Appendix K. Endangered Species Act Section 7 Consultation

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

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September 16, 2008

To: Files

From: Michael D. Silbernagle, Acting Refuge Manager, Oahu National Wildlife Refuge Complex

Subject: Biological Opinion of the U.S. Fish and Wildlife Service on the Effect of the Predator Control Program for Endangered Waterbirds at Oahu National Wildlife Refuge Complex, Oahu, Hawaii

CONSULTATION HISTORY

The U.S. Fish and Wildlife Service (Service) Pacific Islands Fish and Wildlife Office staff working with the National Wildlife Refuge (NWR) Managers identified priority Hawaiian Bird Conservation Focal Area projects on individual Refuges in Hawaii and the Pacific Islands. These projects are to implement high priority recovery actions for six endangered Hawaiian waterbirds, Hawaii Island forest birds, and the Nihoa millerbird (*Acrocephalus familiaris kingi*). In Fiscal Year 2007, the Ecological Services Division, Pacific Islands Fish and Wildlife Office provided approximately $540,000 to five National Wildlife Refuge Complexes within the Pacific Islands to fund eight projects.

On August 27, 2007, funds were allocated to the Oahu NWR Complex to conduct predator control at all of the wetland units (Pearl Harbor NWR- Honouliuli and Waiawa units; James Campbell NWR – Kii and Punamano units). The funds will be used to secure one full time equivalent position and supplies to implement predator control to include 1) live-trapping for small Indian mongoose (*Herpestes auropunctatus*), feral cats (*Felis catus*), feral dogs (*Canis familiaris*), rats (*Rattus* sp.), and American bullfrogs (*Rana catesbeiana*) and 2) utilize diaphacinone bait stations for control of rats and mongoose.

Funds provided by the Service's Ecological Services Division, were required to be obligated by December 31, 2007. This did not allow for the hiring of a Service staff person due to time constraints. The option to contract the work met the deadline to obligate the funds by the end of the calendar year.

A contract was awarded to contractor Pono Pac Land Management on November 13, 2007. The trapping program began on January 3, 2007.

BIOLOGICAL OPINION

PROJECT DESCRIPTION

The Oahu National Wildlife Refuge Complex (Refuge Complex) consists of three National Wildlife Refuges: James Campbell NWR, Pearl Harbor NWR, and Oahu Forest NWR. Each is separated by approximately 25 to 30 miles on the island of Oahu, Hawaii. The goals of the Oahu NWR Complex are to protect, conserve, restore, and enhance native habitats to aid in the recovery and perpetuation of federally listed endangered and threatened species (specifically for four of the six endangered Hawaiian waterbirds); as well as provide migration and wintering habitat for migratory birds, with emphasis on seabird, shorebird, and waterfowl habitats; protect, conserve, manage, and restore the rare coastal dune strand and provide opportunities for compatible wildlife-dependent recreation and interpretation; and create partnerships and provide leadership in coordinating land management activities.

A contractor will carry out the predator control program on the Kii unit of the James Campbell NWR (Figure 1; 117 acres) and the Honouliuli and Waiawa units of the Pearl Harbor NWR (Figure 2; 37 acres and Figure 3; 25 acres, respectively). Predator control is an important part of refuge management in the Hawaiian Islands. The ability to recover endangered avian species is relative to the number of individuals that can reach fledgling stage. Predators kill and/or consume adults, eggs, and young. The predator control contractor will deploy live traps for mongoose, feral cats, feral dogs and rats. Funnel type live traps will be deployed for bullfrogs. The contractor will capture, collect and dispatch as necessary predators caught in live traps. Bait stations will be deployed for rats and mongoose. Data will be collected on the number of targeted and incidental animals captured, amount of bait used, location of traps, and movement of trap locations.

Figure 1. James Campbell National Wildlife Refuge - Kii Unit

Figure 2. Pearl Harbor NWR - Honouliuli Unit

Figure 3. Pearl Harbor NWR - Waiawa Unit

Live Traps – Mongoose and Feral Cats

- Traps will be strategically placed along fence lines, dikes, etc. and coordinated with the Refuge Complex biologist
- Traps will be mapped using global positioning units
- Live traps for small mammals will be checked every 48 hours while trapping activities occur
- Traps will be operated five days a week, closed on weekends and holidays
- Water bottles will be filled and bait will be replaced as needed, shade will be provided by concrete shingles
- Traps will be maintained in good working order; trip pans clear and moving parts free of debris
- Traps not working correctly will be restored to working condition or replaced immediately, if repair is not possible
- Old bait will be bagged and disposed of in a Refuge dumpster; no bait will be scattered on the Refuge
- Types of bait will be alternated and coordinated with the Refuge Complex biologist
- Mongoose trapped will be dispatched with small caliber firearms (.22 cal.); carcasses measured and weighed; prepared for storage; and disposed of at appropriate municipal dump
- Feral cats will be dispatched humanely; individuals with collars will be transported to the Hawaiian Humane Society
- If traps catch Hawaiian moorhen, traps will be relocated with coordination from the Refuge Complex biologist

Live Traps – Feral Dogs

- Traps will be deployed on an as needed basis, for instance, when there is evidence (tracks, sightings, bird kills, etc.) of feral dog ingress onto individual Refuge units
- Traps will be mapped using global positioning units
- Feral dogs captured will be transported to the Hawaiian Humane Society
- When feral dogs are observed killing or harassing federally listed waterbirds or signs of dog related bird kills are found, the Refuge Complex law enforcement officer will be notified

Live Traps – American Bullfrogs

- Traps will be deployed during the breeding season, hatching and fledging stages, of the Hawaiian stilt on the Kii Unit (April through July)
- Funnels will be designed with a minimal diameter opening (six inches or less) to allow for frog capture and minimize potential for Hawaiian moorhen capture
- Specific locations will be coordinated with Refuge Complex biologist
- Traps will be mapped using global positioning units
- Traps will be checked every 24 hours
- Traps will be operated Monday through Friday, pulled from impoundments on weekends, holidays and periods of employee leave

- Species and numbers of all organisms caught in frog traps will be recorded
- Bullfrogs will be dispatched; measured, weighed; stomach contents identified, reproductive status of females determined, presence of any conditions of biological significance will be recorded; and carcasses disposed of properly
- If traps catch Hawaiian moorhen or when moorhen chicks are present, traps will be relocated with coordination from the Refuge Complex biologist

Bait Stations

- Current bait application is with Ramik mini bars (active ingredient diaphacinone)
- Stations will strategically placed along fence lines and interior of Refuge units coordinating with Refuge Complex biologist
- Damaged stations will replaced immediately and reported to Refuge Complex biologist
- Notification signs will be posted and maintained at all refuge units
- Stations will be mapped using global positioning units
- Stations will be visited and cleaned on seven to ten day intervals based on consumption rates
- Moldy or degraded baits will be removed and disposed of according to label restrictions
- Fresh baits will be placed in each station as needed during visits
- Numbers of baits placed and depleted baits will be recorded
- Diaphacinone usage is submitted annually to Pacific Islands Fish and Wildlife Office

The federally endangered Hawaiian coot (*Fulica alai*), Hawaiian stilt (*Himantopus mexicanus knudseni*), Hawaiian duck (*Anas wyvilliana*), and Hawaiian moorhen (*Gallinula chloropus sandvicensis*) are found on all Refuge units. Based on past and ongoing work on the Oahu NWR Complex, the Hawaiian coot, Hawaiian stilt, and the Hawaiian duck have never been documented in the traps within the Refuge Complex units, during trapping efforts that have been implemented periodically since 1992. Although the Hawaiian duck has been caught in live traps on Kauai, based on current Hawaiian duck hybrid studies conducted by Andy Engilis of University California at Davis, it is not likely that a Hawaiian duck will be present within the Oahu Refuge Complex units. .

There is a high likelihood that Hawaiian moorhen will be accidentally trapped in the predator live traps due to the higher densities present on Oahu and the inquisitive nature of these birds. The trapability of moorhen is further demonstrated by a study conducted in 2005 though 2007, by David DesRochers and Refuge Complex staff, as part of his doctoral program at Tufts University, Massachusetts. The program was designed to begin banding this species for a cooperative project on Improving Population Estimates of Hawaiian Moorhen with Call Response Surveys and Banding Data (DesRochers et al. 2006). Within a two-year time period, ninety Hawaiian moorhen were banded with 162 captures. The birds are naturally attracted to the live traps. The wetland units of the Oahu NWR Complex are all fenced and will minimize the potential for Hawaiian moorhen to be killed by feral dogs if moorhen are captured in live traps.

The Oahu Refuge Complex has determined the predator control program will not adversely affect Hawaiian duck, Hawaiian coot or the Hawaiian stilt and actions will be beneficial.

However, Hawaiian moorhen may be harassed due to capture in live traps which could result in injury or harm.

If a Hawaiian moorhen is incidentally captured during live trapping activities the bird will be examined and released immediately, if unharmed. If banded: location, band numbers, colors, and band orientation will be recorded and reported to Refuge Complex biologist. Refuge Manager will be notified immediately if a moorhen is captured.

If a Hawaiian moorhen is injured, an appropriate wildlife veterinarian will be contacted and the bird will be transported for care. The Refuge Manager will be notified immediately of this activity. Capture incidents will be evaluated within 24 hours and trapping efforts will be modified to assist in minimizing any future captures.

The depository designated to receive specimens of Hawaiian moorhen that are collected is the B.P. Bishop Museum, 1525 Bernice Street, Honolulu, Hawaii, 96817 [phone: (808) 547-3511]. If the B.P. Bishop Museum does not wish to accession the specimens, the Service's Division of Law Enforcement in Honolulu, Hawaii [phone: (808) 861-8525; fax: (808) 861-8515] should be contacted for instructions on disposition.

STATUS OF THE SPECIES

The Hawaiian moorhen is an endemic subspecies of the Common moorhen in the Hawaiian Islands. The Hawaiian moorhen was listed as an endangered species in 1967 under the Endangered Species Act (Act) of 1973 (16 U.S.C. 1531 *et seq.*), as amended. In Hawaiian legend, these birds were thought to have brought fire from the gods to the Hawaiian people. The Hawaiian moorhen is a dark gray bird with a black head and neck, and white feathers on their flanks and on their undertail coverts. They have a very distinctive red frontal shield, and their bill tip is yellow with a red base. Their legs and feet are greenish and without lobes. The Hawaiian moorhen usually measure about 13 inches in length. Both sexes are similar and have chicken-like cackles and croaks.

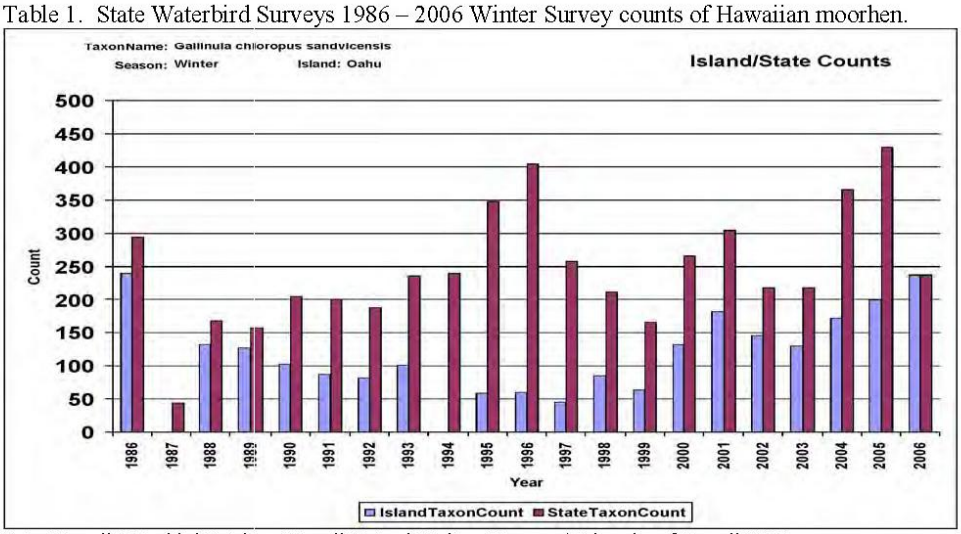
Hawaiian moorhen are the most secretive of the native waterbirds, preferring to forage, nest and rest in dense late succession wetland vegetation. Most birds feeding along the waters edge or in open water will quickly seek cover when disturbed. The preferred habitat for moorhens includes: interspersed dense stands of robust late succession vegetation near open water (approximately 50 percent water to 50 percent vegetation) floating or barely emergent mats of vegetation and water depth less than 3 feet (Service 2005). These birds nest year-round but appear to have two active seasons from November through February and May through August (Service 2007). It is believed that the timing of nesting is related to water levels and late succession wetland vegetation. The Hawaiian moorhen usually lays an average of five to six eggs, although clutches have been up to 13 eggs, and incubation is about 25 days. Hawaiian moorhen consume introduced fishes, crustaceans, mollusks, insects, wetland plants and emergent grasses (Service 2005).

No historical population estimates are available for the endemic Hawaiian moorhen. Because they are such secretive birds, it is difficult to conduct population surveys of this species. It is believed that they were common on the main Hawaiian Islands, except Lanai and Kahoolawe, in

the 1800's but radically declined by the mid-1900. Surveys from the 1950's through the 1960's estimated no more than 57 individuals. Currently Hawaiian moorhen inhabit the islands of Kauai and Oahu (Service 2005). There was an attempted Hawaii State re-introduction of six moorhen (three females and three males) on May 18, 1983 to the island of Molokai at Kakahaia NWR. One of the banded birds was found dead January 2, 1985 and a local resident mistook the other five for chickens they were consumed (Dibben-Young 2007).

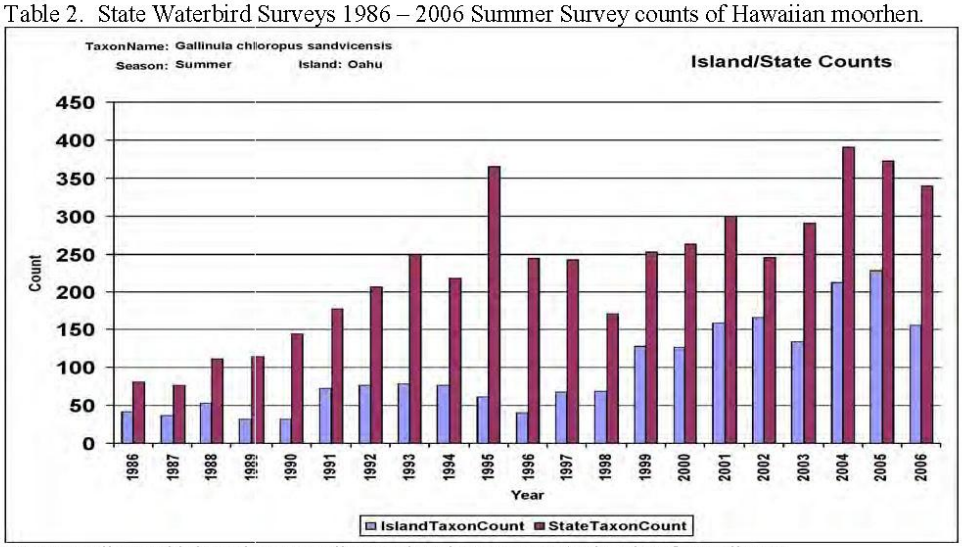
Moorhens are widely distributed on Oahu, but are most prevalent between Haleiwa and Waimanalo. Small numbers exist in Pearl Harbor where foraging occurs in semi-brackish water. The population on the leeward coast is limited to Lualualei Valley. Biannual State waterbird surveys conducted from 1986 through 2006 show numbers of individuals detected on Oahu between 44 and 242 birds (Table 1 and Table 2).

Table 1. State Waterbird Surveys 1986 – 2006 Winter Survey counts of Hawaiian moorhen.



Data: Hawaii Waterbird Database-Hawaii Natural Heritage Program/University of Hawaii 2007

Table 2. State Waterbird Surveys 1986 – 2006 Summer Survey counts of Hawaiian moorhen.



Data: Hawaii Waterbird Database-Hawaii Natural Heritage Program/University of Hawaii 2007

Reasons for Species Decline and Current Threats

The primary causes of the decline of the Hawaiian moorhen are the loss of wetland habitat, predation by introduced animals, hunting in the late 1800's and early 1900's, disease, and environmental contaminants. A significant amount of Hawaii's wetlands have been lost due to human activities. Modification of wetlands includes filling and draining for agriculture, houses, hotels and golf courses. The Service estimates 22,475 acres of wetlands existed within the coastal plains of Hawaii circa 1780 (Service 1990). In 1990, the Service estimated only 15,474 acres remaining, a decrease of 31 percent (Service 2005). This loss of suitable wetlands is compounded by the alteration of wetland plant communities due to invasion by non-native plants. Species such as California grass (*Brachiaria mutica*), pickleweed (*Batis maritima*), water hyacinth (*Eichornia crassipes*), Indian fleabane (*Pluchea indica*) and red mangrove (*Rhizophora mangle*) present a serious threat by out-competing more desirable species and eliminating open water habitats. Unmanaged vegetation significantly reduced open water, shallow water, bare ground, and exposed mudflat habitat. All of these habitats are under serious threat without management to control these aggressive plant species (Service 2005).

Other major contributors to the decline of endangered Hawaiian moorhen are introduced predators. Mongoose, feral cats, and feral dogs are all presently found within wetlands and pose a serious threat to moorhen reproductive success. All three of these predatory species are known to take eggs, young birds, and even nesting adults. Both cats and dogs are of particular concern because of the close proximity of Hawaii wetlands to urban areas. Therefore, it is important that a predator trapping program be established and maintained to prevent the predation of all the Hawaiian waterbirds nesting within wetlands. Other species, such as the cattle egret (*Bulbulcus ibis*), bullfrog, and rat have been observed congregating around nesting waterbirds just prior to

chicks hatching or in areas where young chicks have suddenly disappeared from nests (Woodside 1997). Oahu Refuge staff have documented predation of waterbird chicks by cattle egret and black-crowned night heron (*Nycticorax nycticorax*). A bullfrog was documented predating a moorhen chick at Hanalei National Wildlife Refuge (Viernes 1995). More recently the Key Predators study of 2003 to 2004 on James Campbell National Wildlife Refuge provided the first observations of Hawaiian stilt chicks predation by bullfrogs, which accounted for 45 percent of chick losses over study period (Eijzenga 2005).

ENVIRONMENTAL BASELINE

The environmental baseline describes the status of the species and factors affecting the environment of the species or critical habitat in the proposed action area contemporaneous with the consultation in process. The baseline includes State, local and private actions that affect a species at the time the consultation begins. Unrelated Federal actions that have already undergone formal or informal consultation are also a part of the environmental baseline. Federal actions within the action area that may benefit listed species or critical habitat are also included in the environmental baseline.

Bi-monthly surveys were conducted for waterbirds within Refuge Complex units from 1989 through 2007. Currently only monthly surveys are conducted due to staff constraints. Hawaiian moorhen numbers ranged from zero to 98 individuals counted in surveys from 1989 through 2006 at the James Campbell National Wildlife Refuge - Kii unit (Table 3). However, these survey numbers are thought to be underestimates because of the moorhen's cryptic behavior. Standard survey methods in these counts include visual and aural detection. Recent research conducted by David DesRochers in 2005 through 2007 has shown that passive surveys of cryptic waterbirds underestimate numbers of individuals present in the wetlands. Alternatively, broadcasting vocalizations of cryptic waterbirds to elicit responses increases detection. On average his research has shown, broadcasting calls increased moorhen detection by 30 percent. The Oahu Refuge Complex bi-monthly survey protocol was changed based on DesRochers research, and the Refuge Complex biologist began keeping track of banded versus unbanded moorhen observed during these surveys. With over 90 Hawaiian moorhen banded within the Kii unit, the number of banded birds versus unbanded birds detected during those surveys along with DesRochers research conservatively estimated the population of Hawaiian moorhen within the Kii unit between 100 to 150 birds.

Hawaiian moorhen are currently not consistently present in the Pearl Harbor NWR units. There have been recent incursions into the Honouliuli unit over the last year (2007); however, they have observed consistently occupying that unit. Historically, in Refuge surveys conducted between 1989 and 2004, zero to five Hawaiian moorhen were detected in the Honouliuli unit and zero to 13 individuals in the Waiawa unit (Table 3). The last observations of Hawaiian moorhen consistently occupying these units was in the year 2000. Recent wetland management practices focusing on Hawaiian stilts at these units have not allowed the vegetation to mature to the late succession stage preferred by Hawaiian moorhen. Within the last year cattails (*Typha latifolia*) have been allowed to become more decadent at Honouliuli unit, which could explain the moorhen attempting to return. Hawaiian moorhen are still detected off Refuge in the vicinity of both units.

Table 3. Endangered Hawaiian Moorhen Numbers Oahu National Wildlife Refuge Complex, Bimonthly Surveys Calendar Years 1989-2006 (Range/Average)

	James Campbell National Wildlife Refuge		Pearl Harbor National Wildlife Refuge	
Year	**Kii Unit**	**Punamano Unit**	**Honouliuli Unit**	**Waiawa Unit**
1989	10-40/21	0-10/4	0/0	0/0
1990	9-53/24	0-5/3	0-1/0	0/0
1991	11-34/23	0-6/3	0/0	0/0
1992	22-52/37	0-6/2	0/0	0-2/1
1993	22-48/34	0-5/2	0-4/1	0-5/2
1994	16-39/25	0-7/1	0-3/2	0-10/3
1995	11-38/24	0-2/1	0-2/0	0-13/6
1996	20-53/39	0-1/1	0-5/1	0-11/6
1997	10-44/26	0-1/0	0-4/1	0-8/3
1998	16-54/37	0-1/0	0-4/2	0-8/3
1999	9-45/31	0-2/0	0-5/2	0-6/4
2000	0-57/29	0-3/0	0-4/1	0-5/2
2001	0-48/32	0/0	0/0	0/0
2002	7-44/28	0/0	0-4/0	0/0
2003	15-46/31	0/0	0/0	0/0
2004	14-53/35	0/0	0/0	0-1/0
2005	18-73/50	0-2/0	0-1/0	0/0
2006	21-98/59	0-5/2	0/0	0/0

Data: Oahu Refuge Complex 2007

EFFECTS OF THE ACTION

The primary concern with regard to the implementation of this predator control program is the potential for the unintentional capture of Hawaiian moorhen in predator traps. However, the project will ultimately benefit all four of the endangered Hawaiian waterbirds by reducing predation. The small Indian mongoose has been implicated in at least two bird extinctions throughout the world where it was introduced (Hays 2007). The birds were the barred-wing rail (*Nesoclopeus poecilopterus*) and the Jamaica petrel (*Pterodroma caribbaea*) both ground nesters similar to the moorhen. Trapping will help to alleviate the threat of the mongoose to the ground nesting Hawaiian waterbirds within the units of the Oahu Refuge Complex. Nevertheless, trapping may impact Hawaiian moorhen.

Take of Hawaiian moorhen may occur by harassment and/or injury and mortality from:

- Capture in live traps.
- Injury in live traps from entanglement in trap mechanism or components.
- Injury, exhaustion or heat stress while confined within live traps.
- Drowning in funnel live traps set for bullfrogs.
- Predation by mammalian predators while confined within the live traps.

No trap design is available that will preclude the capture of Hawaiian moorhen while still having the capability of capturing the targeted predators.

CUMULATIVE EFFECTS

Cumulative effects are those impacts of future State and private actions that are reasonably certain to occur within the area of action subject to consultation. Cumulative effects include the impacts of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this Biological Opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Endangered Species Act. There are no expected or known cumulative effects on the Refuge Complex lands since they are protected from future development or impacts from State and private parties.

CONCLUSION

After reviewing the current status of the species and critical habitats, the environmental baseline for Hawaiian moorhen in the action area, and the effects of predator control work at the Oahu National Wildlife Refuge Complex, including the cumulative effects, it is our biological opinion that implementation of predator control is not likely to jeopardize the continued existence of Hawaiian moorhen covered in this opinion. There is no designated critical habitat for Hawaiian waterbirds, so none will be affected.

The no jeopardy conclusions are based on the following: Oahu Refuge Complexes' conservation strategy is to continue implementing a predator control program that will increase the baseline number of individuals for the Hawaiian moorhen and all endangered waterbird species.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined (50 CFR 17.3) by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service (50 CFR 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the Oahu Refuge Complex so that they become binding conditions in order for the exemption in section 7(o)(2) to apply. The Oahu Refuge Complex has a continuing duty to regulate the activity covered by this incidental take statement. If the Oahu Refuge Complex (1) fails to assume and implement the terms and conditions or (2) fails to require any contractors to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to any permit or contract, then the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the contractor must report the progress of the action and its impact on the species to the Refuge manager or Project leader as specified in the incidental take statement [50 CFR § 402.14(i)(3)].

Amount or Extent of Take

This Biological Opinion anticipates the following forms of incidental take:
The Oahu Refuge Complex anticipates that take will occur in the form of harassment (due to the potential capture in traps), and potential injury or death may result because of Oahu Refuge Complex's activities described in this Biological Opinion.

The Oahu Refuge Complex anticipates that the capture of not more than 25 Hawaiian moorhen and the injury or death of a Hawaiian moorhen family unit (unit equals up to two adults and four chicks) may occur annually for the duration of this action.

The Oahu Refuge Complex will not refer the incidental take of any migratory bird for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §703-712), if such take is in compliance with the terms and conditions specified herein.

Effect of Take

In this Biological Opinion, the Oahu Refuge Complex determined that this level of anticipated take is not likely to jeopardize the continued existence of the Hawaiian moorhen and no critical habitat has been designated for this species so no adverse modification of critical habitat is possible.

Reasonable and Prudent Measures

The reasonable and prudent measures given below, with their implementing terms and conditions, are designed to minimize the impacts of incidental take that might otherwise result from the proposed actions. If, during the course of the actions, the level of incidental take is exceeded, the action agency is required to reinitiate consultation and review the reasonable and prudent measures provided in this Biological Opinion. In addition, the Oahu Refuge Complex must cease the activities that caused the taking; must immediately provide an explanation of the causes of the taking; and must review with the Refuge Manager and Refuge Complex biologist the need for possible modification of the reasonable and prudent measures. The Oahu Refuge Complex will offset unavoidable impacts through the implementation of the conservation measures as described in the Biological Opinion. The Oahu Refuge Complex will implement the conservation measures as identified in the Project Description of this Biological Opinion.

The Oahu Refuge Complex will implement all the minimization and avoidance measures outlined in the Project Description. Therefore no reasonable and prudent measures are needed for this biological opinion.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Endangered Species Act (Act) directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The recommendations provided relate only to the proposed action and do not necessarily represent complete fulfillment of the Oahu Refuge Complex's Section 7(a)(1) responsibilities for the species. In order for the Pacific Islands Fish and Wildlife Office to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Pacific Islands Fish and Wildlife Office requests notification of the implementation of any conservation recommendations by Oahu Refuge Complex.

1. The Pacific Islands Fish and Wildlife Office recommends that if Hawaiian moorhen are captured in live traps, attempts should be made to band individual birds. Refuge Complex biologist will be contacted immediately, and if available, will band the birds. Birds will be banded with color bands and U.S. Geological Service's aluminum bands. Banding information will yield important life history information that will aid in recovery of the species.

2. The Pacific Islands Fish and Wildlife Office recommends the Oahu Refuge Complex monitor nesting success of listed waterbirds within Refuge units addressed in this Biological Opinion to determine the effectiveness of the predator control program.

3. The Pacific Islands Fish and Wildlife Office recommends the Oahu Refuge Complex continue to monitor listed waterbird and migratory shorebird and waterfowl use on all Refuge units addressed in this Biological Opinion to determine the effectiveness of the predator control program.

4. The Pacific Islands Fish and Wildlife Office recommends the Oahu Refuge Complex should implement control of avian predator species such as cattle egrets. These birds are often attracted to wetlands areas and have been documented preying on endangered waterbird chicks.

REINITIATION STATEMENT

This concludes formal consultation on this action. As required in 50 CFR § 402.16, reinitiation of consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operation causing such take must cease pending reinitiation. Should there be a failure to carry out any or all of the described measures, or if the measures are not effective, or if these measures are modified in any way without Service coordination, re-initiation of consultation will be required.

Submitted by: Michael D. Silbernagle Date: 9/16/2008
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Concurred by: Jerry F. Leinecke Date: 9/17/2008
Jerry F. Leinecke, Deputy Project Leader

Approved by: Barry W. Stieglitz Date: 9/17/2008
Barry W. Stieglitz, Project Leader

cc: PIFWO, Field Supervisor, Patrick Leonard

REFRENCES

DesRochers, David 2006. The first accurate census of the endangered Hawaiian Moorhen *(Gallinula chloropus sandvicensis*, unpublished.

DesRochers, David W., Michael D. Silbernagle, Aaron Nadig, J. Michael Reed. 2006. Improving population estimates of Hawaiian Moorhen *(Gallinula chloropus sandvicensis)* with call response surveys and banding data, unpublished.

Dibben-Young, Arleone. 2007. Draft Review of Thirty Years of Banding Hawaiian Coot and Hawaiian Moorhen, 1977 to 2007; report compiling available data and anecdotal information, unpublished.

Eijzenga, Jaap. 2005. Draft Key Predators study of 2003 to 2004 on James Campbell National Wildlife Refuge, unpublished.

Hawaii Biodiversity and Mapping Program. 2007. Formerly Hawaii Natural Heritage Program. Hawaii Natural Heritage Program database, unpublished, Center for Conservation Research and Training (CCRT), Pacific BioSciences Research Center (PBRC), University of Hawaii.

Hays, Warren S.T., Sheila Conant. 2007. Biology and Impacts of Pacific Island Invasive Species. 1. A Worldwide Review of Effects of Small Indian Mongoose, *Herpestes javanicus.* Pacific Science (2007), vol. 61, no. 1:3-16. University Press, Honolulu, Hawaii.

Smith, David G., John T. Polhemus. 2003. Habitat use and nesting activity by the Hawaiian Stilt *(Himantopus Mexicanus Knudseni)* and Hawaiian Moorhen *(Gallinula Chloropus Sandvicensis)* at the Hamakua Marsh State Wildlife Sanctuary, Kailua, Oahu. Elepaio 63(8):59-62.

U.S. Fish and Wildlife Service. 1990. Amendment letter on Hawaiian wetland status to Dahl. 1990, Honolulu, Hawaii.

U.S. Fish and Wildlife Service. 2005. Draft Revised Recovery Plan for Hawaiian Waterbirds, Second Draft of Second Revision. U.S. Fish and Wildlife Service, Portland, Oregon. 155pp.

U.S. Fish and Wildlife Service. 2007. Oahu Refuge Complex Waterbird Access database (birddate.mdb) maintained by the Refuge Complex Biologist. Occurrences, survey and banding data for Hawaiian waterbirds on Oahu Refuge Complex 1989 to current (banding records 1968 to current).

Viernes, K.J.F. 1995. Bullfrog predation of an endangered Common Moorhen chick at Hanalei National Wildlife Refuge, Kauai. Elepaio 55:37.

Woodside, David. 1997. Personal communication. U.S. Fish and Wildlife Service, Hawaii and Pacific Islands Complex; Honolulu, Hawaii.

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Haleiwa, HI, 96712
Phone: (808) 637-6330 FAX: (808) 637-3578

In Reply Refer To:

Section 7 Consultation
For Use of *Rodeo*
Oahu National Wildlife Refuge Complex

The Oahu National Wildlife Refuge (NWR) Complex is requesting an informal consultation pursuant to Section 7 of the Endangered Species Act for the proposed application of the herbicide *Rodeo* which contains the active ingredient glyphosphate isopropylamine salt (EPA Registration Number 62719-324) and is manufactured by Dow AgroSciences.

The proposed use of *Rodeo* is to control California bulrush (*Scirpus californicus*), California grass (*Brachiaria mutica*), Cattail (*Typha sp.*), Bufflegrass (*Cenchrus ciliaris syn Pennisetum cialiare)* and Indian marsh fleabane (*Pluchea indica*) within the Kii and Punamano Units of James Campbell NWR, and the Waiawa and Honouliuli Units of Pearl Harbor NWR (See attached map).

DESCRIPTION OF REFUGE UNITS

The Kii Unit is a coastal fresh to slightly brackish water wetland area composed of seven man-made water impoundments, three drainage ditches, and adjacent earthen dikes/roads comprising about 73.8 acres. Total area of Kii Unit is 117.3 acres. Impoundments are managed for endangered native Hawaiian waterbird nesting and maintenance, as well as for wintering migratory birds. Topographic relief is slight with elevations ranging from about 1-5 feet mean sea level. Artesian flow ground water is used to manage wetlands on the Kii Unit. Wetland impoundments are managed to mimic seasonal to permanent wetland conditions that support a variety of vegetation. The purpose of the wetland management objectives is to enhance and recover endangered Hawaiian coot, duck, moorhen, and stilt. Plants include sedges such as Makai (*Bolboschoenus maritimus*), Manyspike flatsedge (*Cyperus polystachyos*), Java sedge (*Cyperus javanicus*), Bent spikerush (*Eleocharis geniculata*), West Indian fimbry (*Fimbristylis ferruginea*), Grass-like fimbry (*Fimbristylis miliacea*), California bulrush (*Schoenoplectus californicus*), and Giant bulrush (*Schoenopluctus tabernaemontani*); cattail (*Typha spp.*); and grasses such as Knotgrass (*Paspalum distichum*), Millet (*Echinochloa spp.*) and Sprangletop (*Leptochloa fusca*). Other plant species found include Saltwort (*Batis maritime*) and California grass (*Urochloa mutica*). Distribution, interspersion, density, relative abundance, and life stage of these plants, as well as their ratio to open water and mudflat, are important to providing suitable optimal habitat for endangered and migratory bird species. Dikes are grass covered consisting mainly of Bermuda grass (*Cynodon dactylon*). Ditches originating off-refuge run through the James Campbell NWR discharging run-off water from the surrounding area

and watershed into the ocean. California grass and Knotgrass are the predominate plants along ditch banks. Water lilies (*Nymphaea spp.*) are found growing in patches within the open water ditches.

The 144-acre Punamano Unit is a natural spring and ground water fed coastal wetland approximately 1.3 miles northwest of the Kii Unit. Vegetation within the deeper pond interior consists mainly of California bulrush. Many of the plant species listed above for the Kii Unit are also found in shallow water areas of the refuge and at the interface between waters edge and upland. Indian marsh fleabane, Christmas berry, and haouli koa are the common shrub along the more upland perimeter areas, but other woody species are intermixed. In the past, minimal habitat management has occurred resulting in excessive vegetative cover. The increasing vegetative cover combined with dense stands of tall emergent plants have reduced the open water areas resulting in the reduction of valuable habitat that benefit resident and migrating waterbirds, including four endangered species. Recent restoration efforts have significantly improved waterbird habitat conditions. Improvement was achieved by the reduction of dense, extensive areas of invasive California bulrush and shoreline woody vegetation. Water flows via Punamano Ditch to the Kii Unit where it discharges into the ocean.

Pearl Harbor NWR is a 61-acre coastal refuge consisting of two wetland units (Waiawa - 24.5 acres and Honouliuli - 36.5 acres) located on the Middle and West lochs of Pearl Harbor. Each unit consists of two man-made ponds managed for endangered and other waterbirds. The refuge is managed under a cooperative agreement with the U.S. Navy which owns the land. Water flows from an aquifer at Waiawa and from an aquifer at Honouliuli. Both units drain into Pearl Harbor.

Honouliuli Unit wetland has slightly brackish impoundments that contain a variety of plants including sedges such as Makai, Manyspike flatsedge, Java sedge, Bent spikerush; cattail; grasses such as Knotgrass and Sprangletop. Other plant species found include Saltwort, Indian marsh fleabane, and Water hyssop (*Bacopa monnieri*). Dikes are gravel-covered with little vegetation on them. Within one of the impoundments a large coral mound rises about 10 feet from the bottom. This coral "rock" is the highest relief on the unit. Relatively flat, undulating bottom topography is dotted with small nesting islets.

The Waiawa Unit has wetlands that are more brackish to hyper saline resulting in a restricted suite of plants compared to the Honouliuli Unit. Predominant plants within the Waiawa wetlands are Makai, Cattail, Saltwort, and Indian marsh fleabane. The earthen dikes are covered with gravel and contain a variety of weedy plants and Bermuda grass (*Cynodon dactylon*). Adjacent uplands are dominated by weedy grasses with a few Kiawe trees.

STATUS OF SPECIES

Six federally listed species, the Hawaiian stilt (*Himantopus mexicanus knudseni*), Hawaiian coot (*Fulica alai*), Hawaiian moorhen (*Gallinula chloropus sandvicensis*), Hawaiian duck (*Anas wyvilliana*), Akoko (*Chamaesyce skottsbergii* var. *skottsbergii*), and the Ewa Hinahina (*Achyranthes splendens* var. *rotundata*) are located in or adjacent to the affected areas.

The James Campbell and Pearl Harbor NWR's have traditionally supported higher numbers of endangered waterbirds than most wetlands on Oahu as a direct result of intense management directed at these species. During the first six months of 2007, numbers of listed waterbirds remained significant and consistent with recent years.

James Campbell NWR supported a monthly average of 101 Hawaiian stilt with a peak of 124 individuals, while coots averaged 250 peaking at 302 individuals, and moorhen averaged 59 with a peak of 69 individuals counted during refuge surveys. Hawaiian duck field identification is difficult at best, making reliable counts difficult to impossible. At best there are only 1-2 birds on the refuge that resemble Hawaiian ducks and their identification cannot be guaranteed due to the extensive hybridization between mallards and Hawaiian ducks.

Pearl Harbor NWR supported a monthly average of 57 Hawaiian stilt with a peak of 116 individuals, while coots averaged 83 peaking at 213 individuals, and moorhen averaged 2 with a peak of 2 individuals counted during refuge surveys. As with James Campbell NWR, Hawaiian duck field identification is difficult at best, making reliable counts difficult to impossible.

A state species of concern, the Short-eared owl (*Asio flammeus*), is also found within the proposed area. This species can be found in low numbers scattered throughout suitable habitat on Oahu. Within the affected area this species is regularly documented on the James Campbell NWR and rarely observed on the wetland units of the Pearl Harbor NWR.

The two endangered plant species Akoko and Ewa Hinahina can be found in or adjacent to the proposed affected areas in viable numbers. Ongoing restoration activities are aimed at improving population numbers.

TREATMENT

The application of *Rodeo* will be used to control undesirable vegetation that encroaches into endangered species habitat, create suitable open water with interspersed vegetation, maintain suitable wetland successional stages for endangered waterbirds and other migratory waterbird species, control undesirable vegetation along refuge fence lines and around refuge support/operational structures, and reduce predator concealment cover on refuge units to enhance the potential for increased endangered waterbird nest, young, and adult survivability.

In addition to the application of *Rodeo*, spraying and burning or spraying and mowing the dead vegetative residue will be used as a mechanism to maintain interspersion and return nutrients to the soil. This in turn promotes the invertebrate prey base needed by many of the waterbirds that utilize the refuge. For applications near fence lines and around refuge support/operational structures, prescribed burning will not be used. Control is accomplished by spraying then mechanically removing vegetation or reducing vegetative biomass by mechanical methods followed by spraying, according to the manufacturer's instructions, to retard rapid regrowth in these areas. The intent is to maximize longevity of refuge property and assist refuge staff in maintaining vegetation at manageable levels within the Complex.

To avoid impact to sensitive habitat and species, herbicide application will be accomplished during low-level nesting periods of Hawaiian coots, moorhens, ducks, and stilts. Areas of known nests and broods will not be sprayed. Herbicide application will occur only when winds do not exceed 10 miles per hour (mph) as measured immediately prior to initiation of application. Application will not begin if it is apparent rain will occur before the time required for herbicide to be absorbed by vegetation per label information and guidance. Care will be taken to protect suitable habitat, not intended to be altered, removed, or killed by herbicide. Application shall be terminated, if during spraying, winds exceed the 10 mph level for a sustained period. Herbicide will be applied by trained refuge personnel using proper protective gear. Application will be by ground methods only and will

utilize a low pressure trailer mounted tank sprayer and a backpack sprayer. Application, in many cases, will be spot treatment directly on the individual invasive plant species. Label application and safety precautions and recommendations will be followed.

Personnel applying *Rodeo* will be trained to identify all threatened and endangered species within the area and to avoid those species during the application process. Known nest and brood locations will be conveyed to the applicator(s) prior to initiation of spraying. If during application a nest unknown previously is discovered spraying will immediately cease and the Refuge Biologist will be notified. Application of Garlon *3A* will enhance opportunities for endangered and native plant species to regenerate and increase population numbers and reduce the competition from invasive plant species.

DETERMINATION

The U.S. Fish and Wildlife Service has determined that the proposed application of this herbicide as previously described is not likely to adversely affect listed species and their habitat pursuant to Section 7 of the Endangered Species Act. The proposed application is in accordance with recovery action 1.3.2 "*Manage vegetation to maximize nesting success, brood survival, food availability, and recruitment of waterbirds*" indicated in the **Second Draft Revised Recovery Plan for Hawaiian Waterbirds, 2nd Revision,** May 2005.

Questions should be directed to Michael Silbernagle, Acting Refuge Manager, Oahu NWR Complex (Tel. 808/637-6330 ext. 23).

Submitted by: Michael D. Silbernagle Date: 9/15/2005
Michael D. Silbernagle, Acting Refuge Manager
Oahu NWR Complex

Approved: Jerry F. Leinecke Date: 9/17/08
Jerry Leinecke, Deputy Project Leader
Hawaiian and Pacific Islands NWR Complex

Concur: Barry W. Stieglitz Date: 9/17/08
Barry Stieglitz, Project Leader
Hawaiian and Pacific Islands NWR Complex

Kii Herbicide Application Map
Fence perimeter = 4,773 linear feet
Outlet Ditch
a
E
Punamano Ditch
Blind Ditch
D
G
Cmakai
Fmakai
Hospital Ditch
A
B
B Ditch
Cmauka
Fmauka
0 200 400 800 Feet
N
E
S
W

Punamano Herbicide Application Map
(Lease to Fee +~80)
North
4.5 acres
South1
2.8 acres
South2
0.4 acres
Area = 125.6 acres
New Perimeter = 11,582 ft (2.2 mi.)
Perimeter:
North = 2,677 ft.
South1 = 2,063 ft.
South2 = 592 ft.
Total Fee = 11,582 ft.
0 250 500 1,000 Feet

Honouliuli Herbicide Application Map
1,970 ft.
P1 perimeter
P1
5.2 acres
0.6 acres
1,128 ft.
Ditch perimeter
3,389 ft.
P2 perimeter
0.2 ac.
P2
14.1 acres
Fence perimeter = 4,773 linear feet
0 75 150 300 Feet

Waiawa Herbicide Application Map
N
W
E
S
Mauka Perimeter
2,920 ft.
Mauka
13.0 acres
5.9 acres
Mangrove Perimeter 2,054 ft.
Makai
6.3 acres
Fence Perimeter = 4,027 linear feet
Makai Perimeter
2,040 ft.
0 75 150 300 Feet

United States Department of the Interior

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In Reply Refer To:

Section 7 Consultation
For Use of *Ramik Mini-Bars*
Oahu National Wildlife Refuge Complex

The Oahu National Wildlife Refuge (NWR) Complex is requesting an informal consultation pursuant to Section 7 of the Endangered Species Act for the proposed application of *Ramik Mini-Bars* which contains the active ingredient Diphacinone, 2-diphenylacetyl-1, 3-Indandione (EPA Registration Number 61282-26) and is manufactured by HACCO, Inc.

The proposed use of *Ramik Mini-Bars* is to reduce or eliminate predation by the Indian mongoose (*Herpestes auropunctatus*), Roof rat (*Rattus rattus*), Norway rat (*Rattus norvegicus*), Polynesian rat (*Rattus exulans*) and the House mouse (*Mus musculus*) on endangered Hawaiian waterbirds within the Kii Unit of James Campbell NWR, and the Waiawa and Honouliuli Units of Pearl Harbor NWR (See attached map).

DESCRIPTION OF REFUGE UNITS

The Kii Unit is a coastal fresh to slightly brackish water wetland area composed of seven man-made water impoundments, three drainage ditches, and adjacent earthen dikes/roads comprising about 73.8 acres. Total area of Kii Unit is 117.3 acres. Impoundments are managed for endangered native Hawaiian waterbird nesting and maintenance, as well as for wintering migratory birds. Topographic relief is slight with elevations ranging from about 1-5 feet mean sea level. Artesian flow ground water is used to manage wetlands on the Kii Unit. Wetland impoundments are managed to mimic seasonal to permanent wetland conditions that support a variety of vegetation. The purpose of the wetland management objectives is to enhance and recover endangered Hawaiian coot, duck, moorhen, and stilt. Plants include sedges such as Makai (*Bolboschoenus maritimus*), Manyspike flatsedge (*Cyperus polystachyos*), Java sedge (*Cyperus javanicus*), Bent spikerush (*Eleocharis geniculata*), West Indian fimbry (*Fimbristylis ferruginea*), Grass-like fimbry (*Fimbristylis miliacea*), California bulrush (*Schoenoplectus californicus*), and Giant bulrush (*Schoenopluctus tabernaemontani*); cattail (*Typha spp.*); grasses such as Knotgrass (*Paspalum distichum*), Millet (*Echinochloa spp.*) and Sprangletop (*Leptochloa fusca*). Other plant species found include Saltwort (*Batis maritime*) and California grass (*Urochloa mutica*). Distribution, interspersion, density, relative abundance, and life stage of these plants, as well as their ratio to open water and mudflat, are important to providing suitable

optimal habitat for endangered and migratory bird species. Dikes are grass covered consisting mainly of Bermuda grass (*Cynodon dactylon*). Ditches originating off-refuge run through the James Campbell NWR discharging run-off water from the surrounding area and watershed into the ocean. California grass and Knotgrass are the predominate plants along ditch banks. Water lilies (*Nymphaea spp.*) are found growing in patches within the open water ditches.

The 144-acre Punamano Unit is a natural spring and ground water fed coastal wetland approximately 1.3 miles northwest of the Kii Unit. Vegetation within the deeper pond interior consists mainly of California bulrush. Many of the plant species listed above for the Kii Unit are also found in shallow water areas of the refuge and at the interface between waters edge and upland. Indian marsh fleabane, Christmas berry, and haouli koa are the common shrub along the more upland perimeter areas, but other woody species are intermixed. In the past, minimal habitat management has occurred resulting in excessive vegetative cover. The increasing vegetative cover combined with dense stands of tall emergent plants have reduced the open water areas resulting in the reduction of valuable habitat that benefit resident and migrating waterbirds, including four endangered species. Recent restoration efforts have significantly improved waterbird habitat conditions. Improvement was achieved by the reduction of dense, extensive areas of invasive California bulrush and shoreline woody vegetation. Water flows via Punamano Ditch to the Kii Unit where it discharges into the ocean.

Pearl Harbor NWR is a 61-acre coastal refuge consisting of two wetland units (Waiawa - 24.5 acres and Honouliuli - 36.5 acres) located on the Middle and West lochs of Pearl Harbor. Each unit consists of two man-made ponds managed for endangered and other waterbirds. The refuge is managed under a cooperative agreement with the U.S. Navy which owns the land. Water flows from an aquifer at Waiawa and from an aquifer at Honouliuli. Both units drain into Pearl Harbor.

Honouliuli Unit wetland has slightly brackish impoundments that contain a variety of plants including sedges such as Makai, Manyspike flatsedge, Java sedge, Bent spikerush; cattail; grasses such as Knotgrass and Sprangletop. Other plant species found include Saltwort, Indian marsh fleabane, and Water hyssop (*Bacopa monnieri*). Dikes are gravel-covered with little vegetation on them. Within one of the impoundments a large coral mound rises about 10 feet from the bottom. This coral "rock" is the highest relief on the unit. Relatively flat, undulating bottom topography is dotted with small nesting islets.

The Waiawa Unit has wetlands that are more brackish to hyper saline resulting in a restricted suite of plants compared to the Honouliuli Unit. Predominant plants within the Waiawa wetlands are Makai, Cattail, Saltwort, and Indian marsh fleabane. The earthen dikes are covered with gravel and contain a variety of weedy plants and Bermuda grass (*Cynodon dactylon*). Adjacent uplands are dominated by weedy grasses with a few Kiawe trees.

STATUS OF SPECIES

Six federally listed species, the Hawaiian stilt (*Himantopus mexicanus knudseni*), Hawaiian coot (*Fulica alai*), Hawaiian moorhen (*Gallinula chloropus sandvicensis*), Hawaiian duck (*Anas*

wyvilliana), Akoko (*Chamaesyce skottsbergii* var. *skottsbergii*), and the Ewa Hinahina (*Achyranthes splendens* var. *rotundata*) are located in or adjacent to the affected areas.

The James Campbell and Pearl Harbor NWR's have traditionally supported higher numbers of endangered waterbirds than most wetlands on Oahu as a direct result of intense management directed at these species. During the first six months of 2007, numbers of listed waterbirds remained significant and consistent with recent years.

James Campbell NWR supported a monthly average of 101 Hawaiian stilt with a peak of 124 individuals, while coots averaged 250 peaking at 302 individuals, and moorhen averaged 59 with a peak of 69 individuals counted during refuge surveys. Hawaiian duck field identification is difficult at best, making reliable counts difficult to impossible. At best there are only 1-2 birds on the refuge that resemble Hawaiian ducks and their identification cannot be guaranteed due to the extensive hybridization between mallards and Hawaiian ducks.

Pearl Harbor NWR supported a monthly average of 57 Hawaiian stilt with a peak of 116 individuals, while coots averaged 83 peaking at 213 individuals, and moorhen averaged 2 with a peak of 2 individuals counted during refuge surveys. As with James Campbell NWR, Hawaiian duck field identification is difficult at best, making reliable counts difficult to impossible.

A state species of concern, the Short-eared owl (*Asio flammeus*), is also found within the proposed area. This species can be found in low numbers scattered throughout suitable habitat on Oahu. Within the affected area this species is regularly documented on the James Campbell NWR and rarely observed on the wetland units of the Pearl Harbor NWR. Short-eared owls (*Asio flammeus*) may prey on mongoose, rats and mice, and are frequently seen on the Kii Unit throughout the year. Black-crowned night herons (*Nycticorax nycticorax hoactli*) also may prey on rats and mice that have taken diphacinone baits. To avoid impact to non-target species, the pesticide will be used in conjunction with live traps. Refuge personnel will utilize cage traps, in conjunction with bait stations, throughout the year to control predator populations.

The two endangered plant species Akoko and Ewa Hinahina can be found in or adjacent to the proposed affected areas in viable numbers. Ongoing restoration activities are aimed at improving population numbers.

TREATMENT

Ramik Mini-Bars will be applied on a continuous basis to control invasive mammal species. The pesticide will be placed in lockable bait stations that will deter non-target species from ingesting the pesticide. Bait stations will be replenished and checked on a weekly basis. Four to sixteen ounces of bait will be placed in each station, and stations will be spaced a minimum of 75 feet to a maximum 330 feet. In addition, all stations will be placed at least 15 feet from water and food crops.

All bait stations will be lockable tamper resistant. The station is constructed of heavy duty plastic that cannot be broken open by hand and is sufficiently strong to resist damage by wildlife. Baits will be placed in a special compartment within the station with only a small access hole. It

is unlikely that baits could be removed by shaking and tipping the container. Public access to treatment sites is restricted. Bait stations will be placed outside of authorized public use areas. Warning signs will be posted indicating the area of pesticide use, the purpose, and the refuge's name and phone number.

This proposed use is similar to current application of diphacinone by the Hawaii Division of Forestry and Wildlife (DOFAW) on wetlands at Kanaha Pond Wildlife Sanctuary, Kahului, and Maui, Hawaii where there has been no documented secondary poisoning from 84 bait stations during a 1.5 year period (*pers. comm.* Chris Alexander). DOFAW have sent carcasses to the National Wildlife Health Research Center in Honolulu for necropsy when the cause of death of non-target species was not obvious. The Oahu NWR complex will follow the same procedure. All signs of secondary poisoning will be reported to the Pesticides Branch of the Hawaii Department of Agriculture within 24 hours. The Service will also notify them in writing at least two weeks prior to applying diphacinone.

Due to the potential introduction of additional exotic plant species, the *Ramik Mini-Bars* were selected because they do not contain seeds of weedy species. Potential contamination to bodies of water is also a concern. The refuge complex receives an average annual rainfall of 18-34 inches with the majority of rainfall occurring from November through March. The pesticide selected is not soluble in water, thus is unlikely to contaminate nearby bodies of water.

DETERMINATION

The U.S. Fish and Wildlife Service has determined that the proposed application of this herbicide as previously described is not likely to adversely affect listed species and their habitat pursuant to Section 7 of the Endangered Species Act. Indian mongoose and rats are the primary predators of the four endangered Hawaiian waterbirds found on the refuge. The proposed application is accordance with recovery action 1.3.3 "*Eliminate or reduce and monitor predator populations*" indicated in the **Second Draft Revised Recovery Plan for Hawaiian Waterbirds, 2nd Revision,** May 2005.

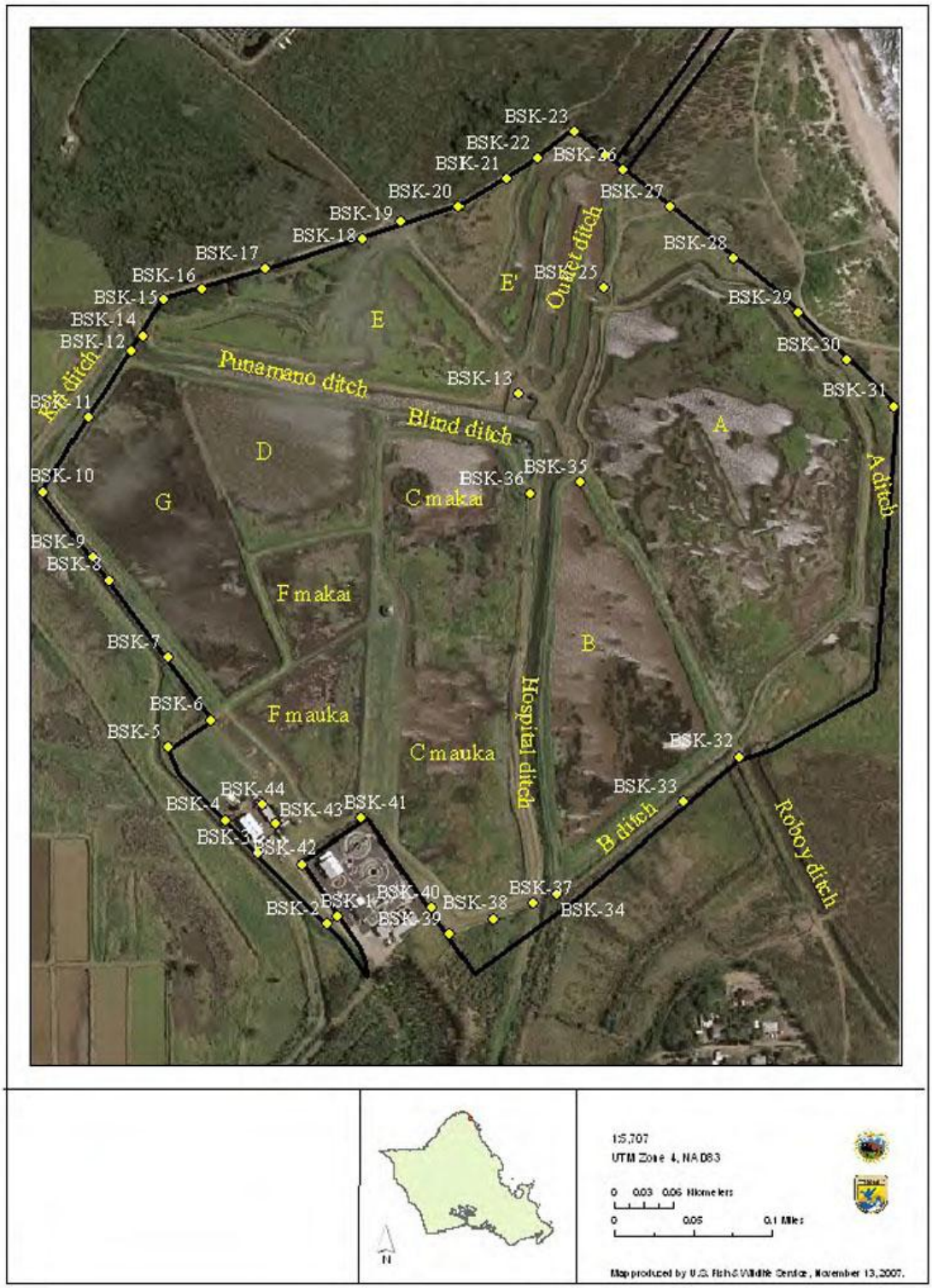
Questions should be directed to Michael Silbernagle, Acting Refuge Manager, Oahu NWR Complex (Tel. 808/637-6330 ext. 23).

Submitted by: Michael D. Silbernagle Date: 9/15/2008
Michael D. Silbernagle, Acting Refuge Manager
Oahu NWR Complex

Approved: Jerry F. Leinecke Date: 9/17/08
Jerry Leinecke, Deputy Project Leader
Hawaiian and Pacific Islands NWR Complex

Concur: Barry W. Stieglitz Date: 9/17/08
Barry Stieglitz, Project Leader
Hawaiian and Pacific Islands NWR Complex

James Campbell National Wildlife Refuge - Kii Unit
Bait Station Locations 2004-2006



Pearl Harbor National Wildlife Refuge - Honouliuli Unit
Bait Station Locations 2004-2006

Pearl Harbor National Wildlife Refuge - Waiawa Unit
Bait Station Locations 2004-2006

In Reply Refer To:

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Section 7 Consultation
For Use of *Habitat*
Oahu National Wildlife Refuge Complex

The Oahu National Wildlife Refuge (NWR) Complex is requesting an informal consultation pursuant to Section 7 of the Endangered Species Act for the proposed application of the herbicide *Habitat* which contains the active ingredient imazapyr (EPA Registration Number 241-426) and is manufactured by BASF T&O.

The proposed use of *Habitat* is to control California bulrush (*Scirpus californicus*), California grass (*Brachiaria mutica*), Cattail (*Typha sp.*), Christmas berry (*Schinus terebinthifolios*) and Red mangrove (*Rhizopora mangle*) within the Kii and Punamano units of James Campbell NWR, and the Waiawa and Honouliuli Units of Pearl Harbor NWR (See attached map).

DESCRIPTION OF REFUGE UNITS

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consisting mainly of Bermuda grass (*Cynodon dactylon*). Ditches originating off-refuge run through the James Campbell NWR discharging run-off water from the surrounding area and watershed into the ocean. California grass and Knotgrass are the predominate plants along ditch banks. Water lilies (*Nymphaea spp.*) are found growing in patches within the open water ditches.

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The Waiawa Unit has wetlands that are more brackish to hyper saline resulting in a restricted suite of plants compared to the Honouliuli Unit. Predominant plants within the Waiawa wetlands are Makai, Cattail, Saltwort, and Indian marsh fleabane. The earthen dikes are covered with gravel and contain a variety of weedy plants and Bermuda grass (*Cynodon dactylon*). Adjacent uplands are dominated by weedy grasses with a few Kiawe trees.

STATUS OF SPECIES

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The two endangered plant species Akoko and Ewa Hinahina can be found in or adjacent to the proposed affected areas in viable numbers. Ongoing restoration activities are aimed at improving population numbers.

TREATMENT

The application of *Habitat* will supplement other techniques (water manipulation, mowing, disking, prescribed burning, and weed-eating) currently used to provide the widest range of suitable habitat for the nesting and maintenance of waterbirds, reduce predator concealment cover within the limited space of refuge units, and maintain secure boundary fences deterring unauthorized public entry. Control methods, other than herbicide use, are utilized to the maximum extent practical within refuge personnel and fiscal limitations.

To avoid impact to sensitive habitat and species, herbicide application will be accomplished during low-level nesting periods of Hawaiian coots, moorhens, ducks, and stilts. Areas of known nests and broods will not be sprayed. Herbicide application will occur only when winds do not exceed 10 miles per hour (mph) as measured immediately prior to initiation of application. Application will not begin if it is apparent rain will occur before the time required for herbicide to be absorbed by vegetation per label information and guidance. Care will be taken to protect suitable habitat, not intended to be altered, removed, or killed by herbicide. Application shall be terminated, if during spraying, winds exceed the 10 mph level for a sustained period. Herbicide will be applied by trained refuge personnel using proper protective gear. Application will be by ground methods only and will utilize a low pressure trailer mounted tank sprayer and a backpack

sprayer. Application, in many cases, will be spot treatment directly on the individual invasive plant species. Label application and safety precautions and recommendations will be followed.

Personnel applying *Habitat* will be trained to identify all threatened and endangered species within the area and to avoid those species during the application process. Known nest and brood locations will be conveyed to the applicator(s) prior to initiation of spraying. If during application a nest unknown previously is discovered spraying will immediately cease and the Refuge Biologist will be notified. Application of Garlon *3A* will enhance opportunities for endangered and native plant species to regenerate and increase population numbers and reduce the competition from invasive plant species.

DETERMINATION

The U.S. Fish and Wildlife Service has determined that the proposed application of this herbicide as previously described is not likely to adversely affect listed species and their habitat pursuant to Section 7 of the Endangered Species Act. The proposed application is in accordance with recovery action 1.3.2 "*Manage vegetation to maximize nesting success, brood survival, food availability, and recruitment of waterbirds*" indicated in the **Second Draft Revised Recovery Plan for Hawaiian Waterbirds, 2nd Revision,** May 2005.

Questions should be directed to Michael Silbernagle, Acting Refuge Manager, Oahu NWR Complex (Tel. 808/637-6330 ext. 23).

Submitted by: _____ Date: 9/15/2008
Michael D. Silbernagle, Acting Refuge Manager
Oahu NWR Complex

Approved: _____ Date: 9/17/08
Jerry Leinecke, Deputy Project Leader
Hawaiian and Pacific Islands NWR Complex

Concur: _____ Date: 9/17/08
Barry Stieglitz, Project Leader
Hawaiian and Pacific Islands NWR Complex

Kii Herbicide Application Map
Fence perimeter = 4,773 linear feet
A
B
B Ditch
Hospital Ditch
Outlet Ditch
a
E
Blind Ditch
Cmakai
Cmauka
Punamano Ditch
D
Fmakai
Fmauka
G
0 200 400 800 Feet
N
E
S
W

Punamano Herbicide Application Map
(Lease to Fee +~80)
North
4.5 acres
South1
2.8 acres
South2
0.4 acres
Area = 125.6 acres
New Perimeter = 11,582 ft (2.2 mi.)
Perimeter:
North = 2,677 ft.
South1 = 2,063 ft.
South2 = 592 ft.
Total Fee = 11,582 ft.
0 250 500 1,000 Feet

Honouliuli Herbicide Application Map
1,970 ft.
P1 perimeter
P1
5.2 acres
0.6 acres
1,128 ft.
Ditch perimeter
3,389 ft.
P2 perimeter
0.2 ac.
P2
14.1 acres
Fence perimeter = 4,773 linear feet
0 75 150 300 Feet

Waiawa Herbicide Application Map
N
W
E
S
Mauka Perimeter
2,920 ft.
Mauka
13.0 acres
5.9 acres
Mangrove Perimeter 2,054 ft.
Makai
6.3 acres
Fence Perimeter = 4,027 linear feet
Makai Perimeter
2,040 ft.
0 75 150 300 Feet

In Reply Refer To:

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Oahu National Wildlife Refuge Complex
66-590 Kamehameha Highway, Room 2C
Haleiwa, HI, 96712
Phone: (808) 637-6330 FAX: (808) 637-3578

Section 7 Consultation
For Use of *Garlon 4*
Oahu National Wildlife Refuge Complex

The Oahu National Wildlife Refuge (NWR) Complex is requesting an informal consultation pursuant to Section 7 of the Endangered Species Act for the proposed application of the herbicide *Garlon 4* which contains the active ingredient triclopyr-butoxy-ethylester (EPA Registration Number 62719-40) and is manufactured by Dow AgroSciences.

The proposed use of *Garlon 4* is to control Indian marsh fleabane (*Pluchea indica*), Christmas berry (*Schinus terebinthifolios*), Kiawe (*Prosopis pallida*), and Haole Koa (Leucaena leucocephala) within the Kalaeloa Unit of Pearl Harbor NWR (See attached map).

DESCRIPTION OF REFUGE

The 37.5-acre Kalaeloa Unit was formerly part of the Barbers Point Naval Air Station, and is the only non-wetland unit of the Pearl Harbor NWR. The unit consists of dryland coastal coralline habitat located on the leeward side of Oahu. It supports the largest remnant stand of the endangered native plant *Achyranthes splendens* var. *rotunda* and other native coastal plants. Dominant native plants of the area include Akoko (*Chamaesyce skottsbergii* var. *skottsbergii*), Ewa hinahina (*Achyranthes splendens* var. *rotundata*), Naio (*Myoporum sandwicense*), Ilima (*Sida fallax*), Hinahina (*Heliotropium anomalum*), and Maiapilo (*Capparis sandwichiana*). Non-native vegetation dominating the area consists of Kiawe and exotic grasses, the most abundant being Buffelgrass.

Intact, native coastal habitat has become increasingly rare on Oahu, and the Kalaeloa Unit provides the Service with an opportunity to restore this unique habitat by providing habitat for rare coastal strand plants.

STATUS OF SPECIES

Two federally listed species - Akoko ((*Chamaesyce skottsbergii* var. *kalaeloana*)) and the Ewa Hinahina (*Achyranthes splendens var. splendens*) - are located within the Kalaeloa Unit. The two endangered plant species can be found in or adjacent to the proposed affected areas in viable numbers. Ongoing restoration activities are aimed at improving population numbers.

TREATMENT

Herbicide application will occur only when winds do not exceed 10 miles per hour (mph) as measured immediately prior to initiation of application. Application will not begin if it is apparent rain will occur before the time required for herbicide to be absorbed by vegetation per label information and guidance. Care will be taken to protect suitable habitat, not intended to be altered, removed, or killed by herbicide. Application shall be terminated, if during spraying, winds exceed the 10 mph level for a sustained period. Herbicide will be applied by trained refuge personnel using proper protective gear. Application will be by ground methods only and will utilize a low pressure trailer mounted tank sprayer and a backpack sprayer. Application, in many cases, will be spot treatment directly on the individual invasive plant species. Label application and safety precautions and recommendations will be followed.

Personnel applying *Garlon 4* will be trained to identify all threatened and endangered species within the area and to avoid those species during the application process. Application of *Garlon 4* will enhance opportunities for endangered and native plant species to regenerate and increase population numbers and reduce the competition from invasive plant species.

DETERMINATION

The U.S. Fish and Wildlife Service has determined that the proposed application of this herbicide as previously described is not likely to adversely affect listed species and their habitat pursuant to Section 7 of the Endangered Species Act.

Questions should be directed to Michael Silbernagle, Acting Refuge Manager, Oahu NWR Complex (Tel. 808/637-6330 ext. 23).

Submitted by: Michael D. Silbernagle — Date: 9/15/2008
Michael D. Silbernagle, Acting Refuge Manager
Oahu NWR Complex

Approved: Jerry Leinecke — Date: 9/17/08
Jerry Leinecke, Deputy Project Leader
Hawaiian and Pacific Islands NWR Complex

Concur: Barry W. Stieglitz — Date: 9/17/2008
Barry Stieglitz, Project Leader
Hawaiian and Pacific Islands NWR Complex

Kalaeloa Herbicide Application Map
N
W
E
S
Unit Size
37.5 acres
Fence perimeter = 5,607 linear feet
0 75 150 300 Feet

In Reply Refer To:

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Oahu National Wildlife Refuge Complex
66-590 Kamehameha Highway, Room 2C
Haleiwa, HI, 96712
Phone: (808) 637-6330 FAX: (808) 637-3578

Section 7 Consultation
For Use of *Garlon 3A*
Oahu National Wildlife Refuge Complex

The Oahu National Wildlife Refuge (NWR) Complex is requesting an informal consultation pursuant to Section 7 of the Endangered Species Act for the proposed application of the herbicide *Garlon 3A* which contains the active ingredient triclopyr triethylamine salt (EPA Registration Number 62719-37) and is manufactured by Monsanto.

The proposed use of *Garlon 3A* is to control Christmas berry (*Schinus terebinthifolios*), Koa haole (*Leucaena leucocephala*), Kiawe (*Prosopis pallida)* and Indian marsh fleabane (*Pluchea indica*) within the Kii and Punamano Units of James Campbell NWR and the Waiawa and Honouliuli Units of Pearl Harbor NWR (See attached maps).

DESCRIPTION OF REFUGE UNITS

The Kii Unit is a coastal fresh to slightly brackish water wetland area composed of seven man-made water impoundments, three drainage ditches, and adjacent earthen dikes/roads comprising about 73.8 acres. Total area of Kii Unit is 117.3 acres. Impoundments are managed for endangered native Hawaiian waterbird nesting and maintenance, as well as for wintering migratory birds. Topographic relief is slight with elevations ranging from about 1-5 feet mean sea level. Artesian flow ground water is used to manage wetlands on the Kii Unit. Wetland impoundments are managed to mimic seasonal to permanent wetland conditions that support a variety of vegetation. The purpose of the wetland management objectives is to enhance and recover endangered Hawaiian coot, duck, moorhen, and stilt. Plants include sedges such as Makai (*Bolboschoenus maritimus*), Manyspike flatsedge (*Cyperus polystachyos*), Java sedge (*Cyperus javanicus*), Bent spikerush (*Eleocharis geniculata*), West Indian fimbry (*Fimbristylis ferruginea*), Grass-like fimbry (*Fimbristylis miliacea*), California bulrush (*Schoenoplectus californicus*), and Giant bulrush (*Schoenopluctus tabernaemontani*); cattail (*Typha spp.*); grasses such as Knotgrass (*Paspalum distichum*), Millet (*Echinochloa spp.*) and Sprangletop (*Leptochloa fusca*). Other plant species found include Saltwort (*Batis maritime*) and California grass (*Urochloa mutica*). Distribution, interspersion, density, relative abundance, and life stage of these plants, as well as their ratio to open water and mudflat, are important to providing suitable optimal habitat for endangered and migratory bird species. Dikes are grass covered consisting mainly of Bermuda grass (*Cynodon dactylon*). Ditches originating off-refuge run through the James Campbell NWR discharging run-off water from the surrounding area and watershed into

the ocean. California grass and Knotgrass are the predominate plants along ditch banks. Water lilies (*Nymphaea spp.*) are found growing in patches within the open water ditches.

The 144-acre Punamano Unit is a natural spring and ground water fed coastal wetland approximately 1.3 miles northwest of the Kii Unit. Vegetation within the deeper pond interior consists mainly of California bulrush. Many of the plant species listed above for the Kii Unit are also found in shallow water areas of the refuge and at the interface between waters edge and upland. Indian marsh fleabane, Christmas berry, and Haouli koa are the common shrub along the more upland perimeter areas, but other woody species are intermixed. In the past, minimal habitat management has occurred resulting in excessive vegetative cover. The increasing vegetative cover combined with dense stands of tall emergent plants have reduced the open water areas resulting in the reduction of valuable habitat that benefit resident and migrating waterbirds, including four endangered species. Recent restoration efforts have significantly improved waterbird habitat conditions. Improvement was achieved by the reduction of dense, extensive areas of invasive California bulrush and shoreline woody vegetation. Water flows via Punamano Ditch to the Kii Unit where it discharges into the ocean.

Pearl Harbor NWR is a 61-acre coastal refuge consisting of two wetland units (Waiawa - 24.5 acres and Honouliuli - 36.5 acres) located on the Middle and West lochs of Pearl Harbor. Each unit consists of two man-made ponds managed for endangered and other waterbirds. The refuge is managed under a cooperative agreement with the U.S. Navy which owns the land. Water flows from an aquifer at Waiawa and from an aquifer at Honouliuli. Both units drain into Pearl Harbor.

Honouliuli Unit wetland has slightly brackish impoundments that contain a variety of plants including sedges such as Makai, Manyspike flatsedge, Java sedge, Bent spikerush; cattail; and grasses such as Knotgrass and Sprangletop. Other plant species found include Saltwort, Indian marsh fleabane, and Water hyssop (*Bacopa monnieri*). Dikes are gravel-covered with little vegetation on them. Within one of the impoundments a large coral mound rises about 10 feet from the bottom. This coral "rock" is the highest relief on the unit. Relatively flat, undulating bottom topography is dotted with small nesting islets.

The Waiawa Unit has wetlands that are more brackish to hyper saline resulting in a restricted suite of plants compared to the Honouliuli Unit. Predominant plants within the Waiawa wetlands are Makai, Cattail, Saltwort, and Indian marsh fleabane. The earthen dikes are covered with gravel and contain a variety of weedy plants and Bermuda grass (*Cynodon dactylon*). Adjacent uplands are dominated by weedy grasses with a few Kiawe trees.

STATUS OF SPECIES

Six federally listed species, the Hawaiian stilt (*Himantopus mexicanus knudseni*), Hawaiian coot (*Fulica alai*), Hawaiian moorhen (*Gallinula chloropus sandvicensis*), Hawaiian duck (*Anas wyvilliana*), Akoko (*Chamaesyce skottsbergii* var. *skottsbergii*), and the Ewa Hinahina (*Achyranthes splendens* var.*rotundata*) are located in or adjacent to the affected areas.

The James Campbell and Pearl Harbor NWR's have traditionally supported higher numbers of endangered waterbirds than most wetlands on Oahu as a direct result of intense management

directed at these species. During the first six months of 2007, numbers of listed waterbirds remained significant and consistent with recent years.

James Campbell NWR supported a monthly average of 101 Hawaiian stilt with a peak of 124 individuals, while coots averaged 250 peaking at 302 individuals, and moorhen averaged 59 with a peak of 69 individuals counted during refuge surveys. Hawaiian duck field identification is difficult at best, making reliable counts difficult to impossible. At best there are only 1-2 birds on the refuge that resemble Hawaiian ducks and their identification cannot be guaranteed due to the extensive hybridization between mallards and Hawaiian ducks.

Pearl Harbor NWR supported a monthly average of 57 Hawaiian stilt with a peak of 116 individuals, while coots averaged 83 peaking at 213 individuals, and moorhen averaged 2 with a peak of 2 individuals counted during refuge surveys. As with James Campbell NWR, Hawaiian duck field identification is difficult at best, making reliable counts difficult to impossible.

A state species of concern, the Short-eared owl (*Asio flammeus*), is also found within the proposed area. This species can be found in low numbers scattered throughout suitable habitat on Oahu. Within the affected area this species is regularly documented on the James Campbell NWR and rarely observed on the wetland units of the Pearl Harbor NWR.

The two endangered plant species Akoko and Ewa Hinahina can be found in or adjacent to the proposed affected areas in viable numbers. Ongoing restoration activities are aimed at improving population numbers.

TREATMENT

The application of *Garlon 3A* will supplement other techniques (water manipulation, mowing, disking, prescribed burning, weed-eating, and hand-pulling) currently used to provide the widest range of suitable habitat for the nesting and maintenance of waterbirds, reduce predator concealment cover within the limited space of refuge units, enhance transitional upland habitats with native vegetation, reduce competition between native and exotic invasive plants, and maintain secure boundary fences deterring unauthorized public entry. Control methods, other than herbicide use, are utilized to the maximum extent practical within refuge personnel and fiscal limitations.

To avoid impact to sensitive habitat and species, herbicide application will be accomplished during low-level nesting periods of Hawaiian coots, moorhens, ducks, and stilts. Areas of known nests and broods will not be sprayed. Herbicide application will occur only when winds do not exceed 10 miles per hour (mph) as measured immediately prior to initiation of application. Application will not begin if it is apparent rain will occur before the time required for herbicide to be absorbed by vegetation per label information and guidance. Care will be taken to protect suitable habitat, not intended to be altered, removed, or killed by herbicide. Application shall be terminated, if during spraying, winds exceed the 10 mph level for a sustained period. Herbicide will be applied by trained refuge personnel using proper protective gear. Application will be by ground methods only and will utilize a low pressure trailer mounted tank sprayer and a backpack sprayer. Application, in many cases, will be spot treatment directly on the individual invasive plant species. Label application and safety precautions and recommendations will be followed.

Personnel applying *Garlon 3A* will be trained to identify all threatened and endangered species within the area and to avoid those species during the application process. Known nest and brood locations will be conveyed to the applicator(s) prior to initiation of spraying. If during application a nest unknown previously is discovered spraying will immediately cease and the Refuge Biologist will be notified. Application of *Garlon 3A* will enhance opportunities for endangered and native plant species to regenerate and increase population numbers and reduce the competition from invasive plant species.

DETERMINATION

The U.S. Fish and Wildlife Service has determined that the proposed application of this herbicide as previously described is not likely to adversely affect listed species and their habitat pursuant to Section 7 of the Endangered Species Act. The proposed application is in accordance with recovery action 1.3.2 "*Manage vegetation to maximize nesting success, brood survival, food availability, and recruitment of waterbirds*" indicated in the **Second Draft Revised Recovery Plan for Hawaiian Waterbirds, 2nd Revision,** May 2005.

Questions should be directed to Michael Silbernagle, Acting Refuge Manager, Oahu NWR Complex (Tel. 808/637-6330 ext. 23).

Submitted by: Michael D. Silbernagle Date: 9/15/2008
Michael D. Silbernagle, Acting Refuge Manager
Oahu NWR Complex

Approved: Jerry Leinecke Date: 9/17/08
Jerry Leinecke, Deputy Project Leader
Hawaiian and Pacific Islands NWR Complex

Concur: Barry W. Stieglitz Date: 9/17/2008
Barry Stieglitz, Project Leader
Hawaiian and Pacific Islands NWR Complex

Kii Herbicide Application Map
Fence perimeter = 4,773 linear feet
A
B
B Ditch
Hospital Ditch
Outlet Ditch
a
E
Blind Ditch
Cmakai
Cmauka
Punamano Ditch
D
Fmakai
Fmauka
G
0 200 400 800 Feet
N
E
S
W

Punamano Herbicide Application Map
(Lease to Fee +~80)
N
W
E
S
North
4.5 acres
South1
2.8 acres
South2
0.4 acres
Area = 125.6 acres
New Perimeter = 11,582 ft (2.2 mi.)
Perimeter:
North = 2,677 ft.
South1 = 2,063 ft.
South2 = 592 ft.
Total Fee = 11,582 ft.
0 250 500 1,000 Feet

Honouliuli Herbicide Application Map
1,970 ft.
P1 perimeter
P1
5.2 acres
0.6 acres
1,128 ft.
Ditch perimeter
3,389 ft.
P2 perimeter
0.2 ac.
P2
14.1 acres
Fence perimeter = 4,773 linear feet
0 75 150 300 Feet

Waiawa Herbicide Application Map
N
W
E
S
Mauka Perimeter
2,920 ft.
Mauka
13.0 acres
5.9 acres
Mangrove Perimeter 2,054 ft.
Makai
6.3 acres
Fence Perimeter = 4,027 linear feet
Makai Perimeter
2,040 ft.
0 75 150 300 Feet

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Oahu National Wildlife Refuge Complex
66-590 Kamehameha Highway, Room 2C
Haleiwa, HI, 96712
Phone: (808) 637-6330 FAX: (808) 637-3578

In Reply Refer To:

Section 7 Consultation
For Use of *Aquamaster*
Oahu National Wildlife Refuge Complex

The Oahu National Wildlife Refuge (NWR) Complex is requesting an informal consultation pursuant to Section 7 of the Endangered Species Act for the proposed application of the herbicide *Aquamaster* which contains the active ingredient glyphosphate isopropylamine salt (EPA Registration Number 524-343) and is manufactured by Monsanto.

The proposed use of *Aquamaster* is to control California bulrush (*Scirpus californicus*), California grass (*Brachiaria mutica*), Cattail (*Typha sp.*), Buffelgrass (*Cenchrus ciliaris syn Pennisetum cialiare)* and Indian marsh fleabane (*Pluchea indica*) within the Kii and Punamano Units of James Campbell NWR, and the Waiawa and Honouliuli Units of Pearl Harbor NWR (See attached map).

DESCRIPTION OF REFUGE UNITS

The Kii Unit is a coastal fresh to slightly brackish water wetland area composed of seven man-made water impoundments, three drainage ditches, and adjacent earthen dikes/roads comprising about 73.8 acres. Total area of Kii Unit is 117.3 acres. Impoundments are managed for endangered native Hawaiian waterbird nesting and maintenance, as well as for wintering migratory birds. Topographic relief is slight with elevations ranging from about 1-5 feet mean sea level. Artesian flow ground water is used to manage wetlands on the Kii Unit. Wetland impoundments are managed to mimic seasonal to permanent wetland conditions that support a variety of vegetation. The purpose of the wetland management objectives is to enhance and recover endangered Hawaiian coot, duck, moorhen, and stilt. Plants include sedges such as Makai (*Bolboschoenus maritimus*), Manyspike flatsedge (*Cyperus polystachyos*), Java sedge (*Cyperus javanicus*), Bent spikerush (*Eleocharis geniculata*), West Indian fimbry (*Fimbristylis ferruginea*), Grass-like fimbry (*Fimbristylis miliacea*), California bulrush (*Schoenoplectus californicus*), and Giant bulrush (*Schoenopluctus tabernaemontani*); cattail (*Typha spp.*); grasses such as Knotgrass (*Paspalum distichum*), Millet (*Echinochloa spp.*) and Sprangletop (*Leptochloa fusca*). Other plant species found include Saltwort (*Batis maritime*) and California grass (*Urochloa mutica*). Distribution, interspersion, density, relative abundance, and life stage of these plants, as well as their ratio to open water and mudflat, are important to providing suitable optimal habitat for endangered and migratory bird species. Dikes are grass covered consisting mainly of Bermuda grass (*Cynodon dactylon*). Ditches originating off-refuge run through the James Campbell NWR discharging run-off water from the surrounding area

and watershed into the ocean. California grass and Knotgrass are the predominate plants along ditch banks. Water lilies (*Nymphaea spp.*) are found growing in patches within the open water ditches.

The 144-acre Punamano Unit is a natural spring and ground water fed coastal wetland approximately 1.3 miles northwest of the Kii Unit. Vegetation within the deeper pond interior consists mainly of California bulrush. Many of the plant species listed above for the Kii Unit are also found in shallow water areas of the refuge and at the interface between waters edge and upland. Indian marsh fleabane, Christmas berry, and haouli koa are the common shrub along the more upland perimeter areas, but other woody species are intermixed. In the past, minimal habitat management has occurred resulting in excessive vegetative cover. The increasing vegetative cover combined with dense stands of tall emergent plants have reduced the open water areas resulting in the reduction of valuable habitat that benefit resident and migrating waterbirds, including four endangered species. Recent restoration efforts have significantly improved waterbird habitat conditions. Improvement was achieved by the reduction of dense, extensive areas of invasive California bulrush and shoreline woody vegetation. Water flows via Punamano Ditch to the Kii Unit where it discharges into the ocean.

Pearl Harbor NWR is a 61-acre coastal refuge consisting of two wetland units (Waiawa - 24.5 acres and Honouliuli - 36.5 acres) located on the Middle and West lochs of Pearl Harbor. Each unit consists of two man-made ponds managed for endangered and other waterbirds. The refuge is managed under a cooperative agreement with the U.S. Navy which owns the land. Water flows from an aquifer at Waiawa and from an aquifer at Honouliuli. Both units drain into Pearl Harbor.

Honouliuli Unit wetland has slightly brackish impoundments that contain a variety of plants including sedges such as Makai, Manyspike flatsedge, Java sedge, Bent spikerush; cattail; and grasses such as Knotgrass and Sprangletop. Other plant species found include Saltwort, Indian marsh fleabane, and Water hyssop (*Bacopa monnieri*). Dikes are gravel-covered with little vegetation on them. Within one of the impoundments a large coral mound rises about 10 feet from the bottom. This coral "rock" is the highest relief on the unit. Relatively flat, undulating bottom topography is dotted with small nesting islets.

The Waiawa Unit has wetlands that are more brackish to hyper saline resulting in a restricted suite of plants compared to the Honouliuli Unit. Predominant plants within the Waiawa wetlands are Makai, Cattail, Saltwort, and Indian marsh fleabane. The earthen dikes are covered with gravel and contain a variety of weedy plants and Bermuda grass (*Cynodon dactylon*). Adjacent uplands are dominated by weedy grasses with a few Kiawe trees.

STATUS OF SPECIES

Six federally listed species, the Hawaiian stilt (*Himantopus mexicanus knudseni*), Hawaiian coot (*Fulica alai*), Hawaiian moorhen (*Gallinula chloropus sandvicensis*), Hawaiian duck (*Anas wyvilliana*), Akoko (*Chamaesyce skottsbergii* var. *skottsbergii*), and the Ewa Hinahina (*Achyranthes splendens* var. *rotundata*) are located in or adjacent to the affected areas.

The James Campbell and Pearl Harbor NWR's have traditionally supported higher numbers of endangered waterbirds than most wetlands on Oahu as a direct result of intense management directed at these species. During the first six months of 2007, numbers of listed waterbirds remained significant and consistent with recent years.

James Campbell NWR supported a monthly average of 101 Hawaiian stilt with a peak of 124 individuals, while coots averaged 250 peaking at 302 individuals, and moorhen averaged 59 with a peak of 69 individuals counted during refuge surveys. Hawaiian duck field identification is difficult at best, making reliable counts difficult to impossible. At best there are only 1-2 birds on the refuge that resemble Hawaiian ducks and their identification cannot be guaranteed due to the extensive hybridization between mallards and Hawaiian ducks.

Pearl Harbor NWR supported a monthly average of 57 Hawaiian stilt with a peak of 116 individuals, while coots averaged 83 peaking at 213 individuals, and moorhen averaged 2 with a peak of 2 individuals counted during refuge surveys. As with James Campbell NWR, Hawaiian duck field identification is difficult at best, making reliable counts difficult to impossible.

A state species of concern, the Short-eared owl (*Asio flammeus*), is also found within the proposed area. This species can be found in low numbers scattered throughout suitable habitat on Oahu. Within the affected area this species is regularly documented on the James Campbell NWR and rarely observed on the wetland units of the Pearl Harbor NWR.

The two endangered plant species Akoko and Ewa Hinahina can be found in or adjacent to the proposed affected areas in viable numbers. Ongoing restoration activities are aimed at improving population numbers.

TREATMENT

The application of *Aquamaster* will be used to control undesirable vegetation that encroaches into endangered species habitat, create suitable open water with interspersed vegetation, maintain suitable wetland successional stages for endangered waterbirds and other migratory waterbird species, control undesirable vegetation along refuge fence lines and around refuge support/operational structures, and reduce predator concealment cover on refuge units to enhance the potential for increased endangered waterbird nest, young, and adult survivability.

In addition to the application of *Aquamaster*, spraying and burning or spraying and mowing the dead vegetative residue will be used as a mechanism to maintain interspersion and return nutrients to the soil. This in turn promotes the invertebrate prey base needed by many of the waterbirds that utilize the refuge. For applications near fence lines and around refuge support/operational structures, prescribed burning will not be used. Control is accomplished by spraying then mechanically removing vegetation or reducing vegetative biomass by mechanical methods followed by spraying, according to the manufacturer's instructions, to retard rapid regrowth in these areas. The intent is to maximize longevity of refuge property and assist refuge staff in maintaining vegetation at manageable levels within the Complex.

To avoid impact to sensitive habitat and species, herbicide application will be accomplished during low-level nesting periods of Hawaiian coots, moorhens, ducks, and stilts. Areas of known nests and broods will not be sprayed. Herbicide application will occur only when winds do not exceed 10 miles per hour (mph) as measured immediately prior to initiation of application. Application will not begin if it is apparent rain will occur before the time required for herbicide to be absorbed by vegetation per label information and guidance. Care will be taken to protect suitable habitat, not intended to be altered, removed, or killed by herbicide. Application shall be terminated, if during spraying, winds exceed the 10 mph level for a sustained period. Herbicide will be applied by trained refuge personnel using proper protective gear. Application will be by ground methods only and will

utilize a low pressure trailer mounted tank sprayer and a backpack sprayer. Application, in many cases, will be spot treatment directly on the individual invasive plant species. Label application and safety precautions and recommendations will be followed.

Personnel applying *Aquamaster* will be trained to identify all threatened and endangered species within the area and to avoid those species during the application process. Known nest and brood locations will be conveyed to the applicator(s) prior to initiation of spraying. If during application a nest unknown previously is discovered spraying will immediately cease and the Refuge Biologist will be notified. Application of Garlon *3A* will enhance opportunities for endangered and native plant species to regenerate and increase population numbers and reduce the competition from invasive plant species.

DETERMINATION

The U.S. Fish and Wildlife Service has determined that the proposed application of this herbicide as previously described is not likely to adversely affect listed species and their habitat pursuant to Section 7 of the Endangered Species Act. The proposed application is in accordance with recovery action 1.3.2 *"Manage vegetation to maximize nesting success, brood survival, food availability, and recruitment of waterbirds"* indicated in the **Second Draft Revised Recovery Plan for Hawaiian Waterbirds, 2nd Revision,** May 2005.

Questions should be directed to Michael Silbernagle, Acting Refuge Manager, Oahu NWR Complex (Tel. 808/637-6330 ext. 23).

Submitted by: Michael D. Silbernagle Date: 9/15/2008
Michael D. Silbernagle, Acting Refuge Manager
Oahu NWR Complex

Approved: Jerry Leinecke Date: 09/17/08
Jerry Leinecke, Deputy Project Leader
Hawaiian and Pacific Islands NWR Complex

Concur: Barry W. Stieglitz Date: 9/17/08
Barry Stieglitz, Project Leader
Hawaiian and Pacific Islands NWR Complex

Kii Herbicide Application Map
Fence perimeter = 4,773 linear feet
A
B
B Ditch
Hospital Ditch
Outlet Ditch
E
Blind Ditch
Cmakai
Cmauka
Punamano Ditch
D
Fmakai
Fmauka
G
0 200 400 800 Feet
N
E
S
W

Punamano Herbicide Application Map
(Lease to Fee +~80)
N
W
E
S
North
4.5 acres
South1
2.8 acres
South2
0.4 acres
Area = 125.6 acres
New Perimeter = 11,582 ft (2.2 mi.)
Perimeter:
North = 2,677 ft.
South1 = 2,063 ft.
South2 = 592 ft.
Total Fee = 11,582 ft.
0 250 500 1,000 Feet

Honouliuli Herbicide Application Map
1,970 ft.
P1 perimeter
P1
5.2 acres
1,128 ft.
Ditch perimeter
0.6 acres
3,389 ft.
P2 perimeter
0.2 ac.
P2
14.1 acres
Fence perimeter = 4,773 linear feet
0 75 150 300 Feet

Waiawa Herbicide Application Map
N
W
E
S
Mauka Perimeter
2,920 ft.
Mauka
13.0 acres
5.9 acres
Mangrove Perimeter 2,054 ft.
Makai
6.3 acres
Fence Perimeter = 4,027 linear feet
Makai Perimeter
2,040 ft.
0 75 150 300 Feet

Kalaeloa Herbicide Application Map
N
W
E
S
Unit Size
37.5 acres
Fence perimeter = 5,607 linear feet
0 75 150 300 Feet

INTRA-SERVICE SECTION 7 EVALUATION FORM
CONSULTATION/CONFERENCE/CONCURRENCE

Origination Person: Johnny Beall

Date: August 9, 1993

I. Region 1: Portland, OR

II. Service Activity:
Prescribed burning as a marsh vegetation management technique on units of the O'ahu National Wildlife Refuge Complex.

III. A. Listed species and/or their critical/essential habitat

1. Within the action that will be or may be affected:

Hawaiian stilt (*Himantopus mexicanus knudseni*), Hawaiian coot (*Fulica americana alai*), Hawaiian moorhen (*Gallinula chloropus sandvicensis*), and Hawaiian duck (*Anas wyvilliana*). Wetland impoundments and adjacent Refuge areas.

2. Within the action area that will not be affected:

B. Proposed species and/or proposed critical habitat.

1. Within the action that will be or may be affected: NONE

2. Within the action area that will not be affected: NONE

IV. Geographic area or station name and action.

Areas within the Oahu National Wildlife Refuge Complex consisting of wetland refuges on the island of O'ahu (James Campbell NWR [Kii and Punamano Units] and Pearl Harbor NWR [Honouliuli and Waiawa Units]; Moloka'i (Kakahai'a NWR); and Maui (Kealia Pond NWR).

V. Location (attach map):

Figures 1-4 show location of James Campbell, Pearl Harbor, Kakahai'a, and Kealia Pond NWRs, respectively.

A. County and State:

All units of this complex are located in the state of Hawai'i.
James Campbell and Pearl Harbor NWRs are located in the County of Honolulu.
Kakahai'a and Kealia Pond NWRs are in Maui County.

B. Section, township, and range:

James Campbell NWR:	Latitude 21° 41'N; Longitude 157° 57'W.
Pearl Harbor NWR:	Latitude 21° 23'N; Longitude 157° 59'W.
Kakahai'a NWR:	Latitude 21° 04'N; Longitude 156° 57'W.
Kealia Pond NWR:	Latitude 20° 48'N; Longitude 156° 29'W.

C. Distance and direction to nearest town:

James Campbell NWR:	Kii Unit is located approximately 3/4 mile northwest and Punamano Unit 2 miles northwest of the town of Kahuku.
Pearl Harbor NWR:	Honouliuli Unit is about 1 mile south of Waipahu. The Waiawa Unit is about 3/4 mile from Pearl City to the northeast and Waipahu to the northwest.
Kakahai'a NWR:	Located approximately 3.5 miles southeast of Kamiloloa.
Kealia Pond NWR:	Located about 1 mile northwest of Kihei.

VI. Action Objectives:

Prescribed burning will be conducted on these wetlands refuges as a means of controlling noxious and exotic vegetation that interferes with nesting and maintenance of endangered and other waterbirds. Control of establishment and spread of these species is required to provide secure, viable, adequate habitat for endangered waterbirds, migratory waterfowl and shorebirds. Specific goals include: providing open water areas interspersed with escape, nesting, and maintenance cover; limiting predator cover and access, providing mudflat areas for nesting (stilts) and feeding, and promotion of desirable wetland plant species with water areas for Hawaiian coot, Hawaiian moorhen, and Hawaiian duck nesting and maintenance.

VII. Explanation of impacts of action:

This action will result in enhanced wetlands for endangered and other species using the Refuge. Undesirable plant species will be controlled encouraging growth of more beneficial species. Dense predator concealment cover will be reduced making it more difficult for predators to prey on endangered species and allow waterbirds to detect predators at a greater distance, reducing predation. Increased habitat for a multitude of species both resident and migratory will be made available. The ratio of open water to vegetation will be altered to provide additional habitat diversity within wetland impoundments.

All burns will be conducted outside major endangered species nesting seasons. Burns will normally be conducted between August and mid-October. Burns will not be initiated when prefledgling birds are present. A check of each burn site will be made to determine the presence of waterbirds, young, and or nests. If any of the above are discovered, no burning in that area of the pond will be undertaken. To provide necessary foraging habitat while burning, not all ponds/impoundments will be drawn down or dry at the

same time. Wetland habitat on the Refuge will continue to be provided for endangered and other waterbirds to utilize until worked ponds are reflooded.

VIII. Effect determination and response requested:

A. Listed species/critical/essential habitat:

Determination	Response Requested
_____ will not affect	_____ *concurrence
_____ beneficial affect	_____ concurrence _____ *formal consultation
_____ is not likely to adversely affect	_____ concurrence _____ *formal consultation
_____ is likely to adversely affect	_____ formal consultation

B. Proposed species/proposed critical habitat:

Determination	Response Requested
_____ will not affect	_____*concurrence
_____ beneficial affect	_____ *concurrence
_____ is not likely to adversely affect	_____ *concurrence
_____ is likely to adversely affect	_____ formal consultation
_____ is likely to jeopardize/adverse modification of critical habitat	_____ conference

REMARKS:

*optional

SECTION 7 EVALUATION

Johnny N. Beall — 7-9-93

REFUGE MANAGER — DATE

OAHU NATIONAL WILDLIFE REFUGE COMPLEX — 7/12/93

Comments:

Ray Rauch — 7/12/93

PROJECT LEADER, HAWAIIAN AND PACIFIC ISLAND NATIONAL WILDLIFE REFUGE COMPLEX — DATE

Comments:

Robert P. Smith — 7-13-93

FIELD SUPERVISOR, PACIFIC ISLANDS OFFICE — DATE

Comments:

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Oahu National Wildlife Refuge Complex
66-590 Kamehameha Highway, Room 2C
Haleiwa, HI, 96712
Phone: (808) 637-6330 FAX: (808) 637-3578

MEMORANDUM

Date: March 24, 2009

To: Files

From: Michael D. Silbernagle, Supervisory Wildlife Biologist, Oahu National Wildlife Refuge Complex

Subject: Amendment of Biological Opinion for Special Use Permit (12510-FY 08-01) Avian Influenza Surveillance Sampling within Oahu National Wildlife Refuge Complex and Maui National Wildlife Refuge Complex

The Avian Influenza (AI) surveillance program is a multi agency effort in the Hawaiian and Pacific Islands. Representatives of the U.S. Fish and Wildlife Service (Service), U.S. Geological Survey, U.S. Department of Agriculture, and Hawaii Department of Land and Natural Resources are working together to sample species that may be vectors for the disease. Swim in traps are being utilized on James Campbell National Wildlife Refuge (NWR) and Maui NWR within the State of Hawaii. The Service completed a special use permit (12510-FY 07-01) and issued a Biological Opinion under Section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq.*), as amended (Act) on December 22, 2006. The Biological Opinion amended January 9, 2008 issued take (harass) levels in the form of capture of not more than; Hawaiian moorhen (50 individuals), Hawaiian coot (525 individuals), Hawaiian duck (50 individuals) and Hawaiian goose (20 individuals) and take (harm) in the form of injury or death of not more than; Hawaiian moorhen (1 individual), Hawaiian coot (1 individual), Hawaiian duck (1 individual) and Hawaiian goose (1 individual) which may occur annually for the duration of this AI surveillance action.

The January 8, 2008 amendment followed issuance of the second Special Use Permit (12510-FY 07-02) which was issued on July 3, 2007, for AI surveillance between October 2007 and May 2008. Based on an increased capture rate (increased trap numbers - six at James Campbell NWR and five at Hanalei NWR) of four coots per trap day which occurred during an extended trapping season of FY 2007, Hawaiian coot take authorization was adjusted in order to avoid exceeding the allotted take numbers. A third Special Use Permit (12510-FY 08-01) was issued for AI surveillance to begin September 2, 2008 and last through March 31, 2009 the designated end of trapping season. Operations were discontinued for trapping at Kauai NWRC and efforts were transferred to Maui NWRC in FY 2009. The project description was the same as the prior

seasons, the Biological Opinion and amended take limits and associated terms and conditions were applicable to this current AI sampling season (FY 2009) so no further consultation was deemed necessary. On March 20, 2009 Hawaiian coot capture numbers reached 512 individuals. Ninety six trap days using six to seven traps at James Campbell NWR; Kii unit, and 86 trap days using six traps at Kealia Pond NWR accounted for capture rate of nine coots per day. Hawaiian coots take authorization will be adjusted in order to avoid exceeding the allotted take numbers for the continuation of the FY 2009 AI season.

STATUS OF THE SPECIES

Updated status information for these four listed waterbird species can be found in the following:

U.S. Fish and Wildlife Service, 2005. Draft Revised Recovery Plan for Hawaiian Waterbirds, Second Draft of Second Revision. U. S. Fish and Wildlife Service, Portland, Oregon. 155p.

U.S. Fish and Wildlife Service, 2004. Draft Revised Recovery Plan for Hawaiian Goose, First Revision. U. S. Fish and Wildlife Service, Portland, Oregon. 148p.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined (50 CFR 17.3) by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service (50 CFR 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the Service so that they become binding conditions in order for the exemption in section 7(o)(2) to apply. The Service has a continuing duty to regulate the activity covered by this incidental take statement. If the Service (1) fails to assume and implement the terms and conditions or (2) fails to require any contractors to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to any permit or contract, then the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Service must report the progress of the action and its impact on the species to the Refuge Manager as specified in the incidental take statement [50 CFR § 402.14(i)(3)].

Avian Influenza Program Section 7 Amendment

Amount or Extent of Take

This amendment to the Biological Opinion anticipates the following forms of incidental take: The Service anticipates that take will occur in the form of harassment (due to the potential capture in traps), and potential injury or death may result because of Service's activities described in this amendment and the Biological Opinion.

Based on current capture rates, the Service anticipates that take (harass) levels in the form of capture of not more than; Hawaiian moorhen (50 individuals), Hawaiian coot (750 up from 525 individuals), Hawaiian duck (50 individuals) and Hawaiian goose (20 individuals) and take (harm) in the form of injury or death of not more than; Hawaiian moorhen (1 individual), Hawaiian coot (1 individual), Hawaiian duck (1 individual) and Hawaiian goose (1 individual) may occur annually for the duration of this action.

The Service will not refer the incidental take of any migratory bird for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §703-712), if such take is in compliance with the terms and conditions specified herein

The increased level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat. Reasonable and prudent measures and terms and conditions of the Biological Opinion dated December 22, 2006, and amendments dated March 17, 2007, and January 9, 2008, will continue to be adhered to.

Submitted by: Michael D. Silbernagle Date: 3/24/2009
Michael D. Silbernagle, Supervisory Wildlife Biologist, Oahu NWRC

Concurred by: Date: 3/24/09
Dave Ellis, Refuge Manager Oahu NWRC

Approved by: Barry W. Stieglitz Date: 3/24/09
Barry W. Stieglitz, Project Leader, Hawaii and Pacific Islands NWRC