The compost, however, must never include food or other municipal solid waste. Composting operations should not be located on airport property. Off-airport property composting operations should be located no closer than the greater of the following distances: 1,200 feet from any AOA or the distance called for by airport design requirements (see AC 150/5300-13, *Airport Design*). This spacing should prevent material, personnel, or equipment from penetrating any Object Free Area (OFA), Obstacle Free Zone (OFZ), Threshold Siting Surface (TSS), or Clearway. Airport operators should monitor composting operations located in proximity to the airport to ensure that steam or thermal rise does not adversely affect air traffic. On-airport disposal of compost by-products should not be conducted for the reasons stated in 2-3f.

f. Underwater waste discharges. The FAA recommends against the underwater discharge of any food waste (e.g., fish processing offal) within the separations identified in Sections 1-2 through 1-4 because it could attract scavenging hazardous wildlife.

g. Recycling centers. Recycling centers that accept previously sorted non-food items, such as glass, newspaper, cardboard, or aluminum, are, in most cases, not attractive to hazardous wildlife and are acceptable.

h. Construction and demolition (C&D) debris facilities. C&D landfills do not generally attract hazardous wildlife and are acceptable if maintained in an orderly manner, admit no putrescible waste, and are not co-located with other waste disposal operations. However, C&D landfills have similar visual and operational characteristics to putrescible waste disposal sites. When co-located with putrescible waste disposal operations, C&D landfills are more likely to attract hazardous wildlife because of the similarities between these disposal facilities. Therefore, a C&D landfill co-located with another waste disposal operation should be located outside of the separations identified in Sections 1-2 through 1-4.

i. Fly ash disposal. The incinerated residue from resource recovery power/heat-generating facilities that are fired by municipal solid waste, coal, or wood is generally not a wildlife attractant because it no longer contains putrescible matter. Landfills accepting only fly ash are generally not considered to be wildlife attractants and are acceptable as long as they are maintained in an orderly manner, admit no putrescible waste of any kind, and are not co-located with other disposal operations that attract hazardous wildlife.

Since varying degrees of waste consumption are associated with general incineration (not resource recovery power/heat-generating facilities), the FAA considers the ash from general incinerators a regular waste disposal by-product and, therefore, a hazardous wildlife attractant if disposed of within the separation criteria outlined in Sections 1-2 through 1-4.

2-3. WATER MANAGEMENT FACILITIES. Drinking water intake and treatment facilities, storm water and wastewater treatment facilities, associated retention and settling ponds, ponds built for recreational use, and ponds that result from mining activities often attract large numbers of potentially hazardous wildlife. To prevent wildlife hazards, land-use developers and airport operators may need to develop management plans, in compliance with local and state regulations, to support the operation of storm water management facilities on or near all public-use airports to ensure a safe airport environment.

a. Existing storm water management facilities. On-airport storm water management facilities allow the quick removal of surface water, including discharges related to aircraft deicing, from impervious surfaces, such as pavement and terminal/hangar building roofs. Existing on-airport detention ponds collect storm water, protect water quality, and control runoff. Because they slowly release water

after storms, they create standing bodies of water that can attract hazardous wildlife. Where the airport has developed a Wildlife Hazard Management Plan (WHMP) in accordance with Part 139, the FAA requires immediate correction of any wildlife hazards arising from existing storm water facilities located on or near airports, using appropriate wildlife hazard mitigation techniques. Airport operators should develop measures to minimize hazardous wildlife attraction in consultation with a wildlife damage management biologist.

Where possible, airport operators should modify storm water detention ponds to allow a maximum 48-hour detention period for the design storm. The FAA recommends that airport operators avoid or remove retention ponds and detention ponds featuring dead storage to eliminate standing water. Detention basins should remain totally dry between rainfalls. Where constant flow of water is anticipated through the basin, or where any portion of the basin bottom may remain wet, the detention facility should include a concrete or paved pad and/or ditch/swale in the bottom to prevent vegetation that may provide nesting habitat.

When it is not possible to drain a large detention pond completely, airport operators may use physical barriers, such as bird balls, wires grids, pillows, or netting, to deter birds and other hazardous wildlife. When physical barriers are used, airport operators must evaluate their use and ensure they will not adversely affect water rescue. Before installing any physical barriers over detention ponds on Part 139 airports, airport operators must get approval from the appropriate FAA Regional Airports Division Office.

The FAA recommends that airport operators encourage off-airport storm water treatment facility operators to incorporate appropriate wildlife hazard mitigation techniques into storm water treatment facility operating practices when their facility is located within the separation criteria specified in Sections 1-2 through 1-4.

b. New storm water management facilities. The FAA strongly recommends that off-airport storm water management systems located within the separations identified in Sections 1-2 through 1-4 be designed and operated so as not to create above-ground standing water. Stormwater detention ponds should be designed, engineered, constructed, and maintained for a maximum 48–hour detention period after the design storm and remain completely dry between storms. To facilitate the control of hazardous wildlife, the FAA recommends the use of steep-sided, rip-rap lined, narrow, linearly shaped water detention basins. When it is not possible to place these ponds away from an airport's AOA, airport operators should use physical barriers, such as bird balls, wires grids, pillows, or netting, to prevent access of hazardous wildlife to open water and minimize aircraft-wildlife interactions. When physical barriers are used, airport operators must evaluate their use and ensure they will not adversely affect water rescue. Before installing any physical barriers over detention ponds on Part 139 airports, airport operators must get approval from the appropriate FAA Regional Airports Division Office. All vegetation in or around detention basins that provide food or cover for hazardous wildlife should be eliminated. If soil conditions and other requirements allow, the FAA encourages

the use of underground storm water infiltration systems, such as French drains or buried rock fields, because they are less attractive to wildlife.

c. Existing wastewater treatment facilities. The FAA strongly recommends that airport operators immediately correct any wildlife hazards arising from existing wastewater treatment facilities located on or near the airport. Where required, a WHMP developed in accordance with Part 139 will outline appropriate wildlife hazard mitigation techniques. Accordingly, airport operators should encourage wastewater treatment facility operators to incorporate measures, developed in consultation with a wildlife damage management biologist, to minimize hazardous wildlife attractants. Airport operators should also encourage those wastewater treatment facility operators to incorporate these mitigation techniques into their standard operating practices. In addition, airport operators should consider the existence of wastewater treatment facilities when evaluating proposed sites for new airport development projects and avoid such sites when practicable.

d. New wastewater treatment facilities. The FAA strongly recommends against the construction of new wastewater treatment facilities or associated settling ponds within the separations identified in Sections 1-2 through 1-4. Appendix 1 defines wastewater treatment facility as “any devices and/or systems used to store, treat, recycle, or reclaim municipal sewage or liquid industrial wastes.” The definition includes any pretreatment involving the reduction of the amount of pollutants or the elimination of pollutants prior to introducing such pollutants into a publicly owned treatment works (wastewater treatment facility). During the site-location analysis for wastewater treatment facilities, developers should consider the potential to attract hazardous wildlife if an airport is in the vicinity of the proposed site, and airport operators should voice their opposition to such facilities if they are in proximity to the airport.

e. Artificial marshes. In warmer climates, wastewater treatment facilities sometimes employ artificial marshes and use submergent and emergent aquatic vegetation as natural filters. These artificial marshes may be used by some species of flocking birds, such as blackbirds and waterfowl, for breeding or roosting activities. The FAA strongly recommends against establishing artificial marshes within the separations identified in Sections 1-2 through 1-4.

f. Wastewater discharge and sludge disposal. The FAA recommends against the discharge of wastewater or sludge on airport property because it may improve soil moisture and quality on unpaved areas and lead to improved turf growth that can be an attractive food source for many species of animals. Also, the turf requires more frequent mowing, which in turn may mutilate or flush insects or small animals and produce straw, both of which can attract hazardous wildlife. In addition, the improved turf may attract grazing wildlife, such as deer and geese. Problems may also occur when discharges saturate unpaved airport areas. The resultant soft, muddy conditions can severely restrict or prevent emergency vehicles from reaching accident sites in a timely manner.

2-4. WETLANDS. Wetlands provide a variety of functions and can be regulated by local, state, and Federal laws. Normally, wetlands are attractive to many types of wildlife, including many which rank high on the list of hazardous wildlife species (Table 1).

NOTE: If questions exist as to whether an area qualifies as a wetland, contact the local division of the U.S. Army Corps of Engineers, the Natural Resources Conservation Service, or a wetland consultant qualified to delineate wetlands.

a. Existing wetlands on or near airport property. If wetlands are located on or near airport property, airport operators should be alert to any wildlife use or habitat changes in these areas that could affect safe aircraft operations. At public-use airports, the FAA recommends immediately correcting, in cooperation with local, state, and Federal regulatory agencies, any wildlife hazards arising from existing wetlands located on or near airports. Where required, a WHMP will outline appropriate wildlife hazard mitigation techniques. Accordingly, airport operators should develop measures to minimize hazardous wildlife attraction in consultation with a wildlife damage management biologist.

b. New airport development. Whenever possible, the FAA recommends locating new airports using the separations from wetlands identified in Sections 1-2 through 1-4. Where alternative sites are not practicable, or when airport operators are expanding an existing airport into or near wetlands, a wildlife damage management biologist, in consultation with the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, and the state wildlife management agency should evaluate the wildlife hazards and prepare a WHMP that indicates methods of minimizing the hazards.

c. Mitigation for wetland impacts from airport projects. Wetland mitigation may be necessary when unavoidable wetland disturbances result from new airport development projects or projects required to correct wildlife hazards from wetlands. Wetland mitigation must be designed so it does not create a wildlife hazard. The FAA recommends that wetland mitigation projects that may attract hazardous wildlife be sited outside of the separations identified in Sections 1-2 through 1-4.

(1) Onsite mitigation of wetland functions. The FAA may consider exceptions to locating mitigation activities outside the separations identified in Sections 1-2 through 1-4 if the affected wetlands provide unique ecological functions, such as critical habitat for threatened or endangered species or ground water recharge, which cannot be replicated when moved to a different location. Using existing airport property is sometimes the only feasible way to achieve the mitigation ratios mandated in regulatory orders and/or settlement agreements with the resource agencies. Conservation easements are an additional means of providing mitigation for project impacts. Typically the airport operator continues to own the property, and an easement is created stipulating that the property will be maintained as habitat for state or Federally listed species.

Mitigation must not inhibit the airport operator's ability to effectively control hazardous wildlife on or near the mitigation site or effectively maintain other aspects of safe airport operations. Enhancing such mitigation areas to attract hazardous wildlife must be avoided. The FAA will review any onsite mitigation proposals to determine compatibility with safe airport operations. A wildlife damage management biologist should evaluate any wetland mitigation projects that are needed to protect unique wetland functions and that must be located in the separation criteria in Sections 1-2 through 1-4 before the mitigation is implemented. A WHMP should be developed to reduce the wildlife hazards.

(2) Offsite mitigation of wetland functions. The FAA recommends that wetland mitigation projects that may attract hazardous wildlife be sited outside of the separations identified in Sections 1-2 through 1-4 unless they provide unique functions that must remain onsite (see 2-4c(1)). Agencies that regulate impacts to or around wetlands recognize that it may be necessary to split wetland functions in mitigation schemes. Therefore, regulatory agencies may, under certain circumstances, allow portions of mitigation to take place in different locations.

(3) Mitigation banking. Wetland mitigation banking is the creation or restoration of wetlands in order to provide mitigation credits that can be used to offset permitted wetland losses. Mitigation banking benefits wetland resources by providing advance replacement for permitted wetland losses; consolidating small projects into larger, better-designed and managed units; and encouraging integration of wetland mitigation projects with watershed planning. This last benefit is most helpful for airport projects, as wetland impacts mitigated outside of the separations identified in Sections 1-2 through 1-4 can still be located within the same watershed. Wetland mitigation banks meeting the separation criteria offer an ecologically sound approach to mitigation in these situations. Airport operators should work with local watershed management agencies or organizations to develop mitigation banking for wetland impacts on airport property.

2-5. DREDGE SPOIL CONTAINMENT AREAS. The FAA recommends against locating dredge spoil containment areas (also known as Confined Disposal Facilities) within the separations identified in Sections 1-2 through 1-4 if the containment area or the spoils contain material that would attract hazardous wildlife.

2-6. AGRICULTURAL ACTIVITIES. Because most, if not all, agricultural crops can attract hazardous wildlife during some phase of production, the FAA recommends against the used of airport property for agricultural production, including hay crops, within the separations identified in Sections 1-2 through 1-4. . If the airport has no financial alternative to agricultural crops to produce income necessary to maintain the viability of the airport, then the airport shall follow the crop distance guidelines listed in the table titled "Minimum Distances between Certain Airport Features and Any On-Airport Agricultural Crops" found in AC 150/5300-13, *Airport Design*, Appendix 17. The cost of wildlife control and potential accidents should be weighed against the income produced by the on-airport crops when deciding whether to allow crops on the airport.

a. Livestock production. Confined livestock operations (i.e., feedlots, dairy operations, hog or chicken production facilities, or egg laying operations) often attract flocking birds, such as starlings, that pose a hazard to aviation. Therefore, The FAA recommends against such facilities within the separations identified in Sections 1-2 through 1-4. Any livestock operation within these separations should have a program developed to reduce the attractiveness of the site to species that are hazardous to aviation safety. Free-ranging livestock must not be grazed on airport property because the animals may wander onto the AOA. Furthermore, livestock feed, water, and manure may attract birds.

b. Aquaculture. Aquaculture activities (i.e. catfish or trout production) conducted outside of fully enclosed buildings are inherently attractive to a wide variety of birds. Existing aquaculture facilities/activities within the separations listed in Sections 1-2 through 1-4 must have a program developed to reduce the attractiveness of the sites to species that are hazardous to aviation safety. Airport operators should also oppose the establishment of new aquaculture facilities/activities within the separations listed in Sections 1-2 through 1-4.

c. Alternative uses of agricultural land. Some airports are surrounded by vast areas of farmed land within the distances specified in Sections 1-2 through 1-4. Seasonal uses of agricultural land for activities such as hunting can create a hazardous wildlife situation. In some areas, farmers will rent their land for hunting purposes. Rice farmers, for example, flood their land during waterfowl hunting season and obtain additional revenue by renting out duck blinds. The duck hunters then use decoys and call in hundreds, if not thousands, of birds, creating a tremendous threat to aircraft safety. A wildlife damage management biologist should review, in coordination with local farmers and producers, these types of seasonal land uses and incorporate them into the WHMP.

2-7. GOLF COURSES, LANDSCAPING AND OTHER LAND-USE CONSIDERATIONS.

a. Golf courses. The large grassy areas and open water found on most golf courses are attractive to hazardous wildlife, particularly Canada geese and some species of gulls. These species can pose a threat to aviation safety. The FAA recommends against construction of new golf courses within the separations identified in Sections 1-2 through 1-4. Existing golf courses located within these separations must develop a program to reduce the attractiveness of the sites to species that are hazardous to aviation safety. Airport operators should ensure these golf courses are monitored on a continuing basis for the presence of hazardous wildlife. If hazardous wildlife is detected, corrective actions should be immediately implemented.

b. Landscaping and landscape maintenance. Depending on its geographic location, landscaping can attract hazardous wildlife. The FAA recommends that airport operators approach landscaping with caution and confine it to airport areas not associated with aircraft movements. A wildlife damage management biologist should review all landscaping plans. Airport operators should also monitor all landscaped areas on a continuing basis for the presence of hazardous wildlife. If

hazardous wildlife is detected, corrective actions should be immediately implemented.

Turf grass areas can be highly attractive to a variety of hazardous wildlife species. Research conducted by the USDA Wildlife Services' National Wildlife Research Center has shown that no one grass management regime will deter all species of hazardous wildlife in all situations. In cooperation with wildlife damage management biologist, airport operators should develop airport turf grass management plans on a prescription basis, depending on the airport's geographic locations and the type of hazardous wildlife likely to frequent the airport

Airport operators should ensure that plant varieties attractive to hazardous wildlife are not used on the airport. Disturbed areas or areas in need of re-vegetating should not be planted with seed mixtures containing millet or any other large-seed producing grass. For airport property already planted with seed mixtures containing millet, rye grass, or other large-seed producing grasses, the FAA recommends disking, plowing, or another suitable agricultural practice to prevent plant maturation and seed head production. Plantings should follow the specific recommendations for grass management and seed and plant selection made by the State University Cooperative Extension Service, the local office of Wildlife Services, or a qualified wildlife damage management biologist. Airport operators should also consider developing and implementing a preferred/prohibited plant species list, reviewed by a wildlife damage management biologist, which has been designed for the geographic location to reduce the attractiveness to hazardous wildlife for landscaping airport property.

c. Airports surrounded by wildlife habitat. The FAA recommends that operators of airports surrounded by woodlands, water, or wetlands refer to Section 2.4 of this AC. Operators of such airports should provide for a Wildlife Hazard Assessment (WHA) conducted by a wildlife damage management biologist. This WHA is the first step in preparing a WHMP, where required.

d. Other hazardous wildlife attractants. Other specific land uses or activities (e.g., sport or commercial fishing, shellfish harvesting, etc.), perhaps unique to certain regions of the country, have the potential to attract hazardous wildlife. Regardless of the source of the attraction, when hazardous wildlife is noted on a public-use airport, airport operators must take prompt remedial action(s) to protect aviation safety.

2-8. SYNERGISTIC EFFECTS OF SURROUNDING LAND USES. There may be circumstances where two (or more) different land uses that would not, by themselves, be considered hazardous wildlife attractants or that are located outside of the separations identified in Sections 1-2 through 1-4 that are in such an alignment with the airport as to create a wildlife corridor directly through the airport and/or surrounding airspace. An example of this situation may involve a lake located outside of the separation criteria on the east side of an airport and a large hayfield on the west side of an airport, land uses that together could create a flyway for Canada geese directly across the airspace of the airport. There are numerous examples of such situations;

therefore, airport operators and the wildlife damage management biologist must consider the entire surrounding landscape and community when developing the WHMP.

SECTION 3.

PROCEDURES FOR WILDLIFE HAZARD MANAGEMENT BY OPERATORS OF PUBLIC-USE AIRPORTS.

3.1. INTRODUCTION. In recognition of the increased risk of serious aircraft damage or the loss of human life that can result from a wildlife strike, the FAA may require the development of a Wildlife Hazard Management Plan (WHMP) when specific triggering events occur on or near the airport. Part 139.337 discusses the specific events that trigger a Wildlife Hazard Assessment (WHA) and the specific issues that a WHMP must address for FAA approval and inclusion in an Airport Certification Manual.

3.2. COORDINATION WITH USDA WILDLIFE SERVICES OR OTHER QUALIFIED WILDLIFE DAMAGE MANAGEMENT BIOLOGISTS. The FAA will use the Wildlife Hazard Assessment (WHA) conducted in accordance with Part 139 to determine if the airport needs a WHMP. Therefore, persons having the education, training, and expertise necessary to assess wildlife hazards must conduct the WHA. The airport operator may look to Wildlife Services or to qualified private consultants to conduct the WHA. When the services of a wildlife damage management biologist are required, the FAA recommends that land-use developers or airport operators contact a consultant specializing in wildlife damage management or the appropriate state director of Wildlife Services.

NOTE: Telephone numbers for the respective USDA Wildlife Services state offices can be obtained by contacting USDA Wildlife Services Operational Support Staff, 4700 River Road, Unit 87, Riverdale, MD, 20737-1234, Telephone (301) 734-7921, Fax (301) 734-5157 *(http://www.aphis.usda.gov/ws/)*.

3-3. WILDLIFE HAZARD MANAGEMENT AT AIRPORTS: A MANUAL FOR AIRPORT PERSONNEL. This manual, prepared by FAA and USDA Wildlife Services staff, contains a compilation of information to assist airport personnel in the development, implementation, and evaluation of WHMPs at airports. The manual includes specific information on the nature of wildlife strikes, legal authority, regulations, wildlife management techniques, WHAs, WHMPs, and sources of help and information. The manual is available in three languages: English, Spanish, and French. It can be viewed and downloaded free of charge from the FAA's wildlife hazard mitigation web site: http://wildlife-mitigation.tc.FAA.gov/. This manual only provides a starting point for addressing wildlife hazard issues at airports. Hazardous wildlife management is a complex discipline and conditions vary widely across the United States. Therefore, qualified wildlife damage management biologists must direct the development of a WHMP and the implementation of management actions by airport personnel.

There are many other resources complementary to this manual for use in developing and implementing WHMPs. Several are listed in the manual's bibliography.

3-4. WILDLIFE HAZARD ASSESSMENTS, TITLE 14, CODE OF FEDERAL REGULATIONS, PART 139. Part 139.337(b) requires airport operators to conduct a Wildlife Hazard Assessment (WHA) when certain events occur on or near the airport.

Part 139.337 (c) provides specific guidance as to what facts must be addressed in a WHA.

3-5. WILDLIFE HAZARD MANAGEMENT PLAN (WHMP). The FAA will consider the results of the WHA, along with the aeronautical activity at the airport and the views of the airport operator and airport users, in determining whether a formal WHMP is needed, in accordance with Part 139.337. If the FAA determines that a WHMP is needed, the airport operator must formulate and implement a WHMP, using the WHA as the basis for the plan.

The goal of an airport's Wildlife Hazard Management Plan is to minimize the risk to aviation safety, airport structures or equipment, or human health posed by populations of hazardous wildlife on and around the airport.

The WHMP must identify hazardous wildlife attractants on or near the airport and the appropriate wildlife damage management techniques to minimize the wildlife hazard. It must also prioritize the management measures.

3-6. LOCAL COORDINATION. The establishment of a Wildlife Hazards Working Group (WHWG) will facilitate the communication, cooperation, and coordination of the airport and its surrounding community necessary to ensure the effectiveness of the WHMP. The cooperation of the airport community is also necessary when new projects are considered. Whether on or off the airport, the input from all involved parties must be considered when a potentially hazardous wildlife attractant is being proposed. Airport operators should also incorporate public education activities with the local coordination efforts because some activities in the vicinity of your airport, while harmless under normal leisure conditions, can attract wildlife and present a danger to aircraft. For example, if public trails are planned near wetlands or in parks adjoining airport property, the public should know that feeding birds and other wildlife in the area may pose a risk to aircraft.

Airport operators should work with local and regional planning and zoning boards so as to be aware of proposed land-use changes, or modification of existing land uses, that could create hazardous wildlife attractants within the separations identified in Sections 1-2 through 1-4. Pay particular attention to proposed land uses involving creation or expansion of waste water treatment facilities, development of wetland mitigation sites, or development or expansion of dredge spoil containment areas. At the very least, airport operators must ensure they are on the notification list of the local planning board or equivalent review entity for all communities located within 5 miles of the airport, so they will receive notification of any proposed project and have the opportunity to review it for attractiveness to hazardous wildlife.

3-7 COORDINATION/NOTIFICATION OF AIRMEN OF WILDLIFE HAZARDS. If an existing land-use practice creates a wildlife hazard and the land-use practice or wildlife hazard cannot be immediately eliminated, airport operators must issue a Notice to Airmen (NOTAM) and encourage the land–owner or manager to take steps to control the wildlife hazard and minimize further attraction.

SECTION 4.

FAA NOTIFICATION AND REVIEW OF PROPOSED LAND-USE PRACTICE CHANGES IN THE VICINITY OF PUBLIC-USE AIRPORTS

4-1. FAA REVIEW OF PROPOSED LAND-USE PRACTICE CHANGES IN THE VICINITY OF PUBLIC-USE AIRPORTS.

a. The FAA discourages the development of waste disposal and other facilities, discussed in Section 2, located within the 5,000/10,000-foot criteria specified in Sections 1-2 through 1-4.

b. For projects that are located outside the 5,000/10,000-foot criteria but within 5 statute miles of the airport's AOA, the FAA may review development plans, proposed land-use changes, operational changes, or wetland mitigation plans to determine if such changes present potential wildlife hazards to aircraft operations. The FAA considers sensitive airport areas as those that lie under or next to approach or departure airspace. This brief examination should indicate if further investigation is warranted.

c. Where a wildlife damage management biologist has conducted a further study to evaluate a site's compatibility with airport operations, the FAA may use the study results to make a determination.

4-2. WASTE MANAGEMENT FACILITIES.

a. Notification of new/expanded project proposal. Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (Public Law 106-181) limits the construction or establishment of new MSWLF within 6 statute miles of certain public-use airports, when both the airport and the landfill meet very specific conditions. See Section 2-2 of this AC and AC 150/5200-34 for a more detailed discussion of these restrictions.

The Environmental Protection Agency (EPA) requires any MSWLF operator proposing a new or expanded waste disposal operation within 5 statute miles of a runway end to notify the appropriate FAA Regional Airports Division Office and the airport operator of the proposal (40 CFR 258, *Criteria for Municipal Solid Waste Landfills*, Section 258.10, *Airport Safety*). The EPA also requires owners or operators of new MSWLF units, or lateral expansions of existing MSWLF units, that are located within 10,000 feet of any airport runway end used by turbojet aircraft, or within 5,000 feet of any airport runway end used only by piston-type aircraft, to demonstrate successfully that such units are not hazards to aircraft. (See 4-2.b below.)

When new or expanded MSWLF are being proposed near airports, MSWLF operators must notify the airport operator and the FAA of the proposal as early as possible pursuant to 40 CFR 258.

b. Waste handling facilities within separations identified in Sections 1-2 through 1-4. To claim successfully that a waste-handling facility sited within the separations identified in Sections 1-2 through 1-4 does not attract hazardous wildlife and does not threaten aviation, the developer must establish convincingly that the facility will not handle putrescible material other than that as outlined in 2-2.d. The FAA strongly recommends against any facility other than that as outlined in 2-2.d (enclosed transfer stations). The FAA will use this information to determine if the facility will be a hazard to aviation.

c. Putrescible-Waste Facilities. In their effort to satisfy the EPA requirement, some putrescible-waste facility proponents may offer to undertake experimental measures to demonstrate that their proposed facility will not be a hazard to aircraft. To date, no such facility has been able to demonstrate an ability to reduce and sustain hazardous wildlife to levels that existed before the putrescible-waste landfill began operating. For this reason, demonstrations of experimental wildlife control measures may not be conducted within the separation identified in Sections 1-2 through 1-4.

4-3. OTHER LAND-USE PRACTICE CHANGES. As a matter of policy, the FAA encourages operators of public-use airports who become aware of proposed land use practice changes that may attract hazardous wildlife within 5 statute miles of their airports to promptly notify the FAA. The FAA also encourages proponents of such land use changes to notify the FAA as early in the planning process as possible. Advanced notice affords the FAA an opportunity (1) to evaluate the effect of a particular land-use change on aviation safety and (2) to support efforts by the airport sponsor to restrict the use of land next to or near the airport to uses that are compatible with the airport.

The airport operator, project proponent, or land-use operator may use FAA Form 7460-1, *Notice of Proposed Construction or Alteration*, or other suitable documents similar to FAA Form 7460-1 to notify the appropriate FAA Regional Airports Division Office. Project proponents can contact the appropriate FAA Regional Airports Division Office for assistance with the notification process.

It is helpful if the notification includes a 15-minute quadrangle map of the area identifying the location of the proposed activity. The land-use operator or project proponent should also forward specific details of the proposed land-use change or operational change or expansion. In the case of solid waste landfills, the information should include the type of waste to be handled, how the waste will be processed, and final disposal methods.

a. Airports that have received Federal grant-in-aid assistance. Airports that have received Federal grant-in-aid assistance are required by their grant assurances to take appropriate actions to restrict the use of land next to or near the airport to uses that are compatible with normal airport operations. The FAA recommends that airport operators to the extent practicable oppose off-airport land-use changes or practices within the separations identified in Sections 1-2 through 1-4 that may attract hazardous wildlife. Failure to do so may lead to noncompliance with applicable grant assurances. The FAA will not approve the placement of airport

development projects pertaining to aircraft movement in the vicinity of hazardous wildlife attractants without appropriate mitigating measures. Increasing the intensity of wildlife control efforts is not a substitute for eliminating or reducing a proposed wildlife hazard. Airport operators should identify hazardous wildlife attractants and any associated wildlife hazards during any planning process for new airport development projects.

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APPENDIX 1. DEFINITIONS OF TERMS USED IN THIS ADVISORY CIRCULAR.

1. **GENERAL.** This appendix provides definitions of terms used throughout this AC.

    1. **Air operations area.** Any area of an airport used or intended to be used for landing, takeoff, or surface maneuvering of aircraft. An air operations area includes such paved areas or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runway, taxiways, or apron.

    2. **Airport operator.** The operator (private or public) or sponsor of a public-use airport.

    3. **Approach or departure airspace.** The airspace, within 5 statute miles of an airport, through which aircraft move during landing or takeoff.

    4. **Bird balls.** High-density plastic floating balls that can be used to cover ponds and prevent birds from using the sites.

    5. **Certificate holder.** The holder of an Airport Operating Certificate issued under Title 14, Code of Federal Regulations, Part 139.

    6. **Construct a new MSWLF.** To begin to excavate, grade land, or raise structures to prepare a municipal solid waste landfill as permitted by the appropriate regulatory or permitting agency.

    7. **Detention ponds.** Storm water management ponds that hold storm water for short periods of time, a few hours to a few days.

    8. **Establish a new MSWLF.** When the first load of putrescible waste is received on-site for placement in a prepared municipal solid waste landfill.

    9. **Fly ash.** The fine, sand-like residue resulting from the complete incineration of an organic fuel source. Fly ash typically results from the combustion of coal or waste used to operate a power generating plant.

    10. **General aviation aircraft.** Any civil aviation aircraft not operating under 14 CFR Part 119, Certification: Air Carriers and Commercial Operators.

    11. **Hazardous wildlife.** Species of wildlife (birds, mammals, reptiles), including feral animals and domesticated animals not under control, that are associated with aircraft strike problems, are capable of causing structural damage to airport facilities, or act as attractants to other wildlife that pose a strike hazard

    12. **Municipal Solid Waste Landfill (MSWLF).** A publicly or privately owned discrete area of land or an excavation that receives household waste and that is not a land application unit, surface impoundment, injection well, or waste pile, as those terms are defined under 40 CFR § 257.2. An MSWLF may receive

other types wastes, such as commercial solid waste, non-hazardous sludge, small-quantity generator waste, and industrial solid waste, as defined under 40 CFR § 258.2. An MSWLF can consist of either a stand alone unit or several cells that receive household waste.

13. **New MSWLF.** A municipal solid waste landfill that was established or constructed after April 5, 2001.

14. **Piston-powered aircraft.** Fixed-wing aircraft powered by piston engines.

15. **Piston-use airport.** Any airport that does not sell Jet-A fuel for fixed-wing turbine-powered aircraft, and primarily serves fixed-wing, piston-powered aircraft. Incidental use of the airport by turbine-powered, fixed-wing aircraft would not affect this designation. However, such aircraft should not be based at the airport.

16. **Public agency.** A State or political subdivision of a State, a tax-supported organization, or an Indian tribe or pueblo (49 U.S.C. § 47102(19)).

17. **Public airport.** An airport used or intended to be used for public purposes that is under the control of a public agency; and of which the area used or intended to be used for landing, taking off, or surface maneuvering of aircraft is publicly owned (49 U.S.C. § 47102(20)).

18. **Public-use airport.** An airport used or intended to be used for public purposes, and of which the area used or intended to be used for landing, taking off, or surface maneuvering of aircraft may be under the control of a public agency or privately owned and used for public purposes (49 U.S.C. § 47102(21)).

19. **Putrescible waste.** Solid waste that contains organic matter capable of being decomposed by micro-organisms and of such a character and proportion as to be capable of attracting or providing food for birds (40 CFR §257.3-8).

20. **Putrescible-waste disposal operation.** Landfills, garbage dumps, underwater waste discharges, or similar facilities where activities include processing, burying, storing, or otherwise disposing of putrescible material, trash, and refuse.

21. **Retention ponds.** Storm water management ponds that hold water for several months.

22. **Runway protection zone (RPZ).** An area off the runway end to enhance the protection of people and property on the ground (see AC 150/5300-13). The dimensions of this zone vary with the airport design, aircraft, type of operation, and visibility minimum.

23. **Scheduled air carrier operation.** Any common carriage passenger-carrying operation for compensation or hire conducted by an air carrier or commercial

operator for which the air carrier, commercial operator, or their representative offers in advance the departure location, departure time, and arrival location. It does not include any operation that is conducted as a supplemental operation under 14 CFR Part 119 or as a public charter operation under 14 CFR Part 380 (14 CFR § 119.3).

24. **Sewage sludge.** Any solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment process; and a material derived from sewage sludge. Sewage does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works. (40 CFR 257.2)

25. **Sludge.** Any solid, semi-solid, or liquid waste generated form a municipal, commercial or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility or any other such waste having similar characteristics and effect. (40 CFR 257.2)

26. **Solid waste.** Any garbage, refuse, sludge, from a waste treatment plant, water supply treatment plant or air pollution control facility and other discarded material, including, solid liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved materials in domestic sewage, or solid or dissolved material in irrigation return flows or industrial discharges which are point sources subject to permits under section 402 of the Federal Water Pollution Control Act, as amended (86 Stat. 880), or source, special nuclear, or by product material as defined by the Atomic Energy Act of 1954, as amended, (68 Stat. 923). (40 CFR 257.2)

27. **Turbine-powered aircraft.** Aircraft powered by turbine engines including turbojets and turboprops but excluding turbo-shaft rotary-wing aircraft.

28. **Turbine-use airport.** Any airport that sells Jet-A fuel for fixed-wing turbine-powered aircraft.

29. **Wastewater treatment facility.** Any devices and/or systems used to store, treat, recycle, or reclaim municipal sewage or liquid industrial wastes, including Publicly Owned Treatment Works (POTW), as defined by Section 212 of the Federal Water Pollution Control Act (P.L. 92-500) as amended by the Clean Water Act of 1977 (P.L. 95-576) and the Water Quality Act of 1987 (P.L. 100-4). This definition includes any pretreatment involving the reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a POTW. (See 40 CFR Section 403.3 (q), (r), & (s)).

30. Wildlife. Any wild animal, including without limitation any wild mammal, bird, reptile, fish, amphibian, mollusk, crustacean, arthropod, coelenterate, or other invertebrate, including any part, product, egg, or offspring thereof (50 CFR 10.12, *Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants*). As used in this AC, wildlife includes feral animals and domestic animals out of the control of their owners (14 CFR Part 139, Certification of Airports).

31. Wildlife attractants. Any human-made structure, land-use practice, or human-made or natural geographic feature that can attract or sustain hazardous wildlife within the landing or departure airspace or the airport's AOA. These attractants can include architectural features, landscaping, waste disposal sites, wastewater treatment facilities, agricultural or aquaculture activities, surface mining, or wetlands.

32. Wildlife hazard. A potential for a damaging aircraft collision with wildlife on or near an airport.

33. Wildlife strike. A wildlife strike is deemed to have occurred when:

a. A pilot reports striking 1 or more birds or other wildlife;

b. Aircraft maintenance personnel identify aircraft damage as having been caused by a wildlife strike;

c. Personnel on the ground report seeing an aircraft strike 1 or more birds or other wildlife;

d. Bird or other wildlife remains, whether in whole or in part, are found within 200 feet of a runway centerline, unless another reason for the animal's death is identified;

e. The animal's presence on the airport had a significant negative effect on a flight (i.e., aborted takeoff, aborted landing, high-speed emergency stop, aircraft left pavement area to avoid collision with animal) (Transport Canada, Airports Group, *Wildlife Control Procedures Manual*, Technical Publication 11500E, 1994).

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Appendix G. Field Data Forms

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TRM WILDLIFE HAZARD OBSERVATION SHEET

Date			Observer					Weather						Page of	
Time (24 Hrs)	Station #	Species	No. Obs	Activity	Height	Cover Type	Grid	Time (24 Hrs)	Station #	Species	No. Obs	Activity	Height, Dirctn	Cover Type	Grid

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