PETITION TO LIST THE AKIKIKI OR KAUAI CREEPER (*OREOMYSTIS BAIRDI*) AND THE AKEKEE OR KAUAI AKEPA (*LOXOPS CAERULEIROSTRIS*) AS ENDANGERED OR THREATENED UNDER THE U.S. ENDANGERED SPECIES ACT

Dr. Eric VanderWerf and American Bird Conservancy

10 October 2007

NOTICE OF PETITION

Dale Hall, Director
U.S. Fish and Wildlife Service
1849 C Street NW, Room 3238
Washington, DC 20240-0001

Ren Lohoefener, Regional Director
U.S. Fish and Wildlife Service
911 NE 11th Ave.
Portland, OR 97232-4181

Patrick Leonard, Field Supervisor
U.S. Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Blvd., Room 3-122
Box 50088
Honolulu, HI 96850

PETITIONERS

Dr. Eric VanderWerf
320 Kupaua Place
Honolulu, HI 96821

_____ Date _10 October 2007_____

American Bird Conservancy
Dr. George H. Fenwick, President
4249 Loudoun Avenue
P.O. Box 249
The Plains, VA 20198
540-253-5780

_____Date _10 October 2007___

Pursuant to Section 4(b) of the Endangered Species Act (ESA), 16 U.S.C. §1533(b), Section 553(3) of the Administrative Procedures Act, 5 U.S.C. § 553(e), and 50 C.F.R. §424.14(a), Dr. Eric VanderWerf and the American Bird Conservancy hereby petition the Secretary of the Interior, through the United States Fish and Wildlife Service (USFWS), to list the Akikiki or Kauai Creeper (*Oreomystis bairdi*) and the Akekee or Kauai Akepa (*Loxops caeruleirostris*) as threatened or endangered species and designate critical habitat to ensure their recovery.

The American Bird Conservancy (ABC) is a 501(c)3 not-for-profit organization dedicated to conserving wild birds and their habitats throughout the Americas (www.abcbirds.org). Founded in 1994, ABC is the only US-based group dedicated solely to overcoming the greatest threats facing native birds in the Western Hemisphere. Together, ABC and its more than 300 partners buy land, restore degraded habitats, remove invasive and non-native species from natural areas, and effect policy changes. ABC draws on people and organizations through bird conservation networks – including the Bird Conservation Alliance, North American Bird Conservation Initiative, Partners in Flight, the National Pesticide Reform Coalition, the Alliance for Zero Extinction (www.zeroextinction.org), and ABC's international network – to identify the most critical issues affecting birds in the Americas and address them. ABC builds coalitions and establishes consensus on conservation priorities using the best available science, develops collaborative solutions engaging the best and most appropriate skills from each partner, and openly shares credit with its partners. ABC measures its success in terms of changes on the ground for the benefit of target bird species and populations. ABC has over 7,000 members throughout the United States, including Hawaii. ABC and its members are concerned with the conservation of endangered species, including the Akikiki and Akekee, and the effective implementation of the ESA.

Dr. Eric VanderWerf is an ornithologist and conservation biologist who has worked in Hawaii since 1991, focusing on the ecology, behavior, evolution, and conservation of Hawaiian birds. He earned a Master of Science degree from the University of Florida in 1992 and a Ph.D. degree from the University of Hawaii in 1999, and has authored over 40 scientific papers and reports. He has worked for the Hawaii Division of Forestry and Wildlife, the Pacific Islands Office of the U.S. Fish and Wildlife Service, and is currently self-employed.

USFWS has jurisdiction over this petition. This petition sets in motion a specific process, placing defined response requirements on USFWS. Specifically, USFWS must issue an initial finding as to whether the petition "presents substantial scientific or commercial information indicating that the petitioned action may be warranted." 16 U.S.C. §1533(b)(3)(A). USFWS must make this initial finding "[t]o the maximum extent practicable, within 90 days after receiving the petition." *Id.* Petitioners need not demonstrate that listing *is* warranted, rather, petitioners must only present information demonstrating that such listing *may* be warranted. In this case, petitioners believe that the best available information demonstrates listing the Akikiki and Akekee as endangered *is* in fact warranted, and therefore expect USFWS to make a positive initial finding on the petition, to promptly commence a status review as required by 16 U.S.C. § 1533(b)(3)(B), and to list these species as endangered under the ESA as soon as practicable.

EXECUTIVE SUMMARY

The Akikiki or Kauai Creeper (*Oreomystis bairdi*) and the Akekee or Kauai Akepa (*Loxops caeruleirostris*) warrant listing under the Endangered Species Act (ESA) because they have small populations, occur in small geographic ranges, are undergoing rapid declines in population and range, are currently impacted by a variety of threats, and are not adequately protected by existing regulatory mechanisms.

The current population of the Akikiki is estimated to be 1312 ± 530 birds, based on surveys conducted in April and May 2007 (Hawaii Division of Forestry and Wildlife and USGS, unpubl. data). The estimated population has declined from 6832 ± 966 birds in 1970 (USFWS 1983, Scott *et al.* 1986), 1472 ± 680 birds in 2000 (Foster *et al.* 2004), and 1364 ± 401 in 2005 (Hawaii Division of Forestry and Wildlife and USGS, unpubl. data). The geographic range occupied by the Akikiki has declined from 88 square kilometers in 1970 to 36 square kilometers in 2000, and may have continued to decline since then.

The current population of the Akekee is estimated to be 3536 ± 1030 birds, based on surveys conducted in April and May 2007 (Hawaii Division of Forestry and Wildlife and USGS, unpubl. data). The estimated population has declined from 7839 ± 704 birds in 2000 and 5669 ± 1003 birds in 2005 (Hawaii Division of Forestry and Wildlife and USGS, unpubl. data). The population in 2000 was previously reported to be over 25,000 birds (Foster *et al.* 2004), but reanalysis of the data using improved methods and a larger data set yielded a lower and more realistic estimate. The geographic range occupied by the Akekee was approximately 88 square kilometers in 1970 (USFWS 1983, Scott *et al.* 1986), and this was reported not to have changed in 2000 (Foster *et al.* 2004), but surveys in 2007 failed to find the species in many areas where it was previously observed, indicating there has been a range contraction, though the extent of the contraction is not known at this time.

The primary threats to the Akikiki and Akekee are habitat loss and degradation caused by invasive alien plants and browsing and rooting by feral ungulates, diseases spread by introduced mosquitoes, predation by alien mammals, and catastrophes such as hurricanes. Some of these threats are severe in magnitude and are occurring over a significant portion of the species' ranges. The threat from mosquito-borne diseases may worsen as global warming allows mosquitoes to invade the highest, coldest parts of the island that once provided refuge from disease.

The Akikiki and Akekee are not adequately protected by existing regulatory mechanisms. Neither species is protected under the Migratory bird Treaty Act (MBTA), and they, and all other Hawaiian honeycreepers, have been deliberately and arbitrarily excluded from such protection even though they are members of a bird family (Fringillidae) specifically protected under the MBTA.

The Akikiki is categorized as critically endangered by the International Union for the Conservation of Nature (IUCN) due to its extremely small and declining population and geographic range (IUCN 2007). The Akekee is categorized as endangered by the IUCN due to its small and declining geographic range and declines in habitat quality (IUCN 2007).

The Akikiki is already a candidate for listing under the ESA, and has been on the list of candidate species since 1994. Sufficient information has been available for years to support listing the Akikiki, but according to the USFWS the listing has been precluded every year by higher priority listing actions (USFWS 2004). The current petition provides new information about the distribution and abundance of the Akikiki demonstrating it has continued to decline since it was first petitioned for listing, and that the need to list it is now even more urgent.

BIOLOGICAL INFORMATION

Species Descriptions

The Akikiki or Kauai Creeper is a small (12-17 grams; 0.4-0.6 ounces) forest bird. It is dark gray to olive gray on the head, back, sides and flanks, and off-white on the throat, breast, belly, and undertail coverts (Pratt *et al.* 1987, Foster *et al.* 2000). The bill is short, slightly decurved, and pale pink. The legs are short and the legs and feet are dull pink. Males and females are similar. Juveniles resemble adults, but have white spectacles around the eyes. The song is a short, descending trill. Males and females give a soft "whit" contact call (Pratt *et al.* 1987, Foster *et al.* 2000).

The Akekee or Kauai Akepa is also a small (10-12 grams; 0.3-0.4 ounces) forest bird. Males are bright yellow below, greenish above, with a yellow forehead and rump (Pratt *et al.* 1987, Lepson and Pratt 1997). Females are similar, but less brightly yellow and slightly smaller. Both sexes have a dark mask that extends from the base of the bill to the eye. The bill is pale bluish, short, and pointed, and the tips if the mandibles are slightly crossed. The legs are short and dark. The tail is notched and somewhat longer than in other Hawaiian honeycreepers. The song is a wavering trill that changes in pitch and speed; call notes given by males and females include a soft "sweet" (Pratt *et al.* 1987, Lepson and Pratt 1997).

Taxonomy

The Akikiki is found only on the island of Kauai, and there are no described subspecies. It has one congener, the Hawaii Creeper (*Oreomystis mana*), which is endemic to the island of Hawaii and is listed as endangered under the ESA (USFWS 2006). The Akikiki was originally described as *Oreomyza bairdi* (Stejneger 1887), was once placed in the genus *Paroreomyza*, and has been treated as a subspecies of various other taxa. All recent authorities agree that it constitutes a separate species, but there continues to be some debate about which species are its closest relatives (Raikow 1977, Johnson *et al.* 1989, Pratt 1992, Fleischer *et al.* 1998, Fleischer and McIntosh 2001, Pratt 2001, James 2004, Pratt 2005). The Akikiki and other Hawaiian honeycreepers are classified within the finch family (Fringillidae), as either a subfamily (Drepanidinae; AOU 1998, Pratt 2005) or a tribe (Drepanidini; Olson and James 1982, Fleischer *et al.* 2001, James 2004).

The Akekee is also found only on the island of Kauai, and there are no described subspecies. It has one congener, the Akepa (*Loxops coccineus*), which has three subspecies on Hawaii, Maui, and Oahu (Pratt *et al.* 1987, Lepson and Pratt 1997, Pratt 2005). The Hawaii Akepa is listed as endangered under the ESA, and the Maui and Oahu forms are probably extinct (USFWS 2006). The Akekee was originally described as *Hemignathus caeruleirostris* (Wilson 1889), and its taxonomy has changed several times in the past (Pratt 1989), but its species status and current taxonomic placement are now generally agreed upon (AOU 1991, Fleischer and McIntosh 2001, Pratt 2005). Like the Akikiki, the Akekee is classified in the finch family (Fringillidae; AOU 1998, Pratt 2005).

Habitat/Life History

The Akikiki and Akekee have similar habitat requirements and are found in mesic and wet native montane forests dominated by ohia (*Metrosideros polymorpha*), koa (*Acacia koa*), olapa

(*Cheirodendron trigynum*), lapalapa (*Cheirodendron platyphyllum*), ohia ha (*Syzygium sandwicensis*), kawau (*Ilex anomala*), and kolea (*Myrsine lessertiana*), with a diverse understory of native plants including ohelo (*Vaccinium calycinum*) and kanawao (*Broussaisia arguta*).

The Akikiki forages on trunks, branches, and twigs of live and dead trees, primarily ohia and koa and occasionally in subcanopy shrubs (Foster *et al.* 2000). It feeds on insects, insect larvae, and other arthropods taken from bark, crevices, dead wood, and epiphytes by gleaning, probing, and rarely by excavation (Foster *et al.* 2000; VanderWerf and Roberts in press). The nesting season of the Akikiki extends primarily from March-June (Foster *et al.* 2000), but recent information indicates nesting may occur from January to July in at least some years (VanderWerf and Roberts in press). Few Akikiki nests have been found, but all have been located in the crowns of ohia trees 4-12.5 m (13-41 ft) above ground and were composed of moss, small pieces of bark, bits of lichen, and fine plant fibers (Eddinger 1972a, Foster *et al.* 2000, VanderWerf and Roberts in press). Both sexes help build the nest and feed the nestlings, but incubation has been observed by the female only, and the male feeds the female during nest construction, incubation, and brooding (Eddinger 1972a, Foster *et al.* 2000, VanderWerf and Roberts in press). There is no information about nest success, reproductive rates, survival of adults or juveniles, or movements (Foster *et al.* 2000, U.S. Fish and Wildlife Service 2006).

The Akekee forages for insects, insect larvae, and spiders on the outer branches and leaves of ohia tress, and occasionally in other trees and understory shrubs (Lepson and Pratt 1997). Prey are taken primarily by gleaning, and the asymmetrical crossed mandibles are used to pry open leaf buds and flower buds, similar to the behavior used by crossbills (*Loxia* spp.). Only six nests of the Akekee have been found and there is limited information about its breeding biology, but the nesting season is thought to extend from March-June (Lepson and Pratt 1997, E. VanderWerf unpubl. data). Nests were located 9-12 meters (30-40 ft) above ground in the crown of ohia trees and were made of moss and lichen, with the nest lining made of fine grasses and soft bark strips (Eddinger 1972b, Berger 1981, Lepson and Pratt 1997). Both sexes help build the nest, but the female alone probably incubates the eggs, and both sexes probably feed the nestlings (Eddinger 1972b, Lepson and Pratt 1997). There is no information about nest success, reproductive rates, survival of adults or juveniles, or movements.

Population Size and Range

The Akikiki is endemic to the island of Kauai. It was considered common from high to low elevations in native forests in the late 1800s (Perkins 1903), and was locally abundant on and near the Alakai Plateau in the early 1960s (Richardson and Bowles 1964). In 1968-1973, the Akikiki was estimated to number 6,832 ± 966 birds, and the range was thought to encompass 88 square kilometers (21,750 acres) ranging in elevation from 600 to 1,600 meters (1,968 to 5,248 feet) (USFWS 1983). In 1981, the number of Akikiki estimated to occur in a 25 square-kilometer (9.7 square-mile) area of the southeastern Alakai was 1,650 ± 450 (Scott *et al.* 1986). In 1968-1973, the estimated Akikiki population in this same area was 2,300 ± 700 birds (USFWS 1983). Surveys in March-April 2000 showed that the Akikiki had decreased in number to 1,472 ± 680 birds, that the range had decreased to 36 square kilometers (8,896 acres), and that the species had disappeared from much of the periphery of its range (Foster *et al.* 2004).

The current population of the Akikiki is estimated to be 1312 ± 530 birds, based on surveys conducted in April and May 2007 (Hawaii Division of Forestry and Wildlife and USGS, unpubl. data). The estimated population thus has declined from 6832 ± 966 birds in 1970 (USFWS 1983, Scott *et al.* 1986), 1472 ± 680 birds in 2000 (Foster *et al.* 2004), and 1364 ± 401 in 2005, (Hawaii Division of Forestry and Wildlife and USGS, unpubl. data). The geographic range occupied by the Akikiki has declined from 88 square kilometers in 1970 to 36 square kilometers in 2000, and may have continued to decline since then.

The Akekee is also endemic to the island of Kauai. It was described as "quite plentiful" (Bryan and Seale 1901) and common "over a large part of the high plateau" in the late 1800s (Perkins 1903), and probably occurred throughout upper elevation forested regions of the island (Munro 1944). Richardson and Bowles (1964) reported that it was fairly common in higher elevation forests. Conant *et al.* (1998) reported that it was common in the area around Sincock's Bog in 1975 and observed it daily. The first quantitative information on population size and distribution was based on extensive surveys conducted from 1968-1973, which yielded an island-wide population estimate of 5,066 ± 840 birds (USFWS 1983). Most individuals were found in the Alakai Plateau area and the Kokee area west of the Alakai at elevations from 800-1,370 meters (2,640-4,520 feet), and smaller numbers were also found at approximately 800 meters (2,640 feet) elevation on Makaleha Mountain and down to 600 meters (1,980 feet) elevation near Hinalele Falls in Wainiha Valley (USFWS 1983). In 1981, the number of Akekee estimated to occur in a 25 square kilometer (9.7 square mile) area of the southeastern Alakai was 1,700 ± 300, with higher densities in the higher, more remote regions of the eastern Alakai Plateau and lower densities toward the west in the Kokee region (Scott *et al.* 1986). In 1968-1973, the Akekee population in this same area was estimated to be 600 ± 200 birds (USFWS 1983), though it is not clear whether these estimates are from exactly the same areas.

The current population of the Akekee is estimated to be 3536 ± 1030 birds, based on surveys conducted in April and May 2007 (Hawaii Division of Forestry and Wildlife and USGS, unpubl. data). The estimated population has declined from 7839 ± 704 birds in 2000 and 5669 ± 1003 birds in 2005 (Hawaii Division of Forestry and Wildlife and USGS, unpubl. data). The population in 2000 was previously reported to be over 25,000 birds (Foster *et al.* 2004), but reanalysis of the data using improved methods and a larger data set yielded a lower and more realistic estimate. The geographic range occupied by the Akekee was approximately 88 square kilometers in 1970 (USFWS 1983, Scott *et al.* 1986), and this was reported not to have changed in 2000 (Foster *et al.* 2004), but surveys in 2007 failed to find the species in many areas where it was previously observed, indicating there has been a range contraction, though the extent of the contraction is not known at this time.

THREATS

Under the ESA, 16 U.S.C. § 1533(a)(1), USFWS is required to list a species for protection if it is in danger of extinction or threatened by possible extinction in all or a significant portion of its range. In making such a determination, USFWS must analyze the species' status in light of five statutory listing factors or threat categories. 16 U.S.C. § 1533(a)(1)(A)-(E); 50 C.F.R. § 424.11(c)(1) - (5). These five factors are discussed below.

The Akikiki and Akekee face similar threats because they are related, occupy similar geographic areas, and have similar habitat requirements, but the severity of certain threats may differ somewhat between the two species due to differences in their life histories, as described below.

A. The present or threatened destruction, modification, or curtailment of its habitat or range.
The habitat of the Akikiki and Akekee has been, and continues to be, negatively affected by invasive alien plant species that displace native plant species used by the Akikiki and Akekee for foraging and nesting, and by the action of feral ungulates, particularly feral pigs and goats (Lepson and Pratt 1997, Foster *et al.* 2004). The Akikiki and Akekee are dependent on areas of intact native forest for foraging and nesting. Feral ungulates have negative impacts on native forest ecosystems in Hawaii by direct browsing of native plants, soil erosion, disruption of native plant regeneration, spreading of invasive alien plant seeds, opening of forest habitat that facilitates invasion by alien plants, and creation of breeding habitat for mosquitoes that carry alien diseases (Cabin *et al.* 2000, Scott *et al.* 2001, USFWS 2006). Hunting of feral pigs is allowed in the Alakai Wilderness Preserve, where most of the remaining Akikiki and Akekee occur, but because of the remoteness and rugged terrain in this area, little hunting actually occurs and feral pig populations are largely uncontrolled. Degradation of forest habitat has played an important role in causing the decrease in range of the Akikiki and Akekee. Most of the decline has occurred at lower elevations on the edge of these species ranges (Foster *et al.* 2004), where disturbance and the effects of ungulates and invasive alien plants are most severe. Continued habitat degradation resulting from the invasion by many non-native plants and the actions of feral ungulates is likely to continue damaging forest structure and integrity, and thus likely to result in continued loss of habitat and curtailment of range.

B. Overutilization for commercial, recreational, scientific, or educational purposes.
Not known to be a threat at this time.

C. Disease or predation.
Avian diseases transmitted by the introduced southern house mosquito (*Culex quinquefasciatus*), particularly avian pox virus (*Poxvirus avium*) and avian malaria (*Plasmodium relictum*), have played a major role in the extinction and decline of many Hawaiian forest birds, and these diseases continue to limit the distribution of many Hawaiian forest bird species, including the Akikiki and Akekee (Scott *et al.* 1986, van Riper *et al.* 1986, Atkinson *et al.* 1995, Scott *et al.* 2001, USFWS 2006). Both species were formerly found at lower elevations but have become restricted to higher elevations where mosquitoes and the diseases they carry are less prevalent (Scott *et al.* 1986, Foster *et al.* 2004). In August and October 1994, Dusek *et al.* (1995) found that *Culex* mosquitoes were less common at 4,400 feet elevation in the Sincock's Bog area (0.09 mosquitoes per trap night) than at 3,800 feet elevation in the Pihea-Alakai Swamp Trail area (6.23 mosquitoes per trap night). Similarly, prevalence of malaria has been lower at high elevations, but there is evidence that malaria prevalence on Kauai has increased over time. In 1960, there was no sign of malaria in blood smears collected near Sincock's Bog (Dusek *et al.* 1995). In 1992, 63 Kauai forest birds captured at the junction of the Pihea Trail and Alakai Swamp Trail were sampled for avian malaria (Cann *et al.* 1996). The only species to test positive for malaria was the Elepaio (*Chasiempis sandwichensis*), in which 4 of 11 birds were positive. Only a single Akikiki was captured and no Akekee were captured, too few birds to adequately judge disease prevalence in these species. In 1994, 2-3% of native forest birds

sampled in the Sincock's bog area and the Pihea-Alakai Swamp Trail area had malaria that was detectable in blood smears (Dusek *et al.* 1995). When the Pihea-Alakai Swamp Trail site was resampled in February 1995, the prevalence of malaria was dramatically higher, indicating an epizootic had occurred in late 1994 (Dusek *et al.* 1995). The overall prevalence of malaria increased from 2.7% to 12.1%, with the largest increases observed in Elepaio (17.6% to 45.5%), Kauai Amakihi (*Hemignathus kauaiensis*) (4.1% to 29.2%), and Akekee (0% to 20%; Dusek *et al.* 1995). Declines in Akikiki and Akekee abundance have been especially severe in the Pihea-Alakai Swamp Trail area and other areas at similar elevations, suggesting mosquito-borne diseases have played an important role in the decline. No Akikiki have tested positive for malaria (C. Atkinson, USGS, unpubl. data, cited in LaPointe 2000), but the sample of Akikiki examined for disease was very small and more data are needed to determine if this low infection rate is caused by a low transmission rate or high mortality of infected birds. Some related species are known to be highly susceptible to introduced diseases and to have ranges largely restricted by disease (USFWS 2006). During clinical trials with some Hawaiian forest bird species, virtually all experimentally infected individuals died, so the absence of infected birds in the wild may in fact indicate a very high mortality rate from disease, and thus that disease is a very serious threat (Atkinson *et al.* 1995).

Introduced predators are one of the most serious threats to Hawaiian forest birds, particularly during nesting (Atkinson 1977; Scott *et al.* 1986; VanderWerf and Smith 2002). The nesting biology of the Akikiki and Akekee have been little studied and few of their nests have been found (Eddinger 1972a, 1972b, Lepson and Freed 1997, Foster *et al.* 2000), but black rats (*Rattus rattus*), Polynesian rats (*R. exulans*), Norway rats (*R. norvegicus*), and feral domestic cats (*Felis domesticus*) are present on the Alakai Plateau where Akikiki and Akekee occur and are potential predators on roosting or incubating adults, nests, and young. Predation, probably by black rats, was the greatest cause of nest failure in the Puaiohi or Small Kauai Thrush (*Myadestes palmeri*), another endangered bird species that inhabits the same areas as the Akikiki and Akekee, occurring at 38% of nests and causing the deaths of two nesting adult females (Tweed *et al.* 2006). Two species of owls, the native Pueo (*Asio flammeus sandwichensis*) and the introduced Barn Owl (*Tyto alba*) also occur on Kauai and are known to prey on forest birds, possibly including the Akikiki and Akekee (Snetsinger *et al.* 1994).

D. <u>The inadequacy of existing regulatory mechanisms</u>.

The Akikiki and Akekee, like all other Hawaiian honeycreepers, are not included on the list of species protected under the Migratory Bird Treaty Act (MBTA) and thus receive no protection under Federal law. In 2006, the USFWS published a proposed rule to revise the list of species protected under the MBTA (USFWS 2006b), but the proposed rule deliberately and arbitrarily excluded Hawaiian honeycreepers, even though they are part of a family (Fringillidae) that is specifically protected under the MBTA.

According to definitions provided in the proposed rule, a species qualifies for protection under the MBTA by meeting one or more of the following criteria:

(1) It (a) Belongs to a family or group of species named in the Canadian convention of 1916, as amended in 1996; (b) specimens, photographs, videotape recordings, or audiotape recordings provide convincing evidence of natural occurrence in the United States or its territories; and (c) the documentation of such records has been recognized by the AOU or other competent scientific authorities.

(2) It (a) Belongs to a family or group of species named in the Mexican convention of 1936, as amended in 1972; (b) specimens, photographs, videotape recordings, or audiotape recordings provide convincing evidence of natural occurrence in the United States or its territories; and (c) the documentation of such records has been recognized by the AOU or other competent scientific authorities.

All Hawaiian honeycreepers clearly meet these criteria. They are known to belong to the family Fringillidae, which is named under both the Canadian and Mexican conventions. There is no question about the status of these species within the United States; they are resident within the United States, and in fact occur nowhere else.

However, the proposed rule later specifically excludes the Hawaiian honeycreepers with no explanation:

> "Native species that belong to families or groups represented in the United States, but which are not expressly mentioned by the Canadian, Mexican, or Russian treaties, including the Megapodiidae (megapodes), Phasianidae (grouse, ptarmigan, and turkeys), Odontophoridae (New World quail), Burhinidae (thick-knees), Glareolidae (pratincoles), Psittacidae (parrots), Todidae (todies), Meliphagidae (honeyeaters), Monarchidae (monarchs), Timaliidae (wrentits), Coerebidae (bananaquits), and Drepanidinae (Hawaiian honeycreepers)."

The fact that the Drepanidinae is not expressly mentioned in the treaties is irrelevant because the taxonomic status of the group has been changed, and all authorities now agree that it is contained in a family, the Fringillidae, that is included under the MBTA. The proposed rule adds and removes other species based on taxonomic changes, and makes revisions to correct errors involving taxonomy of other Hawaiian birds, such as the Omao (*Myadestes obscurus*), Puaiohi, and Hawaiian Coot (*Fulica alai*). There is no logical reason to exclude the Hawaiian honeycreepers, and failure to correct the taxonomy of Hawaiian honeycreepers, as was done for other species, is arbitrary and capricious. It is unfortunate that several of the bird species in the United States most in need of protection have been deliberately excluded.

E. Other natural or manmade factors affecting its continued existence.
Hurricanes struck Kauai in 1983 and 1992 and significantly reduced habitat of the Akikiki and Akekee by blowing down large trees and creating openings in the forest that facilitated the spread of invasive alien plants. Large numbers of dead trees killed by hurricane Iniki in 1992 are still visible on the ground in several areas where Akikiki have declined in abundance or disappeared. Many large wind-thrown trees blocked the Mohihi-Waialae Trail south of Koaie Camp in April 1996, and the trunks of these trees were still visible on the ground in May 2007 (E. VanderWerf pers. obs.). Akikiki and Akekee still occur in this area, but have declined in abundance (Foster *et al.* 2000, Hawaii Division of Forestry and Wildlife and USGS unpubl. data). Habitat damage by the hurricane was more severe at higher elevations near Keaku Cave on the western slope of Waialeale (E. VanderWerf pers. obs.), and neither the Akikiki nor the Akekee have been found in this area recently.

Global warming poses a threat to the Akikiki and Akekee by causing an increase in the elevation at which regular transmission of avian malaria and avian pox virus occurs (Reiter 1998, Benning *et al.* 2002, Harvell *et al.* 2002, Hay *et al.* 2002). Experimental evidence has shown that the parasite that causes avian malaria does not develop in birds below 13° Celsius (C) (55° Fahrenheit (F)), and field studies have found that maximum malaria transmission occurs where mean ambient summer temperature is 17° C (63° F) (LaPointe 2000). Between 13° and 17° C (55° and 63° F), malaria transmission is sporadic and usually associated with warmer periods, such as El Niño events (Feldman *et al.* 1995). There are no forested areas on Kauai where mean ambient temperature is below 13° C (55° F), meaning all parts of the island are subject to malaria at least periodically (Benning *et al.* 2002). According to the Intergovernmental Panel on Climate Change (IPCC 2007), the global average surface warming following a doubling of carbon dioxide concentrations is likely to be in the range of 2° C to 4.5° C, with a best estimate of about 3° C, and is very unlikely to be less than 1.5° C. Benning *et al.* (2002) used GIS simulation to show that an increase in temperature of 2° C (3.6 ° F) would raise the 17° C (63° F) isotherm by 300 m (984 ft), resulting in an 85 percent decrease in the land area on Kauai where malaria transmission currently is only periodic. Loss of such a large proportion of suitable habitat would likely result in extinction of the Akikiki and Akekee (Pounds *et al.* 1999; Still *et al.* 1999). Increases in summertime temperatures and malaria prevalence have been reported on Hawaii Island (Freed *et al.* 2005). Temperature data on Kauai have not been examined, and there is no information about disease prevalence in forest birds on Kauai in the past 10 years.

Species like the Akikiki and Akekee that are endemic to single small islands or habitat areas are inherently more vulnerable to extinction than widespread species because of the higher risks posed to a single population by random demographic fluctuations and localized catastrophes such as hurricanes, fires, and disease outbreaks (Wiley and Wunderle 1994). As populations and ranges of island birds decline due to other threats, the extinction risk from catastrophic events also increases.

CRITICAL HABITAT

The ESA mandates that when the USFWS lists a species as endangered or threatened, the agency generally must also concurrently designate critical habitat for that species. Section 4(a)(3)(A)(i) of the ESA states that, "to the maximum extent prudent and determinable," the USFWS "shall, concurrently with making a determination . . . that a species is an endangered species or threatened species, designate any habitat of such species which is then considered to be critical habitat . . . ". 16 U.S.C. § 1533(a)(3)(A)(i); *see also id.* at § 1533(b)(6)(C). The ESA defines the term "critical habitat" to mean: i. the specific areas within the geographical area occupied by the species, at the time it is listed . . . , on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and ii. specific areas outside the geographical area occupied by the species at the time it is listed . . . , upon a determination by the Secretary that such areas are essential for the conservation of the species. *Id.* at § 1532(5)(A).

Petitioners expect that USFWS will comply with this mandate and designate critical habitat for the Akikiki and Akekee. We believe that all areas currently and historically occupied by the

Akikiki and Akekee meet the criteria for designation as critical habitat, and we therefore expect that these areas, at a minimum, be designated as such.

LITERATURE CITED

Atkinson, C. T., Woods, K. L., Dusek, R. J., Sileo, L., and Iko, W. M., 1995. Wildlife disease and conservation in Hawaii: Pathogenicity of avian malaria (*Plasmodium relictum*) in experimentally infected Iiwi (*Vestiaria coccinea*). *Parasitology* 111:S59-S69.

Atkinson, I.A.E. 1977. A reassessment of factors, particularly Rattus rattus L., that influenced the decline of endemic forest birds in the Hawaiian Islands. Pacific Science 31:109-133.

Benning, T. L., D. LaPointe, C. T. Atkinson, and P. M. Vitousek. 2002. Interactions of climate change with biological invasions and land use in the Hawaiian Islands: modeling the fate of endemic birds using a geographic information system. Proceedings of the National Academy of Science 99:14246-14249.

Bryan, W. A., and A. Seale. 1901. Notes on the birds of Kauai. Occasional Papers of the the Bernice Pauahi Bishop Muesum 1:129-137.

Cabin, R.J., S.G. Weller, D.H. Lorence, T.W. Flynn, A.K. Sakai, D. Sandquist, and L.J. Hadway. 2000. Effects of long-term ungulate exclusion and recent alien species control on the preservation and restoration of a Hawaiian tropical dry forest. Conservation Biology 14:439-453.

Cann, R. L., R. A. Feldman, L. Agullana, and L. A. Freed. 1996. A PCR approach to detection of malaria in Hawaiian birds, p. 202–213. *In* T. B. Smith and R. K. Wayne [eds.], Molecular genetic approaches in conservation. Oxford University Press, New York.

Dusek, R.J., J.K. Lease, C. van Riper III, and C.T. Atkinson. 1995. Prevalence of avian malaria, *Plasmodium relictum*, in Kauai forest birds. Abstract from presentation at the Hawaii Conservation Conference. Honolulu, Hawaii. July, 1995.

Eddinger, C.R. 1972a. Discovery of the nest of the Kauai Creeper. Auk 89:673-674.

Eddinger, C.R. 1972b. Discovery of the nest of the Kauai Akepa. Wilson Bulletin 84:95-97.

Feldman, R.A., L.A. Freed, and R. L. Cann. 1995. A PCR test for avian malaria in Hawaiian birds. Molecular Ecology 4:663-673.

Fleischer, R. C., and C. E. McIntosh. 2001. Molecular systematics and biogeography of the Hawaiian avifauna. Studies in Avian Biology 22: 51-60.

Fleischer, R. C., C. L. Tarr, H. F. James, B. Slikas, C. E. McIntosh. 2001. Phylogenetic placement of the Po`ouli, *Melamprosops phaeosoma*, based on mitochondrial DNA sequence and osteological characters. Studies in Avian Biology 22:98-103.

Foster, J.T., J.M. Scott, and P.W. Sykes, Jr. 2000. 'Akikiki (Oreomystis bairdi). The Birds of North America (A. Poole and F. Gill, eds.). Number 552. The Birds of North America Inc., Philadelphia, PA.

Foster, J.T., E.J. Tweed, R.J. Camp, B.L. Woodworth, C.D. Adler, and T. Telfer. 2004. Long-term population changes of native and introduced birds in the Alaka`i Swamp, Kaua`i. Conservation Biology 18:716-725.

Harvell, C. D., C. E. Mitchell, J. R. Ward, S. Altizer, A. P. Dobson, R. S. Ostfield, and M. D. Samuel. 2002. Climate warming and disease risks for terrestrial and marine biota. Science 296: 2158–2162.

Hay, S. I., J. Cox, D. J. Rogers, S. E. Randolph, D. I. Stern, G. D. Shanks, M. F. Myers, and R. W. Snow. 2002. Climate change and the resurgence of malaria in the East African highlands. Nature 415:905–909.

Intergovernmental Panel on Climate Change. 2007: Summary for Policymakers. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M.Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

IUCN 2007. 2007 IUCN Red List of Threatened Species. <www.iucnredlist.org>. Downloaded on 19 September 2007.

James, H.F. 2004. The osteology and phylogeny of the Hawaiian finch radiation (Fringillidae: Drepanidini), including extinct taxa. Zoological Journal of the Linnean Society 141 (2): 207-255.

Johnson, N.K., J.A. Marten, and C.J. Ralph. 1989. Genetic evidence for the origin and evolution of the Hawaiian honeycreepers (Aves: Fringillidae). Condor 91:379-396.

LaPointe, D. 2000. Avian malaria in Hawaii: the distribution, ecology, and vector potential of forest dwelling mosquitos. Unpublished Ph.D. dissertation. University of Hawaii at Manoa.

Lepson, J. K. and L. A. Freed. 1997. `Ākepa (*Loxops coccineus*). The Birds of North America. Number 294.

Perkins, R.C.L. 1903. Vertebrata. Pp. 365-466 in D. Sharp (ed.). Fauna Hawaiiensis. Vol. 1, part IV. The University Press, Cambridge, England.

Pounds, A.J., M.P. Fogden, and J.H. Campbell. 1999. Biological response to climate change on a tropical mountain. Nature 398:611-614.

Pratt, H.D. 1992. Systematics of the Hawaiian "creepers" Oreomystis and Paroreomyza. Condor 94:836-846.

Pratt, H. D. 2001. Why the Hawai`i Creeper is an *Oreomystis*: what phenotypic characters reveal about the phylogeny of Hawaiian honeycreepers. Studies in Avian Biology 22:81-97.

Pratt, H. D. 2005. The Hawaiian Honeycreepers. Oxford University Press, Oxford, United Kingdom.

Pratt, H. D., P. L. Bruner, and D. G. Berrett. 1987. A field guide to the birds of Hawaii and the tropical Pacific. Princeton University Press, Princeton, NJ.

Raikow, R.J. 1977. The origin and evolution of the Hawaiian honeycreepers (Drepanididae). Living Bird 15:95-117.

Reiter, P. 1998. Global warming and vector-borne disease in temperate regions and at high altitudes. Lancet 352:839–840.

Richardson, F. and J. Bowles. 1964. A survey of the birds of Kauai, Hawaii. B. P. Bishop Museum Bulletin 227.

Scott, J. M., S. Conant, and C. van Riper III. 2001. Evolution, ecology, conservation, and management of Hawaiian birds: a vanishing avifauna. Studies in Avian Biology 22:1-428.

Scott, J. M., S. Mountainspring, F. L. Ramsey, and C. B. Kepler. 1986. Forest bird communities of the Hawaiian Islands: their dynamics, ecology, and conservation. Studies in Avian Biology 9:1-431.

Snetsinger, T.J., S.G. Fancy, J.C. Simon, and J.D. Jacobi. 1994. Diets of owls and feral cats in Hawai`i. `Elepaio 54:47-50.

Stejneger, L. 1887. Birds of Kauai Island, Hawaiian Archipelago, collected by Mr. Valdemar Knudsen, with descriptions of new species. Proceedings of the United States National Museum 12:377-386.

Still, C.J., P.N. Foster, and S. Schneider. 1999. Simulating the effects of climate change on tropical montane cloud forests. Nature 398:608-610.

Tweed, E.J., J. T. Foster, B. L. Woodworth, W. B. Monahan, J. L. Kellerman, and A. Lieberman. 2006. Breeding biology and success of a reintroduced population of the critically endangered Puaiohi. Auk 123:753-763.

U.S. Fish and Wildlife Service. 1983. Kauai forest birds recovery plan. U.S. Fish and Wildlife Service, Portland, Oregon, U.S.A.

U.S. Fish and Wildlife Service. 2004. Review of native species that are candidates or proposed for listing as endangered or threatened; annual notice of findings on resubmitted petitions; Annual description of progress on listing actions; notice of review. Federal Register 71:53756-53835.

U.S. Fish and Wildlife Service. 2006. Revised recovery plan for Hawaiian forest birds. U.S. Fish and Wildlife Service, Region 1, Portland, Oregon, U.S.A.

U.S. Fish and Wildlife Service. 2006b. Revised list of migratory birds. Proposed Rule. Federal Register 71(164):50193-50221.

van Riper, C., III, S. G. van Riper, M. L. Goff, and M. Laird. 1986. The epizootiology and ecological significance of malaria in Hawaiian land birds. Ecological Monographs 56:327-344.

VanderWerf, E. A. 1998. Breeding biology and territoriality of the Hawai`i Creeper. Condor 100:541-545.

VanderWerf, E. A., and P. K. Roberts. In press. Foraging and nesting of the `Akikiki or Kaua`i Creeper (O*reomystis bairdi*). Wilson Journal of Ornithology.

VanderWerf, E. A., and D. G. Smith. 2002. Effects of alien rodent control on demography of the O`ahu `Elepaio, an endangered Hawaiian forest bird. Pacific Conservation Biology 8**:**73-81.

Wiley, J. W., and J. M. Wunderle. 1994. The effects of hurricanes on birds, with special reference to Caribbean islands. Bird Conservation International 3: 319-349.

Figure 1. Population estimates of Akikiki and Akekee over time. Data sources: 1968-1973 data from USFWS 1983; 2000 data for Akikiki from Foster *et al*. 2004; 2000 data for Akekee from Hawaii Division of Forestry and Wildlife and USGS unpublished; 2005 and 2007 data from Hawaii Division of Forestry and Wildlife and USGS unpublished.