EAST BRANCH EXTENSION PHASE II

Citrus Reservoir Wildlife Hazard Management Plan

Prepared for
Department of Water Resources

September 2011

ESA

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626 Wilshire Boulevard
Suite 1100
Los Angeles, CA 90017
213.599.4300
www.esassoc.com

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SECTION 1
Project Purpose and Description

1.1 Project Purpose

A Wildlife Hazard Management Plan (WHMP) is being prepared for the California Department of Water Resourced (DWR) for the proposed Citrus Reservoir project to comply with mitigation measures identified as part of the California Environmental Quality Act (CEQA) process. The Citrus Reservoir project is part of the East Branch Extension Phase II construction project (EBXII). The final Environmental Impact Report (EIR) was approved in March 2009 by DWR. Within the EIR's Land use, Planning and Recreation analysis of impacts, "Effects on Aviation and Wildlife Hazards" was identified and the impact analysis determined that there was a potential hazard associated with the Citrus Reservoir due to the proximity of the project to the Redlands Municipal Airport. The following mitigation measure was provided in Section 3.0 of the Final EIR to lessen potential wildlife hazard impacts to less-than-significant levels:

Mitigation Measures

LU-7: DWR shall reduce the potential attraction of its proposed facilities to wildlife through project design features, and ongoing monitoring as described below:

- DWR shall incorporate one or more avian wildlife deterrent design measures to minimize attracting wildlife. Measures could include one or more physical, mechanical, visual, biological devices and features to deter avian wildlife attraction into project areas coincidental with the Airport Land Use Planning Areas.
- DWR shall not plant seed-bearing grasses or fruit-bearing trees (other than citrus trees or native vegetation required to replace existing habitat value) for landscaping at the Citrus Reservoir or within the disturbed project area coinciding with the Airport Land Use Plan.
- DWR shall coordinate with the City of Redlands to develop a Wildlife Hazard Management Plan for the Citrus Reservoir pursuant to FAA guidelines. At a minimum the Plan would include maintenance, monitoring, and reporting requirements.

The WHMP is being prepared to meet the third element of Mitigation Measure LU-7 of the Final EIR document. The WHMP is focused on the design best management practices and operational procedures to reduce the potential for wildlife hazard attractants associated with the Citrus Reservoir project. The WHMP will also include a plan for assessing wildlife utilization of the Citrus Reservoir to assist in determining if the project attracts wildlife that may cause a risk to aviation at Redlands Municipal Airport. The WHMP document does not include an assessment of the airport or other

facilities. Coordination of this WHMP will be completed with the City of Redlands but does not include information regarding wildlife hazard reduction or actions related to airport property.

1.2 Project Description

1.2.1 Citrus Reservoir

The Citrus Reservoir is part of the EBX II construction project located in Redlands, California **(See Figure 1.2-1)**. The EBXII construction project includes the following elements:

- The Citrus Reservoir
- Approximately six miles of 72 or 78-inch pipeline
- Citrus Pump Station
- Expansion of the existing Crafton Hills Pump Station
- An additional pump at the existing Cherry Valley Pump Station.

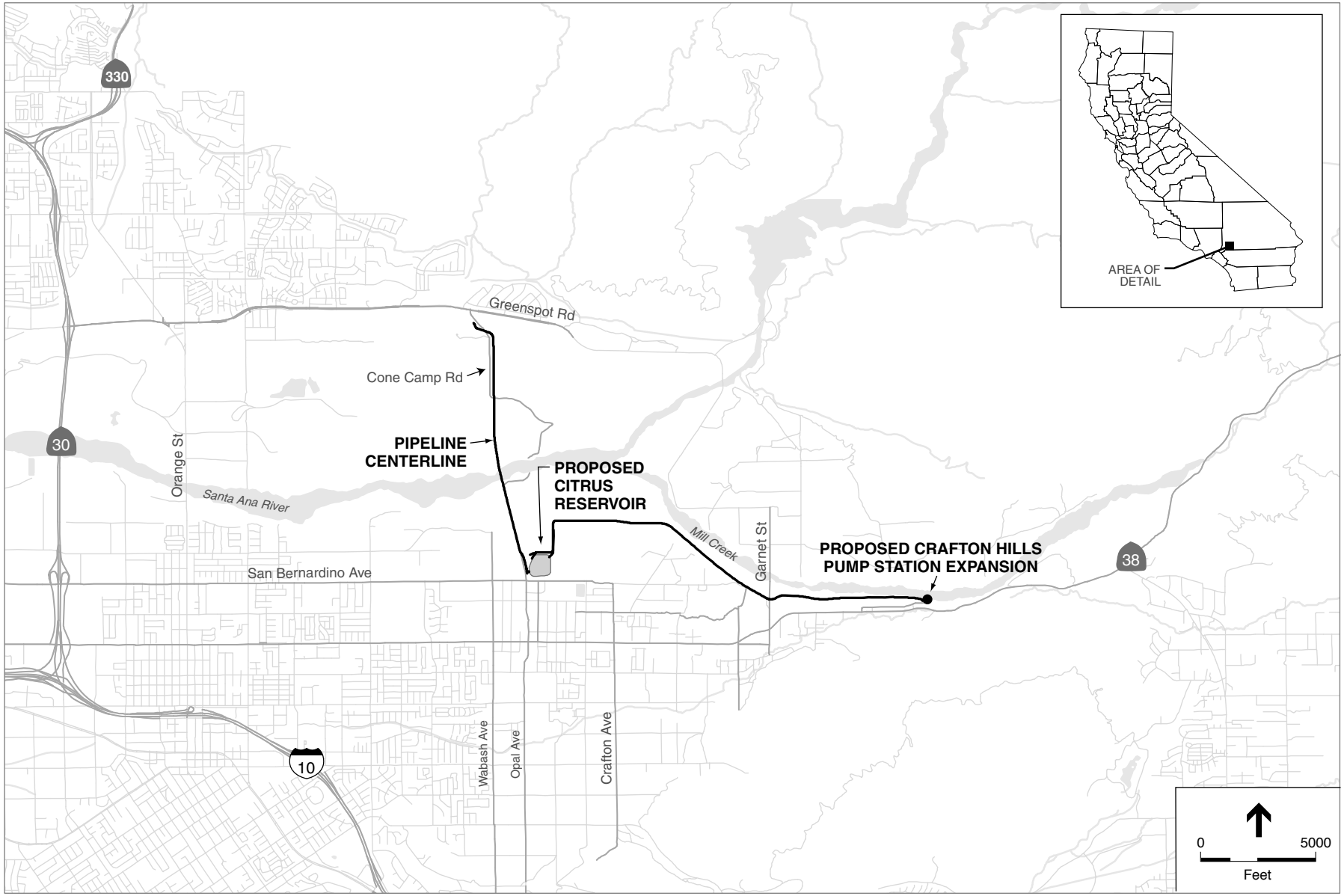
The Citrus Reservoir site is approximately 35 acres and will consist of a 399 acre-feet storage reservoir, operations building, parking, and pump station (see **Figure 1.2-2**). The project is being constructed within an existing citrus orchard (see **Figure 1.2-3)**. The water surface area of the reservoir will be approximately 17 acres at the maximum water level. The actual surface area of the reservoir fluctuates with operational changes is the water level. The maximum depth of the reservoir will be 40 feet deep. The reservoir will be lined with an impermeable liner and will have a chain link fence around the perimeter of the area.

1.2.2 Redlands Municipal Airport

The planned Citrus Reservoir site is located approximately 2,500 feet from Runway 8/26 at the Redlands Municipal Airport. The single runway airport is a general aviation airport located on an approximate 170 acre site. The airport has approximately 82,000 operations annually and approximately 224 based aircraft.[1] The airport serves both piston powered (typical of smaller general aviation planes) and turbine powered (jets or turboprops) planes. The airport also has numerous helicopter operations. Airport facilities include T-hangars, box hangars, conventional hangars, a terminal building, fueling island, tie-down areas, and undeveloped areas (see **Figure 1.2-4**). The City of Redlands completed a Master Plan Update for the airport in 2008. **Figure 1.2-5** provides the Master Plan Conceptual drawing depicting short term and long term development goals for the airport.

The Federal Aviation Administration (FAA) has provided guidance on the general separation distances between an airport's operation area (AOA) and the existence or creation of a wildlife hazard attractant in FAA Advisory Circular (AC) 150/5200-33B "Wildlife Hazard Attractants on or Near Airports" (see **Appendix A** for a copy of the AC).

[1] Redlands Municipal Airport Master Plan (2008)



SOURCE: ESA, 2010.

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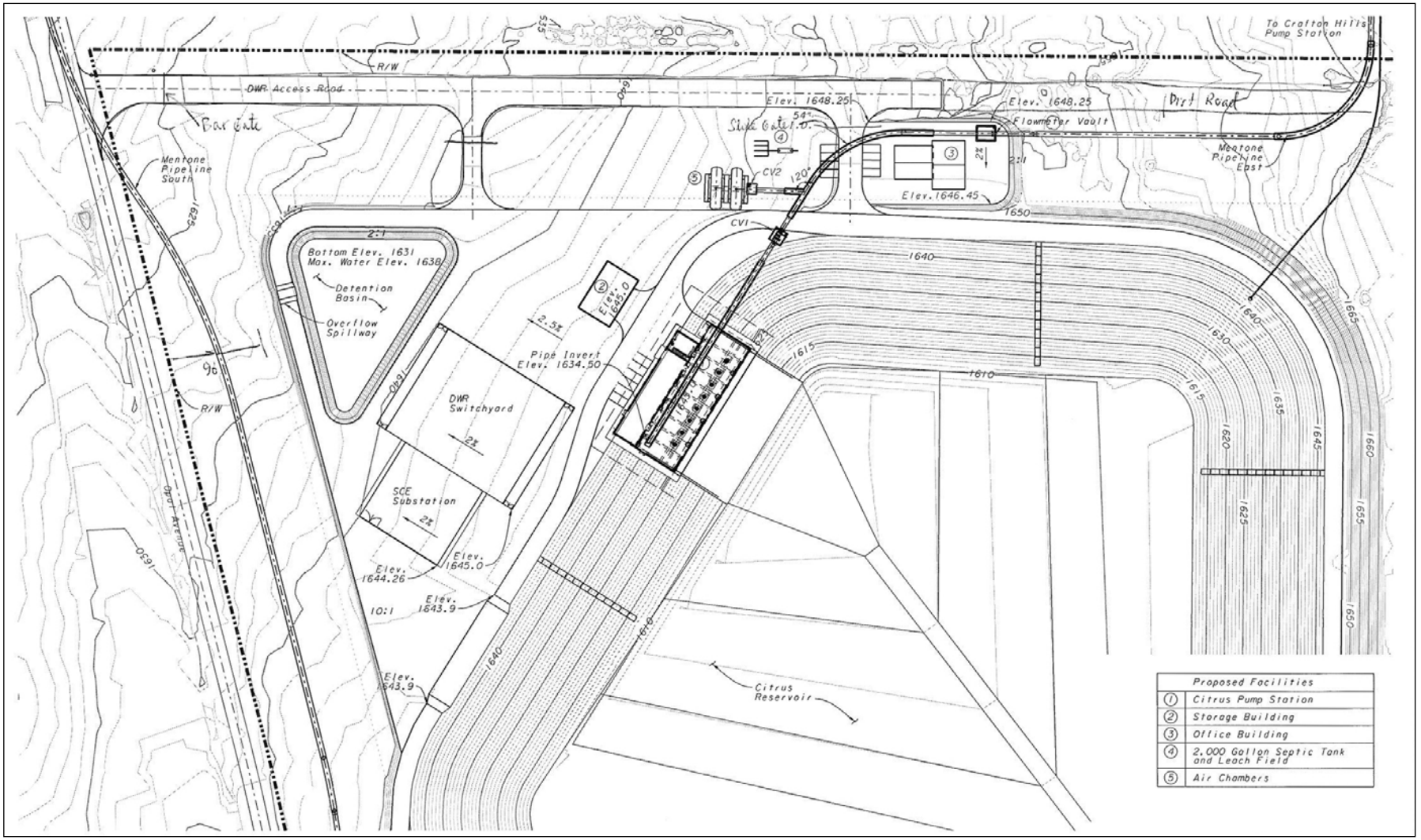
Figure 1.2-1
Project Location



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SOURCE: DWR, 2010.

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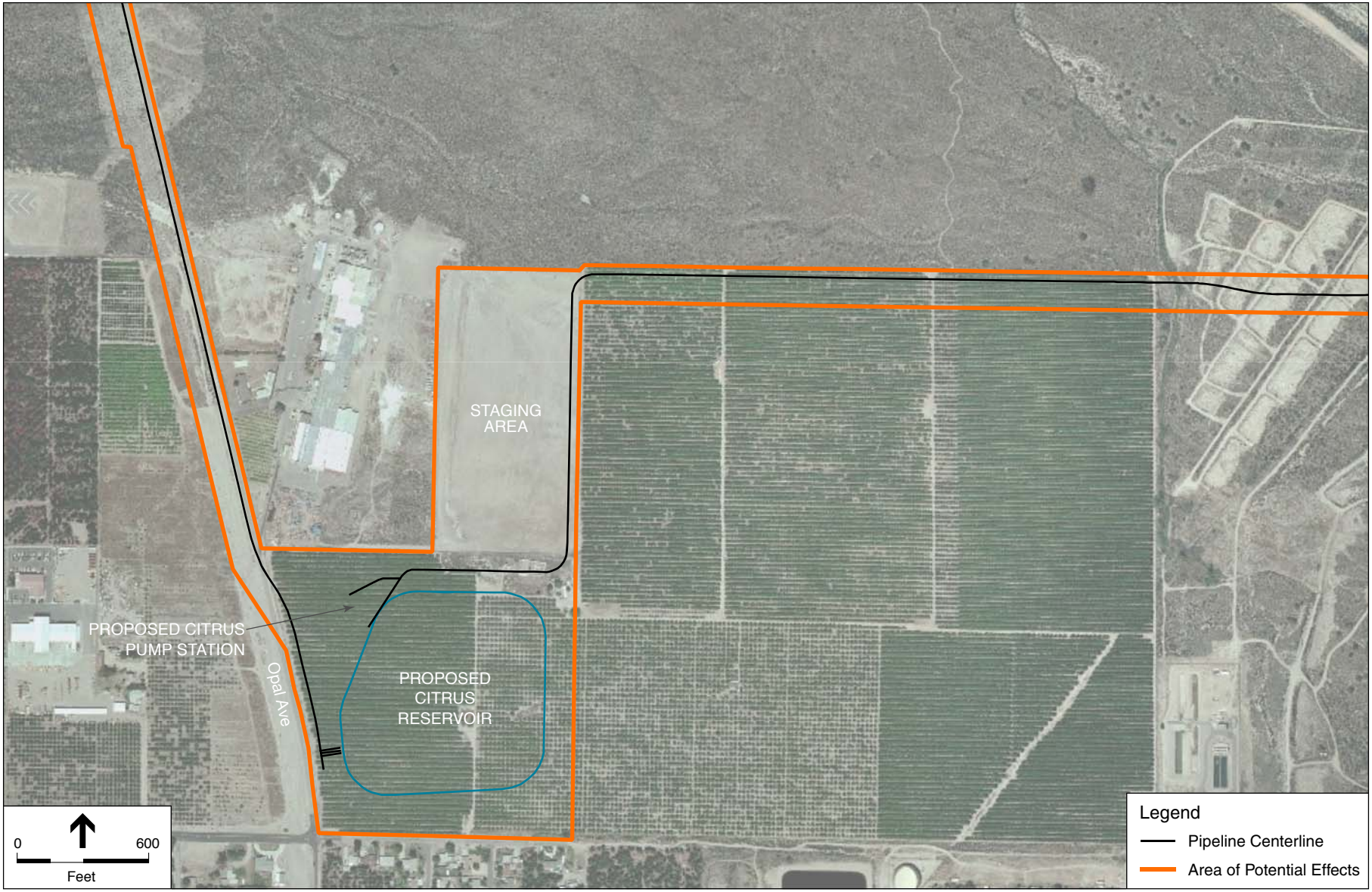
Figure 1.2-2
Citrus Reservoir Site Plan



SOURCE: ESA, 2010.

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Figure 1.2-3
Citrus Reservoir Site Location

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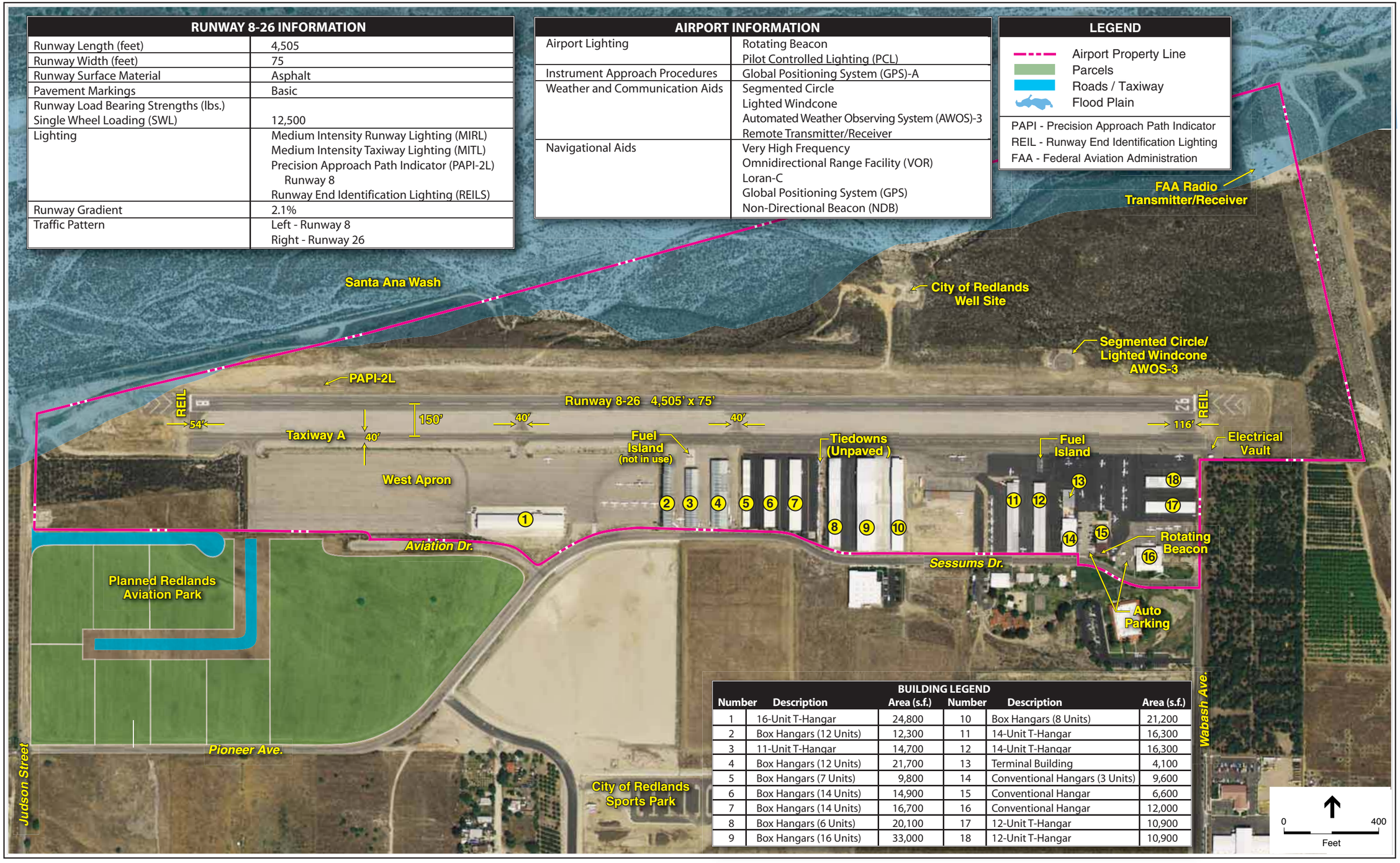
RUNWAY 8-26 INFORMATION	
Runway Length (feet)	4,505
Runway Width (feet)	75
Runway Surface Material	Asphalt
Pavement Markings	Basic
Runway Load Bearing Strengths (lbs.) Single Wheel Loading (SWL)	 12,500
Lighting	Medium Intensity Runway Lighting (MIRL) Medium Intensity Taxiway Lighting (MITL) Precision Approach Path Indicator (PAPI-2L) Runway 8 Runway End Identification Lighting (REILS)
Runway Gradient	2.1%
Traffic Pattern	Left - Runway 8 Right - Runway 26

AIRPORT INFORMATION	
Airport Lighting	Rotating Beacon Pilot Controlled Lighting (PCL)
Instrument Approach Procedures	Global Positioning System (GPS)-A
Weather and Communication Aids	Segmented Circle Lighted Windcone Automated Weather Observing System (AWOS)-3 Remote Transmitter/Receiver
Navigational Aids	Very High Frequency Omnidirectional Range Facility (VOR) Loran-C Global Positioning System (GPS) Non-Directional Beacon (NDB)

LEGEND

- Airport Property Line
- Parcels
- Roads / Taxiway
- Flood Plain

PAPI - Precision Approach Path Indicator
REIL - Runway End Identification Lighting
FAA - Federal Aviation Administration

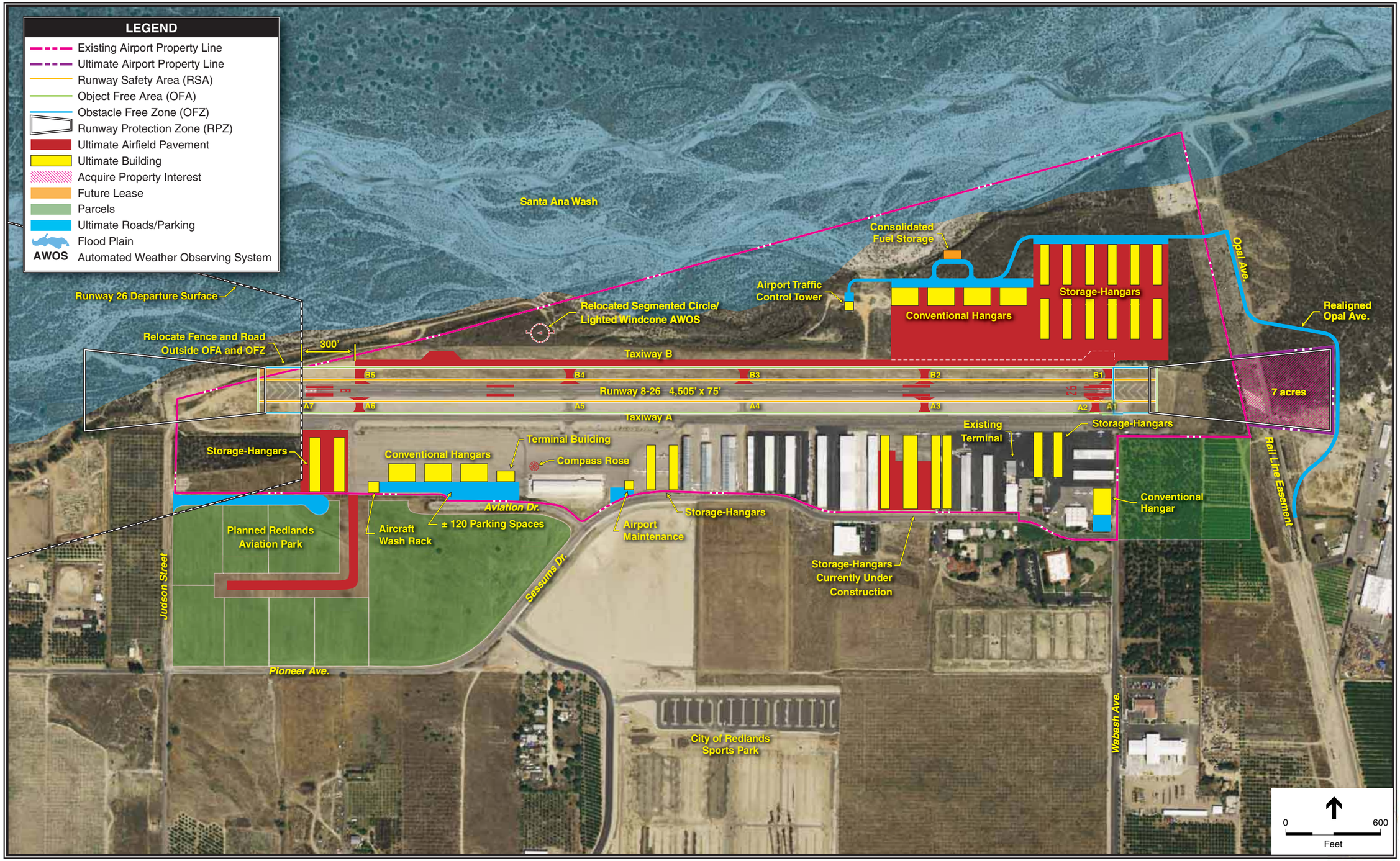


BUILDING LEGEND

Number	Description	Area (s.f.)	Number	Description	Area (s.f.)
1	16-Unit T-Hangar	24,800	10	Box Hangars (8 Units)	21,200
2	Box Hangars (12 Units)	12,300	11	14-Unit T-Hangar	16,300
3	11-Unit T-Hangar	14,700	12	14-Unit T-Hangar	16,300
4	Box Hangars (12 Units)	21,700	13	Terminal Building	4,100
5	Box Hangars (7 Units)	9,800	14	Conventional Hangars (3 Units)	9,600
6	Box Hangars (14 Units)	14,900	15	Conventional Hangar	6,600
7	Box Hangars (14 Units)	16,700	16	Conventional Hangar	12,000
8	Box Hangars (6 Units)	20,100	17	12-Unit T-Hangar	10,900
9	Box Hangars (16 Units)	33,000	18	12-Unit T-Hangar	10,900

SOURCE: Redlands Master Plan, 2010.

Figure 1.2-4
Redlands Municipal Airport - Existing Facility



SOURCE: Redlands Master Plan, 2010.

Figure 1.2-5
Master Plan Concept

Below is the excerpt regarding the separation criteria from Section 1-1 of AC 150/520-33B:

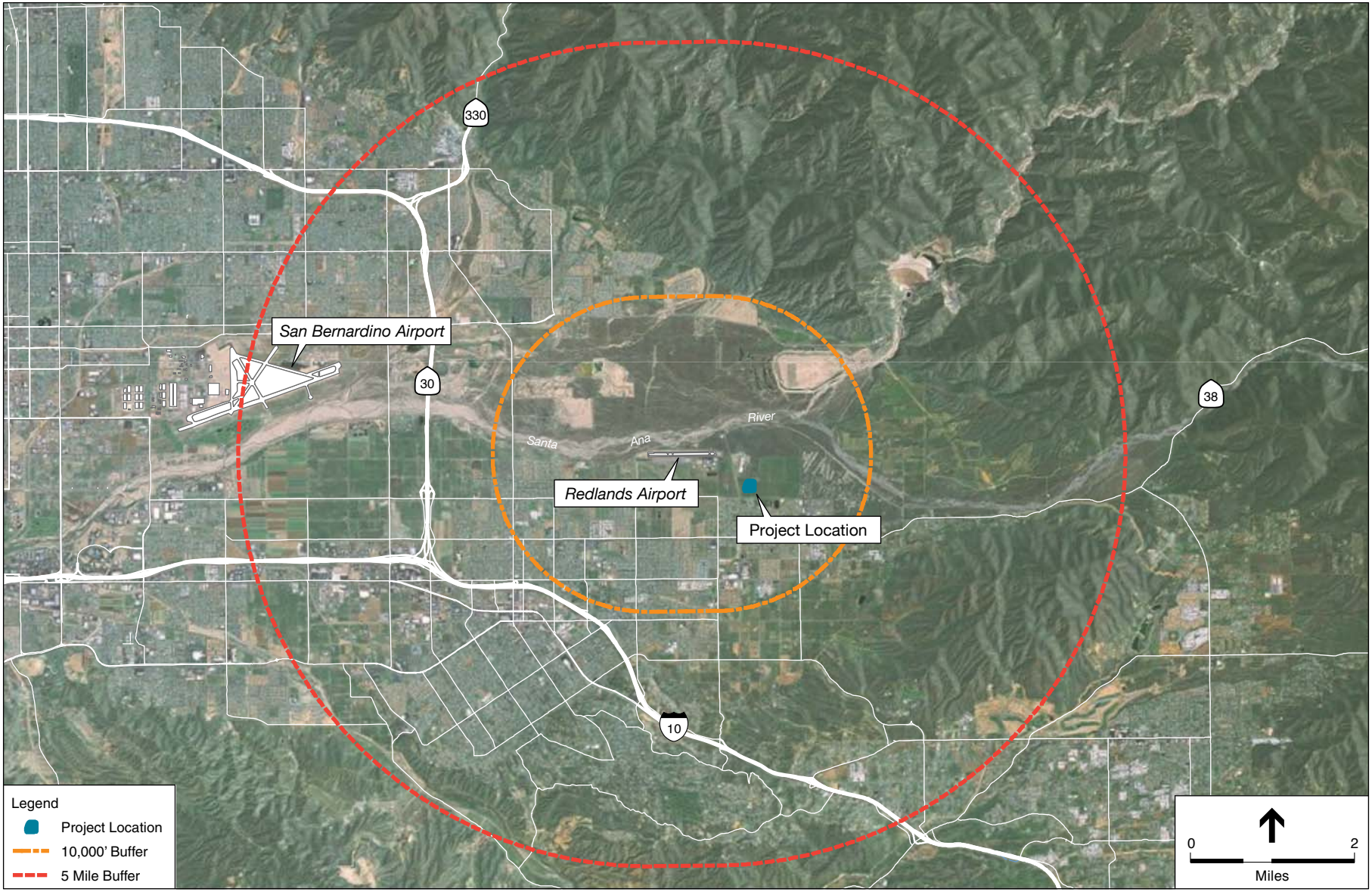
> **1-2. AIRPORTS SERVING PISTON-POWERED AIRCRAFT.** Airports that do not sell Jet-A fuel normally serve piston-powered aircraft. Notwithstanding more stringent requirements for specific land uses, the FAA recommends a separation distance of 5,000 feet at these airports for any of the hazardous wildlife 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.
>
> **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.
>
> **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 1.2-6 provides a graphic that depicts the project site, the Redlands Municipal Airport Air Operation Area (AOA), the 10,000 foot buffer and the 5 mile buffer area. **Figure 1.2-7** provides a more focused view of the 10,000 foot buffer area. Due to the Citrus Reservoir's potential wildlife hazard attractant (open water habitat) and the close proximity to the airport's AOA (within the 10,000 foot separation criteria), DWR has been tasked with developing a proactive WHMP. This WHMP is being prepared to address how design and construction best management practices (BMP's) and future monitoring can be implemented to reduce the potential wildlife hazard risk to aviation.

1.2.3 Wildlife Hazard Regulations

The Federal Aviation Administration (FAA) regulates wildlife hazards at commercial service airports under Tile 14 Code of Federal Regulations (CFR) Federal Aviation Regulations (FAR) Part 139.337 (see **Appendix B).** When an airport has a triggering event as outlined in FAR Part 139.337 (b) (1)-(4), the airport sponsor initiates a Wildlife Hazard Assessment (WHA). Typically, a WHA is completed over a 12 month period and includes the analysis of strike data, the documentation of wildlife populations, movement, and utilization of areas on or near the airport, the identification of wildlife hazard attractants, and a list of recommendations to decrease the potential wildlife hazard risk at that airport. Once the WHA is completed, the FAA then determines if a WHMP is warranted. FAR Part 139.337 (e) and (f) describe the requirements for a WHMP. FAR Part 139.337 (f) states the following:

> (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.



SOURCE: ESA, 2010.

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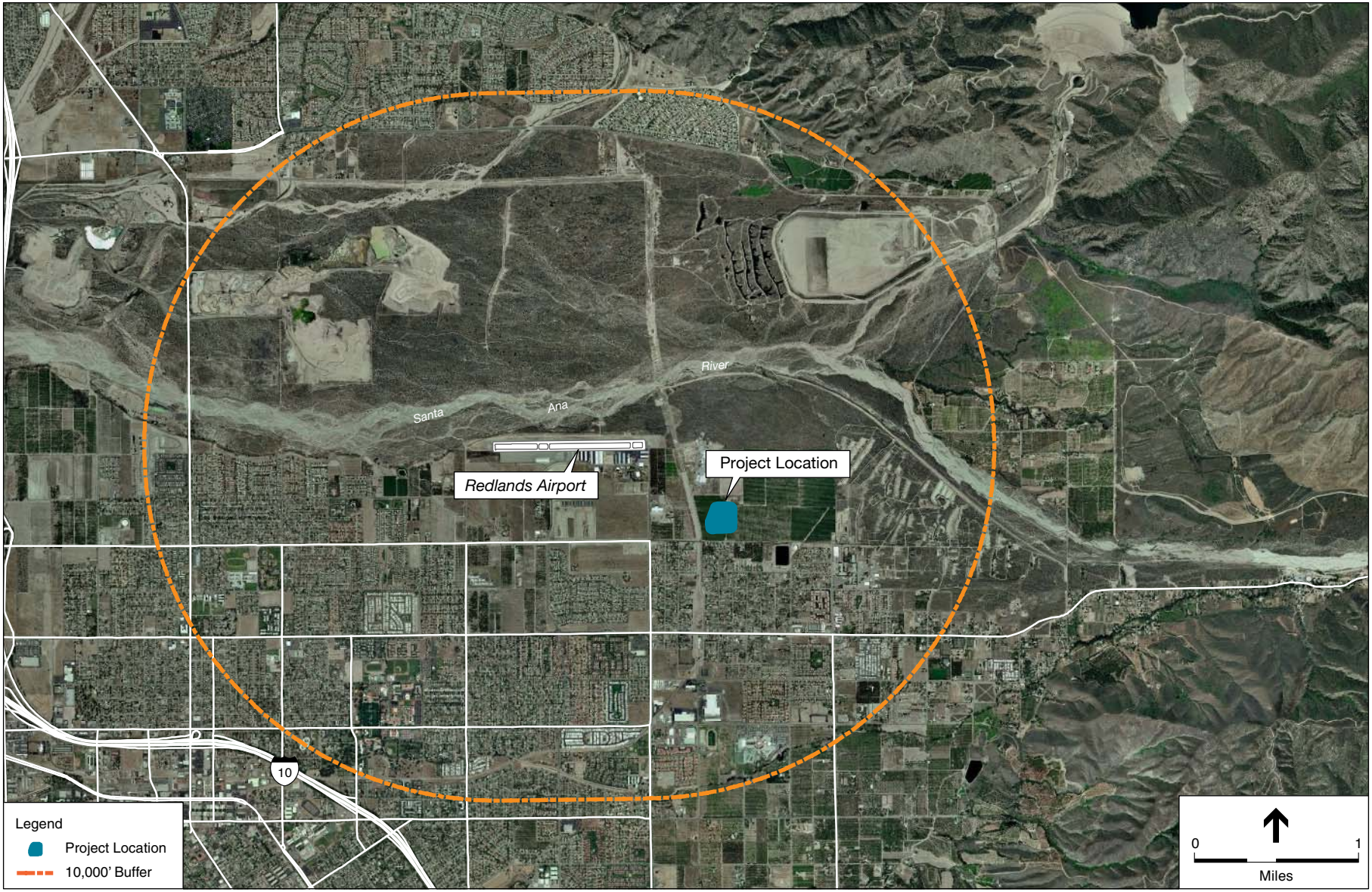
Figure 1.2-6
FAA Separation Criteria
Redlands Municipal Airport



SOURCE: ESA, 2010.

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Figure 1.2-7

10,000 Foot Separation Criteria

(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.

For this project, a WHMP is being developed as a proactive measure due to the potential development of a wildlife hazard attractant and is not being prepared upon the completion of a WHA nor is it being prepared in response to a triggering event occurring at Redlands Municipal Airport. The WHMP focuses solely on the Citrus Reservoir site and does not include any procedures, assessment, or actions regarding with Redlands Municipal Airport. The WHMP will provide guidance for reservoir operators and maintenance personnel.

SECTION 2
Background Information and Preliminary Assessment

2.1 Background Information

2.1.1 Environmental Setting

The Citrus Reservoir project site is located in San Bernardino County on the northern development fringe of the City of Redlands, north of Mentone. The project construction area is located in an existing citrus orchard. The project site is bounded to the south by residential areas, to the east by open areas, commercial/industrial zoned areas, and the airport development area, with agricultural areas directly east of the site. The Redlands Municipal Airport is located approximately 2,500 feet northwest of the project site. To the north of the project site, there is an adjacent light industrial area that includes a school. Further to the north is the Santa Ana River wash area and resource preservation areas. Approximately 2 miles north of the project site is the 672,000 acre San Bernardino National Forest (**see Figure 2.1-1**).

The existing landscape and surrounding land uses near the proposed project site and the Redlands Municipal Airport provide potential wildlife attractants, corridors, shelter, and food sources. With the project site being constructed in a portion of an existing citrus orchard, there will be removal of citrus trees within the construction foot print. Portions of the citrus grove and other agricultural areas outside the construction footprint will remain intact. **Figure 2.1-2** provides a view of the project site's existing citrus orchard area. Agricultural areas may cause wildlife hazard attractants since they provide food sources, resting places, and cover for a variety of wildlife species. The Santa Ana River area, to the north of the site, is dominated by an alluvial scrub habitat (Riversidian alluvial fan sage scrub). This habitat type is comprised of a mainly drought adapted deciduous shrubs, sporadic evergreen woody shrubs, and vegetation that has adapted to periodic flood events. This natural area provides habitat for a variety of wildlife species. **Figure 2.1-3** provides a view of the alluvial scrub habitat generally located to the north of the project site in the Santa Ana River wash area. Urban areas such as residential and light industrial areas also provide shelter, roosting sites, and food sources for numerous wildlife species.

Man-made open water habitats, such as the Citrus Reservoir, are scattered throughout the region. However, large natural water bodies are not present. The closest man-made open water habitat is the Mentone Reservoir which is approximately 1,700 feet due east of the proposed project site (please refer to Figure 2.1-1 for location). **Figure 2.1-4** depicts the Mentone Reservoir open water area (water storage area).

SOURCE: ESA, 2010.

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Figure 2.1-1
Environmental Setting

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Figure 2.1-2
Citrus Reservoir Site
Existing Citrus Orchard Area

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Figure 2.1-3
Riversidian Alluvial Fan Sage Scrub Habitat in Santa Ana River Wash Area

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Figure 2.1-4
Mentone Reservoir Open Water Area

2.1.2 DWR Data Collection

DWR staff have collected bird observation data at both the proposed construction site (the Citrus Orchard) and a nearby reservoir which has similar open water habitat (the Mentone Reservoir). **Figure 2.1-2** provides the location of the two bird observation areas. **Appendix C** provides a description of "EBX II General Bird Survey" methodology and summary of observations. As part of their data collection and analysis, an observed species table was developed. Twenty-three (23) total wildlife observations were conducted. **Table 2.1-1** provides a copy of the DWR bird observation data list of species observed. This information was taken into consideration when the FAA Qualified Airport Wildlife Biologist prepared the preliminary assessment for the project area (see section 2.2).

TABLE 2.2-1
DWR BIRD SURVEY DATA FOR CITRUS ORCHARD AND MENTONE RESERVOIR

Species	Common Name	Citrus Orchard Total Number of Occurrences (22 surveys)	% Occurrence Citrus Orchard	Mentone Reservoir Total Number of Occurrences (23 surveys)	% Occurrence Mentone Reservoir	Status
Accipiter cooperii	Cooper's Hawk	4	18	8	35	DFG WL
Actitis macularia	Spotted Sandpiper		0	4	17	
Aechmophorus occidentalis	Western Grebe		0	4	17	
Aeronautes saxatalis	White-throated Swift	1	5	1	4	
Agelaius phoeniceus	Red-winged Blackbird	1	5		0	
Anas americana	American Wigeon		0	7	30	
Anas platyrhynchos	Mallard		0	16	70	
Anas strepera	Gadwall		0	4	17	
Anthus rubescens	American Pipit		0	1	4	
Aphelocoma californica	Western Scrub-Jay	14	64	18	78	
Archilochus alexandri	Black-chinned Hummingbird		0	1	4	
Ardea alba	Great Egret		0	2	9	
Ardea herodias	Great-blue Heron	1	5	6	26	
Aythya affinis	Lesser Scaup		0	4	17	
Aythya americana	Redhead		0	2	9	DFG SSC
Aythya collaris	Ring-necked Duck		0	7	30	
Aythya valisineria	Canvasback		0	2	9	
Buteo jamaicensis	Red-tailed Hawk	9	41	14	61	
Buteo lineatus	Red-shouldered Hawk	5	23	8	35	
Calidris mauri	Western Sandpiper		0	2	9	
Callipepla californica	California Quail		0	1	4	
Calypte anna	Anna's Hummingbird	19	86	18	78	
Carduelis psaltria	Lesser Goldfinch		0	8	35	
Carduelis tristis	American Goldfinch		0	2	9	
Carpodacus mexicanus	House Finch	15	68	18	78	
Cathartes aura	Turkey Vulture	1	5	3	13	
Catharus guttatus	Hermit Thrush	1	5		0	
Chamaea fasciata	Wrentit	4	18	3	13	

TABLE 2.2-1
DWR BIRD SURVEY DATA FOR CITRUS ORCHARD AND MENTONE RESERVOIR

Species	Common Name	Citrus Orchard Total Number of Occurrences (22 surveys)	% Occurrence Citrus Orchard	Mentone Reservoir Total Number of Occurrences (23 surveys)	% Occurrence Mentone Reservoir	Status
Charadrius vociferus	Killdeer	2	9	12	52	
Colaptes auratus cafer	Northern Flicker (Red-shafted)	1	5	6	26	
Columba fasciata	Band-tailed Pigeon	3	14		0	
Columba livia	Rock Dove		0	4	17	NN
Columbina passerina	Common Ground Dove	5	23	3	13	
Contopus sordidulus	Western Wood-Pewee		0	2	9	
Corvus brachyrhynchos	American Crow	19	86	11	48	
Corvus corax	Common Raven	9	41	11	48	
Dendroica coronata	Yellow-rumped Warbler		0	7	30	
Dendroica nigrescens	Black-throated Gray Warbler		0	1	4	
Dendroica petechia	Yellow Warbler		0	2	9	
Euphagus cyanocephalus	Brewer's Blackbird		0	6	26	
Falco sparverius	American Kestrel	3	14	10	43	
Fulica americana	American Coot		0	9	39	
Geothylpis trichas	Common Yellowthroat		0	1	4	
Hirundo rustica	Barn Swallow		0	6	26	
Icterus cucullatus	Hooded Oriole	1	5	2	9	
Junco hyemalis	Dark-eyed Junco	1	5		0	
Megaceryle alcyon	Belted Kingfisher		0	3	13	
Melopsittacus undulatus	Budgerigar		0	1	4	NN
Melospiza melodia	Song Sparrow		0	7	30	
Mimus polyglottos	Northern Mockingbird	7	32	15	65	
Myiarchus cinerascens	Ash-throated Flycatcher		0	1	4	
Oxyura jamaicensis	Ruddy Duck		0	4	17	
Pandion haliaetus	Osprey	1	5	2	9	
Passer domesticus	House Sparrow	4	18	12	52	NN
Passerina amoena	Lazuli Bunting		0	1	4	
Petrochelidon pyrrhonota	Cliff Swallow	1	5	12	52	

TABLE 2.2-1
DWR BIRD SURVEY DATA FOR CITRUS ORCHARD AND MENTONE RESERVOIR

Species	Common Name	Citrus Orchard Total Number of Occurrences (22 surveys)	% Occurrence Citrus Orchard	Mentone Reservoir Total Number of Occurrences (23 surveys)	% Occurrence Mentone Reservoir	Status
Phalacrocorax auritus	Double-crested Cormorant		0	7	30	
Picoides nuttallii	Nuttal's Woodpecker		0	2	9	
Pipilo crissalis	California Towhee	17	77	15	65	
Pipilo maculatus	Spotted Towhee		0	2	9	
Piranga ludoviciana	Western Tanager	2	9		0	
Podiceps nigricollis	Eared Grebe		0	1	4	
Podilymbus podiceps	Pied-billed Grebe		0	9	39	
Psaltriparus minimus	Bushtit	8	36	8	35	
Quiscalus mexicanus	Great-tailed Grackle	1	5		0	
Regulus calendula	Ruby-crowned Kinglet		0	6	26	
Sayornis nigricans	Black Phoebe	5	23	22	96	
Sayornis saya	Say's Phoebe		0	4	17	
Sialia mexicana	Western Bluebird	1	5	3	13	
Stelgidopteryx serripennis	Northern Rough-winged Swallow	3	14	10	43	
Streptopelia decaocto	Eurasian Collared-Dove	3	14	10	43	NN
Sturnus vulgaris	European Starling	1	5	13	57	NN
Tachycineta thalassina	Violet-green Swallow	2	9	2	9	
Thryomanes bewickii	Bewick's Wren	6	27	9	39	
Tringa flavipes	Lesser Yellowlegs		0	1	4	
Troglodytes aedon	House Wren	1	5	2	9	
Tyrannus verticalis	Western Kingbird	4	18	14	61	
Tyrannus vociferans	Cassin's Kingbird	2	9	4	17	
Vireo gilvus	Warbling Vireo		0	1	4	
Wilsonia pusilla	Wilson's Warbler	1	5	2	9	
Zenaida macroura	Mourning Dove	9	41	13	57	
Zonotrichia atricapilla	White-crowned Sparrow	7	32	4	17	
Calidris sp.	(unidentified sandpiper)		0	1	4	
Icterus sp.	(unidentified oriole - female)		0	1	4	

TABLE 2.2-1
DWR BIRD SURVEY DATA FOR CITRUS ORCHARD AND MENTONE RESERVOIR

Species	Common Name	Citrus Orchard Total Number of Occurrences (22 surveys)	% Occurrence Citrus Orchard	Mentone Reservoir Total Number of Occurrences (23 surveys)	% Occurrence Mentone Reservoir	Status
	(unidentified flycatcher)	3	14		0	
	(unidentified hummingbird)		0	1	4	
	(unidentified raptor)	1	5	1	4	
	(unidentified swallow)	2	9		0	
	(unidentified warbler)	2	9		0	
Canis familiaris	Domestic dog	4	18		0	
Felis catus	Domestic cat	3	14		0	
Gallus sp.	Domestic chicken	7	32		0	
Lepus californicus	Black-tailed Jackrabbit	4	18		0	
Sceloperus sp.	Western Fence Lizard	5	23	3	13	
Spermophilus beecheyi	California Ground Squirrel	5	23	18	78	
Sylvilagus audubonii	Desert Cottontail	3	14	6	26	

STATUS KEY:
DFG WL = Department of Fish and Game Watchlist
DFG SSC = Department of Fish and Game Species of Special Concern
NN = Non-native species"

2.2 Preliminary Assessment

2.2.1 Initial Site Inspection

On June 1 and 2, 2010, ESA staff performed an initial site inspection of the proposed Citrus Reservoir site, adjacent areas, and airport overview tour. While an assessment of the potential wildlife hazard attractant that could be caused by the reservoir could not be completed because the facility does not yet exist, ESA staff surveyed the area and observed wildlife on and near the reservoir site. By understanding the existing environmental setting prior to the construction of the reservoir, observing the existing Mentone Reservoir, and understanding the operational elements of the Redlands Municipal Airport, recommendation for best management practices (BMPs) prior to construction and protocols once operations commence at the Citrus Reservoir can be developed.

2.2.1.1 Citrus Reservoir Location

The initial site inspection of the Citrus Reservoir site included meeting with a DWR staff member and traversing by foot through the citrus grove to the northern extent of the site where the airport property could be viewed. **Figure 2.2-1** and **Figure 2.2-2** provide photo documentation of the existing citrus grove where the Citrus Reservoir will be located. During the site inspection of the citrus grove area, there were a few areas of debris and abandoned structures (see **Figure 2.2-3**) and one area that appeared to be a residence and work area for the citrus farmers (see **Figure 2.2-4**). While the area was predominately citrus trees, there were a few other species scattered throughout the site. These included was a large prickly pear cactus (*Opuntia sp.*) located within the grove (see **Figure 2.2-5**) as well as sporadic shrubs and trees around building structures.

Site inspections of the citrus orchard occurred during the mid-day time period and during the dusk time period (within one hour of sunset) on June 1, 2010. A dawn observation period (within one hour of sunrise) was conducted on June 2, 2010. During the three separate time period site inspections, wildlife observations were recorded. **Table 2.2-2** provides a listing of wildlife observed during the three (3) citrus grove site visits. Increased wildlife movement or increases in wildlife present on the site were not observed during the dawn and dusk time periods at this location.

TABLE 2.2-2
WILDLIFE OBERVATIONS - CITRUS GROVE

Species	Common Name	Number observed	Status[1]
Avian			
Psaltriparus minimus	Bushtit	1	
Gallus gallus domesticus	Domestic Chicken	7	
Corvus corax	Common Raven	8	
Icterus cucullatus	Hooded Oriole	1	
Zenaida macroura	Mourning Dove	3	
Buteo jamaicensis	Red-tailed Hawk	1	
Cathartes aura	Turkey Vulture	1	
Mammal			
Spermophilus beecheyi	Ground Squirrel	2	

1. Status key:
DFG WL = Department of Fish and Game Watchlist
DFG SSC = Department of Fish and Game Species of Special Concern
NN = Non-native species

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Figure 2.2-1
Citrus Reservoir Site
Existing Citrus Orchard (View 1)

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Figure 2.2-2
Citrus Reservoir Site
Existing Citrus Orchard (View 2)

DWR East Branch Extension Phase II. 206008

Figure 2.2-3
Citrus Reservoir Site
Abandoned Structure

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Figure 2.2-4
Citrus Reservoir Site
Building and Farming Operation Area

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Figure 2.2-5
Citrus Reservoir Site
Prickly Pear Cactus in Citrus Orchard

2.2.1.2 Mentone Reservoir

On June 1, 2010 ESA staff and DWR staff inspected the Mentone Reservoir facility to observe wildlife utilization of the site or in close proximity to the site. The Mentone Reservoir was visited a total of three times. Midday and dusk wildlife observation surveys were conducted on June 1, 2010. Dawn time period wildlife observations were conducted on June 2, 2010. **Figure 2.2-6** provides a view of the open water habitat, impermeable lining (observable side slopes were concrete), water spillover area, and the perimeter access road along the top of the berm of the reservoir. **Table 2.2-3** provides a listing of wildlife observed during the three (3) Mentone Reservoir site visits. Increased wildlife movement or increases in wildlife present on the site were not observed during the dawn and dusk time periods at this location. It was noted that the two mallard ducks were observed loafing on the perimeter road but took refuge in the open water habitat when approached. The ducks did not appear to be feeding (see **Figure 2.2-7**). Cliff swallows were observed in feeding activities over the open water habitat (most likely feeding on insects above the open water of the reservoir).

2.2.1.3 Redlands Municipal Airport Area

The areas around the perimeter of the Redlands Municipal Airport (south, east and west) were observed on three occasions. Midday and dusk wildlife observation surveys were conducted on June 1, 2010. Dawn time period wildlife observations were conducted on June 2, 2010. A list of the wildlife species observed during these time periods is provided in **Table 2.2-4**.

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Figure 2.2-6
Mentone Reservoir

DWR East Branch Extension Phase II. 206008

Figure 2.2-7
Mallard Ducks at Mentone Reservoir

TABLE 2.2-3
WILDLIFE OBSERVATIONS - MENTONE RESERVOIR

Species	Common Name	Number observed	Status[1]
Avian			
Petrochelidon pyrrhonota	Cliff Swallow	13	
Anas platyrhynchos	Mallard	2	
Corvus corax	Common Raven	1	
Passer domesticus	House Sparrow	20	NN
Zenaida macroura	Mourning Dove	7	
Sturnus vulgaris	European Starling	11	NN
	unidentified hummingbird	1	
	unidentified finch	6	

1. Status key:
DFG WL = Department of Fish and Game Watchlist
DFG SSC = Department of Fish and Game Species of Special Concern
NN = Non-native species

TABLE 2.2-4
WILDLIFE OBSERVATIONS - REDLANDS MUNICIPAL AIRPORT AREA

Species	Common Name	Number observed	Status[1]
Avian			
Euphagus cyanocephalus	Brewer's Blackbird	2	
Tyrannus verticalis	Western Kingbird	5	
Corvus corax	Common Raven	10	
Passer domesticus	House Sparrow	1	NN
Zenaida macroura	Mourning Dove	7	
Sturnus vulgaris	European Starling	6	NN
Buteo jamaicensis	Red-tailed Hawk	1	
Anas platyrhynchos	Mallard	3	
Cathartes aura	Turkey Vulture	1	
	unidentified owl	1	
	unidentified finch	2	
Mammal			
Lepus californicus	Black-tailed jackrabbit	4	
Spermophilus beecheyi	Ground Squirrel	3	

1. Status key:
DFG WL = Department of Fish and Game Watchlist
DFG SSC = Department of Fish and Game Species of Special Concern
NN = Non-native species

The areas to the south of the airport include open lands, detention ponds, airport non-aviation development and further south, residential development. Detention ponds on airport property, just south of the Advatech Pacific, Inc., provide open water habitat lined with vegetation (see **Figure 2.2-8**). Mallard ducks were observed on these ponds. Ground squirrels were observed in several areas around the airport. **Figure 2.2-9** shows a ground squirrel utilizing a structure for resting or as a viewing point. During the wildlife observations, a commonly viewed species was the Western k ingbird which was observed in **Figure 2.2-10** utilizing barbed wire on airport property as a perch site.

During wildlife observations west of the airport, an unidentified owl was observed in flight from the general direction of the airport to an agricultural area west of the airport. This observation was made during the dawn time period. Ravens were also observed utilizing the agricultural areas west of the airport during all three time periods. To the east of the airport and north of the project site, wildlife observations were made from a gated road (an extension of Opal Avenue that is closed to general traffic). Observed wildlife included black-tailed jack rabbits that were utilizing the sage scrub habitat and a turkey vulture soaring at high altitude above the river wash area.

One site visit of the airport's AOA was conducted with City of Redlands staff. The site visit, which occurred mid morning on June 2, 2010, included a driving tour around the airports perimeter road within the AOA and an aerial survey of the airport area. Only one species of wildlife was observed during the AOA site inspection, which was a red-tailed hawk. It should be noted that during the site inspection there were dugout areas observed under the perimeter fence with mammal tracks and trails leading to and from the AOA to the river wash area (along the northern perimeter fence). Species utilizing these areas could include black-tailed jack rabbits, smaller rodents, and coyotes. During the site visit, City of Redlands staff noted that no "known" wildlife strikes had occurred at the airport. In searching the FAA Wildlife Strike Database, no records were shown for the Redlands Municipal Airport.[1]

While conducting the site inspection of the AOA at the airport, the local Sherriff's office offered to assist in conducting and aerial survey of the airport area and the project site. **Figure 2.2-11** shows a view of the river wash area, including a mining operation, from the fixed wing aircraft. **Figure 2.2-12** shows a view of the project site and the airport's runway. This vantage point is a typical approach pattern for many of the airplanes landing on runway end 26.

It should be noted that the project area's wildlife populations may be influenced due to migratory birds associated with the Pacify flyway. Species groups that utilize the pacific flyway include waterfowl (ducks, geese, and swans), shore birds, and numerous other species.

[1] http://wildlife-mitigation.tc.faa.gov/wildlife/

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Figure 2.2-8
Airport Detention Ponds

DWR East Branch Extension Phase II. 206008

Figure 2.2-9
Ground Squirrel on Airport Property

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Figure 2.2-10
Western Kingbird on Barbed Wire on Airport Property

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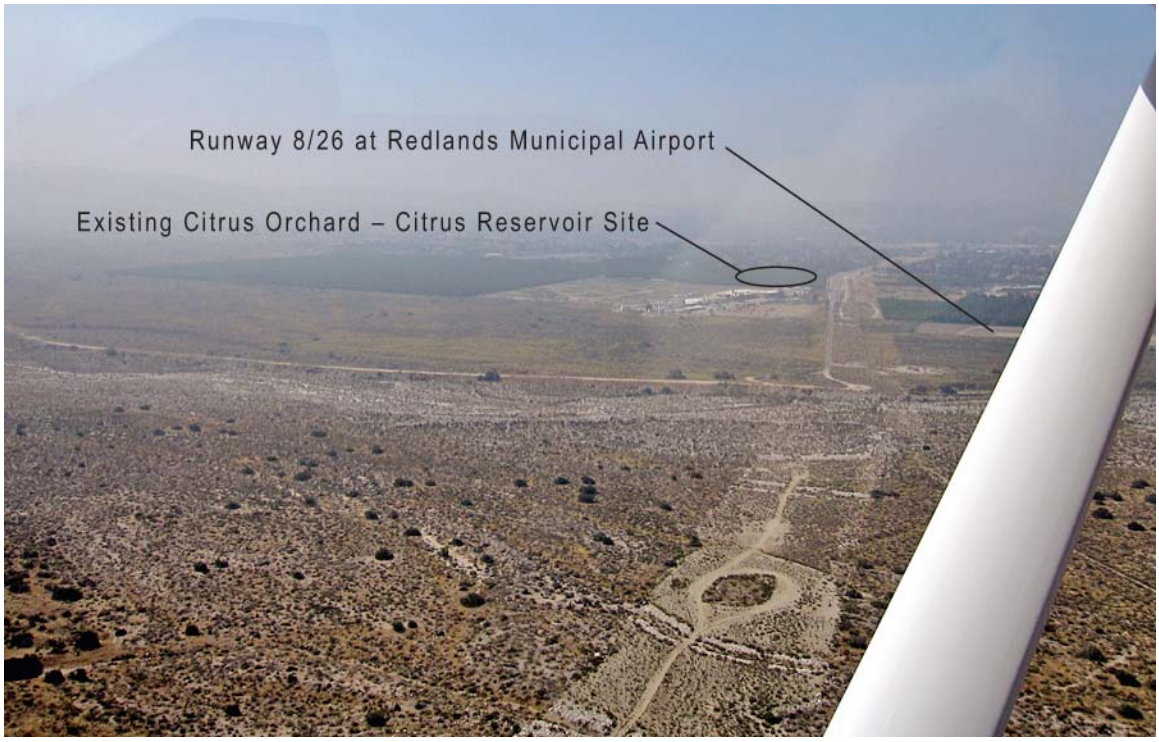
Figure 2.2-11
Aerial View of the Santa Ana River Wash Area



DWR East Branch Extension Phase II. 206008

Figure 2.2-12
Aerial View of the Project Site and Runway 8/26

2.2.2 Preliminary Assessment Results

Through review of the background information provided by DWR (bird observations, project description, and EIR document), site inspection data collection, an interview with City of Redlands staff (airport manager), and review of the environmental setting, preliminary findings regarding potential wildlife hazard attractants were developed. These results are based on existing conditions and are not considered an assessment of the proposed Citrus Reservoir because it has not yet been constructed and could not be inspected or viewed as part of this preliminary assessment.

There are three main preliminary findings (PF) as a result of the preliminary assessment of the Citrus Reservoir site location.

PF-1 There is a potential for waterfowl to be attracted to the planned Citrus Reservoir facility's open water habitat. Waterfowl may utilize the area year round for resting but the number of individuals may increase significantly during migrations seasons. Steps should be taken to make the open water habitat the least attractive as possible for water fowl. This includes the following:

- No vegetation on or near the sides or on the berms associated with the reservoir. This includes landscaping on the constructed berms, emergent vegetation on the sides (littoral area), and submerged vegetation including algae.

- Monitor the open water habitat to ensure fish or invertebrate populations are not present. These would provide a food source attractant for numerous species.
- Monitor the presence of waterfowl utilization the facility and implement deterrent activities if their presence persists.

PF-2 Smaller flocking birds such as swallows may be attracted to the Citrus Reservoir facility as a food source due to insects over the open water area (potentially hatching from the water). If flocking birds persist at the facility in high numbers, implement deterrent activities.

PF-3 An assessment of the Citrus Reservoir facility should be conducted once the facility is operational. This would include wildlife utilization data collection, coordination and communication with the manager of the Redland Municipal Airport (City of Redlands staff), and recommendations to reduce wildlife hazard attractants at the Citrus Reservoir facility if they are warranted.

SECTION 3
Roles and Responsibilities

The roles and responsibilities for implementing the WHMP are provided in this section. The entities involved in the implementation of this plan will include the owners and operators of the Citrus Reservoir facility. Wildlife hazard management roles and responsibilities regarding the City of Redlands and the Redlands Municipal Airport are not included in this document.

3.1 California Department of Water Resources (DWR)

The State of California is the owner of the property on which the Citrus Reservoir will be constructed. DWR, a department of the state government, is responsible for managing water resources within the state. DWR is the project sponsor who is developing the overall East Branch Phase II (EBXII) water supply project. The Citrus Reservoir facility is one of the elements of the EBXII project. DWR is responsible for design, construction, and major maintenance projects once the reservoir facility is operational. DWR will not be the day-to-day operator of this facility.

As the project sponsor, DWR is developing this WHMP document as required in the project's CEQA EIR document (see Section 1.0 for details). The WHMP has been developed to provide a preliminary assessment of the area and environmental setting for wildlife species that could be attracted to and utilize the Citrus Reservoir facility. DWR will be responsible for the overall implementation of the WHMP as a compliance measure with the CEQA EIR mitigation measures.

It is the responsibility of DWR to ensure that the wildlife observation monitoring plan outlined in Section 4.0 is implemented. It is also the responsibility of the DWR to obtain any necessary permits for wildlife deterrent activities or wildlife take permits, if warranted.

3.2 San Bernardino Valley Municipal Water District (SBVMWD)

The SBVMWD, which was formed in 1954 to provide supplemental water to the San Bernardino Valley area, is a municipal water district that serves a 325 square mile area in southwestern San Bernardino County. The SBVMWD is part of the State of California State Water Project (SWP). The SBVMWD is financially supported by property tax revenues from the service area.[1]

DWR and SBVMWD have entered into a "Joint Powers Agreement" for the operation of the East Branch Extension. In regards to the WHMP role of the SBVMWD, they will be the operators of

[1] http://www.sbvmwd.com/

the Citrus Reservoir facility and will conduct the day-to-day operational activities on-site. Responsibilities of the SBVMWD will include observations of the facility and documentation of wildlife activity, if needed. They will also be responsible for deterring wildlife if wildlife appears in size or number to potentially create a wildlife hazard issue for aviation activity at Redlands Municipal Airport (these activities are further described in section 4.0 and 6.0). SBVMWD is also responsible for acquiring and operating wildlife deterrent equipment or exclusionary devices if warranted (staff/contractor implementation and financial resources if needed).

3.3 Roles and Responsibility Summary Matrix

Table 3.3-1 provides a summary matrix of the roles and responsibilities to the DWR and the SBVMWD in regards to the WHMP.

TABLE 3.3-1
ROLES AND RESPONSIBILITIES SUMMARY MATRIX

Organization	Role	Responsibility
DWR	Compliance Oversight	Overall compliance with the WHMP
		Implementation of the wildlife assessment once the facility is operational
		Obtain an necessary permits for wildlife deterrent or take activities
SBVMWD	Plan Implementation	Daily wildlife observations as part of day-to-day operational activities
		Wildlife deterrent activities if needed (trained staff or hired professional services)
		Obtain and operate wildlife deterrent equipment or exclusionary devices if needed

SECTION 4
Best Management Practices

As part of the WHMP, best management practices (BMPs) are being outlined for the design phase, construction phase, and operational phase of the Citrus Reservoir facility. The operational phase BMPs are proactive in nature and should be updated once the wildlife assessment of the operational facility is completed.

4.1 Design Phase BMPs

The Citrus Reservoir facility has been processed under CEQA to determine if significant impacts were expected due to the implementation of the project (EBX II EIR). During the CEQA analysis, wildlife hazard concerns relative to aircraft operations were evaluated due to the close proximity of the reservoir to the Redlands Municipal Airport. The following mitigation measures that addressed design BMPs were included:

> **LU-7:** DWR shall reduce the potential attraction of its proposed facilities to wildlife through project design features, and ongoing monitoring as described below:
>
> - DWR shall incorporate one or more avian wildlife deterrent design measures to minimize attracting wildlife. Measures could include one or more physical, mechanical, visual, biological devices and features to deter avian wildlife attraction into project areas coincidental with the Airport Land Use Planning Areas.
> - DWR shall not plant seed-bearing grasses or fruit-bearing trees (other than citrus trees or native vegetation required to replace existing habitat value) for landscaping at the Citrus Reservoir or within the disturbed project area coinciding with the Airport Land Use Plan.

As stated in the EIR mitigation measures, one or more wildlife related design measures shall be incorporated into the reservoir design. After review of the reservoir design, it is evident that BMP's related to side slopes, littoral zone vegetation, and the ability to draw down the water levels in the reservoir are all being provided as part of the project.

FAA AC 150/5200-33B provides the following guidance related to "water management facilities" on or near airports (see Appendix A for a complete copy of the AC):

> 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.

Even though this project isn't specifically designed for stormwater management, FAA AC 150/5200-33B provides the BMPs closest related to this type of project under Section 2.3:

> **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.

The following BMPs are being implemented through the design of the Citrus Reservoir facility:

Design BMP-1 The Citrus Reservoir facility will be lined with an impermeable lining to prevent emergent or submerged vegetation from taking root within or on the side slopes of the open water area of the reservoir.

Design BMP-2 The Citrus Reservoir has been designed with steep side slopes of 2:1 above the maximum water level and 4:1 below that level. The steep slope of the reservoir sides will make the transition from the top of the berm to the less accessible for waterfowl to traverse to and from the open water habitat to the dry berm area around the reservoir.

Design BMP-3 DWR design plans for landscaping and ground cover in the construction area for the Citrus Reservoir will not include seed-bearing grasses or fruit-bearing trees (other than citrus trees or native vegetation required to replace existing habitat value). This will decrease the potential for food sources, resting areas, and the creation of cover for wildlife species that could be a hazard to aviation.

Hydro seeding application or the use of seed material should not be used for landscaping or ground cover application within the project site.

The use of physical barriers as a wildlife deterrent on the reservoir was evaluated during the design phase of the project. **Appendix D** provides a copy of a memo regarding "Citrus Reservoir Wildlife Deterrent Alternatives" to Ted Craddock, Program Manager DWR from Joe Burke, Senior Engineer DWR dated April 2, 2009. This memo discusses the use of anti-perching devices, netting, wire grids, bird balls, and pillows as potential options for the Citrus Reservoir facility. The attachments to the memo provide descriptions and pictures of sample bird deterrents discussed in the memo (bird spikes, bird net, bird slope, bird wire, bird balls, hexa tiles, PFC20 cover, and sound cannons).

Exclusionary devices on structures and buildings, such as bird spikes, will be discussed in the operational phase BMPs later in this section. Physical barriers or exclusion devices for the open water habitat would be impractical due to maintenance events related to the operation of the reservoir (draining, repair of lining if needed, removal of vegetation, and removal of aquatic wildlife if present), would prohibit the potential use of the water source for emergencies (such as wildfire water source), and would be costly as a first approach to deterring wildlife from the site. The use of physical barriers for the site may be re-evaluated if warranted after a wildlife assessment is completed when the facility is operational or if wildlife appear in size or number that create an immediate threat to aviation safety. The phased approach to implementing wildlife hazard deterrents is discussed in Section 6.0.

4.2 Construction Phase BMPs

During the construction of the Citrus Reservoir facility there may be temporary construction materials stockpiles, water detention areas, waste disposal areas, rock, dirt, or construction debris that may be present on the site. Depending on the types of potential attractants created during the construction phase of the project, there are proactive BMPs that can be considered to reduce the attractiveness of the site. If the site does become a wildlife hazard attractant, there may be a need to provide wildlife deterrent activities. The following BMPs are provided for the construction phase of the project:

Construction BMP-1 Monitoring of wildlife utilization of the construction site should occur periodically. If the construction site supervisor notices wildlife in size of number that could create a hazard to aviation, the DWR project manager should be contacted immediately. At that time, the DWR project manager should send a biologist to the construction site for wildlife observations to document and assess the situation (see section 6.0 for further procedural information).

Construction BMP-2 Wildlife hazard overview training for the construction supervisors, staff who are physically at the construction site on a day-to day basis, should be conducted. This training would consist of a brief session that explains the following items:

- wildlife hazard issue related to potential risk at Redlands Municipal Airport,
- details of what wildlife observations need to be made on the construction site, and
- the point of contact information at DWR if they observe wildlife utilizing the construction site that could pose a risk to aviation.

Construction BMP-3 All food grade waste should be disposed of in a covered trash receptacle as not to provide a food source attractant to wildlife.

Construction BMP-4 If temporary ground cover vegetation is needed on the construction site, the vegetation types used will be consistent with the Design BMP-3.

4.3 Operational Phase BMPs

When the Citrus Reservoir is operational, there will be a 399 acre-feet reservoir facility, pump station building and equipment, parking area, chain link perimeter fence, and service roadways. The reservoir will range in size from 17 acres of water surface at the maximum water level to 9 acres of water surface at the minimum water levels.

The operation phase BMPs are intended to address potential wildlife hazard attractants once the facility becomes operational. Actual wildlife utilization or non-utilization of the Citrus Reservoir facility may warrant the addition, deletion, or modifications of the BMPs provided in this section. Due to the unknown actual utilization of the site by wildlife that could pose a risk to aviation activities at Redlands Municipal Airport, the implementation of exclusionary devices and deterrent equipment or activities is presented in a phased approach (as needed approach).

The operational phase BMPs are divided into three categories; monitoring BMPs, reservoir BMPs and facility BMPs.

4.3.1 Monitoring BMPs

Monitoring BMPs provide general guidance on the day-to-day monitoring activities and the wildlife assessment that should be conducted once the facility is operational.

Monitoring BMP-1 Once the Citrus Reservoir is operational, a 12 month wildlife assessment should be conducted at the facility (see Section 6.0 for protocol). This assessment will identify the species, time of day, seasonality, and activity of wildlife on or near the Citrus Reservoir site. The assessment should include a list of recommendations for decreasing the wildlife hazard attractants associated with the site if warranted. If recommendations are needed, they should be incorporated into this WHMP document and an implementation strategy for each item should be developed. Once the assessment is complete, a thorough review of this WHMP document

should be completed and any modifications needed to address wildlife hazard issues should be incorporated into and updated WHMP document.

Monitoring BMP-2 Citrus Reservoir operation staff (SBVMWD staff) should provide daily observations of the facility area and the open water habitat of the reservoir during periods when pump station is in operation. A daily wildlife observation log sheet is provided in **Appendix E**. A brief training as described in Construction BMP-2 should be provided for operations staff who conduct the wildlife observations. Steps and measures to be taken if wildlife are observed in size and numbers to create a potential risk to aviation safety are described in Section 6.0. After the first year, less frequent observations (e.g. weekly) may be appropriate depending on results of previous observations and use of facility by water fowl.

4.3.2 Reservoir BMPs

The reservoir BMPs address the open water habitat, side slopes, and berm of the constructed reservoir.

Reservoir BMP-1 If any vegetation appears within or on the side slopes of the reservoir's water storage area, it will be removed or killed. If cracks or openings occur in the reservoirs impermeable lining, they will be repaired so as not to allow vegetation to take root within the reservoir.

Reservoir BMP-2 Reservoir side slopes will be maintained at the design slopes.

Reservoir BMP-3 If food sources such as fish, invertebrates, or other aquatic species located in the open water habitat are observed or are observed being consumed by wildlife, steps should be taken to reduce or eliminate the food source (see Section 6.0 for protocol).

Reservoir BMP-4 During maintenance events that drain the reservoir, a biologist should be present to view the bottom of the reservoir and determine if any aquatic life is present that could create a food attractant to wildlife.

Reservoir BMP-5 If water fowl, wading birds, or other avian species are viewed loafing on the berm or side slopes of the reservoir, operations staff should attempt to deter them from the site either by walking up to them or approaching them in a vehicle (if on the berm service road).

Reservoir BMP-6 If avian species are present on the reservoir (open water habitat, side slopes, or berm) and are not deterred by operations staff presence and approach, additional wildlife deterrent techniques should be applied. There are multiple options for deterring wildlife and certain techniques

are more appropriate with specific species (see Section 6.0). When deterring birds, airport operations should be notified in advance. If deterrent activities are not successful at reducing wildlife utilization of the reservoir, further consideration to exclusionary devices should be investigated.

4.3.3 Facility BMPs

The facility BMPs address the pump station building, parking area, service roads, landscaping areas and fencing.

Facility BMP-1 Perch and/or roost sites may become evident once the building, facility structures, stormwater areas, drainage areas, lighting and fencing is constructed or installed. If an area is observed to create perch or roost sites, several different exclusionary devices can be used to exclude avian species from these areas. Exclusionary devices are discussed further in Section 6.0.

Facility BMP-2 Landscaping and ground cover should be maintained to meet the design requirements outline in Design BMP-3. All landscaping should be maintained and not be allowed to overgrow or create potential areas of wildlife cover. If landscaping or ground cover species are observed to create a food source, roosting area, or other wildlife hazard attractant, they should be removed immediately and replaced by a more appropriate species. Changes to landscaping should be consistent with all permit or code requirements and should be reviewed by a biologist prior to implementation.

Facility BMP-3 If dumpsters or other waste receptacles are located outside, they should be covered at all times. Signage should be posted to make sure users keep lids on all dumpsters and waste receptacles that could create a wildlife hazard attractant.

Facility BMP-4 No feeding of wildlife should be permitted on the Citrus Reservoir site. This includes feeding of all wildlife not just avian species.

SECTION 5
Requirements and Permits

Typically, WHMP documents provide a list of requirements and permits needed to implement the recommendations of a Wildlife Hazard Assessment (WHA). Since this WHMP document is being prepared prior to the WHA of the operational Citrus Reservoir facility, requirement and permit information is being provided in general terms and will need to be further reviewed upon completion of the wildlife assessment of the operational facility.

5.1 Requirements

This WHMP is being developed in compliance with mitigation measures established in the East Branch Phase II (EBX II) Final EIR document (see section 1.0 for details). Mitigation measure LU-7 EIR document that addressed the need to complete a WHMP for the Citrus Reservoir project:

- DWR shall coordinate with the City of Redlands to develop a Wildlife Hazard Management Plan for the Citrus Reservoir pursuant to FAA guidelines. At a minimum the Plan would include maintenance, monitoring, and reporting requirements.

5.1.1 Maintenance

Maintenance of the Citrus Reservoir facility in regards to wildlife life hazard management would be addressed through Operational Phase BMPs outlined in Section 4.3.2 Reservoir BMPs and Section 4.3.3 Facility BMPs.

5.1.2 Monitoring

Monitoring of the Citrus Reservoir facility for wildlife species that could create a hazard to aviation operations at Redlands Municipal Airport are addressed through BMPs outlined in Section 4.3.1 Monitoring BMPs. Further details on monitoring protocols are provided in Section 6.0.

5.1.3 Reporting Requirements

Reporting requirements include training facility operations staff (SBVMWD staff) to notify DWR if wildlife are observed in size or number that could create a potential risk to aviation. Once a biologist assesses the situation, DWR will contact City of Redlands to coordinate information related to potential wildlife hazards.

5.2 Permits

Permits related to wildlife hazard management may include local, state, and federal permits from a variety of agencies depending on the actions need to reduce wildlife hazard attractants, deter wildlife, or lethally control wildlife. Since this WHMP is being developed prior to the operation of the facility, there are no permits needed at this time. Once the facility is operational and if there are wildlife hazard issues that arise, there may be a need for permits. The wildlife assessment that is planned to be completed within 12 months of the facility becoming operational should also include a list of permits needed to implement any recommendations made at that time. The following is a list of potential permits that may be needed:

5.2.1 Federal Level Permits and Regulations

This section discuss potential Federal level permits and regulations that may apply to wildlife hazard management activities at the Citrus Reservoir facility if deemed warranted once the facility is operational. A biologist would provide further analysis of species occurrences and wildlife hazard management techniques to be employed if needed. This information is provided as general guidance for future activities. It is also important to note that if a species is not protected or is exempt from permits on the federal level, there may be applicable state or local regulations or permits needed to address activities targeted as specific species.

Migratory Bird Treaty Act (MBTA)

Most native avian species found on or around the Citrus Reservoir site are protected under the MBTA. Under the MBTA, the following applies:

> "Unless and except as permitted by regulations made as hereinafter provided in this subchapter, it shall be unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess,… any migratory bird, any part, nest, or eggs of any such bird,…"[1]

Avian species not protected under the MBTA include non-migratory game birds, introduced game birds, exotic, and feral species. A complete list of the 1,007 species covered under the MBTA can be found in the US Code of Federal Regulations (CFR) Title 50 §10.13.[2]

Per 50 CFR 21.41, federal law allows the tactics of scaring or herding species protected under the MBTA. However, if deterrent activities include lethal control or capturing (take, possess, transport) species protected under the MBTA, a federal depredation permit is required.

U.S. Fish and Wildlife Service Migratory Bird Depredation Permit

This permit would be required if wildlife hazard management required the lethal control or capture of wildlife protected under the MBTA (see **Appendix F** for the permit application form).

[1] US Code Title 16 Chapter 7 § 703 (a)
[2] USDOT (FAA) & USDOA (AHPIS). Wildlife Hazard Management at Airport (2nd ed). 2005

50 CFR 10.13 – List of Migratory Birds provides the most recent list of species and can be viewed at the following website:

http://www.fws.gov/migratorybirds/RegulationsPolicies/mbta/mbtandx.html.

A federal depredation permit does not include federally-listed species under the Endangered Species Act of 1973 (FEIS). If the species is protected under the FEIS, a separate federal permit would be required to harass, scare, capture or kill the species. Bald and Golden Eagles are protected under The Bald and Golden Eagle Act as amended in 1962. There is a separate permitting procedure in place for these two species. If a situation arises at the Citrus Reservoir that includes species that are federally protected species under the FEIS or the Bald and Golden Eagle Act, a biologist should be contacted for further review, coordination, and permitting as needed.

Standing Depredations Orders

50 CFR contains standing orders for depredation activities that apply to certain species and/or species groups (some in specific locations). Activities under these standing orders do not require a federal depredations permit but do have specific requirements that accompany each order. The following standing orders may apply to species on or near the Citrus Reservoir site:

50 CFR 21.43 - Depredation order for blackbirds, cowbirds, grackles, crows and magpies.

A Federal permit shall not be required to control yellow-headed red-winged, rusty, and Brewer's blackbirds, cowbirds, all grackles, crows, and magpies, when 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: Provided:

a. That none of the birds killed pursuant to this section, nor their plumage, shall be sold or offered for sale, but may be possessed, transported, and otherwise disposed of or utilized.

b. That any person exercising any of the privileges granted by this section shall permit at all reasonable times including during actual operations, any Federal or State game or deputy game agent, warden, protector, or other game law enforcement officer free and unrestricted access over the premises on which such operations have been or are being conducted; and shall furnish promptly to such officer whatever information he may require, concerning said operations.

c. That nothing in this section shall be construed to authorize the killing of such birds contrary to any State laws or regulations; and that none of the privileges granted under this section shall be exercised unless the person possesses whatever permit as may be required for such activities by the State concerned.

5.2.2 State of California Regulations and Permits

The California Department of Fish and Game regulates wildlife permitting in the State of California. There have been recent legislative movements to provide additional guidance and permitting for airports with FAA approved Wildlife Hazard Management Plans (California Senate Bill 481). While these new regulations under this legislation apply to airports that meet the requirements of the

legislation, they would not apply to wildlife hazard management activities at the Citrus Reservoir facility.

California Endangered Species Act (CESA)

The California Department of Fish and Game provides the following summary of the laws, regulations, and policies involved in the take of a listed species protected under CESA:

> Section 2080 of the Fish and Game Code prohibits "take" of any species that the commission determines to be an endangered species or a threatened species. Take is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill."
>
> CESA allows for take incidental to otherwise lawful development projects. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate mitigation planning to offset project caused losses of listed species populations and their essential habitats.
>
> When the Department (CA DFG) proposes to undertake a project that has the potential for take of a state-listed species, if the project is part of the management of that species, i.e., for the protection, propagation, or enhancement of the species and its habitat, the Department is not required to get a CESA Incidental Take Permit per California Code of Regulations, Title 14, Section 783.1. However, the Department is still required to complete its obligations under CEQA and prepare a Negative Declaration or an EIR, as appropriate, for the proposed project. If take of a state-listed species is likely to occur, an EIR (or an equivalent CEQA document) will be prepared.[3]

While a permit would be needed to “take” a state-listed species, a permit would not be required to scare or harass state listed species. If wildlife deterrent activities are deemed necessary at the facility, a biologist should assess the issue and provide species specific guidance related to permits and regulations under State of California Fish and Game Code.

5.2.3 Local Regulations and Permits

No known local regulation or permits would apply to wildlife hazard management activities at the Citrus Reservoir facility. If wildlife deterrent activities are deemed necessary at the facility, a biologist should assess the issue and provide species specific guidance related to permits and regulations under any applicable local regulations or permit requirements.

[3] http://www.dfg.ca.gov/habcon/cesa/incidental/cesa_policy_law.html

SECTION 6
Plan Implementation – Procedures and Identification of Resources

This section provides an overview of procedures that can be put in place to address potential wildlife hazard issues at the Citrus Reservoir facility. Procedures are provided for construction site supervisors and operations staff (once the facility is operational) on how to monitor wildlife activity and what to do if wildlife hazard issues arise at the facility. This section also includes the procedures for implementing the wildlife assessment that is planned for the first 12 months the facility is operational. A phased approach to implementing wildlife hazard management activities is outlined within this section which provides example techniques that may be implemented, if deemed necessary.

6.1 Monitoring Procedures

6.1.1 Daily Wildlife Monitoring for Construction & Operational Phases

Construction site supervisors and facility operations staff will be provided basic training to provide a basic understanding of wildlife hazard issues as they relate to the facility (see Section 8.0 for training elements). During the active construction phase and the operational phase of the facility, daily wildlife observations should be made by a designated staff member. This information should be logged in a log book and kept as records for future use during plan review and evaluation and for liability purposes if a wildlife hazard issue arises. Appendix E provides a sample "Wildlife Observation Daily Log" sheet for use in the daily log book. More than one entry can be added a day if necessary (different wildlife observations on the same day) or they can be entered in one summary entry for the date.

The daily log book should also have the "Wildlife Observation Contact Information" page (provided in **Appendix G**) at the front of the book. If wildlife are observed in size or number that could pose a risk to aviation, the staff person should immediately contact the identified person on the "Wildlife Observation Contact Information" sheet. Currently, that information is left blank on the sheet until closer to the actual time needed. At that time, the information should be provided to the construction site supervisor or the facility operations staff. This contact information should be reviewed annually to ensure it is up to date.

Table 6.1-1 provides the key elements described above for the construction site/operation staff wildlife monitoring procedures.

TABLE 6.1-1
DAILY WILDLIFE MONITORING ON-SITE (CONSTRUCTION AND OPERATIONAL PHASES)

Element	Description
1	Complete staff training (onsite construction supervisor and operational staff)
2	Observe site at least once a day for wildlife activity
3	Record wildlife observation in "Daily Wildlife Monitoring Book" • If no wildlife are observed on-site, record this information • Multiple entries can be entered for one date if necessary • A summary entry can be entered to span a 24 hour period
4	Contact the "Wildlife Observation Contact" located in the "Daily Wildlife Monitoring Book" if wildlife are observed in size or number that could pose a threat to aviation activities at Redlands Municipal Airport.

6.1. 2 Biologist Monitoring - Construction Phase

A biologist either familiar with local fauna or an FAA Qualified Airport Wildlife Biologist per FAA AC 150/5200-36 (See **Appendix H**) should conduct monthly wildlife monitoring during the construction phase of the project. Please note that this monitoring includes both avian and mammalian species. The monitoring should occur at a minimum of once a month during three different time periods; dawn, midday, and dusk**. Table 6.1-2** provides a description of the three monitoring periods.

6.1-2
WILDLIFE MONITORING TIME PERIODS

Monitoring Time Period	Description
DAWN	A three hour time period that includes up to 1 hour before sunrise (when enough light is present for making visual observations) and two hours after sunrise.
MIDDAY	A three hour time period that includes 1 1/2 hours before noon and 1 1/2 hours after noon.
DUSK	A three hour time period that includes 2 hours before sunrise and one hour after sunrise (up to the point when visibility diminishes and visual observations are not possible)

Prior to the onset of monitoring, observation points should be established on an aerial or site map to document where wildlife observation points are located. The points should be located in areas that are safe and provide for the majority of the site to be viewed. This is a general observation protocol and should last approximately 1 hour. Once the observation points are established, divide the 1 hour monitoring time period evenly among each observation point (for example, if there are 4 wildlife observation points, visit each point for 15 minutes). The monitoring time periods in Table 6.1-2 give a three hour time frame to complete the 1 hour observation period. The dawn and dusk surveys should be performed as close to sunrise and sunset as possible.

When recording wildlife observations, the biologist should record the species, activity, location, number of individuals, and any other pertinent comments regarding the observation. Example field data sheets are provided in **Appendix I**. The location of each entry on the field data sheet should have a corresponding numbered point, line, or arrow on a field map of the site. This

information will graphically depict location and potentially the movement (line with arrow for flying bird) of wildlife on or near the site.

Table 6.1-3 provides key elements described above for the biologist monitoring during the construction phase of the Citrus Reservoir project. Prior to initiating the construction phase monitoring, this general protocol should be reviewed and modified as needed.

TABLE 6.1-3
BIOLOGIST MONITORING - CONSTRUCTION PHASE

Elements	Description
1	Monthly monitoring during the construction phase. Once a month during each of the three time periods; dawn, midday, and dusk (three total observation periods a month)
2	Establish wildlife observation points on an aerial or site plan map.
3	Conduct wildlife observations for 1 hour during each time period • the 1 hour time frame evenly among the wildlife observation points • record wildlife observations on field data sheet and locations on a field data map
4	If wildlife are observed in size or number that could pose a threat to aviation activities at Redlands Municipal Airport, contact the project manager and the construction site supervisor to determine a course of action to reduce the wildlife hazard attractant or take deterrent measures.
5	Record all wildlife observations in an database (excel or access) file.

6.1.3 Wildlife Hazard Assessment Procedures – Operational Phase

Overview

Once the Citrus Reservoir facility is operational, a 12 month wildlife assessment should be conducted to determine if the reservoir is creating a wildlife hazard attractant. Even though the reservoir is not an airport facility, the general guidance to conducting a wildlife hazard assessment will be followed. The requirements of a wildlife hazard assessment (WHA) are provided in Federal Aviation Regulation (FAR) Part 139.337 Wildlife Hazard Management. FAR Part 139.337 (c) states the following:

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.

It should be noted that the circumstance that prompted the assessment was not one of the "trigger events" that are described in FAR Part 139.337 for airport sponsors to conduct a WHA. The Citrus Reservoir WHA is being conducted as a requirement of the CEQA FEIR mitigation measures described in Section 1.0. Also of note, the Redlands Municipal Airport is not a FAR Part 139 Certificated Airport and does not operate commercial service (air carrier operations). The Citrus Reservoir WHA will address items listed in FAR Part 139.337(c)(1)-(5) but in the context of the reservoir facility and the potential wildlife hazard attractants created by the reservoir facility. The WHA will not address off-site attractants or airport related attractants.

The assessment should be conducted by a FAA Qualified Airport Wildlife Biologist as described in FAA AC 150/5200-36 (see Appendix H). However, wildlife observations can be conducted by biologist under the supervision of the FAA Qualified Airport Wildlife Biologist.

Wildlife Monitoring

The FAA Qualified Airport Wildlife Biologist will work with staff biologists and the operational staff of the Citrus Reservoir to establish on-site wildlife observation points. The wildlife observation points should provide for the majority of the facility (open water habitat, buildings, landscaping, and fencing) to be viewed. Monitoring should occur once a month during three time periods (dawn, midday, and dusk) for 12 consecutive months. This is a total of 36 separate monitoring events. This is a general observation protocol and should last approximately 1 hour. Once the observation points are established, divide the 1 hour monitoring time period evenly among each observation point (for example, if there are 4 wildlife observation points, visit each point for 15 minutes). The monitoring time periods in Table 6.1-2 give a three hour time frame to complete the 1 hour observation. The dawn and dusk surveys should be completed as close to sunrise and sunset as possible.

In addition to the observation periods described above, two (2) nighttime observation periods should be completed. Nighttime monitoring events should begin no sooner than 1 hour after sunset and be the same time length as the previously described observation periods. A spotlight should be utilized for wildlife observations during the nighttime observation period. This would bring the total wildlife observation events during the 12 month period to 38.

Prior to initiating the wildlife monitoring, it should be determined how the wildlife data will be compiled and analyzed to accomplish the following items:

- determine if the site is a wildlife hazard attractant,
- determine what species are present that may cause a wildlife hazard
- determine the location and activity of potentially hazardous wildlife species
- determine local, daily, and seasonal movement of species.

Once the wildlife data is compiled and analyzed, a WHA document should be developed to address the items outlined in FAR Part 139.337 as discussed in the "Overview" section above. If recommendations are developed to decrease wildlife hazard attractants or other measures are deemed necessary as a result of the WHA, this information should be incorporated into a Revised WHMP.

Table 6.1-4 provides key element described above for WHA to be conducted during the operational phase of the Citrus Reservoir project. Prior to initiating the WHA this general protocol should be reviewed and modified as needed.

TABLE 6.1-4
WHA - OPERATIONAL PHASE

Elements	Description
1	12 consecutive months of wildlife monitoring. • a month during each of the three time periods; dawn, midday, and dusk • 2 nighttime surveys
2	Establish wildlife observation points on an aerial or site plan map.
3	Conduct wildlife observations for 1 hour during each time period • split the 1 hour time frame evenly among the wildlife observation points • record wildlife observations on field data sheet and locations on a field data map
4	If wildlife are observed in size or number that could pose a threat to aviation activities at Redlands Municipal Airport, contact the project manager and the construction site supervisor to determine a course of action to reduce the wildlife hazard attractant or take deterrent measures.
5	Record all wildlife observations in an database (excel or access) file.
6	Prepare a WHA document
7	Revise the WHMP as needed

6.2 Phased Approach for Wildlife Control Strategies and Techniques

A phased approach to the implementation of wildlife control strategies and techniques is being provided in this WHMP due to the uncertainty of needs required during the construction and operational phases of the project. The phased approaches discusses options for different types of deterrent activities, exclusionary devices, and wildlife control that may be necessary if wildlife in size and number that utilize the Citrus Reservoir site pose a threat to aviation safety at Redlands Municipal Airport. However, if wildlife are not documented utilizing the site during daily wildlife monitoring, the WHA, or under other documentation, there may be no need to implement these measures. Some, all, or none of the measure discusses in the phased approach may be required.

This section discusses specific attractants that may be present during the construction and/or operation phase and the different types of techniques that can be employed to reduce the attractant or provide wildlife control. This is not an exhaustive list of options but provides a foundation of information. Specific needs for deterrent activities and wildlife control strategies should be further investigated if they arise.

6.2.1 Open Water Habitat

Open water habitat during the construction phase could include any pooling or running water open to the environment. These areas could result from stormwater run-off, dewatering activity, or other activities associated with construction. During the operational phase, open water habitat would be the reservoir water storage area. The following information provides a phased approach to implementing wildlife hazard management strategies for open water habitats (OWH).

OWH PHASE 1: Eliminate attractant or modify habitat

First, determine what the species are attracted to and determine if it can be eliminated or modified to become less of an attractant or eliminated all together. The following are some possible options:

- There could be a food source above or below the surface of the water. If species are attracted to a food source, identify the source and remove it. This should decrease the wildlife hazard attractant.
- Vegetation may be present (emergent, submerged, or littoral) and should be removed immediately.
- Species groups such as waterfowl may be attracted to the open water habitat for resting. If this is the case, wildlife deterrent activities should be employed (See OWH PHASE 2).

OWH PHASE 2: Low Intensity Deterrent Activities

Implement wildlife hazard deterrent activities to reduce wildlife utilization of the open water habitat. There are a variety of techniques that could be implemented and final determination of a course of action should be discussed with a biologist to ensure the techniques a species appropriate and to determine if a permit is require for these activities. The following provides a list of deterrent techniques

- Approaching the wildlife in person with an air horn or in a vehicle with a horn or siren
- Pyrotechnics (shell crackers) can be utilized to scare wildlife resting or feeding.
- Utilize the natural fear of a predator for deterrence by bring a dog in the presence of the birds (preferably a larger dog that has an instinct to hunt or stalk waterfowl). This could be used for the operational phase if wildlife react to walking a dog along to top of the berm. However, this use may not work on repeated attempts with the same individuals since they will grow accustom to the predator and realize it will not enter the water. There are also trained dogs that can be hired or purchased for this use but further investigation should be conducted to determine if it would be appropriate.
- Auditory distress calls should not be used for deterrent activities of species groups attracted to the open water habitats described in this section.

OWH PHASE 3: Medium Intensity Deterrent Activities

If deterrent activities are not successful or not species appropriate, the following list provides additional options that may involve additional professional service, equipment purchase, or installation of equipment.

- Radio control boats could be used to flush wildlife from the surface of the reservoir. It is likely the using more than one boat at a time would be more effective.
- The use of lasers (hand held) has been documented successfully in deterring certain species. If persistent species groups exist, further research should be conducted to determine if lasers could be a deterrent device.
- Sound cannons are propane fueled cannon devices that provide a gun type sound to frighten wildlife. Sound cannons should not be used on a timer or automated system.

They should be trigger activated so that wildlife does not get over exposed to the sound becoming accustomed to it and therefore rendering it non-effective.

- Nonlethal projectiles that can be fired from a gun such as paint balls, rubber bullets, or other material designed for non lethal uses. Utilizing this material over the reservoir may not be desirable and should be further investigated.

OWH PHASE 4: High Intensity Deterrent Activities & Exclusion

- Lethal control or capture is an option for persistent wildlife that do not respond to other documented types of deterrent activities. Coordinate these types of activities with a biologist that can assist in determining a course of action and the permits needed to accomplish these activities. Professional services from a private wildlife control company or the USDA Wildlife Services may be options to conduct these activities.
- Exclusionary devices for the reservoir open water habitat may be cost prohibitive unless a severe, ongoing issue with wildlife hazards that are not successfully managed with other deterrent strategies. Types of exclusionary devices include, bird balls, pillow, wire grids, and solid covers for the open water area of the reservoir. Further investigation should be conducted if wildlife hazard issues arise to this level.

6.2.2 Facilities

Facilities include any building, structures, fencing and equipment that may be associated with the project site. These items may differ from the construction phase to the operational phase but the phase approach to wildlife hazard management below can be applied to both.

FACILITY PHASE 1: Eliminate attractant or modify habitat

First, determine what the species are attracted to and determine if it can be eliminated or modified to become less of an attractant. The following are some possible options:

- There could be a food source associated with landscaping, food waste, or other construction materials/debris associated with the site. If species are attracted to a food source, identify the source and remove it. This should decrease the wildlife hazard attractant.
- Landscaping and ground cover may create a resting area, perch site, or cover for wildlife. If this is observed contact a biologist to determine if habitat modification may be required. If the issue cannot be address through these efforts, wildlife deterrent activities may be required (see FACILITY PHASE 3).
- Buildings, light poles, and other areas may create perch sites or roosting sites for wildlife. If this is the case, exclusionary devices may be appropriate (See FACILITY PHASE 2).

FACILITY PHASE 2: Exclusionary Devices

There are a wide range of exclusionary devices that are available for purchase and installation. The type of exclusionary device should be discussed with a biologist to determine species appropriate devices. The operations staff should also be consulted to ensure the exclusionary devices are appropriate for the structure (not to cause a safety or maintenance issue). Exclusionary devises include anti-perching devices such as bird spikes, bird wire, and wire spider devices, possible building modifications, fencing, or screening areas.

FACILITY PHASE 3: Deterrent Activities

The following deterrent activities may be useful in the facility setting. They are provided in a list from low intensity to high intensity.

- Approaching the wildlife in person with an air horn or in a vehicle with a horn or siren
- Pyrotechnics (shell crackers) can be utilized to scare wildlife resting or feeding.
- Utilize the natural fear of a predator for deterrence by bringing a dog in the presence of the birds (preferably a larger dog that has an instinct to hunt or stalk waterfowl).
- Use of non lethal projectiles that can be fired from a gun such as paint balls, rubber bullets, or other material designed for non lethal uses
- Lethal control or capture is an option for persistent wildlife that do not respond to other documented types of deterrent activities. Coordinate these types of activities with a biologist that can assist in determining a course of action and the permits needed to accomplish these activities. Professional services from a private wildlife control company or the USDA Wildlife Services may be options to conduct these activities.

Chemical repellents (liquid, gas, or solid) were not included in this section due to the sensitive nature of the project as a water storage area.

SECTION 7
Plan Review and Evaluation

Plan review and evaluation are key elements of a successful wildlife hazard management program. It is important for the plan to reflect actual activities, specific wildlife issues, permitting information, and implementation techniques. The documentation of the plan review and evaluation are essential for accurate record keeping.

7.1 Plan Review

The WHMP document should be reviewed, at a minimum, annually. The WHMP is an adaptive plan to address wildlife hazard management at the Citrus Reservoir facility and should be updated or amended if issues arise. Formal plan review should occur annually. This annual review should be documented as part of the WHMP. **Appendix K** provides a "Plan Review and Evaluation Log" that can be utilized by the facility operator SBVMWD or DWR to document the date, staff who reviewed the plan, and any changes or additions that were made. While an annual review is the minimum level of review required, the plan can be reviewed and modified at any time to address the needs of the facility. This information should also be added to the log sheet in Appendix K.

7.2 Plan Evaluation

The WHMP document should be evaluated on an annual cycle. This evaluation should be conducted by a biologist either familiar with the wildlife hazard issues at the Citrus Reservoir and local fauna, or by an FAA Qualified Airport Wildlife Biologist as described in FAA AC 150/5200-36 (see Appendix I). The evaluation should be documented as part of the WHMP. Appendix K, as mentioned above, provides a location in the WHMP for maintaining this documentation.

Additionally, as part of the evaluation, coordination should take place on an annual basis with the City of Redlands. Written notification should be sent to the City of Redlands to determine if they have any comments or issues related to wildlife hazards at the Citrus Reservoir facility. This annual correspondence letter and any written response regarding wildlife hazard issues at the reservoir facility should be added to Appendix K (as a full record of the correspondence). Any other government entity or stake holder correspondence received regarding wildlife hazard issues at the reservoir facility should also be added to Appendix K. These documents will be useful in review and evaluation of the document and addressing concerns as they arise.

SECTION 8
Training

The training section of a WHMP typically describes recommended training for staff who conduct wildlife hazard management activities. Since this document is being prepared prior to determining if wildlife hazard management activities are necessary, this section only discusses the training outline for construction site supervisors and facility operators to identify potential wildlife hazard issues on site. Once the facility is operational and, if deterrent activities are deemed necessary, this section should be updated to include additional training elements.

Training for construction site supervisors and facility operators should be conducted by an FAA Qualified Airport Wildlife Biologist described under FAA AC 150/5200-36 (see Appendix I). The training should consist of a brief seminar (approximately 1-2 hours) that provides the training elements described below along with a site visit of either the construction area or the operational facility. **Table 8-1** provides a list of the training elements that should be included as part of the training program.

TABLE 8-1
TRAINING ELEMENTS

Element	Description
1	Overview of wildlife hazard issues on and near airports.
2	Overview and receipt of a copy of the WHMP.
3	Overview of the Citrus Reservoir site location compared to the location of the Redlands Municipal Airport.
4	Overview of the Redland Municipal Airport facility and operational activity.
5	Description of potential wildlife hazard on either the construction site (for construction site supervisors) or the reservoir facility (for reservoir operations staff). This includes a review of the BMPs in Section 4.0 of the WHMP.
6	Description of potential wildlife hazard species and species groups. Identification of species and species groups along with an identification resource for staff (such as a bird identification book or quick reference guide).
7	Review of protocol for documenting wildlife occurrences on the project site.
8	Contact procedures and contact information for on-site staff to coordinate and report all potential wildlife hazard issues (contact would most likely be the DWR project manager or designated biologist).
9	Site tour and discussion of either the construction site or the operational facility.

This training regiment can be modified as need once the actual construction or operation of the site commence.

Appendices

Appendix A

FAA Advisory Circular 150/500-33B

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.*

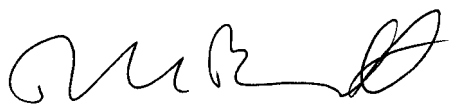
5. BACKGROUND. Information about the risks posed to aircraft by certain wildlife species has increased a great deal in recent years. Improved reporting, studies, documentation, and statistics clearly show that aircraft collisions with birds and other wildlife are a serious economic and public safety 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.)

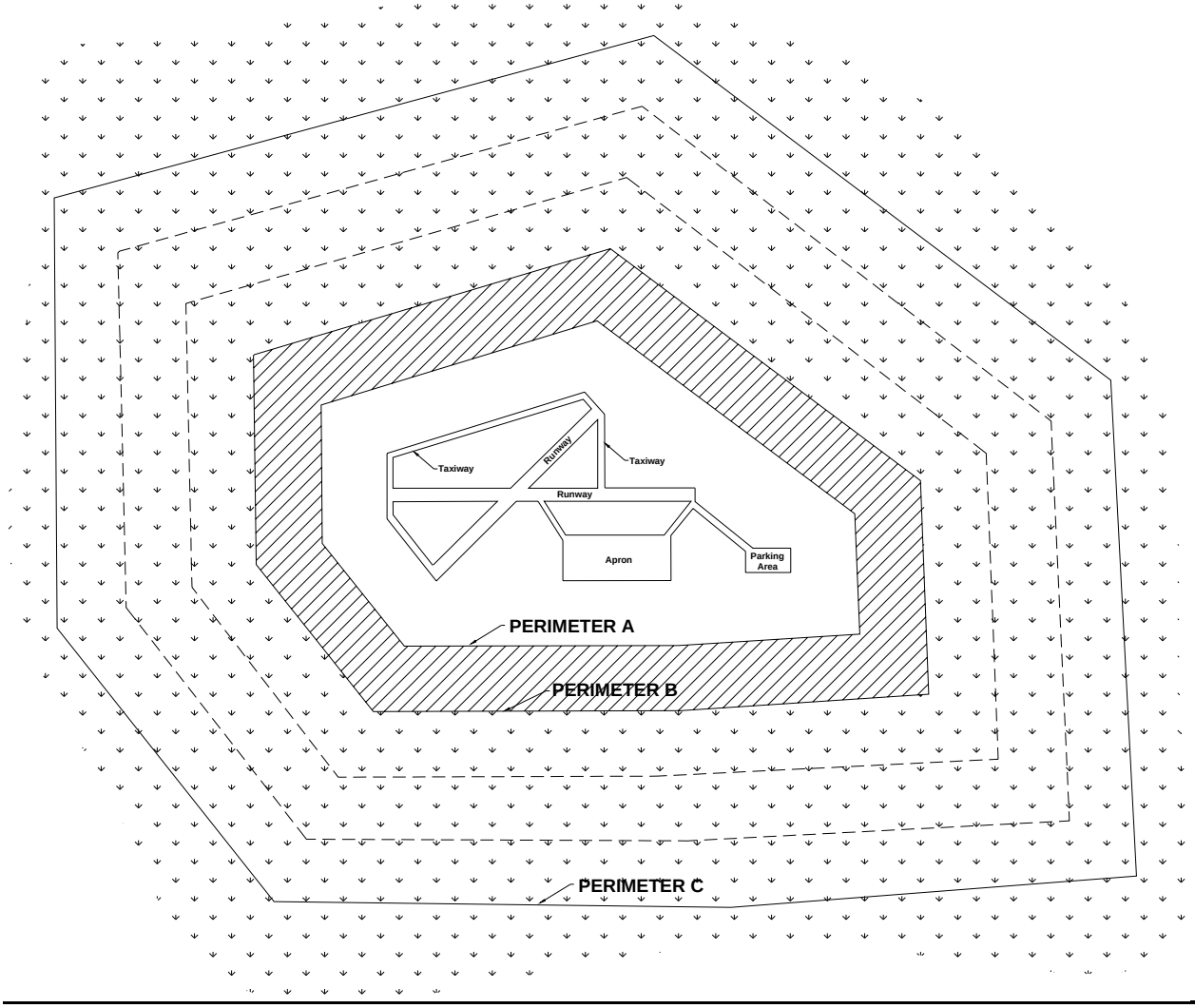
The basis for the separation criteria contained in this section can be found in existing FAA regulations. The separation distances are based on (1) flight patterns of piston-powered aircraft and turbine-powered aircraft, (2) the altitude at which most strikes happen (78 percent occur under 1,000 feet 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 B
FAR Part 139.337

ESA

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.

Appendix C
DWR Bird Survey Methodology

ESA

EBXII GENERAL BIRD SURVEYS

Survey and Identification Methodology:

Basic guidelines for general bird survey methods were found through the Florida Fish and Wildlife Conservation Commission:
http://myfwc.com/docs/FWCG/Bird_survey_guidelines_01Mar09_clean.pdf .
A variation of these methods was used to accompany the request of the EBXII Project Manager.

During the spring and fall seasons, two surveys per site were performed each month. One survey per site was performed each month during the summer and winter seasons. All surveys were conducted between 0800 and 1200 hours. Birds were identified to species as best as possible. Birds not identified to species were recorded to the closest common name as possible.

For all surveys, The Sibley Field Guide to Birds of Western America, 2003 was used for reference and a pair of Nikon Monarch ATB 10x40 binoculars was used for observing. Only one observer was present for all surveys.

Mentone Reservoir-
Surveys were conducted by walking the elevated access road surrounding the reservoir. Observation points were taken every 15-30 feet along the pathway. Birds within 200ft of each observation point were recorded, including those flying over the area. The observation period for each point was at least 3 minutes. A species account was recorded along with the location and for some, the behavior displayed (e.g. breeding, foraging).

Citrus Orchard-
Surveys were conducted by walking the perimeter of the proposed Citrus Reservoir footprint. This was achieved by way of the access roads and driveway. For each survey period, several random tree rows were walked in addition to the access road and driveway. Observation points were taken every 15-30 feet along the pathway. Birds within 200ft of each observation point were recorded, including those flying over the area. The observation period for each point was at least 3 minutes. A species account was recorded along with the location and for some, the behavior displayed (e.g. breeding, foraging).

Database:

Occurrences-A spreadsheet for each survey area displays the species that occurred on specific survey dates. The survey dates are grouped into seasons and the locations where each species was observed is given.
Species Occurrences- Another spreadsheet shows how many times a species occurred at each site for the entire survey period. The listing status for the species is also noted.
Season Observed- A final spreadsheet indicates which season a species was observed for each survey area.

Summary of Observations:

If a species was observed at the orchard or reservoir for at least three seasons or more, they were listed below as Residents. Resident birds are likely to use the orchard or reservoir areas for activities such as foraging, hunting, and breeding, nesting, and nesting activities. In addition, species observed in the area at least three times within the breeding and nesting season (April through July) may indicate a nesting territory existed in the survey area. These species are listed below as Nesting Season Residents if they are migratory species and the survey area is within their summer range. Species that are observed in the fall and winter months are listed as Winter Residents if the area is within the winter range for that species. A species is listed as Migrating if they are observed in the survey area one or two times for the entire survey period and the area is within their known migratory route.
All summer and winter ranges and migration routes were defined wit h The Sibley Field Guide to Birds of Western North America, 2003, David Allen Sibley.

Unidentified species were not included in this summary.
All birds listed below are protected by the Migratory Bird Treaty Act.

Citrus Orchard-

- Residents:
  - Cooper's hawk
  - Western Scrub-Jay
  - Red-tailed Hawk
  - Anna's Hummingbird
  - House Finch
  - Common Ground Dove
  - American Crow
  - Common Raven
  - American Kestrel
  - California Towhee
  - Bushtit
  - Black Phoebe
- Nesting Season Residents:
  - Western Kingbird
- Winter Residents:
  - White-crowned Sparrow
  - Dark-eyed Junco
- Migrating:
  - Hermit Thrush
  - Cliff Swallow

Mentone Reservoir -

- Residents:
  - Cooper's Hawk
  - Mallard
  - Western Scrub-Jay
  - Great-blue Heron
  - Red-tailed Hawk

- Anna's Hummingbird
- House Finch
- Killdeer
- American Kestrel
- Northern Mockingbird
- Double-crested Cormorant
- California Towhee
- Black Phoebe
- Mourning Dove

Nesting Season Residents:

- Lesser Goldfinch
- Barn Swallow
- Cliff Swallow
- Northern Rough-winged Swallow
- Western Kingbird
- Cassin's Kingbird

Winter Residents:

- Western Grebe
- American Wigeon
- Gadwall
- American Pipit
- Lesser Scaup
- Redhead
- Ring-necked Duck
- Canvasback
- Yellow-rumped Warbler
- Belted Kingfisher
- Ruddy Duck
- Spotted Towhee
- Pied-billed Grebe
- Ruby-crowned Kinglet
- Western Bluebird
- White-crowned Sparrow

Migrating:

- Spotted Sandpiper
- Black-chinned Hummingbird
- Western Sandpiper
- Black-throated Gray Warbler
- Violet-green Swallow
- Wilson's Warbler

Since the orchard and reservoir are next to each other, it is likely that some species seen using the orchard were also using the reservoir, and vice versa. This, of course, is dependent on species behavior and territory range.

Appendix D

DWR Memo
Dated April 2, 2009 -
Citrus Reservoir Wildlife
Deterrent Alternatives

ESA

M e m o r a n d u m

Date: April 2, 2009

To: Ted Cradddock, Program Manager
East Branch Extension Phase II

Joe Burke, Senior Engineer
Division of Engineering
From: **Department of Water Resources**

Subject: Citrus Reservoir Wildlife Deterrent Alternatives

The Citrus Reservoir is located approximately 0.5 miles from aircraft operation areas at the Redlands Municipal Airport, which is a general aviation airport serving all small aircraft with weights up to 12,500 pounds and including business jets. The Federal Aviation Administration (FAA) recommends a separation distance for aircraft operation areas at the above type of airport of 10,000 feet from new open water facilities because the open water can attract potentially hazardous wildlife and pose risks to aviators. For projects that are located outside the 10,000 foot criteria but are within five statute miles of the airport's air operations area, the FAA may review development plans to determine whether such changes in land use would create potential wildlife hazards to aircraft operations. San Bernardino International Airport is within the 5 mile criteria. The City of Redlands and Caltrans Division of Aeronautics will also be required to review the proposed project plans for consistency with the adopted Airport Land Use Compatibility Plan for the Redlands Municipal Airport (DWR EBX II Final EIR, January 2009).

Based on the above information, the EIR required mitigation measures consisting of the incorporation of wildlife deterrents such as a wire grid over the reservoir, and preparation of a Wildlife Hazard Management Plan in coordination with the City of Redlands pursuant to FAA guidelines. This memo will summarize the various wildlife deterrent alternatives considered appropriate for the Citrus site based on a review of available reference material, and make a recommendation as to the preferred alternative(s).

Wildlife (specifically bird) control alternatives at the Citrus Reservoir site will likely be limited to 1) Habitat modification and exclusion; and 2) Repellent and harassment techniques. Other techniques such as aircraft flight schedule modification and wildlife removal (trapping, shooting, poisoning) are not considered feasible or desirable.

Habitat Modification and Exclusion

Habitat modification means changing the environment to make it less attractive or inaccessible to wildlife. All wildlife require food, cover, and water to survive. Our discussion will focus on water and cover since it is expected that minimal food sources

will be present at the project site. Some sources of food may be present due to the adjacent orange groves, as well as fish and other aquatic creatures in the reservoir.

Cover: All wildlife require cover for resting, roosting, escape, and reproduction. Non-migratory birds, left undisturbed, will establish territories on building roofs, ledges, and open girders associated with nearby ponds. Techniques are available to exclude birds from the above areas: Anti-perching devices (spikes or other obstructions) can be installed on ledges, roof peaks, rafters, signs, posts, and other roosting and perching areas; Netting and wire can also be used for larger areas. Tube steel beams instead of I-beams inhibit roosting. Some examples of the above devices have been attached.

Some or all of the above measures may be considered for the pump station buildings and appurtenant structures depending on conditions observed after construction.

Water: Water attracts birds; therefore, physical barriers such as bird balls, wire grid, pillows, or netting may need to be considered for the reservoir.

Bird balls are a relatively new application and typically consist of hollow black (UV stabilized) 4 inch diameter high density polyethylene (plastic) balls that are simply dumped onto the surface of the water until it is completely covered. Weighted balls (partially water filled) or hexagonal shapes can also be used for high wind areas.The balls deter birds from landing on the water surface and camouflage the surface. In addition to the deterrent aspects, the balls also provide water quality and economic benefits by reducing evaporation and algae growth due to their almost complete coverage of the surface. The typical coverage is 10 balls per square foot.

Pillows, mats and permeable barriers (pictured left) are also reported to be successful deterrents, and work in a similar fashion to the balls. They have some of the same advantages as the balls; however, they require skilled professional installation. Access may also be limited, requiring temporary removal during maintenance.

Overhead wire grid is reported to be successful in reducing gull and other waterfowl use of retention ponds; a typical system consists of a 10 foot by 10 foot grid. However, its effectiveness on bodies of water greater than 2 acres in surface area may be questionable. For complete elimination, netting (either polyethylene or metallic) can be installed. Wire grids and netting would likely need to be installed by experienced professionals. A custom system may also be required due to the size of the reservoir. Access may be limited, and the wire/netting may need to be temporarily removed for maintenance operations. Some information regarding the above deterrents has been attached.

Repellent and Harassment Techniques

Repellent or harassment techniques are designed to make an area unattractive to wildlife, or to make the wildlife fearful or uncomfortable. Once begun, these techniques must be continued in order to remain effective. Because they are generally not as cost effective over the long term, they are usually practiced in conjunction with habitat modification or exclusion. Repellents work by affecting the animal's senses through chemical, auditory, or visual means. However, it is common for birds to become habituated or acclimatized to repellent devices or techniques, often requiring variation of techniques. Chemical repellents will not be practical or desirable for the reservoir due to water quality issues and so will not be considered.

Audio Repellents: Audio repellents can consist of propane cannons, electronic noise-generating systems, shell crackers and pyrotechnics. Due to habituation, these devices may need to be operated in combination to be effective. Propane cannons can be set up to be operated remotely when birds are observed, thereby reducing the habituation effect of having a continuously operating device, and would likely require minimal training. The cannons can also be operated at decibel levels that will conform to local noise standards. Non-lethal projectiles can be fired from breech-loaded shotguns or from specialized launchers to provide an auditory blast or load noise to drive birds away from an area; However, specially trained personnel or the hiring of a pest control company would be necessary.

Visual Repellents: In general, most visual repellants such as hawk effigies or silhouettes, eye-spot balloons, flags, and Mylar reflecting tapes have shown only short term effectiveness and are inappropriate for use as a long term solution to bird problems. A more promising deterrent that has been used successfully recently is the display of dead birds in a "death pose." Essentially a taxidermy mounted, freeze dried bird is hung by its feet from a roosting area. Permits must be obtained before federally protected migratory birds can be obtained and used as deterrents.

Radio Controlled (RC) Model Aircraft, Cars and/or Boats: RC model aircraft, cars and boats could be considered for use as deterrents. Some advantages would be that a person has control over the models and can direct them precisely at the birds, and the models can also be deployed on an as needed basis with little training or maintenance. RC models can be equipped to fire pyrotechnics or make load noises to scare the birds.

Non-lethal Projectiles: Paint balls and rubber or plastic projectiles fired from paint ball guns and 12-guage shotguns, respectively, can be used to reinforce other techniques to repel larger birds (geese, vultures, etc.). Personnel would need to be trained to use this technique, as the objective is to shoot from a sufficient distance so that the projectile induces temporary pain and does not injure or kill the bird.

Comparison of Alternatives

In order to compare the above alternatives/techniques, the relative costs (both up front and ongoing), lifespan, and level of training required for on site staff were estimated. The following table summarizes the results:

Table 1. Comparison of Bird Mitigation Alternatives for Citrus Reservoir

Alternative	Estimated Cost(s)		Lifespan			Training Required (minimal, moderate, advanced)
	Material/ Construction	On-going (maintenance)	Short < 5 yrs	Medium 5-10 yrs	Long > 10 yrs	
Anti-perch (spikes, netting)	$5,000-$10,000	Some costs for repair of netting as needed			X	NA for buildings
Bird Balls	$2.9 million	Minimal			X	None
Mats	$500K-$1million	Some costs for occasional repair		X		Moderate -May need training for removal during maintenance
Wire Grid/Netting	$250K-$500K	Minimal			X	See above
Propane Cannon(s)	$5,000 -$10,000	Minimal for propane			X	Moderate – some initial training required
Shells / Pyro-technics	$1,000-$2,000	Minimal for shells/pyro High for training and/or use of pest control company			X	Advanced – special training required for use of shotgun, pyrotechnics; use of pest control company may be required.
Posed Bird(s)	$1,000 - $5,000	Some for periodic replacement	X			Minimal – however some initial consultation with a specialist would be required for placement, etc.
RC Aircraft or Boat(s)	$1,000	Some for gas and maintenance		X		Moderate – some training required
Paint Balls / Projectiles	$1,000	Some for paint balls and rubber bullets/plastic			X	Advanced – see Shells / Pyrotechnics above
Pest Control Company	NA	$500 per visit			X	Costs expected to vary depending on level and duration of service

*Netting costs of $ .40 per square foot based on manufacturer website; however, this price is probably only applicable to buildings, higher costs would likely be applicable for the reservoir due to special design and construction requirements.
**Bird Balls have a material cost of $ 4.00 per square foot per quote from manufacturer.

Discussion and Recommendation

Based on a review of the available references as well as the comparison table, it is preferable to use a combination of techniques in order to reduce costs and increase effectiveness. In the absence of actual data for the site and vicinity, it is reasonable to assume that larger migratory and non-migratory birds may be attracted to the reservoir, while smaller migratory and non-migratory birds would be attracted to the buildings. Therefore, a combination of techniques as outlined below would be considered most appropriate for this site.

Buildings / Structures: The buildings and structures associated with the Citrus Reservoir pump station should be designed to the extent feasible with regard to the recommendations of the section on Habitat Modification and Exclusion in this memo. Specifically, anti-perch devices such as spikes and other obstructions can be installed on ledges, roof peaks, rafters, signs, posts, and other roosting and perching areas where birds are observed; Netting and wire can also be used for larger areas. Sample plans and specifications for spikes and other obstructions, as well as contact information for suppliers and consultants have been attached.

Due to the inherent difficulty in determining which specific areas will attract birds, we recommend a phased approach to the installation of the above devices. Obvious areas such as building ledges and rafters that cannot be feasibly designed to reduce the possibility of roosting should have measures installed first. If and when birds are observed in other areas, a decision can be made whether or not to install additional measures in those locations.

Reservoir: The reservoir is likely to attract larger birds, and hence will need different measures than the buildings and structures. We also recommend a phased approach for the reservoir mitigation measures. Costlier techniques such as the use of Bird Balls or Mats should be considered only after all other measures have been exhausted. Based on cost and level of training required, the Propane Cannon and RC Aircraft / Boat options are considered the most reasonable first choice for the reservoir. Only On-Demand Propane Cannons (i.e. no timers) should be used so that the chances of habituation are low and to limit noise pollution. RC aircraft and boats would require some training for operation and maintenance.

If the above measures prove ineffective and/or are not feasible for on site staff, we recommend the use of a pest control company that can provide trained personnel for one time or regular bird control and/or removal operations.

References:

1. *Bird/Wildlife Aircraft Strike Hazard (BASH) Management Techniques.* U.S. Air Force Pamphlet 91-212, 1 February 2004.

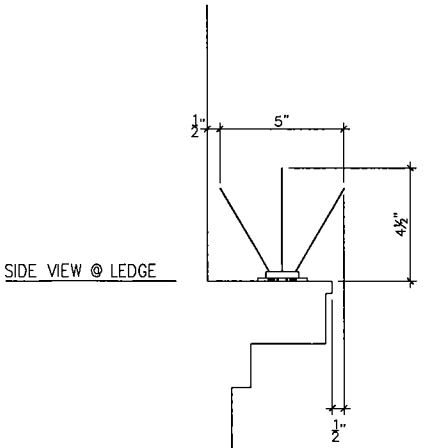
2. *Wildlife Hazard Management at Airports.* U.S. Department of Transportation Federal Aviation Administration / U.S. Department of Agriculture Animal & Plant Health Inspection Service, Second Edition, July 2005.

ATTACHMENTS

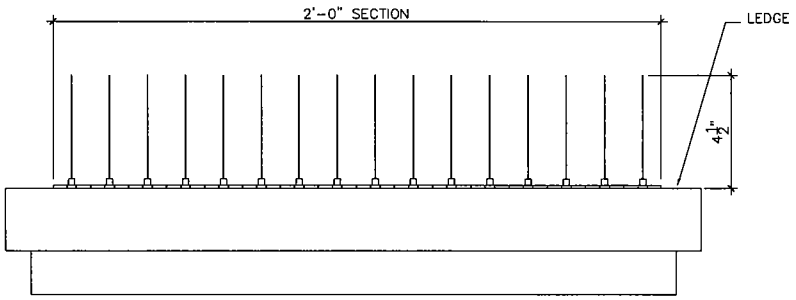
Sample Bird Deterrents

BIRD-B-GONE, INC.

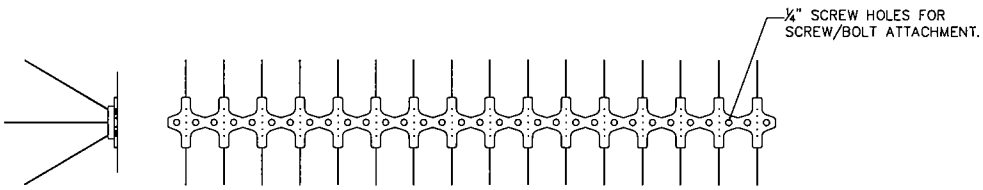
BIRD SPIKE 2001-5"
23918 SKYLINE
MISSION VIEJO, CA 92692
TEL: 800-392-6915 OR 949-472-3122
FAX: 949-472-3116



SIDE VIEW @ LEDGE



FRONT VIEW



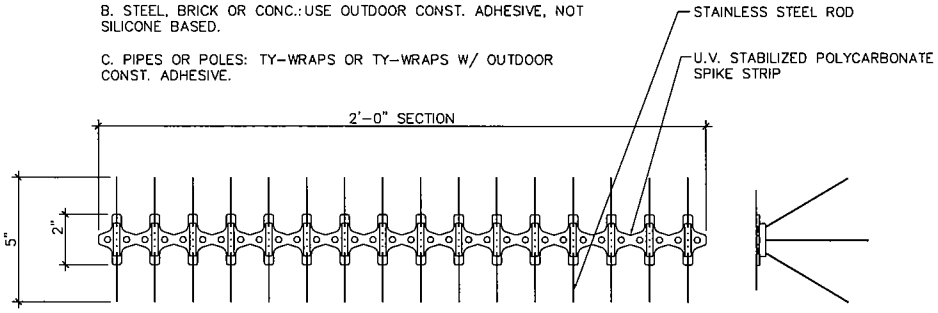
BOTTOM VIEW

NOTE: SPEC. MOUNTING SYSTEM PER PROJECT CONDITIONS:

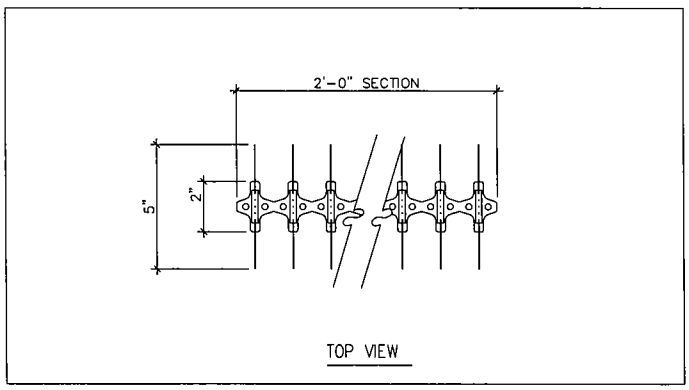
A. WOOD: USE #8 WOOD SCREWS.

B. STEEL, BRICK OR CONC.: USE OUTDOOR CONST. ADHESIVE, NOT SILICONE BASED.

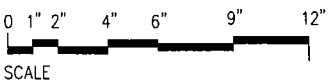
C. PIPES OR POLES: TY-WRAPS OR TY-WRAPS W/ OUTDOOR CONST. ADHESIVE.



TOP VIEW



TOP VIEW



SCALE

BIRDBUSTERS
Established 1985

Innovative Bird Control Products

Bird Net

buy Bird Net products

Bird netting is the strongest and most versatile bird exclusion system in the world. **Bird net** denies pest birds access to literally any architectural configuration including courtyards, rooftops, overhangs, parking garages, etc.

Bird net is a nearly invisible bird control product that comes in black, stone (beige) and translucent colors to blend with your structure. The **bird netting** consists of very thin, ultra-strong strands of polyethlyle

Target Birds Deterred: Different mesh sizes to exclude all pest bird species

Install Bird netting bird exclusion products: In any **bird pressure** area. Any enclosed or semi-enclosed area, opening or building configuration where pest birds need to be excluded. Also useful for pest bird exclusion in airplane hangars and on rooftops or outdoor courtyards as well as aquaculture and agricultural applications.

Material: Polyethylene twine and steel installation hardware

Ease of Installation: Professional level product - involved

Advantages of Bird Net:

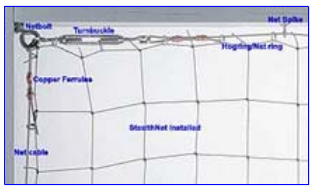
- Long lasting, humane, nearly invisible bird control product
- 100% bird exclusion against all pest bird species
- Extremely strong and versatile bird exclusion product
- Wide variety of fastening devices for use on any substrate
- Specially treated polyethlene is highly resistant to U.V. rays
- Will last for 10 years or more
- Available in black, stone & translucent colors to blend with your structure
- Available in six standard plus custom sizes
- Will not rot or absorb water
- Flame Resistant
- Humane bird control product
- Special net zippers and clips are available for easy maintenance access

How It Works: **Bird netting** consists of high density polyethylene twine that is twisted and knotted to form a strong impenetrable bird barrier to pest birds. The coloring and U.V. treatment are embedded in the composition, making the **bird net** more resistant to the effects of the sun with a more consistent coloring throughout.

A cable support structure is installed on the structure with steel attachments applicable to the substrate (see sample photo at right). The **bird netting** is then stretched tight and attached to the cable support structure with steel bird net rings, forming a tight, solid, impenetrable bird barrier to humanely exclude the targeted pest bird species.

Click here for detail on **bird net** bird control product hardware.
Click here for more **bird net** specifications and color samples.

Click photos to enlarge



buy Bird Net products

Bird Net Sizes and Pricing (Custom sizes also available)							
Mesh Size	**25' x 25'**	**25' x 50'**	**25' x 75'**	**50' x 50'**	**50' x 75'**	**50' x 100'**	**per sq. ft.**
2" (Pigeons, Crows)	$110.00	$220.00	$330.00	$440.00	$660.00	$875.00	.22/sf
1-1/8" (Starlings, Blackbirds)	$200.00	$395.00	$590.00	$785.00	$1,175.00	$1,565.00	.40/sf
3/4" Standard (Sparrows, Swallows)	$215.00	$425.00	$635.00	$845.00	N/A	N/A	.40/sf
3/4" Heavy Duty (Sparrows, Swallows)	$245.00	$485.00	$730.00	$970.00	$1,455.00	$1,940.00	.45/sf
4" Gull Net	$56.25	$112.50	$168.75	$225.00	$337.50	$625.00	.15/sf

Home Bird Wars Identify Your Pest Bird Agricultural Bird Control Aviation Bird Control
Structural Bird Control Products Bird Control for Boats Bird Scare Products
Contact Us Tell Us About Your Bird Problem

707 South Gulfstream Avenue #405, Sarasota, Florida 34236
Toll free 866-915-8225 or 703-299-8855
Fax: 941-952-9766
jackwagner@birdbusters.com

Home Owners Click HERE!

BIRD SLOPE
Ledge Eliminator

Prevents Birds from Landing & Nesting on Ledges.

- Ideal for Ledges, Eaves, Beams and other 90 Degree Areas where Pest Birds are Nesting & Roosting!
- U.V. Protected PVC - Sun & Weather Resistant!
- Easy to Install - Easy to Maintain!
- 2-foot Lengths - Cuts Labor Time in Half!
- Rigid One Piece Construction...Non-Conductive!
- Easy to Install End Caps!
- Easy to Install Extenders for Maximum Protection!
- Longest Guarantee!

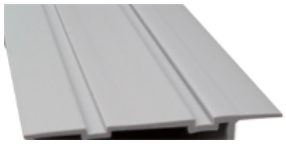
Bird Pressure:	Light to Heavy
Bird Species:	All Birds
Where to Use:	Ledges, i-beams with widths up to 10".
Product Description:	U.V. Protected Outdoor Grade PVC.

Before

After

Before

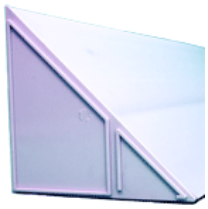
After



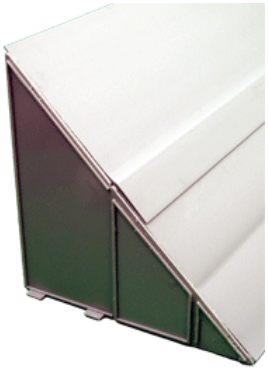
Glue Troughs for Easy Adhesive Application!

Available in Grey and Stone

Clear Polycarbonate Mounting Clip for Vertical Bird Slope Installations. Clip Holds Bird Slope in Place.



Bird Slope End Cap



Bird Slope with Extender End Cap

Specifications

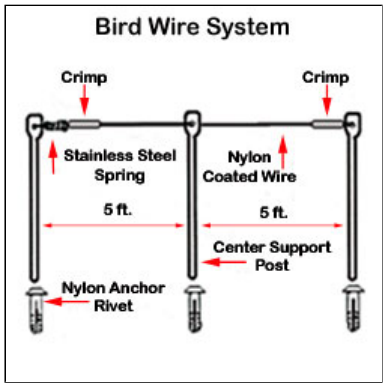
1-800-392-6915
email: **nobirds@birdbgone.com**

Home Owners Click HERE!

BIRD WIRE 2000™

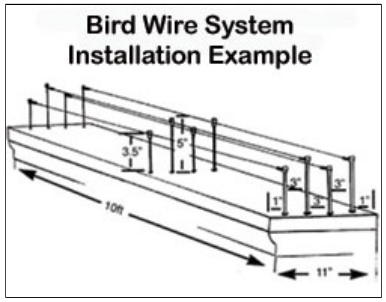
- Keep Pest Birds from Landing & Roosting
- Affordable...Low Profile...Low Visibility
- Industry Leading **5-Year Guarantee**
- **#1** Specified by Architects
- Approved for use on Federal / State Government Structures
- Low Maintenance
- Safe / Humane

Bird Pressure:	Light to Medium
Species:	Pigeons, Seagulls and Larger Birds
Where to Use:	Ledges, Signs, Window Sills, Roof Peaks and Edges, Flat or Curved Surfaces.
Product Description:	Stainless Steel Wire Coated with U.V. Stabilized Clear Nylon.



Bird Wire is a post and wire system that provides an unstable landing area for pigeons, seagulls, and larger birds.

- The system should be installed no more than 1" from the front of the ledge / surface and no more than 1" form the back. Spacing between rows should not exceed 3".
- Alternate the heights of the rows to get the best results out of the bird wire system.
- A support post must be placed every 5', and every 10' or the birds can defeat the system.
- Choose the appropriate hardware for the surface being protected (i.e. wood, masonry, concrete, etc.).



Specifications | Installation Instuctions

1-800-392-6915
email: **nobirds@birdbgone.com**

CIC Ball Company
2280 Amber Drive
Hatfield, PA, 19440, US
Phone: 215-822-3380
Fax: 215-822-3382
Email: sales@cicball.com
Website: www.cicball.com

Item # PEH39370BWF 4" (100mm) HDPE Black Hollow Ball, Water-Filled

larger image

4" (100mm) HDPE Black Hollow Ball, Water-Filled

Bird Deterrent System using Hollow Plastic Balls

CIC Floating Hollow Plastic Ball Covers are used to camouflage ponds, tanks, and water basins to prevent birds from seeing and landing in industrial water that may contain harmful chemicals, oils, acid, and salts.

4” (100mm) Hollow Plastic Balls

- Made In USA; Blow Molded at our Factory in Hatfield, PA
- Made from U.V. Stabilized Black HDPE
- Easy to Install – Just Dump Bags/Cartons into Pond
- Rise and Fall with Liquid Level
- Withstand the Elements – No Maintenance Required

Additional Benefits:

- Prevent Algae Growth
- Odor Control
- Vapor Containment
- Controls Heat Loss and Evaporation

Balls are delivered throughout North America to your site in Bulk Bags or Cartons. CIC Ball works closely with Environmental Engineering companies and supplies the following industries:

- Industrial Processing and Waste Water
- Municipal Water Treatment
- Gold Mining
- Commercial and Military Airports
- Chemical Processing
- Metal Processing and Plating
- Copper Refining

Specifications

Nominal Weight	Custom g
Color	Black
U.V. Stabilized	Yes
Bulk Packaging	2000 Pieces
Carton Packaging	100 Pieces

Print Back

AWTT INC.
Advanced water treatment technologies
Engineered for a lifetime

Hexa Tiles™

Wind resistant tile cover

AWTT INC. Hexa Tile cover system is the result of intense and extensive research leading to a product which fulfills demands of an affordable and wind resistant floating cover for liquids.

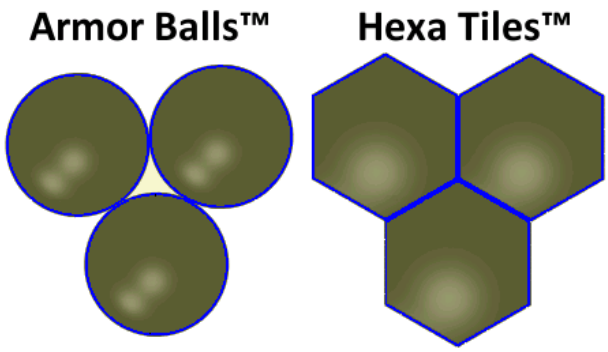
It offers highly effective solutions to problematic liquid storage systems such as municipal and industrial wastewater, treatment processing plants, metal and petrochemical plants, leachate ponds, airports, raw water reservoirs and other applications for heat retention, photosynthesis prevention and or a wildlife deterrent.

The Hexa Tile system ensures coverage of up to 95%. The resulting thermal insulation barrier combines the insulation factor of the air held in each tile with the poor heat conductivity of plastic. While the small air pockets between the tiles are not sealed, they also contribute to this insulation system, which dramatically reduces heat loss and light transfer. The cover also reduces liquid loss through evaporation and prevents odor problems.

The Hexa Tile barrier, contrary to standard covers, does not represent an obstacle to static, moving or dipping equipment. The tiles can be easily pushed aside and the cover reforms itself as the basin and obstacles change configuration, as in a clarifier. In fact, the tiles will keep up with liquid level, rising, lowering and restacking themselves as needed.

Hexa Tiles™ are also an effective wildlife deterrent. When entirely covered, the body of water becomes unattractive to waterfowl and other wildlife such as deer. They simply don't recognize it as water. Compared to netting, Hexa Tiles™ are not sensitive to ice or snow damage and do not require any kind of support.

Hexa Tiles are produced with high quality high density polyethylene (HDPE). The expected life time is 25 years.



The Hexa Tiles™ Advantages:

- Quick and simple to install
- Deters waterfowl from landing on covered waters
- Each tile is made of long lasting, UV resistant, virgin HDPE
- Heating costs reduced by up to 85%
- Decrease liquid loss through evaporation by up to 95%
- Allows movement of equipment through liquid
- Adjusts to the variation of the liquid level by spreading & stacking
- Fast and Effective solution to odor problems
- Virtually maintenance free
- Cannot tear like conventional membrane cover
- Reduces penetration of UV rays, prohibits growth of algae and clogging weeds. Aeration can be installed underneath the Hexa Tiles™
- Reduced chemical consumption
- Unaffected by rain water

Technical Data

Hexa Tiles™ are made of virgin, high density polyethylene HDPE. Hexa Tiles are widely used for all external applications due to its particular resistance to freezing conditions. Degrading effects of sunlight are prevented with UV stabilizing additives. HDPE is also recommended for demineralized water and Chromic acid applications.

Width	**100 mm**
Average weight	38g
Number per sq.ft	10
Number per sq. meter	116

PRODUCT SHEET

PFC 20

The Permeable Floating Cover is comprised of recycled cross-linked polyethylene foam bonded with non-woven geotextile on one side of the mat. This product is designed to control algae and reduce evaporation from water treatment facilities, reservoirs, etc. The mat is conforms to the values and test

PROPERTIES	TEST METHOD	US VALUE
MATERIAL CHARACTERISTICS		
Dimensions		Rolls 54” x 200” x 1”
Composition	95% Recycled, non-contaminated, post industrial, cross-link, closed cell polyethylene foam on polyester geotextile.	
Weight		1.5 LBS/SF
Thickness	ASTM 5199	20 mm (+/- 2 mm)
Light Blockage		> 95%
Density		4 - 6 LBS/SF
Long Term Design Strength		535 LBS/SF
UV Resistance		90 %
Bouyancy		> 52 LBS/FT3 (displ. volume
Application Temp. Range		-60° to +60° C
Chemical Resistance		Most Chemicals
HYDRAULIC BEHAVIOR		
Permittivity	ASTM D 4491	3.235 sec-1
Permeability	ASTM D 2434	>34 gal/min/SF
Water Absorption		< 1 Vol.%
Water Quality Test	NSF 61	Pass
Toxicity		non

PFC is a patent-pending technology

WWW.3RFOAM.COM

Applications:

- Water Reservoirs
- Water Treatment Lagoons
- Aquaculture Ponds
- Holding Ponds for Irrigation

3R FOAM

Exclusively Distributed by:

Recycled Foam Technologies, LLC

4223 Rock Run Road, Havre de Grace, MD 21078

Phone: 410-878-6341 Fax: 410-734-4129

JUNE 2008

BACK ZON LP GAS SCARE CANNONS and ACCESSORIES

ZON - MARK 5 BIRD SCARE CANNON

On-Demand Model

On demand immediate explosions. Greatly enhancing the effectiveness of Bird Air Strike Hazard (BASH) programs at airports and bird/wildlife control at landfill sites, this model fires only on command providing total control and timely deployment. Optional hand held radio transmitter and receiver allows remote activation of up to 99 cannons.

Features:
- Can be mounted on vehicles or vessels for aggressive scare tactics.
- There are no moving parts to replace or adjust.
- Printed circuit board controls gas flow and ignition.
- Spark continues for one second allowing for positive ignition every time (even in extremely windy conditions).
- Comes standard with a manual, push button activator on the end of a 12' cable or optional cordless remote radio receiver and transmitter.

return to top

Optional Radio Transmitter And Receivers

FCC approved transmitters range from 2 to 12 watts. A digital-encoded FSK modulated signal to a companion receiver verifies the digital code and then activates the Zon Mark V. There are over 65,000 different system codes possible which eliminates false activation. Standard transmission range is up to 8,800' (line of sight). An optional programmable activation Sequencer can be interfaced with the Zon Mark V cannon. Contact Margo Supplies to determine proper system to meet your requirements.

Appendix E
Example Daily Wildlife Log

ESA

Daily Wildlife Log - Citrus Reservoir

PAGE_____

DATE	Wildlife Species or Species Group	NUMBER	ACTIVITY	LOCATION	COMMENT

Appendix F

USFWS Federal Migratory Bird Depredation Permit Application

ESA

Department of the Interior
U.S. Fish and Wildlife Service

Expires 11/30/2010
OMB No. 1018-0022

Federal Fish and Wildlife Permit Application Form

Click here for addresses.

Return to: U.S. Fish and Wildlife Service (USFWS)
Migratory Bird Regional Permit Office

Type of Activity: Migratory Bird Depredation Permit

Complete Sections A or B, and C, D, and E of this application. U.S. address may be required in Section C, see instructions for details.
See attached instruction pages for information on how to make your application complete and help avoid unnecessary delays.

A. Complete if applying as an individual

1.a. Last name	1.b. First name	1.c. Middle name or initial	1.d. Suffix

2. Date of birth (mm/dd/yyyy)	3. Social Security No.	4. Occupation	5. Affiliation/ Doing business as (see instructions)

6.a. Telephone number	6.b. Alternate telephone number	6.c. Fax number	6.d. E-mail address

B. Complete if applying on behalf of a business, corporation, public agency or institution

1.a. Name of business, agency, or institution	1.b. Doing business as (dba)

2. Tax identification no.	3. Description of business, agency, or institution

4.a. Principal officer Last name	4.b. Principal officer First name	4.c. Principal officer Middle name/ initial	4.d. Suffix

5. Principal officer title	6. Primary contact

7.a. Business telephone number	7.b. Alternate telephone number	7.c. Business fax number	7.d. Business e-mail address

C. All applicants complete address information

1.a. Physical address (Street address; Apartment #, Suite #, or Room #; no P.O. Boxes)

1.b. City	1.c. State	1.d. Zip code/Postal code:	1.e. County/Province	1.f. Country

2.a. Mailing Address (include if different than physical address; include name of contact person if applicable)

2.b. City	2.c. State	2.d. Zip code/Postal code:	2.e. County/Province	2.f. Country

D. All applicants MUST complete

1. Attach check or money order payable to the U.S. FISH AND WILDLIFE SERVICE **in the amount of $100.00 if you are applying for a new permit or $50.00 if you are requesting a substantive amendment to your existing permit. If you are a homeowner requesting a permit for damage to your personal residence or property, attach $50.00**. Federal, tribal, State, and local government agencies, and those acting on behalf of such agencies, are exempt from the processing fee – ***attach documentation of fee exempt status as outlined in instructions.*** (50 CFR 13.11(d))

2. Do you currently have or have you ever had any Federal Fish and Wildlife permits?
Yes ☐ If yes, list the number of the most current permit you have held or that you are applying to renew/re-issue: _____ No
No ☐

3. Certification: I hereby certify that I have read and am familiar with the regulations contained in ***Title 50, Part 13 of the Code of Federal Regulations*** and the other ***applicable parts in subchapter B of Chapter I of Title 50***, and I certify that the information submitted in this application for a permit is complete and accurate to the best of my knowledge and belief. I understand that any false statement herein may subject me to the criminal penalties of 18 U.S.C. 1001.

_____
Signature (**in blue ink**) of applicant/person responsible for permit (No photocopied or stamped signatures) Date of signature

E. MIGRATORY BIRD DEPREDATION PERMIT

(Migratory Bird Treaty Act, 50 CFR 21.41)

Note: ***A Federal Migratory Bird Depredation Permit is required to capture or kill migratory birds for depredation control purposes. The permit authorizes certain management and control activities necessary to provide for human health and safety, protect personal property, or allow resolution of other injury to people or property. No permit is required merely to scare or herd depredating migratory birds other than endangered or threatened species and bald or golden eagles. You should apply for a depredation permit only after non-lethal management proves unsuccessful. If a permit is issued, you will be expected to continue to integrate non-lethal techniques when implementing any lethal measures. You must be at least 18 years of age to apply.***

Protected Species: ***The species listed in the Code of Federal Regulations at 50 CFR 10.13 are protected under the Migratory Bird Treaty Act. A list of species in the U.S. and their status under the MBTA is available at the following website: http://www.fws.gov/migratorybirds/issues/nonnative/MBTA-protected&NonprotectedSpecies.htm.***

Resident Canada goose nests & eggs: ***If you are only destroying or addling resident Canada goose eggs and your state is one that accepts Federal registration, you may register for free on-line at https://epermits.fws.gov/eRCGR in lieu of obtaining a depredation permit.***

Your application for a depredation permit must include a recommendation from the U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services, for addressing your depredation problem. You may contact Wildlife Services at (866) 487-3297. If Wildlife Services recommends that a permit be issued to capture or kill birds, they will complete a Wildlife Services Permit Review Form (Form 37). This form and a copy of any required State permits must accompany your application. (This form is not required for resident Canada goose egg addling/destruction/OvoControl™G.)

Be as specific as possible in your responses to the questions below. You should submit your application at least 60 days prior to the date that you need your permit (50 CFR 13.11(c)).

Please provide the following information:

1. List the species of migratory birds causing the depredation problem and estimate the number of each involved.

2. Provide the exact location of the property or properties where the control activity would be conducted (State, county, and physical address of the specific site).

3. Description of damage.
(a) Describe the specific migratory bird damage or injury you are experiencing.
(b) How long has it been occurring (e.g., the number of years)?
(c) What times or seasons of the year does it occur?
(d) Describe any human health and safety hazards involved.
(e) Provide details such as types of crops destroyed, human injuries sustained, property damage incurred, and health and safety hazards created.

4. Describe the extent of the damage and estimate the economic loss suffered as a result, such as percentage of acres of crop and dollar loss, cost to replace damaged property, or cost of injuries.

5. Describe the nonlethal measures you have taken to control or eliminate the problem, including how long (e.g., a week, month, year(s)) and how often they have been conducted. List the techniques you have tried, such as harassment (e.g., horns, pyrotechnics, propane cannons), habitat management (e.g., vegetative barriers, longer grass management, fencing), cultural practices (e.g., crop selection and placement, management of pets and feeding schedules), or no feeding policies.

6. Proposed actions.
(a) What actions are you proposing to take to alleviate the problem (e.g., kill, eliminate nesting, trap and relocate)?
(b) Describe the method you propose (e.g., shoot; addle, oil, destroy eggs; trap and relocate; trap and donate birds to a food processing center).
(c) If you propose to trap birds, describe the method that will be used and your (or your agent's) experience with the method.

7. What long-term measures do you plan to take to eliminate the problem?

8. If you are applying on behalf of an airport for a permit to control birds in flight zones, indicate whether you are operating under an approved Wildlife Hazard Management Plan.

9. Anyone who will be acting as your agent or assisting you with the activities authorized by your permit must be authorized as a subpermittee under your permit. As the primary permittee, you will be legally responsible for ensuring that your subpermittees comply with the terms of your permit. List the name of anyone who will be directly involved in doing the work to resolve your problems. Include any commercial company that may be contracted to conduct the work.

10. You must retain records relating to the activities conducted under your permit for at least 5 years from the date of expiration of your permit. Is the physical address you provided in Section C on page 1 of this application the address where your records will be kept?

____ Yes ____ No If "no", provide the physical address:

_____

11. Have you obtained all required State permits or approvals to conduct this activity?

____Yes If "yes", attach a copy of the approval(s). ____ Have applied ____ None required

12. Attach a copy of the completed Wildlife Services Permit Review Form (Form 37) prepared by USDA, APHIS, Wildlife Services providing their recommendation regarding your depredation problem.

PERMIT APPLICATION FORM INSTRUCTIONS

The following instructions pertain to the standard permit form 3-200 that must be completed as an application for a U.S. Fish and Wildlife Service or CITES permit. The General Permit Procedures in 50 CFR 13 address the permitting process. For simplicity, all licenses, permits, registrations, and certificates will be referred to as a permit.

GENERAL INSTRUCTIONS:

- Complete all blocks/lines/questions in Sections A or B, and C and D. Complete all of Section E.
- **An incomplete application may cause delays in processing or may be returned to the applicant. Be sure you are filling in the appropriate application form for the proposed activity.**
- Print clearly or type in the information. Illegible applications may cause delays.
- Sign the application in blue ink. Faxes or copies of the original signature will not be accepted.
- Mail the original application to the address at the top of page one of the application or if applicable on the attached address list.
- **Keep a copy of your completed application.**
- **Please plan ahead. Allow at least 60 days for your application to be processed. Some applications may take longer than 90 days to process. (50 CFR 13.11)**
- Applications are processed in the order they are received.
- Additional forms and instructions are available from http://permits.fws.gov/ .

COMPLETE EITHER SECTION A OR SECTION B:

Section A. **Complete if applying as an individual:**

- Enter the complete name of the responsible individual who will be the permittee if a permit is issued. Enter personal information that identifies the applicant. ***Fax and e-mail are not required if not available.***
- If you are applying on behalf of a client, the personal information must pertain to the client, and a document evidencing power of attorney must be included with the application.
- **Affiliation/ Doing business as (dba)**: business, agency, organizational, or institutional affiliation *directly* related to the activity requested in the application (e.g., a taxidermist is an individual whose business can *directly* relate to the requested activity). The Division of Management Authority (DMA) will **not** accept *doing business as* affiliations for individuals.

Section B. **Complete if applying as a business, corporation, public agency, or institution:**

- Enter the complete name of the business, agency or institution that will be the permittee if a permit is issued. Give a brief description of the type of business the applicant is engaged in. Provide contact phone number(s) of the business.
- **Principal Officer** is the person in charge of the listed business, corporation, public agency, or institution. The principal officer is the person responsible for the application and any permitted activities. Often the principal officer is a Director or President. **Primary Contact** is the person at the business, corporation, public agency, or institution who will be available to answer questions about the application or permitted activities. Often this is the preparer of the application.

ALL APPLICANTS COMPLETE SECTION C:

- For all applications submitted to the Division of Management Authority (DMA) a physical U.S. address is **required**. Province and Country blocks are provided for those USFWS programs which use foreign addresses and are not required by DMA..
- **Mailing address** is address where communications from USFWS should be mailed if different than applicant's physical address.

ALL APPLICANTS COMPLETE SECTION D:

Section D.1 **Application processing fee:**

- An application processing fee is required at the time of application; unless exempted under 50 CFR13.11(d)(3). The application processing fee is assessed to partially cover the cost of processing a request. **The fee does not guarantee the issuance of a permit. Fees will not be refunded for applications that are approved, abandoned, or denied**. We may return fees for withdrawn applications prior to any significant processing occurring.
- **Documentation of fee exempt status is not required for Federal, tribal, State, or local government agencies; but must be supplied by those applicants acting on behalf of such agencies**. Those applicants acting on behalf of such agencies must submit a letter on agency letterhead and signed by the head of the unit of government for which the applicant is acting on behalf, confirming that the applicant will be carrying out the permitted activity for the agency.

Section D.2 **Federal Fish and Wildlife permits:**

- List the number(s) of your most current FWS or CITES permit or the number of the most recent permit if none are currently valid. If applying for re-issuance of a CITES permit, the original permit must be returned with this application.

Section D.3 **CERTIFICATION:**

- **The individual identified in Section A, the principal officer named in Section B, or person with a valid power of attorney (documentation must be included in the application) must sign and date the application in blue ink.** This signature binds the applicant to the statement of certification. This means that you certify that you have read and understand the regulations that apply to the permit. You also certify that everything included in the application is true to the best of your knowledge. Be sure to read the statement and re-read the application and your answers before signing.

Please continue to next page

APPLICATION FOR A FEDERAL FISH AND WILDLIFE PERMIT
Paperwork Reduction Act, Privacy Act, and Freedom of Information Act – Notices

In accordance with the Paperwork Reduction Act of 1995 (44 U.S.C. 3501, *et seq.*) and the Privacy Act of 1974 (5 U.S.C. 552a), please be advised:

1. The gathering of information on fish and wildlife is authorized by:
(Authorizing statutes can be found at: http://www.gpoaccess.gov/cfr/index.html and http://www.fws.gov/permits/ltr/ltr.shtml.)

   a. Bald and Golden Eagle Protection Act (16 U.S.C. 668), 50 CFR 22;
   b. Endangered Species Act of 1973 (16 U.S.C. 1531-1544), 50CFR 17;
   c. Migratory Bird Treaty Act (16 U.S.C. 703-712), 50 CFR 21;
   d. Marine Mammal Protection Act of 1972 (16 U.S.C. 1361, *et. seq.*), 50 CFR 18;
   e. Wild Bird Conservation Act (16 U.S.C. 4901-4916), 50 CFR 15;
   f. Lacey Act: Injurious Wildlife (18 U.S.C. 42), 50 CFR 16;
   g. Convention on International Trade in Endangered Species of Wild Fauna and Flora (TIAS 8249), http://www.cites.org/ , 50 CFR 23;
   h. General Provisions, 50 CFR 10;
   i. General Permit Procedures, 50 CFR 13; and
   j. Wildlife Provisions (Import/export/transport), 50 CFR 14.

2. Information requested in this form is purely voluntary. However, submission of requested information is required in order to process applications for permits authorized under the above laws. Failure to provide all requested information may be sufficient cause for the U.S. Fish and Wildlife Service to deny the request. Response is not required unless a currently valid Office of Management and Budget (OMB) control number is displayed on form.

3. Certain applications for permits authorized under the Endangered Species Act of 1973 (16 U.S.C. 1539) and the Marine Mammal Protection Act of 1972 (16 U.S.C. 1374) will be published in the **Federal Register** as required by the two laws.

4. Disclosures outside the Department of the Interior may be made without the consent of an individual under the routine uses listed below, if the disclosure is compatible with the purposes for which the record was collected. (Ref. 68 FR 52611, September 4, 2003)

   a. Routine disclosure to subject matter experts, and Federal, tribal, State, local, and foreign agencies, for the purpose of obtaining advice relevant to making a decision on an application for a permit or when necessary to accomplish a FWS function related to this system of records.
   b. Routine disclosure to the public as a result of publishing **Federal Register** notices announcing the receipt of permit applications for public comment or notice of the decision on a permit application.
   c. Routine disclosure to Federal, tribal, State, local, or foreign wildlife and plant agencies for the exchange of information on permits granted or denied to assure compliance with all applicable permitting requirements.
   d. Routine disclosure to Captive-bred Wildlife registrants under the Endangered Species Act for the exchange of authorized species, and to share information on the captive breeding of these species.
   e. Routine disclosure to Federal, tribal, State, and local authorities who need to know who is permitted to receive and rehabilitate sick, orphaned, and injured birds under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act; federally permitted rehabilitators; individuals seeking a permitted rehabilitator with whom to place a bird in need of care; and licensed veterinarians who receive, treat, or diagnose sick, orphaned, and injured birds.
   f. Routine disclosure to the Department of Justice, or a court, adjudicative, or other administrative body or to a party in litigation before a court or adjudicative or administrative body, under certain circumstances.
   g. Routine disclosure to the appropriate Federal, tribal, State, local, or foreign governmental agency responsible for investigating, prosecuting, enforcing, or implementing statutes, rules, or licenses, when we become aware of a violation or potential violation of such statutes, rules, or licenses, or when we need to monitor activities associated with a permit or regulated use.
   h. Routine disclosure to a congressional office in response to an inquiry to the office by the individual to whom the record pertains.
   i. Routine disclosure to the General Accounting Office or Congress when the information is required for the evaluation of the permit programs.
   j. Routine disclosure to provide addresses obtained from the Internal Revenue Service to debt collection agencies for purposes of locating a debtor to collect or compromise a Federal claim against the debtor or to consumer reporting agencies to prepare a commercial credit report for use by the FWS.

5. For individuals, personal information such as home address and telephone number, financial data, and personal identifiers (social security number, birth date, etc.) will be removed prior to any release of the application.

6. The public reporting burden on the applicant for information collection varies depending on the activity for which a permit is requested. The relevant burden for a Migratory Bird Depredation permit application varies from 1.5 hours for individuals to 3 hours for businesses. The burden for recordkeeping varies from 15 minutes for individuals to 30 minutes for businesses. This burden estimate includes time for reviewing instructions, gathering and maintaining data and completing and reviewing the form. You may direct comments regarding the burden estimate or any other aspect of the form to the Service Information Clearance Officer, U.S. Fish and Wildlife Service, Mail Stop 222, Arlington Square, U.S. Department of the Interior, 1849 C Street, NW, Washington D.C. 20240.

Freedom of Information Act – Notice

For organizations, businesses, or individuals operating as a business (i.e., permittees not covered by the Privacy Act), we request that you identify any information that should be considered privileged and confidential business information to allow the Service to meet its responsibilities under FOIA. Confidential business information must be clearly marked "Business Confidential" at the top of the letter or page and each succeeding page and must be accompanied by a non-confidential summary of the confidential information. The non-confidential summary and remaining documents may be made available to the public under FOIA [43 CFR 2.13(c)(4), 43 CFR 2.15(d)(1)(i)].

U.S. Fish & Wildlife Service

Migratory Bird Regional Permit Offices

FWS REGION	AREA OF RESPONSIBILITY	MAILING ADDRESS	CONTACT INFORMATION
Region 1	**Hawaii, Idaho, Oregon, Washington**	911 N.E. 11th Avenue Portland, OR 97232-4181	Tel. (503) 872-2715 Fax (503) 231-2019 Email *permitsR1MB@fws.gov*
Region 2	**Arizona, New Mexico, Oklahoma, Texas**	P.O. Box 709 Albuquerque, NM 87103	Tel. (505) 248-7882 Fax (505) 248-7885 Email *permitsR2MB@fws.gov*
Region 3	**Iowa, Illinois, Indiana, Minnesota, Missouri, Michigan, Ohio, Wisconsin**	One Federal Drive Fort Snelling, MN 55111	Tel. (612) 713-5436 Fax (612) 713-5393 Email *permitsR3MB@fws.gov*
Region 4	**Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virgin Islands, Puerto Rico**	P.O. Box 49208 Atlanta, GA 30359	Tel. (404) 679-7070 Fax (404) 679-4180 Email *permitsR4MB@fws.gov*
Region 5	**Connecticut, District of Columbia, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Virginia, Vermont, West Virginia**	P.O. Box 779 Hadley, MA 01035-0779	Tel. (413) 253-8643 Fax (413) 253-8424 Email *permitsR5MB@fws.gov*
Region 6	**Colorado, Kansas, Montana, North Dakota, Nebraska, South Dakota, Utah, Wyoming**	P.O. Box 25486 DFC(60154) Denver, CO 80225-0486	Tel. (303) 236-8171 Fax (303) 236-8017 Email *permitsR6MB@fws.gov*
Region 7	**Alaska**	1011 E. Tudor Road (MS-201) Anchorage, AK 99503	Tel. (907) 786-3693 Fax (907) 786-3641 Email *permitsR7MB@fws.gov*
Region 8	**California, Nevada**	2800 Cottage Way Sacramento, CA 95825	Tel. (916) 414-6464 Fax (916) 414-6486 Email *permitsR8MB@fws.gov*

Appendix G

Example Wildlife Observation Contact Information Sheet

ESA

To be inserted in the front of the Daily Wildlife Observation Book

Wildlife Contact Information

If wildlife are observed in size or number that could create a risk to aviation at Redlands Municipal Airport, please contact:

Primary Contact:

Name _____

Title _____

Organization _____

Office Phone _____

Cell Phone _____

Email _____

Secondary Contact:

Name _____

Title _____

Organization _____

Office Phone _____

Cell Phone _____

Email _____

To be inserted in the front of the Daily Wildlife Observation Book

Appendix H

FAA Advisory Circular
150/5200-36

ESA

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: June 28, 2006 **AC No:** 150/5200-36

Initiated by: AAS-300

1. Purpose.

This Advisory Circular (AC) describes the qualifications for wildlife biologists who conduct Wildlife Hazard Assessments for airports certificated under Title 14, Code of Federal Regulations, Part 139 (14 CFR, Part 139). In addition, it addresses the minimum wildlife hazard management curriculum for the initial and recurrent training of airport personnel involved in implementing a Federal Aviation Administration (FAA) approved Wildlife Hazard Management Plan.

2. Background.

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

3. Applicability.

The Federal Aviation Administration (FAA) recommends that public-use airport operators fulfill the standards and practices contained in this AC. The holders of Airport Operating Certificates issued under Part 139, Subpart D, may use the standards, practices, and recommendations contained in this AC to comply with the wildlife hazard management requirements of Part 139. The FAA also recommends the guidance in this AC for persons wishing to conduct Wildlife Hazard Assessments and for those who help prepare Wildlife Hazard Management Plans or conduct the requisite training.

4. Related Reading Material.

Please review the most recent versions of the following documents:

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

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

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

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

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

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

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

h. Cleary, E. C., R. A. Dolbeer, and S. E. Wright. .*Wildlife Strikes to Civil Aircraft in the United States.* FAA National Wildlife Aircraft Strike Database Serial Reports.

i. Cleary, E. C. and R. A. Dolbeer. 2005. *Wildlife Hazard Management at Airports: A Manual for Airport Operators***.** 2nd Ed. FAA, Office of Airport Safety and Standards, Washington, DC. 347 pages.

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

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

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

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_airtraffic/airports/ or http://wildlife-mitigation.tc.faa.gov/.

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

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.

Airports with an 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.

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

a. 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,**

b. Have taken and passed an airport wildlife hazard management training course acceptable to the FAA Administrator (Appendix B[1]) **and,**

c. 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,**

d. Have successfully complete at least one of the following within the past 3 years:

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

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

(3) Other training acceptable to the FAA Administrator.

Persons wishing to conduct Wildlife Hazard Assessments or provide the requisite training should provide the Certificate Holder documentation verifying they meet the requirements outlined in 5 a – d above.

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

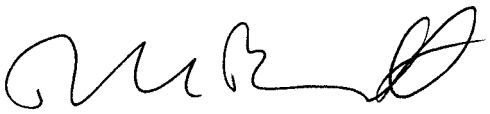
Personnel actively involved in implementing FAA approved Wildlife Hazard Management Plans are subject to the requirements of 14 CFR Part 139.303. §139.303 requires a specific training regimen for all airport personnel. §139.303(c) and (e) requires the holder of an Airport Operating Certificate issued 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)]

[1] Appendix B also contains instruction for those wishing to establish a training program to train wildlife biologist for designation as "qualified airport wildlife biologist" by the FAA Administrator.

§139.303(c) and (e) describe the minimum areas covered during initial and recurrent airport wildlife hazard management training. Depending on local wildlife and environmental issues, additional topics or more in-depth coverage of listed topics, might be needed. Appendix C outlines the training requirements for airport personnel who carry out an airport's Wildlife Hazard Management Plan. Initial and recurrent training must be at least 8 hours in length.

§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.

Remember, 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 [§139.303(d)].



David L. Bennett
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 9 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 9 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 9 semester hours in wildlife subjects, 12 semester hours in zoology, and 9 semester hours in botany or related plant science, as shown in “a” above, plus appropriate experience or additional education.

Appendix B.

1. Curriculum Outline for an Airport Wildlife Hazard Management Course, Acceptable to the FAA Administrator, for Personnel Conducting Wildlife Hazard Assessments, or Providing Training to Personnel Actively Involved in Implementing FAA Approved Wildlife Hazard Management Plans.

A list of training program providers acceptable to the FAA Administrator can be found at the FAA's wildlife strike web page: http://wildlife-mitigation.tc.faa.gov.

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_airtraffic/airports/ and http://wildlife-mitigation.tc.faa.gov/.

Those proposing to establish a program to train qualified airport wildlife biologist to meet the requirements of Title 14, Code of Federal Regulations, §139.337 must submit a complete training syllabus and instructor vita to the FAA. The syllabus must include all lesson plans, student handouts, and graphic presentations. Submit the material to:

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

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 agenda items below.

2. Instructor Qualifications.

The lead instructor for the training should have the following qualifications:

a. Be a qualified airport wildlife biologist

b. Academic credits in education or instructor/teaching experience

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

3. Training Curriculum Outline.

a. Training goals and process

b. Airport familiarization

(1) Introduction to the National Plan of Integrated Airport Systems

(2) Airport design and layout

(3) Navigation aids and Air Traffic Control

(4) Airport operations and safety

(5) Signs, marking, and lighting

(6) Ground vehicle operator communication

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 Office of Airports 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 (WHA)
   (1) Triggering events for WHA
   (2) Duration and contents of WHA
   (3) Wildlife surveys at airports to assess wildlife hazards
   (4) Data analysis and presentation of results
   (5) Writing a WHA
k. FAA review of WHA and determination of need for Wildlife Hazard Management Plan (WHMP)
l. Drafting and carrying out integrated WHMP
   (1) Contents of WHMP
   (2) FAA review of WHMP

(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

4. Recommendations.

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

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 C.

1. Training curriculum outline for airport personnel actively involved in implementing FAA approved Wildlife Hazard Management Plans.

The goal of the training course must be to provide the knowledge, skills, and abilities needed by airport personnel to safely and accurately implement relevant portions of an FAA approved Wildlife Hazard Management Plan. To be acceptable to the FAA, initial and recurrent training must be at least 8 hours in length and include the 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, (conducted by a qualified airport wildlife biologist), 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 —

(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 firearms and pyrotechnic launchers.

(2) Fundamentals of using ammunition and pyrotechnics.

(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.

(6) Live fire training with firearms and pyrotechnic launchers.

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 charged with responsibility 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 employee conduct hazardous wildlife management activity on the airport and for six months after termination of employment.

[2] State Certificated Hunter Safety Instructors, police officers, and firearms instructors should be qualified to teach firearms 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.

Appendix I

Example Field Data Sheet for WHA

ESA

Citrus Reservoir

Wildlife Hazard Assessment

Observation Point		**Sky Code**		**Observer:**	
Time Period		**Wind Code**			
Start Time		**Season**			
Date		**Sun-rise/set**			

No	SPECIES CODE	NUMBER INDIV	ACTIVITY	LOCATION	COMMENT