

Environmental Assessment Predator Damage Management to Protect Avian Wildlife in Hawaii

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

In Cooperation with
Hawaii Department of Land and Natural Resources
Hawaii Army National Guard

In Coordination with
United States Department of Interior, Fish and Wildlife Service



1. PURPOSE AND NEED

1.1. INTRODUCTION

The United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services program (WS) is proposing to implement a program to reduce or alleviate predation caused by introduced mammals and the cattle egret (*Bulbulcus ibis*) on populations of native forest birds, waterbirds, seabirds, the Hawaiian (nene) goose (*Branta sandvicensis*), and introduced game birds. The action supports federal recovery and conservation plans, and state action plans which call for the control of predation to assist in the conservation of endangered species, migratory seabirds and game birds in the state of Hawaii.

Managing the protection and recovery of Hawaii's indigenous wildlife and the conservation of introduced game bird populations requires the control of predation caused by introduced mammals that may feed on eggs, young and adults. Section 1.4 of this EA lists the recovery, conservation, and restoration plans that call for removing the following specific predators to protect and enhance populations of native birds and managed game bird species. Feral dogs (*Canis familiaris*), cats (*Felis catus*), small Indian mongoose (*Herpestes auropunctatus*), rats (*Rattus* spp.) and house mice (*Mus musculus*) have been identified as predators requiring control in the recovery plans for endangered Hawaiian waterbirds, endangered and other indigenous forest birds, the Hawaiian goose and the conservation of migratory seabird nesting colonies (USFWS 2004, 2005a, 2005b, 2006). The introduced cattle egret has also been identified as a predator on Hawaiian waterbirds (USFWS 2005a).

Wildlife damage management, or control, is defined as the alleviation of damage or other problems caused by wildlife (Leopold 1933, The Wildlife Society 1990, Berryman 1991). The WS program uses an Integrated Wildlife Damage Management (IWDM) approach (sometimes referred to as "Integrated Pest Management" or IPM) in which a variety of methods may be used or recommended to prevent or reduce damage caused by wildlife. IWDM is described in Volume 4, Chapter 1, pages 1-7 of the ADC Final Environmental Impact Statement (FEIS) (USDA 1997, revised). The control of wildlife damage may also require that the offending animal(s) be removed or that local populations of the offending species be reduced through lethal methods. The FEIS contains detailed discussions of potential environmental impacts from methods that are used for predator management in the State of Hawaii.

1.2. INTRODUCED PREDATORS

1.2.1. RATS

The roof rat (*Rattus rattus*) is especially adapted to wooded gulches, sugarcane fields, and dry, wet or even extremely wet forests. It retains a commensal relationship with man but it does not depend on man for survival. This species is locally common at lower and middle elevations, and is found sparsely distributed at higher altitudes (Tomich 1986). According to Tomich (1986), the

roof rat has been noted specifically as a predator on native birds. The most noteworthy example is the extinction of the Laysan rail (*Porzana plameri*) at Midway Atoll, located in the Northwestern Hawaiian Islands. The roof rat has also caused the extirpation of the Laysan finch (*Telespyza cantans*) from this area. Schwartz and Schwartz (1950) report roof rat predation on nestlings of the zebra dove (*Geopelia striata*) on Hawaii. The roof rat has entered the remote forests of Hawaii where it is the prominent rodent species (Tomich 1986). Roof rats may compete for the food of native birds such as the omao (*Myadestes obscurus*), olomao (*Myadestes lanaiensis*), kamao (*Myadestes myadestinus*), puaiohi (*Myadestes palmeri*) and ou (*Psittirostra psittacea*). They feed primarily on seasonally abundant fruit but may occasionally raid a bird nest (Scott et al 1986). Native forest birds that have survived up to now in large numbers are unlikely to be annihilated by rats (Tomich 1981) but the rarest forest birds could be severely impacted when subjected to other stresses as well (Scott et al. 1986).

1.2.2. MONGOOSE

The small Indian mongoose (*Herpestes auropunctatus* or *javanicus* depending on author) in Hawaii originated from Indian stocks brought originally to Jamaica and subsequently to Hawaii (Tomich 1986). It is present on Oahu, Molokai, Maui and Hawaii. Mongoose may have become established on Kauai. A lactating female that was killed by an automobile was recovered in November 1976 near Kalaheo (Tomich 1986). Many sightings have been reported on Kauai since then but without any specimen being taken despite many trapping efforts by the U.S. Department of Agriculture over the past 10 years (Peter Silva pers. comm, USDA Wildlife Services).

Mongoose range from sea level to 9,200 ft on Mauna Kea, about 7,000 ft. for Mauna Loa on the island of Hawaii, and about 6,000 ft in Kipahulu Valley on Maui (Tomich 1986). The diet of mongooses in Hawaii was discussed by Baldwin et al. (1952) and Mostello (1996). They are omnivorous, consuming up to 18 percent plant material, 45 percent invertebrates, 29 percent mammals and 8 percent birds (Baldwin et al. 1952). Mostello (1996) found similar diet composition with up to 15 percent of the samples containing plant material, 86 percent with invertebrates, 39 percent with mammals, 3 percent of the samples contained birds, and 2 percent contained herpetofauna (reptiles or amphibians).

Schwartz and Schwartz found the mongoose to be an important predator on the ring-necked pheasant (1951) but not a factor that adversely affects California quail populations in Hawaii (1950). Of 86 mongoose scats examined in areas occupied by California quail, no remains of this bird were found (Schwartz and Schwartz 1950). King and Gould (1967) suggest that the mongoose is responsible for the extirpation and reduction of the Newell's shearwater (*Puffinus newelli*) on Oahu, Moloka'i, Maui and Hawaii (Tomich 1986), but Hays and Conant (2007), point out that they did so without citing any sources. Stone et al. (1994) also stated, without citing any sources (Hays and Conant 2007) that the mongoose is a "known or suspected" nest predator on at least eight federally listed endangered species. These include the Hawaiian goose, Hawaiian crow (*Corvus hawaiiensis*), Hawaiian duck (*Anas wyvilliana*), Hawaiian coot (*Fulica alai*), Hawaiian stilt (*Himantopus mexicanus*), common moorhen (*Gallinula chloropus*) and Hawaiian (dark-rumped) petrel (*Pterodroma phaeopygia*). The mongoose has been identified as

a key predator to waterbirds in the Draft Revised Recovery Plan for Hawaiian Waterbirds (USFWS 2004). Tomich (1986) states that predation by mongoose on Hawaiian goose is well documented. Banko and Manuwal (1982), determined that mongoose predation on eggs accounted for 62 percent, and attacks on incubating females 10 percent, of all unsuccessful nests of wild Hawaiian geese that they studied (Tomich 1986). A study conducted in Hawai'i Volcanoes National Park demonstrated that 77 percent of Hawaiian goose eggs lost between 1978 and 1981 were lost to mongooses (Banko 1988).

Hays and Conant (2007) suggest that the degree to which mongooses are responsible for the decline of bird species in Hawaii is difficult to assess, because of other exacerbating factors such as introduction of rats, cats, dogs, pigs and habitat loss from encroachment by humans. They further suggest that ground nesting bird populations may have established a predator-prey equilibrium with the mongoose in Hawaii, although the presence of mongooses poses a substantial barrier to the reestablishment of ground nesting birds in their historical ranges. Four once-common bird species have been extirpated from all Fijian islands with mongooses but persist on mongoose-free islands: the banded rail (*Rallus philippensis*), sooty rail (*Porzana tabuensis*), white-browed rail (*Poliolimnas cinereus*), and purple swamphen (*Porphyrio porphyrio*) (Gorman 1975 in Hays and Conant 2007). They also believe that trapping programs to control mongoose are of limited use, because removing the mongooses from a strip of habitat around the sensitive area creates a region of empty habitat that lures more mongooses into the area. These programs are very expensive, because monitoring traps is a labor-intensive procedure.

1.2.3. DOGS

Feral dogs (*Canis familiaris*) constitute a threat to ground-nesting game birds to a limited degree because dogs exist in low numbers and confine their foraging mostly to rats (Tomich 1986), sheep, goats and pigs (Schwartz and Schwartz 1949). They may, however, seriously influence the Hawaiian goose populations in the wild (Schwartz and Schwartz 1949, Tomich 1986) and colonial sea birds (Tomich 1986). Dogs have been identified as responsible for the killing of a number of Laysan albatrosses at Pacific Missile Range Facility (Tim Ohashi pers. comm.).

1.2.4. CATS

Feral cats are most common at lower and middle elevations, but also go high into the mountains in Hawaii (Tomich 1986). The feral cat is generally regarded as an important predator on both ground nesting and arboreal nesting game birds, but it is probably less important than rat and mongoose in most areas in Hawaii (Schwartz and Schwartz 1949). It is considered an important predator on burrow nesting colonial seabirds (Tomich 1986). Feral cat colonies are particularly problematic for bird conservation efforts. Smith et al. (2002) found 44 adult shearwater carcasses at Malaekahana near a feral cat colony.

Predation by introduced mammalian predators such as feral cats is listed as a factor that limits the recovery of palila populations on Mauna Kea (USFWS 2003). Feral cats are the primary predator of palila (Hess et.al. n.d.). The scats from feral cats found on Mauna Kea show bird

remains in 59 percent of the samples (n=87). Stomach samples from 96 cats on Mauna Kea showed that birds were the most common prey item. Passerines were found in 53.1 percent of the cat stomach samples and gallinaceous birds were present in the 33.3 percent of the samples. There was an additional 15.5 percent of the samples that contained bird remains that were unidentifiable, therefore the actual number of samples containing either passerines or gallinaceous birds are even higher (Steve Hess, pers. comm.). Pletschet and Kelly (1990) attributed 5 percent of palila nest mortality to egg depredation and 35 percent to nestling depredation by feral cats and black rats. Studies by van Riper (1980a) and Pratt et al. (1997) have shown that feral cats prey on palila nests and adults (USFWS 2006). Laut et al. (2003) recorded a feral cat predating on one of the seven palila nests that they monitored with video camera.

1.2.5. CATTLE EGRETS

Cattle egrets were introduced to Hawaii in 1959 by the Hawaii State Board of Agriculture in an attempt to control the flies that pester cattle (Breese 1959). Since their introduction they have become a very successful species in the islands, with greatly increased numbers and an expanded range (Paton et al. 1986). Their benefits to man and their effects on the Hawaiian environment are not entirely clear. Cattle egrets are a hazard to aviation because of their preference for feeding in grassland disturbed by grazing animals as well as tractor mowers that cut grass on airfields.

Cattle egrets were introduced into Hawaii to control cattle associated flies, but they also consume freshwater prawns, an important fisheries farming industry on Oahu (Paton et al. 1986).

The cattle egret is listed as a predator on Hawaii's endangered waterbirds in the Draft Revised Recovery Plan for Hawaiian Waterbirds (USFWS 2006). In other areas, cattle egrets may forage along marine shorelines, especially for dead or exhausted small migrant birds (Cunningham 1965) or capture exhausted small migrants on marine oil rigs (Myers and Wallace 2003). It would not be unlikely for a cattle egret to feed on a waterbird chick given its diverse and opportunistic feeding behavior, if one was encountered during foraging.

1.3. PURPOSE

The purpose of the proposed action is to reduce or alleviate predation caused by introduced mammals and the cattle egret on populations of native forest birds, waterbirds, seabirds, Hawaiian goose, and introduced game birds. The action supports federal and state actions to protect and enhance endangered species, protect migratory seabirds and provide recreational hunting opportunities in the state of Hawaii.

1.3.1. RELATIONSHIP OF THIS EA TO OTHER ENVIRONMENTAL DOCUMENTS AND MANAGEMENT PLANS

- 1.3.1.1. 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. Relevant discussions are incorporated by reference.
- 1.3.1.2. Draft Revised Recovery Plan for Hawaiian Waterbirds Second Draft of Second Revision. U.S. Fish and Wildlife Service (USFWS). Portland, OR. 155pp. While the most important cause of decline of the four species of endangered Hawaiian waterbirds is loss of wetland habitat. Other factors that have contributed to waterbird population declines, and continue to be detrimental include predation by introduced animals.
- 1.3.1.3. Draft Revised Recovery Plan for the Hawaiian Goose (*Branta sandvicensis*). USFWS, Portland, OR. 148 + xi pp. The recovery plan for the Hawaiian goose states that a key limiting factor to recovery is predation on eggs, goslings, and adults by introduced predators, especially the small Indian mongoose.
- 1.3.1.4. Regional Seabird Conservation Plan, Pacific Region. USFWS, Portland, OR. The purpose of the seabird conservation plan is to identify USFWS priorities for seabird management, monitoring, research, outreach, planning and coordination. It lists the need to control non-native cats, dogs, rats, mongoose, cattle egrets, and barn owls in Hawaii where they negatively affect seabird populations, especially in Newell's shearwater and Hawaiian petrel colonies.
- 1.3.1.5. Revised Recovery Plan for Hawaiian Forest Birds. Region 1, USFWS Portland, OR. 622 pp. The recovery plan for Hawaiian forest birds lists actions to recover Hawaii's endangered forest birds, which includes recommendations for reducing or eliminating the detrimental effects of introduced predators.
- 1.3.1.6. Draft Environmental Assessment Kaena Point Ecosystem Restoration Project. The USFWS has provided a grant to the Hawaii Chapter of The Wildlife Society for the Kaena Point Ecosystem Restoration Project. The project proposes to construct a predator proof fence at Kaena Point Natural Area Reserve, removal of predators inside the fence, and public outreach and project coordination. HDLNR is preparing a Conservation District Use Application pursuant to HRS 343 for the project which will be on conservation lands and near the shoreline.
- 1.3.1.7. Kawainui Marsh Wetland Restoration and Habitat Enhancement Project. The objective of the Kawainui Marsh Wetland Restoration and Habitat Enhancement Project is to restore habitat for native Hawaiian water birds, migratory shorebirds and waterfowl, and native fish species in Kawainui Marsh, Kailua, Oahu, and to involve local organizations, businesses, schools and county, state and federal

agencies in the process in order to integrate the wildlife sanctuary into the fabric of the community. By including a broad spectrum of community organizations, businesses, schools and government agencies, the project will instill a sense of ownership by local citizens, educate residents and visitors, and help to encourage further habitat restoration in Kawainui (DLNR 2005).

1.4. DECISION TO BE MADE

Based on agency relationships and legislative mandates, WS is the lead agency for this EA, and therefore responsible for the scope, content and decisions made. The USFWS, DOFAW and Hawaii Army National Guard (HIARNG) had input during preparation of the EA to ensure an interdisciplinary approach in compliance with NEPA and agency mandates, policies and regulations.

As cooperating agencies, DOFAW and HIARNG may adopt this EA and make and document their own decision for the issuance of any permits needed to carry out the selected actions.

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

- 1.4.1. Should WS continue to conduct an integrated introduced mammal predator and cattle egret control operations in Hawaii to alleviate depredations on native and managed game species?
- 1.4.2. What are the environmental effects associated with the proposed action and alternatives? What interests and environmental resources might be affected?
- 1.4.3. Might the proposed action have significant effects on the quality of the human environment requiring preparation of an EIS?

1.5. SCOPE OF THIS ANALYSIS

1.5.1. Actions Analyzed

This EA evaluates Wildlife Services control of predation caused by introduced mammals and the cattle egret to protect native wildlife and introduced game birds throughout the state. Actions would be coordinated with the DOFAW, HIARNG, and USFWS.

1.5.2. 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.

1.5.3. Site Specificity

This EA emphasizes major issues as they relate to specific sites whenever possible, however, many introduced predator management issues apply wherever control of predation is needed to protect other biological resources, regardless of site specific location. All known locations and substantive issues are identified herein, however new land owners or agency programs may enter into agreement with WS under the actions covered under this analysis.

Wildlife Services personnel use the WS Decision Model as the “on the ground” site-specific procedure for each damage management action conducted by WS. The Decision Model is a thought process that guides WS through the analysis and development of the most appropriate individual strategy to reduce damages and detrimental environmental effects from damage management actions (see Section 2.1 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, DOFAW, HIARNG, private landowners and/or USFWS and any mitigations and standard operating procedures (SOP) described herein and adopted or established as part of the decision.

1.5.3.1. Specific Site Description

1.5.3.1.1. Kaena Point Natural Area Reserve (NAR), Oahu

WS conducts mammalian predator trapping and diphacinone rodenticide applications within the Kaena Point NAR. The area is administered by DOFAW and is part of Hawaii’s Natural Areas System that protects areas with unique or rare biotic communities. The purpose of the predator control operation is to reduce predation caused by the small Indian mongoose, rats, mice, feral cats and dogs, to protect and enhance the survival of colonies of wedge-tailed shearwaters (*Puffinus pacificus*), Laysan albatrosses (*Diomedea immutabilis*), other sea birds, and endangered plant populations within the Kaena Point NAR.

Kaena is a rugged wilderness area on the western tip of Oahu. The Kaena Point NAR, which lies within the Kaena Point State Park, occupies 12 acres on the leeward side of the peninsula on the westernmost tip of the island of Oahu. Elevation ranges from sea level to 20 feet. The Reserve’s lava-rock shoreline encloses sand dunes at the point, and rises into basalt talus slopes above the coastal lowlands. The sand dune area of the Reserve is part of the most extensive dune system on Oahu. Two native plant communities are present in the Reserve, a rare Naupaka (*Scaevola sericea*) Mixed Coastal Dry Shrubland and an ilima (*Sida fallax*) Coastal Dry Mixed Shrub and Grassland (NARS circa 1988). Prior to the development of the Kaena Point NAR Management Plan (circa 1988) no albatrosses or shearwaters nested within the NAR. The Laysan Albatross Birdstrike Abatement Plan was implemented by WS to discourage albatrosses from nesting in and around Dillingham Airfield at Mokuleia, which was 4.1 miles from the NAR. The

albatrosses were instead, allowed to nest at Kaena Point and in Kuaokala Game Management Area as part of the plan.

WS provides bait stations for the application of diphacinone rodenticide within the Kaena Point NAR. Bait stations are serviced bimonthly to maintain effectiveness. WS consults with the Oahu Natural Area Reserve System (NARS) Manager before using any control technique. The Oahu NARS Manager determines the acceptability and suitability of each method proposed for use.

The USFWS has provided a grant to the Hawaii Chapter of The Wildlife Society for the Kaena Point Ecosystem Restoration Project. The project includes the construction of a predator proof fence by a private contractor at Kaena Point Natural Area Reserve. HDLNR is preparing an Environmental Assessment pursuant to HRS 343 for the project which will be on conservation lands and near the shoreline. The role of WS will be to continue diphacinone applications to control mongoose and rodents and to trap feral cats and mongoose within the enclosure and along the perimeter of the fence.

1.5.3.1.2. Kuaokala Game Management Area (GMA), Oahu

Hunting Unit 1 on the island of Oahu consists of a portion of the Kuaokala Game Management Area and the Kuaokala Forest Reserve, east of Manini Gulch and a portion of the Mokuleia Forest Reserve west of the paved road leading from Peacock Flats to the Old Radar Station. The Kuaokala Game Management Area is classified as a “Game Production” area under the DOFAW Game Animal Management Classification system. Production of game birds and mammals is a primary objective in this area. No listed threatened or endangered species occur in this hunting area.

WS conducts mammalian predator trapping using cage traps to reduce predation caused by the small Indian mongooses, feral cats, rats, mice and feral dogs to protect and enhance the survival of introduced game bird populations (listed below). Nesting Laysan albatrosses and red-tailed tropicbirds (*Phaethon rubricauda*) may also benefit from the predator control.

Ring-neck Pheasant (*Phasianus colchicus*)
Green Pheasant (*Phasianus colchicus*)
California Valley Quail (*Callipepla californica*)
Japanese Quail (*Coturnix japonica*)
Gambel's Quail (*Callipepla gambelii*)
Erckel's Francolin (*Francolinus erkelii*)
Gray Francolin (*Francolinus pondicerianus*)
Black Francolin (*Francolinus francolinus*)
Chukar (*Alectoris chukar*)
Barred Dove (*Geopelia striata*)
Spotted Dove (*Streptopelia chinensis*)

WS personnel conduct predator trapping operations and consults with the Oahu District Wildlife Manager before using any control technique. The Wildlife Manager determines the acceptability and suitability of each method proposed for use.

1.5.3.1.3. [REDACTED], Ewa, Oahu

WS conducts mammalian predator trapping using cage traps to reduce predation caused by the small Indian mongooses, feral cats, rats, mice and feral dogs to protect and enhance the survival of the endangered Hawaiian stilt population within the [REDACTED] Ewa, Oahu. The work is being conducted pursuant to a Federal Safe Harbor Agreement.

WS provides and maintains live cage traps around the [REDACTED] to capture feral cats and Indian mongooses.

[REDACTED] Predator control is conducted around [REDACTED] and several other water impoundments within the refinery to provide additional foraging habitat. [REDACTED] has committed to monitor the stilts and coots occurring on their property and implement adaptive management strategies, should current management activities appear ineffective. In addition, [REDACTED] conducts an education program for its employees and contractors about the Hawaiian Stilt and Hawaiian Coot at the [REDACTED]. During the state fiscal year 2006, a total of eight stilts fledged at [REDACTED].

1.5.3.1.4. Ukumehame Firing Range, Maui

Ukumehame Firing Range (UFR) is located on the mauka side of the main Honoapi‘ilani Highway. Originally leased to Olowalu Sugar Company, the company cultivated sugar cane on the property from 1870 through 1930, when Pioneer Mill took over the property. Pioneer Mill cultivated sugar cane on the property until 1988, when the state appropriated the property for the range (HIARNG 2006b).

Constructed in 1990, Ukumehame Range consists of six dirt berms demarcating a bull’s eye pistol range, a 600 yard KD range, a 200 yard recreational rifle range, a practical pistol range, a police combat range, a skeet and trap range, and parking lots to accommodate shooters. There are no standing structures on the facility (HIARNG 2006b).

Ukumehame Firing Range is frequented by the endangered Hawaiian black-necked stilt, and the endangered Hawaiian Coot (*Fulica alai*) during the wet season (typically November through March). It is believed that the construction of berms on the firing

range helped create the seasonal wetland, attracting these and other waterbird species to UFR (HIARNG 2006a).

The Hawaiian goose uses UFR year round. A captive release site was located on properties upslope from UFR. With the success of the captive rearing program, the Hawaiian goose's range has expanded to include UFR. At least ten breeding pairs use UFR and the adjacent Maui County Firing Range. In the HIARNG fiscal year 2005, DOFAW biologists documented at least two active nests at UFR. One of these nests failed due to mongoose depredation (HIARNG 2006a). In April, 2000, HIARNG personnel initiated a Section 7 consultation with the USFWS under the Endangered Species Act. The USFWS issued a Biological Opinion in October, 2001 that outlined procedures to protect endangered waterbirds, including the implementation of a predator control program during those times when these birds are most vulnerable (during the wet months and the breeding season) (HIARNG 2006a). WS and HIARNG entered into a cooperative service agreement whereby WS conducts mammal trapping operations at UFR between April and September in accordance with the guidelines set forth in the Section 7 consultation between USFWS and the HIARNG. The purpose of the operation is to reduce predation to enhance the survival of the endangered Hawaiian stilt and Hawaiian goose.

1.5.3.1.5. Kawainui State Wildlife Sanctuary

Kawainui State Wildlife Sanctuary is located on the windward side of the island of Oahu, Hawaii and is managed by the State of Hawaii, Division of Forestry and Wildlife. Kawainui Marsh is the largest remaining freshwater wetland in Hawaii (encompassing 830 acres), situated in the Koolaupoko watershed. It was once part of an extensive system of wetlands, fishponds and agricultural terraces. Kawainui provides critical flood control and sediment filtration for the area and the Kailua Bay ecosystem. The marsh provides habitat for four endangered waterbirds – the Hawaiian stilt, Hawaiian coot, common moorhen, Hawaiian duck and numerous species of migratory shorebirds and waterfowl (DLNR 2005).

1.5.3.1.6. Hamakua Marsh State Wildlife Sanctuary

Hamakua Marsh was designated by Governor's Executive Order as a Hawaii State Wildlife Sanctuary. The project area is located near Kailua, Oahu and covers 22.7 acres. Hamakua Marsh lies downstream from Kawainui Marsh, the largest remaining freshwater wetland in the State. Kawainui Stream, which runs past the project site, was the primary drainage for Kawainui Marsh as it made its way to Kaelepulu Pond and into Kaelepulu Stream, which empties into the ocean. In the early 1960's, the Army Corps of Engineers constructed a flood control levee, which cut off upstream flow from Kawainui Marsh to Kawainui Stream. Once part of an extensive system of wetlands, fishponds and agricultural terraces, Hamakua Marsh is now dependent upon rainfall runoff originating on an adjacent hillside and Coconut Grove, an urban section of Kailua, and salt water backed up in Kawainui Stream from Kailua Bay. Hamakua Marsh State Wildlife

Sanctuary provides nesting, feeding and loafing habitat for native Hawaiian waterbirds, shorebirds and migratory waterfowl.

1.5.3.1.7. Pouhala State Wildlife Sanctuary

Pouhala Marsh is comprised of a remnant fishpond and coastal marsh in the western lagoon of Pearl Harbor, Oahu. Pouhala, at 70 acres, is the largest of the remaining wetland habitats in Pearl Harbor. The Recovery Plan for Hawaiian Waterbirds (US Fish and Wildlife Service, 2005) has identified Pouhala Marsh as a core wetland of critical importance for the recovery of Hawaii's endangered water birds. (DLNR 2006)

Hawaiian stilt numbers on the marsh can exceed 150 birds (10% of the remaining world population). Hawaiian stilts nest in the marsh, but most nests and chicks are lost due to predation by mongooses, dogs and feral cats. Pouhala Marsh also provides feeding and loafing habitat for migratory shorebirds and waterfowl (DLNR 2006)

1.6. 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. The procedures followed included a published legal notice in the Honolulu Advertiser and a notice in the The Environmental Notice, a newsletter of the Hawaii Office of Environmental Quality, and direct mailings to parties that had expressed interest in WS activities at specific sites 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. All public comments will be considered prior to reaching a decision. All members of the public who have expressed an interest in this EA will be notified of the decision.

1.7. 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. Coordination in the development of this EA was made with the HDLNR, HIARNG and USFWS.

1.7.1. AUTHORITY OF FEDERAL AND STATE AGENCIES IN WILDLIFE MANAGEMENT

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

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 USFWS has the responsibility for conserving, protection and enhancing fish, wildlife, plants and their habitats. 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.

1.7.1.2. USDA-APHIS-WS Animal and Plant Health Inspection Service

Wildlife Services is the Federal program 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).

1.7.1.3. State of Hawaii, Department of Land and Natural Resources, Division of Forestry and Wildlife

The Hawaii Department of Land and Natural Resources has responsibility for managing all protected and classified wildlife in Hawaii, including Federally listed threatened and endangered species, on State, private and some Federal lands (Hawaii Revised Statutes (HRS 195D). The HDLNR also has responsibility for the management and enforcement activities required by the Hawaii Endangered Species Act.

1.7.1.4. State of Hawaii, Department of Defense, Hawaii Army National Guard

The Endangered Species Act mandates that the HIARNG responsibly manage any threatened or endangered species that occur on its training areas. Therefore it is the HIARNG's responsibility to monitor and protect any of these species found on its training areas. This is particularly the case at UFR, since the construction of the firing range attracted some of these species to the area.

1.7.2. FEDERAL REGULATORY FRAMEWORK

Several Federal laws 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:

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

NEPA requires that Federal actions be evaluated for environmental impacts, that these impacts be considered by the decision maker(s) prior to implementation, and that the public be informed. This EA has been prepared in compliance with Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR 1500 et seq.), USDA (7 CFR 1b), and the APHIS Implementing Guidelines (7 CFR 372). In accordance with CEQ and USDA regulations, APHIS Guidelines Concerning Implementation of NEPA Procedures, as

published in the Federal Register (44 CFR 50381-50384) provide guidance to APHIS regarding the NEPA process.

1.7.2.2. 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)).

1.7.2.3. 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).

Wildlife Services program provides Federal leadership in helping to solve problems that occur when human activity and wildlife are in conflict with one another.

1.7.2.4. 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 APHIS-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.

1.7.2.5. 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 was 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.

1.7.2.6. 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.

1.7.2.7. 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.

1.7.2.8. 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.

1.7.2.9. 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 would not be expected to have direct or indirect effects on the coastal zone.

1.7.2.10. 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.

1.7.2.11. 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.

1.7.2.12. Facilitation of Hunting Heritage and Wildlife Conservation Executive Order (EO) 13443 August 17, 2007.

EO 13443 directs Federal agencies that have programs and activities that have a measurable effect on public land management, outdoor recreation, and wildlife management, including the Department of the Interior and the Department of Agriculture, to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat.

1.7.3. HAWAII STATE LAWS

1.7.3.1. Hawaii Revised Statutes §195D-5 Conservation Programs

State conservation agencies may enter into agreements with federal agencies, counties, private landowners, and organizations for the administration and management of any area or

facility established under section 195D-21 or 195D-22, or public lands utilized for conserving, managing, enhancing, or protecting indigenous aquatic life, wildlife, land plants, threatened and endangered species, and their habitat.

1.7.3.2. Hawaii Revised Statutes §183D-65 Posting; Destruction of Predators

HRS authorizes the HDLNR to destroy predators deemed harmful to wildlife within any game management area, public hunting area, or forest reserve or other lands under the jurisdiction of the department.

1.7.4 LEGAL STATUS OF TARGET SPECIES

1.7.4.1. Dogs and Cats

Hawaii Revised Statutes Chapter 143 authorizes the county police chiefs to impound and seize cats, dogs and other small domesticated animals. The County or the humane society with whom the County has contracted for services is authorized to seize and impound any dog, cat, or other small domesticated animal, when such dog, cat, or other small domesticated animal is a stray, and to dispose of such dog, cat, or small domesticated animal in accordance with Chapter 143. On private lands, Wildlife Services turns captured dogs over to the county or humane society.

Hawaii Revised Statutes Chapter 183D-65 authorizes the HDLNR to destroy predators deemed harmful to wildlife within any game management area, public hunting area, or forest reserve or other lands under the jurisdiction of the department. On state lands, while under cooperative service agreement with state agencies, Wildlife Services acts as an agent of the state in the disposition of dogs and cats. Where the predators are dogs and the methods of destruction may endanger pets or hunting dogs, all major points of entrance into the area where the predators are to be destroyed is posted with signs indicating that a program of predator destruction in the area is in progress. By statute, any predator may be destroyed in a posted area without claim or penalty whether or not the predator is the property of some person.

1.7.4.2. Small Indian Mongoose

The mongoose is not afforded any protection by either state or federal statutes or rules. They are considered a pest in Hawaii. Hawaii Revised Statute 142-92 prohibits individuals from introducing, keeping or breeding any mongoose within the State except upon and according to the terms of a written permit which may be granted by the department of agriculture, in its discretion, to scientists, scientific institutions, associations, or colleges, or to officers, boards, or commissions of the State or any county. The department cannot issue a permit authorizing the keeping or breeding of mongoose within either the county of Kauai or the island of Lanai.

1.7.4.3. Rats (*Rattus* spp.) and Mice

Three species of rats are found in Hawaii, the Norway rat (*Rattus norvegicus*), black rat (*Rattus rattus*) and the Polynesian rat (*Rattus exulans*). The mouse (*Mus domesticus*) is also present on all the islands. These introduced rodents are not protected by any federal or state statute or rule.

1.7.4.4. Cattle Egret

The cattle egret was introduced to Hawaii by the Territorial Board of Agriculture in 1959 to control flies that plagued cattle. Introductions originated near Homestead Air Force Base in Florida. The introduced cattle egret is protected under the federal Migratory Bird Treaty Act and by the State of Hawaii under HRS Chapter 183D-62. Federal and state permits are required for killing this species.

2. ALTERNATIVES

Through cooperative agreements, WS assists land and natural resource managers in preventing losses of native wildlife and other wildlife with economic or recreational value at wetlands, within Natural Areas Reserves, Game Management Areas and other hunting areas, and private properties. The alternatives considered in detail include technical assistance, and the current integrated wildlife damage management program.

2.1. 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 native wildlife and wildlife with economic or recreational value.

A major goal of the program is to protect endangered species, seabird and game bird populations. 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 introduced mammalian predator management whereby WS personnel conduct wildlife control actions. 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 predator management needs for reducing depredations. Natural Resource 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 environmental or habitat modification, live traps, steel jaw leg hold traps, exclusionary devices, and leg snares. Lethal methods considered by Wildlife Services include American Veterinary Medical Association approved euthanasia techniques, such as CO² gas and shooting.

Predator control 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 to control cattle egrets 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-effective¹ 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.

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. The IWDM Strategies

2.1.1.1 Technical Assistance Recommendations

Wildlife Services personnel may 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 (traps, baits, etc.) and information on exclusion devices and barriers that could reduce predation. The implementation of these 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, however, WS will direct the requestor to the appropriate state or federal regulatory agency. Technical assistance is generally provided following consultation or an on-site visit. When species are protected by the Endangered Species Act, WS would direct the requester to the USFWS for consultation. Generally, several management strategies are described to the requester for short and long-term solutions to problems; these strategies are based on the level of risk, need, and practical application.

2.1.1.2 Operational Predator Management Assistance

Operational predator management assistance is initiated by WS when the problem cannot effectively be resolved through technical assistance, and when Agreements for Control or other comparable documents provide for WS operational assistance. 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 described in this EA. The operational non-lethal and lethal methods that APHIS-WS may use an Integrated Wildlife Damage Management Program are listed below and described briefly. Habitat management, cultural practices, and other methods employed only by resource managers are not included in this list.

Shooting – used with the intent to kill individual animal

Spotlight Shooting - used for nocturnal species such as feral cats

Cage Traps – live traps used as a primary tool for controlling mongoose and feral cats, these animals are then euthanized

Leg Snares - used for feral pig and dog control

Corral Traps – live traps used for feral pig control if there are high numbers

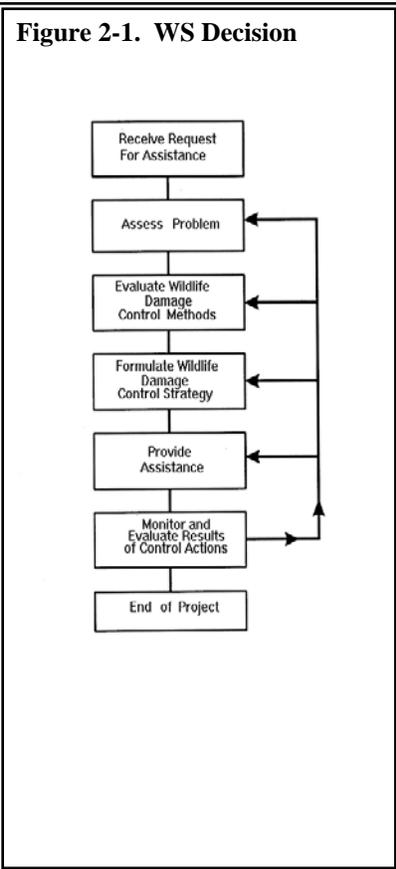
Padded Leghold Traps - used intermittently to capture feral/free-ranging dogs

Snap Traps – kill traps used for rodent assessment and control of small numbers of rodents

Diphacinone – an EPA registered toxicant used for rodent and mongoose control from bait stations. Applicators must possess a commercial pesticides applicator certification from the state of Hawaii.

2.1.2 Wildlife Services Decision Making

The WS Decision Making² process is a procedure for evaluating and responding to damage complaints (Figure 2-1). 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. WS then monitors the take of target and non target species. Monitoring of the effectiveness of the actions would be done by the land/resource management agencies in coordination with WS to determine if the program is benefitting listed species or if changes are needed. The agencies requesting assistance from WS would use the results of monitoring to develop site specific work plans (annually or as needed). 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 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.

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.

Table 3. Minimization Measures

Minimization Measures/SOPs	Alternatives	
	Current Program	Technical Assistance Only
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 wildlife damage management strategies and their impacts.	X	X
Predators 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 and mammals.	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 as much as practicable.	X	
All live traps would be maintained with food and water.	X	
All pesticides used by WS are registered with the EPA and HDOA.	X	
EPA-approved label directions would be followed.	X	
Pesticides would be used only by certified personnel.	X	
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	
Pesticide 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 pesticides are provided to all WS personnel involved with specific rodent damage management activities.	X	
Concerns about Impacts of Damage Management on Target Species, T/E Species, Species of Concern, and Non-target Species		
WS has consulted with the USFWS on all proposed projects and follows all conditions on consultations and permits to avoid unnecessary harm to threatened or endangered species	X	
Management actions would be directed toward localized populations or groups and/or individual offending mammals.	X	
WS personnel are trained and experienced to select the most appropriate methods for removing targeted introduced mammals and excluding non-target species.	X	

TECHNICAL ASSISTANCE ONLY TO RESOURCE MANAGERS

Alternative 2, the Technical Assistance to Natural Resource Managers Alternative would require that upon request, WS would provide assistance in the form of information, demonstrations, and advice on available and appropriate predator control methods. Technical assistance includes demonstrations on the proper use of management devices (i.e., cage traps, shooting) and information on habitat management, and animal behavior modification that could reduce predation. The implementation of these actions is then the responsibility of the requester, as are all environmental compliance procedures including consultation with the USFWS on actions that may affect federally listed species under the Endangered Species Act. 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 natural resource manager. Generally, several management strategies are described to the requester for short and long-term solutions to predation problems; these strategies are based on the level of risk, need, and practical application. Technical assistance has no provisions for direct control actions by Wildlife Services.

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 introduced mammalian predator management.

3.2 Effects on Non-target Species

The analysis will examine the potential non-target impacts from implementing the predator control program. Could it affect other non-target animals such as native species? Could people's pets be harmed by the proposed activities?

3.3. Effects on Threatened and Endangered Species

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

3.4 Issues not considered in detail with rationale

These issues were considered and rejected from detailed analysis in this EA because the findings have not varied in numerous other WS NEPA documents and they have already been determined in USDA (1997, revised).

3.4.1 Irreversible and Irrecoverable 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.

3.4.2 Other Natural Resource Values

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 natural resource managers to improve conditions for desired wildlife species. When WS recommends habitat alterations it may refer managers to other Federal or state 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, as discussed in Section 1.7.2, no issues have been identified relative to bird damage management that is inconsistent with Executive Orders 12898, 13045, 13112, or 13186

3.4.3 Animal Welfare

Animal welfare, humaneness and animal rights have been discussed in several WS EAs and the USDA (1997) EIS. Wildlife Services strives to use the most humane tools available which can accomplish effective predator control to protect seabird colonies, threatened and endangered species and game bird population. In integrated wildlife damage management program, consideration is always given to non-lethal methods as a first resort (W.S. Directive 2.101). Lethal methods are only used when judged necessary to safeguard the resources protected using the WS Decision Model (Slate et al. 1992).

3.4.4 Effectiveness of APHIS-WS Predator Damage Management Methods

The national APHIS-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 conduct introduced predator management 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. personnel are trained in the effective use of each predator control method.

WS believes that it is important to maintain the widest possible selection of predator control methods to effectively resolve introduced predator problems in Hawaii. 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.

Meckstroth and Miles (2005) studied predator control efforts in fragmented habitat within an urban environment in California. The study indicated that the periodic predator control program they evaluated had little impact on reducing certain predators and subsequently did not enhance numbers or success of ground nesting waterbirds. They concluded that only intensive, continuous (rather than periodic) trapping, like the strategy used by Wildlife Services in Hawaii, will have the effect of reducing predation significantly to enhance waterbird populations.

Game bird population dynamics in Hawaii are little understood. Predation on breeding hens, eggs and young may affect game bird recruitment but how predation relates to the overall mortality and reproductive rates which are influenced by environmental events such as rainfall is not well documented.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Introduction

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 Chapter 3 and comparison with the proposed action to determine if the real or potential impacts are greater, lesser, or similar.

4.2 Alternative 1 – Proposed Action: Continue the Current WS Predator Control Program (also called the NEPA “No Action” Alternative).

4.2.1 Effects on Target Species

Table 4-1 to 4-7 provide information on the number of introduced mammal and bird predators WS removed in calendar years 2005-2008 from seven specific project locations. Mammals include feral cats, dogs, mongoose, rats and mice. No cattle egrets were taken during the period to protect seabirds, endangered species and game birds. Population data are not available for mammal species taken but these species are abundant and their populations would not be expected to be adversely affected due to high reproduction and recruitment rates. Population level effects are not expected, but any removals could be considered a potential (if minor) benefit to Hawaii’s ecosystem. Local, mostly temporary impacts may be seen in localized project areas. Continuation of the current program would be likely to produce similar or possibly greater take of target species, however, due to the legal status and relative abundance of these species, increased effects would be considered to be beneficial to the local environment from which individuals are removed.

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Tables 4-1 to 4-8. Tables 4-1 to 4-7 show number of predator species killed to protect seabirds, forest birds, endangered waterbirds and introduced game birds. Table 4-8 shows statewide totals (cumulative take) of predator species killed in all areas on all projects conducted by Wildlife Services, including airports. Other forms of take of mammals are not reported to DLNR and are not known. Cumulative take of cattle egrets was obtained from Wildlife Services Management Information System records.

Table 4-1 Oahu	Feral Cat	Small Indian Mongoose	Feral Dog	Black Rat	Polynesian Rat	Norway Rat	House Mouse	Rats/Mice Mix	Rats Mix	Cattle Egret
2005	50	378		2						
2006	45	302	1		23					
2007	51	268	1	19		1				
2008	6	64		2						

Table 4-2 Kaena Point Oahu	Feral Cat	Small Indian Mongoose	Feral Dog	Black Rat	Polynesian Rat	Norway Rat	House Mouse	Rats/Mice Mix	Rats Mix	Cattle Egret
2005	7	83	2							
2006	9	54			1					
2007	10	62	4		3					
2008	9	69			4					

Table 4-3 Kuaokala Oahu	Feral Cat	Small Indian Mongoose	Feral Dog	Black Rat	Polynesian Rat	Norway Rat	House Mouse	Rats/Mice Mix	Rats Mix	Cattle Egret
2005	51	400	2	6	2					
2006	50	442	1	11	1					
2007	66	406	6	17						
2008	50	394	6	9						

Table 4-4 Ukumehame Maui	Feral Cat	Small Indian Mongoose	Feral Dog	Black Rat	Polynesian Rat	Norway Rat	House Mouse	Rats/Mice Mix	Rats Mix	Cattle Egret
2005	27						310			
2006	1	13		3			124			
2007	4	7		60			171			
2008	10	11								

Table 4-5 Hamakua Marsh, Oahu	Feral Cat	Small Indian Mongoose	Feral Dog	Black Rat	Polynesian Rat	Norway Rat	House Mouse	Rats/Mice Mix	Rats Mix	Cattle Egret
2008	23	190		17						

Table 4-6 Pouhala Marsh, Oahu	Feral Cat	Small Indian Mongoose	Feral Dog	Black Rat	Polynesian Rat	Norway Rat	House Mouse	Rats/Mice Mix	Rats Mix	Cattle Egret
2008	19	446	5	1			2			

Table 4-7 Kawainui Marsh, Oahu	Feral Cat	Small Indian Mongoose	Feral Dog	Black Rat	Polynesian Rat	Norway Rat	House Mouse	Rats/Mice Mix	Rats Mix	Cattle Egret
2008	14	273		1						

Table 4-8 Statewide Cumulative Take	Feral Cat	Small Indian Mongoose	Feral Dog	Black Rat	Polynesian Rat	Norway Rat	House Mouse	Rats/Mice Mix	Rats Mix	Cattle Egret
2005	433	2347	10	31	30	1	490	7		2210
2006	533	1787	5	19	34	73	368		4	3130
2007	448	1917	11	113	37	31	344			1874
2008	414	2312	54	36	22	1	17			2839

4.2.2 Effects on Non-Target Species

Only two gray francolins (*Francolinus pondicerianus*) were killed as non-target species in the project areas over the three year predator control period from 2005 to 2007. Other species were captured but released unharmed including 83 wedged-tailed shearwaters at Kaena Point NAR from 2005 to 2007. Because Wildlife Services uses cage traps that capture the animals alive, the chance of killing a non-target species is low due to the high frequency of trap checks. The effects on non-target species are therefore very limited. This is not likely to change with any expansion of operations into other locales, since the same trapping equipment and methods will be employed. No pets have been captured or killed by the program.

4.2.3 Effects on Threatened and Endangered Species

The Army National Guard has conducted formal consultation for Ukumehame Firing Range on Maui with the USFWS issuing a Biological Opinion on November 22, 2000 (1-2-00-F-06 (DH/EAS)). USFWS determined that predator control at Wildlife Habitat Incentives Program (WHIP) sites in Kawainui Marsh (1-2-2006-I-271, 1-2-2006-I-273) was not likely to adversely affect threatened and endangered waterbirds or their habitat. USFWS further determined that predator control at Puohala Marsh (1-2-2006-I-693) and Hamakua Marsh (1-2-2006-I-705) were not likely to adversely affect federally listed endangered waterbirds. At Puohala Marsh, control of cats and dogs must be conducted only outside the waterbird nesting/breeding seasons. There are several listed plant species at Kaena Point NAR, however most of the populations occur on rocky slopes that are not frequented by WS. Some listed plants may occur on the dunes system but locations have been identified and the areas avoided by WS personnel. Rodent control at Kaena Point NAR is expected to benefit listed plant species. There are no listed species at Kuaokala GMA. A Safe Harbor Agreement

governs WS actions on behalf of [REDACTED]. Operations are not likely to adversely affect the listed waterbirds.

WS conducted Section 7 consultations with the USFWS under ESA to ensure that other site specific program activities were not likely to adversely affect threatened or endangered species (Appendix 1). There are no known instances of death, injury, harm, or harassment as a result of cattle egret control activities and none are anticipated. The USFWS has recognized that a small amount of taking through inadvertent trapping may be unavoidable if predators are to be controlled for the benefit of the species and have established allowances for incidental take. As reasonable and prudent measures, WS will ensure that the chances for incidental take are reduced by inspecting traps on a regular basis and releasing any waterbirds captured. Trapping introduced small mammal predators is expected to benefit endangered waterbirds, the Hawaiian goose and forest birds by removing potential predators of those species.

USFWS has reviewed all existing ESA compliance documentation associated with this proposal and has determined that all current USDA trapping projects proposed in this EA for endangered species protection are covered under existing Section 7 consultations (Aaron Nadig, USFWS pers comm. Jan 22, 2009 email and Jan 28, 2009, telecom).

4.3 Alternative 2 – Technical Assistance to Resource Managers

4.3.1 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 technical advice to resource 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 predator 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. Since predator species are non-native and abundant, the consequences of taking a higher number of individuals would not be expected to affect overall populations.

4.3.2 Effects on Non-Target Species

Wildlife Services would have no effect on non-target species under this alternative. Negative impacts on other species may increase without control actions. Wildlife Services would not affect any native species under this alternative because it would provide no direct management. Wildlife Services would provide technical advice to resource 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.

4.3.3 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 natural resource managers to control predation, 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.

4.4 Monitoring

The USDA Wildlife Services program actively monitors the effects of its programs to determine if the effects fall within projected results. When program environmental effects are substantially different than projected, or if new environmental issues arise, new information becomes available, the regulatory framework changes, or a new reasonable alternative that should be considered is identified, the USDA Wildlife Services may determine that additional NEPA compliance measures are necessary.

4.4.1 Management Information System (MIS).

MIS is a primary record keeping system established by Wildlife Services. The MIS will record the target animals taken, any non-target animals affected, and methods used. Review of the MIS facilitates a determination of whether or not program impacts will fall within levels determined through this EA.

4.4.2 NEPA Monitoring and Review.

It is Wildlife Services policy to review all NEPA documents to determine if they are still valid or if substantial changes warrant additional NEPA compliance. Wildlife Services routinely reports on its findings to the

Federal Decision maker to ensure that NEPA compliance is up-to-date. Decisions from reviews of Wildlife Services' NEPA documents are normally provided to the public every 5 years, and sooner if new information substantially changes the proposed action, issues, alternatives or environmental impact findings.

4.4.3 Adaptive Management:

Any predator control program resulting from this EA would be monitored in three different ways: Monitoring of the effectiveness of the actions would be done by the land/resource management agencies in coordination with WS to determine if the program is benefitting listed species or if changes are needed. The agencies requesting assistance from WS would use the results of monitoring to develop site specific work plans (annually or as needed). Wildlife Services, in collaboration with cooperating agencies will continue to collect information on predation, non-target impacts, and other effects. New information would be considered against the selected alternative to determine if program changes are warranted. Substantial program changes may warrant additional NEPA compliance and public involvement.

4.5 Summary of Environmental Consequences

No statewide effects on target species populations, negative effects on threatened and endangered species, or other native species are expected from implementation of either alternative. Localized and temporary impacts on target species populations can be expected and is desired within project sites.

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Appendix 1 ESA Section 7 Consultations

Reference Number	Project Administrator	Location	Approved Methods/ Summary of Conditions	Endangered Species	Consultation Date	Determination
SHA	██████	██████ Oahu	Live traps, deployed during breeding season	Hawaiian Coot Hawaiian Stilt	April 1, 2002	Not likely to Adversely Affect (NLTAA)
1-2-2006-I-705	Natural Resource Conservation Service, USDA	Hamakua Marsh, Oahu	Live traps, hunting, bait stations. Trapping prior to and during breeding season and until all chicks have fledged, three traps per acre, checked every 48 hours. Bait stations deployed throughout the year or until rat/mongoose population are deemed low to not affect any endangered waterbird. Four stations deployed per acre. Hunting only during non-breeding season.	Hawaiian Stilt Hawaiian Coot Hawaiian Duck Hawaiian Moorhen	Nov 1, 2006	NLTAA
1-2-2006-I-693	Natural Resource Conservation Service, USDA	Pouhala Marsh, Oahu	Live traps, hunting, bait stations, Conditions same as Hamakua Marsh	Hawaiian Stilt Hawaiian Coot Hawaiian Duck Hawaiian Moorhen	Sep 29, 2006	NLTAA
1-2-2006-I-273	Natural Resource Conservation Service, USDA	Kawainui Marsh, Oahu	Live traps, hunting, bait stations, Conditions same as Hamakua Marsh.	Hawaiian Stilt Hawaiian Coot Hawaiian Duck Hawaiian Moorhen	Aug 10, 2006	NLTAA
1-2-00-F-06 (DH/EAS)	Hawaii Army National Guard	Ukumehame Firing Range, Maui	Live traps, bait stations. Actions restricted to wet periods or years when UFR wetlands form, no predator control during dry periods or years. All traps set back from wetland margin, no traps adjacent to wetlands, trap checks daily, traps placed strategically to prevent ingress of predators, traps should be placed in shade or otherwise sheltered in the event nontarget endangered waterbird is captured; captured waterbird should be provided veterinary care as per contingency plan	Hawaiian Goose Hawaiian Coot Hawaiian Stilt		Not likely to jeopardize

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Reference Number	Project Administrator	Location	Approved Methods/ Summary of Conditions	Endangered Species	Consultation Date	Determination
	Division of Forestry and Wildlife	Kaena Point NAR	Live traps, bait stations. Most of the listed plant species occur on slopes or rock faces where predator control activities do not occur. WS personnel have been instructed to avoid disturbing any plant species within the reserve. WS will use a map of all known locations of listed plants and will avoid working near these individuals and populations.	<p>Endangered Plants</p> <p><i>Achyranthes splendens</i> var. <i>rotundata</i></p> <p>'Āwiwi (<i>Centaurium sebaeoides</i>)**</p> <p>'Akoko (<i>Chamaesyce celastroides</i> var. <i>kaenana</i>)**</p> <p>Pu'uka'a (<i>Cyperus trachysanthos</i>)**</p> <p>Ma'o hau hele (<i>Hibiscus brackenridgei</i>)**</p> <p>Kuluī (<i>Nototrichium humile</i>)</p> <p>Carter's panicgrass (<i>Panicum fauriei</i> var. <i>carteri</i>)</p> <p>Dwarf naupaka (<i>Scaevola coriacea</i>)*</p> <p><i>Schiedea kealiae</i>**</p> <p>'Ohai (<i>Sesbania tomentosa</i>)**</p> <p><i>Vigna o-wahuensis</i>**</p> <p>Mammal</p> <p>Hawaiian monk seal (<i>Monachus schauinslandi</i>)*</p>		NLTAA
	Division of Forestry and Wildlife	Kuaokala GMA	Live traps, bait stations.	None		

** = Endangered Species, Ka'ena Point designated as Critical Habitat