FINAL ENVIRONMENTAL ASSESSMENT

Managing Wildlife Hazards to Aviation at Civil Airports in Hawaii

Prepared by:
United States Department of Agriculture
Animal and Plant Health Inspection Service
Wildlife Services

In Cooperation with
Hawaii Department of Transportation, Airports Division
Hawaii Department of Land and Natural Resources
Federal Aviation Administration

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INTRODUCTION

Civilian airport managers in Hawaii have requested the assistance of the U.S. Animal and Plant Health Inspection Service, Wildlife Services Program (WS) to help alleviate wildlife hazards at airports and airfields. Based primarily on the need to reduce wildlife strikes to protect human safety and property during aircraft operations, WS is proposing to implement an integrated wildlife hazard management program at civilian airports throughout the State. This Pre Decision Environmental Assessment (EA) documents the purpose and need for action, environmental issues, alternative proposals to meeting the need, and the environmental consequences of responding to airport managers' requests for assistance. This EA serves as a vehicle for environmental compliance, especially WS' compliance with the National Environmental Policy Act (NEPA) which mandates that Federal agencies consider the effects of any proposal on the human environment and make informed decisions. This EA will result in a Decision that will be made subsequent to agency cooperation and input during the draft preparation, and to a public review and comment period.

1.0 PURPOSE AND NEED FOR ACTION

1.1 Wildlife Hazards to Aviation – An Introduction

A widespread and diverse problem exists for the Nation's air traffic safety especially when wildlife comes into contact with aircraft during takeoff and landing operations. Wildlife strikes cost U.S. civil aviation over $500 million each year (Birdstrike Committee 2004), and bird strikes alone cause an estimated seven fatalities and $245 million damage to civil and military aircraft each year (Conover et al. 1995). Statistics indicate a growing need for wildlife damage management at our Nation's airports.

Between 1990 and 1999 there were 2,492 wildlife strikes in the U.S. that caused damage to aircraft; and the number of reported wildlife strikes to aircraft increased from 1,750 to 4,500 (Cleary et al. 2002). In 2004, civil aircraft and foreign carriers reported about 6,100 bird and other wildlife strikes in the United States (Birdstrike Committee USA 2005). The number of strikes recorded is significant since only an estimated 20-25% of all bird strikes are reported (Birdstrike Committee USA 2005, Conover et al. 1995, Dolbeer et al. 1995, Linnell et al. 1996, Linnell et al. 1999). Consequently, the number of airports requesting assistance to manage the impact of wildlife on air traffic safety has increased nationwide from less than 50 in 1990 to more than 400 in 2000 (Cleary et al. 2002).

Because velocity influences the force of impact, a single bird or small flock of birds can cause substantial damages. For example, a 12-lb Canada goose struck by an aircraft traveling 150-mph at lift-off generates the equivalent force of a 1,000-lb weight dropped from a height of 10 feet.

Increasing volumes of air traffic, advances in aircraft technology (which create faster and quieter aircraft), and increasing populations of some bird species, contribute to a potential increase in the number of wildlife strikes. As a result, the Federal Aviation Administration (FAA) and others involved with aircraft safety expect the risk, frequency, and potential severity of wildlife/ aircraft collisions to escalate over the next decade (Cleary et al. 2004).

All airports are ecologically and operationally unique. Airports differ in climate, topography, altitude, ecological features, size, operational facilities and services, and in the general layout of runway and taxiway systems. Hazards created by wildlife within the aerodrome environment will vary according to the species present, their movement patterns, types of habitat, weather conditions, hour of the day, and the time of year (Dunaway 1993). A long-term ecological study or wildlife hazard assessment (WHA) can identify and quantify these factors that contribute to wildlife strikes. The assessment can form the basis for developing a wildlife management plan at airports that is often necessary and requires both immediate action to eliminate existing wildlife threats and long-term management

to create an airport environment that is as unattractive to wildlife as possible (Dunaway 1993).

The FAA is responsible for setting and enforcing the Federal Aviation Regulations (FAR) and policies to enhance public aviation safety. To ensure compliance with FAR Part 139.337, the FAA requires certified airports to conduct an ecological study, otherwise referred to as a WHA, when any of the following events occur on or near an airport:

1 An air carrier aircraft experiences a multiple bird strike or engine ingestion

2 An air carrier aircraft experiences a damaging collision with wildlife other than birds.

3 Wildlife of a size or in numbers capable of causing an event described in 1 or 2 of this section is observed to have access to any flight pattern or movement area.

Upon completion of the WHA, the FAA may require the development of a wildlife hazard management plan (WHMP). The development of a WHMP is the responsibility of the airport manager under terms of the FAA/ADC (ADC renamed Wildlife Services) Memorandum of Understanding (MOU) and as required by FAR Part 139.337. The WHMP must be developed and formulated with the ecological study as a basis, within 12 months of the completion of the ecological study or WHA.

1.2 Wildlife Strikes at Hawaii's Airports

Over 31.5 million passengers used Hawaii's airports in 2004 in over 1.1 million aircraft operations (takeoffs + landings) (Hawaii Department of Transportation (HDOT) 2005). The volume of traffic combined with the potential wildlife hazards represents a serious concern regarding human safety and economic losses to property. Strike damages to aircraft include both direct costs of damage as well as indirect costs such as traveler delays and extra maintenance inspections and repairs resulting in additional delays and expenditures.

Wildlife Services maintains a wildlife strike database and reports all collisions with civil and commercial aircraft occurring in Hawaii to the FAA. From 1990 to 2002, Hawaii's airports ranked 15th in the total number of reported wildlife strikes in the U.S. Hawaii's airports have followed the National trend of increased recorded strikes The FAA's National Wildlife Strike Database shows that from 1990 through 2005, there were 1,519 reported wildlife strikes to aircraft in Hawaii. Table 1 presents the number of strikes reported each year in Hawaii and the Nation.

Table 1. Reported Wildlife Strikes in Hawaii and the Nation between 1990 and 2005.

Year	Species	State	Bird Strikes	Mammal Strikes	Reptile Strikes	State Strikes	Total US Strikes
1990	ALL	HI	38	0	0	38	2150
1991	ALL	HI	57	0	0	57	2591
1992	ALL	HI	44	1	0	45	2709
1993	ALL	HI	39	0	0	39	2815
1994	ALL	HI	27	0	0	27	2865
1995	ALL	HI	46	0	0	46	2944
1996	ALL	HI	108	0	0	108	3220
1997	ALL	HI	105	0	0	105	3735
1998	ALL	HI	94	0	0	94	4242
1999	ALL	HI	86	0	0	86	5530
2000	ALL	HI	61	0	0	61	6530
2001	ALL	HI	117	1	0	118	6413
2002	ALL	HI	164	2	0	166	6896
2003	ALL	HI	124	0	0	124	6866
2004	ALL	HI	199	0	0	199	8033
2005	ALL	HI	210	4	0	214	7877
Total Strikes:			1,519	8	0	1,527	75,416

Source: FAA National Wildlife Strike Database (Level IIIB) - Version 7.5 dated 3-16-06 http://wildlife.pr.erau.edu/database/excel_files/LevelIIIBsummary608.xls

The severity of the problem in Hawaii has prompted airfield managers to rely on the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) Wildlife Services (WS) program expertise to conduct ecological studies to identify hazards and determine the best strategies to manage wildlife problems at all major State airports. Wildlife Services has conducted wildlife hazard assessments (ecological studies) at all the major airports in Hawaii to identify and develop plans to reduce hazards to aviation and the traveling public: Hilo International Airport (ITO) (March 2004, revised); Lanai City Airport (LNY) (June 2005); Lihue Airport (LIH) (December 2004); Kahului Airport (KAH) (April 2005); Kona International Airport (KOA) (August 2001); Honolulu International Airport (HIA) (January 2004), Molokai Airport (MKK) (February 2004); and Kapalua Airport (VHM) (May 2005). The hazard assessments provide airports with the necessary information to identify problematic species, seasonal trends in species abundance, abatement recommendation, and legalities surrounding the management of these species. As wildlife/aviation hazards are identified at different airports throughout Hawaii, the number of requests for assistance may increase. Federal Aviation Administration is in the process of reviewing and approving wildlife hazard management plans based on the wildlife hazard assessments. Wildlife Services provides operational wildlife hazard

management at several civilian airports and military airfields on Oahu, Kauai, Molokai, Lanai, Hawaii, and Maui.

Table 2. Wildlife/Aircraft strikes at civilian airports in Hawaii relative to the National total for the same species (March 1995 to February 2005).

Species	Strikes in Hawaii	Total US Strikes
BARN OWL	26	69
BLACK FRANCOLIN	1	1
BLACK-CROWNED NIGHT-HERON	1	3
CATTLE EGRET	1	14
CHESTNUT MANNIKIN	3	3
COMMON MYNA	2	2
COMMON WAXBILL	1	1
DOMESTIC DOG	1	3
DOVES	4	55
EURASIAN SKYLARK	4	5
FINCHES	1	4
HOUSE CAT	1	2
HOUSE FINCH	3	7
HOUSE SPARROW	2	11
MALLARD	1	42
MYNA	1	1
NUTMEG MANNIKIN	7	7
PACIFIC GOLDEN-PLOVER	58	59
PERCHING BIRDS (y)	2	75
PLOVERS	2	6
RACING PIGEON	1	1
ROCK PIGEON	1	125
RUDDY TURNSTONE	1	1
SANDERLING	1	3
SHORT-EARED OWL	10	16
SMALL INDIAN MONGOOSE	2	2
SPARROWS	1	157
SPOTTED DOVE	10	10
TROPICBIRDS	1	1
UNKNOWN BIRD	10	2385
UNKNOWN BIRD - LARGE	2	114
UNKNOWN BIRD - MEDIUM	6	385
UNKNOWN BIRD - SMALL	33	1281
UNKNOWN BIRD OR BAT	1	365
WEDGE-TAILED SHEARWATER	2	2
WESTERN MEADOWLARK	1	39
ZEBRA DOVE	9	9

From FAA (2006)

Table 2 shows that a wide variety of birds may be involved in strikes with aircraft. It should be noted that the species presented in Table 1 represent *reported* strikes, and there is likely to be some misidentification resulting in reporting error since not all persons reporting strikes are trained in bird identification. Pilots, airport personnel and Wildlife Services specialists contribute to the strike reports that go to the FAA who create a final summary report.

During FY 2005, Wildlife Services either verified or received reports of 152 aircraft strikes from a variety of species, and five threats of a strike which affected air traffic (MIS 2005).

The bird species discussed in this EA occur in Hawaii and could occur on most airports in the State. If these birds present an aircraft/bird strike hazard or potential hazard, the proposed action (as described in Section 2) would allow Wildlife Services to respond with appropriate actions. Those actions could be non-lethal or lethal depending on the case-by-case situation as evaluated by Wildlife Services and airport personnel and authorized by Wildlife Services' migratory bird permit or individual airport permits.

1.3 Significant Wildlife Strikes Outside of Hawaii

The following is a selected list of significant wildlife strikes to civil and military aircraft in about the past year from Birdstrike Committee USA http://www.birdstrike.org/commlink/signif.htm (2006). These examples are presented to show the widespread and diverse nature of the need for action, and how serious the damages and threats to human safety can be anywhere wildlife and aviation conflict. They are not intended to criticize any airports. Fortunately, Hawaii has not suffered any catastrophic collisions due to wildlife strikes, but these examples are relevant to demonstrate the need for action to protect air traffic safety since similar events could occur anywhere wildlife is abundant. Wildlife hazard management programs are designed to reduce the risk and probability that there will be strikes.

> June 10, 2005. During take-off run of DC-9-30 at Kansas City International Airport (MO), first officer saw small bird fly in front of aircraft and disappear to the left. The aircraft began to vibrate, yawed to the left and made several loud banging noises as the compressor stalled in the left engine. Pilot notified the tower and made an emergency landing that was uneventful. The engine was run at idle until after landing. Several fan blades were damaged along with the fan case. The flight was cancelled. Smithsonian, Division of Birds identified feathers as from American kestrel (a small falcon). Cost of repairs estimated at $800,000.
>
> June 24, 2005. During take-off roll at Subic Bay (Philippines), one engine on a U.S.-based A-310 had multiple bird strikes. A loud bang was heard followed by vibration and pull to right. The pilot aborted take-off. Fan blades badly damaged and a large section of the nose cowl was torn from

the nacelle. Fan cowling was damaged and #3 flap fairing was damaged by engine shrapnel. Birds identified by Smithsonian, Division of Birds as Philippine ducks. Time out of service was 4 days. Cost of repairs were estimated at $9,456,000 (U.S. carrier).

September 1, 2005. A Falcon 20 departing Lorain County (OH) Airport hit a flock of mourning doves at rotation, causing the #1 engine to flame out. As the gear was retracted, the aircraft hit another flock which caused the #2 engine RPM to roll-back. The pilot was not able to sustain airspeed or altitude and crash-landed, sliding through a ditch and airport perimeter fence, crossing a highway and ending in a corn field. Aircraft sustained major structural damage beyond economical repairs. Both pilots were taken to hospital. Costs totaled $1.4 million.

September 13, 2005. A DC-10 landing at Forth Worth Meacham International (TX) Airport ingested about 15-20 rock pigeons in the #3 engine. Engine change was required and aircraft was out of service for 1 week. Cost estimated at $1.5 -$2 million.

October 16, 2005 BE-1900 departing Ogdensburg International (NY) struck a coyote during take-off run. The nose gear collapsed causing the plane to skid to a stop on the runway. Propeller blades went through the skin of the aircraft. Engine #1 and #2, propellers, landing gear, nose, fuselage had major damage. Insurance declared aircraft a total loss. Cost of repairs would have been $1.5 million.

December 30, 2005. A Bell 206 helicopter Pilot flying a Bell 206 helicopter at 500 feet AGL near Washington, LA looked up from instruments to see a large vulture crashing into the windshield. He was temporarily blinded by blood and wind. After regaining control, the pilot tried to land in a bean field nearby but blood was hampering his vision and the left skid hit the ground first causing the aircraft to tip on its side. Pilot was taken to the hospital and had several surgeries to repair his face, teeth and eye. Aircraft was damaged beyond repair. Cost of repairs would have been $1.5 million.

January 1, 2006. A B-757 ingested a great blue heron into an engine during take-off at Portland International (OR). Engine was shut down and a one-engine landing was made. Fan section of the engine was replaced. Time out of service was 15 hours. Cost was $244,000.

1.4 Disease Monitoring including West Nile Virus Sampling

West Nile Virus sampling is being done at KAH and HIA. Decoy traps are used to capture birds for sampling. Wildlife Services provides live birds to U.S. Geological Survey (USGS) for testing. The West Nile Virus Threat to Hawai'i and the Pacific Islands is described by J. Burgett on a USFWS website: http://refuges.fws.gov/habitats/westNileVirusHawaii.html

The invading West Nile virus (WNV) is having severe impacts on birds and other wildlife as it moves westward from its point of introduction in New York. Mosquitoes carry WNV when they become infected from feeding on WNV infected birds. Infected mosquitoes can then spread WNV to other animals and humans when they bite. Birds in many taxonomic groups suffer fatal infections, including corvids, other passerines, and raptors, with some groups having nearly 100 percent mortality rates. Because WNV is apparently carried by migrating birds, wildlife managers in North America have few options but to watch and wait for its arrival, and hope that stricken bird populations can recover with time.

There is a good chance that pathways that could introduce WNV to Hawai'i and other Pacific islands can be controlled, and WNV kept out of the islands. In addition to the human health benefits of preventing WNV introduction, there is a compelling need to prevent a major loss of global biodiversity. The rich avifauna of Hawai'i and other Pacific islands have already been severely depleted by a combination of a number of sources including introduced avian diseases. The introduction of WNV into Hawai'i could have negative consequences for extant native avifauna. The 'Alala (*Corvus hawaiiensis*) for example, with a population of only 52 individuals, may not recover if WNV further reduces the population. The vulnerability of other endangered bird taxa, as well as non-listed endemics, is unknown but could be significant. In total, 32 of the 92 listed endangered species of birds in the U.S. could face extinction if WNV were to become established in the islands.

The mosquito vectors are widespread in Hawai'i and there is no disease-free winter. Once established in competent host populations of birds, WNV would probably not be eradicated and would most likely spread to other islands by the same pathways by which it reached Hawai'i. Mitigation strategies, while important for public health, may not prevent the spread of the disease to native birds. Therefore, efforts must be focused on preventing the introduction and establishment of WNV in Hawai'i and other Pacific islands.

Wildlife Services is currently cooperating with the State of Hawaii's Department of Health (HDH) and the U.S. Geological Survey (USGS) by providing live-captured birds from various airports and providing them to USGS veterinarians for blood extraction and screening as part of the WNV surveillance program. The birds are live-trapped and removed off of airports to avoid wildlife-aircraft collisions. To date, there has been no positive identification of WNV in the State.

Wildlife Services also plans to conduct Avian Influenza surveillance at state operated airports by sampling shorebirds such as the Pacific golden plover and the ruddy turnstone that have already been involved in collisions with aircraft. There are no plans to actually take shorebirds for the AI surveillance project.

1.5 Purpose

The primary purpose of the proposed action is to protect air traffic from wildlife hazards at civilian airports in Hawaii by minimizing the potential for wildlife strikes at airfields. A secondary purpose of the proposed action is to protect human health and safety and airport property from wildlife transmitted diseases and other hazards due to ectoparasites and fecal contamination where people may be exposed on airport property.

Because of the large numbers of birds that use airport property, Wildlife Services participates with health officials by providing bird specimens captured for West Nile virus sampling as a related component of its wildlife hazard management program. In addition, Wildlife Services may provide samples to health officials for monitoring spread of avian influenza or other diseases that may be carried by wildlife.

1.6 Relationship of this EA to other Environmental Documents, Management Plans, and Memoranda of Understanding

Animal Damage Control Final Environmental Impact Statement. Wildlife Services issued a programmatic EIS which analyzed its activities (USDA 1997, revised) and a Record of Decision on the National APHIS-Wildlife Services program. This EA is tiered to the USDA EIS (1997, revised).

Environmental Assessment: Wildlife Hazard Management at Kahului Airport. A Finding of No Significant Impact and decision to implement an integrated wildlife hazard management program were issued in April 1997. This EA encompasses and updates the 1997 Kahului Airport EA. The decision resulting from this EA will supersede the 1997 Finding of No Significant Impact on the Kahului Airport EA.

Environmental Assessment: Wildlife Hazard Management at Honolulu International Airport. A Finding of No Significant Impact and decision to implement an integrated wildlife hazard management program were issued in September 1997. This EA encompasses and updates the 1997 Honolulu Airport EA. The decision resulting from this EA will supersede the 1997 Finding of No Significant Impact on the Honolulu Airport EA.

Environmental Assessment: Wildlife Hazard Management at Lihue Airport. A Finding of No Significant Impact and decision to implement an integrated wildlife hazard management program were issued in February 1997. This EA encompasses and updates the 1997 Lihue Airport EA. The decision resulting from this EA will supersede the 1997 Finding of No Significant Impact on the Lihue Airport EA.

Environmental Assessment: Wildlife Hazard Management at Small Airports in Hawaii. A Finding of No Significant Impact and decision to implement an integrated wildlife hazard management program were issued in March 2000. This EA encompasses and updates the 2000 Small Airports EA. The decision resulting from this EA will supersede the 2000 Finding of No Significant Impact on the Small Airports EA.

Wildlife Services will incorporate applicable portions of finalized Wildlife Hazard Management Plans into actions consistent with this EA. Wildlife Hazard Management Plans are based on ecological assessments which identify hazards to aircraft, effective solutions, and cooperative roles of agencies involved with implementation and support.

Memorandum of Understanding between FAA and APHIS-WS (No. 12-34-71-0003-MOU)

Wildlife Services and FAA signed a Memorandum of Understanding (MOU) in 1989 to establish a cooperative relationship between the two agencies for resolving wildlife hazards to aviation to benefit public safety.

1.7 Legal Status of Wildlife Species

Most wildlife species encountered on airfields are protected by both federal and state regulations. Federal and State depredation permits are required for wildlife hazard management operations involving the killing of birds. All birds are protected by the State of Hawaii. A state wildlife control permit is necessary to conduct bird control operations at airports under DLNR administrative rule §13-124-7.

Migratory bird species are afforded protection under the Migratory Bird Treaty Act of 1918 (CFR 50, Part 21.43) and a federal depredation permit, issued by the U.S. Fish and Wildlife Service, is required to destroy these species. No permit or authorization is required to merely haze or scare migratory birds. The word “migratory,” as referred to in the Migratory Bird Treaty Act, does not necessarily mean that the species has to migrate. For example, cattle egrets, which are year-round residents in Hawaii, are protected as a migratory species under this act. The Pacific golden plover is a migratory bird and is listed as a bird of conservation concern in coastal areas of the United States mainland by the USFWS. While the species is not a conservation concern in the Hawaiian Islands, the USFWS has asked WS to haze or relocate whenever possible and kill as few as possible (correspondence from Tami Tatehall, Permit Administrator, July 18, 2002).

The Federal Endangered Species Act (ESA) of 1973 affords protection to wildlife species in danger of becoming extinct. The U.S. Fish & Wildlife Service (USFWS) is the federal regulatory agency responsible for the enforcement of

these wildlife laws. A permit is required to harass endangered species and it is unlikely that a permit would be issued for lethal control of an endangered species. Wildlife Services holds an ESA Section 10 permit which is required to haze or scare birds from the airfield.

The HDLNR, the State regulatory agency, also maintains a separate threatened and endangered species list. A state wildlife control permit to haze endangered species is also required by the HDLNR.

Under section 7 of the ESA, federal agencies such as the FAA and WS are required to consult with the USFWS if any proposed action will impact a threatened or endangered species. This consultation is usually conducted during the National Environmental Policy Act (NEPA) process, but it can occur any time that a federal agency desires consultation with USFWS regarding its actions.

1.8 Decision to Be Made

Based on agency relationships, MOUs and legislative mandates, WS is the lead agency for this EA, and therefore responsible for the scope, content and decisions made. The HDOT has cooperated in the development of this EA, and WS has coordinated input with HDLNR, USFWS, and FAA.

Based on the scope of this EA, the decisions to be made are:

Should WS conduct an integrated wildlife hazard management program in Hawaii to alleviate hazards to aviation safety at Hawaii's airports? For clarification, Wildlife Services proposes only to implement a portion of FAA approved airport wildlife hazard management plans.

Might the proposed action have significant effects on the quality of the human environment, thus triggering the need to prepare an Environmental Impact Statement?

1.9 Scope of This Analysis

1.9.1 Actions Analyzed

This EA evaluates Wildlife Services bird and mammal hazard management to protect human safety and property associated with aviation at Hawaii's civilian airports. Nuisance and human health hazard management actions are also evaluated as they relate to activities within airport properties. Actions would be coordinated with the HDLNR, USFWS, FAA and/or HDOT (Airports Division) as they apply to agency jurisdiction.

1.9.2 Period for which this EA is Valid

If it is determined that an EIS is not needed, this EA will remain valid until WS and other appropriate agencies determine that new needs for action, changed conditions, or new alternatives having different environmental effects must be analyzed. At that time, this analysis and document would be amended as necessary pursuant to NEPA. Review of the EA would be conducted annually to ensure that the EA is sufficient. If conditions change substantially, a new decision may be warranted.

1.9.3 Site Specificity

This EA emphasizes major issues as they relate to specific airports whenever possible, however, many wildlife hazard management issues apply wherever management is needed, regardless of site specific location. All known locations and substantive issues are identified herein; however, new airports or programs may enter into agreement with WS under the actions covered under this analysis. Wildlife Services personnel use the WS Decision Model (Slate et al. 1992) as the "on the ground" site-specific procedure for each damage management action conducted by WS. The Decision Model is an undocumented thought process that guides WS though the analysis and development of the most appropriate individual strategy to reduce damages and detrimental environmental effects from damage management actions (see Chapter 3, Section 3.3.3 for a description of the Decision Model). The Decision Model (Slate et al. 1992) and WS Directive 2.105 describe the site-specific thought process that is used by WS. Decisions made using the model would be in accordance with plans, goals, and objectives of WS, FAA and/or HDOT (Airports Division) and any mitigations and standard operating procedures (SOP) described herein and adopted or established as part of the decision.

1.9.4 Airport Districts

The discussion in this section provides general information on civil airports in Hawaii and presents passenger use and aircraft operation (takeoffs and landings) statistics. Statewide the use of Hawaii's airports by 31.5 million passengers in 2004 represents a 2.5 percent increase in volume compared with 2003. The number of aircraft operations statewide in 2004 was over 1.1 million, which represents a 15.1 percent increase over the previous year.

Oahu District

Honolulu International Airport (HNL) is a joint-owned, joint-use, military and civilian airport located on about 4,500 acres of land,

four miles northwest of the central business district of Honolulu. Hickam Air Force Base, home of the 15th Air Base Wing and Pacific Air Force Headquarters is located within the airport environs. The airport is the hub of air transportation for the State as well as the entire Pacific basin. All international flights and the majority of mainland domestic flights pass through HNL, as do most inter-island flights. In 2004 19.3 million passengers passed through HNL and 320,520 aircraft operations (take-offs and landings) occurred (HDOT 2005). These included medium and heavy jet airliners and military aircraft, general aviation fixed wing and helicopter traffic. The primary land uses in the immediate vicinity of HNL include aviation related commercial/industrial activities, military activities and general business.

Dillingham Airfield (HDH) is located on the island of Oahu. It is open to civil aircraft only during daylight hours. At night, the U.S. Army may conduct helicopter training operations. Extensive commercial glider operations and sky diving occur daily. In 2004 68,553 aircraft operations (take-offs and landings) occurred (HDOT 2005).

Kalaeloa Airport (JRF) is a general aviation airfield located on the island of Oahu. In 2004 140,736 aircraft operations (take-offs and landings) occurred at Kalaeloa Airport (HDOT 2005).

Maui District

Kalaupapa Airport (LUP). Kalaupapa Airport is a unmanned airfield, that serves the State- run Hansen's disease settlement on Kalaupapa Peninsula, Molokai. In 2004 10,764 passengers passed through the airport and 4228 aircraft operations occurred (HDOT 2005).

Molokai Airport (MKK). In 2004, 192,037 passengers passed through Molokai Airport and 36,757 aircraft operations (take-offs and landings) occurred (HDOT 2005).

Lanai Airport (LNY). In 2004, 98,617 passengers passed through Lanai Airport and 8,026 aircraft operations occurred (HDOT 2005).

Hana Airport (HNM). In 2004, 6,895 passengers passed through Hana Airport and 6,122 aircraft operations occurred (HDOT 2005).

Kahului Airport (OGG). In 2004, 5.4 million passengers passed through Kahului Airport and 160,552 aircraft operations occurred (HDOT 2005).

Kapalua Airport (JHM). In 2004, 102,579 passengers passed through Kapalua Airport and 7,236 aircraft operations occurred (HDOT 2005).

Kauai District

Lihue Airport (LIH). In 2004, 2.5 million passengers passed through Lihue Airport and 104,506 aircraft operations occurred (HDOT 2005).

Port Allen Airport (PAK). In 2004, 2,462 aircraft operations occurred at Port Allen Airport (HDOT 2005).

Hawaii District

Hilo International Airport (ITO). In 2004, 1.2 million passengers passed through Hilo International Airport and 98,375 aircraft operations occurred (HDOT 2005).

Kona International Airport (KOA). In 2004, 2.7 million passengers passed through Kona International Airport and 137,918 aircraft operations occurred (HDOT 2005).

Waimea-Kohala Airport (MUE). In 2004, 5,517 passengers passed through Waimea-Kohala Airport and 2,860 operations occurred (HDOT 2005).

Upolu Airport (UPP). In 2005, 14 operations occurred (HDOT 2005).

1.9.5 Summary of Public Involvement Efforts

Public participation in the National Environmental Policy Act (NEPA) process was consistent with Wildlife Services NEPA implementing procedures and Council on Environmental Quality regulations. This EA is based on individual airport EA's which were issued to the public for 30-day review and comment periods, and again for notification of the Decision and Findings of No Significant Impact. The procedures followed included published legal notices in general circulation newspapers serving the project areas, notice in the Hawaii Office of Environmental Quality clearing house and direct mailings to parties that had expressed interest in WS activities at airports or with the issues identified in this EA.

This EA has been prepared in coordination with cooperating agencies prior to being made available to the public for a 30-day review period. Any

new issues or alternatives raised after publication of this EA will be fully considered to determine whether the EA should be revised prior to reaching a decision.

1.9.6 Authority and Compliance

Wildlife Services is the lead agency and decision-maker for this EA, and is responsible for the EA's scope, content and outcome. As cooperating agency, the HDOT provided input for this EA and will provide advice and recommendations to WS regarding when, where, how, and to what extent, wildlife hazard management could be conducted at Hawaii's airports. HDLNR and USFWS are wildlife regulatory agencies and provide permits to control resident, migratory and endangered wildlife in the state of Hawaii.

Authority of Federal and State Agencies in Wildlife Damage Management

USDA-APHIS-WS

Animal and Plant Health Inspection Service-Wildlife Services is the Federal agency authorized by Congress to protect American resources and human health and safety from damage caused by wildlife. The primary statutory authorities for the APHIS-WS program are the Act of March 2, 1931 (46 Stat. 1468; 7 U.S.C. 426-426b) as amended, and the Act of December 22, 1987 (101 Stat. 1329-331, 7 U.S.C. 426c).

USFWS

The Mission of the U.S. Fish & Wildlife Service is to work with others to conserve, protect and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people. The primary statutory authorities for the USFWS mission are: 16 United States Code (U.S.C.) 1531 et seq., Endangered Species Act (ESA) of 1973, as amended; 16 U.S.C. 703-712, and the Migratory Bird Treaty Act (MBTA) of 1918, as amended. USFWS issues permits to WS to haze endangered species and take migratory birds.

HDLNR

The Hawaii Department of Land and Natural Resources has responsibility for managing all protected and classified wildlife in Hawaii, (Hawaii Revised Statutes (HRS) 183D and 195D) The HDLNR also has responsibility for the management and

enforcement activities required by the Hawaii Endangered Species Act.

HDOT

The Hawaii Department of Transportation, Airports Division Code of Federal Regulations (CFR) Part 139.337 requires that airports certified under Part 139 experiencing wildlife hazards to aviation implement Wildlife Hazard Management Plans based on ecological studies. The plans are incorporated into the airport certification manual. HDOT as the operator of airports in Hawaii must implement these plans to retain FAA certification to operate the airport.

Regulatory Framework

The FAA is responsible for setting and enforcing the CFR and policies to enhance public safety. For commercial airports, 14 CFR, Part 139.337 (Wildlife Hazard Management) directs the airports to conduct an ecological study (wildlife hazard assessment) if an air carrier aircraft experiences multiple wildlife strikes or an air carrier aircraft experiences substantial damage from striking wildlife. The regulations require that airports certified under Part 139 experiencing wildlife hazards to aviation implement Wildlife Hazard Management Plans based on ecological studies. The plans are incorporated into the airport certification manual and must be implemented to retain operation certification.

Federal Laws and Executive Orders

Several Federal laws and Executive Orders regulate wildlife damage management. The State and Federal agencies involved in this action comply with these laws and consult and cooperate with other agencies as appropriate. The following Federal laws are relevant to the actions considered in this EA:

- National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321-4347)

  Environmental documents pursuant to NEPA must be completed before Federal actions can be implemented. The NEPA process requires careful evaluation of the need for action, and that Federal actions be considered alongside all reasonable alternatives, including the “No Action Alternative”. It also requires that the potential impacts on the human environment be considered for each alternative. The alternatives and impacts must be considered

by the decision-maker(s) prior to implementation, and that the public is to be informed.

This EA has been prepared in compliance with NEPA (Public Law 91-190, 42 U.S.C. Section 4231, et seq.,); the President's Council for Environmental Quality (CEQ) Regulations, 40 CFR Section 1500 – 1508.

- Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544)

  It is Federal policy under the ESA that all Federal agencies shall seek to conserve endangered and threatened species and shall utilize their authorities in furtherance of the purposes of the ESA (Sec.2(c)). Section 7 consultations with the USFWS are conducted to use the expertise of the USFWS to ensure that "any action authorized, funded, or carried out by such an agency . . . is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat of such species. Each agency shall use the best scientific and commercial data available." (Sec.7 (a)(2)).

- Act of March 2, 1931, as amended (46 Stat. 1486; 7 U.S.C. 426-426b), as amended (sometimes called the Animal Damage Control Act of 1931), and the Act of December 22, 1987 (101 Stat. 1329-331; 7 U.S.C. 426c)

  These Acts authorize WS, in cooperation with other agencies, to reduce damage caused by wildlife.

- Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), as amended (7 U.S.C. 136 et seq.; 86 Stat. 975)

  The FIFRA requires the registration, classification and regulation of all pesticides used in the United States. The Environmental Protection Agency (EPA) is responsible for implementing and enforcing FIFRA. All chemical methods integrated into any selected program as implemented by WS or other cooperating agencies must be registered with and regulated by the EPA and the Hawaii Department of Agriculture Pesticide Branch and used in compliance with labeling procedures and requirements.

- Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-711; 40 Stat. 755), as Amended (MBTA)

The MBTA provides USFWS regulatory authority to protect families of bird species that migrate outside the United States. The law prohibits the "take" of these species by any entity, unless permitted by USFWS; permits may be granted to protect resources from migratory bird damage. The Migratory Bird Treaty Reform Act of 2004 clarifies the MBTA and required the USFWS to establish a list of non-native bird species found in the United States which are not protected by the Act. The USFWS finalized that list on March 15, 2005. Several species in North America are already not protected under the MBTA because neither the species nor their family were listed in the MBTA; European starlings and house sparrows are examples. Species such as the feral pigeon are included in the final list of nonnative species to be excluded from protections under MBTA. The selected action will be in compliance with the regulations of the MBTA, as amended.

- Invasive Species Executive Order 13112

  Authorized by President Clinton, EO 13112 establishes guidance to agencies to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause. The EO, in part, states that each agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law: 1) reduce invasion of exotic species and the associated damages, 2) monitor invasive species populations, provide for restoration of native species and habitats, 3) conduct research on invasive species and develop technologies to prevent introduction, 4) provide for environmentally sound control, and 5) promote public education on invasive species.

- National Historic Preservation Act (NHPA) of 1966, as amended (U.S.C 470 et seq.)

  The NHPA requires Federal agencies to: 1) evaluate the effects of any Federal undertaking on cultural resources; 2) consult with the State Historic Preservation Office (SHPO) regarding the value and management of specific cultural, archaeological and historic resources; and 3) consult with appropriate Native Hawaiian groups to determine whether they have concerns for traditional cultural resources in areas of these Federal undertakings. Wildlife hazard management activities do not generally have the potential to affect historic resources since there is little to no ground disturbance or alteration of the physical environment. Hazing and/or removing wildlife to protect human safety and property does not generally

have the potential to affect historic resources. Wildlife Services has consulted with the State Historic Preservation Office.

- Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (Executive Order (EO) 12898)

  Environmental Justice (EJ) promotes the fair treatment of people of all races, incomes and cultures with respect to the development, implementation and enforcement of environmental laws, regulations and policies. Fair treatment implies that no person or group of people should endure a disproportionate share of the negative environmental impacts resulting either directly or indirectly from the activities conducted to execute this country's domestic and foreign policies or programs. EJ has been defined as the pursuit of equal justice and equal protection under the law for all environmental statutes and regulations without discrimination based on race, ethnicity, or socioeconomic status. All WS activities are evaluated for their impact on the human environment and compliance with EO 12898 to ensure EJ. Any wildlife hazard management methods selected will be as selective and conscientiously as possible. This action is not anticipated to result in disproportionate impacts on persons of any race, income, or culture.

- Coastal Zone Management Act (CZMA) of 1972, as amended (16 U.S.C. 1451-1464)

  This act, in part, requires Federal agencies to examine their activities for offsite effects. A section of the CZMA requires that all Federally conducted or supported activities directly affecting the coastal zone must be undertaken in a manner consistent to the maximum extent practicable with approved State coastal management programs (15 CFR Part 930, Subpart 930.32). The actions described in this EA conform to airport, FAA, and State policy, and would not be expected to have direct or indirect effects on the coastal zone.

- Protection of Children from Environmental Health and Safety Risks (EO 13045)

  Children may suffer disproportionately for many reasons from environmental health and safety risks, including their developmental physical and mental status. Because the Wildlife Services makes it a high priority to identify and assess environmental health and safety risks, Wildlife Services has considered the impacts that alternatives analyzed in this EA might

have on children. Mammalian predator damage management, as proposed in this EA, would only involve legally available and approved damage management methods in situations or under circumstances where it is highly unlikely that children would be adversely affected. Therefore, implementation of any of the alternatives would not pose environmental health or safety risks to children.

- Migratory Bird Executive Order (EO) 13186

  EO 13186 directs agencies to protect migratory birds and strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and minimize the take of migratory birds through enhanced collaboration between agencies and American Indian tribes. A National-level MOU between the USFWS and Wildlife Services is being developed to facilitate the implementation of Executive Order 13186.

  Hawaii State Laws

  HDLNR - Most wildlife species encountered on airfields are protected by both federal and state regulations. Federal and State depredation permits are required for wildlife hazard management operations involving the killing of birds. All established bird populations are protected by the State of Hawaii. A state wildlife control permit is necessary to conduct bird control operations at airports under DLNR administrative rule §13-124-7.

  The HDLNR, the State regulatory agency, also maintains a separate threatened and endangered species list. A state wildlife control permit to haze endangered species is also required by the HDLNR. Hawaii endangered species law prohibits any taking, transport or commerce in designated species.

2.0 ALTERNATIVES

Through cooperative agreements, WS assists airport managers in preventing wildlife collisions with aircraft at all of Hawaii's major civilian airports. The alternatives considered in detail include technical assistance, and the current integrated wildlife damage management program.

2.1 Alternative 1. Integrated Wildlife Damage Management – Proposed Action and "No Action" Alternative

The current integrated wildlife damage management (IWDM) program is the Proposed Action in this EA. It is also the "No Action alternative", which is a procedural NEPA requirement (40 CFR 1502). The IWDM alternative serves as a baseline for comparison with alternatives. The No Action alternative can be defined as no change from the current course of action. This alternative provides an array of tools and management methods which may be selected to protect human safety, property, and human health from wildlife related hazards or threats at and around civilian airports in Hawaii.

A major goal of the program is to minimize wildlife strike hazards. To meet this goal, WS would continue to respond to requests for assistance with, at a minimum, technical assistance, or where appropriate when permitted by the USFWS and HDLNR, operational hazard management whereby WS personnel conduct wildlife hazard management actions on or around the airfields. An IWDM approach would continue to be implemented under this alternative allowing for the use of legally available methods, either singly or in combination, to meet wildlife hazard management needs for reducing strikes or potential strikes. Airport managers requesting assistance would be provided information regarding the use of effective non-lethal and lethal techniques, as appropriate. Non-lethal methods and technical assistance instruction and advice can include hazing, environmental or habitat modification, decoy traps and other live traps, exclusionary devices, nest destruction, and alpha chloralose (a sedative used to capture waterfowl and pigeons). Lethal methods considered by Wildlife Services include: shooting, egg addling/destruction, snap traps, diphacinone, and American Veterinary Medical Association approved euthanasia techniques, such as CO_2 gas. Bird damage management would be allowed in the State, when requested, on private or public property where a need has been documented and an Agreement for Control or other comparable document has been completed. All management actions would comply with appropriate laws, orders, policies, and regulations. Migratory Bird permits are provided by the USFWS after an independent review of the WS proposal.

The most effective approach to resolving wildlife damage is to integrate the use of several methods simultaneously or sequentially. The philosophy behind IWDM is to implement effective management methods in a cost-effective[1] manner while minimizing the potentially harmful effects on humans, target and non-target species, and the environment. IWDM draws from an array of options to create a combination of methods for the specific circumstances. IWDM may incorporate habitat modification, e.g. removing attractants such as water, planting grasses that do not attract problem wildlife species, brush clearing, herbicide application, fixing fences or gates, or mowing when grasses are seeding; animal behavior modification (i.e., scaring as in hazing); local population reduction; or any combination of these, depending on the characteristics of the specific damage problem. In selecting management techniques for specific damage situations consideration is given to the species responsible, the extent and magnitude of the hazard, the duration or frequency of the hazard, prevention of future hazards, and the presence and vulnerability of non-target species or species that should be protected.

2.1.1 The IWDM Strategies

2.1.1.1 Technical Assistance Recommendations

Wildlife Services personnel provide technical assistance in the form of information, demonstrations, and advice on available and appropriate wildlife damage management methods. Technical assistance includes demonstrations on the proper use of management devices (i.e., propane exploders, exclusionary devices, and cage traps) and information on habitat management, and animal behavior modification that could reduce damage. The implementation of these damage management actions is then the responsibility of the requester, as are all environmental compliance procedures; WS is not responsible for any permits or other compliance measures triggered by actions of the parties implementing these actions. Technical assistance is generally provided following consultation or an on-site visit with the airport manager or representative. Generally, several management strategies are described to the requester for short and long-term solutions to damage problems; these strategies are based on the level of risk, need, and practical application. Technical assistance could include airport use of any of the non-lethal or lethal methods listed in 2.1.3.

[1] The cost of management may sometimes be secondary because of overriding environmental, legal, human health and safety, animal welfare, or other concerns.

2.1.1.2 Operational Hazard Management Assistance

This is the conduct or supervision of bird damage management by WS personnel. Operational damage management assistance is initiated when the problem cannot effectively be resolved through technical assistance, and when Agreements for Control or other comparable documents provide for WS operational damage management. The initial investigation defines the nature, history, extent of the problem, species responsible for the damage, and methods that would be available to resolve the problem. Professional skills of WS personnel are often required to effectively resolve problems, especially if restricted-use pesticides are proposed, or the problem is complex requiring the direct supervision of wildlife professionals. Wildlife Services considers the biology and behavior of the damaging species and other factors. The recommended strategy (ies) may include any combination of technical assistance, non-lethal and lethal actions listed below. The operational non-lethal and lethal methods that WS may use in an Integrated Wildlife Damage Management Program are listed below and described briefly. Habitat management, cultural practices, and other methods employed only by airport managers are not included in this list.

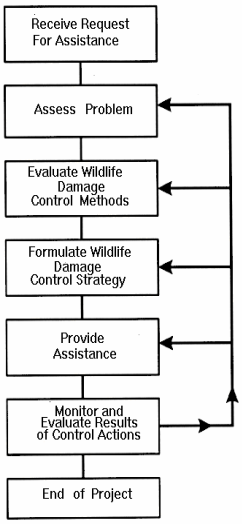
- Pyrotechnics - 15 mm and 12 gauge
- Propane Canons
- Vehicle Harassment
- Exclusionary Barriers (netting, wire cloth, etc.) - mainly for nuisance bird issues
- Scarecrows (silhouette, owl, canine) - used to some degree in terminal buildings for nuisance issues and on the AOAs for deterrence
- Electronic Scare Devices - use electronic scare devices such as AV Alarms and hawk scream distress calls to haze wildlife
- Hand Capture (bare hand, pole) - used mostly for subdued domestic wildlife that have escaped from cargo holds. Has also been used for quick capture of wildlife in terminal areas
- Harass Shooting - Lethally taking a portion of the population as a scare tactic to reinforce pyrotechnics and propane canons
- Shooting - Mostly reported for animals taken if the intent is to kill every individual present, i.e. night roost shoots, mongooses or cats on the AOA.
- Spotlight Shooting - used for nocturnal species, namely common barn owls, axis deer, feral pigs and various

introduced passerine birds in terminal areas for nuisance issues

- Net Gun - A firearm used to propel a net to live capture free ranging animals on the AOA (mainly used for escaped domestic dogs from cargo holds)
- Dog Harassment - use of trained dogs to haze wildlife on the AOA (mostly for MBTA species)
- Dog Take - use of dogs to lure or flush birds for lethal shooting (mostly for species that we are permitted to take)
- Mylar Tape - used over ponding water to deter water/wading birds, most of the T&E species
- Decoy Traps - mainly used for avian species. Sizes range from small English sparrow traps to large modified Australian crow traps (6' X 6' X 6'). Some birds translocated, most of them euthanized
- Cage Traps - mainly used for mammalian species. Sizes range depending on target species. Most animals released to Humane Societies, some euthanized
- Raptor Traps - traps consist of small wire cages or platforms with monofilament nooses to capture common barn owls and the short-eared owl, or Pueo. Barn owls are euthanized, Pueo are relocated
- Leg Snares - used for feral pig control
- Corral Traps - used for feral pig control if there are high numbers
- Padded Leghold Traps - used intermittently on feral/free-ranging dogs that are accessing the AOA through fencelines
- Snap Traps - used for rodent assessment and control on the AOAs (prey base for raptors)
- Glue Boards – these are the same as snap traps
- BTS Snake Traps - used when snake sightings occur. Part of a contingency plan
- Mist Nets - used to live capture birds for tag and release purposes
- Throw Nets – general use for birds after baiting.
- Egg/Nest Destruction/Removal – considered lethal control if nest is active
- Eaton's 4-The-Birds Repellent - used in terminal buildings and AOA signage for nuisance issues
- Rodenticides - used for rodent control on some airfields (prey base for raptors; nuisance issues near WS facilities)
- Herbicides – Wildlife Services may do limited spot applications of general use herbicides to control seeding herbs to reduce attractants.

- Brush clearing – Wildlife Services may occasionally assist with brush clearing to reduce roosting habitat.

Figure 3-1. WS Decision



2.1.2 Wildlife Services Decision Making

The WS Decision Making[2] process is a procedure for evaluating and responding to damage complaints (Figure 3-1). WS personnel are frequently contacted only after airports have attempted non-lethal methods and found them to be inadequate for reducing threats and damages to an acceptable level. WS personnel evaluate the appropriateness of strategies, and methods are evaluated for their availability (legal and administrative) and suitability based on biological, economic and social considerations. Following this evaluation, the methods deemed to be practical for the situation are developed into a management strategy. After the management strategy has been implemented, monitoring is conducted and evaluation continues to assess the effectiveness of the strategy. If the strategy is effective, the need for management is ended. In terms of the WS Decision Model (Slate et al. 1992), most damage management efforts consist of continuous feedback between receiving the request and monitoring the results with the damage management strategy.

2.1.3 Coordination and Conformance with Federal Aviation Administration requirements.

WS participates with the FAA under a MOU to provide wildlife damage management information or services, upon request, to airport managers. Sometimes WS evaluates wildlife hazards at airports and then provides Wildlife Hazard Assessments which outline the detected wildlife hazards, and assists airports in developing Wildlife Hazard Management Plans to address wildlife threats. These plans may include specific recommendations to reduce threats associated with a particular wildlife species, including birds. The Federal Aviation Administration requires and approves wildlife hazard management plans under certain circumstances for certificated airports (Department of Transportation, Federal Aviation Regulations, Part 139). WS also sometimes assists airport managers in obtaining USFWS depredation permits which allow for the take of migratory birds to reduce hazard threats posed by migratory birds.

[2] The WS Decision Model is not a written process but a mental problem-solving process common to most, if not all professions to determine appropriate actions to take.

2.1.4 Standard Operating Procedures.

Minimization measures are built into the program as standard operating procedures (SOP) to avoid or minimize negative environmental effects. Table 3 presents these measures and indicates which alternatives would include each measure.

Table 3. Minimization Measures

Minimization Measures/SOPs	Alternatives	
	Proposed Action Alternative	Technical Assistance Alternative
Animal Welfare and Humaneness of Methods Used by WS		
Research on selectivity and humaneness of management practices would be adopted as appropriate.	X	X
The WS Decision Model (Slate et al. 1992) would be used to identify effective biological and ecologically sound bird damage management strategies and their impacts.	X	X
Birds would be killed in as humane a fashion as practicable. When possible, euthanasia procedures recommended by the American Veterinary Medical Association would be used for live birds.	X	
The use of newly developed, proven non-lethal methods would be encouraged when appropriate.	X	X
WS would continue to improve the selectivity and humaneness of management devices.	X	X
Chemical immobilization/euthanasia procedures that do not cause pain would be used.	X	
All live traps would be maintained with food and water.	X	
The WS Decision Model (Slate et al. 1992), designed to identify the most appropriate damage management strategies and their impacts, would be used to determine bird damage management strategies.	X	X
All pesticides and herbicides used by WS are registered with the EPA and HDOA.	X	
EPA-approved label directions would be followed.	X	
Most avicides and live traps would be primarily restricted to private lands.	X	
Pesticides would be used only by certified personnel.	X	

Minimization Measures/SOPs	Alternatives	
	Proposed Action Alternative	Technical Assistance Alternative
WS employees who use pesticides participate in approved continuing education to keep abreast of developments and maintain their certifications for safe and effective use.	X	
Avicide use, storage, and disposal conforms to label instructions and other applicable laws and regulations, and Executive Orders 12898 and 13045.	X	
Material Safety Data Sheets for avicides are provided to all WS personnel involved with specific bird damage management activities.	X	
Research is being conducted to: 1) improve bird damage management methods and strategies, 2) increase selectivity for target species, 3) develop effective non-lethal methods, and, 4) evaluate non-target hazards and environmental impacts.	X	X
Concerns about Impacts of Damage Management on Target Species, T/E Species, Species of Special Concern, and Non-target Species		
WS and the USFWS determined there would be “no effect” or a “not likely to adversely affect” T/E species and would continue to adhere to all applicable measures to ensure protection of T/E species.	X	
Management actions would be directed toward localized populations or groups and/or individual offending birds.	X	
WS personnel are trained and experienced to select the most appropriate methods for removing targeted birds and excluding non-target species.	X	
WS take of birds would be provided to the USFWS and DLNR for monitoring the potential impacts on bird populations or trends in populations to assure the magnitude of take is maintained below the level that would cause significant adverse impacts to the viability of bird populations (See Chapter 4)	X	

Minimization Measures/SOPs	Alternatives	
	Proposed Action Alternative	Technical Assistance Alternative
WS consulted with the USFWS regarding the nationwide program and would continue to abide by all applicable measures identified by the USFWS to ensure protection of T/E species.	X	X

2.2. Alternative 2 - Technical Assistance to Airport Managers

Alternative 2, the Technical Assistance to Airport Managers Alternative would require that upon request, WS would provide assistance in the form of information, demonstrations, and advice on available and appropriate wildlife damage management methods. Technical assistance includes demonstrations on the proper use of management devices (i.e., propane exploders, exclusionary devices, and cage traps) and information on habitat management, and animal behavior modification that could reduce damage. The implementation of these damage management actions is then the responsibility of the requester, as are all environmental compliance procedures; WS is not responsible for any permits or other compliance measures triggered by actions of the parties implementing these actions. Wildlife Services has no regulatory authority to enforce any of its recommendations, or the environmental compliance requirements of such actions. Technical assistance is generally provided following consultation or an on-site visit with the airport manager. Generally, several management strategies are described to the requester for short and long-term solutions to damage problems; these strategies are based on the level of risk, need, and practical application. Technical assistance could include airport use of any of the non-lethal or lethal methods discussed under the proposed action. This alternative would not allow WS to provide direct lethal or non-lethal control to airport managers.

3.0 ISSUES DRIVING THE ANALYSIS

WS has determined through related NEPA processes (other Wildlife Services NEPA analyses), and through the interagency and public involvement processes with this EA that the following environmental issues are relevant to this proposal. The issues are environmental resources of concern that will be used to drive the analysis and determine the environmental effects of the alternatives courses of actions in Chapter 4.

3.1 Effects on Target Species.

The analysis in Chapter 4 will determine how the program would be likely to affect species targeted in wildlife damage management at Hawaii's airports. It will also reveal the status of targeted species and how they are protected by law.

3.2 Effects on Threatened and Endangered Species.

The analysis in Chapter 4 will reveal the potential effects on threatened and endangered species from implementing the alternatives, and the legal process used to arrive at these determinations.

3.3 Effects on Native Species

The analysis in Chapter 4 will discuss the potential effects the program might have on native species populations, and what laws are in place to protect such species.

3.4 Issues not considered in detail

The following resource values in Hawaii are not expected to be adversely affected by the alternatives analyzed: soils, geology, minerals, water quality/quantity, flood plains, wetlands, visual resources, air quality, prime and unique farmlands, aquatic resources, timber, wilderness, and cultural resources. Wildlife Services does not participate in habitat modification that would have the potential to affect compliance with environmental requirements relating to soils, water quality/quantity, floodplains, wetlands, and visual resources. Most habitat modification is conducted by airports as part of a program to reduce attractants to wildlife. When WS recommends habitat alteration to airports, it also refers airport managers to other Federal agencies with the legal authority and responsibility to ensure compliance with related environmental laws. The methods proposed in this EA are not of the type that could affect historic and cultural resources since they do not involve ground disturbance or physical alteration to any man made structures or objects. These resources will not be analyzed further. In addition, no issues have been

identified relative to bird damage management that is inconsistent with Executive Orders 12898 (Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations), 13045 (Protection of Children From Environmental Health Risks and Safety Risks), 13112 (Invasive Species), or 13186 (Responsibilities of Federal Agencies To Protect Migratory Birds).

The following issues were considered and rejected from detailed analysis in this EA because the findings have not varied in numerous other WS NEPA documents and are not significant impacts on the human environment. The issues have already been assessed in detail in USDA (1997, revised) to which this EA is tiered.

3.5 Animal Welfare

Animal welfare and animal rights have been discussed in several WS EAs and the USDA (1997) EIS, to which this EA is tiered. Wildlife Services strives to use the most humane tools available which can accomplish effective bird damage management at airports to protect human safety, health and property. In an integrated wildlife damage management program, preference is always given to non-lethal methods when practical and effective (WS Directive 2.101). Lethal methods are only used when judged necessary to safeguard the protected resources according to the WS Decision Model (Slate et al. 1992).

3.5 Effectiveness of WS Bird Damage Management Methods.

The national WS integrated wildlife damage management program was found to be the most effective alternative in USDA (1997, revised). This conclusion is applicable to the operational program in Hawaii to protect aviation safety from wildlife hazards because it provides the widest array of legally available options, flexibility, and professional administration and accountability. Under the current and proposed program, all methods are used as effectively as practically possible, in conformance with the WS Decision Model (Slate et al. 1992), WS Directives and relevant Federal and State laws and regulations. The efficacy of each method is based, in part, on the application of the method, the skill of the personnel using the method, and the guidance provided by WS Directives and policies for WS personnel. WS personnel are trained in the effective use of each bird damage management method.

WS believes that it is important to maintain the widest possible selection of damage management methods to effectively resolve wildlife hazard management problems. Some methods may be more or less effective, or applicable depending on weather conditions, time of year, biological considerations, economic considerations, legal and administrative

restrictions, or other factors (see Appendix C for a more detailed discussion of methods).

4.0 ENVIRONMENTAL CONSEQUENCES

Chapter 4 provides information needed for making informed decisions and in selecting the appropriate alternative for meeting the purpose of the proposed action. This chapter analyzes the environmental consequences of each alternative in relation to the issues identified for detailed analysis in Section 3.

4.1 Irreversible and Irretrievable Commitments of Resources

Other than relatively minor uses of fuels for motor vehicles and electricity for office operations, no irreversible or irretrievable commitments of resources result from the Hawaii Wildlife Services program. Based on these estimates, the Hawaii WS program produces negligible impacts on the supply of fossil fuels and electrical energy.

4.2. Cumulative and Unavoidable Impacts

Cumulative and unavoidable impacts of each alternative on wildlife populations are discussed and analyzed in this chapter. This EA recognizes that the total annual removal[3] of wildlife by all causes is the cumulative mortality. Cumulative impacts would be mortality caused by Hawaii WS wildlife damage management and other known causes of mortality (USDA 1997, revised). It is not anticipated that the proposed action would result in any adverse cumulative effects on any native or non-native wildlife populations, including threatened and endangered species or migratory birds.

Estimating wildlife densities is not precise and populations and habitats are often dynamic, therefore, professional judgment is required to account for unknowns and variables. Some of the variables include the ability of habitats to support populations of animals, habitat variability effects on population stability, predation and recruitment. In addition, wildlife populations can change considerably from one year to the next due to factors such as drought, food shortages or disease. Therefore, adverse effects assessments are based on conservative estimates and trends to better ensure that no unwanted adverse wildlife population impacts would occur.

Generally, WS conducts damage management on species whose population densities are high (*e.g.,* overabundant or anthropogenic abundant (Conover 2001)) and/or invasive and only after they have caused damage or an identified potential damage risk exists. The

3 It is recognized that the other causes of wildlife mortality (i.e., road kills, disease, natural mortality, etc.) occurs throughout Hawaiian but no reliable system exists for recording this information.

analysis for magnitude of impact on these species' populations generally follows the process described in USDA (1997, revised Chapter 4).

Many bird species that cause or threaten damage are protected by the USFWS under the MBTA. Therefore, those species are taken in accordance with applicable State and Federal laws and regulations, including the USFWS and the HDLNR permitting processes, authorizing the take of migratory birds, and their nests and eggs. The USFWS, as the agency with migratory bird management responsibility, could impose restrictions on depredation take as needed to assure cumulative take does not adversely affect the continued viability of specific populations. This should assure that cumulative impacts on species protected under the MBTA would have no significant adverse impact on the long-term viability of the population.

4.3 Alternative 1 – Proposed Action: Continue the Current WS Adaptive Integrated Wildlife Damage Management Program (also called the NEPA "No Action" Alternative).

Alternative 1 would continue the current Hawaii WS wildlife damage management program.

4.3.1 Effects on Target Species

Bird Species Taken under Federal Migratory Bird Treaty Permit

Most Hawaiian populations of migratory birds do not actually migrate, however these birds are protected under the Migratory Bird Treaty Act and a Federal permit is required to take these species. Little trend analysis has been done on non-native migratory birds (K. Swift, USFWS, pers. comm.) and assessing meaningful trends for many species in Hawaii is difficult for lack of comparable quantitative data on statewide populations over time (Pyle 1995).

Northern Cardinal

The northern cardinal is an alien, introduced species in Hawaii. It is now a resident (Pyle 2005, revised). It is protected under the Migratory Bird Treaty Act and may only be taken under Federal permit. Wildlife Services reports all take to the USFWS Migratory Bird Office which has jurisdiction over this and other migratory bird species. During FY 2005, Wildlife Services removed 100 northern cardinals from airports in Hawaii. In 2005 it took 654 northern cardinals in Hawaii for all reasons, including airports. Cardinals are taken primarily by shooting and cage traps. Cardinals are an

abundant species in Hawaii and taking this number is not expected to create a substantial decline in overall numbers

Mourning Dove

The mourning dove is an alien introduced species which has become a resident. It is a relatively new species (Pyle 2005, revised) and is a hunted game species. The mourning dove is also protected under the Federal Migratory Bird Treaty Act and may only be taken under Federal permit. Wildlife Services reports all take to the USFWS Migratory Bird Office which has jurisdiction over this and other migratory bird species. During FY 2005 Wildlife Services removed no mourning doves from airports in Hawaii. Wildlife Services removed only 8 mourning doves in Hawaii for all reasons, including airports. This species is included in this section since take may be expected in subsequent years. Mourning doves are taken by shooting and cage traps. Mourning doves are abundant in Hawaii and taking this number is not expected to create a substantial decline in overall numbers.

Cattle Egrets

Cattle egrets are an introduced species in Hawaii. A small number of cattle egrets were originally released in Hawaii in 1959 as a biological control agent to control cattle pests (Breese 1959). Cattle egrets have increased dramatically and are now common in Hawaii. The cattle egret population in Hawaii was estimated to be 13,000 in 1982 (Paton et al. 1986). They are a concern at airports because they tend to forage on the grassy areas associated with runways and landing strips. Localized population reductions aimed at specific roost sites away from airports are likely to be short lived since egrets are highly transient (Paton et al. 1986). The Honolulu zoo reports that the cattle egret may be accountable for the decrease in native wetland birds because of their increasing competition for food and nest areas, and directly preying upon young birds (Honolulu Zoo undated). The Cattle Egret threatens native waterbirds by preying on their young and competing for food and wetland habitats. Its habit of foraging for food near airports has increased the threat of aircraft strikes.

Wildlife Services removed 661 cattle egrets from airports in the State in FY 2005 and 2210 birds, 73 eggs and 50 nests for all reasons in FY 2005. Cattle egrets are protected under the Federal Migratory Bird Treaty Act and can only be taken under permit. Wildlife Services reports all take to the USFWS Migratory Bird Office which has jurisdiction over this and other migratory bird

species. Cattle egrets are an abundant species in Hawaii and taking this number is not expected to create a substantial decline in overall numbers.

House Finch

The house finch is an introduced species in Hawaii but is now a resident (Pyle 2005, revised). It is native to western North America and is now established on all of the main Hawaiian Islands (Moulton and Pimm 1983). The house finch is probably successful because it has adapted to coexisting with humans in altered habitats such as those found on airport properties. The large native range of this species and the similarities between disturbed habitats in Hawaii and in North America also make this species well suited for establishment in Hawaii. The house finch serves as a reservoir for avian pox and malaria (Earlham College 2005, revised). The house finch is not only a problem at airports but it also causes extensive damage to grain crops. In one study on a farm in Oahu, this species consumed or destroyed 30-50% of the sorghum crop (Hill 1993). This species also competes with native species and serves as vectors for invasive plants.

The house finch is protected under the Federal Migratory Bird Treaty Act and can only be taken under permit. Wildlife Services reports all take to the USFWS Migratory Bird Office which has jurisdiction over this and other migratory bird species. During FY 2005, Wildlife Services removed 3,956 house finch from airports in Hawaii and 5601 house finch for all reasons, including airports. House finches are taken primarily by shooting and cage traps. House finches are an abundant species in Hawaii and taking this number is not expected to create a substantial decline in overall numbers. Indirect effects are likely to be beneficial by reducing some potential to damage grain crops, property, and native plants and birds.

Black Crowned Night Heron

Black crowned night herons are a resident, native species in Hawaii (Pyle 2005, revised). They are not endemic but are distributed almost worldwide. In the Hawaiian Islands, the black crowned night heron can be found in all coastal wetlands (Honolulu Zoo undated). This heron is widely distributed in Hawaii and their population appears stable (State of Hawaii 2005).

Black crowned night herons are protected under the Federal Migratory Bird Treaty Act and may only be taken under Federal

permit. Wildlife Services reports all take to the USFWS Migratory Bird Office which has jurisdiction over this and other migratory bird species.

During calendar year 2006, Wildlife Services removed 78 black crowned night herons during night operations from the canals at the end of the main runway 8L and the ends of 22L and 22R at Honolulu International Airport/Hickam AFB. There was no other black crowned night heron take at any other airport or for any other reason. A total of 234 black crowned night herons were also dispersed during this same period. Black crowned night herons are shot and dispersed in these areas because they are in the pathway of aircraft taking off and landing. Birds the size of black-crowned night herons can cause a fatal aviation incident and therefore they are aggressively managed in these areas.

The black-crowned night heron population on Oahu does not appear to be negatively affected by WS actions at Honolulu International Airport, which represents a fraction of the species' Oahu range. The average annual take of black-crowned night herons at HNL from 2002 to 2006 has been 69 birds. Although an exact population estimate is not available, the state of Hawaii likely supports 1,000s of herons (personal communication, David Leonard, DLNR). While take by WS does not appear to be affecting the population, the species is native and therefore Wildlife Services will explore ways of reducing heron take. Such measures include, but are not limited to, improved documentation of movement patterns and risk analyses based on these patterns and evaluating the potential for habitat modifications to make traditional foraging areas at the Honolulu International Airport less attractive.

Western Meadowlark

Western Meadowlarks are an introduced species and occur only on Kauai. They are protected under the Federal Migratory Bird Treaty Act and can only be taken under permit. Wildlife Services reports all take to the USFWS Migratory Bird Office which has jurisdiction over this and other migratory bird species. During FY 2005 Wildlife Services removed no meadowlarks at airports in Hawaii. In 2005, Wildlife Services removed 512 meadowlarks from Kauai. Meadowlarks are taken by shooting. Meadowlarks are an abundant species on Kauai and taking this number is not expected to create a substantial decline in overall numbers. Indirect effects are likely to be beneficial by reducing some potential to damage grain crops, property, and native plants and birds.

Common Barn Owl

Common barn owls are an introduced species in Hawaii and are now resident. Barn owls are protected under the Federal Migratory Bird Treaty Act and can only be taken under permit. Wildlife Services reports all take to the USFWS Migratory Bird Office which has jurisdiction over this and other migratory bird species. During FY 2005, Wildlife Services removed 3 common barn owls from airports in Hawaii and 388 for all reason including airports. Common barn owls are taken primarily by shooting. Taking this number is not expected to create a substantial decline in overall numbers.

Other Passerines

Other passerine species are protected under the Federal Migratory Bird Treaty Act and can only be taken under permit. Wildlife Services reports all take to the USFWS Migratory Bird Office which has jurisdiction over migratory bird species. During FY 2005, Wildlife Services removed 37 “other passerines” from airports in Hawaii and 1012 for all reasons including airports. These species are taken primarily by shooting and cage traps

Eurasian Skylarks

The Eurasian skylark is an introduced species in Hawaii and is protected under the Federal Migratory Bird Treaty Act and can only be taken under permit. Wildlife Services reports all take to the USFWS Migratory Bird Office which has jurisdiction over this and other migratory bird species. During FY 2005, Wildlife Services removed 577 skylark from airports in Hawaii and 740 for all reasons including airports. Skylarks are taken primarily by shooting and cage traps. They are an abundant species in Hawaii and taking this number is not expected to create a substantial decline in overall numbers. Indirect effects are likely to be beneficial by reducing some potential to damage grain crops, property, and native plants and birds. As discussed in section 4.3.1 Effects on Target Species.

Pacific Golden Plovers

Pacific Golden-Plover strikes with aircraft have occurred at the all major airports in Hawaii, especially during late fall when juveniles of the year arrive. Pacific Golden-Plovers winter in Hawaii before migrating back to Alaska (Johnson and Connors 1996). These birds are protected by the Migratory Bird Treaty Act. The Pacific

golden plover is a migratory bird and is listed as a bird of conservation concern in coastal areas of the United States mainland by the USFWS. While the species is not a conservation concern in the Hawaiian Islands, the USFWS has asked WS to haze or relocate whenever possible and kill as few as possible (correspondence from Tami Tate-Hall, Permit Administrator, July 18, 2002). Wildlife Services did not take any Pacific golden plovers in 2005 but has increased hazing efforts to attempt to control hazards associated with this species.

Table 4. Number of Individual Animals Killed at Non-Military Airports and WS Statewide Take All Reasons in FY 2005.

Species	HNL	**HC&S Maui	HDH	ITO	OGG	JRF	JDM	LNY	LIH	MKK	Total Airport Take	All WS Take for all reasons
Avadavat, Red	1207	0	0	0	0	337	0	0	0	0	1544	1646
Albatross	0	0	0	0	0	0	0	0	0	0	0	0
Bulbul Red Vented	755	0	12	0	0	288	0	0	0	0	1055	1286
Northern Cardinal	59	0	0	9	15	17	0	0	0	0	100	654
Red Crested Cardinal	191	0	26	0	55	174	29	0	0	0	475	2690
Cat, Free Range	10	0	1	0	67	8	2	5	0	0	93	432
Chicken, Feral	0	0	46	0	29	0	0	0	0	0	75	180
Dog, Free Range/Hybrid	0	0	0	1	0	0	0	0	0	0	1	24
Dove, Mourning	0	0	0	0	0	0	0	0	0	0	0	8
Dove, Spotted	404	0	100	0	736	517	169	18	0	0	1944	5181
Dove, Zebra	885	0	519	251	1210	1022	552	291	0	0	4730	13345
Duck, Feral	0	0	0	0	3	0	0	0	0	0	3	37
Egret, Cattle	397	97	4	11	80	47	24	1	0	0	661	2210 73 egg 50 nest
Finch, House	2307	0	109	7	406	1079	12	36	0	0	3956	5601

Species	HNL	**HC&S Maui	HDH	ITO	OGG	JRF	JDM	LNY	LIH	MKK	Total Airport Take	All WS Take for all reasons
Finch, Saffron	1	0	0	0	0	13	0	0	0	0	14	24
Francolin,Gray	0	0	5	0	56	9	94	133	0	0	297	924
Francolin, Black	0	0	0	0	38	4	38	0	0	0	80	1809
Heron, Black Crowned Night-	60	0	0	0	0	0	0	0	0	0	60	67
Hog, Feral	0	0	0	4	0	0	0	0	0	0	4	233
Jungle Fowl	0	0	0	0	0	0	0	0	0	0	0	1166
Mannikin, Chestnut	2637	0	22	1136	300	1631	11	0	0	0	5737	20022
Mannikin, Nutmeg	688	0	27	0	124	37	59	0	0	0	935	4386
Meadowlark, Western	0	0	0	0	0	0	0	0	0	0	0	512
Mockingbird, Northern	1	0	0	0	0	0	0	0	0	0	1	15
Myna	461	0	218	494	0	663	101	465	0	0	2402	5257
Owl, Common Barn	0	0	0	1	0	1	1	0	0	0	3	388
Passerine, Other	0	0	0	0	0	37	0	0	0	0	37	1012
Pheasant, Ring Necked	0	0	0	0	0	1	5	129	0	0	135	158
Pigeons, Feral	1	4	1	0	0	0	1	2	0	0	9	1003
Quail	0	0	0	0	0	0	0	0	0	0	0	0

Species	HNL	**HC&S Maui	HDH	ITO	OGG	JRF	JDM	LNY	LIH	MKK	Total Airport Take	All WS Take for all reasons
Shearwater	0	0	0	0	0	0	0	0	0	0	0	0
Silverbill, Warbling	31	0	0	0	11	5	0	0	0	0	47	49
Skylarks, Eurasian	205	0	0	0	72	93	22	185	0	0	577	740
Sparrow, House/English	340	0	199	199	1988	18	7	36	0	0	2787	3415
Sparrow, Java	2684	0	0	0	3574	3275	70	0	0	0	9603	15350
Mongooses	84	0	16	27	0	342	0	0	0	0	469	2381
Rat, Polynesian	0	0	0	0	0	0	0	0	0	0	0	31
Rat/mice Mix	0	0	0	0	10	1	0	0	0	0	11	55
Tern, Common Fairy	0	0	0	0	0	0	0	0	0	0	0	0
Turkey, Wild	0	0	0	0	0	0	0	7	0	0	7	15
White-eye, Japanese	4	0	0	0	0	1	0	0	0	0	5	15
Waxbill, Common	180	0	0	0	0	36	0	0	0	0	216	274
Removed - All Species	**13,592**	**101**	**1,305**	**2,140**	**8,774**	**9,656**	**1,197**	**1,308**	**0**	**0**	**38,073**	**64,902**

** These properties are located adjacent to airports and provide habitat for birds to roost and nest which can contribute to hazards at the airfields.

While Table 4 showed the number of individual animals killed at airports, the majority of Wildlife Services effort to remove wildlife hazards from airfields is handled by non-lethal methods such as hazing with firearms or vehicles to the point that the animal(s) leaves the zone of hazard, even if temporarily. Table 5 presents information about the numbers of

individuals of all species hazed from airfields and the number and type of endangered or threatened species hazed from airports.

Table 5. Numbers of Individuals of all Species and Endangered Species Dispersed at Airports in Hawaii*.

	HDH	HNL	ITO	OGG	JRF	JHM	LNY	LIH	MKK
Individuals of all Species Dispersed	51,963	103,413	8,346	29,578	70,053	2,535	3,640	534,388	6,087
Hawaiian duck (Koloa) *(Anas wyvilliana),* Endangered	2	16			8			129	
Hawaiian hawk (*Buteo solitarius*), Endangered		1							
Hawaiian stilts, (*Himantopus mexicanus knudseni*), Endangered		55		29	117				
Hawaiian goose, *(Branta (=Nesochen) sandvicensis*), Endangered								1099	
Hawaiian common moorhen *(Gallinula chloropus sandvicensis*), Endangered								1	
Hawaiian coot *(Fulica alai),* Endangered									

*Individuals may be dispersed multiple times and are counted in each dispersal. For example, one bird dispersed three times will be counted as three individuals dispersed.

The activity of hazing an endangered species can be considered a take under the Endangered Species Act and must be done under a permit issued by the USFWS. Wildlife Services obtains such permits to haze endangered species from airfields if they are encountered and considered to be a hazard to air traffic safety. Hazing endangered species generally benefits the individual hazed by removing it from the strike zone and potentially preventing a bird aircraft strike. No endangered species have been killed at airports in Hawaii from Wildlife Services operations, however, aircraft strikes have resulted in kills.

Effect of WS take on the viability and abundance of non-native bird species in Hawaii.

More species of birds have been introduced in the Hawaiian Islands than anywhere else on earth (Moulton and Pimm 1986, Shehata *et al*. 2001), and many of these introduced species have established breeding populations in Hawaii (Loope et al*.* 2001). Most introductions were intentional during the late 1800's and early 1900's, and by the 1950's they were restricted by the government (Pyle 1995). Bird Species were introduced for a number of reasons including recreational hunting, aesthetics and biological control of other introduced species (Moulton et al*.* 2001). The cattle egret (*Bubulcus ibis*) and barn owl (*Tyto alba*) are examples of birds that were introduced to provide biological control of other invasive species (Loope et al*.* 2001).

Successful introductions of bird species in Hawaii were made due to the altered habitats created by human activity; most species were introduced into habitats that had already been changed through deforestation, grazing, and agriculture (Moulton and Pimm 1983).

Non-native bird species can cause harm to natural systems and other human interests in a number of ways. These include competition with endemic Hawaiian birds, most of which are endangered or threatened (van Riper et al*.* 1986), dispersion of Non-native invasive plants (Cuddihy and Stone 1990) (Loope et al*.* 2001), agricultural damage (Loope et al*.* 2001), and the spread of disease and parasites. Introduced birds function as vectors and reservoirs for avian diseases that are spread to native species of birds. Avian diseases, especially avian malaria and avian pox, are one of the greatest factors leading to the decline of native Hawaiian birds (van Riper and van Riper 1986, Banko et al*.* 2001, van Riper and Scott 2001). The rich avifauna of Hawai'i and other Pacific islands have already been severely depleted by introduced avian diseases. The introduction of West Nile virus into Hawai'i would have catastrophic consequences for the native avifauna (USFWS undated).

Several introduced birds have detrimental impacts on specific native birds. The barn owl (*Tyto alba*) preys upon the Newell's shearwater (*Puffinus auricularis newelli*) and other native birds (Ainley et al. 2001). The mallard duck (*Anas platyrhynchos*) hybridizes with the Hawaiian duck (*Anas wyvilliana*), an endemic species, which contributes to its decline (Rhymer 2001). Introduced insectivorous birds impact Hawaiian plants by preying upon insects that are pollinators for native plants (Cuddihy and Stone 1990). Still, introduced birds are not generally targeted by current invasive species managers (Ikuma et al. 2002) and thus the cumulative mortality would be expected to be low.

While Wildlife Services may have localized impacts on non-native migratory birds on and around airfields, it does not intend or expect to reduce overall populations of non-native birds on the islands. However, even localized reductions would be considered by wildlife management agencies as providing potential benefit to native ecosystems and agriculture. Since most species of non-native migratory birds in Hawaii are actually resident, this alterative would not affect regional migratory bird populations.

Introduced bird species taken by Wildlife Services

There are no non-protected introduced bird species in Hawaii. All species are protected if they are established and require permits for take. Other bird species taken and that are abundant in Hawaii include: red vented bulbul, red crested cardinal, feral chicken, spotted dove, zebra dove, gray and black francolin, chestnut and nutmeg manikin, myna, ring-necked pheasant, feral pigeons, quail, Java sparrow, English sparrow, and feral ducks. Table 4 shows the number of individuals of each species removed for airport related protection, as well as the total number removed for all reasons by Wildlife Services. Population data are not available for these species but these species are not native, are abundant and any reductions in their populations would be considered beneficial to Hawaii's native ecosystem. Regardless, WS is not attempting to reduce overall populations and only localized impacts are expected. These species populations would not be expected to be adversely affected due to high reproduction and recruitment rates. Hawaii Department of Land and Natural Resources issues a permit to Wildlife Services to take species from airports including endangered, migratory, and introduced birds and other animals as needed.

Mammals taken by Wildlife Services

Mammals include feral cats, dogs, pigs, mongoose, rats, and mice. All mammals are introduced species, and are not protected. Mongoose, rats, mice, and feral cats and dogs are not protected. Pigs are game species

and require a permit for control. Feral cats and dogs are provided to the Hawaii Humane Society for adoption or, euthanization and disposal. Few pigs are encountered on airport property. Population data are not available for these species but these species are abundant and would not be expected to be adversely affected due to high reproduction and recruitment rates. These non native mammals threaten native birds and plants, and or cause damage to agriculture, and can harbor disease. Population-level effects are not expected, but any removals could be considered a potential (if minor) benefit to Hawaii's ecosystem and/or economy. Local, mostly temporary impacts may be seen in localized project areas. Axis deer may also be encountered on Kahului and Kalaupapa.

4.3.2 Effects on Threatened and Endangered Species

WS conducted a Section 7 consultation with the USFWS pursuant to the ESA and the agencies concurred that the airport wildlife hazard activities would not be likely to adversely affect threatened or endangered species. In addition to an informal consultation, Wildlife Services holds a Section 10 permit to harass endangered species off of airfields if they should create a hazard to air traffic safety.

Wildlife Services hazed endangered species as noted in Table 5 from airports in Hawaii in 2005. Hazing would be likely to benefit the individual birds hazed since it prevents potential strikes with aircraft. No other endangered species are found on airports that may be affected by WS operations. Therefore, WS fully complies with the Federal Endangered Species Act. The State of Hawaii also allows that endangered or threatened species may be hazed at airports under a protected wildlife permit. Wildlife Services regularly coordinates its actions and any hazing of listed species that occur in airport operation areas with these two agencies.

Wildlife Services has no effect on habitat at airports but may recommend habitat manipulation at airports to airport managers to reduce attractants to wildlife. In this case, airport management is responsible for completing any requirements for Endangered Species Act compliance in the case of any listed plant species or effects on animals. Because airports are in previously disturbed areas, little chance of this occurs.

4.4 Technical Assistance Program

Under this alternative, WS would provide education and advice as described in Section 2.2 to airport managers and would not take direct action to manage wildlife hazards at airports.

4.4.1 Effects on Target Species

Wildlife Services would not affect any species under this alternative because it would provide no direct management. Wildlife Services would provide education and technical advice to airport managers, but has no legal authority over the actions of others. Thus it could not control the outcome and environmental consequences. The effects on target species by individuals outside of Wildlife Services from this alternative could be similar depending upon the skill and experience level of those receiving technical assistance and implementing the actions. Removing fewer individual animals or the wrong ones could result in higher risks to aviation safety (since species removed by WS on and around the airfields are only removed if they are determined to be a threat to aviation safety). Since most species are non-native and abundant, the consequences of taking a higher number of individuals on airport properties would not be expected to affect regional populations of non-native species. Individuals implementing control actions could affect native or protected species due to lack of experience and training.

Wildlife Services would not affect any native species under this alternative because it would provide no direct management. Wildlife Services would provide education and technical advice to airport managers, but has no legal authority over the actions of others. Thus it could not control outcome and environmental consequences. The effects on native species by individuals outside of Wildlife Services could be higher depending upon the skill and experience level of those receiving technical assistance and implementing the actions. Individuals implementing control actions could affect native species due to lack of experience or training.

4.4.2 Effects on Threatened and Endangered Species

Wildlife Services would not affect any threatened or endangered species under this alternative because it would provide no direct management. Wildlife Services would provide education and technical advice to airport managers to control wildlife hazards and threats, but has no legal authority over the actions of others. Thus it could not control the outcome and environmental consequences.

There could be a higher risk of inadvertently taking non-target threatened or endangered species by individuals outside of Wildlife Services depending upon the skill and experience level of those receiving technical assistance and implementing the actions. Removal of non-native species can enhance the survival of threatened and endangered species. Under this alternative, WS would not be involved in Section 7 consultation with the USFWS.

4.5 Summary of Environmental Consequences

Table 6 presents conclusions derived from the analysis in Chapter 4. No statewide or regional effects on any species included in this assessment are expected. Localized and temporary impacts on some species populations can be expected and is desired within project sites. No observed impact to native species is expected, and although hazing may be considered as “take” under the ESA, hazing endangered species from aircraft operations areas is a non-lethal technique that may benefit the species by reducing the potential for strikes with aircraft.

Table 6. Summary of Environmental Consequences

Alternative 1. Proposed Action - Integrated Wildlife Damage Management	
Target Species	Localized mostly temporary impacts on populations at project sites. Most target species are not native. Some are protected under the MBTA and may be taken under permit by the USFWS. The primary method of protecting air traffic safety is by using non lethal hazing methods. Species are killed when hazing is not effective or practical. Most species creating a hazard are abundant and no overall population declines are expected. Migratory birds are only taken as allowed under USFWS permit. USFWS has regulatory responsibility fro managing populations of migratory birds and issuing permits for take. WS also holds a permit from the State of Hawaii to remove birds and other wildlife that crate a property or human safety hazard at airports in Hawaii. No statewide or regional population effects are detected, and no notable cumulative impacts are expected based on professional opinion of USFWS and DLNR.).
T&E Species	The endangered Hawaiian stilt, Hawaiian hawk, Hawaiian duck, Hawaiian coot and Hawaiian moorhen were hazed and may be hazed from airfields. Hazing is done under USFWS permit. Hazing may benefit species by potentially removing them from the strike zone.
Native Species	Most native species are hazed and not taken. The black crowned night heron is removed where local populations threaten aviation safety. The population is stable and removal does not appear to contribute towards a decline in the statewide population.
Alternative 2. Technical Assistance	
Target Species	WS would have no effect on any species since it would not provide direct assistance. WS would provide education, advice and recommendations under this alternative to assist airport managers who would then implement actions. WS has no regulatory authority over the actions of others. Effects by entities other than WS would be expected to be similar depending on the training and experience of the individuals implementing actions.
T&E Species	
Native Species	

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APPENDIX A

Wildlife Strikes to Aircraft in Hawaii and Nationwide between 1990 and 2004

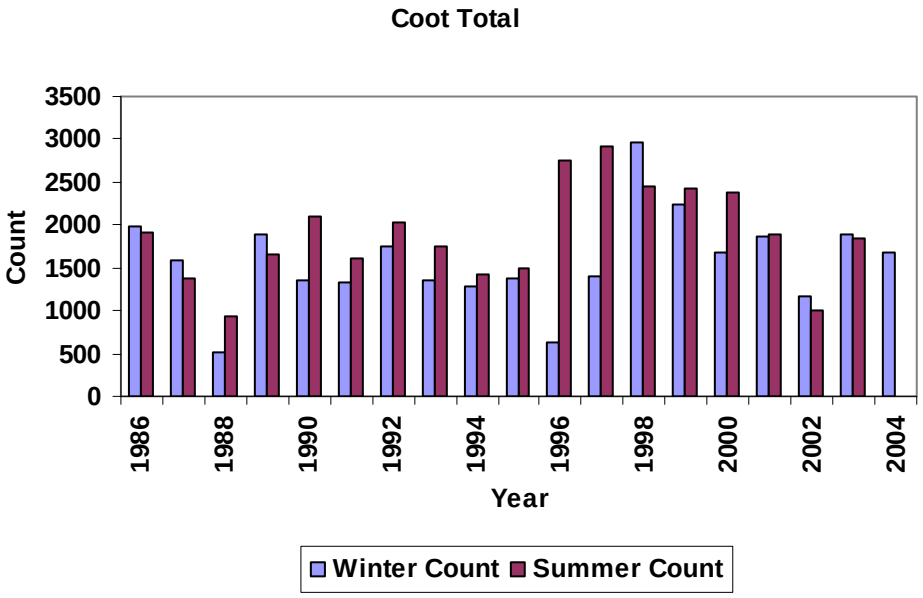
Species	State	Strikes	Total US Strikes
AMERICAN GOLDEN-PLOVER	HI	2	22
AMERICAN ROBIN	HI	1	220
BARN OWL	HI	48	226
BLACK NODDY	HI	1	3
BLACK-CROWNED NIGHT-HERON	HI	2	13
BLACK-NECKED STILT	HI	1	1
CARDINALS,BUNTINGS,SPARROWS	HI	2	53
CATTLE EGRET	HI	2	104
CHESTNUT MANNIKIN	HI	23	23
CHUKAR	HI	1	1
COMMON MYNA	HI	28	28
DOVES	HI	37	574
DUCKS	HI	1	552
EGRET	HI	8	229
EURASIAN SKYLARK	HI	4	4
EUROPEAN STARLING	HI	1	1295
FINCHES	HI	6	35
FRIGATEBIRDS	HI	1	1
GEESE	HI	1	295
GREAT FRIGATEBIRD	HI	4	5
GREY FRANCOLIN	HI	1	1
GULLS	HI	5	4525
HAWAIIAN HAWK	HI	1	1
HOUSE CAT	HI	2	8
HOUSE FINCH	HI	2	12
HOUSE SPARROW	HI	4	23
JAPANESE WHITE-EYE	HI	1	1
JAVA SPARROW	HI	1	1
KILLDEER	HI	1	655
MANNIKINS	HI	18	18
MEADOWLARKS	HI	3	61
MYNA	HI	2	2
NORTHERN CARDINAL	HI	1	1
NORWAY RAT	HI	2	3
NUTMEG MANNIKIN	HI	18	18
OWLS	HI	31	219
PACIFIC GOLDEN-PLOVER	HI	196	206
PERCHING BIRDS (y)	HI	1	91
PHEASANTS	HI	1	1
PIGEONS	HI	1	21
PIGEONS, DOVES	HI	4	27
PLOVERS	HI	3	27

RED AVADAVAT	HI	1	1
RED-CRESTED CARDINAL	HI	2	2
RED-TAILED TROPICBIRD	HI	1	2
RED-VENTED BULBUL	HI	1	1
RING-NECKED PHEASANT	HI	4	48
ROCK DOVE	HI	12	1083
RUDDY TURNSTONE	HI	3	3
SANDPIPERS	HI	2	115
SHORT-EARED OWL	HI	14	55
SPARROWS	HI	39	1539
SPOTTED DOVE	HI	27	29
SWALLOWS	HI	1	367
TERNS	HI	1	33
TOWNSENDS SHEARWATER	HI	2	2
TROPICBIRDS	HI	1	1
UNKNOWN BIRD	HI	524	33791
UNKNOWN BIRD OR BAT	HI	29	3425
UPLAND SANDPIPER	HI	1	60
WARBLING SILVERBILL	HI	1	1
WEDGE-TAILED SHEARWATER	HI	3	3
WESTERN MEADOWLARK	HI	5	152
ZEBRA DOVE	HI	65	65

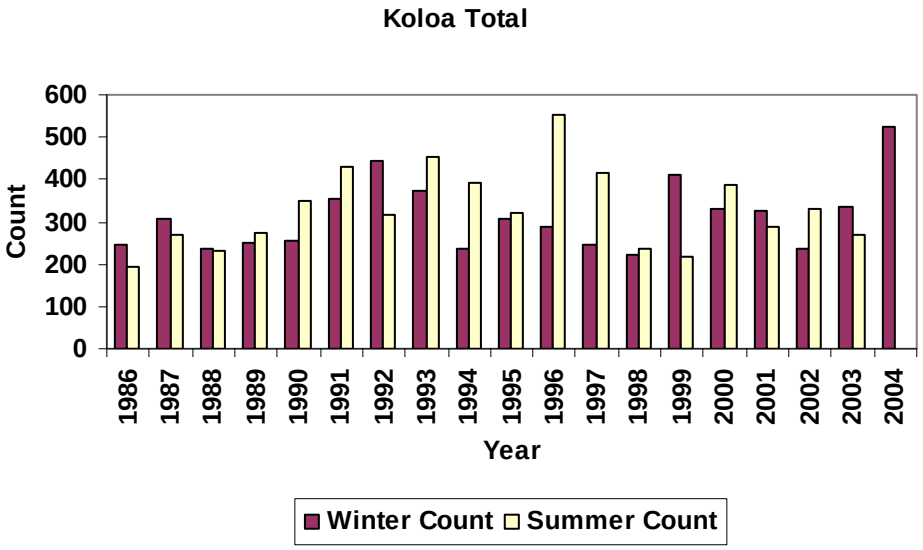
Selected Search Criteria:
From: Jan
1990 To: Dec 2004

State: HI
Species: All
Downloaded - Thu Jan 13 2005 13:24:21 MST

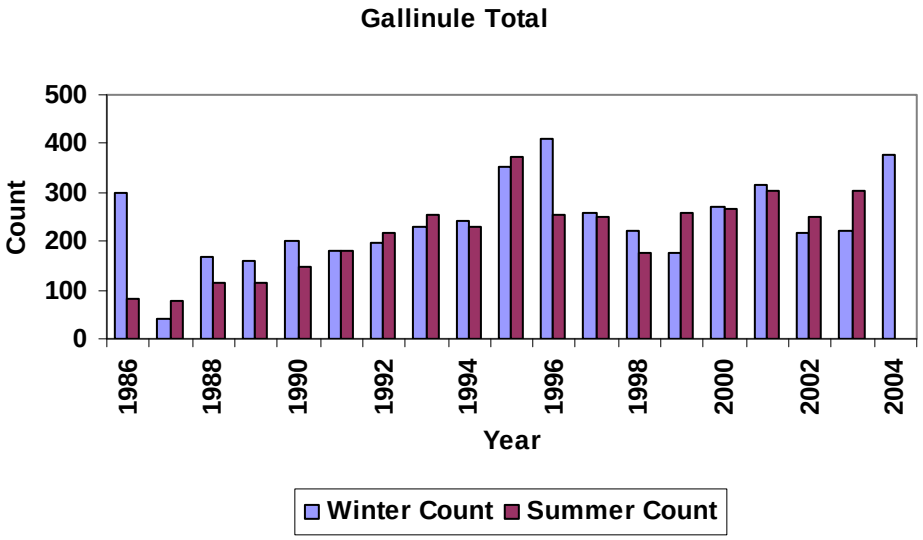
APPENDIX B



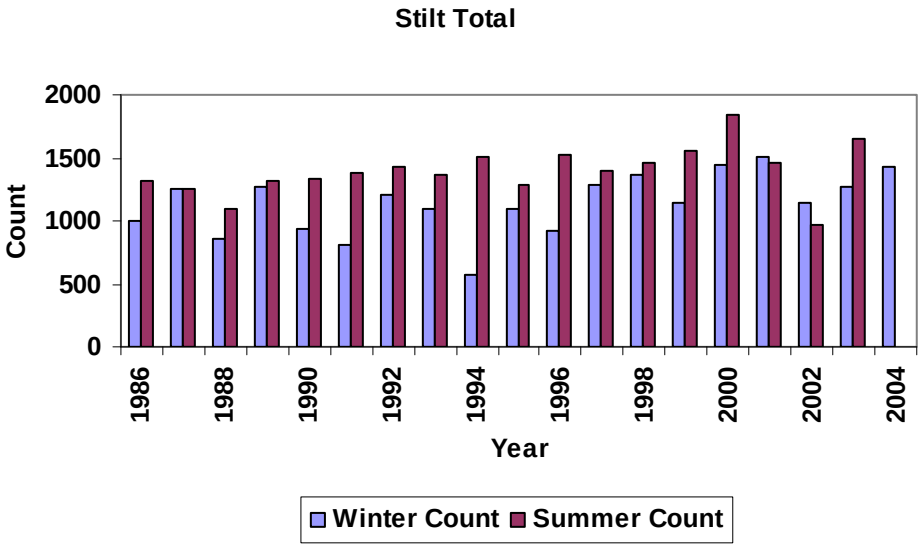
Appendix B 1 Endangered Hawaiian Coot Counts from Annual Statewide Waterbird Surveys conducted once in January (winter) and August (summer) of each year.



Appendix B 2 Endangered Hawaiian Duck Counts from Annual Statewide Waterbird Surveys conducted once in January (Winter) and August (Summer) of each year.



Appendix B 3 Endangered Hawaiian Moorhen Counts from Annual Statewide Waterbird Surveys conducted once in January (Winter) and August (Summer) of each year.



Appendix B 4 Endangered Hawaiian Stilt Counts from Annual Statewide Waterbird Surveys conducted once in January (winter) and August (summer) of each year.