



ENVIRONMENTAL ASSESSMENT
WILDLIFE DAMAGE MANAGEMENT TO PROTECT HAWAIIAN
AGRICULTURE

Prepared by:

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1 PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION

This environmental assessment (EA) is prepared pursuant to the National Environmental Policy Act (NEPA). The action proposed is the current program of a cooperative wildlife damage management program in Hawaii to protect the state's agriculture from damage and depredations from wildlife. For the purpose of this EA, agricultural resources and commodities include livestock, crops, orchards, landscaping, nursery and potted plants, poultry, and aquaculture products. The United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services (WS) program is charged to protect agricultural resources from damage or depredations by wildlife. Wildlife Services carries out wildlife control on behalf of cooperating parties.

1.2 NEED FOR ACTION

1.2.1 Overview of Hawaiian Agriculture

Agriculture is Hawaii's third largest source of revenue (\$551 million in 1991), behind tourism and military-related spending. Hawaii agriculture is a rich mixture of agricultural commodities. It continues to make its transition from one dominated by sugarcane and pineapple plantations to more balanced and diversified crops. Macadamia nuts, papayas, cut florals, potted plants and landscaping were important growth areas of Hawaiian agriculture in the late-1980's (U.S. Congress 1993). Produce crops by new farmers on Oahu have taken advantage of the decline in sugar and the close proximity to Honolulu consumers (Bank of Hawaii 1997). Diversified agriculture now accounts for more than half of the total farm value (USDA 1997a).

Agriculture in Hawaii takes place in a wide range of soils and microclimates, ranging from rocky a'a lava where coffee and papayas are grown to rich volcanic soils where onions, potatoes, and many other vegetables are grown. Crops are grown in rain forests to dryland forests, and include high elevation areas favorable for producing cool season crops such as cabbage and strawberries, as well as mild subtropical lowlands where bananas, taro and exotic tropical flowers flourish (USDA 1997a).

In 1995-1996 the macadamia nut crop was estimated at 50 million pounds net, wet-in-shell, with a value of \$37 million. Cut florals, potted plants and landscaping represented \$67.7 million in revenues. According to the last economic census, there were 5,336 farms in Hawaii on 1.6 million acres in 1992. Of these farms 4,752 were less than 50 acres and only 73 were 2,000 acres or more in size (Bank of Hawaii 1996).

The climate and isolation have made Hawaii an ideal location for major seed companies

developing new, improved seed crops (field corn, sunflowers, soybeans, sorghum) for further breeding and distribution on the U.S. mainland prior to commercial distribution (USDA 1997a). Since 1966 all of the major seed companies and most of the corn research institutions in the United States have looked to Hawaii for developing seed corn. The local corn industry has grown to be worth over \$10 million, most of it due to seed corn (Watanabe 1997).

The aquaculture industry in Hawaii has expanded over the past 20 years. In 1976 there were 13 aquafarms generating revenues of \$209,000. In 1996 farm production was valued at \$20 million from 115 farms that raised 30 different plant and animal products including shrimp, snails, pearl oysters, tilapia and various aquarium fishes and plants.

In 1995, there were 800 beef cattle operations in four counties on the islands of Hawaii, [REDACTED] (HASS 1995). The inventory of cattle and calves on Hawaii's ranches totaled 171,000 head on January 1, 1996. The industry generated revenues of \$14.6 million in 1995. The major portion, 74 percent, of the cattle industry is on the island of Hawaii where 700,000 acres were in production. Most of the cattle are exported to mainland U.S., Canada and Mexican market ports as calves.

The growth sector of the livestock industry is small ruminants. There are 22,000 head of sheep and an undetermined, but growing number of meat goats produced in the state of Hawaii (HASS 1995). Poultry operations totaled 55 statewide in 1995, with revenues of \$13.5 million (HASS 1995).

1.2.2 Wildlife Damage to Agriculture

Introduced species of ungulates, rodents and birds are responsible for the depredations and damage to crops in Hawaii. Native wildlife are rarely a problem. Whenever WS receives a request for technical or operational assistance, the value of the commodity lost due to wildlife depredations or damages is provided by the producers. In fiscal year 1996, WS received reports of crop loss due to wildlife depredations at \$60,000. On aquaculture projects losses were reported at \$14,000. Livestock and poultry producers reported losses of \$11,225. There was one incident of wildlife damage to commercial forestry and nursery reported to WS but no dollar value was assessed.

1.2.2.1 Introduced Rodents

Rats (*Rattus* spp.) are the main vertebrate pest for sugarcane and macadamia nut orchards throughout the state.

1.2.2.2 Introduced Ungulates (hooved animals)

Axis deer (*Axis axis*) cause damage to a wide range of crops including pineapple crops on the island of Lanai, produce crops on Maui and corn seed crops on Molokai. Feral pigs (*Sus scrofa*) also forage in a wide range of crops including macadamia nut, pineapple, potato and taro.

1.2.2.3 Introduced Birds

The move to a diversity of crops has resulted in more diversity in the vertebrate pest problems. Introduced red-vented bulbuls (*Pycnonotus cafer bengalensis*) are considered a pest among commercial and hobby farmers of flowers, fruits and vegetable crops (Warshauer 1987). Red-crested cardinals (*Paroaria coronata*), house finches (*Carpodacus mexicanus*), northern cardinals (*Cardinalis cardinalis*) interfere with seedling production of produce crops. Introduced game birds such as the gray francolin (*Francolinus pondicerianus*) and black francolin (*Francolinus francolinus*) forage on newly planted corn seeds. Seed research farms on Kauai, Maui and Molokai, in particular, are impacted greatly by these game birds that pull up newly germinated cultivars of extremely high value. Parrots (*Psittacula krameri* and *Amazona viridigenalis*) are becoming an increasing problem among corn growers. Cattle egrets (*Bubulcus ibis*) impact aquaculture by feeding on prawns. Feral pigeons (*Columba livia*) contaminate the feed of cattle with their droppings which can cause a livestock health problem. Ricebirds (*Lonchura punctulata*) and chestnut mannikins (*Lonchura malacca*) destroyed Hawaii's fledgling sorghum industry in the 1970's and continue to be a problem on other grain crops.

1.2.2.4 Introduced Predators

Feral dogs (*Canis familiaris*) have caused losses in livestock production. Mongoose (*Herpestes auropunctatus*) and feral cats (*Felis catus*) impact poultry operations.

1.2.2.5 Migratory Birds (indigenous)

Black-crowned night herons (*Nycticorax nycticorax hoactli*) impact aquaculture by feeding on prawns and fish.

1.2.2.6 Endangered Species

The federal and state listed endangered common moorhen (*Gallinula chloropus*) caused seasonal depredations to research crops on Kauai.

1.3 CURRENT PROGRAM

1.3.1 General Integrated Pest Management Strategy

The most effective approach to resolving wildlife damage problems is to integrate the use of several methods, either simultaneously or sequentially. Integrated Pest Management (IPM) as used in the WS program, is the integration and application of practical methods of prevention and control to reduce damage by wildlife while minimizing harmful effects of control measures on humans, other species, and the environment. The IPM approach used by the WS program consists of three action approaches: 1) management of the resource being negatively affected, 2) management of the wildlife responsible for, or associated with the damage, or 3) physical separation of the two. Resource management includes alteration of cultural practices such as animal husbandry or crop selection, other habitat modification, and alteration of human behavior. Management of the wildlife includes behavior alteration through harassment or scaring and population manipulation through translocation or lethal removal. Physical separation may consist of fencing, netting, or other barriers.

Selection of the appropriate approach and method is the result of applying the standard WS decision making process. The WS Decision Model (USDA 1997c) is a version of the general professional action model and is applied to all WS operations. The problem is first identified, then a determination is made if the assistance requested is within existing authorities and abilities. Impacts of the problem are considered, and an assessment is made of the actions potentially applicable to the particular situation. This is followed by selection and implementation of those methods or approaches most appropriate. This process concludes with an assessment of the effectiveness of the actions to determine if additional treatment is required.

1.3.2 Interagency Coordination

Resident wildlife species are under the management authority of the State of Hawaii Department of Land and Natural Resources. WS is issued a Protected Wildlife Permit from HDLNR each year, which specifies the species, locations and methods approved to conduct wildlife damage control operations. Terms of the permit are negotiated with HDLNR. Additionally, WS may request a Wildlife Control Permit from a district biologist of HDLNR for specific projects on each island. Monthly reports of animals taken under each permit are submitted to HDLNR.

1.3.3 Wildlife Services Program in Hawaii

The current WS program to protect agriculture in the State of Hawaii is described using active and inactive WS projects that have addressed the control of wildlife damage to agricultural commodities and resources. Targeted wildlife species are named specifically

but the analyses is intended to examine WS projects as they relate to major groups of wildlife in Hawaii as categorized in section 1.2.2 of this EA. Each project is individually funded by the producer or requester. Due to the temporary nature of some wildlife problems, WS operations to protect agricultural resources and commodities are usually short-term. They are inactive as soon as the problem is resolved. The on-going active projects address mainly seasonal recurring problems.

1.3.3.1 Active Projects

Wildlife Services currently provides wildlife damage control assistance to protect agriculture on [REDACTED]. The total acreage involved is [REDACTED] acres on private, state and federal lands (Table 1). The protection of seed research crops from bird depredations on [REDACTED] and [REDACTED] is the largest agricultural related activity of WS. Lethal control using shotguns is the predominant method to control black and gray francolin on [REDACTED]. These game birds are also trapped live and given to the Hawaii Division of Forestry and Wildlife for eventual release in hunting areas. The operations are seasonal, on [REDACTED], operations are conducted from August to February. The main methods for controlling depredations to corn, sunflower, and other experimental seed crops on [REDACTED] from parrots, jungle fowl, pigeons, francolins, pheasants and other introduced species of birds are shooting and vehicle harassment. On [REDACTED] the operations are conducted from August to January and again from April to May.

At [REDACTED], on [REDACTED] the [REDACTED] has [REDACTED] acres under taro cultivation. Feral pigs will occasionally up-root the taro. At the request of the [REDACTED], WS controls pig damage by shooting, snaring or trapping. Activities conducted by WS for [REDACTED] are categorically excluded from NEPA analysis by [REDACTED] procedures, but are included in our analysis to portray cumulative impacts. Feral pigs also caused damages to pineapple crops on [REDACTED]. Leg snares have been employed to remove the pigs. Shooting and snaring are the primary methods to control feral pig depredations to experimental crops at an experimental farm on the island of [REDACTED].

Table 1. Active WS agriculture damage control projects in the state of Hawaii (USDA 1997b)

Farm Type	Island	Acres	Commodity or Resource	Depredating Wildlife	Methods
Seed Research Farm	██████	██	Corn seed research	deer, birds	shotgun
Seed Company	██████	██	Sunflower, corn seed research	pigs, birds	shotgun
██████████████████	██████	██	Taro	pigs	snares, traps
Experimental Farm	██████	█	Various experimental crops	pigs	snares
Pineapple Plantation	██████	██	Pineapple	pigs	snares
Experimental Farm	██████	██	Various experimental crops	birds	shotgun

1.3.3.2 Inactive Projects

The following projects (Table 2) were conducted and completed by WS prior to this analysis. They represent additional types of projects that may be carried out by WS to protect agriculture on various islands.

WS provided operational assistance in the form of setting leghold traps, snares, and shooting to remove the dogs that killed sheep. Common mynas were shot with shotguns, and hazed using pyrotechnics and mylar flash tape to protect grapes at a vineyard.

Throughout the homestead farm lots in ████████, Molokai, feral dogs were killed by shooting, trapping and snaring to protect livestock including cattle, goats, chickens and horses. Introduced birds such as red-crested cardinals, house finches, zebra doves, spotted doves, and house sparrows were shot, trapped and hazed to protect watermelon seedlings at one of the state’s largest produce farms.

The endangered moorhen and introduced birds caused depredations to research crops including corn and sunflowers at a seed company on the island of ██████. After consultation with the FWS, WS used propane cannons, pyrotechnics and temporary fences to reduce depredations by the endangered moorhen. Feral pigeons were shot at a dairy on ██████ to prevent fecal contamination of cattle feed.

At an aquafarm in ██████████, WS conducted control operations on black-

crowned night herons to protect aquaculture production. The methods used were shooting and constructing net barriers. Cattle egrets were shot to control damage to produce crops. Cattle egrets were shot to control depredations to a number of vegetable crops at a produce farm in [REDACTED]. Doves were shot and mylar flash tape installed to protect seed research.

Table 2. Inactive WS agriculture damage control projects in the state of Hawaii (USDA 1997b)

Farm Type	Island	Acres	Commodity or Resource	Depredating Wildlife	Method
Homesteads	[REDACTED]	[REDACTED]	cattle, sheep, goats, chickens	feral dogs	Shooting, snares, leghold traps, padded jaw traps
Produce Farm	[REDACTED]	[REDACTED]	watermelon, produce	introduced birds	shoot, haze
[REDACTED]	[REDACTED]	[REDACTED]	cattle, sheep, goats, chickens	feral dogs	shooting, snares, leghold traps, padded jaw trap
Vineyard	[REDACTED]	[REDACTED]	grapes	introduced birds	shoot, haze, propane cannon, mylar flash tape
Ranch	[REDACTED]	[REDACTED]	livestock	feral dogs	shooting, snares, leghold traps, padded jaw traps
Dairy	[REDACTED]	[REDACTED]	cattle feed	pigeon	shoot, haze
Seed Company	[REDACTED]	[REDACTED]	corn, sunflower, seed research crops	endangered moorhen, introduced birds	shoot (non endangered birds), haze, propane cannon, --mylar flash tape
Experimental Farm	[REDACTED]	[REDACTED]	research crops	cattle egrets	shoot
Aquafarm	[REDACTED]	[REDACTED]	prawns, fish	black-crowned night heron, cattle egret	shoot, haze
Produce Farm	[REDACTED]	[REDACTED]	Vegetable produce	cattle egrets	shotgun

1.3.4 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. Hawaii Department of Agriculture (HDOA), Hawaii Department of Land and Natural Resources (DLNR) and FWS have had input throughout the EA preparation to ensure that there is an interdisciplinary approach to complying with NEPA, agency mandates, policies or

regulations.

The decisions to be made are:

- Should the wildlife damage control program to protect agriculture commodities as currently implemented be continued in the state (the no action alternative)?
- Should it cease?
- Should it be implemented in an expanded format in the state?
- Would there be any significant impact on the environment?

1.3.5 Scope of this Environmental Assessment Analysis

This EA is tiered to the WS programmatic Environmental Impact Statement (USDA 1997c). This EA analyzes the proposed action and alternatives of WS providing operational assistance to control wildlife damage to agricultural commodities and resources including crops, livestock, poultry and aquaculture in the state of Hawaii. The analysis includes active projects and those projects that are completed but are considered inactive and expected to resume due to the temporary nature of wildlife damage problems. WS may also enter into new agreements that fall within the scope of actions covered by this analysis. The analysis does not include research conducted by WS in Hawaii to develop methods to protect sugarcane, macadamia nuts and other crops from rat damage; some of these activities are categorically excluded under APHIS NEPA Implementing Procedure (7 CFR Part 372.5(c)2(i)).

1.3.5.1 Period for which this EA is Valid

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 will be supplemented pursuant to NEPA. Review of the EA will be conducted annually to ensure the EA is sufficient.

1.3.5.2 Site Specificity

This EA addresses all lands under past and present Cooperative Service Agreements in the state. WS may also enter into new agreements within the scope of actions covered by this analysis. This EA emphasizes issues as they relate to specific areas whenever possible; however, many issues apply wherever wildlife damage and resulting management occur, and are treated as such. The standard WS Decision Model (USDA 1997c) and WS Directive 2.201 will be the site-specific procedure for NEPA compliance for individual actions conducted by WS in the state. Many site-specific actions may be

categorically excluded from further NEPA documentation by APHIS NEPA implementing regulations.

1.3.5.3 Actions Analyzed

This EA evaluates active and inactive projects as the types of actions that prevent or control wildlife damage to livestock, poultry, aquaculture and crops on the islands of Kauai, Oahu, Molokai, Maui, and Hawaii from feral dogs, cats, pigs, axis deer, introduced birds, rodents, mongoose, native water birds such as black-crowned night heron and the endangered moorhen.

1.4 AUTHORITY AND COMPLIANCE

1.4.1 WS Legislative Authority

The primary statutory authority for the WS program is the Animal Damage Control Act of 1931 as amended, (7 U.S.C. 426-426c; 46 STAT. 1468) which provides that:

“The Secretary of Agriculture is authorized and directed to conduct such investigations, experiments, and tests as he may deem necessary in order to determine, demonstrate, and promulgate the best methods of eradication, suppression, or bringing under control on...State, Territory or privately owned lands...brown tree snakes and other animals injurious to agriculture, horticulture, forestry, animal husbandry, wild game animals, furbearing animals, and birds...”

In 1988, Congress strengthened the legislative mandate of WS with the Rural Development, Agriculture, and Related Agencies Appropriations Act (Public Law 100- 202, Dec. 22, 1987, STAT. 2329-1331 (7 U.S.C. 426c)) which authorizes the Secretary of Agriculture to enter into agreements to control nuisance mammals and birds.

1.4.2 Compliance with Federal Law

1.4.2.1 National Environmental Policy Act

NEPA requires that federal Agencies consider the impacts of their decisions on the environment. This document follows Animal and Plant Health Inspection Service Implementing Procedures for the National Environmental Policy Act.

1.4.2.2 Endangered Species Act (ESA)

It is WS (WS Directive 2.310) and Federal policy, under the ESA, that all Federal

agencies shall seek to conserve threatened and endangered (T&E) species and shall utilize their authorities in furtherance of the purposes of the Act (Sec. 2(c)). WS conducts Section 7 consultations with the FWS to utilize the expertise of the FWS 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...” (Sec. 7(a)(2)).

1.4.2.3 Migratory Bird Treaty Act

The Migratory Bird Treaty Act provides the FWS regulatory authority to protect birds that migrate. WS informs FWS of activities to conduct control operations on Migratory Birds.

1.4.2.4 Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

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 chemicals used or recommended by the WS program in Hawaii are registered with and regulated by both the Federal EPA and DOA. WS uses the chemicals according to labeling procedures and requirements as regulated by the EPA and DOA (WS Directive 2.401).

1.4.2.5 National Historic Preservation Act (NHPA) of 1966 as amended

The NHPA requires: 1) Federal agencies to evaluate the effects of any Federal undertaking on cultural resources, 2) consult with the State Historic Preservation Office regarding the value and management of specific cultural, archaeological and historic resources.

1.4.2.6 Environmental Justice

Executive Order 12898 requires Federal agencies to make Environmental Justice part of their mission, and to identify and address disproportionately high and adverse human health and environmental effects of Federal programs, policies and activities on minority and low-income persons or populations.

1.5 ISSUES

The issues that have been identified as important to this analysis are:

Issue 1: The effectiveness of the WS operations to protect agricultural commodities and

- resources.
- Issue 2: Impacts on federal and state listed threatened and endangered animals and plants and those proposed for listing.
- Issue 3: Impacts on migratory birds.
- Issue 4: Humaneness of techniques.
- Issue 5: Impacts on target/nontarget species.

2 ALTERNATIVES

2.1 DESCRIPTION OF ALTERNATIVES

2.1.1 Alternative 1 - Current Program (No Action)

The No Action alternative is a procedural NEPA requirement (40 CFR 1502.14(d)), it is a viable alternative that could be selected, and serves as a baseline for comparison with other alternatives. This alternative embraces the current program as described in Section 1.3 of this document and includes both active and inactive projects. WS may enter into new agreements but the program would be similar. The No Action Alternative, as defined here, is consistent with the Council on Environmental Quality (CEQ) definition (CEQ 1981).

2.1.2 Alternative 2 - No WS Operational Program - Technical Assistance Only

This alternative would terminate the WS program to control depredations on agricultural commodities within the State of Hawaii but would allow WS to provide technical assistance and make recommendations when requested. Examples of technical assistance may include providing training on bird and animal damage identification and demonstrations on how to use various scare techniques. Under this alternative, the producer could carry out the control work under permit by the U.S. Fish and Wildlife Service, if migratory birds were involved, and the Hawaii Department of Land and Natural Resources if any other bird were involved.

2.1.3 Alternative 3 - Non-Lethal Before Lethal Control Program

The Non-Lethal Before Lethal Control Program alternative would require the use of all practical nonlethal methods prior to WS recommending or using lethal controls to resolve wildlife damage problems.

2.1.4 Alternative 4 - Use of Public Hunting before Lethal Control

The Use of Public Hunting before Lethal Control would require WS to determine if public hunting is a suitable remedy prior to WS recommending or using lethal controls to resolve

wildlife damage problems. Under this alternative, operational wildlife damage management would be replaced by a public hunting program.

2.1.5 Alternative 5 - Expanded WS Program to Protect Agriculture Commodities

The expanded program would include all aspects of the current program with the addition of staff and inclusion of operations to more effectively serve the future needs of producers on all the islands. Control methods would be similar but operations would be expanded to other properties. The expansion of the current WS program would be dependent upon the need of such services and funding support by the producers or other agencies.

3 ENVIRONMENTAL CONSEQUENCES

This section analyzes the environmental consequences using Alternative 1 (the current program) as the baseline for comparison with the other alternatives to determine if the real or potential impacts are greater, lesser, or the same.

The following resources within the state of Hawaii would not be significantly impacted by any of the alternatives analyzed: soils, geology, minerals, water quality/quantity, wetlands, visual resources, air quality, aquatic resources, and historical sites. Impacts on these resources will not be analyzed further.

3.1 ENVIRONMENTAL JUSTICE

This action would be in compliance with Executive Order 12898 to ensure Environmental Justice. It is not anticipated that the proposed action would result in any adverse or disproportionate environmental impacts on minority and low-income persons or populations.

3.2 CUMULATIVE AND UNAVOIDABLE IMPACTS

This EA recognizes that the total annual removal of individuals from wildlife populations by all causes is the cumulative mortality. The WS operational program to protect agricultural commodities and resources statewide is not likely to result in any significant adverse cumulative impacts on target and nontarget animals (including threatened and endangered species). The removal of individuals from a wildlife population, to prevent damage to agriculture does not adversely affect the population. Generally the reason that a wildlife species becomes a pest is due to high inherent reproductive and adaptive capabilities. The recruitment and a species ability to shift to other food resources ensures the population survival, and minimizes the effects of the annual removal of individuals to protect crops and livestock.

3.3 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The WS operational program to protect agricultural resources statewide will require minor commitments of fossil fuels and electrical energy for motor vehicles, office support, and propane cannons. These uses will produce negligible impacts on the supply of fossil fuels and electrical energy.

3.4 ISSUES ANALYZED IN DETAIL

3.4.1 Alternative 1 - Continue the Current Program (No Action)

3.4.1.1 Issue 1 - Effectiveness

The current program satisfies the immediate need to reduce or eliminate economic losses from wildlife and is considered to be effective. Wildlife damage to crops and aquaculture is difficult to assess. Conversely, efficacy is equally difficult to determine. Often the reduction or elimination of the wildlife causing the problem and subsequent subjective observation of a decline in damage is sufficient evidence that the operation was successful. Determining the presence or absence of damage to livestock is a reliable way of assessing effectiveness of wildlife control operations in livestock production. WS program personnel are experienced in controlling animals, the requester pays directly for the services. There are no measurements available to quantify the effectiveness of the program, only testimonies from producers or requestors, and the annual renewal of cooperative agreements which generally indicate that the requestor was satisfied with the results of the operation.

3.4.1.2 Issue 2 - Impacts on threatened and endangered species.

Only two endangered species and no threatened species have been encountered in WS operations to protect agriculture. The federally listed common moorhen, along with introduced birds such as pheasants, jungle fowl, spotted and zebra doves, and cardinals were implicated in pulling seedlings of corn and other crops at [REDACTED], Kauai. WS used selective shooting of the introduced birds as well as hazing techniques (propane exploders and mylar flash tape), and temporary fencing to keep the birds from the seedlings. Because the hazing affected the moorhens, a Section 7 consultation was initiated with the FWS (November 16, 1992). The FWS stated that while a few moorhens would be scared off from the crops, the crop seedlings made up only a very small part of their diet; the nutrition from the seedlings would be expected to be insignificant to the moorhen's overall health; the period when seedlings required protection, (winter months) did not include the moorhen's sensitive breeding season (spring and summer). It was their conclusion that WS operations to protect the crops would not negatively affect the moorhen.

Nene have been observed on fields near [REDACTED] [REDACTED] by WS in control operations to

protect seed corn from introduced birds. The nene do not cause any damage, but during control operations to move introduced birds, the nene may be disturbed from the fields and fly to an adjacent resort development or █████ Airport. WS has initiated informal Section 7 consultation with the FWS. The FWS concurred that the proposed action does not adversely affect the population of nene or other endangered species (FWS 1998).

If WS activities under new agreements could affect any other listed species, it would first consult with the FWS and/or DLNR to ensure that program activities would be in compliance with provisions of the Endangered Species Act.

3.4.1.3 Issue 3 - Impacts on Migratory Birds

The take of migratory birds by WS to control damage to agriculture is minimal, therefore, does not significantly impact populations on any of the islands. A total of 157 introduced cattle egrets were shot at a produce farm in █████, Oahu after the birds were found to damage vegetables in 1997. From fiscal year (October 1 to September 30) 1991 to 1996, no other cattle egrets were taken to protect agricultural commodities. In WS operations at airports during this same time period, an average of 3,255 cattle egrets per year were shot to reduce the threat of a life-threatening bird/aircraft collision. This take is not considered a significant impact since, the cattle egret population, with a high reproductive rate, still remains stable, and makes up part of the invasive introduced species assemblage in the islands that generally has been detrimental to native biota.

One native migratory bird, the black-crowned night heron, preys on aquaculture commodities. Black-crowned night herons have been removed from aquafarms, but the numbers were not significant. From fiscal years 1991 to 1996, a total of five black-crowned night herons were killed by WS operations to protect aquaculture commodities. This is an average of 0.83 birds per year.

3.4.1.4 Issue 4 - Humaneness of Techniques

The issue of humaneness, as it relates to the killing or capturing of wildlife is an important but very complex concept that can be interpreted in a variety of ways. Humaneness is a person's perception of harm or pain inflicted on an animal, and people may perceive the humaneness of an action differently. Some individuals and groups are opposed to some of the management actions of WS, especially lethal methods. However, it is concluded that the most effective and expeditious methods must be used to handle wildlife conflicts. WS personnel are experienced and professional in their use of management methods so that they are as humane as possible. Traps and snares are checked regularly, usually within 48 to 72 hours. In most cases where capture is required, leg snares are used, this is a non-lethal and humane way of capture.

3.4.1.5 Issue 5 - Impacts on Target and Non-Target Species

The impact of the program on target and non-target species during a typical 1- year period is listed in Table 3. These numbers are not significant on the overall population of any of the introduced species because of the high reproductive and recruitment rates.

3.4.2 Alternative 2 - No Federal WS Operational Program - Technical Assistance Only

Under this alternative, operational wildlife damage management would be conducted by the producer or his agent. WS would provide the technical assistance to support the producer or a third party if requested. This alternative retains all elements of the Current Program Alternative, but the work would be conducted by different people. The effectiveness of the alternative would be the same as the Current Program Alternative if methods and control devices are applied by personnel with the same technical expertise and professional oversight capabilities as the WS program. This may not always be possible for a producer. This may result in higher environmental costs to achieve protection of agriculture and livestock if done by the producer or his agent. The impacts to migratory birds, target and non-target species and the issue of humaneness would be similar to those of the Current Program Alternative. WS employs wildlife biologists to manage the program. WS as a federal agency is also subject to the Government Performance and Results Act of 1993, which requires that federal agencies establish standards measuring their performance and effectiveness. The GPRA is another mechanism whereby WS is held accountable to maintain an effective program. Under Section 7 of the Endangered Species Act, federal agencies, such as WS, must consult with the FWS if any proposed actions will impact threatened and endangered species.

Table 3. Impacts on Target/Non Target Species: The number of wildlife killed, freed, and dispersed as a result of WS agriculture damage control operations in Hawaii in calendar year 1996.

Island	Farm Type	Target/Non Target	Killed	Freed	Dispersed
■	Pineapple Farm	Feral Hogs	5		
■	Research Farm	Spotted Dove Zebra Dove	60 40		
■	Produce	Red crested Cardinal Zebra Dove			7 10

█	Corn Seed Farm	Red crested Cardinal	144		
		Spotted Dove	153		106
		Zebra Dove			280
		Black Francolin	288	16	3
		Gray Francolin	379	40	1
		Feral Pigeons	8		
		Erkels Francolin (non target)	8		
█	Seed Research	Feral Dogs	1	1	
		Spotted Dove	307		12006
		Zebra Dove	97		7797
		Cattle Egret	122		767
		House Finch	2		3714
		Erkels Francolin	4		12
		Jungle Fowl	261		1333
		Common Myna	30		2527
		Ring necked Pheasant	18		62
		Feral Pigeons	37		263
		English Sparrows	24		5371
█	Taro Farms	Feral Hog	4		
█	Experimental Farm	Feral Hog	2	12	

3.4.3 Alternative 3 - Non-Lethal Before Lethal Control Program

The Hawaii Department of Land and Natural Resources indicated that shooting of native species should only be considered after non-lethal methods have been attempted and found to be unsuccessful (DLNR 1998). The Non-Lethal Before Lethal Control Program is a modification of the present WS program that would require the use of all practical nonlethal methods prior to WS recommending or using lethal controls to resolve wildlife damage problems. Ultimately, both nonlethal and lethal controls would be used under a modified Integrated Pest Management program. The impacts of this alternative on native species would be similar to those described under the Current Program Alternative.

The process of using nonlethal methods before lethal methods tends to be counter intuitive to some service recipients. Often the service recipient needs the immediate problem solved while nonlethal methods are established as part of a long-term solution. In some cases, not only would lethal before nonlethal be more efficient, it could also increase the chance of the successful implementation of nonlethal techniques.

Since damage losses and the costs of implementing the Nonlethal Before Lethal Control

Program Alternative generally fall on resource owners, many resource owners may believe that they can not afford the cost of this alternative and might act on their own using lethal methods. The impacts to threatened and endangered species, migratory birds, target and non-target species and the issue of humaneness as a result of actions taken by individuals attempting to resolve their own wildlife damage problems are discussed in the second alternative - No Federal WS Operational Program and the Current Program alternative.

3.4.4 Alternative 4 - Use of Public Hunting before Lethal Control

The Hawaii Department of Land and Natural Resources indicated that the control of game animals on private lands should be conducted after it has been determined that public hunting is not a reasonable or appropriate method of control (DLNR 1998). The Use of Public Hunting before Lethal Control is a modification of the present WS program that would require WS to determine if public hunting is a suitable remedy prior to WS recommending or using lethal controls to resolve wildlife damage problems. Under this alternative, operational wildlife damage management would be replaced by a public hunting program. Public hunting would not resolve wildlife damage problems that tend to be specific to a particular wildlife species, season, crop, and property. As in the discussion regarding the use of non-lethal methods before lethal methods, often the service recipient needs the immediate problem resolved while methods such as the establishment of a public hunting area to control wildlife populations are not focused on controlling the actual damage situation.

The suitability of a private property for public hunting use can only be determined by the private property owner. Public hunting if made part of a regional IPM program in situations where harvests may alleviate wildlife damage problems may still require specific operational wildlife damage control actions.

Using public hunting to control wildlife damage on private property where migratory birds and endangered species exist, may be detrimental to those species if hunting participants are not carefully controlled. Non-target take may also increase. Target take would increase since the objective is not to control specific damages but to harvest the population. Crippling of wildlife would increase in a public hunting program.

3.4.5 Alternative 5 - Expanded Program

Under an expanded program, operations would extend to control wildlife damage to crops not previously protected and aquaculture and livestock on properties not previously worked on. The expansion is dependent on requests and funding from producers. It may require more staff. The impacts and analysis of issues are the same as Alternative 1 (Current Program).

4 CONCLUSION

The action proposed by this environmental assessment is the current program alternative which would allow the types of operations described as active and inactive projects to protect agriculture resources and commodities described on each of the islands of Kauai, Oahu, Molokai, Maui and Hawaii.

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8 APPENDIX

DECISION
AND
FINDING OF NO SIGNIFICANT IMPACT
FOR WILDLIFE DAMAGE MANAGEMENT
TO PROTECT HAWAIIAN AGRICULTURE
ENVIRONMENTAL ASSESSMENT

I. INTRODUCTION

Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS - formerly Animal Damage Control), has prepared an environmental assessment (EA) that analyzes alternatives for a wildlife damage management program to protect Hawaii's agriculture from damage and depredations from wildlife. The EA incorporates by reference the findings of the Animal Damage Control (ADC) Programmatic Environmental Impact Statement (EIS). This EA is tiered to the EIS.

Introduced species of ungulates, rodents, and birds are responsible for the depredations and damage to agriculture in Hawaii. WS provides assistance to a variety of agriculture producers to reduce losses through an integrated pest management approach. WS maintains active operations to control wildlife damage on approximately ■ acres of lands in the State of Hawaii. WS actions have been applied to another ■ acres of agricultural lands on projects that are considered currently inactive. Whenever WS receives a request for technical or operational assistance, the value of the commodity lost due to wildlife depredations or damages is provided by the producers. In fiscal year 1996, WS received reports of crop loss due to wildlife depredations at \$60,000. On aquaculture projects losses were reported at \$14,000. Livestock and poultry producers reported losses of \$11,225.

Wildlife Services is the Federal Government agency authorized to manage wildlife that create human health and safety hazards or damage property. The agency's authority comes from the Animal Damage Control Act of March 2, 1931, as amended, and pursuant to the Rural Development, Agriculture, and Related Agencies Appropriations Act of 1988. WS cooperates with individual producers to control wildlife damages and depredations to agriculture.

The Hawaii Department of Land and Natural Resources (HDLNR) permits WS to take bird species when necessary to protect agriculture resources. WS keeps the US Fish and Wildlife Service (USFWS) informed of wildlife damage management activities, and complies with Section 7 requirements of the Endangered Species Act.

The USFWS, HDLNR, Hawaii Department of Agriculture and the State Historic Preservation Officer cooperated with WS to determine whether or not WS activities were in compliance with relevant laws, regulations, policies, orders and procedures.

This analysis examined the environmental consequences and compares alternative methods of addressing proposed wildlife management in the State of Hawaii. The analysis and supporting documentation are available for review from WS (720 O'Leary St. S.W., Olympia, WA 98502).

II. DECISION AND RATIONALE

I have carefully reviewed the EA and the input resulting from the interagency and public involvement process. I believe that the issues identified in the analysis are best addressed by selecting Alternative 1 - Continue the Current Program.

Alternative 1 is the preferred alternative. It best addresses all issues identified in the EA and provides the environmental safeguards that address concerns about the human environment. Alternative 1 is reasonable and fully compatible with agreements between WS and its cooperators. It provides a service to the public with no significant adverse effects on the environment. All wildlife damage management will be conducted in a manner consistent with the Endangered Species Act of 1973 and an informal consultation that has been completed with the USFWS.

III. PUBLIC INVOLVEMENT

A number of local organizations and individuals were notified of the availability of the Predecisional Environmental Assessment. In addition, a formal notice as published on June 10, 1998 in the Honolulu Advertiser newspaper on Oahu to solicit comments on the draft. No comments were received from this public input process.

Public input into WS is achieved on the national level through the National Animal Damage Control Advisory Committee (NADCAC) made up of 20 individuals representing agricultural, wildlife management, animal welfare, and public health interests. Committee members serve a 2-year term, and can be on the committee for three consecutive 2-year terms. NADCAC meets annually, usually in the Washington, D.C. area. Notices are published in the Federal Register announcing solicitations for membership and announcing meeting dates and locations. NADCAC was authorized in 1986, and is one method that WS uses to obtain public input into the program.

WS went beyond the minimum requirements for public notice (APHIS Implementing Procedures 7 CFR 372.8(b)(3)) by soliciting public input at the predecisional stage. The documentation on the public involvement effort is available for public review.

IV. MAJOR ISSUES

The following issues were identified as being important to the scope of the analysis (40 CFR 1508.25): effectiveness of the WS operations to protect agricultural commodities and resources, impacts on federally listed threatened and endangered species, impacts on migratory birds, humaneness of techniques, and impacts to target and nontarget species.

V. ALTERNATIVES

The following five alternatives were developed to respond to the above issues. A summary of the effects of the alternatives is contained in the EA.

I reached my decision based on the following review of the alternatives developed from the EA.

Alternative 1 - Current Program (No Action) - The No Action alternative is a procedural NEPA requirement (40 CFR 1502.1(d)), it is a viable alternative that was selected and served as the baseline for comparing the other alternatives. This alternative embraces the current program as described in Section 1.3 of the PEA and includes both active and inactive projects. WS may enter into new agreements but the program would not change. The No Action alternative, as defined here is consistent with the Council on Environmental Quality (CEQ) definition.

Alternative 2 - No WS Operational Program - Technical Assistance Only - This alternative would terminate the WS program to control depredations on agricultural commodities within the State of Hawaii but would allow WS to provide technical assistance and make recommendations when requested. Examples of technical assistance may include providing training and demonstrations of how to use various scare techniques to disperse wildlife and wildlife damage identification. Under this alternative the producer could carry out the control work under permit by the USFWS, if migratory birds were involved, and the HDLNR if any other bird was involved. This alternative was not selected because it would limit WS involvement in any wildlife damage problem and reduce the level of expertise and accountability to successfully alleviate the problem and address society's concerns.

Alternative 3 - Non-Lethal Before Lethal Control Program - The Non-Lethal Before Lethal Control Program alternative would require the use of all practical non-lethal methods prior to WS recommending or using lethal controls to resolve wildlife damage problems involving native species. This alternative was not selected since lethal methods on native species serve to reinforce non-lethal methods making the latter more effective. If native species populations are not threatened by an occasional lethal take, there is no scientific justification for restricting that take in order to achieve maximum control efficacy.

Alternative 4 - Use of Public Hunting Before Lethal Control - The Use of Public Hunting Before Lethal Control would require WS to determine if public hunting is a suitable remedy prior to WS recommending the use of lethal control to resolve wildlife damage problems. Under this alternative, operational wildlife damage management would be replaced by a public hunting program. This alternative was not selected. Only the private land owner can determine whether public hunting is suitable on his property. Proper hunting programs have no net effect on the game populations and hunting pressure is not directed at offending individuals. Damage could still occur within a public hunting area.

Alternative 5 - Expanded WS Program to Protect Agricultural Commodities - The expanded program would include all aspects of the current program with the addition of staff and inclusion of operations to more effectively serve the future needs of producers on all the islands. Control methods would be similar but operations would be expanded to other properties. This alternative was not selected since the expansion of the current WS program would be dependent upon the need of such services and funding support by the producers or other agencies.

FINDING OF NO SIGNIFICANT IMPACT

The EA indicates that there will not be a significant impact on the quality of the human environment as a result of the proposed action. I agree with this conclusion, and therefore, determine that an Environmental Impact Statement (EIS) will not be prepared. This determination is based on consideration of the following factors which are addressed in the PEA:

1. The proposed activities will not significantly affect public health and safety.
2. The proposed activities will not have an impact on unique characteristics of the geographical areas such as historical or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
3. The effects on the human environment of the proposed activities are not highly controversial.
4. The effects of the proposed activities are not highly uncertain and do not involve unique or unknown risks.
5. The proposed activities do not establish a precedent for future actions.
6. There are no significant cumulative effects identified by this assessment.
7. The proposed activities do not affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or will cause a loss or destruction of significant scientific, cultural, or historical resources, including interference with native Hawaiian traditional uses or sacred sites.
8. The proposed activities will fully comply with the Endangered Species Act of 1973, as amended. An informal Section 7 consultation for the proposed activities has been completed.
9. The proposed activities will not threaten a violation of Federal, State or local law or requirements imposed for the

protection of the environment.

For additional information concerning this decision, please contact Gary Oldenburg, USDA APHIS WS, 720 O'Leary Street, NW, Olympia WA 98502 or Tim J. Ohashi, USDA APHIS WS, 2275 Koapaka Street, Suite H420, Honolulu, HI 96819.

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