Determination of Non-Impairment

Mālama ʻAimakapā: ʻAimakapā Fishpond Wetlands Restoration Management Plan

National Park Service (NPS) *Management Policies 2006* (§1.4) requires analysis of potential effects to determine whether or not proposed actions would impair a park's resources and values. The fundamental purpose of the national park system, established by the *Organic Act* and reaffirmed by the *General Authorities Act*, as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values. However, the laws do give the NPS the management discretion to allow impacts on park resources and values when necessary and appropriate to fulfill the purposes of the park. That discretion is limited by the statutory requirement that the NPS must leave resources and values unimpaired unless a particular law directly and specifically provides otherwise.

The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values (NPS *Management Policies 2006*). Whether an impact meets this definition depends on the particular resources that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts.

An impact on any park resource or value may, but does not necessarily, constitute impairment. An impact would be more likely to constitute impairment when it affects a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park, or
- key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or
- identified in the park's general management plan or other relevant NPS planning documents as being of significance.

An impact is less likely to constitute impairment if it is an unavoidable result of an action necessary to preserve or restore the integrity of park resources or values and it cannot be further mitigated. Impairment may result from visitor activities, NPS administrative activities, or activities undertaken by concessioners, contractors, and others operating in the park. Impairment may also result from sources or activities outside the park.

Description of Park Purpose and Significance

Kaloko-Honokōhau National Historical Park (Kaloko-Honokōhau NHP or the Park) was authorized in 1978 by Public Law 95-625:

> "In order to provide a center for the preservation, interpretation, and perpetuation of traditional native Hawaiian activities and culture, and to demonstrate historic land use

patterns as well as to provide a needed resource for the education, enjoyment, and appreciation of such traditional native Hawaiian activities and culture by local residents and visitors, there is established the Kaloko-Honokōhau National Historical Park…."

The legislation further states, "The Secretary shall administer the park… generally in accordance with the guidelines provided in the study report entitled "*The Spirit of Kaloko-Honokōhau*" prepared by the Honokōhau Study Advisory Commission and the National Park Service, May 1974, GPO 690-514."

Regarding ʻAimakapā, the Honokōhau Advisory Commission Study Report states:

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PRESERVATION PLAN

RECOMMENDATIONS

1. The fishponds and their immediate surroundings should be restored, as nearly as possible, to the conditions that existed before the introduction of foreign influences.

2. A monitoring system should be established for water quality in offshore areas as well as inland water bodies such as springs, wells, and fishponds.

5. The area's remnant Hawaiian ecosystems should be protected from further depreciation and competition by exotic plants and animals.

6. The natural environment should be preserved by protecting outstanding environmental and scenic features and by maintaining the ecological balance of the area.

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Good water quality is essential to fishpond culture, and since the source is almost entirely in the rainy *mauka* areas, management of these and other lands adjacent to the park will have a direct impact on water resources within the park. Thus, cooperative planning efforts with the state, county, and private landowners is an important part of this proposal.

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A program will be established to restore existing historic sites within these [fishpond] complexes as nearly as possible to their original appearance for the function they fulfilled. The fishponds, particularly ʻAimakapā, were historically larger than they are today. Ka-loko will be cleaned of overgrowth and the *mākāhā* (sluice gates) rebuilt to allow the tides to flow evenly into and out of the pond. Its *kuapā*, the largest and thickest man-made sea wall on the Island of Hawaiʻi, is still somewhat intact but has been damaged over the years and will require repair. The overall intent of the program

will be to make the fishpond and numerous surrounding sites, which were part of the fishpond culture, functional once again.

ʻAimakapā will be restored to the extent at which it will not have an adverse effect on the wildlife that presently inhabits the pond. Further historical research will be necessary to determine what place wildlife such as the *āeʻo* (Hawaiian stilt), *koloa* (Hawaiian duck), and the *ʻalae-keʻokeʻo* (Hawaiian coot) actually had in the fishpond during historic and prehistoric times.

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On-Site

The acquisition and development of Ka-loko, Hono-kō-hau by the National Park Service will allow direct management control over on-site resources. Among other things, this will enable the National Park Service to:

1. Control uses of park lands and adjacent waters;

2. Implement preservation and restoration projects, including (a) the restoration and operation of the fishponds and other historic features; and (b) the re-establishment of the area's endemic plant and animal species;"

The 1994 *Kaloko-Honokōhau National Historical Park General Management Plan/EIS* provides for the implementation of the guidance for the restoration of ʻAimakapā (pages: 39, 41, and 66).

Impairment Determinations for the Selected Alternative

Impairment determinations are not necessary for non-resource topics such as Visitor Experience and Safety because visitor experience and safety are not generally considered to be park resources or values and cannot be impaired the same way that an action can impair park resources and values. The topics analyzed in the EA that have been evaluated for impairment are: Geology, Soils, and Topography; Special Status Species; Wildlife; Vegetation; Water Resources and Wetlands; and Cultural Resources.

Geology, Soils, and Topography

ʻAimakapā is a naturally-formed *loko puʻuone*, a fishpond separated from the sea by a sand berm. Two lava flows border ʻAimakapā and the barrier white-sand berm, Honokōhau Beach, isolates ʻAimakapā from the ocean on the seaward side. The Park's oldest lava flow (5,000 to 10,000 years ago) forms the underlying permeable pāhoehoe substrate and shorelines for ʻAimakapā Fishpond. A narrow finger of younger aʻa lava (2,200 to 2,300 years old) overlooks the landward edge of ʻAimakapā Fishpond. Honokōhau Beach forms a natural barrier between ʻAimakapā Fishpond and the ocean and is the Park's largest sandy beach.

ʻAimakapā is shallow, 2-6 ft deep and about 5-ft deep in most areas. Evidence suggests that ʻAimakapā Fishpond was formed through the combined action of land subsidence and shoreline depositional processes that formed a barrier spit across the mouth of the fishpond. Although it is

also possible that a constructed sea wall exists beneath the barrier beach, data from a magnetic study of the berm indicate that the barrier beach is natural and there is no manmade wall beneath it. No excavations of the berm have been conducted.

Because of the relatively young age of the lava flows and the low rainfall, soil development within the Park is minimal, limited to pockets in the pāhoehoe lava, where eolian deposits of silt, volcanic ash and dust, and shoreline vegetation-derived organic humus accumulate. Terrestrial sediments generally are not present along the Park's shoreline. ʻAimakapā Fishpond's sediments are comprised of silty, flocculent anaerobic mud. Sediment accumulation ranges from 0 to 59 inches with the deepest accumulations in the far northeastern side of the pond. Reductions in pond water-area in recent times have resulted primarily from infilling by locally generated sediments and overgrowth by nonnative vegetation. Mike Kolman (Soil Scientist for the Natural Resources Conservation Service) field-sampled the newly formed soils within the 18-ac, nonnative, paspalum grass community and described a new soil series that was recently (within the previous 10 years) created by the filtering action of the fibrous above-and-below-ground biomass of the paspalum grass structure.

Implementation of this restoration project will not alter the existing fishpond hydrologic conditions. There will be minor impacts from repeated surface disturbance and compaction on wetland soils, existing park trails and pahoehoe lava flats from crews accessing restoration areas on foot and from equipment: e.g., mini-excavator, remote access amphibious vehicle (RAV), and utility vehicles (UTV) during treatment and removal of materials from the site. To minimize impacts, protective mats and/or other surfaces (geo-textile material covered with three to six inches of wood chips), will be used to protect substrates when transiting equipment, and temporary trail areas will be reseeded and restored upon completion. If the use of wetlands-approved herbicide is deemed necessary under integrated pest management (IPM) protocols, the selective use of wetlands-approved herbicide to treat nonnative plant infestations would produce minor adverse impacts to soils. Wetlands-approved herbicides have a brief half-life, especially in tropical climates, and they have a limited ability to move through the soil. Active restoration of native vegetation on previously infested sites will result in return to natural hydrologic conditions and nutrient cycling at ʻAimakapā. Ultimately, nonnative fish will be controlled as part of the long-term restoration and management of ʻAimakapā Fishpond and wetland following a separate environmental review of specific control methods. Nonnative fish removal will return the pond sediments to a more natural state. Although there may be minor temporary impacts to the Park's geologic features and soils during this restoration project, once completed the ecological integrity of ʻAimakapā Fishpond and its wetlands will be restored. Therefore, the implementation of this project will not result in the impairment of geologic features, topography, or soils.

Water Resources and Wetlands

Kaloko-Honokōhau NHP is located at the coastal edge of the local watershed. No surface water streams or intermittent streams exist within the Park or in the immediately surrounding area. Groundwater is a critical park resource, supplying freshwater to a variety of ponds and pools. Groundwater inputs to Park resources alter the salinity and temperature of receiving waters (ponds, pools, marine waters), and add nutrients and other dissolved constituents. Groundwater

occurs a few feet above sea level within the Park and is composed of brackish water overlying saltwater in a highly permeable volcanic-rock aquifer. Ultimately, groundwater discharges to the coastal Hawaiian fishponds and anchialine pools in the Park, and to the ocean, delivering nutrients and establishing estuarine-like conditions in the coastal nearshore waters. All water resources in the Park are vulnerable to contamination from human activities and saltwater intrusion.

ʻAimakapā Fishpond (approximately 30 ac), is brackish, with no direct connection to the sea and exchanges of water through the barrier beach are very low. Locations of groundwater influx into the pond are visibly evident along the eastern *mauka* (inland) edge and at seeps on the shoreline. *ʻAuwai* (channels) at the north and south ends of the barrier beach are now filled with sand, but likely the pond had greater exchange with the ocean water when it was in use as a fishpond in historic times. Within the fishpond, secondary walls form separated areas where fingerlings were raised and/or where different species of fish were kept. The Park's wetlands, including ʻAimakapā, comprise about 4% of the parklands.

Natural and artificial processes, including the invasion of nonnative vegetation that dominates some areas today, have altered the ʻAimakapā wetland habitat. Large-scale tree removal of nonnative red mangrove (*Rizophora mangle*) and *kiawe* (mesquite; *Prosopis pallida*) was completed around the fishpond in the 1990s. In 1998 it was observed that although Park wetlands were invaded by nonnative vegetation, some areas of native marsh remained, which supported native species and comprised some of the best wetlands remaining in the state at that time. Up until the late 1990s, Aimakapā Fishpond, and their adjoining wetlands have provided important waterbird habitat. Because of the history of bird-census data showing use of wetlands by abundant numbers of listed bird species, the US Fish and Wildlife Service (USFWS) identified ʻAimakapā as a "core wetland" in its recovery plan for the endangered Hawaiian coot and the endangered Hawaiian stilt. To recover Hawaiʻi's waterbirds, it is crucial that ʻAimakapā wetlands do not become dominated by nonnative species that lead to the wetlands filling in and no longer having open water. A review of historical photographs of ʻAimakapā reveals a gradual and extensive reduction in open water and mud flat area through encroachment of emergent vegetation, with a steady increase in upland and invasive plant species in the marsh flats.

Tidal flat and brackish estuarine wetlands, which provide critical trophic and habitat support for culturally important native fish, shellfish, and migratory birds, are particularly susceptible to change through nonnative flora and fauna invasion. The vascular plants that invaded the ʻAimakapā mud-flat areas have dramatically altered the abundance, community composition, and diversity of sediment microbe and animal communities; and therefore changed the flow of organic matter, energy, and nutrients. Essentially, the invasion of vascular plants has shifted the algae-based food web to a detritus-based food web. This trophic-level shift has resulted in the loss of basic support for the native fish and shorebirds by reducing the type and amount of species that were consumed by the higher trophic-level species. Therefore, removing the invasive, nonnative plants improves both the wetland habitat and native fish habitat.

In addition to the two fishponds, more than 180 anchialine pools have been identified within the Park, representing approximately 25% of pools estimated to occur in the state. Anchialine pools

are small brackish coastal pools that lack a surface connection to the ocean but are hydrologically connected to groundwater and the ocean through the permeable aquifer. These anchialine pools are significant biological and cultural resources within the Park, and are home to unique, endemic flora and fauna including three invertebrates, which are candidates for listing as endangered or threatened by the USFWS. Anchialine pools within the ʻAimakapā project area occur both inside and outside the delineated wetland. Anchialine pools adjacent to ʻAimakapā Fishpond occur in very flat pahōehōe and are unusual in their shallowness and strong tidally driven surface area and salinity fluctuations.

Park inland waters are in relatively good condition; however, they are at risk of degradation from nonpoint source pollution. The approximately 600 ac of marine waters within the legislative boundary of Kaloko-Honokōhau NHP are under the jurisdiction of the United States. The Park marine waters are classified by the state as Class AA, which are "waters to remain in their natural pristine state as nearly as possible with an absolute minimum of pollution or alteration of water quality from any human-caused source or actions." (HAR §11-54-3(c)(1)). Hawaiʻi Administrative Rules also require that "*where high quality waters constitute an outstanding national resource, such as waters of national and state parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected*." Waters off Honokōhau Beach do not meet State of Hawaiʻi water quality standards for total nitrogen, total phosphorous, turbidity, nitrate-nitrite, ammonium, and phosphate.

Removal of nonnative wetland-plants will improve ʻAimakapā wetlands, anchialine pools, and water quality by decreasing nutrient input resulting from the decay of nonnative plant biomass. Removal will also increase open water and improve wetland hydrology towards a more naturally functioning system. Ground disturbance and loosening of roots and sediment during plant removal could potentially contribute to water turbidity and impact water quality in ʻAimakapā and wetland-associated anchialine pools. However, these effects will be temporary and would be minimized by Best Management Practices (BMP), such as turbidity silt screens and vegetation buffers that prevent sediment release to water.

If the use of wetlands-approved herbicide is deemed necessary under IPM protocols, impacts to water quality would be short-term, and negligible. Due to their rapid degradation in water and sunlight via hydrolysis and photolysis, wetlands-approved herbicides rapidly dissipate from water in several days. High-accuracy, direct application methods would be used to minimize or prevent overspray, and herbicide-specific BMPs would be followed.

To minimize risk of leaks and spills of fuels and lubricants, machinery would be cleaned and inspected prior to initially entering the site, and proper planning (a Spill Plan) and BMPs (e.g., drip pans, absorbent mats, biodegradable lubricants where possible, daily maintenance checks, and proper standard storage and transportation safety procedures for such fluids) will be used.

Because increases in turbidity and nutrients resulting from vegetation removal will be minor and of short duration and because best management practices will be used, and because the ʻAimakapā Fish Pond and its associated wetlands and anchialine pools will be restored to a more natural state, this project will not result in the impairment of Park water resources and wetlands.

Special Status Species

Thirteen species in the Park are listed as "threatened" or "endangered" under the ESA and three are considered "candidates" for listing (however, the status of these candidates is being revised by the USFWS). The endangered Hawaiian duck, has never been confirmed as sighted within the Park's wetlands. Listed species that could be affected by projects occurring at ʻAimakapā Fishpond and its immediate vicinity include Hawaiian coot (*Fulica alai*) and Hawaiian stilt (*Himantopus mexicanus knudseni*), Hawaiian hoary bat (*Lasiurus cinereus semotus*), Hawaiian monk seal (*Neomonachus schauinslandi*), and Hawaiian green sea turtle (*Chelonia mydas*).

Hawaiian coot

The endangered Hawaiian coot is endemic to the Hawaiian Islands. Historically, this waterbird was likely common in large natural marshes and ponds, and in wetlands of constructed taro fields and fishponds. Hawaiʻi Island has few wetlands that support coots, and the island supports a small breeding population of less than 100 birds. ʻAimakapā is considered core wetlands for the recovery of the Hawaiian coot population. Hawaiian coots breed year-round with peak breeding activity at ʻAimakapā April through July. Coot nesting and reproductive success at ʻAimakapā have declined since the early 1990s, with no nests recorded during monthly surveys in 2006 and 2010-2011 and no fledging chicks recorded between 2003 and 2012. Possible reasons for this decline include nests and fledging chicks may have been missed during surveys, inconsistency of predator control effort, and declining suitable breeding habitat at ʻAimakapā while the development of the nearby Kealakehe wastewater treatment plant provided new, non-natural nesting habitat. Water salinity appears to be important in coot habitat selection. Hawaiian coots prefer freshwater areas over brackish for nesting and are rarely found in saline habitats; likely because coots may be limited to freshwater by an inability to excrete excess salt at an efficient rate. Additionally, salinity fluctuations may affect food availability for adults and chicks. Coots prefer open water, interspersed with emergent plants, that is less than 1-ft deep for foraging, but they can dive in water up to 4-ft deep. Coots obtain food near the water's surface and dive for aquatic plants (seeds and leaves) and invertebrates (including snails, crustaceans, and insects) and small fish. Threats to the Hawaiian coots include loss of wetland habitat, introduced predator species, altered hydrology including increased salinity, habitat alteration by nonnative plants, disease (especially avian botulism), and environmental contaminants. In the Park, Hawaiian coots may be preyed on by introduced predators, including cats, mongooses, rats, native and nonnative large fish, and cattle egrets (*Bubulcus ibis*), and predator control has a positive effect on reproductive success of both waterbird species at ʻAimakapā. The indigenous black-crowned night heron (*Nycticorax nycticorax hoactli*) may also be a predator of chicks. The USFWS considers Hawaiian coots as having high potential for recovery. The State population averages approximately 2,000 birds with a long-term slightly increasing population trend overall. Criterion #1 for downlisting the Hawaiian coots is, "*All core wetlands [including ʻAimakapā] are protected and managed in accordance with the management practices outlined in [the] recovery plan*." Disturbance to Hawaiian coots from human activity, including work crews, volunteer work groups, cultural practitioners, UTVs, gas-powered tools, machinery, and helicopter flight used near birds and nesting birds may result in short-term impacts to

individuals. Helicopter operations would avoid water and wetland areas, and would not land in the Project Area.

The NPS has consulted with USFWS and has obtained an incidental take permit under the Endangered Species Act to carry out restoration actions year-round, including the breeding season. As a result of this proposed project, the USFWS anticipates that up to two Hawaiian coot nests (nest or nest with eggs) annually, or a total of thirty over the 15-year project duration, may be incidentally taken due to nest abandonment or egg death, and that annually, up to two newly-hatched Hawaiian coot chicks may be harassed to the level of harm. It is the USFWS's biological opinion: 1) the effects of the proposed action are not likely to jeopardize the continued existence of the Hawaiian coot; and 2) the Hawaiian coot population is stable or increasing statewide, and the project is expected to have an overall beneficial effect on the species. Based on the USFWS's biological opinion we have determined this project will not lead to the impairment of Hawaiian coots.

Hawaiian stilt

The endangered Hawaiian stilt is an endemic subspecies of the black-necked stilt. Although populations have been stable for several decades, they remain at very low levels. The Kona Coast supports the largest number of Hawaiian Stilts on Hawai'i Island, and 'Aimakapā is considered a core wetland for the Hawaiian stilt population recovery. Stilts breed at 'Aimakapā February through September with a peak from March through July. Nesting and successful reproduction at 'Aimakapā has declined since the early 1990s, with no nesting recorded in 2006 and in 2009 to 2011, and no fledging chicks recorded between 2003 and 2013. Possible reasons for the decline include nests and fledging chicks may have been missed during surveys, inconsistency of predator control effort, and declining suitable breeding habitat at 'Aimakapā while the development of new areas (e.g., Cyanotech Corp. and the Kealakehe wastewater treatment plant) provided non-natural nesting habitat. Adult stilts use habitats with a range of salinities, but they nest more often and more successfully in freshwater. Hawaiian Stilts generally nest in areas of low cover with low-growing vegetation combined with freshly exposed mudflats and, in 'Aimakapā, on islands or rock walls. Stilts are wading birds, feeding in shallow water up to about breast height. Chicks will swim from nest islands to foraging areas. Hawaiian Stilts opportunistically feed on a wide variety of aquatic invertebrates (including water boatmen, beetles, brine fly larvae, polychaete worms, crabs) and small fish, which are an important part of their diet. Threats to the Hawaiian Stilts include loss of wetland habitat, introduced predator species, altered hydrology, habitat alteration by nonnative plants, disease (especially avian botulism), and environmental contaminants. In the Park, Hawaiian Stilts may be preyed on by introduced cats, mongooses, rats, cattle egrets, native and nonnative large fish, and indigenous black-crowned night heron. Predator control has a positive effect on reproductive success of both waterbird species at 'Aimakapā. The USFWS considers Hawaiian Stilts as having high potential for recovery. Statewide population estimates fluctuate between approximately 1,100 and 2,100 birds. Criterion #1 for downlisting the Hawaiian Stilts is, "*All core wetlands [including 'Aimakapā] are protected and managed in accordance with the management practices outlined in [the] recovery plan.*" Disturbance to Hawaiian stilts from human activity, including work crews, volunteer work groups, cultural practitioners, UTVs, gas-powered tools,

machinery, and helicopter flight used near birds and nesting birds may result in short-term impacts to individuals. Helicopter operations would avoid water and wetland areas, and would not land in the Project Area.

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Hawaiian hoary bat

The endangered Hawaiian hoary bat is the only existing native terrestrial mammal known from Hawai‘i. Threats to this species include habitat loss, roost disturbance, pesticide use on prey populations (direct and indirect), barbed-wire fences, wind farms, and potentially climate change; it is unknown if disease or predation are a significant threat. Hoary bats are solitary, roosting during the day, mainly in densely leafed native and nonnative vegetation higher than 15 ft. They begin foraging either just before or just after sunset, primarily along watercourses, coastlines, and forest/pasture boundaries. This restoration project will not result in the impairment of the Hawaiian hoary bat because the timing of bat usage of the area (after sunset) does not coincide with daytime work hours, and suitable bat-roosting trees are not present in the project area.

Hawaiian monk seal

The endangered Hawaiian monk seal hauls-out onto beaches for resting, molting, giving birth or nursing. Although the monk seal is much less abundant in the main Hawaiian Islands compared to the Northwestern Hawaiian Islands, they do enter National Park waters and occasionally haul out on the shoreline to rest; potentially using ‘Aimakapā’s barrier beach for basking. Monk seals are solitary, and are threatened by human disturbance, especially mothers with pups. Pupping and nursing activity by monk seals has not been recorded within the Park. Information on the use of Park waters and shoreline by the monk seal is through opportunistic sightings rather than systematic surveys. Seventy-one opportunistic sightings have been recorded in the Park since 2003. The NPS coordinates with and reports monk seal sightings to the NOAA Fisheries. In 2015, the National Marine Fisheries Service revised Hawaiian monk seal critical habitat to include areas in the Main Hawaiian Islands. The Park's shoreline falls within the criteria essential to monk seal conservation and is included as critical habitat under the new revision.

During restoration and management actions, crews on foot, all-terrain UTVs or other equipment may traverse the beach berm to access the *makai*, southern portion of the wetlands. Occurrence of seals in the Park is rare; however, if crews on foot, by UTV or other equipment, encounter a resting monk seal when accessing the wetlands via the barrier beach berm, avoidance and minimization actions will be employed. The area occupied by the seal will be avoided and an alternate access route (from the main trail) will be used until the seal has returned to the ocean. Signs and barriers will be placed to keep visitors at distance away from a resting seal. Noise generated by the project will not affect resting seals because project noise levels will be primarily low and will generally be drowned-out by wave-action noise on the ocean side of the berm. Because of the above avoidance and minimization measures, this project will not result in the impairment of the Hawaiian monk seal.

Hawaiian green turtle

Although the Northwestern Hawaiian Islands, primarily French Frigate Shoals, continue to be the main breeding area for the Hawaiian green turtle, nesting has occurred on some beaches in the main Hawaiian Islands; however, no green turtle nesting or attempted nesting has been recorded in the Park. The Hawaiian green turtle forages on marine algae around the main Hawaiian Islands. At Kaloko-Honokōhau NHP, resident juveniles are regularly observed foraging in nearshore waters and basking on park beaches; however, mature adults have not been observed. Disease (fibropaplloma tumors), direct take, fisheries incidental take, boat collisions, and nest predation are primary threats to the Hawaiian green sea turtles. The Park is one of the few areas in Hawai‘i where green sea turtles do not have fibropapilloma tumors. The turtles can be found throughout the Park’s waters, and the main areas of use by for foraging, resting, and basking on the shore are ‘Aimakapā’s barrier beach and the ‘Ai‘ōpio Fishtrap area in Honokōhau Bay. Park beachgoers are requested to keep a distance of at least 20 ft from turtles in the water and onshore. However, in these areas many basking green turtles appear habituated to passing human foot traffic and UTV traffic. Basking green turtles encountered by crews on foot and UTV will maintain a minimum distance of 20 feet from basking green turtles. Larger equipment will not transit within 50 feet of a basking turtle, or an alternate route will be used until the individual clears the area on their own. Because of the above avoidance and minimization measures, this project will not result in the impairment of the green turtle.

Orangeblack Hawaiian damselfly

The orangeblack Hawaiian damselfly is now proposed for listing as endangered; and is associated with anchialine pool habitat in the Park, including several pools within and immediately adjacent the ‘Aimakapā wetlands. This species was once Hawai‘i’s most abundant damselfly because it utilizes a variety of aquatic habitats for breeding sites. There are numerous threats to this damselfly including past and present land use and water management practices, including agriculture, urban development, groundwater development, feral ungulates, and destruction of surface water resources.

Manual and mechanical removal of plants are not expected to impact damselfly larvae. If the use of wetlands-approved herbicide is deemed necessary under integrated pest management (IPM)

protocols, the selective use of wetlands-approved herbicide to treat nonnative plant infestations will be implemented in accordance with the registered labels, state and federal regulations and permits, NPS policy, and BMPs. A State of Hawai‘i National Pollution Discharge Elimination System herbicide permit will be obtained for herbicide application in wetlands in advance. By law, only herbicides registered by EPA specifically for application in wetlands will be used. If used, herbicide chemicals have potential to enter the aquatic environment, and may directly contact with orangeblack Hawaiian damselfly larvae in the wetland. However, herbicides that are EPA-registered for application in aquatic settings pose very low risk to aquatic wildlife because a wide margin of safety exists between concentrations that cause mortality to laboratory test animals and the potential exposure to wildlife from use in their habitat.

The use of BMPs and SOPs to prevent spills and overspray, the accuracy of application, and the low impact and low level of toxicity on species outside of the plant kingdom and non-target vegetation may potentially result in occasional adverse impacts to orangeblack Hawaiian damselfly. However, David Foote (Research Entomologist with the U.S. Geological Survey), who has studied the orangeblack Hawaiian damselfly extensively, has never seen damselfly larvae in areas dominated by pickleweed. The majority of locations where herbicides may be used are areas dominated by pickleweed. While it is unlikely, we cannot rule out the potential that our activities may result in mortality of some orangeblack Hawaiian damselfly larvae. Although individual larvae maybe harmed, overall this project will be a net benefit for the species because the removal of nonnative vegetation from the ‘Aimakapā wetlands will lead to more habitat for the orangeblack Hawaiian damselfly in the Park. Because this project will be a net benefit to the orangeblack Hawaiian damselfly, this project will not lead to the impairment of the species.

Plants

No endangered plant species naturally exist or have been out-planted in the ‘Aimakapā project area. Therefore, this project will not impair any special status plant species.

Other federally protected bird species

The black-crowned night heron and the Pacific golden plover, *Pluvialis fulva* as well as three other common migratory shorebirds [sanderling (*Salidris alba*), ruddy turnstone (*Arenaria interpres*), wandering tattler (*Heteroscelus incanus*)] are seen frequently in the Park and are protected under the Migratory Bird Treaty Act (MBTA). Modern threats to shorebirds in the Pacific Islands include urban, industrial, military, agricultural, and recreational development (loss of habitat); introduction of invasive, non-native plants (degradation of habitat) and non-native animals (predation, disease, competition); human disturbance; and contaminants (sewage discharge, oil spills, radioactive wastes, pesticides). The migratory Pacific golden plover is indigenous to Hawai‘i and is listed in the *U.S. Shorebird Conservation Plan* as “high concern.” The ruddy turnstone and the wandering tattler are also identified by the Conservation Plan as “high concern” and “moderate concern,” respectively.

The black-crowned night heron, and the migratory shorebirds use the Park's shoreline habitat and the rocky intertidal beach areas of the Park for feeding. The plover and ruddy turnstone are occasionally seen inland of the ʻAimakapā wetland foraging in the duff along the Ala Hele Ike Hawaiʻi Trail. Conservation and restoration of shorebird habitats in the U.S. Pacific Islands is a growing effort and essential for the protection of endangered and declining shorebird populations. Wetlands, beach strand, coastal forests, and mangrove habitats are particularly vulnerable on Pacific islands due to increasing development pressures and already limited acreage. Modified habitats, such as pastures, urban grass parks, and golf courses provide habitat for wintering shorebird species across the Pacific Islands.

Several other species of migratory waterfowl protected under the MBTA winter at ʻAimakapā Fishpond. These include, northern pintail (*Anas acuta*), northern shoveler (*Anas clypeata*), pied-billed grebe (*Podilymbus podiceps*) American wigeon (*Anas americana*), lesser scaup (*Aythya affinis*), green-winged teal (*Anas carolinensis*), semipalmated plover (*Charadrius semipalmatus*), and blue-winged teal (*Anas discors*). The Ruff (*Philomachus pugnax*), ring-necked duck (*Aythya collaris*), and tufted duck (*Aythea fuligula*) have been observed in the Park.

There may be temporary disturbance to individuals of these migratory bird species. However, the removal of nonnative vegetation and the restoration of ecological integrity and biodiversity of the wetlands system, and the return to natural hydrologic conditions, will lead to improved foraging conditions for these species and may prevent avian botulism outbreaks. Predator control will lead to increased survival of these species. Overall, this project will be a net benefit to these species and will not result in impairment of these species.

Wildlife

Wildlife in the ʻAimakapā wetlands area primarily consists of nonnative species (mongoose, feral cats, rodents, pigs, and various birds), special status species (discussed above), introduced and native fish, and aquatic and wetlands invertebrates. The native *pueo* (Hawaiian short-eared owl; *Asio flammeus sandwichensis*) and nonnative barn owl (*Tyto alba*) are uncommon in the Park.

The Park's fishponds and anchialine pools support a distinctive assemblage of aquatic invertebrates. Native ʻ*opaeʻula*, (red shrimp; *Halocaridina rubra*, *Metabetaeus lohena*, and *Palaemonella burnsi*), grapsid crabs, amphipods, snails (*Theodoxus* spp.) and undescribed invertebrate species inhabit the anchialine pools. *Metabetaeus lohena* and *P. burnsi* were recently removed from the candidate species list by the USFWS. A limited number of aquatic invertebrates have been identified in ʻAimakapā Fishpond, including 27 different taxa of insects, three crustaceans, and two mollusks. Various terrestrial invertebrate species also occur at ʻAimakapā, including many arthropods (bees, wasps, beetles, and ants).

The primary fish cultured in Hawaiian fishponds—ʻ*ama*ʻ*ama* (striped mullet, *Mugil cephalis*), *awa* (milkfish, *Chanos chanos)*, and *āhole* (Hawaiian flagtail, *Kuhlia sandvicensis*) —are catadromous, spawning in the ocean, then seeking out brackish estuaries in which to mature. ʻAimakapā Fishpond contains ʻ*awa* and ʻ*ama*ʻ*ama* but today has no opening to the sea. A recent

fish survey found an *omilu* (bluefin trevally, *Caranx melampygus*) in the pond, which may have been introduced by a shoreline fisherman.

The impacts to aquatic invertebrates from vegetation control would be from substrate compaction and crushing by vehicles and heavy equipment, temporary loss of cover and existing habitat for substrate-dwelling invertebrates during ground-disturbing removal of living root masses. These impacts will be short-term and minor**.** Because areas of active restoration are relatively small, this project will not result in the impairment of aquatic invertebrates communities.

If the use of wetlands-approved herbicide were deemed necessary under IPM protocols, herbicide chemicals to treat nonnative plant infestations would have potential to enter the aquatic environment and may directly contact some individuals of invertebrate species in the wetland. Herbicides that are EPA-registered for application in aquatic settings pose very low risk to aquatic wildlife because a wide margin of safety exists between concentrations that cause mortality to laboratory test animals and the potential exposure to wildlife from use in their habitat. The use of BMPs and SOPs to prevent spills and overspray, the accuracy of application, and the low impact and low level of toxicity on species and non-target vegetation in their habitat means that the effects of herbicide use would be negligible to minor impacts to native wildlife, native fish and aquatic insects and would not result in the impairment of native wildlife, native fish or aquatic insects.

Vegetation

Vegetation within the Park is dominated by nonnative species, several of which pose a significant threat to archeological sites: *kiawe* (*Prosopis pallida*), Christmas berry (*Schinus terebinthifolius*), *koa haole* (*Leucaena leucocephala*), sour bush (*Pluchea indica*), *klu* (*Acacia farnesiana*), pickleweed (*Batis maritima*) and seashore paspalum (*paspalum sp.*).

Situated on the coast with shoreline *kiawe* and *milo* (*Thespesia populnea*) forest to the north and south, ʻAimakapāʼs wetland marsh habitats are currently dominated by nonnative seashore paspalum and pickleweed (with scattered *milo* invading walls and pahōehōe). However, a number of native species persist in the wetland including ʻ*ākulikuli* (*Sesuvium portulacastrum*), *ōhelo kai* (*Lycium sandwicense*), the sedges *makaloa* (*Cyperus laevigatus*) and *kaluhā* or *makai* (bulrush, *Bolboschoenus maritimus*), ʻ*ae*ʻ*ae* (water hyssop *Bacopa monnieri*), and the aquatic grass (*Ruppia maritima*).

This project will adhere to NPS IPM principles of vegetation control and will use a “toolbox” of methods (manual, mechanical, chemical) to restore and maintain the native wetland vegetation. Restoration of ʻAimakapā wetlands over the next 15 years is confined to removal of plants and root material (organic soils and peat deposits will be removed only to the degree necessary to remove live belowground root biomass), and does not include shaping or altering soil substrate (e.g., no cut, fill, or grading).

Manual methods will be used in culturally or naturally sensitive areas such as cultural sites, rock walls, anchialine pools, and areas containing native plants. Manual methods include: hand tools

such as shovels, hoes, and sod cutters to remove paspalum grass; small gas-powered tools such as line and blade cutters, small chainsaws, pruners, and handsaws to remove woody species; and hand-pulling, covering/smothering growth with tarpaulin, and use of torches for propane flaming aboveground biomass of pickleweed.

Mechanical methods include powered machinery such as the Park's mini-excavator, mini-tractor, or a remote access amphibious utility vehicle (RAV) with a backhoe attachment and amphibious trailer, and a helicopter to move equipment and transport large amounts of vegetation waste to the disposal area. Machinery would potentially be used for first removal of large expanses of nonnative vegetation, especially the waterlogged root-matter of paspalum grass, from areas where archeological clearance has been given and manual methods have proven infeasible.

Chemical methods may be selectively used in the wetland to control woody species, pickleweed, or other species. Chemical control of nonnative species would be implemented if an IPM action threshold is met and if other methods (manual, mechanical, tarping) prove ineffective or inefficient. If chemical control is needed on parklands, per NPS policy, the most specific (selective) chemical available for the target species would be used unless considerations of persistence or other environmental and/or biotic hazards would preclude its use. Herbicides registered by EPA specifically for use in aquatic settings have very low toxicity and mortality rate for fish and aquatic organisms. No applications would be made directly to water. Herbicide application methods such as hack and squirt, frill and girdle, injection, and cut-stump treatments are commonly used in Hawai‘i as cut-surface means to apply chemicals to woody nonnative plants such as *kiawe, haole koa* and *milo*. These methods minimize drips and overspray drift, and are a prudent approach in sensitive species habitats. In addition, foliar (leaf) wick and/or spot-spray treatments can be applied to individual plants or can be broadcast over areas of low growing plants such as pickleweed.

Tools and powered machinery will be cleaned free of nonnative propagules prior to entering the site. Intact stands of native plants will be preserved whenever possible to minimize impact and accelerate native plant recovery. If impacts to native plants cannot be avoided, whenever possible native plants will be transplanted and or used as propagative material for outplanting. Active restoration by outplanting native plants from approved partner nurseries or in-park nurseries on previously infested sites will result in major beneficial effects to native plant populations by facilitating more rapid restoration of ecological integrity and biodiversity of the wetlands system and a more rapid return to natural plant cover in the wetland. Because restoration efforts from this project will result in the removal of nonnative plants and the establishment of native plant communities, impacts from the project will not impair the Park's vegetation resources.

Cultural Resources

Within the boundaries of Kaloko-Honokōhau National Historical Park, the cultural landscape, archeological sites, and ethnographic resources within the Park represent a wide range of the diverse aspects of Hawaiian culture, including societal organization and leadership, agriculture, aquaculture, religion, recreation, housing, and burial practices. These sites represent not only

pre-contact Hawaiian culture, but also the post-contact changes that took place in the Hawaiian culture over time. Among these sites, ʻAimakapā is a significant cultural resource; a rare example of a naturally-formed *loko puʻuone*, a fishpond separated from the sea by a sand berm and modified by Hawaiians to hold and grow fish.

Kaloko-Honokōhau National Historical Park is also a National Historic Landmark (NHL), the Honokōhau Settlement NHL, designated in 1962. Both the NHL and the Park are included on the National Register of Historic Places (1966 and 1978 respectively) under Criterion D (Information Potential). All archeological sites within the boundaries of the Park and NHL are eligible for the National Register as contributing elements, and have the potential to be affected by the restoration and management of ʻAimakapā wetlands. The NPS initiated consultation with Native Hawaiian Organizations and other interested parties on August 1, 2012, and with the Advisory Commission on Historic Properties and the Hawaiʻi State Historic Preservation Officer (SHPO), on March 1, 2013, and notified them of the development of this Management Plan/EA. This project undertaking is eligible for streamlined review under both the 2008 *Programmatic Agreement between the National Park Service, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers for Compliance with Section 106 of the National Historic Preservation Act* and the *2006 Programmatic Agreement between Kaloko-Honokōhau National Historical Park and the Hawaii State Historic Preservation Officer*. Consultation with the Hawaiʻi SHPO concluded on February 18, 2016, with a letter to the Hawaiʻi SHPO confirming use of the streamlined review process.

Because protective safeguards and mitigation measures, including those required in the programmatic agreements, will be implemented to avoid harming the archeological sites, ethnographic resources, and cultural landscape at ʻAimakapā and throughout the Park during the restoration activities, this restoration project will not result in the impairment of Park cultural resources and values. The removal of destructive, nonnative vegetation will 1) prevent further damage to historic properties, 2) will improve quality of the anchialine pool, wetlands and fishpond habitats for native, culturally important plants, fish, and wildlife, and 3) will complete a major step towards accomplishing the larger, long-term goals to restore the Park's two fishponds "*as nearly as possible to their original appearance for the function they fulfilled*"[1] as set out in the 1974 *Spirit of Ka-loko Hono-kō-hau Advisory Commission Report* and the 1994 *Kaloko-Honokōhau NHP General Management Plan/EIS*. Furthermore, restoration of the native plant community will enhance the cultural landscape by returning it to a state similar to one that existed during the period of significance of the Honokōhau Settlement National Historic Landmark (1200 AD – 1848 AD).

[1] Honokōhau Study Advisory Commission, 1974. Spirit of Ka-loko Hono-kō-hau Report, pp. 30,