

RESOLUTION MEPC.171(57)  
Adopted on 4 April 2008  
DESIGNATION OF THE  
PAPAHĀNAUMOKUĀKEA MARINE NATIONAL MONUMENT  
AS A PARTICULARLY SENSITIVE SEA AREA

**ANNEX 12**

**RESOLUTION MEPC.171(57)**

**Adopted on 4 April 2008**

**DESIGNATION OF THE  
PAPAHĀNAUMOKUĀKEA MARINE NATIONAL MONUMENT  
AS A PARTICULARLY SENSITIVE SEA AREA**

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

BEING AWARE of the ecological, socio-economic and scientific attributes of the Papahānaumokuākea Marine National Monument, as well as its vulnerability to damage by international shipping activities and the steps taken by the United States to address that vulnerability,

NOTING the Revised Guidelines for the Identification and Designation of Particularly Sensitive Sea Areas adopted by resolution A.982(24) (PSSA Guidelines) and the Revised Guidance Document for Submission of PSSA Proposals to IMO set forth in MEPC/Circ.510,

HAVING CONSIDERED the proposal made by the Government of the United States that the Papahānaumokuākea Marine National Monument be designated as a Particularly Sensitive Sea Area,

HAVING AGREED that the criteria for the identification and designation of a Particularly Sensitive Area provided in resolution A.982(24) are fulfilled for the Papahānaumokuākea Marine National Monument,

HAVING NOTED that the Maritime Safety Committee, at its eighty-third session, in considering the necessary associated protective measures, adopted new and amended, routing measures, as well as a new ship reporting system applicable to the proposed Particularly Sensitive Sea Area,

1. DESIGNATES the Papahānaumokuākea Marine National Monument described in annex 1 as a Particularly Sensitive Sea Area;
2. INVITES Member Governments to recognize the ecological, socio-economic, and scientific attributes of the area, set forth in annex 2, as well as its vulnerability to damage by international shipping activities, as described in annex 3; and
3. FURTHER INVITES Member Governments to note the associated protective measures established to address the area's vulnerability, the details of which are contained in annex 4, and request ships flying their flag that they act in accordance with such measures.

ANNEX 1

**DESCRIPTION OF THE PAPAHĀNAUMOKUĀKEA MARINE  
NATIONAL MONUMENT PSSA\***

(Reference chart: United States 19016, 2007 edition; 19019, 2007 edition; 19022, 2007 edition. These charts are based on World Geodetic Survey 1984 and astronomic datum.)

**Description of the Particularly Sensitive Sea Area for the Papahānaumokuākea Marine National Monument**

To avoid the risk of damage from ship groundings and pollution damage by international shipping activities and the destruction and degradation of this unique, fragile, and pristine coral reef ecosystem, as well as of significant cultural and archaeological resources, mariners should exercise extreme care when navigating in the area bounded by a line connecting the following geographical positions which is designated as a Particularly Sensitive Sea Area:

<b>Point</b>	<b>LATITUDE</b>	<b>LONGITUDE</b>
1	28°26'.24 N	175°10'.65 W
2	28°16'.07 N	175°00'.00 W
3	26°50'.89 N	173°30'.79 W
4	26°36'.00 N	171°37'.70 W
5	26°35'.49 N	171°33'.84 W
6	26°35'.09 N	171°30'.84 W
7	26°34'.07 N	171°27'.50 W
8	26°33'.35 N	171°25'.16 W
9	26°14'.25 N	170°23'.04 W
10	25°50'.55 N	167°57'.88 W
11	25°48'.99 N	167°48'.35 W
12	25°47'.09 N	167°36'.72 W
13	25°39'.84 N	167°26'.48 W
14	25°35'.10 N	167°19'.79 W
15	25°10'.43 N	166°45'.00 W
16	24°40'.91 N	166°03'.36 W
17	24°35'.64 N	165°34'.99 W
18	24°23'.98 N	164°32'.24 W
19	23°52'.82 N	161°44'.54 W
20	23°52'.10 N	161°41'.20 W
21	23°51'.18 N	161°37'.92 W
22	23°50'.08 N	161°34'.71 W
23	23°48'.79 N	161°31'.58 W
24	23°47'.33 N	161°28'.55 W
25	23°45'.69 N	161°25'.62 W
26	23°43'.88 N	161°22'.81 W
27	23°41'.92 N	161°20'.13 W
28	23°39'.80 N	161°17'.60 W
29	23°37'.54 N	161°15'.21 W

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\* The text in this annex is taken from the United States submission contained in document MEPC 56/8.

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<b>Point</b>	<b>LATITUDE</b>	<b>LONGITUDE</b>
30	23°35'.14 N	161°12'.99 W
31	23°32'.62 N	161°10'.93 W
32	23°29'.99 N	161°09'.05 W
33	23°27'.25 N	161°07'.35 W
34	23°24'.42 N	161°05'.85 W
35	23°21'.51 N	161°04'.54 W
36	23°18'.52 N	161°03'.43 W
37	23°15'.48 N	161°02'.53 W
38	23°12'.39 N	161°01'.84 W
39	23°09'.27 N	161°01'.35 W
40	23°06'.13 N	161°01'.09 W
41	23°02'.97 N	161°01'.03 W
42	22°59'.82 N	161°01'.19 W
43	22°56'.69 N	161°01'.57 W
44	22°53'.58 N	161°02'.15 W
45	22°50'.51 N	161°02'.95 W
46	22°47'.50 N	161°03'.95 W
47	22°44'.55 N	161°05'.15 W
48	22°41'.67 N	161°06'.54 W
49	22°38'.88 N	161°08'.13 W
50	22°36'.19 N	161°09'.90 W
51	22°33'.61 N	161°11'.85 W
52	22°31'.14 N	161°13'.97 W
53	22°28'.81 N	161°16'.25 W
54	22°26'.61 N	161°18'.69 W
55	22°24'.56 N	161°21'.26 W
56	22°22'.66 N	161°23'.97 W
57	22°20'.92 N	161°26'.80 W
58	22°19'.35 N	161°29'.74 W
59	22°17'.95 N	161°32'.78 W
60	22°16'.73 N	161°35'.90 W
61	22°15'.70 N	161°39'.10 W
62	22°14'.85 N	161°42'.37 W
63	22°14'.20 N	161°45'.68 W
64	22°13'.73 N	161°49'.03 W
65	22°13'.47 N	161°52'.41 W
66	22°13'.40 N	161°55'.80 W
67	22°13'.53 N	161°59'.18 W
68	22°13'.85 N	162°02'.55 W
69	22°14'.31 N	162°05'.45 W
70	22°14'.37 N	162°05'.89 W
71	22°45'.18 N	164°51'.62 W
72	22°50'.26 N	165°34'.99 W
73	22°55'.50 N	166°19'.63 W
74	22°55'.93 N	166°23'.32 W
75	22°57'.41 N	166°36'.00 W
76	23°03'.75 N	166°45'.00 W
77	23°05'.48 N	166°47'.45 W

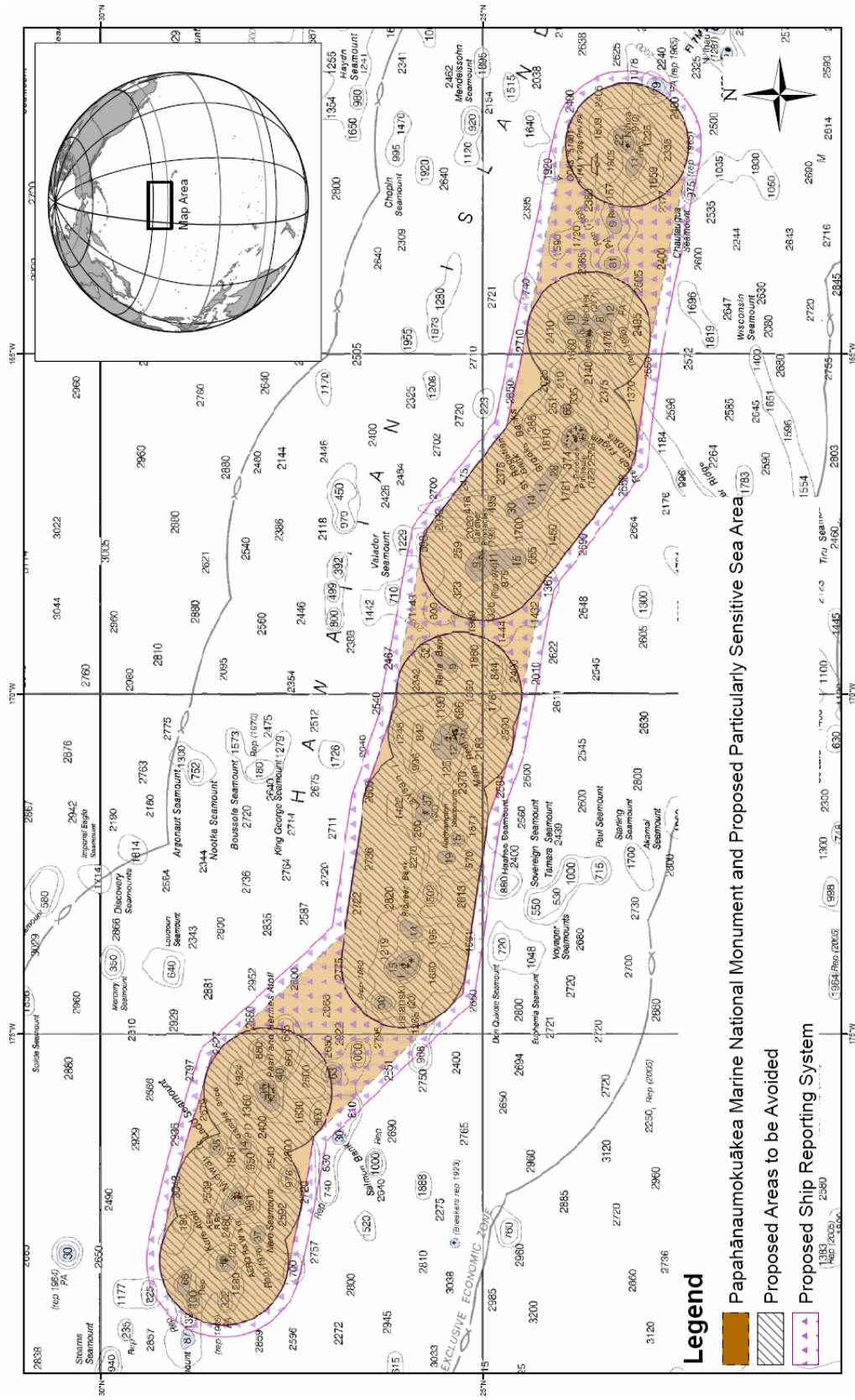
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<b>Point</b>	<b>LATITUDE</b>	<b>LONGITUDE</b>
78	24°12'.69 N	168°22'.84 W
79	24°12'.69 N	168°22'.84 W
80	24°12'.70 N	168°22'.86 W
81	24°35'.77 N	170°44'.39 W
82	24°36'.29 N	170°47'.58 W
83	24°37'.18 N	170°50'.37 W
84	24°37'.76 N	170°52'.17 W
85	24°56'.23 N	171°50'.19 W
86	25°16'.61 N	174°24'.84 W
87	25°49'.84 N	175°00'.00 W
88	27°14'.76 N	176°29'.87 W
89	27°24'.95 N	177°33'.31 W
90	27°35'.87 N	178°29'.90 W
91	27°36'.64 N	178°33'.93 W
92	27°37'.53 N	178°37'.32 W
93	27°38'.60 N	178°40'.65 W
94	27°39'.85 N	178°43'.90 W
95	27°41'.28 N	178°47'.05 W
96	27°42'.89 N	178°50'.10 W
97	27°44'.66 N	178°53'.03 W
98	27°46'.59 N	178°55'.83 W
99	27°48'.67 N	178°58'.49 W
100	27°50'.89 N	179°01'.00 W
101	27°53'.25 N	179°03'.35 W
102	27°55'.74 N	179°05'.54 W
103	27°58'.34 N	179°07'.54 W
104	28°01'.05 N	179°09'.35 W
105	28°03'.85 N	179°10'.98 W
106	28°06'.74 N	179°12'.40 W
107	28°09'.71 N	179°13'.61 W
108	28°12'.73 N	179°14'.62 W
109	28°15'.80 N	179°15'.41 W
110	28°18'.91 N	179°15'.98 W
111	28°22'.05 N	179°16'.33 W
112	28°24'.72 N	179°16'.44 W
113	28°25'.20 N	179°16'.45 W
114	28°25'.82 N	179°16'.44 W
115	28°28'.35 N	179°16'.36 W
116	28°31'.49 N	179°16'.03 W
117	28°34'.60 N	179°15'.49 W
118	28°37'.68 N	179°14'.72 W
119	28°40'.71 N	179°13'.74 W
120	28°43'.68 N	179°12'.54 W
121	28°46'.58 N	179°11'.13 W
122	28°49'.39 N	179°09'.52 W
123	28°52'.11 N	179°07'.70 W
124	28°54'.72 N	179°05'.70 W
125	28°57'.21 N	179°03'.51 W

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<b>Point</b>	<b>LATITUDE</b>	<b>LONGITUDE</b>
126	28°59'.58 N	179°01'.15 W
127	29°01'.81 N	178°58'.62 W
128	29°03'.90 N	178°55'.93 W
129	29°05'.83 N	178°53'.10 W
130	29°07'.60 N	178°50'.13 W
131	29°09'.21 N	178°47'.04 W
132	29°10'.64 N	178°43'.84 W
133	29°11'.89 N	178°40'.54 W
134	29°12'.95 N	178°37'.16 W
135	29°13'.82 N	178°33'.71 W
136	29°14'.50 N	178°30'.21 W
137	29°14'.99 N	178°26'.66 W
138	29°15'.28 N	178°23'.08 W
139	29°15'.36 N	178°19'.49 W
140	29°15'.25 N	178°15'.90 W
141	29°14'.94 N	178°12'.32 W
142	29°14'.43 N	178°08'.78 W
143	29°03'.47 N	177°12'.07 W
144	29°02'.55 N	177°07'.29 W
145	28°38'.96 N	175°35'.47 W
146	28°38'.67 N	175°34'.35 W
147	28°34'.91 N	175°19'.74 W
148	28°26'.24 N	175°10'.65 W

CHARTLET



## ANNEX 2

### **ECOLOGICAL, SOCIO-ECONOMIC, AND SCIENTIFIC ATTRIBUTES OF THE PAPAHĀNAUMOKUĀKEA MARINE NATIONAL MONUMENT PSSA\***

#### **1 *Ecological Criteria***

##### **1.1 Uniqueness or rarity**

1.1.1 The Papahānaumokuākea Marine National Monument (North-western Hawaiian Islands or NWHI) supports a unique, dynamic coral reef ecosystem, which, thanks to its relative isolation, is among the healthiest in the world (Citizen's Guide 2006). It is one of the last remaining large-scale wilderness coral reef ecosystems on the planet and the largest coral reef ecosystem in the marginal tropical seas (Cousteau 2003). Approximately one-quarter of the species found in the NWHI are endemic to the Hawaiian Island chain, which is one of the highest rates of marine endemism in the world (Friedlander *et al.* 2005; Citizen's Guide 2006). The proportion of scientifically non-described coral reef species (e.g., sponges, corals, algae, and other invertebrates) in this area is one of the highest in the world (Cousteau 2003). The NWHI also contain important breeding and nesting grounds for a number of species, many of which are at risk, including the critically endangered Hawaiian monk seal, the threatened green sea turtle, and 19 species of seabirds (Henderson 2001; NOAA 2004b; Citizen's Guide 2006).

1.1.2 The uniqueness of this area was expressed in 2003 by ocean explorer Jean-Michel Cousteau in his **Voyage to Kure** expedition log: "These islands are a celebration of the uniqueness brought on by isolation. Along this ribbon of life, we found teeming populations of spinner dolphins and large apex predators such as reef sharks, jacks, and groupers. We encountered many of the Hawaiian endemic species of reef fish, including the rare masked angelfish and Hawaiian grouper; all perfect reminders of an intact coral reef ecosystem" (Cousteau 2003).

##### **1.2 Critical Habitat**

1.2.1 Parts of the proposed area provide critical habitat for a variety of endangered or threatened species that are protected under various United States domestic laws. These species include the critically endangered Hawaiian monk seal; the endangered sperm whale; the endangered hawksbill, leatherback, and green sea turtles; the endangered short-tailed albatross; six endangered plant species; and four endangered land birds: the Nihoa finch, Nihoa millerbird, Laysan finch, and Laysan Duck, the world's rarest duck. Of these species, seven are listed in Appendix I of the Convention on Trade in Endangered Species of Wild Flora and Fauna (CITES) and nine are listed on the World Conservation Union (IUCN) Red List of Threatened Species (including three with "critically endangered" status).

##### **1.3 Dependency**

1.3.1 The ecological processes of the NWHI ecosystem are dependent on the health of its vast, diverse coral reef tracts. Often called the "rainforests" of the sea, coral reefs are vital to

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\* The text in this annex is taken from the United States submission contained in document MEPC 56/8.



maintaining the biological diversity of the oceans (Citizen's Guide 2006). The pristine coral reefs of the NWHI are the foundation of a symbiotic community composed of countless millions of plants and animals dependent upon one another for survival (Citizen's Guide 2006). These reefs perform important ecosystem services including filtering water, protecting islands from sediment deposition and storms, and providing nourishment for marine organisms.

1.3.2 Thousands of species depend on the coral reefs of the NWHI. Hawaiian monk seals, a majority of which make their home in the NWHI, are the only surviving marine mammal that is dependent on coral reef ecosystems (Citizen's Guide 2006; Cousteau 2003). The high incidence of apex predators such as sharks, jacks, and groupers also depends on the high productivity of this ecosystem. In turn, the prevalence of apex predators has a significant effect on the structuring of the fish assemblage of the area, impacting the diversity and relative abundance of species lower on the food chain. Thus, adverse impacts on these apex predators could cause populations of smaller fish to quickly become unbalanced, changing the trophic structure and order of dominance within the ecosystem (Maragos and Gulko 2002; Friedlander and DeMartini 2002; Suthers 2004).

1.3.3 Approximately 14 million seabirds, with 5.5 million nesting annually in the NWHI, rely on the coral reef ecosystem for food and other habitat needs (Naughton and Flint 2004). In turn, the ecosystem is dependent on these birds' role in the high relative productivity and diversity of the NWHI. Nutrient-rich defecation (guano) deposited by the birds on the islands and nearshore waters – which subsequently is dissolved and provides significant levels of nitrogen to the ecosystem – is thought to stimulate the prolific growths of algae found around the islands. When high levels of algal growth are combined with significant wave action, such as at La Perouse Pinnacle at French Frigate Shoals, this creates favourable conditions for the growth of other species (Maragos and Gulko 2002).

1.3.4 The ecological processes of the NWHI depend on more than just its coral reefs. Beyond the banks and steep slopes, between 1,640 and 14,000 feet, the ocean floor levels out at sea bottom which contains distinct, rich habitat (Press and Siever 1986; Benoit-Bird *et al.* 2001). This habitat is linked to the coral reef ecosystem by a dense assemblage of small fish, shrimp, and squid that migrate from the ocean depths to near the surface in regular patterns and serve as an important food resource for many animals, including spinner dolphins, bottom fish, tunas, and billfish (Benoit-Bird *et al.* 2001). The importance of offshore and deepwater habitat is also evidenced by the movements and diets of Hawaiian monk seals. Although part of the seals' diet comes from shallow-water coral reef fish, the seals are known to travel over one hundred miles between islands and dive to depths of greater than 900 feet when foraging for deepwater prey, mainly bottom fish, which make up the primary part of their diet (Henderson 2001; TenBruggencate 2006). Each of these habitats is essential to the other, and the loss of one affects the operation of all the others throughout the system. Accordingly, an impact on one part of the system can threaten the entire ecosystem as well as the diversity of species that depend on the area.

## 1.4 Diversity

1.4.1 The NWHI supports more than 7,000 species of fishes, mammals, plants, coral, and other invertebrates (Bush 2006). Discoveries of species in the NWHI are continuing to be made, as demonstrated by a 2006 research expedition in French Frigate Shoals which yielded over 100 species not previously known to exist in the area and many of which may be previously unknown to science (Associated Press 2006). The rich diversity of the NWHI is in part due to

the relative isolation of the area and minimal impact from humans, which is underscored by the starkly contrasting lower levels of diversity found in the marine areas of the main Hawaiian Islands (DeMartini and Friedlander 2004; Friedlander *et al.* 2005a; NOAA 2004g). Coral reefs are among the most highly diverse of all ecosystems on the planet; the coral reef ecosystem of the NWHI exemplifies this point.

1.4.2 Further contributing to diversity, the ecosystem of the NWHI contains a wide variety of habitats, extending from the shoreline to depths of approximately 14,000 feet. For example, within the pristine coral reefs of the NWHI, the percentage of coral cover varies widely, creating a series of interconnected but distinct types of coral reef habitats, or zones (e.g., shelf, fore reef, reef crest, back reef, and lagoon). Wave exposure is the primary factor causing zonation in the NWHI, but gradients in sediment, salinity, and temperature are also important (Friedlander *et al.* 2005a). As a result of this zonation, the coral reefs of the NWHI contain a variety of environmental niches and resources that support a diverse array of species.

## **1.5 Productivity**

1.5.1 Coral reef ecosystems have the highest gross primary productivity of all ocean areas, and the proposed area contains several thousand square miles of coral reefs, indicating a highly productive ecosystem. Also indicative of the area's productivity is the high incidence of apex predators such as sharks, jacks, and groupers, which make up more than half of the total fish biomass in the NWHI. A very high replacement rate of small and mid-size fish is necessary to support an apex predator-dominated ecosystem.

1.5.2 The productivity of the proposed area can readily be seen by comparing it to the productivity in the main Hawaiian Islands. A comparison of both biomass and trophic structure between reef fish communities in the NWHI and the main Hawaiian Islands showed that across similar habitats, biomass was 260 per cent higher in the NWHI (Friedlander and DeMartini 2002). Productivity is especially high in the area's inshore waters, shallow lagoons, and coral reefs. For example, the lagoon in French Frigate Shoals produces nearly ten times the amount of phytoplankton as produced in the same volume of water in the open seas. The area also has extensive submerged banks, which have high levels of primary productivity due to the existence of expansive algal meadows. Furthermore, while apex predators represent only three per cent of the fish biomass in the main Hawaiian Islands, they make up 54 per cent of the biomass in the NWHI (Suthers 2004).

## **1.6 Spawning or Breeding Grounds**

1.6.1 The NWHI provide critical breeding and nesting grounds for a wide variety of species. The area contains the breeding grounds for almost the entire remaining population of the Hawaiian monk seal, and serves as the seals' primary haul-out, pupping, and weaning habitat. The area also provides the breeding grounds and primary nesting sites for approximately 90 per cent of the threatened Hawaiian Islands green sea turtle population. Millions of Central Pacific seabirds also congregate on these islands to breed, including all but three of Hawaii's 22 species of seabirds, such as the grey-backed tern, short-tailed albatross, and the red-tailed tropicbird. More than 99 per cent of the world's Laysan albatrosses and 98 per cent of the world's black-footed albatrosses return to the NWHI each year to reproduce. For some bird species, the NWHI provide their only breeding site.

## **1.7 Naturalness**

1.7.1 Because of their geographical isolation and long history of protection, the reefs of the NWHI are among the healthiest and most undisturbed coral reefs on the planet. Their naturalness is perhaps best evidenced by the relatively high diversity and productivity in the NWHI as compared with the reefs of the main Hawaiian Islands, which have experienced much greater impacts from humans, and by the fact that the NWHI is one of the worlds last remaining large-scale apex predator-dominated reef ecosystems.

## **1.8 Integrity**

1.8.1 The area of the NWHI is a prime example of a self-sustaining ecological entity. The volcanic islands, coral atolls, shallow reefs, banks, slopes, shoals, seamounts, deep reefs, and open water form the basis for this interlocking and complex ecosystem. Its integrated nature is evidenced by the vast number of interdependent processes that connect the varied NWHI habitats, as discussed in particular in section 3.4 (Dependency) of this proposal. Examples of this include: (1) the critical link between the shallow coral reef and the deep ocean floor habitats manifested by species that migrate regularly from great depths and are consumed by many shallower water animals; (2) the foraging, feeding, breeding, and pupping areas of the Hawaiian monk seal range from the offshore, deepwater habitats to the land areas; and (3) the deposits of bird guano stimulate algal growth which, when combined with wave action, contributes to the growth of other species and the high productivity of the ecosystem.

1.8.2 While the NWHI are a part of the greater chain of Hawaiian Islands, there is clear evidence that the NWHI function as a distinct, biological unit. The NWHI ecosystem is highly productive, diverse, and apex predator-dominated while the ecosystem around the main Hawaiian Islands has substantially lower productivity, less species diversity, and is not apex predator-dominated. These differences demonstrate that the NWHI function as an integral unit.

## **1.9 Fragility**

1.9.1 The area contains several thousand square miles of coral reefs made up of at least 57 species of hard coral and 12 species of soft coral. Coral communities are fragile ecosystems. They require a delicate balance across a range of environmental conditions in order to be healthy and grow. The health of a coral ecosystem may be threatened by changes to even one of those environmental conditions. Corals derive a substantial portion of their nutrition from symbiotic algae (called zooxanthellae) within their tissues. Because algae require light for photosynthesis, clear and clean water conditions are necessary for growth and well-being. The introduction of pollutants can be toxic to the coral.

1.9.2 The physical structure of the reef is provided by calcium carbonate, which forms the rock framework or reef “skeleton”. This calcium carbonate is deposited at a rate of about one-centimetre per year by the living coral animal (polyp). These polyps exist in a thin layer at the surface of the reef rock. The coral reef system of the NWHI has taken thousands of years to build and, if damaged, regeneration of the reef may never occur. If optimal conditions for regeneration exist, it would still take hundreds, and perhaps thousands of years, for a damaged area of the reef to return to its previous condition.

1.9.3 In the NWHI, transiting ships are a primary anthropogenic threat to this fragile ecosystem because of ship groundings and pollution from operational and accidental discharges. Secondary and cumulative damage may occur when dislocated coral fragments caused by groundings are tossed against healthy coral by wave action, currents, and storms.

1.9.4 The isolation of the NWHI affords both protection from and vulnerability to invasive species, which can be transferred by ships. The islands' ecosystems have evolved without the influence of outside forces, demonstrated by the high level of native and endemic species. To date, 11 non-native species have been identified in the waters of the NWHI. Non-native species can displace native species and seriously disrupt and imbalance the natural ecosystem.

## **1.10 Bio-geographic importance**

1.10.1 The NWHI represent one of the last remaining examples of an intact apex predator-dominated coral reef ecosystem with large top predator fish such as sharks in abundance. Because it is isolated, many aspects of the area represent what a completely pristine and undisturbed bio-geographic system would look like at this latitude if one still existed.

1.10.2 The area is geologically unique. The islands were created from a single plume of magma rising from a hot spot in the earth's mantle. Built up over millions of years of eruption, high volcanic islands were formed, then carried north-westerly by the movement of the Pacific Plate beneath. Twenty-eight million years ago the last emergent feature of the chain, Kure, was located where the present Big Island of Hawaii is now located.

## **2 Social, cultural and economic criteria**

### **2.1 Human Dependency**

2.1.1 The NWHI are of particular importance because of their significance in Native Hawaiian history and culture. The NWHI have long been considered a sacred place in Native Hawaiian traditions, and two of the islands in particular contain important archaeological sites (Kikiloi 2006). Early Polynesian voyagers, in their trans-Pacific voyages aboard large double-hulled sailing canoes, were the first humans to arrive in the NWHI, as early as 1000 A.D. Early Hawaiians lived on Nihoa for an estimated 700 years, but this occupation mysteriously ceased before Captain Cook's first landing in Hawaii in 1778 (Citizen's Guide 2006). Their early presence is evidenced by numerous sites on Nihoa and Mokumanamana (Necker), which are listed on both United States and State of Hawaii Registers of Historic Places for their cultural and historical significance. Together, the two islands have 140 recorded cultural sites, including ceremonial, residential, and agricultural sites, some which resemble historically important Polynesian sites in Tahiti and the Marqueses (Emory 1928; Cleghorn 1988; Liller 2000; Kawaharada 2001; Kikiloi 2006). These sites are being studied to increase the understanding of the connection between Native Hawaiian culture and the early Polynesians.

2.1.2 Oral traditions also confirm the relationship of the islands to ancestral Native Hawaiians, and recent ethnological studies have highlighted the continuity of traditional practices in the NWHI. Native Hawaiian cultural practitioners continue to voyage to the NWHI to honour their ancestors and perpetuate these practices. In 1997, Hui Mālama i Nā Kūpuna o Hawaii's Nei, a group dedicated to the repatriation of ancestral remains, returned sets of iwi (bones) to Nihoa and Mokumanamana (Necker). In 2003, the voyaging canoe *Hōkūle`a* travelled to Nihoa so that a group could conduct traditional ceremonies. In 2004, the *Hōkūle`a* sailed to Kure Atoll, and

in 2005 it took a group to Mokumanamana (Necker) for ceremonies on the summer solstice (Citizen's Guide 2006). Finally, underscoring the importance of the NWHI marine ecosystem in Native Hawaiian culture, oral traditions identify the coral polyp as the first living creature to emerge on Earth and the foundation and the building block of all other life in the sea (Friedlander *et al.* 2005b). It follows that ensuring a healthy, intact ecosystem in the NWHI plays an important role in perpetuating Native Hawaiian cultural traditions.

## 2.2 Cultural heritage

2.2.1 The NWHI are rich in underwater cultural heritage. The numerous wrecks found in the area are time capsules which capture specific elements of our seagoing past. Documents indicate that over 120 vessels and aircraft have been lost in the waters of the proposed area. These remains are representative of distinct phases of Pacific history and include Japanese junks, Hawaiian sampans, 19th century whalers, United States Navy side wheel steamers, French sailing ships, and fighter aircraft lost during the World War II Battle of Midway. Only a handful of these sites have been located and assessed so far, but these surveys reveal resources unique to the North-western Hawaiian Islands. The wrecks of the whaling ships **Pearl** and **Hermes**, both of which ran aground in 1822, are the only archaeological remains of the South Seas whaling industry, and the oldest shipwrecks found thus far in Hawaii. The scattered remains of the **USS Saginaw**, lost in 1870, capture the United States Civil War-era technology of the "old steam navy." The wreck site of the **Dunnottar Castle**, an iron hulled sailing ship lost in 1886, offers a rare glimpse of the days of the Tall Ships. These and many other sites are rare, representative of broad themes of maritime history, and a testimony to the uniqueness of Pacific seafaring history. Unwarranted damage or removal of submerged archaeological sites is prohibited by state and federal preservation laws, and United States Monument management agencies seek to protect these heritage resources as windows into the past.

## 3 *Scientific and educational criteria*

### 3.1 Research

3.1.1 This area is of high scientific interest and offers unparalleled opportunity for research. Given the fact that the NWHI are remote and rich with marine and terrestrial life, they provide one of the few areas in the world where researchers can conduct large-scale comparisons between human-impacted marine ecosystems and un-impacted marine ecosystems (Citizen's Guide; Friedlander and DeMartini 2002). Such comparisons may serve as a living model to guide restoration efforts elsewhere.

3.1.2 As further evidence of the importance of this area for research, in October 2006 an international team of biologists made discoveries in French Frigate Shoals of several new species of coral, sea stars, snails, and clams. The researchers also discovered over one hundred species never before seen in French Frigate Shoals and many of which may have been previously unknown to science (Associated Press 2006). These scientific discoveries suggest that much research remains to be done to fully understand and appreciate this complex ecosystem.

3.1.3 Research and monitoring conducted by United States federal and state agencies, academic institutions, and other organizations over the last 30 years have contributed substantially to the understanding of natural and anthropogenic factors influencing the NWHI and the interconnectedness of the physical and biological processes along the entire Hawaiian Island chain. Ongoing research and monitoring of the marine ecosystems in the NWHI will continue to

provide significant insights that will benefit management not only for the NWHI but in the entire Hawaiian Island chain and marine ecosystems around the world.

### **3.2 Baseline for monitoring studies**

3.2.1 The NWHI are one of the few marine regions on earth where monitoring and research activities can be conducted in the virtual absence of local human habitation and activities. It thus provides ideal baseline conditions with regard to biota and environmental characteristics because it has not had substantial perturbations and is thus in a natural or near-natural condition. Remote, uninhabited, and relatively pristine in comparison to the main Hawaiian Islands and other marine ecosystems around the world, the NWHI serve as one of the few modern sentinels for monitoring and deciphering short-term and long-term responses to local, regional, and global environmental and anthropogenic stressors.

### **3.3 Education**

3.3.1 The NWHI provide a model and rare benchmark of a healthy, intact integrated ecosystem preserved in its natural or near-natural state that may inspire Hawaiian residents as well as others to take part in ocean restoration efforts in their communities. This guiding premise led to “Navigating Change”, a multi-year, interagency project which focuses on raising awareness and motivating people to change their attitudes and behaviours to better care for Hawaii’s land and ocean resources. A five-part video and educational curriculum featuring the traditional Polynesian voyaging canoe *Hōkūle`a* during its 2004 expedition to the NWHI was completed in partnership with several agencies and organizations. Teacher workshops on the “Navigating Change” program have been held since 2003 across Hawaii and an outreach co-ordinator leads an associated curriculum in schools state-wide. As people learn more about the NWHI, many will want to go there and experience it. Therefore, the educational message that is being sent to preserve the fragile balance of the NWHI is that people must admire it from afar. Educational activities, therefore, will focus on bringing the place to the people, not the people to the place.

## ANNEX 3

### **VULNERABILITY TO DAMAGE BY INTERNATIONAL SHIPPING ACTIVITIES\***

#### **1 *Vessel Traffic Characteristics***

##### **1.1 Operational factors**

1.1.1 There are limited maritime activities conducted in the waters of the NWHI, undoubtedly due to the islands' remote location and harsh environmental conditions for human activities. Pursuant to the Presidential Proclamation of June 15, 2006, most domestic activities within NWHI waters are prohibited or strictly regulated. Public access to the land portions of the NWHI has for many years been allowed by permit only, except for Midway Atoll, and permits are issued only for research and Native Hawaiian cultural activities. The maritime activities in this area are primarily research and management, fishing, cultural practices, and recreation. Research activities include assessment, long-term monitoring of resources, impacts and threats from human activities, and protection and conservation of NWHI resources. An estimated four million dollars are spent annually on research and management of the area. There are eight remaining commercial fishing permits in the NWHI, although the Presidential Proclamation and codifying regulations require closure of the fishery five years from the date of the Proclamation. Native Hawaiian cultural practitioners voyage to the NWHI to honour their ancestors and perpetuate traditional practices. Current tourism and recreational activities are limited to Midway Atoll and, under the Proclamation, a permit is now required. The extent to which ocean tourism and recreation occurs in the NWHI is unknown, but it appears to be extremely low. These activities may include wildlife watching, diving and snorkelling, charter fishing, and tour boats. Additionally, a management plan for tourism to the historic World War II location and military heritage sites on Midway Atoll is currently being developed and up to three cruise ships may visit the island each year.

##### **1.2 Vessel Types**

1.2.1 Container ships, bulk carriers, tankers, freighters, and fishing vessels regularly transit the waters surrounding the NWHI. With the exception of a few small boats at Midway Atoll and Tern Island (French Frigate Shoals), no vessels home port in the NWHI. Research and management vessels, eight fishing vessels, vessels used by Native Hawaiians, some recreational vessels, and a few cruise ships, conduct strictly regulated activities in NWHI waters (Franklin 2006; Mohri 2006).

##### **1.3 Traffic Characteristics**

1.3.1 Although due to its remoteness, the exact route of vessels through this area is unknown, it appears that most traffic passes to the north of the island chain, following the great circle routes to and from ports on the west coast of North America and East Asia. Other trans-Pacific ships travelling from ports in Hawaii transit at least 100 miles south of the NWHI. Occasionally, vessels transiting from the south pass within the boundaries of the proposed PSSA (Franklin 2006; Tosatto 2005; Horizon Lines 2006; Devany 2006).

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\* The text in this annex is taken from the United States submission contained in document MEPC 56/8.

1.3.2 A preliminary analysis of vessel traffic patterns within the NWHI was conducted based on data collected by the World Meteorological Organization's Voluntary Observing Ships scheme. This scheme collects geo-referenced data from select non-research vessels that make frequent and regular crossings of all major ocean basins. While the scheme does not capture the total traffic in the area, during a 21-month study period in 2004 and 2005, approximately 132 vessels reported from within the area of the proposed PSSA: 104 of these vessels were freighters, 8 were tankers, 4 were research vessels, 2 were passenger vessels, 2 were vessels used for educational purposes, 1 was a recreational vessel, 1 was a towing vessel with a 666-foot vessel in tow, and 10 were unidentified vessels. The 132 vessels were flagged in 23 different countries (Franklin 2006).

## 1.4 Substances Carried

1.4.1 While precise data is not available for the types of harmful substances carried on board the vessels that transit the waters of the NWHI, it is possible to identify examples of such substances from incidents that have occurred in the area. Three vessels, the **Paradise Queen II** (1998), the **Swordman I** (2000), and the **Casitas** (2005), all grounded in the NWHI and had significant quantities of bunker fuel or were carrying other types of fuel onboard (Cascadia Times 2006; Shallenberger 2004). These substances are harmful to the marine ecosystem and to the terrestrial environment when washed ashore. In another incident, a container of the pesticide, carbofuran, washed ashore at Laysan Island (Friedlander *et al.* 2005).

1.4.2 Three other ship accidents occurred involving cargoes that may not be classified as "hazardous substances," but that would be harmful if released into this area of the sea. The first incident involved the **Anangel Liberty** in 1980 where 2,200 tons of kaolin clay was dumped overboard to lighten the ship enough to pull it off one of the reefs on French Frigate Shoals. Fortunately, the currents on that day carried most of the clay out to sea rather than onto the reef. Had it not, the clay could have smothered coral thus adversely affecting the ecosystem. The other two incidents involved the grounding on Laysan of fishing vessels that had evidence of rats on board. Again, fortunately, the rats did not take up residence on the nearby island; however, if they had, it would have been extremely harmful to the ecology of the area because such introduced species can become "ecosystem busters" and cripple the ecosystem within that area (Shallenberger 2004).

## 2 Natural Factors

### 2.1 Hydrographical

2.1.1 The hydrography of the NWHI underscores the need for mariners to navigate with extreme caution. The chain of small islands, atolls, banks, seamounts, pinnacles, shoals, and other emergent features are remnants of volcanic islands which are eroding and subsiding beneath the ocean surface. While only the peaks of the original islands remain above the water's surface, coral growth on submerged slopes has matched the rate of subsidence (Evans *et al.* 2004). Due to these features, navigation in this area is dangerous and must be done with extreme caution. Water depths in this area range from the water's surface to slightly submerged banks, reefs, and other emergent features to the ocean floor at more than 14,000 feet.

2.1.2 The area of the proposed PSSA is currently covered by mostly small scale charts, with the most recent surveys taking place since 2000 near known islands, reefs and atolls. Although modern hydrographic surveys by the University of Hawaii and satellite imagery of the area have



allowed NOAA's Office of Coast Survey to correct the position of several of these features, many of the submerged banks and isolated features have yet to be updated or discovered.

2.1.3 In 2003, a mapping expedition was undertaken by NOAA and the University of Hawaii Undersea Research Laboratory. The primary objective of this project was to provide for more complete and accurate charts and survey data to support the management of the NWHI Coral Reef Ecosystem Reserve and protection of its resources. This expedition included hydrographic experts to ensure that appropriate International Hydrographic Organization quality standards were met. The hydrographic data will be applied to all affected charts by the end of 2007. Notwithstanding, large areas of the NWHI remain to be surveyed and nautical charts updated.

## 2.2 Meteorological

2.2.1 The northeast trade winds prevail throughout the year, but westerly blows can be expected during the winter. The average velocity of the winds is 12 knots, with monthly averages of 16 knots in December and 9.5 knots in August. Gales have been experienced in July and September. Occasional heavy showers of short duration also occur, cutting visibility to about 2 miles (Coast Pilot 7, 38<sup>th</sup> ed., 2006).

2.2.2 Tropical storms and hurricanes are a potential, but infrequent, threat to the shallow coral reef community structure of the NWHI. They can generate extreme wave energy events that can damage the coral and are the primary natural force in altering and shaping coral reef community structures (Dollar 1982; Dollar and Grigg 2004). Since 1979, two hurricanes (category 2) have passed near the NWHI. The most recent significant tropical storm was Hurricane Nele which passed near Gardner Pinnacles in 1985 (Friedlander *et al.* 2005).

2.2.3 Pacific Decadal Oscillation (PDO) events and the El Nino/La Nina phenomenon (ENSO) are two other meteorological factors that occur in the area of the NWHI. PDO events have been described as long-lived El Nino-like patterns of Pacific climate variability. They appear to persist for 20 to 30 years, compared to the 6 to 18 months for an El Niño event. The effects of the PDO are strongest in the North Pacific, while secondary signatures exist in the tropics. PDO sea level pressure anomalies vary with low pressures over the North Pacific and high pressure over the subtropical Pacific. These pressure patterns cause enhanced counter-clockwise wind stress over the North Pacific. With regard to the ENSO, while scientists do not fully understand how one is triggered, the initial detection occurs by a rise in atmospheric pressure in the western Pacific and a drop in pressure in the eastern Pacific (Garrison 1999). This causes trade winds to shift direction, which subsequently causes warm water in the western Pacific to flow across the Pacific basin. This mass of warm water has a number of effects on climate and ocean conditions. For example, it can cause trade wind speeds to drop, which can cause an increase in sea surface temperature (Hoeke *et al.* 2004). Light winds are likely the cause of recent coral bleaching in the NWHI. Increased water temperatures stress the coral, which causes it to expel the symbiotic zooxanthellae. If water temperature does not decrease and zooxanthellae do not return to the coral tissue, the coral will die.

## 2.3 Oceanographic

2.3.1 The NWHI are influenced by a wide range of oceanographic conditions that vary on spatial and temporal scales. Ocean currents, waves, temperatures, nutrients, and other oceanographic parameters and conditions influence ecosystem composition, structure, and function in the NWHI. Ocean currents play an important role in the dispersal and recruitment of

marine life in the NWHI. Surface currents are highly variable in both speed and direction (Firing *et al.* 2004), with long-term average surface flow from east to west in response to the prevailing northeast trade wind conditions. The highly variable nature of the surface currents is due in large part to eddies created by local island effects on large-scale circulation. Marine debris accumulation in shallow water areas of the NWHI also is influenced by large and small-scale ocean circulation patterns. These eddies might also result in pollution from vessels accumulating in the coral thus damaging resources.

2.3.2 Ocean waves also play an important role in the NWHI. The distribution of corals and other shallow water organisms is influenced by the exposure to waves. The size and strength of ocean wave events have annual, inter-annual, and decadal time scales. Annual extra-tropical storms (storms that originate outside the tropical latitudes) create high energy large wave events from five to over ten meters which approach largely from the northwest during the winter. During this time, the average wave power increases substantially and extreme wave events of over ten meters pound the shallow water coral communities, thus posing a hazard to the coral reef communities and to navigation. Decadal variability in wave power is possibly related to PDO events (Manutau *et al.* 1997). The number of extreme wave events has been recorded during the periods from 1985 to 1989 and from 1998 to 2002, and anomalously low numbers of extreme wave events occurred during the early 1980s and during the period from 1990 to 1996 (Friedlander *et al.* 2005).

## 2.4 Other helpful information

2.4.1 There is substantial evidence that international shipping activities are causing or may cause damage to the recognized attributes of the proposed PSSA. The hazards to navigation in the NWHI are demonstrated by the large number of shipwrecks throughout the NWHI chain. Over 60 shipwrecks have occurred in the area and some of these wrecks serve as the origin of a number of the islands' names.<sup>1</sup> While some of these wrecks are truly historic and therefore serve as time capsules of seafaring history, there have been a number of significant maritime casualties in more recent years. In 1998, the 80-foot **Paradise Queen II** ran aground on Kure Atoll. It spilled approximately 4,000 gallons of diesel fuel and other petroleum hydrocarbons. The remaining 7,000 gallons on board the vessel were recovered during salvage operations. The 85-foot **Swordman I** ran aground on Pearl and Hermes Atoll in 2000. It was carrying over 10,000 gallons of diesel fuel and hydraulic oil and approximately \$1.5 million was spent for response and removal of the vessel. In 2005, the 145-foot **Casitas** also ran aground on Pearl and Hermes Atoll, carrying over 33,000 gallons of diesel fuel on board. The vast majority of diesel fuel was salvaged and the vessel was removed from the Atoll and scuttled in an estimated \$5 million clean up and removal operation (Cascadia Times 2006; Shallenberger 2004; Biennial Coastal Zone Conference 2003).

2.4.2 The grounding of the **Anangel Liberty** on French Frigate Shoals in 1980 plowed a channel 2-3 metres deep, 100 metres long, and 30 meters wide in the coral reef. Coral communities were damaged within 50 meters on both sides of the channel ploughed by the freighter as a result of cargo (kaolin clay) that was dumped. In 1977, the burning and sinking of the **Hawaiian Patriot** to the south of French Frigate Shoals resulted in more than five million gallons of fuel oil entering the ocean (United States Fish & Wildlife Serv. 2005; United States Coral Reef Task Force 1999). Also in 1977, **Irene's Challenge** spilled

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<sup>1</sup> This figure does not include aircraft or vessels that were sunk in the Battle of Midway.

approximately 10.4 million gallons of crude oil approximately 50 miles to the north of Lisianski Island. MEPC 56/INF.2, annex 1, provides a table summarizing select incidents that have occurred between 1970 and 2006 (United States Coral Reef Task Force 1999; NOAA 2006).

2.4.3 In addition to the damage that may be caused to the NWHI by spills or releases of ships' cargos or bunker fuel, damage may be caused by the grounding of ships on fragile coral and other sensitive habitats in the area. In the case of vessel grounding, destruction in the area of contact may be widespread and result in the scouring and destruction of coral by dislodgement and pulverization, as well as the crushing, fracturing, and removal of reef structure. Impacts may also include the scarring and abrading of nearby resources as wave action, currents, and wind move rubble produced at the initial site of the grounding. Additionally, there may be increased sedimentation with the fracturing and erosion of the reef structure, which can smother coral and other sensitive habitats (Coral Reef Restoration Handbook 2006). Damage may also be caused by subsequent vessel removal efforts which can further crush and bury sensitive resources. A vessel that has grounded and then is abandoned can continue to damage resources as debris becomes dislodged from the vessel and from its movement at the grounding location by wind and wave action.

2.4.4 Fortunately, although damage to coral and other resources has occurred from the ships that have grounded or sunk in the NWHI, recovery and removal efforts as well as favourable weather patterns and the currents occurring at the time of these maritime casualties have so far spared the fragile NWHI ecosystem from being seriously adversely impacted (Shallenberger 2004). Without taking the necessary action to increase maritime safety, protect the fragile marine environment, and facilitate the ability to respond to developing maritime emergencies, it is reasonably foreseeable that ships will continue to run aground in the NWHI and cause physical damage to the fragile coral reef ecosystem, as well as pose a threat of severe damage to this pristine area from the release of cargo and bunker fuel. Given the remoteness of the NWHI, the low level of development on the islands, and the minimum amount of domestic maritime activity that takes place within the surrounding waters, vessels that transit the area are one of the most persistent and significant anthropogenic threats to the recognized attributes of the area.

2.4.5 Another element that increases the vulnerability of the NWHI to international shipping activities is that, although the islands span 1,200 miles, most emergency response equipment is stationed in the main Hawaiian Islands, including Kauai, which is to the east of the NWHI. Search, rescue, and response operations have been staged from Midway Atoll, which is at the far north-western end of the island chain; however, without assistance from resources based in the main Hawaiian Islands, search, rescue, and response from Midway can generally reach only 10 miles offshore due to the limited equipment located permanently on the island. The sparse land area and fragile environment of the other islands makes it virtually impossible for them to act as staging areas for emergency response efforts. This fact, coupled with the hazardous nature of navigation throughout this area, results in the NWHI being highly vulnerable to damage by international shipping.

2.4.6 Another potential source of damage to this pristine area by international shipping activities is from the introduction of alien species. While only approximately 11 alien species have been detected in the waters of the NWHI, once established these species are extremely difficult – if not impossible – to control and eradicate from the reefs. Therefore, it is critical to keep ships that may be carrying ballast water or species on their hulls from foundering or

grounding on the reefs and providing the opportunity for the introduction of alien species (Citizen's Guide 2006).

2.4.7 In addition to the threat posed by transiting ships, another stress to the environment of the NWHI is marine debris, a severe and chronic threat to the area. Ocean currents carry a wide array of marine debris to the NWHI, including derelict fishing nets and other gear, household plastics, hazardous materials, and shore-based debris, and deposit it on the reef and beaches of the island chain. The debris frequently entangles and kills coral and leads to the death of animals such as seabirds and the Hawaiian monk seal through the ingestion of material or entanglement in nets. Derelict fishing gear also poses a navigation hazard because, for example, it can get wrapped around the propeller of a vessel. In the past 10 years, United States agencies have removed over 560 tons of debris from NWHI reefs at a cost of approximately US\$13.5 million (Citizen's Guide 2006; Brainard 2006).

2.4.8 The IMO measure of six existing ATBAs is already in effect. While there has been no incident in the areas of the existing ATBAs subsequent to their adoption that involves the vessels to which the ATBAs apply (e.g., vessels of 1,000 gross tons and above), there have been incidents in the NWHI outside of the existing ATBAs and incidents within the ATBAs by vessels to which the ATBAs do not now apply. For instance, the **Paradise Queen II** grounded on Kure Atoll, an area which is not now included within the ATBAs. Within the ATBA surrounding Pearl and Hermes Atoll, the **Swordman I** and **Casitas** ran aground; however, these vessels were smaller than the 1,000 gross ton applicability threshold of the existing ATBAs.

ANNEX 4

**ASSOCIATED PROTECTIVE MEASURES FOR THE PAPAHĀNAUMOKUĀKEA  
MARINE NATIONAL MONUMENT PSSA\***

*Expansion and amendment of the areas to be avoided “In the region of the Papahānaumokuākea Marine National Monument Particularly Sensitive Sea Areas (PSSA)”*

(Reference chart: United States 19016 (2007 edition; 19019, 2007 edition; 19022, 2007 edition.)

**Note:** These charts are based on World Geodetic System 1984 Datum (WGS-84) and astronomic datum<sup>2</sup>.)

**Description of the Areas to be Avoided**

Given the magnitude of obstacles that make navigation in these areas hazardous, and in order to increase maritime safety, protection of the environment, preservation of cultural resources and areas of cultural importance significant to Native Hawaiians, and facilitate the ability to respond to developing maritime emergencies in the Papahānaumokuākea Marine National Monument, all ships solely in transit should avoid the following areas:

1 Those areas contained within a circle of radius of 50 nautical miles centred upon the following geographical positions:

- |      |              |  |
|------|--------------|--|
| (1)  | 28° 25'.18 N | 178° 19'.75 W (Kure Atoll)                       |
| (2)  | 28° 14'.20 N | 177° 22'.10 W (Midway Atoll)                     |
| (3)  | 27° 50'.62 N | 175° 50'.53 W (Pearl and Hermes Atoll)           |
| (4)  | 26° 03'.82 N | 173° 58'.00 W (Lisianski Island)                 |
| (5)  | 25° 46'.18 N | 171° 43'.95 W (Laysan Island)                    |
| (6)  | 25° 25'.45 N | 170° 35'.32 W (Maro Reef)                        |
| (7)  | 25° 19'.50 N | 170° 00'.88 W (Between Maro Reef and Raita Bank) |
| (8)  | 25° 00'.00 N | 167° 59'.92 W (Gardner Pinnacles)                |
| (9)  | 23° 45'.52 N | 166° 14'.62 W (French Frigate Shoals)            |
| (10) | 23° 34'.60 N | 164° 42'.02 W (Necker Island)                    |
| (11) | 23° 03'.38 N | 161° 55'.32 W (Nihoa Island)                     |

2 The areas contained between the following geographical positions:

		Begin Co-ordinates		End Co-ordinates	
		Latitude	Longitude	Latitude	Longitude
<b>Area 1</b>	Lisianski Island (N) ---> Laysan Island	26° 53'.22 N	173° 49'.64 W	26° 35'.58 N	171° 35'.60 W
	Lisianski Island (S) ---> Laysan Island	25° 14'.42 N	174° 06'.36 W	24° 57'.63 N	171° 57'.07 W
<b>Area 2</b>	Gardner Pinnacles (N) ---> French Frigate Shoals	25° 38'.90 N	167° 25'.31 W	24° 24'.80 N	165° 40'.89 W
	Gardner Pinnacles (S) ---> French Frigate Shoals	24° 14'.27 N	168° 22'.13 W	23° 05'.84 N	166° 47'.81 W

\* The text in this annex is directly taken from document MSC 83/28, annexes 25 and 26.

<sup>2</sup> The charts are available in paper, raster, or ENC form and may be found at <http://chartmaker.ncd.noaa.gov/NSD/coastpilot.htm>. Mariners are also urged to consult the latest edition, of the United States Coast Pilot No.7, available at <http://chartmaker.ncd.noaa.gov/nsd/coastpilot7.htm> and in particular, Chapter 14, which pertains to Hawaii, available at [http://chartmaker.ncd.noaa.gov/nsd/Cp7/CP7-39ed-Ch14\\_7.pdf](http://chartmaker.ncd.noaa.gov/nsd/Cp7/CP7-39ed-Ch14_7.pdf).

*A ship reporting system (CORAL SHIPREP) is established in “The Papahānaumokuākea Marine National Monument” Particularly Sensitive Sea Area (PSSA)*

## **1 Categories of ships**

### **1.1 Ships required to participate in the system**

1.1.1 As a condition of entry to a United States port or place, all ships 300 gross tonnage or greater, and all ships in the event of a developing emergency, and that are in transit through the reporting area are required to participate in CORAL SHIPREP, except for sovereign immune vessels which are exempt under SOLAS regulation V/1.

### **1.2 Ships recommended to participate in the system**

1.2.1 All ships 300 gross tonnage or greater, fishing vessels, and all ships in the event of a developing emergency, and that are in transit through the reporting area are recommended to participate in CORAL SHIPREP.

## **2 Geographical coverage of the system and the number and edition of the reference chart used for the delineation of the system**

2.1 The geographical coverage of CORAL SHIPREP is depicted by the geographical positions in the appendix.

2.2 The reference charts that include the ship reporting area are United States 19016, 2007 edition, 19019, 2007 edition, and 19022, 2007 edition. These charts are based on World Geodetic System 1984 Datum (WGS-84) and astronomic datum.

## **3 Format, content of reports, times and geographical positions for submitting reports, authorities to whom reports should<sup>3</sup> be sent, available services**

### *3.1 Format*

3.1.1 The ship report should be drafted in accordance with the format shown in paragraph 2 of the appendix to resolution A.851(20).

### *3.2 Content*

3.2.1 The report for a ship entering the system should contain the following information:

System identifier: CORAL SHIPREP

A	Name of the ship, call sign, or IMO identification number
B	Date and Time (UTC)
C or D	Position
E or F	Course and speed of ship
I	Destination
L	Intended route through the reporting area
O	Vessel draft

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<sup>3</sup> For those ships that are required to report the use of the word “should” in this annex is to be read as “shall”.

P	General categories of hazardous cargo on board
Q or R	Defects or deficiencies, if relevant
T	Contact information of ship's agent or owner
U	Ship size and type (e.g., length, tonnage, and type)
W	Total number of persons on board

3.2.2 The report for a ship leaving the system should contain the following information:

System identifier: CORAL SHIPREP

A	Name of the ship, call sign, or IMO identification number
B	Date and Time (UTC)
C or D	Position

3.2.3 A ship may elect, for reasons of commercial confidentiality, to communicate that section of the report which provides information on general categories of hazardous cargo by non-verbal means prior to entering the reporting area.

### 3.3 *Geographical positions for submitting reports*

3.3.1 Each ship should submit a full report in accordance with paragraph 3.2.1 as soon as it crosses the boundary to enter the ship reporting system.

3.3.2 Each ship should submit a report in accordance with paragraph 3.2.2 as soon as it crosses the boundary to leave the ship reporting system.

3.3.3 Further reports should be made whenever there is a change in navigation status or circumstances, particularly in relation to item Q of the reporting format.

### 3.4 *Authority to whom reports should be sent*

3.4.1 The shore-based Authority is the United States Coast Guard's Communication Area Master Station Pacific (CAMSPAC). For ships 300 gross tonnage and greater, an e-mail address to be used for reporting through INMARSAT-C will be provided in advance of implementation of this system through Notices to Mariners. In the event of a developing emergency, ships are urged to call the United States Coast Guard 14th District. Vessels unable to report in through INMARSAT-C should report to [nwhi.notification@noaa.gov](mailto:nwhi.notification@noaa.gov).

## 4 **Information to be provided to ship and procedures to be followed**

4.1 The CORAL SHIPREP shore-based Authority will provide critical alerts and information to shipping about specific and urgent situations and other information that may affect safety of navigation within the IMO-adopted Areas To Be Avoided and "The Papahānaumokuākea Marine National Monument" Particularly Sensitive Sea Area, as well as remind ships about the existence of the IMO-adopted Areas To Be Avoided and necessity of navigating with extreme caution through the Particularly Sensitive Sea Area.<sup>4</sup>

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<sup>4</sup> Pending the final decision of MEPC 57 on the designation of this PSSA.

4.2 Navigational warnings and emergency broadcasts will be issued as NAVTEX messages or specifically directed at GMDSS equipped vessels using INMARSAT-C.

## **5 Radio Communication required for the system and frequencies on which reports should be transmitted**

5.1 This system will be based on INMARSAT-C and an e-mail and ships equipped with such capabilities should report through INMARSAT-C.

5.2 In the event of a developing emergency, a ship is urged to call the United States Coast Guard 14th District at 001-808-541-2500 to request a response and assistance.

5.3 For vessels unable to communicate through INMARSAT-C, reports should be made prior to, during, or after transiting through the reporting area to [nwhi.notification@noaa.gov](mailto:nwhi.notification@noaa.gov).

5.4 Commercially sensitive information will be kept confidential and should be transmitted prior to entry into the reporting system. Such information may be sent to [nwhi.notification@noaa.gov](mailto:nwhi.notification@noaa.gov).

5.5 The language used for reports to the system should be English, employing the IMO *Standard Marine Communications Phrases*, where necessary.

5.6 Communications associated with CORAL SHIPREP are, in accordance with SOLAS regulation V/11, free of charge to affected vessels.

## **6 Relevant rules and regulations in force in the area of the system**

### *6.1 International actions*

6.1.1 The United States has taken appropriate action to implement the international conventions to which it is party.

6.1.2 In recognition of the fragile environment in this area and potential hazards to navigation, the IMO has adopted several Areas To Be Avoided to protect the Northwestern Hawaiian Islands and has designated the area as a Particularly Sensitive Sea Areas where mariners should navigate with extreme caution.

6.1.3 The United States applies its laws in accordance with international law, which includes navigational rights under customary international law as reflected in the United Nations Convention on the Law of the Sea. No restrictions shall apply to or be enforced against foreign flagged vessels unless in accordance with such law.

### *6.2 Domestic Actions*

6.2.1 The United States has taken considerable action to ensure maritime safety and to protect the fragile environment and cultural resources and areas of cultural importance significant to Native Hawaiians in the NWHI. This area has been the subject of a variety of protective measures, including designation of this area as the North-western Hawaiian Islands Marine National Monument (subsequently renamed the Papahānaumokuākea Marine National Monument) in recognition of its fragility and to protect the many species of coral, fish, birds, marine mammals, and other flora and fauna, as well as to protect historical and archaeological



heritage resources, including cultural resources and areas of significant importance to Native Hawaiians.

6.2.2 Regulations in this area, *inter alia*, prohibit taking, possessing, injuring, or disturbing any resource; altering the seabed; anchoring or deserting a vessel; and possessing fishing gear unless stowed. All of these activities may be allowed by permit; however, permits cannot be issued for such things as releasing an introduced species. Activities such as discharging or depositing any material into the Monument, or discharging or depositing any material outside the Monument that subsequently injures Monument resources, except discharges incidental to vessel use, such as approved marine sanitation device effluent, cooling water, and engine exhaust are also prohibited. The United States strictly regulates entry into the Monument and, for those vessels subject to United States jurisdiction, requires the mandatory use of vessel monitoring systems on those vessels that may be allowed into the Monument for specific purposes.

## **7 Shore-based facilities to support operation of the system**

7.1 The shore-based Authority is the United States Coast Guard's Communications Area Master Station Pacific (CAMSPAC). CAMSPAC provides maritime distress communication services and safety and weather broadcasts to commercial and recreational mariners, and also provides secure voice communications and record message delivery services for all United States Coast Guard cutters, aircraft, and shore units. Additionally, CAMSPAC is one of the United States Coast Guard's Pacific Area's (PACAREA) Continuity of Operations sites. CAMSPAC delivers contingency and interagency communication services for Incident Commanders by deploying a state-of-the-art transportable communications centre. CAMSPAC is the Operational Commander of the United States Coast Guard's Pacific Area Communications System, consisting of communication stations in Honolulu Hawaii, Kodiak Alaska, and remote facilities in Guam. There are approximately 150 people assigned to CAMSPAC.

7.2 CORAL SHIPREP will use INMARSAT-C communications equipment. A computer server handles and sorts incoming reports and sends the return message. Incoming reports are text messages that arrive via either internet e-mail or telex. When the ship reporting system server receives a report, the server sends the ship a specific return message. Area co-ordinators will monitor and update the information to the server for inclusion in the outgoing message.

## **8 Alternative communication if the shore-based facilities fail**

8.1 NAVTEX Broadcast Notice to Mariners may be used to notify mariners of the temporary failure of the system and can provide mariners with basic information necessary to navigate safely through this area.

8.2 For those ships reporting through INMARSAT-C, the standard protocol now used for such systems will be used to re-route incoming and outgoing communications through an alternative address and it is expected that this will minimize the system's downtime, though a short delay may occur.

## **9 Measures to be taken if a ship does not report**

9.1.1 All means will be used to encourage and promote the full participation of the ships recommended to submit reports.

9.1.2 If reports are not submitted by those ships required to report and the ship can be positively identified, appropriate action will be taken – including interaction with the flag State – in accordance with customary international law as reflected in the 1982 United Nations Convention on the Law of the Sea.

## APPENDIX

### GEOGRAPHICAL CO-ORDINATES

#### SHIP REPORTING SYSTEM

(Reference chart: United States 19016 (2007 edition; 19019, 2007 edition; 19022, 2007 edition.)  
These charts are based on World Geodetic System 1984 Datum (WGS-84) and astronomic datum.)

#### 1 Outer Boundary

Point	LATITUDE	LONGITUDE
1	29°25'.47 N	178°16'.97 W
2	28°43'.73 N	175°13'.84 W
3	27°00'.77 N	173°25'.78 W
4	26°44'.91 N	171°28'.07 W
5	26°24'.23 N	170°20'.59 W
6	25°56'.43 N	167°32'.10 W
7	24°50'.20 N	165°58'.69 W
8	24°05'.52 N	161°56'.86 W
9	24°05'.29 N	161°56'.62 W
10	24°04'.37 N	161°51'.53 W
11	24°03'.44 N	161°46'.45 W
12	24°02'.41 N	161°41'.39 W
13	24°01'.31 N	161°36'.35 W
14	23°59'.68 N	161°31'.55 W
15	23°57'.85 N	161°26'.85 W
16	23°55'.54 N	161°22'.31 W
17	23°52'.96 N	161°17'.92 W
18	23°50'.12 N	161°13'.72 W
19	23°46'.94 N	161°10'.08 W
20	23°43'.49 N	161°06'.47 W
21	23°39'.71 N	161°03'.09 W
22	23°35'.72 N	161°00'.14 W
23	23°31'.59 N	160°57'.46 W
24	23°27'.32 N	160°55'.23 W
25	23°22'.74 N	160°53'.71 W
26	23°18'.29 N	160°52'.17 W
27	23°13'.57 N	160°51'.04 W
28	23°08'.68 N	160°50'.46 W
29	23°03'.70 N	160°50'.17 W
30	22°58'.67 N	160°50'.35 W
31	22°53'.84 N	160°51'.04 W
32	22°49'.11 N	160°52'.20 W
33	22°44'.46 N	160°53'.56 W
34	22°40'.03 N	160°55'.52 W

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<b>Point</b>	<b>LATITUDE</b>	<b>LONGITUDE</b>
35	22°35'.73 N	160°57'.68 W
36	22°31'.54 N	161°00'.25 W
37	22°27'.57 N	161°03'.23 W
38	22°23'.76 N	161°06'.64 W
39	22°20'.24 N	161°10'.23 W
40	22°17'.02 N	161°14'.13 W
41	22°14'.04 N	161°18'.34 W
42	22°11'.35 N	161°22'.80 W
43	22°09'.19 N	161°27'.45 W
44	22°07'.29 N	161°32'.11 W
45	22°05'.87 N	161°36'.94 W
46	22°04'.62 N	161°41'.89 W
47	22°03'.94 N	161°47'.09 W
48	22°03'.41 N	161°52'.36 W
49	22°03'.41 N	161°57'.51 W
50	22°03'.82 N	162°02'.83 W
51	22°04'.49 N	162°08'.04 W
52	22°05'.43 N	162°13'.12 W
53	22°05'.97 N	162°16'.41 W
54	22°06'.29 N	162°16'.85 W
55	22°34'.57 N	164°47'.27 W
56	22°47'.60 N	166°38'.23 W
57	24°03'.82 N	168°27'.91 W
58	24°25'.76 N	170°45'.39 W
59	24°46'.54 N	171°53'.03 W
60	25°07'.60 N	174°28'.71 W
61	27°05'.82 N	176°35'.51 W
62	27°27'.32 N	178°38'.66 W
63	27°28'.93 N	178°43'.56 W
64	27°30'.64 N	178°48'.40 W
65	27°32'.74 N	178°52'.96 W
66	27°35'.06 N	178°57'.30 W
67	27°37'.89 N	179°01'.49 W
68	27°40'.90 N	179°05'.60 W
69	27°44'.17 N	179°09'.41 W
70	27°47'.74 N	179°12'.85 W
71	27°51'.45 N	179°16'.00 W
72	27°55'.32 N	179°18'.82 W
73	27°59'.33 N	179°21'.13 W
74	28°03'.49 N	179°23'.15 W
75	28°07'.82 N	179°24'.76 W
76	28°12'.31 N	179°26'.18 W
77	28°16'.95 N	179°27'.05 W
78	28°21'.61 N	179°27'.63 W
79	28°26'.18 N	179°27'.77 W
80	28°30'.87 N	179°27'.48 W
81	28°35'.61 N	179°26'.95 W
82	28°40'.09 N	179°25'.75 W

<b>Point</b>	<b>LATITUDE</b>	<b>LONGITUDE</b>
83	28°44'.46 N	179°24'.31 W
84	28°48'.70 N	179°22'.50 W
85	28°52'.81 N	179°20'.43 W
86	28°56'.71 N	179°17'.77 W
87	29°00'.58 N	179°14'.92 W
88	29°04'.18 N	179°11'.69 W
89	29°07'.62 N	179°08'.20 W
90	29°10'.86 N	179°04'.37 W
91	29°13'.76 N	179°00'.21 W
92	29°16'.24 N	178°55'.78 W
93	29°18'.51 N	178°51'.26 W
94	29°20'.45 N	178°46'.50 W
95	29°22'.26 N	178°41'.67 W
96	29°23'.52 N	178°36'.64 W
97	29°24'.53 N	178°31'.54 W
98	29°25'.16 N	178°26'.31 W
99	29°25'.42 N	178°20'.92 W
100	29°25'.29 N	178°16'.70 W

## 2 Inner Boundary Around Kure Atoll, Midway Atoll, and Pearl and Hermes Atoll

<b>Point</b>	<b>LATITUDE</b>	<b>LONGITUDE</b>
1	27°14'.76 N	176°29'.87 W
2	27°24'.95 N	177°33'.31 W
3	27°35'.87 N	178°29'.90 W
4	27°36'.64 N	178°33'.93 W
5	27°37'.53 N	178°37'.32 W
6	27°38'.60 N	178°40'.65 W
7	27°39'.85 N	178°43'.90 W
8	27°41'.28 N	178°47'.05 W
9	27°42'.89 N	178°50'.10 W
10	27°44'.66 N	178°53'.03 W
11	27°46'.59 N	178°55'.83 W
12	27°48'.67 N	178°58'.49 W
13	27°50'.89 N	179°01'.00 W
14	27°53'.22 N	179°03'.39 W
15	27°55'.69 N	179°05'.61 W
16	27°58'.29 N	179°07'.61 W
17	28°01'.01 N	179°09'.47 W
18	28°03'.81 N	179°11'.10 W
19	28°06'.71 N	179°12'.53 W
20	28°09'.67 N	179°13'.75 W
21	28°12'.70 N	179°14'.75 W
22	28°15'.78 N	179°15'.54 W
23	28°18'.91 N	179°16'.11 W
24	28°22'.04 N	179°16'.45 W
25	28°24'.72 N	179°16'.56 W

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<b>Point</b>	<b>LATITUDE</b>	<b>LONGITUDE</b>
26	28°25'.20 N	179°16'.57 W
27	28°25'.81 N	179°16'.56 W
28	28°28'.35 N	179°16'.44 W
29	28°31'.49 N	179°16'.10 W
30	28°34'.61 N	179°15'.54 W
31	28°37'.69 N	179°14'.75 W
32	28°40'.71 N	179°13'.74 W
33	28°43'.68 N	179°12'.54 W
34	28°46'.58 N	179°11'.13 W
35	28°49'.39 N	179°09'.52 W
36	28°52'.11 N	179°07'.70 W
37	28°54'.72 N	179°05'.70 W
38	28°57'.21 N	179°03'.51 W
39	28°59'.58 N	179°01'.15 W
40	29°01'.81 N	178°58'.62 W
41	29°03'.90 N	178°55'.93 W
42	29°05'.83 N	178°53'.10 W
43	29°07'.60 N	178°50'.13 W
44	29°09'.21 N	178°47'.04 W
45	29°10'.64 N	178°43'.84 W
46	29°11'.89 N	178°40'.54 W
47	29°12'.95 N	178°37'.16 W
48	29°13'.82 N	178°33'.71 W
49	29°14'.50 N	178°30'.21 W
50	29°14'.99 N	178°26'.66 W
51	29°15'.28 N	178°23'.08 W
52	29°15'.36 N	178°19'.49 W
53	29°15'.25 N	178°15'.90 W
54	29°14'.94 N	178°12'.32 W
55	29°14'.43 N	178°08'.78 W
56	29°03'.47 N	177°12'.07 W
57	29°02'.55 N	177°07'.29 W
58	28°38'.96 N	175°35'.47 W
59	28°38'.67 N	175°34'.35 W
60	28°34'.91 N	175°19'.74 W
61	28°26'.24 N	175°10'.65 W
62	28°24'.61 N	175°08'.95 W
63	28°24'.53 N	175°09'.04 W
64	28°20'.09 N	175°04'.91 W
65	28°16'.05 N	175°01'.92 W
66	28°11'.78 N	174°59'.33 W
67	28°07'.29 N	174°57'.23 W
68	28°02'.63 N	174°55'.68 W
69	27°57'.84 N	174°54'.62 W
70	27°53'.01 N	174°54'.05 W
71	27°48'.12 N	174°54'.05 W
72	27°43'.28 N	174°54'.62 W
73	27°38'.48 N	174°55'.71 W

<b>Point</b>	<b>LATITUDE</b>	<b>LONGITUDE</b>
74	27°33'.81 N	174°57'.32 W
75	27°29'.30 N	174°59'.43 W
76	27°25'.00 N	175°02'.03 W
77	27°20'.93 N	175°05'.07 W
78	27°17'.18 N	175°08'.59 W
79	27°13'.73 N	175°12'.47 W
80	27°10'.59 N	175°16'.67 W
81	27°07'.88 N	175°21'.25 W
82	27°05'.57 N	175°26'.09 W
83	27°03'.66 N	175°31'.15 W
84	27°02'.22 N	175°36'.40 W
85	27°01'.29 N	175°41'.78 W
86	27°00'.73 N	175°47'.22 W
87	27°00'.68 N	175°52'.74 W
88	27°01'.09 N	175°58'.16 W
89	27°01'.99 N	176°03'.53 W
90	27°03'.34 N	176°08'.81 W
91	27°05'.12 N	176°13'.91 W
92	27°07'.37 N	176°18'.79 W
93	27°09'.98 N	176°23'.40 W
94	27°13'.02 N	176°27'.74 W
95	27°13'.77 N	176°28'.70 W

### 3 Inner Boundary Around Lisianski Island, Laysan Island, Maro Reef, and Raita Bank

<b>Point</b>	<b>LATITUDE</b>	<b>LONGITUDE</b>
1	26°50'.89 N	173°30'.79 W
2	26°36'.00 N	171°37'.70 W
3	26°35'.49 N	171°33'.84 W
4	26°35'.10 N	171°30'.84 W
5	26°34'.07 N	171°27'.50 W
6	26°33'.35 N	171°25'.16 W
7	26°14'.26 N	170°23'.04 W
8	26°08'.69 N	169°48'.96 W
9	26°08'.36 N	169°49'.03 W
10	26°07'.62 N	169°45'.83 W
11	26°06'.03 N	169°40'.57 W
12	26°03'.97 N	169°35'.64 W
13	26°01'.51 N	169°30'.91 W
14	25°58'.65 N	169°26'.45 W
15	25°55'.32 N	169°22'.34 W
16	25°51'.67 N	169°18'.60 W
17	25°47'.78 N	169°15'.19 W
18	25°43'.54 N	169°12'.34 W
19	25°39'.05 N	169°09'.93 W
20	25°34'.37 N	169°08'.08 W
21	25°29'.54 N	169°06'.76 W

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<b>Point</b>	<b>LATITUDE</b>	<b>LONGITUDE</b>
22	25°24'.61 N	169°05'.93 W
23	25°19'.63 N	169°05'.64 W
24	25°14'.65 N	169°05'.93 W
25	25°09'.69 N	169°06'.66 W
26	25°04'.85 N	169°08'.02 W
27	25°00'.17 N	169°09'.96 W
28	24°55'.66 N	169°12'.35 W
29	24°51'.35 N	169°15'.14 W
30	24°47'.37 N	169°18'.48 W
31	24°43'.69 N	169°22'.22 W
32	24°40'.34 N	169°26'.31 W
33	24°37'.42 N	169°30'.78 W
34	24°35'.00 N	169°35'.64 W
35	24°33'.02 N	169°40'.66 W
36	24°31'.34 N	169°45'.88 W
37	24°30'.31 N	169°51'.08 W
38	24°29'.68 N	169°56'.53 W
39	24°29'.56 N	170°01'.81 W
40	24°29'.61 N	170°04'.57 W
41	24°35'.77 N	170°44'.39 W
42	24°36'.29 N	170°47'.58 W
43	24°37'.18 N	170°50'.37 W
44	24°37'.76 N	170°52'.17 W
45	24°56'.23 N	171°50'.19 W
46	25°16'.61 N	174°24'.84 W
47	25°29'.56 N	174°38'.45 W
48	25°33'.28 N	174°42'.03 W
49	25°37'.33 N	174°45'.20 W
50	25°41'.68 N	174°47'.84 W
51	25°46'.23 N	174°50'.05 W
52	25°50'.93 N	174°51'.77 W
53	25°55'.80 N	174°52'.91 W
54	26°00'.71 N	174°53'.47 W
55	26°05'.67 N	174°53'.61 W
56	26°10'.59 N	174°53'.07 W
57	26°15'.46 N	174°52'.08 W
58	26°20'.20 N	174°50'.57 W
59	26°24'.75 N	174°48'.44 W
60	26°29'.15 N	174°45'.94 W
61	26°33'.26 N	174°42'.96 W
62	26°37'.11 N	174°39'.49 W
63	26°40'.60 N	174°35'.63 W
64	26°43'.75 N	174°31'.43 W
65	26°46'.49 N	174°26'.87 W
66	26°48'.90 N	174°22'.09 W
67	26°50'.79 N	174°17'.03 W
68	26°52'.20 N	174°11'.79 W
69	26°53'.21 N	174°06'.43 W



Point	LATITUDE	LONGITUDE
70	26°53'.74 N	174°00'.98 W
71	26°53'.74 N	173°55'.48 W
72	26°53'.29 N	173°50'.02 W
73	26°52'.56 N	173°44'.58 W
74	26°51'.85 N	173°39'.14 W
75	26°51'.13 N	173°33'.69 W
76	26°50'.75 N	173°30'.87 W

#### 4 Inner Boundary Around Gardner Pinnacles, French Frigate Shoals, and Necker Island

Point	LATITUDE	LONGITUDE
1	25°49'.64 N	167°52'.66 W
2	25°49'.70 N	167°52'.65 W
3	25°48'.99 N	167°48'.35 W
4	25°47'.09 N	167°36'.72 W
5	25°39'.84 N	167°26'.48 W
6	25°35'.10 N	167°19'.79 W
7	25°10'.43 N	166°45'.00 W
8	24°40'.91 N	166°03'.36 W
9	24°35'.64 N	165°34'.99 W
10	24°23'.78 N	164°31'.12 W
11	24°23'.59 N	164°31'.14 W
12	24°23'.31 N	164°29'.74 W
13	24°21'.85 N	164°24'.52 W
14	24°20'.10 N	164°19'.39 W
15	24°17'.75 N	164°14'.56 W
16	24°14'.99 N	164°09'.97 W
17	24°11'.86 N	164°05'.69 W
18	24°08'.30 N	164°01'.80 W
19	24°04'.48 N	163°58'.23 W
20	24°00'.27 N	163°55'.22 W
21	23°55'.85 N	163°52'.59 W
22	23°51'.17 N	163°50'.56 W
23	23°46'.33 N	163°48'.98 W
24	23°41'.37 N	163°47'.99 W
25	23°36'.34 N	163°47'.56 W
26	23°31'.27 N	163°47'.60 W
27	23°26'.27 N	163°48'.28 W
28	23°21'.34 N	163°49'.50 W
29	23°16'.53 N	163°51'.14 W
30	23°11'.96 N	163°53'.47 W
31	23°07'.54 N	163°56'.15 W
32	23°03'.46 N	163°59'.38 W
33	22°59'.65 N	164°03'.01 W
34	22°56'.27 N	164°07'.10 W
35	22°53'.22 N	164°11'.49 W
36	22°50'.60 N	164°16'.18 W

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<b>Point</b>	<b>LATITUDE</b>	<b>LONGITUDE</b>
37	22°48'.48 N	164°21'.16 W
38	22°46'.73 N	164°26'.28 W
39	22°45'.49 N	164°31'.60 W
40	22°44'.83 N	164°37'.03 W
41	22°44'.65 N	164°42'.51 W
42	22°44'.92 N	164°47'.99 W
43	22°45'.11 N	164°49'.52 W
44	22°45'.39 N	164°51'.48 W
45	22°45'.17 N	164°51'.53 W
46	22°50'.26 N	165°34'.99 W
47	22°55'.50 N	166°19'.63 W
48	22°55'.93 N	166°23'.32 W
49	22°57'.41 N	166°36'.00 W
50	23°03'.75 N	166°45'.00 W
51	23°05'.48 N	166°47'.45 W
52	24°12'.70 N	168°22'.86 W
53	24°12'.88 N	168°22'.78 W
54	24°16'.05 N	168°27'.28 W
55	24°19'.15 N	168°31'.66 W
56	24°22'.27 N	168°35'.95 W
57	24°25'.71 N	168°39'.94 W
58	24°29'.51 N	168°43'.55 W
59	24°33'.67 N	168°46'.63 W
60	24°38'.06 N	168°49'.29 W
61	24°42'.68 N	168°51'.46 W
62	24°47'.45 N	168°53'.12 W
63	24°52'.34 N	168°54'.28 W
64	24°57'.32 N	168°54'.82 W
65	25°02'.32 N	168°54'.95 W
66	25°07'.30 N	168°54'.43 W
67	25°12'.19 N	168°53'.32 W
68	25°16'.99 N	168°51'.76 W
69	25°21'.57 N	168°49'.60 W
70	25°25'.94 N	168°46'.93 W
71	25°30'.09 N	168°43'.86 W
72	25°33'.89 N	168°40'.42 W
73	25°37'.37 N	168°36'.52 W
74	25°40'.49 N	168°32'.24 W
75	25°43'.24 N	168°27'.68 W
76	25°45'.57 N	168°22'.82 W
77	25°47'.43 N	168°17'.76 W
78	25°48'.79 N	168°12'.47 W
79	25°49'.72 N	168°07'.09 W
80	25°50'.11 N	168°01'.62 W
81	25°50'.18 N	168°00'.09 W

**5 Inner Boundary Around Nihoa Island**

<b>Point</b>	<b>LATITUDE</b>	<b>LONGITUDE</b>
1	23°52'.82 N	161°44'.54 W
2	23°52'.10 N	161°41'.20 W
3	23°51'.18 N	161°37'.92 W
4	23°50'.08 N	161°34'.71 W
5	23°48'.79 N	161°31'.58 W
6	23°47'.33 N	161°28'.55 W
7	23°45'.69 N	161°25'.62 W
8	23°43'.88 N	161°22'.81 W
9	23°41'.92 N	161°20'.13 W
10	23°39'.80 N	161°17'.60 W
11	23°37'.54 N	161°15'.21 W
12	23°35'.14 N	161°12'.99 W
13	23°32'.62 N	161°10'.93 W
14	23°29'.99 N	161°09'.05 W
15	23°27'.25 N	161°07'.35 W
16	23°24'.42 N	161°05'.85 W
17	23°21'.51 N	161°04'.54 W
18	23°18'.52 N	161°03'.43 W
19	23°15'.48 N	161°02'.53 W
20	23°12'.39 N	161°01'.84 W
21	23°09'.27 N	161°01'.35 W
22	23°06'.13 N	161°01'.09 W
23	23°02'.97 N	161°01'.03 W
24	22°59'.82 N	161°01'.19 W
25	22°56'.69 N	161°01'.57 W
26	22°53'.58 N	161°02'.15 W
27	22°50'.51 N	161°02'.95 W
28	22°47'.50 N	161°03'.95 W
29	22°44'.55 N	161°05'.15 W
30	22°41'.67 N	161°06'.54 W
31	22°38'.88 N	161°08'.13 W
32	22°36'.19 N	161°09'.90 W
33	22°33'.61 N	161°11'.85 W
34	22°31'.14 N	161°13'.97 W
35	22°28'.81 N	161°16'.25 W
36	22°26'.61 N	161°18'.69 W
37	22°24'.56 N	161°21'.26 W
38	22°22'.66 N	161°23'.97 W
39	22°20'.92 N	161°26'.80 W
40	22°19'.35 N	161°29'.74 W
41	22°17'.95 N	161°32'.78 W
42	22°16'.73 N	161°35'.90 W
43	22°15'.70 N	161°39'.10 W
44	22°14'.85 N	161°42'.37 W
45	22°14'.20 N	161°45'.68 W
46	22°13'.73 N	161°49'.03 W

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<b>Point</b>	<b>LATITUDE</b>	<b>LONGITUDE</b>
47	22°13'.47 N	161°52'.41 W
48	22°13'.40 N	161°55'.80 W
49	22°13'.53 N	161°59'.18 W
50	22°13'.85 N	162°02'.55 W
51	22°14'.31 N	162°05'.45 W
52	22°14'.37 N	162°05'.89 W
53	22°14'.59 N	162°06'.88 W
54	22°15'.87 N	162°12'.18 W
55	22°17'.70 N	162°17'.31 W
56	22°19'.97 N	162°22'.20 W
57	22°22'.73 N	162°26'.84 W
58	22°25'.88 N	162°31'.15 W
59	22°29'.41 N	162°35'.09 W
60	22°33'.28 N	162°38'.61 W
61	22°37'.47 N	162°41'.72 W
62	22°41'.93 N	162°44'.34 W
63	22°46'.63 N	162°46'.47 W
64	22°51'.48 N	162°48'.05 W
65	22°56'.46 N	162°49'.09 W
66	23°01'.50 N	162°49'.58 W
67	23°06'.58 N	162°49'.49 W
68	23°11'.61 N	162°48'.89 W
69	23°16'.57 N	162°47'.70 W
70	23°21'.36 N	162°45'.98 W
71	23°26'.02 N	162°43'.75 W
72	23°30'.40 N	162°41'.01 W
73	23°34'.51 N	162°37'.83 W
74	23°38'.26 N	162°34'.18 W
75	23°41'.69 N	162°30'.18 W
76	23°44'.72 N	162°25'.79 W
77	23°47'.36 N	162°21'.11 W
78	23°49'.55 N	162°16'.16 W
79	23°51'.24 N	162°10'.99 W
80	23°52'.44 N	162°05'.63 W
81	23°53'.14 N	162°00'.25 W
82	23°53'.36 N	161°54'.75 W
83	23°53'.09 N	161°49'.28 W
84	23°52'.82 N	161°47'.09 W
85	23°52'.39 N	161°44'.67 W

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