ATTACHMENT A: DETERMINATION OF NON-IMPAIRMENT

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 to the extent that 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 would be less likely to constitute an 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. The description of the parks' purpose and significance is found below and is subject to the no-impairment standard.

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 stated that "The Secretary shall administer the park... and generally in accordance with the guidelines provided in the study report entitled "Kaloko-Honokōhau" prepared by the Honokōhau Study Advisory Commission and the National Park Service, May 1974, GPO 690-514."

The Kaloko-Honokōhau report states:

An educational program would be established within the park to teach the values and traditions of the Hawaiian culture. An important segment of this educational program would involve a facility designed primarily for native Hawaiians and removed from any major public use area, where the dignity and integrity of the culture would be maintained. It would be an intimate personal experience extending over a period of one day or more, rather than being part of an exhibit open to the regular visitor.

Classes would be conducted outdoors or in a halau (open shed). The halau would be necessary to provide work space for canoe-building, hula instruction, and other activities which require work space under a protective shelter.

Instruction would be provided in basket weaving, lau hala plaiting, wood carving, feather work, musical instruments, nut crafts, and the making of fishing materials such as nets, hooks, ropes, lines, and sinkers.

Kaloko-Honokōhau National Historical Park's General Management Plan (GMP) (NPS 1994) states:

Kaloko-Honokōhau National Historical Park was established to set aside a place to preserve, interpret, and perpetuate the native Hawaiian culture. The place, Kaloko-Kaloko-Honokōhau, is particularly appropriate for that purpose, having once been a thriving Hawaiian settlement. Within the park are numerous and significant remnants of that settlement. For many, particularly Hawaiians, Kaloko-Honokōhau is also a spiritual place, a place for renewal. The park is to be a place where people will be able to engage in ancient Hawaiian activities and recreate traditional Hawaiian crafts. This renewal and recreating should be carried out in a setting that evokes an image of traditional Hawai'i.

...the proposed action would make major portions of the park available to native Hawaiians and others who wish to pursue, in depth, activities associated with traditional Hawaiian culture. The proposed action also calls for the development of a live-in facility, in the traditional Hawaiian style, where a limited number of people can come to participate in and to recreate the old Hawaiian ways.

Impairment Determinations for the Selected Alternative

Impairment determinations are not necessary for visitor experience, socioeconomics, public health and safety, environmental justice, land use, and park operations, etc., because impairment findings relate back to park resources and values. These impact topics are not generally considered to be park resources or values according to the *Organic Act*, and cannot be impaired the same way that an action can impair park resources and values. After dismissing the above topics, the topics evaluated in the EA remaining to be evaluated for impairment include geology and soils, vegetation, water resources and wetlands, cultural resources, wildlife, and special status species.

Geology and Soils

The geology of Kaloko-Honokōhau National Historical Park comprises prehistoric lava flows from Hualalai Volcano. These prehistoric flows range in age from 1,000 to 10,000 years old. The lava is mostly *pāhoehoe* (smooth basaltic lava), with several large areas of '*a*' \bar{a} (rough, broken basaltic lava), and is characterized as alkaline olivine basalt. These flows are highly permeable and contain lava tubes.

The park area is classified by the USDA Natural Resources Conservation Service, as Soil Map Unit rPYD- Punaluu extremely rocky peat, with 6 to 20 percent slopes. This map unit covers about 70 ac, approximately 11.6% of the park. The soils in this area are organic soils (not mineral) and have a unique behavior to them. The Punaluu soil is classified as a Euic, isohyperthermic, micro Lithic Ustifolists. The soils are also very shallow (0 to 10 in to basalt bedrock) (Pete Biggam, NPS Geological Resources Division, pers. comm. 2010). This well-drained organic soil overlies *pahoehoe* lava bedrock. It occurs on gently sloping to moderately steep uplands. Rocky outcrops occupy about 30% of the surface area. The soil texture is peat, with organic matter content about 65%. This soil is moderately acid. The available water holding capacity is very low. Although this organic soil is rapidly permeable, the underlying *pahoehoe* lava is very slowly permeable, except where water moves rapidly through cracks. Runoff is slow, and the erosion hazard by water and wind is slight.

The Kaloko-Honokōhau shoreline is predominantly rough lava and rocky in appearance, owing to the geologic recency of the volcanic activity. There is a coral sand beach fronting Honokōhau Bay, the only large natural sand beach in the vicinity. The topography of the park is flat, rising in elevation from sea level to approximately 90 feet (ft) along the *mauka* portion. Although the general slope is relatively smooth, the actual surface is very rough as a result of past lava flows.

Impacts from the construction and operation of the Cultural Center to topography and geology would be beneficial. The original geologic features of this location were significantly altered in the 1970s when the area was bulldozed by the Hu'ehu'e Ranch to create a basin in the 'a'ā flow to deposit dredge spoils from Kaloko Fishpond. The substrate of this area is composed of the non-native deposit of the dredge spoils (sandy silt, shell, etc.) from the pond, pumped into the area. During construction of the hale for the Center, concrete piers would be installed in this deposit but not deep enough to disturb the original substrate or bedrock. If digging were required for any footing, an archeologist would conduct test excavations prior to work and would monitor all ground disturbances. Any removed deposits would remain on-site within the project area.

Given that the geologic features in this area were previously disturbed, no impacts to the underlying native soil or other geologic resources are anticipated.

Site preparation and hale construction may necessitate use of rock materials that bulldozers pushed into a berm around the site in the 1970s. The berm is approximately 10 to 13 ft higher than surrounding native topography, creating an artificial topographical feature not representative of the original 'a'ā lava flow. Removal of this artificial berm would result in a beneficial impact to the current (1970s era) topography by somewhat restoring the original landscape.

Because the project will occur on previously disturbed areas and because of the beneficial impacts, the selected alternative will not result in impairment to geology and soils.

Vegetation

The vascular plants of Kaloko-Honokōhau NHP have been well documented. In total, 130 plant species have been recorded through surveys and incidental encounters within Kaloko-Honokōhau NHP since 1987, though not all species are currently present. Canfield (1990) identified 69 flowering plants species, 39 (59%) of which were alien (introduced since 1778), and five (7%) were Polynesian introductions. Pratt and Abbott (1996) found 116 vascular plant species, 80 (69%) of which were alien, and four (3%) were Polynesian introductions. Pratt and Abbott (1996) added 56 species (46 alien, nine indigenous, and one endemic) to the Canfield (1990) survey. Of the alien species, 11 are especially invasive and likely to have a "serious negative impact on park vegetation" (Pratt and Abbott 1996:10). Of these, fountain grass (*Pennisetum setaceum*) and ivy gourd (*Coccinia grandis*) are on the state Noxious Weeds list (HDOA 2003).

Vegetation within the park has been significantly altered since the arrival of humans and is now dominated by alien species including the non-native fountain grass (*Pennisetum setaceum*), *koa haole* or *ekoa* (*Leucaena leucocephala*) and *klu* (*Acacia farnesiana*) shrubs, and *kiawe* (*Prosopis pallida*) trees. Only the coastal low strand and strand scrub communities are not dominated by alien species (Canfield 1990, Pratt and Abbot 1996).

Many of the plants found within the park are also cultural resources and are significant as food sources, medicine, tools, and as materials for thatching, weaving, cordage, and traditional Hawaiian crafts. The park's GMP (NPS 1994) and vegetation management plan (Pratt 1998) guides management actions for alien vegetation control, fuel reduction, and native plant restoration. The NPS has restored 17.2 acres (ac) of coastal dryland shrub forest in Kaloko-Honōkohau NHP through clearing invasive species followed by outplanting native species and encouraging the native seed bank. Additionally, approximately 18.5 ac of lands surrounding archeological sites have been cleared and are maintained.

Aquatic plants and algae in the marine waters and brackish water fishponds and anchialine pools in the park include varieties of seaweed (*limu*) and a native seagrass (*Ruppia maritima*). Many of these seaweeds are edible and were a staple in the Native Hawaiian diet (Abbott 1992). Edible *limu* in the park include *limu kohu* (*Asparagopsis taxiformis*), *limu 'ele'ele* (*Ulva sp.*) and *limu palahalaha* (*Ulva fasciata*). An inventory of marine algae for Kaloko-Honokōhau is in preparation by the University of Hawaii. One non-native marine alga, *Acanthophora spicifera*, has invaded Kaloko Fishpond and the NPS conducted a removal and plant control study in 2007 with mixed results (Weijerman et al. 2008). This species is still present in Kaloko Fishpond and has been documented in Honokōhau Harbor (Smith et al. 2002) and as a minor component of intertidal turf algae (McDermid et al. 2007), but has been not been found outside of the fishpond in NPS surveys for the past five years.

The majority of the vegetation at the selected alternative location for the Cultural Center, and the foot trail leading to, it is comprised of alien species: fountain grass, pickleweed (*Batis maritima*), sourbush (*Pluchea carolinensis*), kiawe (*P. pallida*), and klu (*Acacia farnesiana*). Few native species exist at the selected alternative location for the Cultural Center with the exception of several individual naupaka (*Scaevola sericea*) and pa'u o hi'iaka (*Jacquemontia ovalifolia*) at the site, and milo (*Thespesia. populnea*) along the foot trail. Construction and operation of the Cultural Center would include removal of invasive species in the project area and restoration of appropriate endemic, indigenous, and Polynesian-introduced species resulting in long-term, local beneficial impacts to native plant communities. Existing native vegetation at the selected alternative site may need to be pruned in some cases to allow for construction activities, however, pruning would not adversely affect native vegetation.

Because non-native vegetation will be removed and native plants will be established, the selected alternative would not result in impairment to vegetation in the park.

Water Resources and Wetlands

Kaloko-Honokōhau NHP contains a variety of water resources fed by groundwater from the Keahou Aquifer. The coastal groundwater system within the park is composed of brackish water overlying saltwater in a highly permeable volcanic-rock aquifer (Oki et al. 1999). The brackish water is formed by seaward-flowing fresh groundwater mixing with underlying saltwater from the ocean. Brackish water flowing through the park ultimately discharges to the coastal Hawaiian fishponds and anchialine pools in the park, and to the ocean, establishing estuarine-like conditions in the coastal nearshore waters (Juvik and Juvik 1998). Groundwater occurs a few feet above sea level within the park, and is affected strongly by ocean tides and ocean level (Oki et al. 1999). Groundwater recharge is mainly from places of higher rainfall on the slopes of Hualalai (Engott 2011). The park is a located at the coastal foot of the watershed. No surface water streams or intermittent streams exist within the park or in the area immediately surrounding the park. Park waters are in relatively good condition (Hoover and Gold 2005). However, they are at risk of degradation from nonpoint source pollution (e.g., Oki et al. 1999, Parsons et al. 2008, Knee et al. 2008, Grossman et al. 2010) and groundwater development (e.g., Oki et al. 1999, Grossman et al. 2010) associated with urban development and human activities upslope of and adjacent to the park. Within the park, pollutants from paved-parking lot runoff at the Visitor Contact station are captured in a drainage filtration device. Other parking areas within (Kaloko Fishpond) or adjacent to (Honokohau Harbor) the park are unpaved and oils and other fluids may drip from vehicles and adhere to the gravel.

The park's unique water resources include two large ancient Hawaiian fishponds and their associated wetlands: 'Aimakapā Fishpond (approximately 30.5 ac), and Kaloko Fishpond (approximately 17.4 ac). 'Aimakapā Fishpond is brackish, with no direct connection to the sea. It is fed by groundwater mixing with underlying saltwater and its salinity averages 12 parts per

thousand (ppt). 'Aimakapā contains the highest proportion of groundwater, making it the most vulnerable to changes in groundwater quantity and quality (Hoover and Gold 2005). Kaloko Fishpond is also supplied by groundwater but has an open connection to the sea through two $m\bar{a}k\bar{a}h\bar{a}$ (sluice gate) in the *kuapā* (seawall) and has higher salinities, around 22 ppt. (NPS unpublished data). 'Ai'ōpio Fishtrap is a small, 1.7-ac marine fishtrap (salinity 35 ppt) at the southern end of Honokōhau Bay whose stone walls are constructed from the shoreline across a small bay forming an artificial enclosure around the naturally curving shoreline. The fishtrap wall has a large opening to the sea and its walls are submerged at high tide. 'Ai'ōpio is the park's most utilized area by visitors and cultural practitioners.

The park's wetlands comprise about 3% of the park (not including submerged lands) and the major wetlands areas are associated with Kaloko and 'Aimakapā Fishponds and a small area inland of 'Ai'ōpio Fishtrap; smaller wetlands areas are associated with a few anchialine pools (Hoover and Gold 2005, Kikuchi and Belshe 1971, Canfield 1990, Pratt 1998, Cogan et al. 2011). Using the Cowardin classification system (Cowardin et al. 1979), the park's wetlands are considered "Estuarine." The Estuarine System consists of "deepwater tidal habitats and adjacent tidal wetlands that are usually semi-enclosed by land but have open, partly obstructed, or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land" (Cowardin et al. 1979). Alien invasive vegetation dominates these wetlands; however, native species are mixed with aliens at 'Aimakapā Fishpond.

In addition to the two fishponds, more than 180 anchialine pools have been identified within the park. 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 a permeable aquifer (Holthuis 1973). The park encompasses approximately 25% of the state's estimated (Mitchell et al. 2005) anchialine pool resources. 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 U.S. Fish and Wildlife Service (USFWS).

The waters of anchialine pools have a strong cultural significance. The only source of potable water along this area of the West Hawai'i shoreline, the pools were a significant factor in enabling Native Hawaiian settlement of the area, and continued to be important through historical times for a variety of uses including bathing, washing, and cooking (e.g., *see* Honokōhau Study Advisory Commission 1974). Many of the park pools were modified for specific use by ancient Hawaiians with stone walls, platforms and other features.

The 600 ac of marine waters within the legislative boundary of Kaloko-Honokōhau NHP are under the jurisdiction of the United States (36 CFR 1.2(3)), and the submerged lands within in the legislated boundary are owned by the State of Hawai'i and are under the jurisdiction of the State Department of Land and Natural Resources (DLNR). The park 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 humancaused source or actions." (HAR Section11-54-3(c)(1)). Hawai'i 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.*" (HAR Section11-54-1.1(c)).

No wetlands, or water resources exist at the selected alternative location for the Cultural Center; however, groundwater at this elevation is close to the surface. Physical construction of the Center would not affect park water quality and "zero discharge" composting toilets would be installed to keep human waste from entering natural water systems. Natural water resources within the park would not be pumped for use. During operation of the Center, participating groups would be required to carry in drinking water and non-potable water would be pumped to a holding tank for irrigation via waterline from the Kaloko Road. Showering and bathing would not be permitted at the Cultural Center site; therefore, no on-site water runoff would occur. Participants may bathe in the ocean without the use of soaps, shampoos, and personal hygiene products. Waste wash-water from food preparation and dish and utensil cleaning would be collected, contained, removed from the site, and disposed of in appropriate wastewater systems. Short-term automotive fluid drips would continue to occur from ongoing public use of the Kaloko Parking Area.

Based on the above mentioned avoidance and minimization measures, the selected alternative would not result in impairment to water resources and wetlands in the park.

Cultural Resources

Within the boundaries of Kaloko-Honokōhau National Historical Park, evidence of the ancient Hawaiian culture that once thrived here is abundant. Archeological sites and ethnographic resources within the park represent a wide range of the different aspects of that 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 changes that took place in that culture over time during post-contact.

To date, 461 archeological sites have been recorded in the park (18% of the park's total land and water area has been intensively inventoried). Undoubtedly, other terrestrial and submerged sites remain unrecorded. These sites substantiate significant prehistoric and historic Hawaiian occupation of this area. The area was used by *maka 'āinana* (common people), and *ali 'i* (chiefs, nobles) until the late nineteenth century (Tomonari-Tuggle and Tuggle 2006a, 2006b).

Some of the most significant and unique sites in the park are the Kaloko and 'Aimakapā Fishponds, and the 'Ai'ōpio Fishtrap. The Kaloko Fishpond is a *loko kuap*ā-type pond, a natural embayment separated from the sea by a massive, 800-ft long constructed seawall (*kuapā*). The *kuapā* is an excellent example of the engineering skill of the ancient Hawaiians. Approximately 11 ac in size, Kaloko Fishpond also has secondary walls within the pond forming five discrete areas (Renger 1974). Kaloko is an area of spiritual importance and has been documented in oral histories as home to a spirit guardian of the pond (mo'o) and other supernatural beings. Many archeological sites surrounding the pond indicate significant human occupation and include habitation sites, burial grounds, and petroglyph fields. Kaloko Fishpond is one of only two *loko kuapā* left on the island that has not been overtaken by lava flows (Kikuchi and Belshe 1971). The Kaloko Fishpond was managed as a functioning aquaculture fishpond until the late 1950s but by 1961, it was in disrepair (Bond and Gmirkin 2003). 'Aimakapā fishpond, a *loko pu'uone* (large pond formed behind a barrier beach), is the largest of the park's fishponds and comprises approximately 12 ac of water. The pond has secondary walls forming at least six compartments for separating fish. A partially buried, stone-lined channel $(m\bar{a}k\bar{a}h\bar{a})$ cut through the north end of the barrier beach once formed the sluice gate by which seawater entered the pond. Numerous archeological sites indicate intensive human activity in the area, particularly use by *ali*'*i* for recreational and ceremonial purposes (NPS 1994).

The 'Ai'ōpio Fishtrap is a 1.7-ac pond, consisting of a stone and coral wall forming an artificial enclosure along a naturally curving shoreline. The only fishtrap on Hawai'i Island; it had a variety of uses well into recent history. 'Ai'ōpio is referred to as a fishtrap, rather than fishpond, because there is no *mākāhā* or sluice gate, and the trap contains four rectangular walled enclosures that may have been used as holding pens for netted fish (Kikuchi and Belshe 1971). 'Ai'ōpio is a *loko kuapā*-type fishtrap, meaning the builders created a wall as an artificial means for trapping fish as opposed to using natural shoreline features or an inland pond (Apple and Kikuchi 1975).

At the south side of the 'Ai'ōpio Fishtrap is the *Pu'uoina Heiau*, probably the finest example of a platform type in Kona. To the west of *Pu'uoina Heiau* at Ala'ula Cove (Alula Bay) is a *heiau* known as *Maka'opio*. The striking feature of this *heiau* is two great upright stone slabs. Several other *heiau* are present in the Honokōhau and Kealakehe *ahupua'a*.

The park also contains numerous Hawaiian burial sites. These sites are important to Native Hawaiians, and most especially to descendants of the area. In Hawaiian culture, burial sites are considered especially sacred grounds with *mana* (supernatural or divine power).

Numerous other sites of significance are located throughout the park, including: *kahua hale* (house platforms); *ko*'*a* (fishing shrine); *ahu* (stone mounds); a concentration of more than 50 stone enclosures (believed to be agricultural planters); lava tube shelters; canoe landings and shelters; salt pans; and important concentrations of petroglyphs. These concentrations include *papamu* (grids of pecked holes used for the Hawaiian game *konane* and most likely other uses (Ed Stasack, pers. comm. 2010) and *poho piko* (pecked cups in the lava used for ceremonial placement of a baby's umbilical cords) (Stasack and Stasack 2007, Durst and Glidden 1999, Emory et al. 1959); and battered processing areas. One of the petroglyph sites is the only known commemoration of the *Makahiki*, an annual event beginning with the *Lono* ceremony and ending with the *Ku* ceremony (E. Stasack pers. comm. 2010).

More than 180 anchialine (brackish) pools have been identified in the park, many of which were modified with rock walls, platforms and other features for access. Specific uses of pools included bathing, washing, and cooking (e.g., *see* Honokōhau Study Advisory Commission 1974). The coastal pools were a shoreline source of potable water in this area of West Hawai'i, and enabled human settlement of the area. The pools continued to be important through historical times for a variety of uses.

The construction footprint for the selected alternative was surveyed, including the proposed foot trail and proposed waterline corridors to the site (Johnson-Campbell 2011). The survey revealed areas of natural, undisturbed ground within the larger bulldozed area of the selected alternative,

the re-identification of a known historic trail segment, and identification of one previously unrecorded archeological feature within the selected alternative. The existing trail segment is a small portion of a mauka-makai (mountain-to-sea) trail that passed through the area. The majority of the historic trail within the selected alternative area was destroyed by bulldozing in the 1970s prior to park establishment. The proposed foot trail leading from the Ala Kahakai Trail would route participants from the coastal trail to the previously bulldozed corridor to the Center. No historic properties were found within the proposed foot trail or the bulldozed corridors. However, a previously recorded archeological site and several archeological features were found adjacent to the corridor. In total, ten previously undocumented archeological features were identified nearby, outside of the footprint of the proposed Cultural Center.

The selected location was bulldozed prior to park establishment and sediments dredged from Kaloko Fishpond were pumped to the area and deposited over the disturbed ground surface. Therefore, little natural ground surface remains and any historic properties previously present in the area were destroyed or buried by dredge spoils. There are no known archeological deposits in the selected location and the bulldozing of the area make it unlikely that buried deposits exist. Constructing the Center at this site would involve minor ground disturbance. It may be necessary to move dredge materials or areas of previously bulldozed rock for placement of structure footings, and the possibility exists that buried deposits may be discovered when conducting ground-disturbing work. Archeological test-excavations would be conducted to determine presence of archeological sites or features in the substrate below the dredge spoils.

During construction and operation of the Center at the selected location, the historic trail segment and rock cairn identified within the proposed project area footprint would be flagged and avoided. The placement of an aboveground waterline from the Kaloko Parking Area to the selected location would skirt a previously identified early to mid-20th century walled habitation complex and continue south along the previously bulldozed dredge-pipeline corridor and the above-mentioned bulldozed trail (proposed foot trail). Because the waterline would be placed on the surface along the bulldozed dredge-line trail, the installation and maintenance of this waterline would not cause physical impacts to archeological features. However, the waterline would be somewhat visible from outside the site where it would extend along a portion of the site boundary wall. The waterline could have a direct, long-term negligible visual impact on a small portion of the site at the boundary wall. No additional adverse impacts to cultural resources will occur. Several previously unrecorded features were found within 15 ft of the foot trail corridor, but would not be affected by regular use of the trail. No impacts are expected to occur to these features because the access path would be used for foot access only, and the Cultural Center participants would be required to stay on the trail.

Based on the above mentioned avoidance and minimization measures, the selected alternative would not result in impairment to cultural resources in the park.

Wildlife

The only remaining native, resident birds in Kaloko-Honokōhau are the waterbirds, the endemic *ae*'o (Hawaiian stilt, *H. mexicanus knudseni*) and the '*alae ke*'oke'o (Hawaiian coot; *F. alai*), and the indigenous '*auku*'u (black-crowned night heron; *N. nycticorax hoactli*) (Morin 1996). These species along with protected migratory waterbirds, Hawaiian hoary bat, marine turtles,

candidate anchialine-pool invertebrates, and marine mammals are covered in the *Special Status Species* section.

The native *pueo* (Hawaiian short-eared owl; *Asio flammeus sandwichensis*) and alien barn owl (*Tyto alba*) are uncommon in the park. Common non-native terrestrial bird species at Kaloko-Honokōhau include the Japanese white-eye (*Zosterops japonicas*), house finch (*Carpodacus mexicanus*), nutmeg mannikin (*Lonchura punctulata*), common myna (*Acridotheres tristis*), yellow-billed cardinal (*Paroaria capitata*), northern cardinal (*Cardinalis cardinalis*), warbling silverbill (*Lonchura malabarica*), zebra dove (*Geopelia striata*), spotted dove (*Streptopelia chinensis*), yellow-fronted canary (*Serinus mozambicus*), saffron finch (*Sicalis flaveola*), red-masked parakeet (*Aratinga erythrogenys*) and francolins (*Francolinus pondicerianus* and *Francolinus*). Another non-native species regularly seen in the park is the cattle egret (*Bubulcus ibis*) (Morin 1998, Waddington 2002-2010).

The most noticeable terrestrial mammal in the park is the Indian mongoose (*Herpestes javanicus*), an introduction to the islands in the 1800s that has played a part in upsetting the fragile terrestrial ecosystem of Hawai'i. In addition to the mongoose, feral cats (*Felis catus*) are in the park. Mongoose and feral cats are significant predators of native wildlife and prey on the eggs and young of waterbirds. Mice (*mus musculus*) and rats (*Rattus* spp.) are in the park, and rats may prey on waterbird eggs or chicks.

A 2007 herpetological inventory of the park identified seven species of herpetofauna from three different families. Green anole (*Anolis carolinensis*), honu (*Chelonia mydas mydas*) snake-eyed skink (*Cryptoblepharus peocilopleurus*), stump-toed gecko (*Gehyra mutilate*), house gecko (*Hemidactylus frenatus*), tree gecko (*Hemiphyllodactylus typus*), metallic skink (*Lampropholis delicate*), mourning gecko (*Lepidodactylus lugubris*), gold dust day gecko (*Phelsuma laticauda laticauda*), blind snake (*Ramphotyphlops braminus*), and other undidentified geckos, lizards and skinks were found (Bazzano 2007).

Culturally important native fish are found in both 'Aimakapā and Kaloko Fishponds. Among others, 'ama 'ama (striped mullet; *Mugill cephalus*), aholehole (zebra-head flagtail; *Kuhlia sandvicensis*), 'O'opu akupa (Eleotris sandwicensis) and awa (milkfish; Chanos chanos) are found in Kaloko are. Kaloko is open to the sea through two mākāhā (sluice gates). An assemblage of common nearshore reef fish as well as the predatory barracuda (kaku; Sphyraena barracuda) enters the pond through these openings. 'Aimakapā also contains awa and 'ama 'ama. The native feeble shrimp, Palaemon debilis, is found in both fishponds (MacKenzie and Bruland 2012). Invasive species in fishponds include mosquito fish (Gambusia affinis), tilapia (Oreochromis mossambicus) and guppies (Poecilia reticulata).

Native *opae 'ula*, (red shrimp; *Halocaridina rubra*), grapsid crabs, amphipods, snails (*Nerita* spp.) and undescribed invertebrate species inhabit the anchialine pools. Anchialine ecosystems are vulnerable to nonpoint source pollution and long-term reductions in groundwater flow, loss of habitat from coastal development, degradation of habitat, invasive species (alien fish, prawns, insects, and vegetation) and possibly nighttime light pollution (USGS 2005, Hoover and Gold 2005). Over collection of '*ōpae 'ula* for the aquarium trade is an emerging issue that may be a threat to these shrimp in the future.

Kaloko-Honokōhau NHP marine waters are one of several West Hawai'i Fisheries Management Areas designated by the State of Hawai'i, and are part of the National System of Marine Protected Areas (75 FR 29317, May 25, 2010). The National Park's 600 ac of marine habitat support a variety of wildlife; many of these are culturally significant species. The shoreline and intertidal (between high and low tides) habitat consists of sandy beach, lava benches with tide pools, lava cliffs, and rocky shore and contains an abundance of marine invertebrates (crustaceans, cnidarians, mollusks, echinoderms) and fish (see Parrish et al. 1990 for species lists). Common species in the intertidal and shallow subtidal zones include 'a'ama (crabs; *Grapus tenuicrustatus*), 'opihi (limpets; *Cellana* spp.), wana (sea urchins; *Echinothrix* spp, *Echinometra* spp.),and *leho* (cowries, *Cypraea* spp.)

The subtidal marine habitat contains well-developed stony coral (ko'a) communities (dominated by Porites spp., Pocillopora spp., and others) interspersed among areas of hardbottom habitats that have very low coral cover and low spatial complexity (Beets et al. 2010, Gibbs et al. 2007). The soft octocoral, *Sarcothelia edmonsoni*, is common in the park, particularly in areas of high submarine groundwater discharge (Grossman et al. 2008). These corals provide habitat and refuge for a diverse assemblage of reef fish, and invertebrates, many of which are culturally important fisheries species including akule (bigeye scad; Selar crumenophthalmus), opelu (mackerel scad, Decapterus macarellus) he'e (octopus, Octopus spp.), ula (spiny lobsters, Panulirus spp.), see Parrish et al. (1990) and Beets et al. (2010) for detailed species lists. Two non-native fish species, the peacock grouper (roi, *Cephalopholus argus*) and bluestripe snapper (ta'ape, Lutjanus kasmira), were introduced to the Hawaiian Islands from the South Pacific in the 1950s, and are common within the park (Randall 1996, Beets et al. 2010). Effects of fishing pressure is evident at Kaloko-Honokohau NHP where fish abundance, biomass, and diversity were lower than at the more remote Kalaupapa NHP which has lower visitor use (Beets et al. 2010). Major threats to park marine wildlife include over harvesting, and degradation of habitat from nonpoint source pollution, marine debris, boat groundings, and oil spills.

Construction of the Center and subsequent human presence at the selected location during Center operation may cause some bird species to avoid the area. Wildlife in the selected location primarily consists of exotic species including invasive mongoose, rodents, and various alien birds. Exotic gray francolins (*Francolinus pondicerianus*) are frequently seen ground foraging near the selected alternative location. In fact, human activity and long-term presence in the area may result in localized, long-term, direct, minor negative impacts from increased populations of some pest species such as mongoose, feral cats, and rodents that are detrimental to native species. Negligible short-term adverse impacts to lizards (anole, skinks, and geckos) may result from habitat displacement during alien vegetation removal associated with Center construction activities at both Alternative locations. However, new habitat will be provided through native plant restoration. Geckos and others may also inhabit *halau* structures once they are constructed.

Construction of the Cultural Center would include removal of invasive plant species at the selected site. However, Center operations and activities would also include restoration of appropriate native and Polynesian-introduced plant species to the Center's landscape, resulting in improved habitat for terrestrial wildlife.

Center-related marine fishing and shoreline gathering activities would be subject to State of Hawai'i fishing regulations and would focus on traditional methods of resource protection, and on education of participants to prevent overharvesting of resources. Negligible to minor negative impacts on marine wildlife species are anticipated from operation of the Cultural Center at this location. Anchialine pools remain closed to all activities including bathing, gathering, and modification; therefore, no negative impacts to anchialine pool wildlife will occur. Aimakapā Fishpond is closed to fishing and swimming; however, Kaloko Fishpond will be used as a traditional aquaculture for culturally significant fish. Negative impacts to fish populations (overharvesting) in fishponds will be prevented through traditional methods of resource management and protection, and through education of participants.

Based on the facts that essentially there is no native wildlife at the location for the selected alternative, native habitat will be restored, and traditional methods of resource management and protection will be practiced and taught, the selected alternative would not result in impairment of wildlife in the park.

Special Status Species

Three candidate species (plants and animals for which there is sufficient information to propose as endangered or threatened under the Endangered Species Act) of invertebrates recorded within the park are associated with anchialine pool habitat; these are the pinapinau (Hawaiian orangeblack damselfly, Megalagrion xanthomelas), and two caridean shrimp, 'ōpae'ula, (*Metabetaeus lohena*, and *Palaemonella burnsi*. Anchialine ecosystems appear to be relatively tolerant of variations in salinity, temperature, and nutrients however, tolerance probably varies from pool to pool, and they are vulnerable to nonpoint source pollution and long-term reductions in groundwater flow (Hoover and Gold 2005). Additional threats to anchialine pools species include loss of habitat from coastal development, degradation of habitat, invasive species (alien fish, prawns, insects, and vegetation) and possibly nighttime light pollution (USGS 2005, Hoover and Gold 2005). Anchialine pools will not be impaired by the project as no pools occur in the selected alternative location and no impacts to water quality will result from the construction and operation of the Cultural Center.

The USFWS (2011a) identifies 'Aimakapā as a "core wetland" in its recovery plan for the endangered ae 'o (Hawaiian coot) and the endangered 'alae kea (Hawaiian stilt). Kaloko Fishpond is a foraging area for the Hawaiian stilt and 'Aimakapā is a breeding area for both the stilt and the coot (Morin 1998, Waddington 2002-2010). A UTV would be required to shuttle material to the site and UTV access to the site is far enough away from Kaloko and 'Aimakapā fishponds to avoid disturbance to stilts and coots. A helicopter may also be used to shuttle material to the site. The helicopter would avoid flying over fishponds where 'alae kea and ae'o occur. The selected alternative would not result in impairment of 'alae kea and ae'o.

Individual *kolea* (Pacific golden plovers) have been observed at the selected alternative location, and center activities may displace or disrupt plovers with established wintering territories in the area. Construction and subsequent operation of the Center could disrupt plover activity in the area, resulting in negligible to minor, short-term to long-term, site-specific adverse impacts to individual *kolea*. The selected alternative would not result in impairment of *kolea*.

The endangered Hawaiian monk seal, '*Īlio-holo-i-ka-uaua* (Monachus schauinslandi) hauls-out onto beaches for resting, molting, giving birth or nursing (Antonelis et al. 2006, NMFS 2007). Although the monk seal is much less abundant in the main Hawaiian Islands compared to the Northwestern Hawaiian Islands (Antonelis et al. 2006, NMFS 2007), they do enter National Park waters and occasionally haul out on the shoreline to rest. 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. Thirty opportunistic sightings have been recorded in the park since 1994 (NPS unpubl. data; T. Wurth, National Marine Fisheries Service, pers. comm. 2012). The NPS coordinates with and reports monk seal sightings to the National Marine Fisheries Service (NMFS). The NMFS has issued a proposed rule-making (76 FR 32026; June 2, 2011) stating that they propose to expand the current critical habitat for monk seals to include areas in the Main Hawaiian Islands. The park's shoreline falls within the criteria essential to monk seal conservation and will be included as critical habitat under the proposed revision. The Project location is more than 500 ft from the shoreline. To avoid potential impacts to the Hawaiian monk seal, viewing of monk seals on the shoreline must be from at least 150 ft away, and limited to one-half hour. Swimming with or touching Hawaiian monk seals are prohibited. Based on the avoidance and minimization measures described above, this project will not lead to impairment of Hawaiian monk seals.

Populations of the endangered humpback whale *koholā* (*Megaptera novaeangliae*) winter in the Hawaiian Islands. Whales may arrive in Hawaiian waters as early as November and a few may leave as late as June (NMFS 1991). During the peak abundance of the Hawaiian population, December to April, *koholā* are regularly observed within park waters. The location for the selected alternative is more than 500 ft from the shoreline. Therefore, this project will not lead to impairment of humpback whales.

The green sea turtle honu (Chelonia mydas) forages on marine algae around the main Hawaiian Islands (Hirth 1997, Arthur and Balazs 2008), and are regularly observed foraging in nearshore waters at Kaloko-Honokōhau NHP (NPS unpubl. data, NMFS unpubl. data). The NPS has collaborated with the NMFS Pacific Islands Fisheries Science Center, Marine Turtle Research Program, to conduct research and monitoring on the demographics, health, and habitat use of these turtles since 2000. One hundred and ninety-six individual juvenile turtles have been tagged or identified at the park since 2000 and the recapture rate is approximately 80% (NMFS/NPS unpubl. data) suggesting that these turtles are "resident" to some extent. Although the turtles can be found throughout the park's waters, the main areas of use by the turtles for foraging, resting, and basking on the shore are Honokohau Bay and the Ai'opio Fishtrap area. However, one turtle is known to enter Kaloko Fishpond occasionally to feed on algae in the pond. Although the Northwestern Hawaiian Islands, primarily French Frigate Shoals, continue to be the main breeding area for the green turtle, nesting has occurred on some beaches in the main Hawaiian Islands (Maison et al. 2010); however, no green turtle nesting or attempted nesting has been recorded in the park. The location for the selected alternative is more than 500 ft from the shoreline. Therefore, this project will not lead to impairment of green sea turtles.

The endangered hawksbill sea turtle, *honu 'ea* has been observed in park waters by NPS and recreational divers, including repeat sightings of identified individuals. Hawksbill turtles in Hawai'i are opportunistic foragers on invertebrates and potentially algae (NMFS and USFWS)

1998). The Hamakua Coast of Hawai'i Island has been identified as an important foraging ground for hawksbill sea turtles (Ellis et al. 2000). Hawksbill turtles nest in the main Hawaiian Islands, primarily on beaches along the south-facing shores coast of Hawai'i Island (Seitz et al. 2012). Although Hawksbill sea turtles occur in the park's offshore waters, they are not known to bask on park beaches or elsewhere in Hawai'i as do green turtles. No historic records have been found describing past nesting by hawksbill turtles in the park. The proposed action will not affect the hawksbill sea turtle because the species does not haul-out or nest in the project area.

The endangered ' $\bar{o}pe'ape'a$ (Hawaiian hoary bat, L. cinereus semotus) is the only existing native terrestrial mammal known from Hawai'i. The bat has been documented in the park (Fraser et al. 2007, Bonaccorso and Pinzari in litt. 2010). A 2005 acoustic survey detected bats on only 4 of 15 survey nights between April and July in the park (Fraser et al. 2007). All bat detections were in April, with the exception of one in late May. In the park, bats were active 40-60 minutes after sunset between April and July. Documented acoustic detections of bats in the park consisted of foraging activity opportunistically in a variety of habitats: over native and non-native shrubland, roads and trails, and coastal water bodies (including ocean and brackish water pools) (Fraser et al. 2007). The presence of bats at the selected location was recorded during a single deployment of an acoustic monitor from October 2 to 7, 2009. Bats vocalizations were recorded at the on all five nights and the majority of activity was just after sunset and the data suggest that the bat(s) were transiting the selected location rather than feeding (Bonaccorso and Pinzari in litt. 2010). Hawaiian hoary bats roost in both exotic and native woody vegetation higher than 15 ft (4.6 m) (Frank Bonaccorso, USGS, pers. Comm. 2011; USFWS 2011b). The breeding season for the hoary bat is generally April through August. The lack of detections in the park throughout the breeding season suggests that bats may not be breeding or have limited breeding in the park. Tree removal or tree pruning may affect roosting bats, and if during the breeding season, this activity could affect breeding bats and pups. To avoid potential impacts to the Hawaiian hoary bat, removal or thinning of woody vegetation taller than 15 ft would be limited to months outside of the April 15 to August 15 breeding season. If helicopters are used to ferry materials, they will operate outside of the April 15 to August 15 hoary bat breeding-season. Based on the avoidance measure, the selected alternative will not result in the impairment of the Hawaiian hoary bat.

The endangered Blackburn's sphinx moth (*Manduca blackburni*) is known to occur near the park (USFWS 2005); however, its status within the park is unknown. The species is found in the dry to mesic habitats between the elevations of sea level and 5,000 ft (1,525 m) (USFWS 2005). Likely food sources for the adult moth are nectar from native plants including species in the genus *Ipomoea* (e.g., *koali 'awa*), *ile 'e* (*Plumbago zeylanica*), *maiapilo* (*Capparis sandwichiana*); the larvae feed upon non-native tree tobacco (*Nicotiana glauca*) and the native *Nothocestrum breviflorum* (USFWS 2005, Black 2005). Several of these plant species occur within the park; however, *Nothocestrum* sp and *N. glauca* have not been reported (Canfield 1990, Pratt and Abbot 1996, Cogen et al. 2011). Threats to the moth include habitat loss, fragmentation, and degradation from urban and agricultural development, invasion by non-native plant species, non-native parasitoids and insect predators, over-collection (trade and personal collections), and increased wildfire frequency (USFWS 2005, Black 2005). Potential nectar plants occur at the selected location. Larval host plants do not occur at either site. Because no larval host plants occur at the site for the selected alternative, the selected alternative will not result in the impairment of the Blackburn's sphinx moth.

All currently known nesting sites for the threatened 'a'o, (Puffinus auricularis newelli, Newell's shearwater) and the endangered 'ua'u (Pterodroma sandwichensis, Hawaiian petrel) are at higher elevation than the park (Simons and Hodges 1998). Occurrences of these species in the park or of flying over the park are unknown and have not been recorded. On land, these seabirds are threatened by introduced small-mammal predators, disorientation fledglings by urban lighting, and collisions with urban lights, utility lines and poles, buildings, and fencing (Simons and Hodges 1998). Because bright electric lights will not be used at the Cultural Center, and the species are not known to nest in the park, the selected alternative will not result in the impairment of Newell's shearwater or the Hawaiian petrel.

Five endangered and one candidate species of plants have been out-planted in the park. NPS 2006 Management Policies require the NPS to manage out-planted species for their natural distribution and abundance. None of the out-planted endangered or candidate plant species also currently occur naturally in the park, although *loulu (Pritchardia affinis)* was found in the park's pollen record (Athens and Ward 2006, Douglas and Hotchkiss 1998, Pratt 1998). The candidate *ko'oko'olau* (beggartick *Bidens micrantha* ssp. *ctenophylla*) was recorded by Pratt and Abbot (1996) and probably by Canfield (1990) as *Bidens hawaiensis* (Pratt and Abbot 1996) in their park surveys. The out-plantings of *P. affinis* and *Sesbania tomentosa* are part of a demonstration/education landscape planting and not a recovery population. No endangered or candidate plant species will be impaired as none are located at selected alternative Project site.

The *maiapilo* (Hawaiian native caper, *Capparis sandwichiana*) is an endemic shrub that grows in dry, coastal habitats within the park. *Maiapilo* distribution is widespread throughout the park (Canfield 1990, Pratt and Abbott 1996), and it is abundant in the park relative to adjacent areas outside the park boundary. The plant is characterized by night-blooming, fragrant, large white flowers that open in the evening and fade in the daytime. *Maiapilo* is listed on the IUCN Red List as "vulnerable, (Bruegmann and Caraway 2003) and is considered a species of concern by the USFWS because of habitat loss; however it is not presently a candidate for listing. It has been considered "vulnerable" since 1999 (Wagner et al. 1999). A large *maiapilo* is located in the Alternative 2 (NPS Preferred) location and several individuals are growing along the footpath leading to that site. If removal of the individual *maiapilo* is necessary, new *maiapilo* will be outplanted at the site. Because new *maiopilo* will be out-planted if the existing miaopilo is removed, this project will not result in the impairment of *maiopilo*.

The selected alternative would not result in impairment to special status species.