Before the Secretary of Commerce

PETITION TO REVISE CRITICAL HABITAT for the HAWAIIAN MONK SEAL (*Monachus schauinslandi*) under the ENDANGERED SPECIES ACT

Photo by NOAA available at: http://celebrating200years.noaa.gov/transformations/sanctuaries/image6.html.

CENTER for BIOLOGICAL DIVERSITY

KAHEA The Hawaiian-Environmental Alliance

Ocean Conservancy Start a Sea Change

July 2, 2008

Notice of Petition

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Petitioners

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The Center for Biological Diversity is a non-profit, public interest environmental organization dedicated to the protection of native species and their habitats through science, policy, and environmental law. The Center has over 40,000 members throughout the United States. The Center and its members are concerned with the conservation of endangered species, including the Hawaiian monk seal, and the effective implementation of the Endangered Species Act.

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KAHEA: The Hawaiian-Environmental Alliance is a community-based organization working to improve the quality of life for Hawai'i's people and future generations through the revitalization and protection of Hawai'i's unique natural and cultural resources. We advocate for the proper stewardship of our resources and for social responsibility by promoting multi-cultural understanding and environmental justice. KAHEA is committed to securing the strongest possible protections for some of Hawai'i's most ecologically unique and culturally sacred places. The organization's core mission reflects the principle that "the land and the people are one" and that the extinction of a species or destruction of a sacred place portends the ultimate demise of our cultural heritage. We work with cultural practitioners, resource experts, kupuna, and concerned citizens to develop coordinated strategies, share expertise, build networks, and encourage citizen participation through outreach and education in order to become more effective in protecting Hawai'i's fragile environment, resources and people. By joining forces, Native

Hawaiians, environmentalists, and the concerned public can have a much greater impact on the issues that affect us all.

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Ocean Conservancy is a non-profit science-based environmental advocacy organization with over 150,000 members. Ocean Conservancy is dedicated to protecting marine wildlife species and to conserving coastal and ocean resources. To further its goals, Ocean Conservancy conducts policy-oriented research, promotes public awareness, education, and citizen involvement in the conservation of marine wildlife and their habitats, and supports domestic and international programs for the protection of these resources. Ocean Conservancy is involved in numerous projects to further protections for endangered species and their habitats, including Hawaiian monk seals.

Action Requested

Pursuant to Section 4(b)(3)(D) of the Endangered Species Act ("ESA"), 16 U.S.C. § 1533(b)(3)(D), Section 553(3) of the Administrative Procedures Act, 5 U.S.C. § 553(e), and 50 C.F.R. § 424.14(a), the Center for Biological Diversity, Kahea, and Ocean Conservancy hereby petition the Secretary of Commerce, through the National Marine Fisheries Service ("NMFS") to revise the critical habitat designation for the Hawaiian monk seal as codified at 50 C.F.R. § 226.201. Petitioners request that critical habitat be expanded to include key beach areas, sand spits and islets, including all beach crest vegetation to its deepest extent inland, lagoon waters, inner reef waters, and ocean waters out to a depth of 200 meters around the Main Hawaiian Islands, and to extend critical habitat designation in the Northwestern Hawaiian Islands to Sand Island and ocean waters out to a depth of 500 meters for this critically imperiled species.

This petition sets in motion a specific process, placing definite response requirements on NMFS. Specifically, NMFS must issue an initial finding as to whether the petition "presents substantial scientific or commercial information indicating that the revision may be warranted." 16 U.S.C. § 1533(b)(3)(D)(i). NMFS must make this initial finding "[t]o the maximum extent practicable, within 90 days after receiving the petition." *Id.* Petitioners need not demonstrate that the proposed revision action *is* warranted, rather, Petitioners must only present information demonstrating that such action *may* be warranted. While Petitioners believe that the best available science demonstrates that revising the existing critical habitat designation for Hawaiian monk seals to include areas in the Main Hawaiian Islands *is* in fact warranted, there can be no reasonable dispute that the available information, including NMFS' own documents, indicates that such revision *may* be warranted. As such, NMFS must promptly make a positive initial finding on the petition and commence preparation or a proposed rulemaking to revise critical habitat for the Hawaiian monk seal.

As described in this petition, the areas of the Main Hawaiian Islands and Northwestern Hawaiian Islands we propose for critical habitat designation meet all the criteria for such designation as defined at 6 U.S.C. § 1532(5) and 50 C.F.R. §§ 424.02 & 424.12. However, in the event that NMFS determines that some portions of the requested critical habitat revision do not meet the criteria for such designation, we, in the alternative, request that NMFS analyze whether some subset of this area should be designated as critical habitat.

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Executive Summary

The Hawaiian monk seal (*Monachus schauinslandi*) is among the most endangered marine mammals in the world and the protection of critical habitat in the Main Hawaiian Islands is essential for its survival and recovery. Hawaiian monk seals primarily inhabit the Northwestern Hawaiian Islands, a chain of small islands and atolls far north of the Main Hawaiian Island chain. However, while monk seals are declining in their principal range; increasing numbers of Hawaiian monk seals are inhabiting and giving birth to pups on the Main Hawaiian Islands.

Since the mid 1950s, the monk seal population has precipitously declined with only about 1200 animals remaining. The Hawaiian monk seal population is suffering from low juvenile survival with only about one in five young monk seals surviving to adulthood. Monk seals are dying of starvation in the Northwestern Hawaiian Islands and pups and adults are emaciated and weak. The stress of other threats could also drive monk seals to extinction. Already, important pupping beaches have been lost due to sea level rise and erosion, and the Northwestern Hawaiian Islands will largely disappear under predicted levels of sea level rise because the islands emerge only few meters above sea level.

In contrast, the Main Hawaiian Islands offer a promising hope for recovery of the Hawaiian monk seal. A small population of monk seals have inhabited the Main Hawaiian Islands and the population is growing each year. The National Marine Fisheries Service ("NMFS") predicts that there are over 100 monk seals in the Main Hawaiian Islands making it one of the larger subpopulations. The potential for population growth, increased habitat, and greater food availability in the Main Hawaiian Islands make this subpopulation, and the revision of critical habitat, pivotal for the survival and recovery of the Hawaiian monk seal.

Increasingly, females are hauling out on shore of the Main Hawaiian Islands and giving birth to pups. Since 1996, there has been a steady increase in the number of pups born each year. These pups are also in better condition than pups born in the Northwestern Hawaiian Islands, they are fatter and healthier indicating greater food availability in the region for breeding females. These births on the Main Hawaiian Islands are a significant contribution to the overall monk seal population.

The Center for Biological Diversity, Kahea, and Ocean Conservancy request that NMFS revise the critical habitat for the Hawaiian monk seal to include habitat protection for the Main Hawaiian Islands. The Main Hawaiian Islands provide ample coastline suitable for monk seals to haul out for pupping, nursing, resting, and molting. The high elevation Main Hawaiian Islands may also provide a refuge for monk seals as sea level continues to rise. Monk seals in the Main Hawaiian Islands also forage more successfully and closer to shore than those in the Northwestern Hawaiian Islands allowing them to capture prey without expending as much energy. According to the recent recovery plan, coastal and marine habitat in the Main Hawaiian Islands is a high priority for monk seal conservation and recovery.

As set forth in this petition, the designation of critical habitat in the Main Hawaiian Islands is vital and could be a key step toward preventing the extinction of the Hawaiian monk seal. Critical habitat designation would ensure management that is consistent with the requirements of the Endangered Species Act. Key areas of the Main Hawaiian Islands that provide important habitat for monk seals must receive legal protection that is desperately needed.

Introduction

The Center for Biological Diversity, Kahea, and Ocean Conservancy request that existing critical habitat designation for the Hawaiian Monk Seal (*Monachus schauinslandi*) under the Endangered Species Act ("ESA") be revised to include coastal and marine areas of the Main Hawaiian Islands that are essential for the conservation of the monk seals, and that critical habitat in the Northwestern Hawaiian Islands be extended to include important foraging grounds. As explained in this petition, the area proposed for critical habitat designation provides essential terrestrial areas for population growth, including beaches for monk seals to give birth, nurse and wean pups. It also provides marine habitat for foraging, socializing, mating, and resting.

Hawaiian monk seals are critically endangered and the population in the Northwestern Hawaiian Islands is declining rapidly. The threats from food limitation, shark predation, global warming and sea level rise, entanglement, disease, habitat loss and disturbance, fisheries interactions, and pollution are driving this already small population to the brink of extinction. The Main Hawaiian Islands, however, provide one of the most promising avenues of recovery for the species. Designating the proposed area as critical habitat would provide meaningful protection against many of these threats and would aid in ensuring the continued survival and eventual recovery of the species.

This petition reviews the natural history and status of the Hawaiian monk seal, focusing largely on the importance of the Main Hawaiian Islands to the seal. The petition describes the importance of the proposed critical habitat area for the species and explains why designating such area as critical habitat is supported by the best available science and required by law. Prompt designation of these areas as critical habitat is an essential step if the Hawaiian monk seal is to have a future.

Part 1. Natural History and Status of the Hawaiian Monk Seal

A. Natural History of the Hawaiian Monk Seal

The Hawaiian monk seal is the only endangered marine mammal whose entire range is within the United States (NMFS 2007). It is one of the world's most endangered seals and the only extant tropical seal (MMC 2007; Donohue et al. 2007).

a. Taxonomy and Description of the Hawaiian Monk Seal

Kingdom: Animalia
Phylum: Chordata
Class: Mammalia
Order: Carnivora
Family: Phocidae
Genus: *Monachus*
Species: *schauinslandi*

The Hawaiian monk seal (*Monachus schauinslandi*) is a pinniped from an ancient lineage. In native Hawaiian, the seal is known as *Ilio-holo-i-ka-uaua,* meaning "dog that runs in rough water." The Hawaiian monk seal may have inhabited the Hawaiian Islands as early as 14-15 million years ago (NMFS 2007). With the Caribbean monk seal extinct and the Mediterranean monk seal nearing extinction, the Hawaiian monk seal is genetically important and has the best chance of preserving the *Monachus* lineage (NMFS 2007).

Maintaining some of its primitive anatomical features, the monk seal is named for its resemblance to a monastic robe with folds around its neck and its preference for solitude and small groups (FWS 2008). As adults, Hawaiian monk seals are gray and their pelage often turns brown with weathering. Some monk seals display a tinge of green or red algal growth. Adult females weigh approximately 205 kg and are 2.3 meters long, and males are smaller weighing about 170 kg with a length of 2.1 meters (NMFS 2007). Pups are silvery gray with black fuzzy fetal hair. Newborn pups weigh approximately 14-17 kg and grow to 50-100 kg at weaning (NMFS 2007).

Monk seals spend about two-thirds of their time in the marine habitat foraging for food, cooling, resting, playing, and mating (Antonelis et al. 2006). However, monk seals haul out on land for pupping, nursing, molting, and resting. On land, they generally select sandy beaches, but will also use vegetation near the beach for shelter (Antonelis et al. 2006). Seals have also been observed hauled out in other settings including rocky escarpments and gnarled emergent reef (Harting et al. 2002).

b. Distribution, Abundance, and Population Trends

Hawaiian monk seals are found throughout the Northwestern Hawaiian Islands with six main reproductive sites at Kure Atoll, Midway Islands, Pearl and Hermes Reef, Lisianski Island, Laysan Island, and the French Frigate Shoals (NMFS 2007). Subpopulations are relatively small with only a few hundred individual seals (Baker 2006). Increasingly, monk seals are populating the Main Hawaiian Islands. Seals have been observed on each of the eight Main Hawaiian Islands (NMFS 2007). Home ranges for monk seals in the Northwestern Hawaiian Islands are much larger at 163-7400km^2 compared to ranges in the Main Hawaiian Islands, which are between 34-800 km^2 (NMFS 2007).

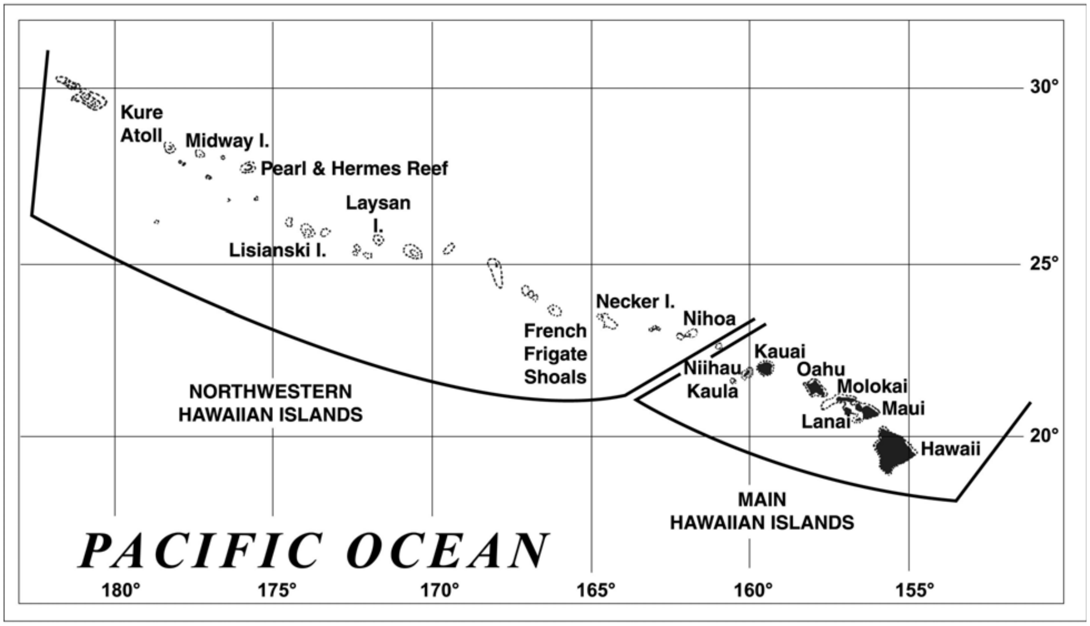

Figure 1. Map of the Hawaiian Islands (NMFS 2007).

Monk seals tend to return to the same location year after year, but about 10-15 percent of seals migrate among the Northwest Hawaiian Island subpopulations (NMFS SAR 2007). However, it is rare for seals to migrate between the Main Hawaiian Islands and the Northwestern Hawaiian Islands and NMFS is considering whether the Main Hawaiian Island stock should be designated and managed as a separate stock (NMFS SAR 2007).

In 2006, the total population of Hawaiian monk seals was estimated to be 1,202 seals (NMFS 2007). Of those monk seals, a minimum of 77 seals were attributed to populating the Main Hawaiian Islands (NMFS 2007). The reproductive capacity of the population is extremely low because of years of poor juvenile survival and almost no recruitment of breeding females (MMC 2007).

Hawaiian monk seals have experienced a dramatic population decline, and scientists predict that the population will fall below 1000 animals within the next five years (Yates MSW 2008; MMC 2007). The non-pup beach count in 2007 was the lowest ever recorded (NMFS 2007a). The Hawaiian Archipelago likely supported many more monk seals than it does today based on records of historical abundance (Antonelis et al. 2006). Monk seals declined about 50 percent between the late 1950s and 1970s, and beach counts of non-pups declined by 66 percent between 1958 and 2006 (NMFS 2007). The Northwestern Hawaiian Islands have experienced a monk seal decline of about 4.1 percent annually (NMFS 2007a). The population at the French Frigate Shoals is indicative of the entire population because it is the single largest subpopulation (NMFS 2007). The subpopulation of the French Frigate Shoals declined by approximately 73 percent between 1989 and 2005 (NMFS SAR 2007). Due to high juvenile mortality the age distribution is also severely inverted (Antonelis et al. 2006).

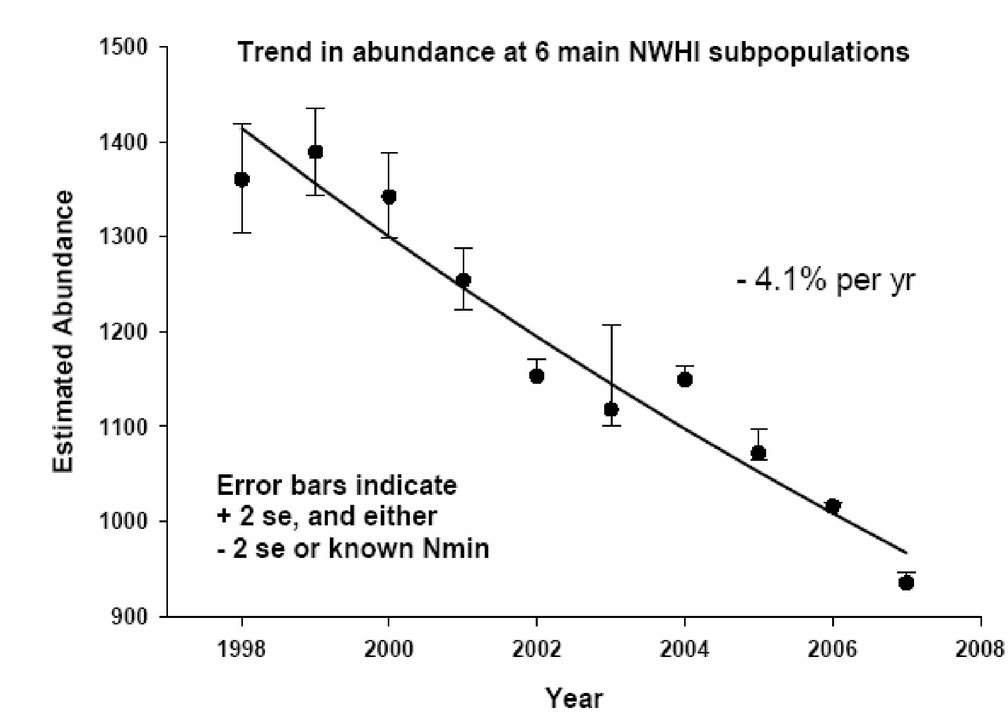

Figure 2. Trends in abundance of Hawaiian monk seals at the six main NWHI sub-populations combined, 1998-2007. This graph does not include abundance estimates for Necker, Nihoa or the Main Hawaiian Islands. Error bars indicate + 2 standard errors and either – 2 standard errors or known minimum abundance. The fitted trend line reveals an estimated decline of 4.1% per year (NMFS 2007a).

Low juvenile survival is the proximate cause for population declines, with many weaned pups dying before reaching maturity, mostly due to starvation (Baker 2006). Pups up to two years of age have low survival rates, and juveniles up to four years of age have intermediate survivorship, with adults demonstrating normal survival rates (Baker et al. 2007). Survival of pups is extremely low with eight of ten dying before their third year (Parrish et al. 2007 (citing Baker et al. 2006)). Meaning that juveniles have about a one in five chance of surviving to adulthood (Littnan MSW 2008). This decline on the Northwestern Hawaiian Islands is an ongoing trend and combined with current threats to the species is predicted to continue (Antonelis et al. 2006).

In contrast, monk seals are increasingly hauling out and pupping on the Main Hawaiian Islands (Antonelis et al. 2006). Increased sightings and births suggest that numbers are increasing on the Main Hawaiian Islands (Antonelis et al. 2006). Beginning in the late 1990s, monk seals have been consistently observed on the Main Hawaiian Islands. In 2000, at least 45 monk seals, and in 2001 at least 52 monk seals were documented in aerial surveys of the Main Hawaiian Islands (Baker and Johanos 2004 in NMFS 2007). In 2005, NMFS documented 77 monk seals on land (NMFS SAR 2007).

The population continues to increase with a minimum Main Hawaiian Island population of 88 monk seals in 2007 (Wurth MSW 2008)(See Figure 3). Scientists estimate that for other subpopulations of monk seals at least 50 percent of the animals are in the water and not visible during counts, therefore data suggest that there are easily over 100 monk seals in the Main Hawaiian islands making those islands one of the primary breeding sites (See Baker & Johanos 2002 in MMC 2003).

	Male	*Female*	**Total**
Adult	25	24	49
Sub-adult	9	3	12
Juvenile	5	9	14
Pup	4	9	13
Total	43	45	88

Figure 3. Minimum Main Hawaiian Island Population (Wurth MSW 2008).

In sum, while the monk seals in the Northwestern Hawaiian Islands are experiencing an alarming decline, the opposite trends have been observed in the Main Hawaiian Islands (Littman MSW 2008). Seals are in better condition, there are increasing numbers of pups, higher juvenile survival, and an increasing population (Littman MSW 2008).

c. Feeding and Prey Selection

Monk seals prey on a variety of fish, cephalopods, and crustaceans in benthic and demersal habitats (NMFS 2007). Common prey include reef fish (Labridae, Holocentridae, Balistidae, and Scaridae), octopus, squid, lobster, and eel (Antonelis et al. 2006; FWS 2008). Most analysis of monk seal prey has been done from the beach and it is possible that they also select different prey types at more distant locations (Parrish et al. 2007; Longenecker et al. 2002).

Monk seals forage on the sea floor, usually searching for food on talus and sand near coral reefs (Antonelis et al. 2006; NMFS 2007). Sometimes they will forage in reef caves or coral beds (Antonelis et al. 2006; NMFS 2007). Although it used to be commonly believed that monk seals foraged in shallow reef habitats, recent studies show that they regularly forage in deeper waters from 100-300 meters and occasionally even deeper and travel further that previously believed (Parrish et al. 2007; Longenecker et al. 2002). Foraging seals most commonly dive up to 150 meters, with occasionally deeper dives (Antonelis et al. 2006). Juvenile seals will mostly forage at shallow depths of 10-30 meters (NMFS 2007). However, in their first year seals have also been found to forage in sand fields where the adults feed at depths of 100 meters (Parrish et al. 2007). Monk seals capture wrasses and eels by burrowing into the sand to dig out prey that is hiding or they will use their head and shoulders to dislodge a rock revealing prey (Parrish et al. 2007).

Monk seals in different subpopulations each have unique foraging locations, distances traveled, and dive depths (Antonelis et al. 2006). Monk seals in the Northwestern Hawaiian Islands forage farther from shore than those in the Main

Hawaiian Islands (Farry pers. comm. 2008; Parrish et al. 2007). Studies have found foraging ranges to vary from less than 1 km up to 322 km (Antonelis et al. 2006).

d. Reproduction

Adult females begin to give birth between the ages of five and nine (NMFS 2007). They will mate at sea, and the behavior is unknown because mating is rarely observed (NMFS 2007).

After mating at sea, pregnant females haul out on shore to give birth. Generally, monk seals select sandy beaches near coral reefs that protect the shallow waters from active surf and predators such as sharks (Harting et al. 2002). Often females will select the same site each year and give birth to one pup (NMFS 2007). Monk seals give birth at various times of the year, with births peaking in March and April (NMFS 2007). On average females give birth every 381 days, shifting the pupping time to later in the year as females age (Baker 2006).

Monk seals nurse their pups for about 5 to 6 weeks, and mothers fast during the nursing period (NMFS 2007). After nursing, the mother returns to sea to resume feeding and the pup is weaned (NMFS 2007). Occasionally, a mother will switch pups and this can adversely affect a younger pup who may be weaned too early to survive (NMFS 2007). After returning to sea to forage, females will mate about 3-4 weeks later, and haul out to molt about 5-6 weeks later (NMFS 2007).

Recently, annual births of Hawaiian monk seals have been fewer than 200 seals (NMFS 2007). On the Northwestern Hawaiian Islands, juvenile survival poses a serious problem to the persistence of the species. After weaning, the ability of juveniles to become self sufficient and survive to adulthood is a critical period (Antonelis et al. 2006). All six major subpopulations in the Northwestern Hawaiian Islands have experienced declines in juvenile survival and recruitment in the last 10 years (Antonelis et al. 2006).

Births have been increasing on the Main Hawaiian Islands since the mid-1990s, and births have been recorded every year since 1996 (Baker et al. 2006). Pups on the Main Hawaiian Islands are healthier and more likely to survive to adulthood (Baker et al. 2006).

B. The Importance of the Main Hawaiian Islands for the Hawaiian Monk Seal

The Main Hawaiian Islands are essential to the survival and recovery of the species. The Main Hawaiian Islands consists of eight islands and several small islets and rocks including: Niihau, Kauai, Oahu, Molokai, Lanai, Maui, Kahoolawe, and Hawai'i. The coastline of the Main Hawaiian Islands totals 1,506 km (Baker 2006).

Monk seals use both the terrestrial and marine habitat around the Main Hawaiian Islands. They haul-out for pupping, nursing, resting, and molting; yet they spend two-thirds of their time in the water foraging, playing, and resting. Results from satellite tagged monk seals showed that seals on the Main Hawaiian Islands foraged near the beaches they inhabit (NMFS 2007).

The Main Hawaiian Islands were likely part of the historic range of the Hawaiian monk seal before Polynesians arrived (Baker et al. 2006). It is likely that monk seals were found throughout the Hawaiian Archipelago (Baker et al. 2006). The ages of the volcanoes responsible for the formation of the Hawaiian Islands indicates that some of the current Northwestern Hawaiian Islands and Main Hawaiian Islands did not yet exist when monk seals arrived in Hawai'i (Baker et al. 2006). Like other species extirpated by human colonization, it is theorized that monk seals were extirpated from the Main Hawaiian Islands in locations colonized by the Polynesians (Baker et al. 2006). Historically, the Northwestern Hawaiian Islands may have been on the periphery of the monk seals' range prior to human presence in Hawai'i (Baker et al. 2006; Baker & Johanos 2004).

Now, monk seals are increasingly populating the Main Hawaiian Islands (Baker 2006). Hawaiian monk seals have been sighted on each of the eight Main Hawaiian Islands, and their presence is increasing (NMFS 2007). It is likely that monk seals are recolonizing the Main Hawaiian Islands (Baker 2006). Beach counts have identified at least 45 seals in the Main Hawaiian islands in 2000, and 52 in 2001, and 77 in 2005 (NMFS 2007). Already 41 seals have been observed in the Main Hawaiian Islands for 2008 (NOAA 2008) (See Figure 4). These numbers, however, do not represent the total number of animals because there were likely uncounted seals in the water and others undetected. Since monk seals spend two-thirds of the time in the water, it is possible that only one-third of a subpopulation is hauled out at any given time (NOAA 2008).

Island	*April 28,2007*	*October 20, 2007*	*April 19, 2008*
Kaua'i	13	6	15
O'ahu	6	5	15
Moloka'i	19	7	8
Maui/Lana'i	1	3	0
Kaho'olawe	2	1	2
Big Island	0	1	1
Total	41	23	41

Figure 4. Semi-annual Hawaiian monk seal beach count (NOAA 2008)

While seals occur on each of the Main Hawaiian Islands, the largest number of seals is likely on Niihau Island (Baker 2006). Seals are also common on Kauai, Oahu, and Molokai including estimates that there are 30-40 seals on Kauai, 20-30 on Oahu, 10-20 on Molokai, 3-5 on Maui/Lanai, and 3-5 on Hawai'i (NOAA 2008a). Across the Hawaiian archipelago seals tend to decrease from the northwest to the southeast and in areas that are more remote (Baker 2006; Baker & Johanos 2004). However, since the seals prefer remote areas, it is quite likely that many seals go undetected. Satellite monitored seals spend considerable time in the neritic waters close to human population centers in the Main Hawaiian Islands (Littnan et al. 2007). Monk seals have also been found to travel among the Main Hawaiian Islands (Littnan et al. 2007, Robinson & Bernard in MMC 2003).

Births have increased on the Main Hawaiian Islands since the mid-1990s (NMFS 2007). The first recorded birth of a monk seal in the Main Hawaiian Islands was in 1962, and the next was in 1988 (Baker & Johanos 2003). Since 1996, births have been recorded annually and steadily increasing (*Id.*). The number of pups born have increased significantly in recent years with at least 10 births each year since 2003 (NMFS 2007; see Figure 5). Births in the Main Hawaiian Islands continued to increase in 2007 with a documented increase to 13 pups (NMFS 2007a, NOAA 2008). Early in 2008 there were already eight pups born in the Main Hawaiian Islands suggesting that the number of pups born may surpass 2007 (NOAA 2008).

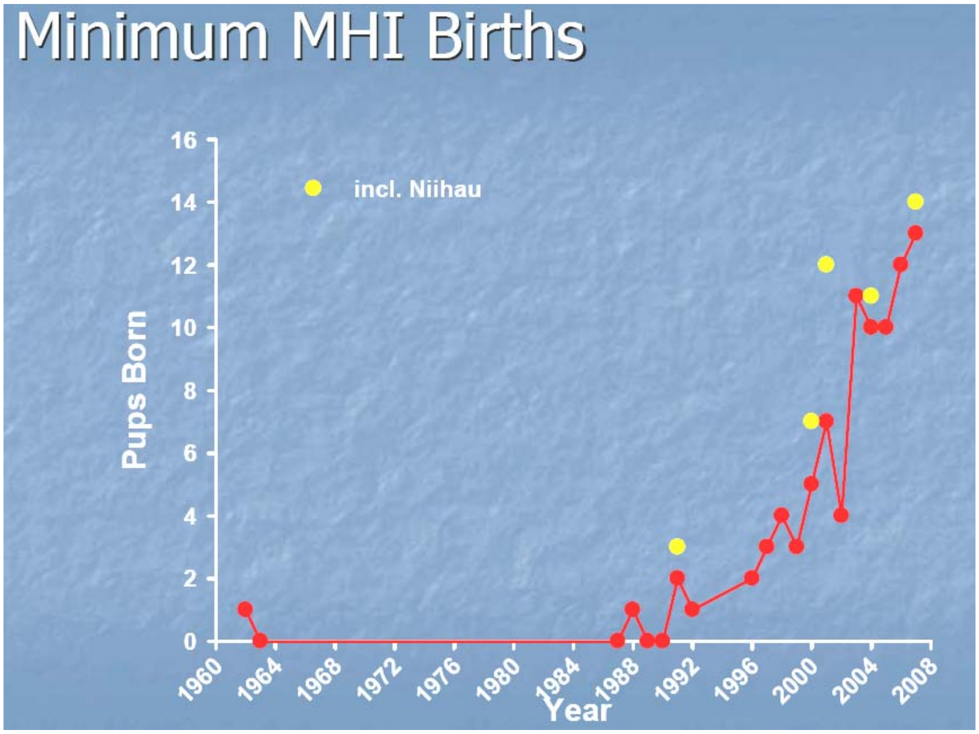

Figure 5. Minimum Births on Main Hawaiian Islands (Wurth MSW 2008).

Pups born on the Main Hawaiian Islands have been healthier and more likely to survive to adulthood than those born on the Northwestern Hawaiian Islands (Baker et al. 2006). Monk seals on the Main Hawaiian Islands are in better condition than those of the Northwestern Hawaiian Islands (Littnan et al. 2007, Baker 2006; Baker & Johanos 2004). Compared to the Northwestern Hawaiian Islands, the pups on the Main Hawaiian Islands wean at a larger size and in good condition, thus improving their chances of survival. Pups born on the Main Hawaiian islands exceed the 95^{th} percentile of average girth and length of pups in the Northwestern Hawaiian Islands (NMFS 2007).The girth of weaned pups on the Main Hawaiian Islands averaged 121.7 cm compared to 104.7 cm in the Northwestern Hawaiian Islands (Baker et al. 2006). Pups also measured 140.3 cm in length on the Main Hawaiian Islands compared to 126.0 cm in the Northwestern Hawaiian Islands (Baker et al. 2006). These larger sizes and better condition reflects greater prey availability and thus better foraging conditions in the Main Hawaiian Islands

(Baker et al. 2006; Baker 2006; Baker & Johanos 2004). According to Baker, "the excellent condition of weaned pups indicates potential for further population growth" (Baker et al. 2006: 127). Additionally, young monk seals nearly always remain at the island of their birth emphasizing the importance of the Main Hawaiian Islands as monk seal habitat (Harting et al. in MMC 2003).

The expansion of the monk seals to the Main Hawaiian Islands represents a significant increase of the carrying capacity for the species, providing more foraging habitat and prey availability (Ragen 2003). Monk seals on the Main Hawaiian Islands are closer to foraging grounds. There is more prey availability in the Main Hawaiian Islands, perhaps because the density of seals is lower, or because there is less competition for prey between apex predators (Baker et al. 2006).

In addition to the importance of foraging habitat in the Main Hawaiian Islands, the beach habitat also represents a significant expansion for the monk seals. The terrestrial habitat of the Northwestern Hawaiian Islands is about 14 km^2, and monk seals use only a portion of that beach habitat (Ragen 2003). In comparison, the Main Hawaiian Islands can provide a significantly greater amount of terrestrial habitat (*Id.*). The Main Hawaiian Islands also have higher elevations and will have more persistent terrestrial habitat under conditions of sea level rise and erosion (Baker 2006).

The population of monk seals on the Main Hawaiian Islands is likely below the carrying capacity of those islands, and the Main Hawaiian Islands will provide important habitat for recovery of the species. According to NMFS' stock assessment report, "If the monk seal population does expand in the [Main Hawaiian Islands], it may bode well for the species' recovery and long-term persistence" (NMFS SAR 2007). The Marine Mammal Commission has also acknowledged the importance of protecting marine habitat on the Main Hawaiian Islands for the recovery of the Hawaiian monk seal (Cottingham Letter 2003).

C. Threats to the Hawaiian Monk Seal

There are a variety of threats to the Hawaiian monk seal including starvation, entanglement in marine debris, predation by sharks, interactions with fisheries, habitat loss, and disease. While food limitation is believed to be primarily responsible for the ongoing decline of the species, each of these threats could affect the survival of the monk seals because the small population is extremely vulnerable.

a. Starvation

Starvation is the most critical threat to the existence of the Hawaiian monk seal. Juveniles and adults are often found in an emaciated condition in the Northwestern Hawaiian Islands, signaling starvation as a cause of population decline (Longenecker et al. 2002). Food limitation is affecting the population demonstrated by smaller pup and juvenile sizes, which in turn results in low juvenile survival (NMFS 2007). For example, French Frigate Shoals, the largest subpopulation, has experienced a dramatic decline in juvenile survival and size (NMFS 2007). Smaller pups indicate that foraging efforts may have been inadequate for females prior to giving birth and nursing (NMFS 2007). A low birth rate may also indicate a food shortage (NMFS 2007).

The limited food availability may be the cumulative result of various factors. First, overfishing may stress prey sources. Fisheries in the Northwestern Hawaiian Islands used to target some of the same fish preyed upon by monk seals (NMFS 2007). Now, there is a moratorium on most fishing in the Papahānaumokuākea Marine National Monument. Additionally, competition for prey with other apex predators may affect foraging success of the monk seals. Several predatory fish such as sharks and jacks forage in the same habitat as the monk seals and forage on the same prey, thus increasing competition for food (NMFS 2007). Large jacks and sharks have been found following seals and competing for the prey that seals flush out of hiding places (Parrish et al. 2007). Meanwhile, fishing in the Main Hawaiian Islands has reduced such apex predators and may be responsible for more successful foraging of monk seals (Baker and Johanos 2004 in NMFS 2007).

One of the leading theories for the lack of available prey for the monk seals is that the carrying capacity of the habitat has been decreased due to changes in oceanographic conditions (NMFS SAR 2007). Climate change and oceanographic conditions may be limiting food and habitat (NMFS 2007). Changes in climate, currents, and upwelling commonly alter productivity and prey availability in the ocean (NMFS 2007). This in turn may reduce foraging success for monk seals. One study found a correlation between young monk seal survival in the northern Northwestern Hawaiian Islands and the Transition Zone Chloropyll Front after a lag of 1-2 years, indicating that variation in ocean productivity may limit prey for the Hawaiian monk seals (Baker 2006).

The increasing temperature of the global ocean may contribute to prey unavailability. The ocean absorbs about 80 percent of the heat put into the climate system (Bindoff et al. 2007). Already, there have been measurable temperature increases in the surface waters of the ocean (Bindoff et al. 2007). Changes in ocean temperature affect ocean productivity and can cause declines in productivity thus limiting prey (Behrenfeld et al. 2006).

b. Entanglement in Marine Debris

Despite concerted efforts to clean up derelict fishing gear and other marine debris in the Northwestern Hawaiian Islands, entanglement remains one of the principal threats to the monk seals. Of the pinniped species, Hawaiian monk seals have one of the highest entanglement rates (NMFS 2007). The Northwestern Hawaiian Islands accumulate significant amounts of marine debris because they are situated at the convergence of the North Pacific subtropical gyre. Currents carry plastic materials, and derelict fishing gear in particular, to the beaches and reefs of the Northwestern Hawaiian Islands.

Monk seals can become entangled in nets, lines, rings, and other plastic debris in their habitat. Once entangled they can suffer injuries or death from the lines and nets wrapped around them, or have problems swimming, foraging, and escaping predators (NMFS 2007).

While many entanglements likely go undetected, between 1982 and 2006, reports documented 268 monk seal entanglements, nearly half of which were due to fishing gear (NMFS 2007). Of those entangled seals 57 suffered serious injuries and 8 died (NMFS 2007). Pups and juvenile seals are the most susceptible to entanglement in marine debris comprising nearly 80 percent of all observed entanglements, despite being only 46 percent of the total population (Henderson 2001 in NMFS 2007).

c. Predation by Sharks

Monk seals are attacked by sharks, as documented both from injuries and recently observed predation. Shark predation may be partly responsible for the decline in monk seal populations. Juveniles suffer the highest mortality and injury from shark predation (Parrish et al. 2007). Additionally, sharks are increasingly attacking young nursing pups on the French Frigate Shoals, accounting for 15-21 percent of cohort mortality there (NMFS 2007). Galapagos sharks have been seen patrolling off pupping beaches in the Northwestern Hawaiian Islands (MMC 2007). In 1999, as many as 22 of the 92 pups born on the French Frigate Shoals were likely killed by sharks (NMFS SAR 2007). In 2006, of 39 births 16 pups died or disappeared and half of those were suspected to result from shark predation (MMC 2007).

d. Interactions with Fisheries

The designation of the Papahānaumokuākea Marine National Monument has virtually eliminated the direct interactions between commercial fisheries and Hawaiian monk seals in the Northwestern Hawaiian Islands because it offers protection out to 50 nautical miles from the islands (NMFS 2007). Some limited fishing, however, still is permitted in the area.

Commercial and recreational fisheries in the Main Hawaiian Islands do pose a risk of interactions with Hawaiian monk seals. Between 1982 and 2006, there were 55 documented fishery interactions with monk seals, including several entanglements in gillnets and hookings (NMFS 2007). Of those interactions, 38 were seals with imbedded hooks from various fisheries (NMFS 2007). Several of the interactions were also due to nearshore lay gillnets, and recently a few Hawaiian monk seals died as a result of drowning in gillnets in the Main Hawaiian Islands (NMFS 2007). Fisheries interactions have been on the rise in the Main Hawaiian Islands since 2000 (NMFS SAR 2007).

e. Habitat Loss and Disturbance

The habitat used by Hawaiian monk seals consists of both terrestrial and marine areas. The terrestrial habitat on the Northwest and Main Hawaiian Islands is fairly well documented and is comprised mainly of sandy beaches but monk seals may also use rocky areas and emergent reefs as well as vegetated areas for shelter (Antonelis et al.

2006). The marine habitat can extend far offshore of the islands and include deep benthic areas with deep water coral beds (NMFS 2007). Monk seals are associated with coral reefs and mostly forage on talus and sand near reefs, but have also been found to forage in reef caves and coral beds (Antonelis et al. 2006).

Human disturbance and habitat loss threaten monk seal habitat. While human disturbance on the Northwestern Hawaiian Islands is limited because of their remote location, disturbance and development causes habitat loss on the Main Hawaiian Islands. Many of the beaches used by monk seals are also popular for human recreation. Many areas currently used by monk seals in the Main Hawaiian Islands are being developed or are being considered for development (NMFS 2007). Such development may disturb monk seal pupping or may cause monk seals to avoid areas of coastal habitat (NMFS 2007). Beach development and sea walls can also constrain habitat as sea level rises.

Human disturbance of seals on the Main Hawaiian Islands may inhibit their ability to use coastal habitat (NMFS 2007). As monk seals increasingly populate the Main Hawaiian Islands, the likelihood of interactions with humans also increases. Recently, Hawaiian monk seals have successfully hauled out and even given birth on popular beaches (NMFS 2007). There are also instances of humans and dogs harassing monk seals on the beach (NMFS 2007). Human disturbance can also make monk seals more susceptible to predators or abandonment of pups (Dupree 2002). While monk seals generally prefer more remote areas, as their numbers increase they are more likely to inhabit areas with more people. Monk seals on the Main Hawaiian Islands may also be more tolerant of humans near them (Gilmartin 2002). A future concern is that as monk seals become accustomed to humans, their playful interactions may become sources of biting or accidental injury (Wurth MSW 2008; Dupree 2002). Overall, however, the communities near monk seal pupping events are supportive of the presence of the seals (Dupree 2002). Although human disturbance on the Northwestern Hawaiian Islands has largely been eliminated with the designation of the Papahānaumokuākea Marine National Monument, the threat of military operations in the vicinity of Hawaiian monk seals still looms.

f. Global Warming

An overarching threat to the habitat of the Hawaiian Monk seal is global warming and its ecological consequences. As described below, sea level rise, warming ocean temperatures, and ocean acidification may harmfully alter the terrestrial and marine habitat of the Hawaiian monk seal.

i. Sea Level Rise

Sea level rise threatens the terrestrial habitat of the Hawaiian monk seal (NMFS 2007). The Northwestern Hawaiian Islands are largely protected from human disturbance, but impending sea level rise will eliminate important habitat in the Northwestern Hawaiian Islands in the foreseeable future. The Northwestern Hawaiian Islands rise only a few meters above sea level, and the loss of beach habitat due to storms and sea level rise will become increasingly problematic for the monk seals (NMFS 2007). There has already been a loss of important pupping beaches due to erosion that may reflect rising sea levels (MMC 2007). For example, terrestrial habitat has shrunk at the French Frigate Shoals eliminating some important pupping and resting islets (NMFS SAR 2007).

With conservative estimates of sea level rise that is predicted within this century, Baker et al. found that the Northwestern Hawaiian Islands would experience significant habitat loss (Baker et al. 2006)(See Figure 6). French Frigate Shoals and Pearl and Hermes Reef are only about 2 meters above sea level, and sea level rise of 48 cm would result in the loss of between 15 and 65 percent of their area (Baker et al. 2006). With sea level rise of 88 cm, Pearl and Hermes Reef islands would be reduced by 51 to 69 percent, and French Frigate Shoals would lose between 40 and 57 percent of its land, with Gin and Trig Islands mostly submerged (Baker et al. 2006). Meanwhile, Lisianski Island will be the least affected and may provide a refuge for animals using the terrestrial areas of the Northwestern Hawaiian Islands.

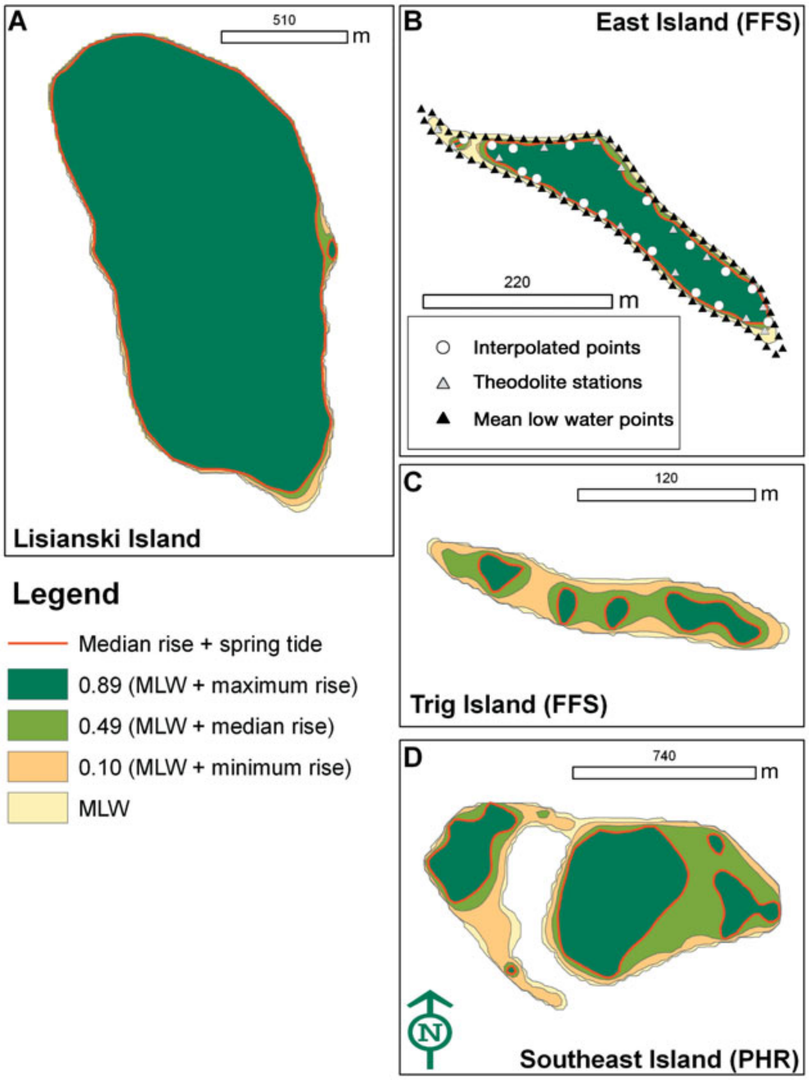

Figure 6. Current and projected maps of 4 Northwestern Hawaiian Islands at mean low water (MLW) with minimum (9 cm), median (48 cm) and maximum (88 cm) predicted sea level rise. The median scenario at spring tide is also shown. (A) Lisianski Island; (B) East Island, French Frigate Shoals, showing the measured and interpolated points along the waterline and berm used to create the Triangular Irregular Network (TIN); (C) Trig Island, French Frigate Shoals; (D) Southeast Island, Pearl and Hermes Reef (Baker et al. 2006).

The sea level rise scenarios that Baker et al. analyzed, however, are likely vast underestimates of sea level rise to come within this century. They based their predictions on the Intergovernmental Panel on Climate Change ("IPCC") report in 2001. In 2007, the IPCC projected that global sea level will rise between 18-59 cm in this century (Solomon et al. 2007). One of the most troubling of recent scientific findings is that this projection is almost certainly a substantial underestimate. Melting of the Greenland ice sheet has accelerated far beyond what scientists predicted even just a few years ago, with a more than doubling of the mass loss from Greenland due to melting observed in the past decade alone (Rignot and Kangaratnam 2006). The acceleration in the rate of melt is due in part to the creation of rivers of melt water, called "moulins," that flow down several miles to the base of the ice sheet, where they lubricate the area between the ice sheet and the rock, speeding the movement of the ice towards the ocean. The IPCC projection of 18-59 cm in this century assumes a negligible contribution to sea level rise by 2100 from loss of Greenland and Antarctic ice, but leading experts have stated that that conclusion is no longer plausible due to multiple positive feedback mechanisms including dynamical processes such as the formation of moulins, reduced surface albedo, loss of buttressing ice shelves, and lowered ice surface altitude (Hansen et al. 2006). Paleoclimatic evidence also provides strong evidence that the rate of future melting and related sea-level rise could be faster than previously widely believed (Overpeck et al. 2006).

While it has been commonly assumed that the response time of ice sheets is millennia, this may reflect the time scale of the forcings that cause the changes, rather than the inherent response time of the ice sheets (Hansen et al. 2007). The forcing from continued unabated greenhouse gas emissions in this century could lead to a dynamically changing ice sheet that is out of our control (Hansen et al. 2007). Just 2-3°C (3.6-5.4° F) of warming would likely cause sea level to rise by at least 6 m (18 feet) within a century (Hansen 2006). Temperature changes of 2-3°C (3.6-5.4° F) are well within the range of estimates for this century provided by the IPCC (Solomon et al. 2007). Change of this magnitude is very likely. A recent scientific finding is that the emissions ceiling to limit warming to less than an additional 1º C in this century is actually a 350 ppm atmospheric CO_2 concentration (McKibben 2007, Hansen et al. 2008). However, the current CO_2 concentration is already well past that ceiling at 383 ppm (McKibben 2007, Hansen et al. 2008).

Sea level rise expected within this century will likely result in the loss of primary monk seal habitat on the Northwestern Hawaiian Islands, including the French Frigate Shoals and other important beach habitat. In contrast, habitat on the Main Hawaiian Islands will likely persist as sea level rises up to 6 meters. (See figures 7 & 8).

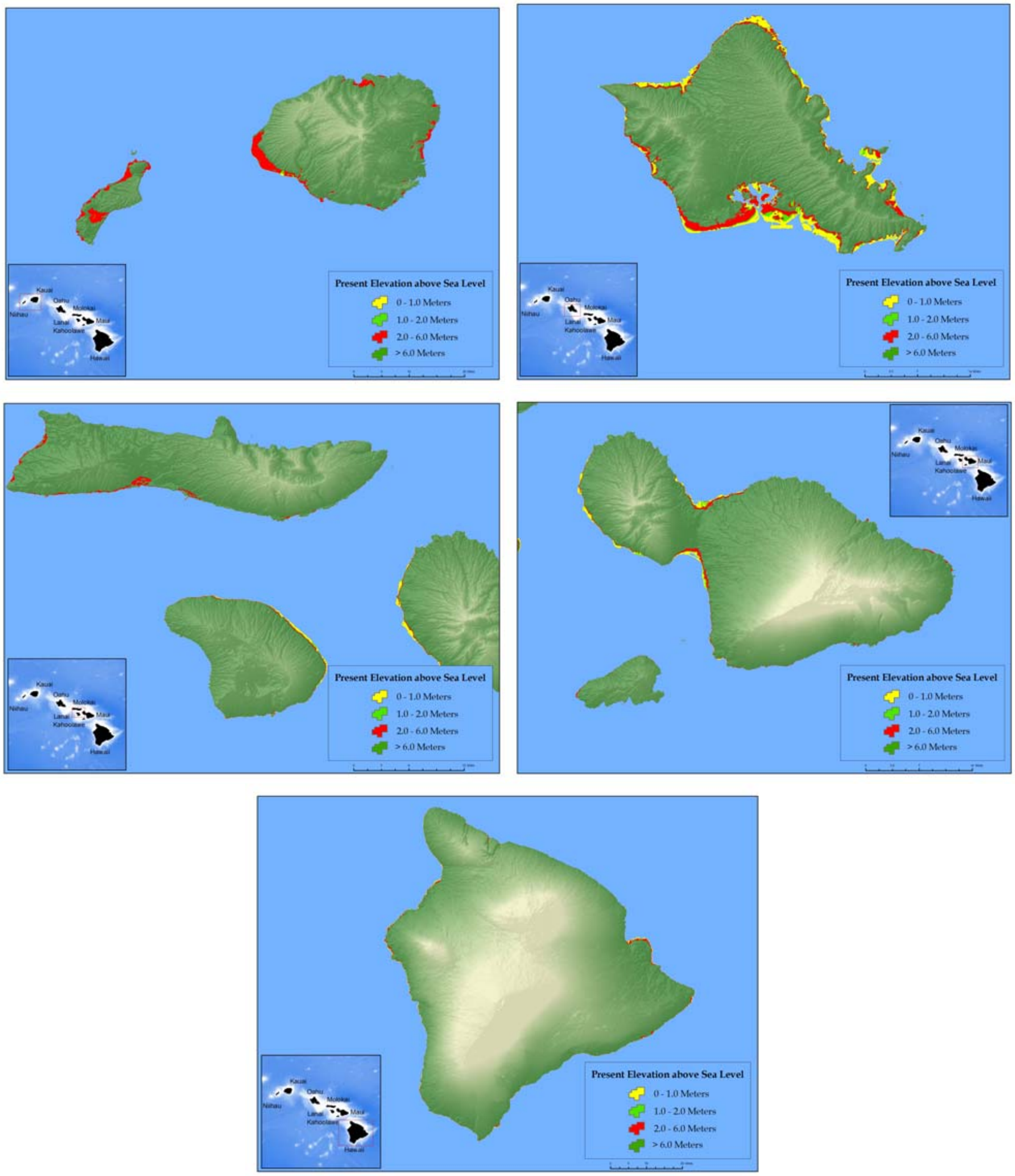

Figure 7. Sea Level Rise on the Main Hawaiian Islands at 1 meter (yellow), 2 meteres (green), and 6 meters (red) (Center for Biological Diversity 2008).

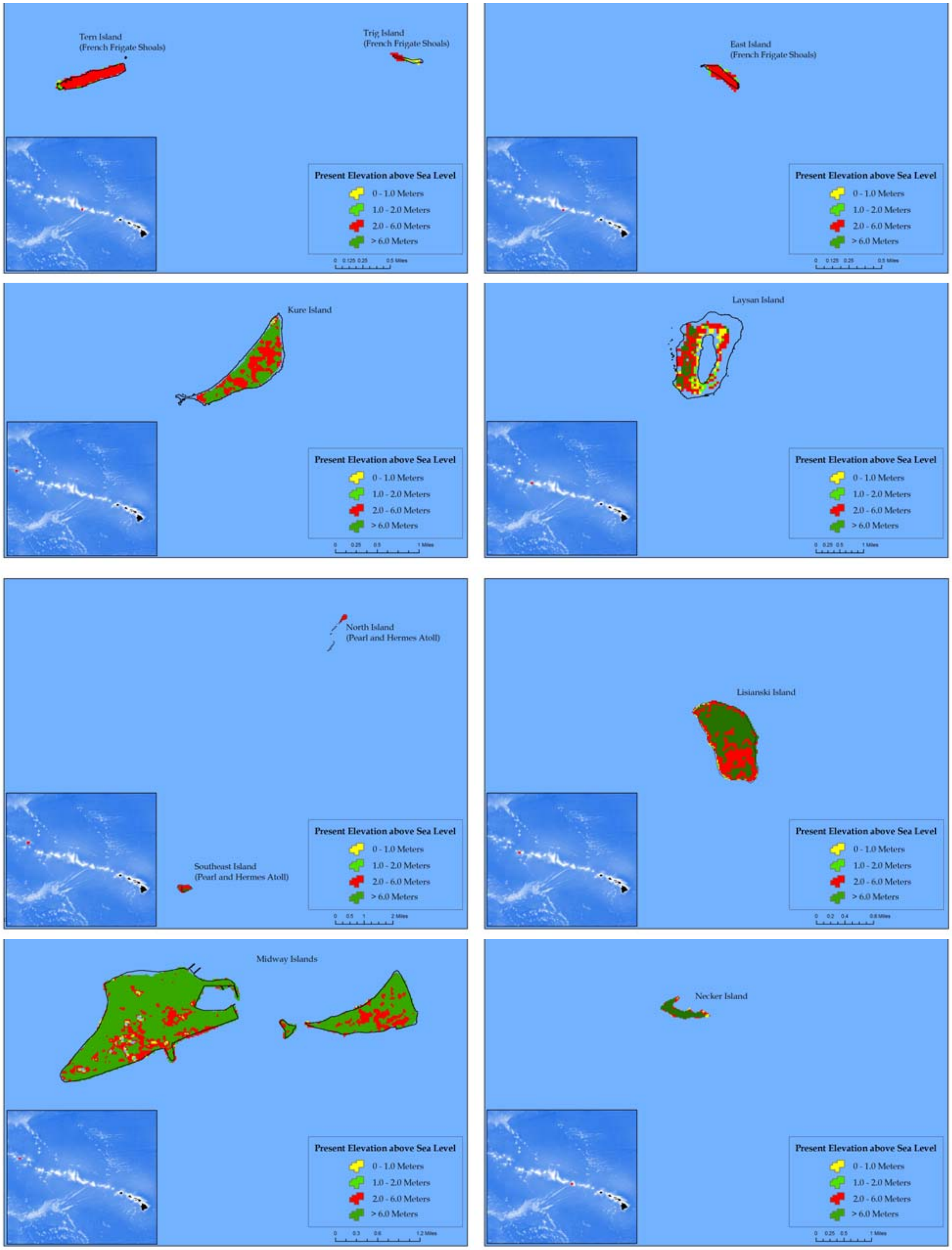

Figure 8. Sea Level Rise on the Northwestern Hawaiian Islands at 1 meter (yellow), 2 meteres (green), and 6 meters (red) (Center for Biological Diversity 2008).

ii. Ocean Temperatures and Oceanic Changes

The increasing temperature of the global ocean is triggering a meltdown of carefully balanced interactions in the marine community. Water temperature is an important factor determining habitat ranges and physiological functioning of marine organisms, and even minor changes are seriously disruptive. Global ocean temperatures have increased by 0.31 °C on average in the upper 300 m during the past 60 years (1948-1998) (Levitus et al. 2000), and locally, some ocean regions are experiencing even greater warming (Bindoff et al. 2007). Changes in ocean heat content have penetrated as deep as 3000 m. Global ocean temperatures increased by 0.10 °C in the upper 700 m between 1961-2003 (Bindoff et al. 2007) and by 0.037 °C in the upper 3000 m (Levitus et al. 2005).

Warming waters are devastating for species that are unable to migrate toward cooler waters because of habitat requirements, environmental barriers, or lack of mobility (Scavia et al. 2002). These climatic changes are occurring at an unprecedented rate which also hinders the adaptation of many organisms (Parmesan 2006). Invasive species may gain an advantage over native species in these warmer conditions (Stachowicz et al. 2002). Warmer waters favor different species of phytoplankton, some of which are associated with "red tides" that shade ocean vegetation, deplete oxygen, and often have toxic properties (Smith et al. 2000). Thus, warming waters can alter the marine habitat and carefully balanced interactions in the marine ecosystem, with adverse affects on monk seals. Coral reefs are extremely important to the habitat of monk seals because they protect the Northwestern Hawaiian Islands and provide foraging habitat for the seals. Yet, corals are extremely vulnerable to changes in ocean temperature. Increased water temperatures results in bleaching and mortality of coral reefs (Hoegh-Guldberg 2007). Researchers predict that coupled with ocean acidification, global warming may result in the destruction of most coral reefs by mid-century (Hoegh-Guldberg 2007).

Notably, the largest increases in global ocean temperature have occurred in the upper ocean where primary production is concentrated, and these changes appear to be impacting global ocean productivity (Behrenfeld et al. 2006). Significant global declines in net primary production between 1997-2005 were attributed to reduced nutrient enhancement due to ocean surface warming (Behrenfeld et al. 2006). Reduced primary productivity may limit food supply for monk seals.

El Niño Southern Oscillation (ENSO) events can also impact ocean productivity. Although the effects of climate change on the ENSO cycle are difficult to predict, leading climate scientists believe that near-term global warming will lead to an increased likelihood of stronger ENSO events (Hansen et al. 2006). Most climate models yield a tendency towards a more ENSO-like state or no clear change (Collins 2005). Some climate scientists have hypothesized that during the early Pliocene, when the Earth was 3° C (5.4° F) warmer than today, a permanent ENSO-like condition existed (Hansen et al. 2006). From the observational record, intense ENSO events were more abundant in the later part of the 20th century. The 1982-83 and 1997-98 ENSO events were successively labeled the "El Niño of the Century" because the warming in the Eastern Equatorial

Pacific was unprecedented in the past 100 years (Hansen et al. 2006). ENSO has been known to have negative impacts for pinnipeds, including mortality and decreased reproductive success, often due to changes in ocean productivity (Baker et al. 2006). However, some research indicates that after a lag, Hawaiian monk seals in the most northerly habitat may have improved survival after ENSO events because more productive waters reach further south than in other years (Baker et al. 2007a)

ENSO tends to increase entanglement rates for the Hawaiian monk seals (Donohue et al. 2007). Despite efforts to clean up marine debris, monk seal entanglements continue (*Id.*). Between the years 1982 and 2004, two to 25 seals were entangled each year and the mean annual entanglement rate was greater for ENSO years (*Id.*). This is likely because the convergence zone is drawn further southward during ENSO, thus concentrating marine debris in the Northwestern Hawaiian Islands (*Id.*).

iii. Ocean Acidification

The oceans are also becoming increasingly acidic due to their uptake of carbon dioxide from the atmosphere. The oceans have thus far absorbed approximately 30% of the excess carbon dioxide released since the beginning of the industrial revolution (Feely et al. 2004, WBGU 2006). The world's oceans, in fact, store about 50 times more carbon dioxide than the atmosphere (WBGU 2006), and most carbon dioxide released into the atmosphere from the use of fossil fuels will eventually be absorbed by the ocean (Caldeira and Wickett 2003). As the ocean absorbs carbon dioxide from the atmosphere it changes the chemistry of the sea water by lowering its pH. The oceans' uptake of these excess anthropogenic carbon dioxide emissions, therefore, is causing ocean acidification (WBGU 2006).

Surface ocean pH has already dropped by about 0.1 units on the pH scale, from 8.16 in 1800 to 8.05 today — a rise in acidity of about thirty percent (Orr et al. 2005; Guinotte et al. 2008). The pH of the ocean is currently changing rapidly at a rate 100 times anything seen in hundreds of millennia, and may drop by another 0.3 or 0.4 (100 – 150% increase in the concentration of H^+ ions) by the end of this century (Orr et al. 2005, Meehl et al. 2007). A recent survey of the Pacific Coast of the United States revealed that ocean acidification is already occurring more rapidly than predicted (Feely et al. 2008). If carbon dioxide emissions continue unabated, resulting changes in ocean acidity could exceed anything experienced in the past 300 million years (Caldeira and Wickett 2003). Even if carbon dioxide emissions stopped immediately, the ocean would continue to absorb the excess carbon dioxide in the atmosphere, resulting in further acidification until the planet's carbon budget returned to equilibrium.

The Hawai'i Ocean Time-Series has collected numeric data that demonstrates this trend. The data shows that from 1990 to the present that Hawai'i's ocean acidification has tracked the atmospheric carbon dioxide and resulted in a decline in pH from approximately 8.12 to approximately 8.08 units (Bindoff 2007).

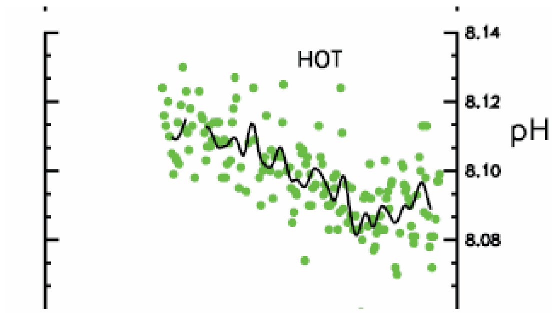

Figure 9. Changes in surface pH from Hawai'i Ocean Time-Series (Dore et al., 2003). Values were calculated from DIC and alkalinity. (Bindoff 2007).

Ocean acidification from unabated anthropogenic carbon dioxide emissions poses a profound threat to marine ecosystems because it affects the physiology of numerous marine organisms, causing detrimental impacts that may ripple up the food chain. Changes that have been observed in laboratory experiments include impacts to the productivity of algae, photosynthesis of phytoplankton, metabolic rates of zooplankton and fish, oxygen supply of squid, reproduction of clams, nitrification by microorganisms, and the uptake of metals (WBGU 2006). Perhaps most importantly, increasing ocean acidity reduces the availability of carbonate ions needed by marine life to build shells and skeletons (Orr et al. 2005).

Phytoplankton, corals, coralline macroalgae, urchins, seastars, clams, oysters, crustaceans and many other organisms rely on calcium carbonate in the ocean to build skeletons (WBGU 2006). Normally, ocean waters are saturated with carbonate ions that marine organisms use to build skeletons (WBGU 2006). However, the acidification of the oceans shifts the water chemistry to favor bicarbonate, thus reducing the availability of carbonate to marine organisms (WBGU 2006). Acidic waters also dissolve existing protective carbonate skeletons and shells (Orr et al. 2005). Already the ocean surface layer has lost 10% of its carbonate compared to preindustrial levels (WBGU 2006). Continuing carbon dioxide emissions could result in a decrease in calcification rates by up to 60% by the end of this century (Ruttimann 2006). The average response of corals to a doubling in pCO2 is a 30% decline in calcification (Kleypas 2006). The combined stresses of warmer temperatures, rising sea levels, and ocean acidification are likely to produce major changes to coral reefs in the decades to come (Royal Society 2005).

Even marine animals that do not calcify are threatened by carbon dioxide increases in their habitat. Changes in the ocean's carbon dioxide concentration result in accumulation of carbon dioxide in the tissues and fluids of fish and other marine animals, called hypercapnia, and increased acidity in the body fluids, called acidosis. These impacts can cause a variety of problems for marine animals including difficulty with acid-base regulation, calcification, growth, respiration, energy turnover, and mode of metabolism (Pörtner 2004). Squid, for example, show a very high sensitivity to pH because of their energy intensive manner of swimming (Royal Society 2005). Because of their energy demand, even under a moderate 0.15 pH change squid have reduced capacity to carry oxygen, and higher carbon dioxide pressures are likely to be lethal (Pörtner 2004). Impacts to squid, among the most sensitive of marine species to changes in pH, would likely impact squid-eating monk seals.

Levels of ocean acidification predicted within the foreseeable future will likely impact both the habitat and prey of Hawaiian monk seals. Monk seals depend on coral reef habitat for foraging and corals are faced with decreased calcification due to ocean acidification. Additionally, prey of the monk seals ranging from squid to crustaceans may be adversely impacted by declining ocean pH further limiting the food available to monk seals.

g. Disease

Although not yet a major threat, infectious disease is a serious concern for the survival of the already low population of Hawaiian monk seals (Aguirre et al. 1999). Diseases can not only cause mortality, but they can also increase the monk seal's vulnerability to predation or capacity for reproduction (Aguirre et al. 1999). In the Main Hawaiian Islands, monk seals spend ample time near human population centers where they can be exposed to agriculture, pets, livestock, and runoff containing disease agents (Littnan et al. 2007). Disease transfer from livestock, feral animals, pets, and humans on the Main Hawaiian Islands is of increasing concern as monk seals populate those islands. For example, leptospira bacteria are found in many of the streams and estuaries on the Main Hawaiian Islands and have been detected in monk seals (NMFS 2007). Some deaths of monk seals in the Main Hawaiian Islands have been attributed to disease (Littnan et al. 2007; Honnold et al. 2005). Spread of disease to the main subpopulations in the Northwestern Hawaiian Islands could be devastating (Littnan et al. 2007). A few unexplained mortality events in the Northwestern Hawaiian Islands may have resulted from disease, but this is unconfirmed (NMFS 2007). A related concern is exposure of Hawaiian monk seals to pesticides, which are highly concentrated in Hawai'i, which may increase monk seals' vulnerability to disease (Littnan et al. 2007).

h. Other Threats

Male aggression has been a problem for Hawaiian monk seals as the population declines and males now outnumber females (NMFS 2007). Males have been known to mob females or juveniles attempting to mount them resulting in serious injury or death of the victims (NMFS 2007).

Vessel groundings may injure or kill monk seals because they can result in spills of contaminants such as oil, entanglement in gear, and destruction of coral reef habitat (NMFS 2007). This is a risk both in the Northwest and Main Hawaiian Islands. Many marine mammals are also threatened by vessel strikes. There has been some evidence of vessels colliding with monk seals (NMFS 2007). As monk seals become more abundant in the Main Hawaiian Islands they are in the path of more vessel traffic (NMFS 2007).

Monk seals have been exposed to contaminants such as PCBs in the Northwestern Hawaiian Islands due to former military operations in the area (NMFS 2007). Additionally, oil and fuel spills in the Main Hawaiian Islands can harm monk seals occupying those areas from oiling, ingestion, and contamination of prey (NMFS 2007). Moreover, biotoxins such as ciguatoxin can also adversely affected monk seals, as these biotoxins can accumulate in the monk seal's prey and also harm the seals (NMFS 2007).

* * *

In sum, monk seals continue to be critically endangered due to population declines and low juvenile survival. The threats of starvation, entanglement, pollution, global warming, and other threats place this marine mammal at great risk of extinction. The one glimmer of hope is that monk seals are increasing in the Main Hawaiian Islands and encouraging the growth of that subpopulation may be a promising path for recovery.

Part 2. Critical Habitat for the Hawaiian Monk Seal

A. The Importance of Critical Habitat under the Endangered Species Act

The ESA's purpose is "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, [and] to provide a program for the conservation of such endangered species and threatened species." 16 U.S.C. § 1531(b). To carry out this purpose the ESA requires that NMFS designate "critical habitat" for each listed species. 16 U.S.C. § 1533. Critical habitat is defined by Section 3 of the ESA as:

> (i) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 1533 of this title, 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 in accordance with the provisions of section 1533 of this title, upon a determination by the Secretary that such areas are essential for the conservation of the species.

16 U.S.C. §1532(5) (emphasis added). "Conservation" includes not only actions that support the survival of the species, but also its recovery to the point where ESA protections are no longer necessary. 16 U.S.C. § 1532(3). The designation and protection of critical habitat is one of the primary ways in which the fundamental purpose of the ESA, "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved," is achieved. 16 U.S.C. §1531(b).

The legislative history of the ESA shows Congress clearly recognized the importance of critical habitat designation in conserving listed species:

> classifying a species as endangered or threatened is only the first step in insuring its survival. Of equal or more importance is the determination of the habitat necessary for that species' continued existence…If the protection of endangered and threatened species depends in large measure on the preservation of the species' habitat, then *the ultimate effectiveness of the Endangered Species Act will depend on the designation of critical habitat.*

H.R. Rep. No. 94-887 at 3 (1976) (emphasis added).

The primary mechanism by which critical habitat protects a listed species is through the section 7 consultation process. 16 U.S.C. §1536(a)(2) (1994). Section 7 requires federal agencies to ensure that no action they authorize, fund, or carry out will "jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of [critical habitat]." *Id.*

In a recent critical habitat designation, NMFS acknowledged several benefits of critical habitat. Critical habitat designation provides agencies, private entities and the public with clear notification of important habitat for imperiled species (73 Fed. Reg. 19000, 19008 (Apr. 8, 2008) (Designation of Critical Habitat for North Pacific Right Whale)). Thus, aiding parties to determine the potential effects of their activities on critical habitat (*Id.*).

Critical habitat also can provide benefits beyond the section 7 process, including educational benefits. According to NMFS, "some larger benefit accrues to society as a result of designation, including the educational value derived from identification and designation of the critical habitat areas within which the [primary constituent elements] are found" (*Id.* at 19009). In the case of the Hawaiian monk seal, NMFS also noted in its recovery plan that seal pupping on popular beaches can provide an educational conservation experience for the public (NMFS 2007).

Another indirect benefit of a critical habitat designation is that it helps focus Federal, state, and private conservation and management efforts in designated areas. Management efforts may address special considerations needed in critical habitat areas, including conservation regulations to restrict private as well as Federal activities. The Hawaiian monk seal recovery plan emphasized the importance of cooperative management of monk seals in the Main Hawaiian Islands and critical habitat designation can catalyze such collaboration.

These benefits of critical habitat designation are applicable to the designation of critical habitat for the Hawaiian monk seal on the Main Hawaiian Islands. NMFS, in its initial designation of critical habitat for the Hawaiian monk seal, emphasized the benefits provided by critical habitat: "The benefit provided by the designation is the clear and early notification to Federal agencies and the public of the existence of critical habitat and the importance of the area to the Hawaiian monk seal" (51 Fed. Reg. 16047 (Apr. 30, 1986)).

In sum, Congress, the courts, and NMFS itself have repeatedly recognized the significant benefits of critical habitat designation to listed species. Such benefits are not merely theoretical, as recent studies demonstrate that species with critical habitat are twice as likely to be recovering as those without it (Taylor et al. 2005). The Hawaiian monk seal, a species whose recovery is in serious doubt, can benefit from critical habitat designation of habitat in the Main Hawaiian Islands. NMFS must promptly designate such habitat.

B. Habitat Use in the Main Hawaiian Islands

The following figures represent known haulout sites for Hawaiian monk seals:

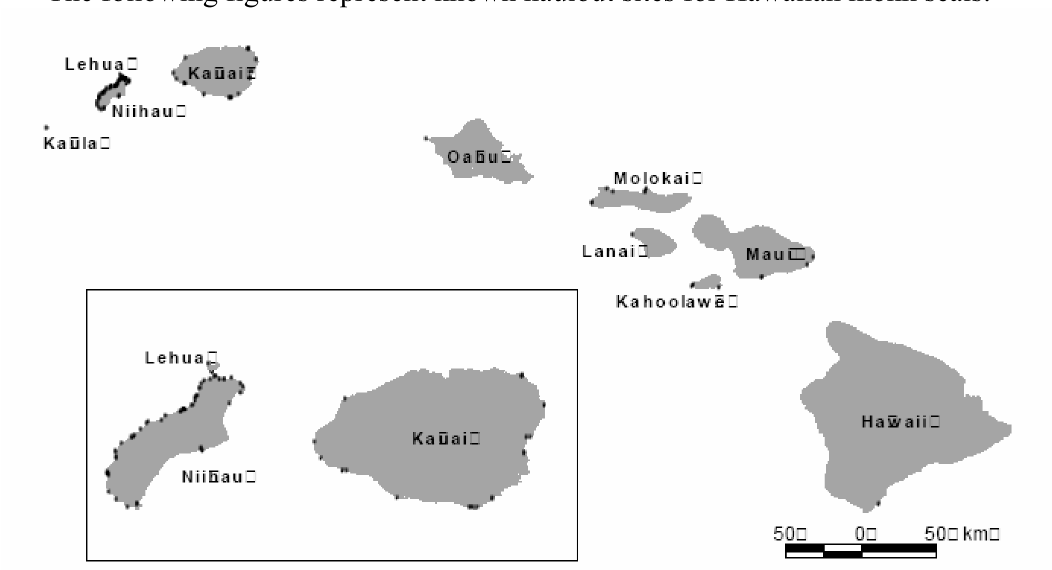

Figure 10. Location of Hawaiian monk seals observed during aerial surveys (and additional ground sightings) in the main Hawaiian Islands during 2000-2001. Insets of Kauai and Niihau (not to scale) are provided. Sightings of multiple seals near one another often appear as one dot. (Baker & Johanos 2003).

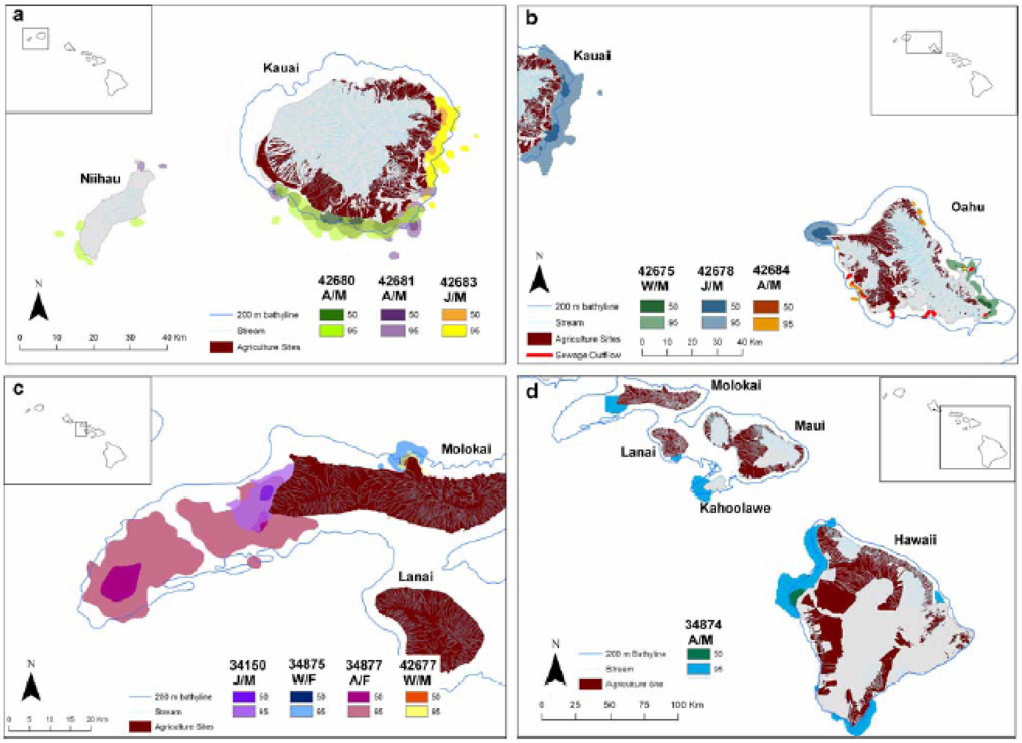

Figure 11. a–d: The calculated 95% and 50% probability distributions representing the overall habitats used by monk seals in the MHI. Location of streams and land used for agriculture are also indicated on the map. The age (A, adult; J, juvenile; W, weaner) and sex (M, male; F, female) classes of the seals are indicated. (Littnan et al. 2007).

C. Existing Critical Habitat for the Hawaiian Monk Seal

This petition requests amendment of the current Hawaiian monk seal critical habitat to include essential habitat areas in the Main Hawaiian Islands. In 1986, NMFS designated critical habitat for the monk seals in the Northwestern Hawaiian Islands (51 Fed. Reg. 16047 (Apr. 30, 1986)), and revised critical habitat to include more offshore areas in 1988 (53 Fed. Reg. 18988 (May 26, 1988)).

Currently, critical habitat for the Hawaiian monk seal includes all beach areas, sand spits and islets, including all beach crest vegetation to its deepest extent inland, lagoon waters, inner reef waters, and ocean waters out to a depth of 20 fathoms around the Northwestern Hawaiian Islands for this critically imperiled species. 50 C.F.R. § 226.201.

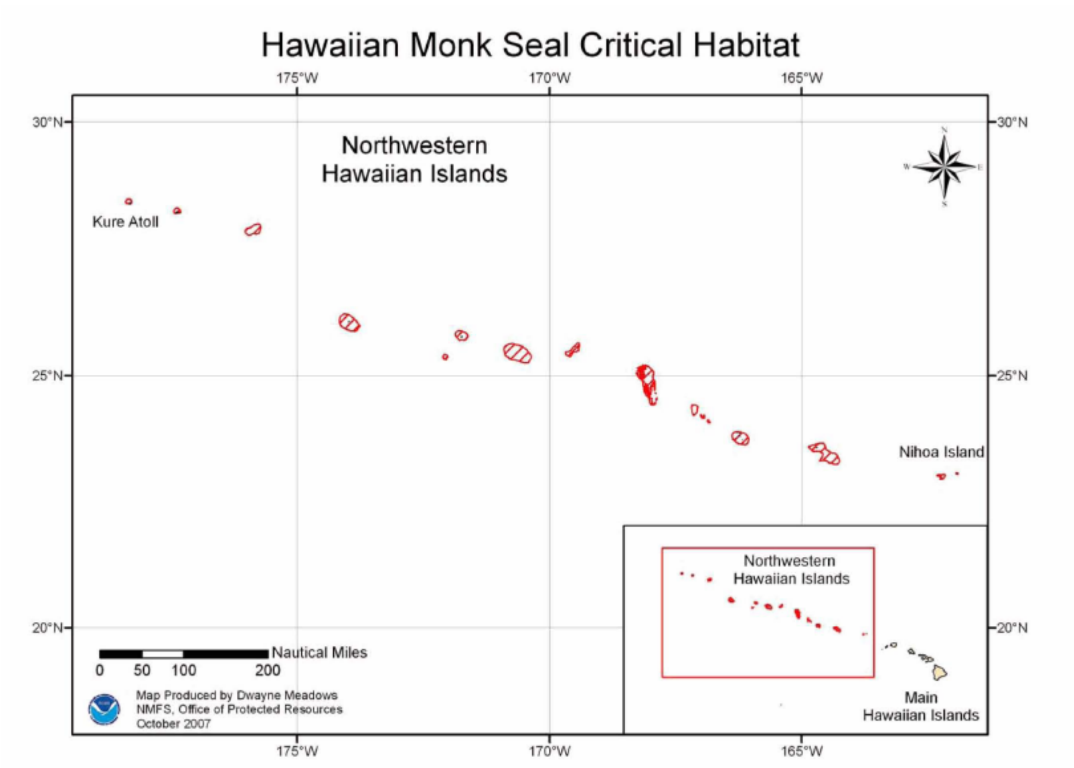

Figure 12. Hawaiian monk seal critical habitat (NMFS 2007a).

While the current critical habitat is important for the protection of the Hawaiian monk seal, expanded habitat protection is absolutely essential for the recovery of the population. The scientific consensus is that the Main Hawaiian Islands are the best opportunity for the recovery of the dwindling population of monk seals (NMFS 2007). The increasing use of the Main Hawaiian Islands by the monk seals as well as their better condition on the Main Hawaiian Islands suggests the importance of protecting habitat there. Amending the current critical habitat designation to include the proposed area would greatly benefit the species and may be vital in preventing its extinction.

Additionally, expanded protection of deeper waters in the Northwestern Hawaiian Islands will also help protect foraging grounds that were previously believed to be beyond the habitat of monk seals.

D. The Hawaiian Monk Seal Recovery Plan

Designating critical habitat for the Hawaiian monk seal in the Main Hawaiian Islands is consistent with the recovery plan for the species. Section 4(f) of the ESA requires NMFS to develop and implement recovery plans for listed species. 16 U.S.C. § 1533(f)(1). A recovery plan is "supposed to be a basic road map to recovery," which lays out the "process that stops or reverses the decline of a species and neutralizes threats to its existence" and provides a "means for achieving the species' long-term survival in nature." *Fund for Animals v. Babbitt*, 903 F. Supp. 96, 103 (D.D.C. 1995). If implemented, a valid recovery plan provides the means by which a species recovers to the point that its listing under the ESA is no longer warranted. *Id.*

One of the central recovery strategies for the Hawaiian monk seal is to promote the growth of the population of monk seals on the Main Hawaiian Islands (NMFS 2007). One of four key actions to promote the recovery of Hawaiian monk seals is:

> Ensure the continued natural growth of the Hawaiian monk seal in the MHI by reducing threats including interactions with recreational fisheries, disturbance of mother-pup pairs, disturbance of hauled out seals, and exposure to human and domestic animal diseases. This should be accomplished with coordination of all federal, state, local, and non-government parties, volunteer networks, and increased outreach and education in order to develop a culture of co-existence between humans and seals in the MHI.

(NMFS 2007: vii). According to the Recovery Plan, in addition to current protections of Northwest Hawaiian Island terrestrial and marine habitats important to monk seals, additional habitat protections should be afforded to the monk seals (NMFS 2007). "Maintain current ESA Critical Habitat designations with possible expansion as new data are collected" (NMFS 2007: IV-7). In regards to habitat protection in the Main Hawaiian Islands, the plan sets out to improve efforts to "ensure that Hawaiian monk seals will not be disturbed or displaced from preferred habitats" (NMFS 2007: IV-8).

With increasing numbers of monk seals populating the Main Hawaiian Islands habitat protection is important. As population declines devastate the populations in the Northwestern Hawaiian Islands, the Main Hawaiian Islands may be the last vestige of suitable habitat for the conservation and recovery of the Hawaiian monk seal.

> Protection of terrestrial habitat is important for those areas currently occupied by monk seals, and for those areas that might be available for re-colonization, such as beaches on the MHI.

(NMFS 2007: I-51). The Recovery Plan states "the recovery potential can be considered high because the MHI represent a large amount of under-occupied habitat, which could support a larger population of seals if appropriate management actions were in place" (NMFS 2007: I-2).

Critical habitat on the Main Hawaiian Islands is also consistent with the recovery goal to mitigate indirect anthropogenic impacts on monk seal habitat on the Main Hawaiian Islands (NMFS 2007). Moreover, the Recovery Plan recognized the need for special management in the Main Hawaiian Islands by designating such measures as a criterion for recovery (NMFS 2007). The plan calls for management measures to reduce the threats from fishing gear (NMFS 2007). The recovery plan emphasizes that the Main Hawaiian Islands present an opportunity for monk seal recovery and recognizes that "actions to date have not resulted in a recovering population" (NMFS 2007: IV-1).

Finally, the recovery plan prioritizes creating a management plan for Hawaiian monk seals on the Main Hawaiian Islands (NMFS 2007). This management plan is needed because monk seals are increasingly populating the Main Hawaiian Islands posing management challenges. The goals of the management plan are to coordinate public education, collect information, population assessments, recording and communication, response and intervention (permitted and non-permitted activities), research, and protection (NMFS 2007). Each of these goals of the management plan will be furthered by critical habitat designation on the main Hawaiian Islands.

E. Requested Revision of Critical Habitat

We request that NMFS revise the critical habitat designation of the Hawaiian monk seal in the Northwestern Hawaiian Islands to include Sand Island and its harbor in the Midway Islands, and waters out to a depth of 500 meters that are known to be important foraging grounds for Hawaiian monk seals. Additionally, We request that critical habitat be expanded to include all beach areas, sand spits and islets, including beach crest vegetation to its deepest extent inland, lagoon waters, inner reef waters, and ocean waters out to a depth of 200 meters around each of the Main Hawaiian Islands. The following is proposed regulatory language for the revised designation of critical habitat for the Hawaiian monk seal. If NMFS should find that that some portions of the requested critical habitat revision do not meet the criteria for such designation, we, in the alternative, request that NMFS analyze and designate as critical habitat the portions of the area that warrant critical habitat protection.

a. Proposed Regulatory Text

50 C.F.R. part 226 is amended as follows:

PART 226—DESIGNATED CRITICAL HABITAT

1. The authority citation for 226 continues to read as follows:

Authority: 16 U.S.C. 1533.

2. Section 226.201 is amended by redesignating existing critical habitat as subsection (a), adding Sand Island and increasing the depth to 500 meters; and adding new subsection (b) including areas in the Main Hawaiian Islands. Revised section 226. 201 reads as follows:

§ 226.201 Critical habitat for Hawaiian monk seals.

HAWAIIAN MONK SEAL
(Monachus schauinslandi)

(a) Northwestern Hawaiian Islands — All beach areas, sand spits and islets, including all beach crest vegetation to its deepest extent inland, lagoon waters, inner reef waters, and ocean waters out to a depth of 500 meters around the following:

Kure Atoll (28°24′ N, 178°20′ W)
Midway Islands (28°14′ N, 177°22′ W)
Pearl and Hermes Reef (27°55′ N, 175° W)
Lisianski Island (26°46′ N, 173°58′ W)
Laysan Island (25°46′ N, 171°44′ W)
Maro Reef (25°25′ N, 170°35′ W)
Gardner Pinnacles (25°00′ N, 168°00′ W)
French Frigate Shoals (23°45′ N, 166°00′ W)
Necker Island (23°34′ N, 164°42′ W)
Nihoa Island (23°03.5′ N, 161°55.5′ W).

(b) Main Hawaiian Islands — All beach areas, sand spits and islets, including all beach crest vegetation to its deepest extent inland, lagoon waters, inner reef waters, and ocean waters out to a depth of 200 meters around the following:

Niihau
Kauai
Oahu
Molokai
Lanai
Maui
Kahoolawe
Hawai'i

Within this area, the primary constituent elements are those habitat components that are essential for the primary biological needs of feeding, birthing, nursing, resting, and migrating, and include all marine waters, along with associated marine aquatic flora and fauna in the water column, and the underlying marine benthic community.

b. Proposed Area Contains Physical and Biological Features Essential to the Conservation of the Species

The ESA mandates that specific areas in which are found "physical or biological features essential to the conservation of the species" qualify as critical habitat. 16 U.S.C. §1532(5). According to NMFS' regulations, in designating critical habitat, NMFS must consider the requirements of the species, including, but not limited to (1) space for individual and population growth, and for normal behavior; (2) food, water, air, light, minerals, or other nutritional or physiological requirements; (3) cover or shelter; (4) sites for breeding, reproduction, or rearing of offspring; and, generally, (5) habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of the species. 50 CFR 424.12(b). The proposed critical habitat area described above clearly contains "physical or biological features essential to the conservation" of the Hawaiian monk seal and therefore must be designated as critical habitat for the species.

i. Areas for Population Growth and Normal Behavior

Habitat in the Main Hawaiian Islands is especially promising for monk seal population growth (Baker & Johanos 2004). While the Northwestern Hawaiian Island subpopulations of monk seals are on a continuing decline, monk seals are increasingly populating the Main Hawaiian Islands. Notably, since 1996 there has been a steady increase in the number of births of monk seals on the Main Hawaiian Islands. Moreover, adult and juvenile monk seals on the Main Hawaiian Islands are in better condition and more likely to survive than monk seals found on the Northwestern Hawaiian Islands. Monk seals have high fidelity to terrestrial sites (Baker et al. 2007).

Normal behavior of Hawaiian monk seals includes the use of both terrestrial and aquatic habitat. Such areas within the Main Hawaiian Islands have been included in the proposed critical habitat designation. Hawaiian monk seal habitat includes the terrestrial areas of the islands used by monk seals and areas within 200 km of their resident islands (NMFS 2007). Hawaiian monk seals use sandy beaches and other haulouts for pupping, nursing, molting, and resting (NMFS 2007). Monk seals use areas between nearshore shallows to 500 meters deep for foraging (NMFS 2007). Much of the time that monk seals spend in shallow waters is socializing and resting, and deeper diving is used for foraging (Parrish et al. 2007).

It is important that the critical habitat areas also include areas that can be used for hauling out even under scenarios of sea level rise expected within this century. The Main Hawaiian Islands provide for higher elevations with suitable habitat (Baker 2006). Conservation of such suitable habitat on the "high islands" is an important strategy for the survival of the Hawaiian monk seal (Baker 2006).

ii. Food and Water

Monk seals use aquatic areas in the proximity of haulout beaches for foraging. Monk seals in the Main Hawaiian Islands occupy ranges which are between 34-800 km^2 (NMFS 2007). Hawaiian monk seals eat a variety of prey including reef fish, crustaceans, and cephalopods (NMFS 2007). They tend to forage on the sea floor on reefs or on sandy talus slopes near reefs (NMFS 2007). Recent research has demonstrated the importance of sand fields on the deep slope as foraging grounds for monk seals (Parrish et al. 2007). Monk seals will typically dive 150 meters to forage and up to 500 meters in depth (NMFS 2007). Recent satellite monitoring of seals indicates that seals spend time in nearshore, neritic, marine habitats within the 200 meter depth contours surrounding the Main Hawaiian Islands and adjacent banks (Littnan et al. 2007).

In the Northwestern Hawaiian Islands there is a need to extend critical habitat to deeper waters because new studies have contradicted the previous belief that monk seals foraged only on shallow reef habitats (Parrish et al. 2007). Monk seals forage in a variety of marine habitats "they forage on nearly every reef, bank, and submerged seamount within approximately 500 m of the surface in the Northwestern Hawaiian Islands" (Baker et al. 2007a: 277). The areas proposed for critical habitat include marine areas including shallow and deep waters believed to be suitable for monk seal foraging. Food limitation is among the primary threats to the survival of the Hawaiian monk seal and the protection of foraging areas is important for monk seals to feed.

iii. Cover and Shelter

Vegetation near haulout beaches are frequently used by monk seals for cover and shelter (NMFS 2007). The proposed critical habitat designation includes vegetation adjacent to beaches used by monk seals. Additionally, monk seals use the marine habitat and reefs for cover and shelter that is included in the designation.

Shallow, protected waters are also important for mothers to teach their pups to swim and forage without the threat of predation (Alter 2006 citing Supp. EA).

iv. Sites for Breeding, Reproduction, or Rearing of Offspring

Hawaiian monk seals are increasingly using and requiring beach habitat on the Main Hawaiian Islands for successful pupping, nursing, and weaning. As described above, more and more monk seals are being born on the Main Hawaiian Islands each year they have steadily been increasing since 1996. Beach habitat is essential for the birth and rearing of monk seal offspring. Monk seals haulout onto shore, usually on sandy beaches to give birth. Then the females spend approximately six weeks nursing the pups onshore and using shallow near shore waters before returning to the water to forage. Monk seals tend to be loyal to haulout areas, and the same seals are often observed returning to the same beaches each year. For this reason, critical habitat must include areas on the Main Hawaiian Islands that are known to be used by monk seals.

It is essential that NMFS address the threat of sea level rise when designating critical habitat for the Hawaiian monk seal. The loss of beach habitat due to sea level rise could be the deathblow to the monk seal. The proposed critical habitat includes areas in proximity to existing monk seal haulouts that are likely to be available for monk seals under scenarios of sea level rise.

c. Primary Constituent Elements

NMFS's regulations require the agency to list "primary constituent elements" when designating critical habitat. 50 CFR 424.12(b). Primary constituent elements "shall focus on principal biological and physical" elements within the designation area and "may include, but are not limited to, the following: roost sites, *nesting grounds*, spawning sites, *feeding sites*, seasonal wetland or dryland, *water quality* or quantity, host species or plant pollinator, geological formation, vegetation type, tide, and specific soil types." *Id.* (emphasis added).

The following primary constituent elements are essential elements for monk seal conservation: coastal areas for pupping and hauling out, vegetation for shelter and protection, shallow waters adjacent to the above, reef and nearby talus bottom areas for foraging, marine waters up to 500 meters deep around the Northwestern Hawaiian Islands, marine waters up to 200 meters deep around the Main Hawaiian Islands, and the water column. Additionally, upslope habitat is essential above elevations of 6 meters from mean high tide, thus protecting terrestrial habitat under current projections of sea level rise.

d. The Proposed Area Requires Special Management Considerations

The ESA mandates that designated critical habitat for endangered or threatened species must have "physical or biological features which may require special management considerations or protection". 16 U.S.C. §1532(5). The proposed critical habitat area for the Hawaiian monk seal meets this standard.

The best evidence that the proposed critical habitat area "may require special management considerations" is the fact that NMFS already provides some management of the area through beach monitoring and monks seal protection zones for monk seals hauled out on popular beaches (NMFS 2007). As a court held in overturning the U.S. Fish and Wildlife Service's unlawful refusal to designate critical habitat for the Mexican spotted owl, a refusal based upon the agency's conclusion that existing management measures were adequate, the fact that certain management measures were already in place to benefit the owl actually buttressed the argument for designating the contested areas as critical habitat.

> Whether habitat does or does not require special management by Defendant or FWS is not determinative on whether or not that habitat is "critical" to a threatened or endangered species. What is determinative is whether or not the habitat is "essential to the conservation of the species" and special management of that habitat is possibly necessary. 16 U.S.C. § 1532(5)(A)(i). Thus, *the fact that a particular habitat does, in fact, require special management is demonstrative evidence that the habitat is "critical."* Defendant, on the other hand, takes the position that if a habitat is actually under "adequate" management, then that habitat is per se not "critical." This makes no sense. A habitat would not be subject to special management and protection if it were not essential to the conservation of the species. *The fact that a habitat is already under some sort of management for its conservation is absolute proof that such habitat is "critical."*

Center for Biological Diversity v. Norton, 240 F. Supp. 2d 1090, 1099 (D. Ariz. 2003) (emphasis added).

Moreover, even if the existing management measures could be deemed to provide "adequate" management for the species from the threat of human disturbance, these measures are insufficient to address numerous other threats to monk seals and their habitat in the Main Hawaiian Islands. The recovery plan also acknowledges the need for increased management and special measures for the Hawaiian monk seals on the Main Hawaiian Islands (NMFS 2007).

e. Critical Habitat Designation Is both Prudent and Determinable

Under the ESA, NMFS can refuse to designate critical habitat only if such designation it "not prudent" or "not determinable." 50 CFR 424.12. A designation is not prudent when one or both of the following situations exist:

> (i) The species is threatened by taking or other human activity, and identification of critical habitat can be expected to increase the degree of such threat to the species, or
> (ii) Such designation of critical habitat would not be beneficial to the species.

50 CFR 424.12(a)(1). A designation is not determinable when one or both of the following exist:

> (i) Information sufficient to perform required analyses of the impacts of the designation is lacking, or
> (ii) The biological needs of the species are not sufficiently well known to permit identification of an area as critical habitat.

50 CFR 424.12(a)(2).

Because the designation of critical habitat for the Hawaiian monk seal in the Main Hawaiian Islands is both prudent and determinable, NMFS must promptly designate such habitat. Neither of the "not prudent" scenarios identified in the regulations apply here. There is no reason to assume that identifying the proposed area for critical habitat designation will put monk seals at increased risk for "take" because Hawaiian monk seals are not hunted or taken intentionally for human purposes.

Further, it is well established by NMFS in the recovery plan and elsewhere that increased long-term protection of Hawaiian monk seals in the Main Hawaiian Islands is not just beneficial to the species, but critical to its survival (Baker 2006, NMFS 2007). The Marine Mammal Commission has stated that promoting an increase in the number of monk seals in the Main Hawaiian Islands should be a high priority (MMC 2007). According to the Marine Mammal Commission, stable Hawaiian monk seal subpopulations in the Main Hawaiian Islands are likely to considerably reduce the possibility of extinction (Ragen 2002). This is for several reasons. The foraging habitat and prey available to monk seals is greater on the Main Hawaiian Islands and will increase the carrying capacity of the monk seal's habitat (Ragen 2003). Genetic variability will increase with more males and females participating in reproduction (*Id.*). Additionally, new subpopulations on the Main Hawaiian Islands will likely increase the persistence of the species by protecting against simultaneous extirpation and improving the possibility of recolonization (*Id.)*. These factors demonstrate that the Main Hawaiian Islands provide areas for population growth.

Only in rare circumstances is critical habitat designation "not prudent." 50 C.F.R. § 424.12(a)(1); *see also Natural Res. Defense Council v. United States Dep't of Interior*, 113 F.3d 1121, 1126 (9th Cir. 1997) (finding "not prudent" exception narrowly allowed). Clearly, establishing Main Hawaiian Islands critical habitat for the monk seal is prudent.

The requested critical habitat designation is also determinable because there is sufficient information about the areas in the Main Hawaiian Islands used by monk seals to determine the proposed area is critical. This Petition and source materials support this factor. Moreover, NMFS has collected significant data about the sites that monk seals use for hauling out on the Main Hawaiian Islands. Furthermore, the use of cameras and tagging are improving studies of monk seal foraging areas.

Conclusion

Current scientific evidence shows that providing permanent ESA critical habitat protection to areas in the Main Hawaiian Islands that are used by the Hawaiian monk seal is an effective and necessary step towards conserving and recovering the monk seal population. The proposed critical habitat designation will have a significant benefit for the Hawaiian monk seal, protecting beach and marine habitat desperately needed for the monk seals and guiding the management of those areas. Conserving the population of Hawaiian monk seals on the Main Hawaiian Islands is essential to promoting the survival of the overall population of the monk seals. Given the numerous threats facing the monk seal – starvation, entanglement in marine debris, predation, and changes brought by global warming – there is an urgent need to provide every possible protection to the species. As NMFS recognized in its recovery plan for the Hawaiian monk seal, it is essential to ensure the continued growth of the population in the Main Hawaiian Islands. Critical habitat designation will improve the monk seal's likelihood of survival. Designating the proposed critical habitat area will provide reliable, meaningful protections while enabling NMFS and other agencies to work more effectively towards the ultimate goal of the ESA, recovery of the Hawaiian monk seal to the point where its listing as an endangered species is no longer necessary.

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