



To All Interested Government Agencies and Public Groups:

OCT 12 2011

Under the National Environmental Policy Act (NEPA), an environmental review has been performed on the following action.

TITLE: Environmental assessment entitled, "Environmental Assessment, University of Hawai'i (UH) Marine Center and Hawai'i Undersea Research Laboratory (HURL) Vessel Operations, Papahānaumokuākea Marine National Monument, Northwestern Hawaiian Islands."

LOCATION: Northwestern Hawaiian Islands, Hawai'i

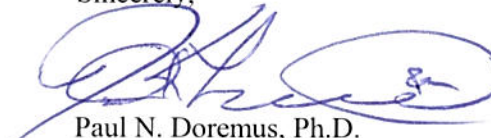
SUMMARY: This environmental assessment evaluates the impacts of allowing the HURL program and the UH Marine Center to use the Pisces IV and Pisces V submersibles, the Remotely Operated Vehicle (ROV) and the University of Hawaii research vessel KA'IMIKAI-O-KANALOA (KOK) as support platforms for permitted research activities in the Papahānaumokuākea Marine National Monument (PMNM). An annual conservation and management permit would be issued to the UH Marine Center for operations of the research vessel KOK, and an annual research permit would be issued to HURL for operations of the Pisces submersibles, ROV, and voucher specimen collections each year for a five year period. Both permits would be issued by NOAA's Office of National Marine Sanctuaries, the United States Fish and Wildlife Service and the State of Hawai'i, as co-trustees of the monument. The assessment finds that the individual and cumulative impacts of this action are not significant. Accordingly, the environmental assessment has resulted in a finding of no significant impact (FONSI).

RESPONSIBLE OFFICIAL: T. 'Aulani Wilhelm, Superintendent
Papahānaumokuākea Marine National Monument
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The environmental review process led us to conclude that this action will not have a significant effect on the human environment. Therefore, an environmental impact statement will not be prepared. A copy of the FONSI including the supporting environmental assessment is enclosed for your information.

Although NOAA is not soliciting comments on this completed EA/FONSI, we will consider any comments submitted that would assist us in preparing future NEPA documents. Please submit any written comments to the responsible official named above.

Sincerely,



Paul N. Doremus, Ph.D.
NOAA NEPA Coordinator

Enclosure

ENVIRONMENTAL ASSESSMENT

**UNIVERSITY OF HAWAI‘I (UH)
MARINE CENTER AND
HAWAI‘I UNDERSEA RESEARCH LABORATORY
(HURL) VESSEL OPERATIONS**

**Papahānaumokuākea Marine National Monument
Northwestern Hawaiian Islands
Hawai‘i**

National Oceanic and Atmospheric Administration
National Ocean Service, Office of National Marine Sanctuaries

September 2011

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1

EXECUTIVE SUMMARY

2 This Environmental Assessment was prepared in accordance with the National Environmental
3 Policy Act of 1969 (42 United States Code §4321, *et seq.*), as implemented by the Council on
4 Environmental Quality regulations (40 Code of Federal Regulations Parts 1500-1508), and
5 National Oceanic and Atmospheric Administration (NOAA) Administrative Order (NAO) 216-6,
6 which describes NOAA policies, requirements, and procedures implementing NEPA.

7 NOAA's Office of National Marine Sanctuaries proposes to issue an annual conservation and
8 management permit to the University of Hawai'i (UH) Marine Center for the operation of the UH
9 research vessel (R/V) *Ka'imikai-o-Kanaloa* (KOK) and an annual research permit to the Hawai'i
10 Undersea Research Laboratory (HURL) for the operation of HURL submersibles and a
11 Remotely Operated Vehicle within Papahānaumokuākea Marine National Monument
12 (hereinafter referred to as the "proposed action") each year for a duration of five years. Both
13 permits would support a range of deep-sea marine research projects. The UH Marine Center
14 R/V KOK would provide transportation for research teams working on permitted projects within
15 Papahānaumokuākea Marine National Monument (PMNM or Monument). Researchers aboard
16 this vessel would also have access to HURL submersibles and a Remotely Operated Vehicle
17 (ROV) for underwater work.

18 The purpose of the proposed action is to satisfy the Findings of Presidential Proclamation 8031
19 which authorizes research in the Monument designed to enhance understanding of Monument
20 resources and assist in the conservation and management of the Monument (Monument
21 Management Plan, 2008). The proposed action is needed to support research operations which
22 would garner a better understanding of deep-sea ecosystems 200-4,000 m (660-13,123 ft)
23 through voucher specimen collection of new records and new species, bathymetric habitat
24 mapping, and characterization of the deep-sea ecosystems. This information would allow for
25 better management of deep water areas within PMNM, consistent with Proclamation 8031.

26 The proposed action would not result in impacts on the following resource categories: terrestrial
27 biological resources, soils and topography, land use, traffic, air quality and ambient noise, visual
28 resources, natural hazards, and utilities and other infrastructure. The proposed action would not
29 result in significant impacts to marine biological resources, physical conditions, marine traffic,
30 solid waste and cultural resources. The proposed action would not create environmental health
31 and safety risks that may disproportionately affect minority or disadvantaged populations, and
32 would not result in significant cumulative impacts to any environmental resource category.

33 NOAA therefore anticipates issuing a Finding of No Significant Impact for the proposed action.

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**ENVIRONMENTAL ASSESSMENT
UH MARINE CENTER AND HURL VESSEL OPERATIONS
PAPAHĀNAUMOKUĀKEA MARINE NATIONAL MONUMENT, HAWAII**

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ACRONYMS AND ABBREVIATIONS

ATBA	Area to Be Avoided
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
dB	Decibel
DOD	U.S. Department of Defense
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency
FONSI	Finding of No Significant Impact
FR	Federal Register
Ft	feet
HAR	Hawai'i Administrative Record
HDOH	Hawai'i Department of Health
HURL	Hawai'i Undersea Research Laboratory
IMO	International Maritime Organization
KOK	<i>Ka'imikai-o-Kanaloa</i>
lbs	pounds
LORAN	Long Range Navigation
m	meter(s)
m ²	square meter(s)
MHI	Main Hawaiian Islands
NAAQS	National Ambient Air Quality Standards
NAO	NOAA Administrative Order
NEPA	National Environmental Policy Act
nm	nautical miles
NOAA	National Oceanic and Atmospheric Administration
NWHI	Northwestern Hawaiian Islands
PCBs	polychlorinated biphenyls
PMNM	Papahānaumokuākea Marine National Monument
PSSA	Particularly Sensitive Sea Area
R/V	research vessel
ROV	remotely operated vehicle
SOEST	School of Ocean and Earth Science and Technology
SPA	Special Preservation Area
spp.	Species (plural)
SRS	Ship Reporting System
sub	submersible
UH	University of Hawai'i
uPa	Micropascal
USCG	U.S. Coast Guard
USFWS	U.S. Fish and Wildlife Service

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1 **1. PURPOSE AND NEED FOR ACTION**

2 **1.1 SUMMARY OF PROPOSED ACTION**

3 NOAA's Office of National Marine Sanctuaries proposes to issue an annual conservation and
4 management permit to the University of Hawai'i (UH) Marine Center for the operation of the UH
5 research vessel (R/V) *Ka'imikai-o-Kanaloa* (KOK) and an annual research permit to the Hawai'i
6 Undersea Research Laboratory (HURL) for the operation of HURL's submersibles and a
7 Remotely Operated Vehicle within Papahānaumokuākea Marine National Monument, each year
8 for a five year period (hereinafter referred to as the "proposed action"). Both permits would
9 support a range of deep-sea marine research projects. The UH Marine Center R/V KOK would
10 provide transportation for research teams working on permitted projects within
11 Papahānaumokuākea Marine National Monument (PMNM or Monument). Researchers aboard
12 this vessel would also have access to HURL submersibles and a Remotely Operated Vehicle
13 (ROV) for underwater work. This Environmental Assessment will consider the effects of the
14 proposed action for a duration of five years.

15 **1.2 PURPOSE AND NEED**

16 The purpose of the proposed action is to satisfy the findings of Presidential Proclamation 8031
17 which authorizes research in the Monument designed to enhance understanding of Monument
18 resources and assist in the conservation and management of the Monument (Monument
19 Management Plan, 2008). The proposed action is needed to conduct vessel, submersible, and
20 ROV operations in support of separately permitted research activities taking place at depths
21 between 200m and 4,000m (660-13,123 ft). Conducting vessel, submersible and ROV
22 operations to support permitted research projects would contribute toward a better
23 understanding of the deep-sea benthic environment. This information would allow for better
24 management of deep sea resources in PMNM, consistent with Presidential Proclamation 8031.
25 It is noted that this activity was permitted in 2007 and 2009. The proposed action is a
26 continuation of these respective research and conservation and management activities.

27 **1.3 BACKGROUND**

28 Papahānaumokuākea Marine National Monument (PMNM) – Regulatory Environment

29 President George W. Bush established PMNM on June 15, 2006, to protect the resources of the
30 Northwestern Hawaiian Islands (NWHI). The purposes and management regime for the
31 Monument, as well as restrictions and prohibitions regarding activities in PMNM, are set forth in
32 Proclamation 8031 (Proclamation; 71 FR 36443) and codified in regulations (50 CFR 404).

33 Papahānaumokuākea (Figure 1-1) is administered jointly by three Co-Trustees – the
34 Department of Commerce through the National Oceanic and Atmospheric Administration
35 (NOAA), the Department of Interior through the U.S. Fish and Wildlife Service (FWS), and the
36 State of Hawai'i through the Department of Land and Natural Resources (collectively, the Co-
37 Trustees). In addition, the Co-Trustee agencies work in close collaboration and consultation
38 with the Office of Hawaiian Affairs to ensure that both cultural and natural resources are
39 protected in a manner appropriate and with reverence to the Native Hawaiian host culture. The
40 mission of PMNM is to carry out seamless integrated management to ensure ecological integrity
41 and achieve strong, long-term protection and perpetuation of NWHI ecosystems, Native
42 Hawaiian culture, and heritage resources for current and future generations.

43 Papahānaumokuākea includes a number of existing federal conservation areas: the
44 Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve, managed by the U.S.
45 Department of Commerce through NOAA; and Midway Atoll National Wildlife Refuge, Hawaiian
46 Islands National Wildlife Refuge, and Battle of Midway National Memorial, managed by the U.S.
47 Department of Interior through FWS. These areas remain intact within the Monument, subject
48 to their applicable laws and regulations in addition to the provisions of the Proclamation.
49 Papahānaumokuākea also include State of Hawai'i lands and waters, managed by the State
50 through the Department of Land and Natural Resources as the Northwestern Hawaiian Islands
51 Marine Refuge and the State Seabird Sanctuary at Kure Atoll. These areas also remain in
52 place and are subject to their applicable laws and regulations. Inscription of
53 Papahānaumokuākea as a World Heritage Site in 2010 added to the history of the NWHI, as the
54 only mixed natural and cultural seascape in the world.

55
56 Although the Monument contains different areas of management, all activities within PMNM are
57 subject to permit approval by the Monument Co-Trustees according to the Monument permitting
58 criteria regulations in 50 CFR 404.11. Permit categories include research, conservation and
59 management, education, Native Hawaiian practices, recreation (Midway only), and special
60 ocean use. All Federal permits including PMNM permits are subject to National Environmental
61 Policy Act (NEPA) compliance. Chapter 13-60.5, Hawai'i Administrative Rules remains in effect
62 for proposed activities in State of Hawai'i waters and may be subject to Hawaii Revised Statutes
63 343 environmental review.

64
65 According to NAO 216-6, the purpose for an environmental assessment (EA) is to determine
66 whether significant environmental impacts could result from a proposed action. An EA is
67 appropriate where environmental impacts from the proposed action are expected, but it is
68 uncertain that those impacts will be significant. Specific factors that ONMS believe are relevant
69 include the potential effects of the proposed research on unique characteristics of this
70 geographic region. However, ONMS will also evaluate the potential effect of the proposed
71 research on all factors, including several shown below:

- 72 1) degree to which effects on the human environment are likely to be highly controversial;
73 2) degree to which the action establishes a precedent for future actions with significant
74 effects or represents a decision in principle about a future consideration;
75 3) individually insignificant but cumulatively significant impacts; and
76 4) degree to which endangered or threatened species, or their critical habitat as defined
77 under the Endangered Species Act of 1973, are adversely affected.

78 The environmental assessment prepared for the proposed research was available for public
79 comment on the Monument website (<http://papahanaumokuakea.gov/>) for 30 days. No
80 comments were received. Additionally, this EA incorporates by reference the previous EA
81 completed for permits issued in 2009 for this same research project and vessel operations. That
82 EA was also available for a 15 day public comment period and no comments were received. UH
83 Marine Center and Hawai'i Undersea Research Laboratory (HURL)

84 The UH Marine Center maintains three research vessels: the R/V *Kilo Moana*, the R/V *Klaus*
85 *Wyrcki*, and the R/V KOK. The R/V *Kilo Moana* is owned by the United States Navy and is not
86 designed for submersible deep-sea work. The R/V *Klaus Wyrcki* is a smaller vessel designed to
87 operate in coastal areas. Only the R/V KOK is designed and equipped for deep-sea
88 submersible research.

89 HURL is one of six national centers established by NOAA and UH under NOAA's Undersea
90 Research Program (NURP) to study deep water marine processes in the Pacific Ocean. HURL
91 builds its research program through an annual request for proposals. Projects are selected
92 through peer review and by a scientific advisory panel. In addition, HURL accepts funded
93 requests from private, state, or federal agencies and participates in international collaborative
94 research projects in the Pacific. Research proposals for work in PMNM are then reviewed by
95 the Monument Co-Trustees according to the Monument permitting criteria on a case-by-case
96 basis before the issuance of a permit is considered.

97 The current focus of HURL's Pacific-wide research projects are on deep-sea geology and
98 ecosystems and potential global climatic influences. Future projects may include research on
99 the geology and biology of emerging and subsiding islands, marine product and fishery
100 assessments, and processes of submarine mineral accumulations on seamounts, volcanoes,
101 and islands.

Figure

Figure 1-1. Papahānaumokuākea Marine National Monument, Hawai'i

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1 **2 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVE**

2 **2.1 INTRODUCTION**

3 This chapter presents a discussion of the two project alternatives: 1) proposed action or
4 preferred alternative, and 2) the no action alternative. The proposed action and the no action
5 alternative are analyzed in terms of how well they meet the purpose and need of the project,
6 as described in Chapter 1.

7 **2.2 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVE**

8 **2.2.1 Proposed Action**

9 NOAA's Office of National Marine Sanctuaries proposes to issue two PMNM permits each
10 year, for a period of five years for vessel support operations in deep sea areas 200m-
11 4,000m (660-13,123 ft) within PMNM. One permit (conservation and management permit)
12 would be issued to the UH Marine Center for operation of R/V KOK. Activities permitted
13 under the conservation and management permit include entrance into the Monument,
14 operation of the multibeam sonar mapping system, operation of small support boats,
15 anchoring of the authorized vessels on non-coral substrate, and limited discharge
16 associated with vessel operations. A second permit (research permit) would be issued to
17 HURL for submersible and ROV operations in order to support separately permitted
18 research projects in PMNM. Activities permitted under the research permit include
19 discharging or depositing material or matter into the Monument including ballast materials
20 composed of steel washer punches and seawater and specimen collection. Objectives of
21 the proposed action include vessel support operations of R/V KOK, support operation for
22 two deep-diving submersibles (*Pisces IV* and *Pisces V*), and an ROV (RCV-150) (Table 2-
23 1). R/V KOK would be permitted to enter and conduct operations within PMNM. The KOK,
24 *Pisces* submersibles, and ROV would be operating in deep waters 200-4,000 m (660-13,123
25 ft) around all island areas within the PMNM. The home port for R/V KOK is Honolulu Harbor
26 at Pier 45. The submersibles are housed and maintained at HURL facilities at Makai Pier in
27 Waimanalo on the windward side of O'ahu.

28 In order to meet the purpose and need of the proposed action, two Monument permits are
29 required. The conservation and management permit allows the primary vessel to enter and
30 operate and conduct mapping in PMNM. The research permit is needed to allow the specific
31 activities including specimen collection. Issuing only one permit would not meet the purpose
32 and need because deep water research requires both a primary research vessel (the R/V
33 KOK) and the deep sea submersibles and ROVs.

34

35 R/V *Ka'imikai-o-Kanaloa* (KOK)

36 The UH Marine Center operates R/V KOK, owned by the State of Hawai'i. On average, the
37 KOK accommodates 30 personnel on each cruise, with a maximum capacity of 32 crew
38 members. In addition to traditional berthing and living spaces, the KOK has wet and dry
39 laboratory space, a rock lab, a clean room, and a dark room. The vessel is ballasted with
40 fresh potable water from the dock in Honolulu. There are no ballast water exchanges at
41 sea. The length overall (LOA) for the KOK is 223 feet. While in the Monument, the KOK
42 would only anchor in emergency situations, and efforts would be made to drop anchor in
43 areas that are relatively free of coral.

44 The KOK is dry docked every three years and the bottom and sides are cleaned using a
45 high pressure water system to remove dirt and growth on the hull. The hull is then repainted
46 with an anti-fouling paint, which is approved by the U.S. Environmental Protection Agency
47 (EPA) to retard marine growth and preserve the bottom surface. The hull is also painted
48 with a marine paint for protection in the salt water environment. The last time KOK was dry-
49 docked was November 2008. When the KOK is not in dry-dock, divers routinely scrub the
50 hull and propellers to remove marine growth and reduce drag.

51 The KOK has a Redfox Marine Sanitation Device (MSD), which uses aerobic bacteria to
52 break down the waste material from the ships sewage system. The Redfox MSD discharges
53 into the grey water holding tank. The KOK can retain sewage and grey water on board for
54 an average of two days before the holding tank reaches capacity and grey water must be
55 discharged. All sewage would be treated and the grey water retained until at a minimum of
56 3 nm from all PMNM Special Preservation Area (SPA) boundaries (Figure 2-1).

57 The ship would carry up to 101,000 gallons of diesel fuel and up to 1,000 gallons of
58 lubrication oil, ten 16-ounce cans of WD-40 and 20 gallons of an EPA approved solvent.
59 These are kept in the designated holding tanks located in the engine room. Used oil is
60 stored in a designated labeled drum until return to port. HURL typically generates about one
61 gallon of used oil per dive day. Excess oils from maintenance and repairs are cleaned up
62 with cloth rags and/or oil absorbent pads. Used rags are stored in designated, labeled bins
63 until return to port. The ship also carries approximately 40 gallons of paint and paint
64 thinners that are stored in a large box on deck. Waste and excess paint is retained on
65 board until the ship returns to port for proper disposal.

66 The ship would also carry about 75 gallons of spare hydraulic fluid for the ROV. The
67 hydraulic charge cart adjacent to the ROV A-frame/winch holds about 20 gallons, and the
68 remainder is stored in 5-gallon containers on the half deck below the hangar. The A-
69 frame/winch power pack is located in the hangar and has a capacity of about 40 gallons of
70 hydraulic fluid. An additional 20 gallons of spare hydraulic fluid for the A-frame/winch is
71 stored in 5-gallon containers on the half deck below the hangar. Maintenance crews also
72 keep small amounts of lubricants and solvents which are necessary for the proper operation
73 and maintenance of the ROV in the Tracking room.

74 Although an oil spill at sea is unlikely, the crew would address the spill in accordance with
75 the KOK Shipboard Oil Pollution Emergency Plan as approved by the U.S. Coast Guard
76 (USCG). A Non-Tank Vessel Response Plan has also been submitted to the USCG. In the
77 case of a hazardous material spill, the crew would follow procedures described in the KOK
78 Safety Management Manual.

79 The KOK Safety Management Manual also addresses solid waste management.
80 Degradable waste that is ground up into small pieces would be discharged overboard at a
81 minimum distance of 3 nm from SPA boundaries, and degradable waste that is not ground
82 would be discharged at a minimum distance of 12 nautical miles from SPA boundaries. Any
83 degradable waste that may remain floating for some time, would be discharged at a
84 minimum distance of 25 nm from SPA boundaries. All plastics are retained on board until
85 the vessel returns to port. Laboratory waste is also retained on board until it can be properly
86 disposed of at home port.

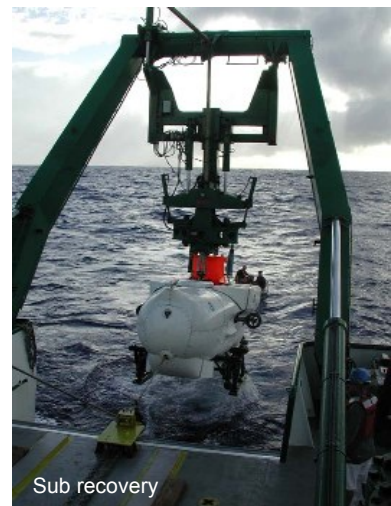
87 The KOK is equipped with a SeaBeam 3012 multibeam sonar bathymetric system. The
88 system is only turned on during mapping projects. The SeaBeam system uses active sonar

89 to map the depth and contours of the sea floor (bathymetry). The system sends a focused
90 pulse of sound (ping) straight down and listens for the reflected echo off of the sea floor.
91 The amount of time it takes for the noise to be sent, reflected, and received is converted into
92 a depth measurement. Power, amplitude, pulse width, and ping rate vary depending on the
93 depths of the ocean in the area being mapped. The SeaBeam uses a frequency of 12
94 kilohertz and a maximum power of 30 kilowatts for deep ocean mapping pinging every 1-25
95 seconds. The source level on the maximum response axis is 231 decibels (dB) re. 1
96 micropascal (uPa) at one meter. In practice, due to slight mismatches between the amplifier
97 and the projectors, the power levels in actual systems are usually 1-2 dB lower than the
98 specified number which is based on an ideal match. The beam pattern is a vertically
99 focused narrow beam system with 2x2 degree beams. The mapping system is operated
100 during transit and service days for 24-36 hours straight. It is also operated for shorter
101 durations during normal submarine and ROV operations, approximately 8-12 hours (J.
102 Smith, personal communication via email, SOEST, October 26, 2009).

103 This type of sonar is different from Low-Frequency Active Sonar used by the U.S. Navy
104 which uses a frequency range of 100-1,000 hertz (Federation of American Scientists, 2007).

105 Pisces IV & Pisces V

106 The Pisces submersibles can do a maximum of about 40 dives
107 per year total. An average cruise within the Monument is 30-
108 days in duration. A maximum of one cruise a year would take
109 place within the Monument. There are typically 3 science groups
110 on each cruise and each group conducts between 3-9 dives
111 during the cruise duration, for a maximum total of 27
112 submersible dives within the Monument per year. Most of the
113 submersible work occurs in the aphotic zone beneath the
114 photocline where light does not penetrate.



115 The submersibles would use steel washer punches for ballast.
116 The punches are approximately 10mm thick, with a high surface
117 area. The punches are made of uncoated low-carbon steel, and
118 washed before use. To land on the sea floor, the submersible
119 pilot drops one round of weights, and when the sub is ready to
120 return to the surface, the pilot drops a second round of weights.
121 In total, each submersible would drop approximately 300-400 pounds (lbs) of washer
122 punches per dive (150-200 lbs per drop). A 5-gallon bucket of washer punches weighs
123 about 100 lbs. During a 30 day cruise consisting of 27 submersible dives, a maximum of
124 10,800 lbs of steel washer punches would be discharged. Over a five year period, a
125 maximum of 54,000 lbs of steel washer punches would be discharged. Submersible
126 operators would survey their surroundings visually and have access to detailed maps and
127 would avoid sensitive areas, such as coral colonies, when landing and dropping weights. All
128 ballast would be dropped in the aphotic zone. When low-carbon steel ballast corrodes in
129 seawater the process releases iron into the surrounding environment (Lenntech, 1998). The
130 decay rate of steel in seawater varies depending on the type of steel. It would take
131 approximately 5 years for a 10 millimeter-thick piece of steel to corrode in seawater. Actual
132 corrosion rate depends on the salinity, oxygen availability,
133 and temperature of the water (National Association of
134 Corrosion Engineers, 1984).



135 Up to 100 pounds of seawater may be pumped out or flooded into the hard ballast tanks of
136 the submersibles, depending on the ballasting needs encountered. Under certain
137 conditions, high pressure air may be used in soft ballast tanks to increase the buoyancy of a
138 submersible during the ascent at the end of a dive mission. The soft ballast tanks are open
139 to the environment to avoid rupture due to rapidly expanding air near the surface. The
140 surplus ballast air is released into the surrounding water.

141 The operator would perform pre-dive and post-dive maintenance checks on each
142 submersible. During these checks, all hydraulic and pressure compensating systems are
143 examined for leaks and potential problems. Any oil leak found on these systems must be
144 addressed prior to the next dive mission to ensure proper operation of the vehicle and thus
145 the safety of observers and crew. No solvents or fuels are used to operate the
146 submersibles. Silicone-based lubricants are used to treat the seals within pressure proof
147 systems on the submersible.

148 All electrical and hydraulic systems on the submersibles are sealed to the environment as
149 intrusion of seawater into any part of these components must be avoided to ensure the
150 safety of observers and crew. All power generation is electrical. The battery systems emit a
151 small amount of hydrogen gas which is released through check valves to avoid pressure
152 build up inside the battery pods.

153 The submersibles would be launched in the morning in clean condition and remain
154 immersed in seawater during the day. Every evening, each submersible is recovered and
155 rinsed with fresh water to remove residual seawater, which causes corrosion and
156 crystallization issues.

157 Remotely Operated Vehicle

158 The ROV system consists of the vehicle and launching garage, a winch/A-frame unit, and
159 the associated power and control consoles. The system has been upgraded from the
160 original design to incorporate fiber optic data transmission. The ROV is ballasted with
161 syntactic foam and attached lead blocks. Both types of ballast are fixed to the vehicle and
162 are not released. No liquid ballast is used. The compact hydrodynamic design and
163 neutrally buoyant tether cable allow close up inspections with a high degree of
164 maneuverability. The vehicle can operate to depths of 914 m (3,000 ft). Color video and a
165 single manipulator are standard equipment on the RCV-150. The investigator can record
166 video and vehicle data (depth, heading, etc.) and can verbally annotate the video recording
167 in real time. Other equipment, such as an attached basket, may be adapted for use on the
168 ROV.

169 In preparation for any research cruise, the maintenance crews would wash the ROV with
170 fresh water and Simple Green™ prior to departure and again following any maintenance
171 onboard the KOK. While at sea, operators would rinse the ROV with fresh water on board
172 the KOK after each dive.

173 Collection of Voucher Specimens

174 In addition to bathymetric mapping conducted by the KOK, operation of the two
175 submersibles and ROV, the final component of each research cruise is the collection of
176 deep water voucher specimens. Scientists specially trained in the identification of sponges,
177 deep water corals and invertebrates travel in the submersibles to depth and guide the

178 submersible operator to utilize the submersibles' manipulator arms to collect voucher
179 samples of specimens that cannot be visually identified or may represent a new geographic
180 record or new species in accordance with the Monument's Voucher Specimen Guidelines
181 stated below and included as Appendix A:





182 Collection of a limited number of a visually observable marine organism morphotype, which
183 cannot be visually identified or may represent a new geographic record or new species, from
184 each of the Permitted Activity Location areas defined within the respective Monument
185 permit, based upon the per island/atoll abundance criteria below:

- 186 a. One (1) specimen can be taken, removed, or possessed if an abundance
187 assessment cannot be ascertained, or fewer than ten (10) such specimens are
188 present, cumulative during the course of the collection event per island or atoll;
- 189 b. Up to three (3) specimens can be taken, removed, or possessed if an
190 abundance assessment of ten (10) or more of such specimens is ascertained,
191 cumulative during the course of the collection event per island or atoll;
- 192 c. For clonal organisms that cannot be visually identified or may represent a new
193 geographic record or new species, take shall be limited to no more than half the
194 clonal organism visually observed. Up to three (3) clonal specimens of similar
195 morphology can be taken, removed, or possessed if an abundance assessment
196 of ten (10) or more of such specimens is ascertained, cumulative during the
197 course of the collection event per island or atoll.

198
199 The abundance criteria as specified above is intended to prohibit over-collection and
200 adverse impacts to deep water ecosystems. The Monument's Voucher Specimen
201 Guidelines were developed by a Monument Management Board sanctioned working group
202 consisting of leading taxonomists and scientists with expert knowledge of Pacific marine
203 resources. Once specimens are collected according to the Monument's Voucher Specimen
204 Guidelines, they are stored aboard the ship and transported to Honolulu for further
205 laboratory identification and museum curation.
206

Figure 2-1. Project Location

Table 2-1. UH and HURL Facility Specifications

Facility	Specifications	
<p>Ka'imikai O Kanaloa</p>	<p>Built: 1979 (Modified 1993) Ownership: State of Hawai'i Length: 223 ft Beam: 38 ft Draft: 13 ft 6 in Gross Tonnage: 259 Displacement: 1,961 tons Speed: Cruising 10 knots; Full 11 knots; Minimum 1 knot Range: 15,000 nautical miles (nm) (60 days) Fuel Capacity: 101, 000 gallons* Endurance: 50 days (food and fresh water)</p>	
<p>Pisces IV</p>	<p>Length: 20 ft Width: 10 ft 6 in Height: 11 ft Weight: 13 tons Crew: 1 Pilot 2 Observers Life Support: 140 hours for 3 people Max. Operating Depth: 6,500 ft (1981 meters) Power: 2 lead-acid battery systems Duration: 7 - 10 hours Buoyancy Control: seawater, high-pressure air and droppable descent/ascent weights.</p>	
<p>Pisces V</p>	<p>Length: 20' Width: 10' 6" Height: 11' Weight: 13 tons Crew: 1 Pilot 2 Observers Life Support: 140 hours for 3 people Max. Operating Depth: 6,280 ft. (1914 meters) Power: 2 lead-acid battery systems Duration: 7 - 10 hours Buoyancy Control: seawater, high-pressure air and droppable descent/ascent weights.</p>	
<p>RCV-150</p>	<p>Length: 52" Width: 47" Height: 43" Buoyancy in water: 15 lb Weight in air: 1,215 lb Max. Operating Depth: 3,000 ft. (914 meters) Power: 880 VAC via umbilical Operators: 2 Duration: limited by operator endurance. Propulsion: four 10" diameter thrusters, two horizontal, two vertical Speed: 1.5 knots forward, 0.5 knot vertical (approximate)</p>	

Source: HURL, 2007

*Note: The fuel capacity differs from the source specifications sheet because some of the fuel tanks have been converted to water tanks since the specifications were initially posted. S. Winslow, personal communication via email, School of Ocean and Earth Science and Technology (SOEST), 30 August 2009.

208 **2.2.2 Alternative Two / No Action Alternative**

209 Alternative two would be no issuance of any permits to support deep sea submersible
210 research activities in the PMNM. Under this alternative, NOAA's Office of National Marine
211 Sanctuaries would not take any action to meet the purpose and need of the project.
212 Although the no action alternative does not meet the purpose and need as stated in Chapter
213 1.2, it has been carried forward for analysis in order to adhere to the Council on
214 Environmental Quality (CEQ) regulations requiring consideration of the no action alternative.

215 **3 AFFECTED ENVIRONMENT**

216 **3.1 OVERVIEW**

217 This chapter describes the environmental setting and baseline conditions of the
218 environmental resources within and adjacent to the project location. The Proposed Action
219 has potential to impact marine biological resources, cultural resources, water quality and
220 solid waste. These resource categories are described here and carried through the impact
221 analysis presented in Chapter 4.0. Preliminary project screening indicated that neither the
222 no action alternative nor the proposed action would affect many of the resources typically
223 addressed in NEPA impact documents. These resources are described here, but not
224 carried through the impact analysis.

225 Terrestrial Biological Resources, Soils and Topography – There are no terrestrial or coastal
226 components to the proposed action and no impacts to terrestrial biological resources or
227 impacts to soils and topography are anticipated.

228 Land Use – There are no terrestrial or coastal components to the proposed action and no
229 impacts or conflicts involving land use are anticipated.

230 Noise – No impacts to ambient noise are anticipated as a result of the proposed action,
231 except for minimal boat motor noise.

232 Visual Resources – There are no surface or land-based components to the proposed action
233 that would impact the aesthetics or visual appearance of the PMNM.

234 Natural Hazards – The proposed action would not impact, induce, or intensify the natural
235 potential for flooding, erosion, earthquake, volcanic, or hurricane activities within the
236 PMNM.

237 Utilities and Other Infrastructure – The proposed action would not result in the construction
238 of utilities or permanent infrastructure in the PMNM, nor would it affect the availability of
239 utility services.

240

241 The descriptions of the target islands and resources potentially affected are incorporated by
242 reference and summarized from the Papahānaumokuākea Marine National Monument
243 Final Management Plan and Environmental Assessment (2008).

244 Table 3-1 summarizes the environmental effects of the proposed action and the no action
 245 alternative. This information is a summary of Chapter 4.0, Environmental Consequences.

Table 3-1 Summary of Anticipated Environmental Effects of the Proposed Action and No Action Alternative

Resource Category	Proposed Action	No Action Alternative
Terrestrial Biological Resources, Soils and Topography, Land Use, Traffic, and Ambient Noise, Visual Resources, Natural Hazards, Utilities and Other Infrastructure.	No significant anticipated impact.	No impact.
Marine Biological Resources	<p>No significant impact to marine biological resources with implementation of Best Management Practices (BMPs).</p> <p>If any endangered monk seal or sea turtle is observed or enters the project area at any time, in-water work would cease until such animals leave the area.</p> <p>No significant impact anticipated through the limited collection of voucher specimens in accordance with the Monument's Voucher Specimen Guidelines.</p>	No impact.
Cultural Resources	<p>No significant impact to cultural resources.</p> <p>If any indication of a culturally or historically significant site is found during the proposed work, activities would be halted until the proper authorities can be notified and a determination can be made that it is safe to proceed.</p>	No impact.
Physical Conditions/Water Quality	No significant impact to water quality as small quantities of steel washer punches (each puncher = 10mm thick) are dropped over an extremely large area, maximum 10,8000 lbs per year and 54,000lbs over five years, over 362,075 square kilometers.	No impact.
Solid Waste	No significant impact to solid waste is anticipated with the implementation of mitigations and operating practices as needed.	No impact.
Marine Traffic	No significant impact to marine traffic is anticipated by adding one additional research cruise per year.	No impact.

Resource Category	Proposed Action	No Action Alternative
Air Quality	No significant impact to air quality is anticipated by adding one additional research cruise per year. The submersibles are battery-powered and therefore do not produce emissions.	No impact
Hazardous and Regulated Materials	No significant impact. In the event of an oil or toxic chemical spill, vessel crew would follow all established procedures detailed in the USCG approved Shipboard Oil Pollution Emergency Plan and Safety Management Manual. With these mitigation measures in place, no significant impact to resources are likely to occur as a result of the proposed action.	No impact

246

247 **3.2 MARINE BIOLOGICAL RESOURCES**

248 PMNM encompasses the Northwestern Hawaiian Islands of the Hawaiian archipelago and
249 includes an area of approximately 139,797 square miles (362,075 square kilometers), spans
250 a distance of approximately 1,200 miles and includes islands, coral atolls, seamounts,
251 banks, and shoals. This diverse ecosystem is home to many species of coral, fish, birds,
252 marine mammals, and other flora and fauna, including the endangered Hawaiian monk seal,
253 the threatened green turtle, and the endangered leatherback and hawksbill turtles. The area
254 is also rich in history and represents a place of great cultural significance to Native
255 Hawaiians.

256 The KOK, *Pisces* submersibles, and ROV would be operating in deep waters 200-4,000 m
257 (660-13,123 ft) around all island areas within the PMNM. The descriptions of the target
258 islands and marine biological resources are incorporated by reference and summarized
259 from the Papahānaumokuākea Marine National Monument Final Management Plan and
260 Environmental Assessment (2008).

261 **3.2.1 The Northwestern Hawaiian Islands (NWHI)**

262 The NWHI can be characterized as a large marine ecosystem exposed to a wide range of
263 oceanographic conditions and environmental and anthropogenic stressors. Submerged
264 geomorphologic features, including reef, slope, bank, and seamount habitats, support a
265 diverse range of shallow and deepwater marine life. Small islands and islets provide critical
266 breeding grounds and nesting sites for endangered, threatened, and rare species that
267 forage throughout the coral reef, deepwater, and pelagic marine ecosystems encompassing
268 the NWHI.

269 The following paragraphs provide descriptions of important marine biological resources for
270 each atoll in the NWHI. The descriptions of these target islands below are summarized from
271 the Papahānaumokuākea Marine National Monument Final Management Plan (2008).

272 Nihoa Island

273 Nihoa Island is located about 155 miles northwest of Kaua'i and the Main Hawaiian Islands
274 (MHI). Nihoa is approximately 150 land acres and is the largest emergent volcanic island in
275 the NWHI. Nihoa's surrounding submerged coral reef habitat totals approximately 142,000
276 acres. Nihoa's seabird colony boasts one of the largest populations of Tristram's storm-
277 petrel (*Oceanodroma tristrami*), Bulwer's petrel (*Bulweria bulwerii*) and blue-grey noddies
278 (*Procelsterna cerulean*) in the Hawaiian Islands and possibly in the world.

279 Necker Island (Mokumanamana)

280 Necker Island is a dry volcanic island shaped like a fishhook and includes about 45 acres of
281 land. Necker is also known by the Hawaiian name Mokumanamana, and is spiritually
282 significant in the Native Hawaiian culture. Geologists believe it was once as large as O'ahu.
283 Wave erosion has reduced the remaining land to a submerged shelf about 40 miles long
284 and 15 miles wide. While this shelf holds more than 380,000 acres of coral reef habitat,
285 severe waves and currents in the exposed areas inhibit coral growth.

286

287 French Frigate Shoals (Kānemiloha'i)

288 French Frigate Shoals, the largest atoll in the chain, forms an 18 mile long crescent-shaped
289 cove and consists of 67 acres of total emergent land and approximately 23,000 acres of
290 coral reef habitat. The lagoon contains two exposed volcanic pinnacles and 12 low, sandy
291 islets. French Frigate Shoals is home to the largest breeding colony of the endangered
292 Hawaiian monk seal (*Monachus schauinslandi*) and supports nesting sites for 90 percent of
293 Hawai'i's green sea turtle (*Chelonia mydas*) population. The shoals also have the largest
294 diversity of breeding seabirds (18 spp.) in the NWHI.

295 Gardner Pinnacles (Pūhāhonu)

296 Gardner Pinnacles consists of two volcanic peaks. Bird guano has given the peaks a
297 frosted appearance, indicating their importance as a roosting site and breeding habitat for
298 12 species of sub-tropical seabirds. In scale, these pinnacles are small, the larger reaching
299 only 180 feet and about 590 feet in diameter. Surrounding the pinnacles is approximately
300 600,000 acres of coral reef habitat, most of which is in waters 60 feet in depth.

301 Maro Reef (Ko'anako'a)

302 Maro Reef is a submerged open atoll with less than one acre of emergent land. At very low
303 tide, only a small coral rubble outcrop of a former island is believed to break above the
304 surface. The shallow water reef ecosystem covers nearly half a million acres and is the
305 largest coral reef in the NWHI. It is biologically rich with 95 percent coral cover in some
306 areas, one of the highest observed in the NWHI. Maro has intricate "reticulated" reef crests,
307 patch reefs and surrounding lagoons. Deepwater channels with irregular bottoms cut
308 between shallow reef structures. Maro's outermost reefs absorb the energy of swells that
309 travel toward the inner lagoon. The innermost area lies within reticulated reefs and
310 aggregated patch reefs and has the characteristics of a true lagoon, with little influence from
311 large ocean swells. Because of Maro's structural complexity, the shallow reef is poorly
312 charted and has been largely unexplored.

313 Laysan Island (Kauō)

314 Laysan is the second largest island in the NWHI, with approximately 915 land acres.
315 Laysan is surrounded by 100,000 acres of coral reef. Most of the reef area at Laysan is in
316 deeper waters, with a small shallow-water reef area in a bay off the southwest side of the
317 island. About two million birds nest here – boobies, frigate birds, terns, shearwaters,
318 noddies, albatrosses – as well as the endangered Laysan duck (*Anas laysanensis*) and
319 finch (*Telespyza cantans*).

320 Lisianski Island (Papa'āpoho)

321 Lisianski Island, the second largest NWHI atoll is over 12 miles at its widest point and
322 includes 400 acres of land. Lisianski is a low sand and coral island approximately 20 million
323 years old and reaches a height of 40 feet above sea level. Lisianski is part of a larger open
324 atoll, and lies at the northern end of a reef bank called Neva Shoal, which is estimated to be
325 close to 290,000 acres. The coral cover around the island totals 310,000 acres.

326 Pearl and Hermes Atoll (Holoikauaua)

327 Pearl and Hermes is a large atoll with several small islets forming 80 acres of land and
328 nearly 300,000 acres of coral reef habitat. The atoll extends over 20 miles across and 12
329 miles wide. Pearl and Hermes reef is a true atoll, fringed with shoals, including permanent
330 and ephemeral sandy islets. The islets provide important dry land respites for seals, turtles,
331 and birds in need of rest, protection from predators, or nesting grounds. The islets are
332 periodically washed over when winter storms pass through the area.

333 Midway Atoll (Pihemanu)

334 Midway Atoll consists of three small sandy islets, also known as the “Midway Islands,”
335 totaling 1,540 acres and a large elliptically shaped barrier reef measuring approximately five
336 miles in diameter. The atoll is surrounded by approximately 88,500 acres of coral reef.
337 Numerous patch reefs dot the lagoon. Despite being heavily used by humans, Midway
338 boasts the largest nesting colonies of both Laysan and black-footed albatrosses in the
339 world.

340 Kure Atoll (Mokupāpapa)

341 Kure Atoll is located at the northern extent of coral reef development. The atoll is nearly
342 circular with a six-mile diameter enclosing nearly 200 acres of emergent land. The outer
343 reef forms almost a circle around the lagoon except for passages to the southwest. The
344 only permanent land in the atoll is crescent-shaped Green Island, located near the fringing
345 reef in the southeastern part of the lagoon. Kure contains 80,000 acres of coral reef habitat.

346 Banks and Seamounts

347 There are approximately 30 submerged banks throughout the NWHI. Surrounding French
348 Frigate Shoals is a series of submerged banks. An unnamed bank is located just to the east
349 of French Frigate. To the west are South East Brooks Bank, St. Rogatien Bank, and
350 another unnamed bank. Raita Bank is just west of Gardner Pinnacles (see also Figure 2-1).
351 The crest or top of Raita Bank is nearly 60 feet from the ocean surface. Pioneer Bank is
352 only 22 nm from Neva Shoals, and the features combine to form a major coral reef
353 ecosystem rich in biodiversity with a variety of marine habitats. Bank areas provide
354 extensive habitat for bottomfish and a few are known to provide foraging habitat for
355 endangered Hawaiian monk seals. Large precious corals, such as gold, pink and black
356 corals, are also found in the deep waters of these banks. Unlike shallow reef corals that
357 harness sunlight through photosynthesizing symbiotic dinoflagellates in their tissues, deep-
358 water corals live in near-total darkness and thus for a food source, deep-water corals rely on
359 their tentacles to capture plankton from the water column.

360 **3.2.2 Coral Reefs**

361 A total of 57 stony coral species are known in the shallow waters of the NWHI, of which 17
362 endemic species account for 37 to 53 percent of the relative abundance surveyed on each
363 reef in the NWHI (Friedlander et al. 2005). Seven species of coral within the *Acropora*
364 genus have been documented in the central NWHI, despite their near absence from the
365 MHI. Coral cover varies significantly across the NWHI. Most regions have low coral cover
366 with the exception of Maro Reef and Lisianski Island having comparatively high coral cover.

367 Despite their high latitudes, more species of coral have been reported for the NWHI (52
368 spp.) than the MHI (48 spp.) (Friedlander et al. 2005).

369 Shallow water coral reef habitat harbors a diversity of macro algae. Currently, a total of 355
370 algal species have been recorded from coral reef habitats of the NWHI. The NWHI contain
371 a large number of Indo-Pacific algal species not found in the MHI, such as the green
372 calcareous alga (*Halimeda velasquezii*). Unlike the MHI where alien species and invasive
373 algae have overgrown many coral reefs, the reefs of the NWHI are largely free of alien
374 algae.

375 Deepwater corals in the Monument are even more diverse than those in shallow water. To
376 date, 137 gorgonian octocorals and 63 species of azooxanthellate scleractinians have been
377 documented to occur in the Monument (Parrish and Baco 2007). In November 2007 two
378 new genera of deep water bamboo corals were collected by submersibles at a single site off
379 Twin Banks (Watling, pers comm.).

380 **3.2.3 Bottomfish**

381 Descriptions of bottomfish habitats in the NWHI indicate that the distribution and abundance
382 of bottomfish are patchy, and appear to be associated with cavities or oceanic current
383 patterns that serve as prey attractants (Kelly et al. 2004). The commercial bottomfish
384 industry targets onaga (*Etelis coruscans*), ehu (*E. carbunculus*), opakapaka (*Pristipomoides*
385 *filamentosus*), kalekale (*P. sieboldii*), lehi (*Aphareus rutilans*), gindai (*P. zonatus*), and
386 hapuupuu (*Epinephelus quernus*). Species of Hawaii bottomfish that are federally regulated
387 include uku (*Aprion virescens*), white ulua (*Caranx ignobilis*), black ulua (*C. lugubris*),
388 butaguchi (*Pseudocaranx dentex*), taape (*Lutjanus kasmira*), yellow tail kalekale
389 (*Pristipomoides auricilla*) and kahala (*Seriola dumerili*). These species together are
390 collectively known as the Bottomfish Management Unit Species (Hawaii Bottomfish Fishery
391 2007). In January 2010, the NWHI federal bottomfish fishery closed via a buyout process
392 facilitated by the NOAA National Marine Fisheries Service. The closure was a result of a
393 congressional appropriation that compensated the owners of seven bottomfish licenses.
394 Since that time there have been no commercial fishing allowed in PMNM.

395 **3.2.4 Seabirds**

396 As the proposed action will predominately take place in the deep sea areas around the
397 target islands, it is unlikely that seabirds will be affected. Seabird colonies in the NWHI
398 constitute one of the largest and most important assemblages of seabirds in the world, with
399 approximately 14 million birds representing 20 breeding species (Naughton and Flint 2004).
400 Both seabirds and migratory birds are also part of the ecosystem. The NWHI contain over
401 95 percent of the world's black-footed and Laysan albatrosses. The short-tailed albatross is
402 the only ESA-listed seabird in the NWHI. The current worldwide population is approximately
403 1,700 individuals, and due to habitat management and stringent protection, the population
404 has increased by approximately six percent per year (U.S. Fish and Wildlife Service 2000).
405 The primary range of this species is along the coasts, traveling between its breeding
406 colonies in Japan, along Russia, the Aleutian Islands, and down the coast of North America.
407 Land-based sighting records indicate that at least 15 short-tailed albatrosses have visited
408 the NWHI over the past 60 years. Most of these sightings have been at Midway Atoll (U.S.
409 Fish and Wildlife Service 2000), where two individuals are present every breeding season.
410 The greatest threats to seabirds in the NWHI are marine debris, invasive species,
411 contaminants, and climate change.

412 **3.2.5 Special Status Species**

413 A total of 24 different species of marine mammals have been recorded by research cruises
 414 within the U.S. Exclusive Economic Zone in waters surrounding the NWHI and are afforded
 415 protection under the Marine Mammal Protection Act (Barlow 2003). Marine mammals
 416 observed in the NWHI include whales, dolphins, and Hawaiian monk seals. Use of
 417 acoustics (i.e. sound waves) is an important tool for marine mammals in communication,
 418 locating prey, and navigation.

419 According to the Endangered Species Act of 1973, endangered species are those currently
 420 facing extinction. Threatened species are those likely to become endangered within the
 421 foreseeable future. Twenty-three species of plants and animals known to occur in the NWHI
 422 are listed under the Endangered Species Act (see table from PMNM Management Plan and
 423 Environmental Assessment (2008)). Of those listed species that occur in the marine
 424 ecosystem, eight are plants and birds that would not be affected. Sea turtles and marine
 425 mammals are discussed further below.

Special Status Species in the NWHI			
Common Name	Taxonomic Name	Protection	Occurrence
Land plants			
Loulu/fan palm	<i>Pritchardia remota</i>	ESA	Resident
Kamanomano	<i>Cenchrus agrimonoides</i>	ESA	Resident
'Ohai	<i>Sesbania tomentosa</i>	ESA	Resident
	<i>Amaranthus brownei</i>	ESA	Resident
	<i>Mariscus pennatiformis</i>	ESA	Resident
	<i>Schiedea verticillata</i>	ESA	Resident
Land Birds			
Laysan duck	<i>Anas laysanensis</i>	ESA	Resident
Laysan finch	<i>Telespyza cantans</i>	ESA	Resident
Nihoa finch	<i>T. ultima</i>	ESA	Resident
Nihoa millerbird	<i>Acrocephalus familiaris kingi</i>	ESA	Resident
Seabirds			
Short-tailed albatross	<i>Phoebastria albatrus</i>	ESA/MBTA	Rare
Sea Turtles			
Olive Ridley	<i>Lepidochelys olivacea</i>	ESA	Occasional
Leatherback	<i>Dermochelys coriacea</i>	ESA	Occasional
Loggerhead	<i>Caretta caretta</i>	ESA	Occasional
Hawksbill	<i>Eretmochelys imbricata</i>	ESA	Rare
Green	<i>Chelonia mydas</i>	ESA	Resident
Marine mammals			
Hawaiian monk seal	<i>Monachus schauinslandi</i>	ESA/MMPA	Resident
Humpback whale	<i>Megaptera novaeangliae</i>	ESA/MMPA	Seasonal
Sperm whale	<i>Physeter macrocephalus</i>	ESA/MMPA	Occasional
Blue whale	<i>Balaenoptera musculus</i>	ESA/MMPA	Rare
Fin whale	<i>B. physalus</i>	ESA/MMPA	Rare
Sei whale	<i>B. borealis</i>	ESA/MMPA	Rare
North Pacific right whale	<i>Eubalaena japonica</i>	ESA/MMPA	Rare
Spinner dolphin	<i>Stenella longirostris</i>	MMPA	Resident
Bottlenose dolphin	<i>Tursiops truncatus</i>	MMPA	Resident

Source: NOAA 2004b

426

427 **Sea Turtles**

428 There are five ESA-listed sea turtles that could occur in the waters of the Monument. The
 429 Hawaiian population of the green turtle, loggerhead, and olive ridley are listed as threatened
 430 under the ESA. The leatherback and hawksbill turtles are listed as endangered under the
 431 ESA. The green turtle is common in the NWHI; the other turtles are rarely sighted in the
 432 Monument and are not considered further in this analysis.

433 **Hawaiian Green Turtle (*Chelonia mydas*)**

434 Green sea turtles have been protected under the ESA since 1978. Over 90 percent of all
435 sub-adult and adult green turtles found throughout Hawai'i originate from the NWHI. After
436 more than 25 years of protected nesting and foraging habitats in the Hawaiian archipelago,
437 the Hawaiian green sea turtle population is showing some signs of recovery. Green turtle
438 nesting sites occur at Pearl and Hermes Atoll, Lisianski Island, Maro Reef, and French
439 Frigate Shoals. French Frigate Shoals is the primary nesting site for green turtles,
440 accounting for 400 nesting sites or 90 percent of all nesting within the Hawaiian Archipelago
441 (NOAA 2006).

442 Marine Mammals

443 There are nine species of marine mammals that are listed under the ESA or MMPA that
444 occur in the PMNM. Five are considered to only occur rarely or occasionally and are not
445 considered further in this analysis. The Hawaiian monk seal is a resident of the PMNM as
446 are the spinner and bottlenose dolphins, whereas the humpback whale is a seasonal
447 resident.

448 Hawaiian Monk Seal (*Monachus schauinslandi*)

449 The Hawaiian monk seal was listed as an endangered species under the ESA in 1976 and
450 is protected by the State of Hawai'i under HRS 195D. The population is estimated at 1,200
451 individuals (Antonelis et. al 2006), however models predict that the population will fall below
452 1,000 individuals within the next five years, due to a variety of threats including predation,
453 disease, and marine debris. While 80 to 100 Hawaiian monk seals coexist with humans in
454 the main Hawaiian Islands, the great majority of the population lives among remote islands
455 and atolls within PMNM. Their range generally consists of the islands, banks, and corridors
456 within the PMNM, although individuals have been found farther than 50 nm from shore.
457 Designated critical habitat for this species under the ESA encompasses all beach areas,
458 sand spits and islets, including all beach crest vegetation to its deepest extent inland, lagoon
459 waters, inner reefs, and ocean waters out to a depth of 20 fathoms (36.5 m) around the
460 following: Pearl and Hermes Atoll; Kure Atoll; Midway Atoll, except Sand Island and its
461 harbor; Lisianski Island; Laysan Island; Maro Reef; Gardner Pinnacles; French Frigate
462 Shoals; Mokumanamana; and Nihoa (50 CFR 226.201).

463 Humpback Whale (*Megaptera novaeangliae*)

464 Humpback whales occur consistently in the winter but are found mainly in waters
465 surrounding the seven main Hawaiian Islands. Recent research by Johnston et al. (2007)
466 reveals that the Monument hosts many more humpback whales than originally thought.

467 Spinner and Bottlenose Dolphins (*Stenella longirostris* and *Tursiops truncatus*)

468 Spinner and bottlenose dolphins are year-round residents of the Hawaiian Islands. They are
469 not considered threatened or endangered under the ESA or depleted under the MMPA
470 though they are protected under the MMPA. While both species are widely distributed
471 throughout the world in tropical and warm temperate waters, they are considered separate
472 stocks from other populations due to their isolation in the Hawaiian archipelago (NOAA
473 2000). Both species occur from the island of Hawai'i to Kure Atoll. There are an estimated
474 743 bottlenose dolphins and 3,184 spinner dolphins within 28.7 miles (25 nautical miles,
475 46.3 kilometers) of the main Hawaiian Islands. Because waters beyond 28.7 miles (25
476 nautical miles, 46.3 kilometers) of the coast or the waters of the NWHI were not surveyed,

477 this number is considered an underestimate of the population size (NOAA 2000). The
478 largest pod of spinner dolphins within the Monument occurs at FFS, with approximately 500
479 individuals (Andrews et al. 2006). Smaller pods occur at Pearl and Hermes Atoll, Midway
480 Atoll, and Kure Atoll. While spinner dolphins have a capacity for high mobility, it appears that
481 movements between islands are relatively infrequent, with each pod having a high affinity to
482 a specific atoll (Karczmarski et al.2005).

483 3.3 CULTURAL RESOURCES

484 3.3.1 Native Hawaiian Significance

485 The ocean serves as a central source of physical and spiritual sustenance for Native
486 Hawaiians on a daily basis. Poetically referred to as Ke kai pōpolohua mea a Kāne (the
487 deep dark ocean of Kāne), the ocean was divided into numerous smaller divisions and
488 categories, from the nearshore to the deeper pelagic waters (Malo 1951). Likewise,
489 channels between islands were also given names and served as connections between
490 islands, as well as a reminder of their larger oceanic history and identity.

491 Today, Native Hawaiians continue to maintain their strong cultural ties to the land and sea.
492 This concept of interconnectedness transcends geography. Native Hawaiians understand
493 the importance of managing the islands and waters as one, as they are inextricably
494 connected to one another (Beckwith 1951; Lili'uokalani 1978). Despite the fact that the
495 NWHI were not used and experienced on a daily basis by most Hawaiians, they have
496 always been seen as an integral part of the Hawaiian archipelago and have been honored
497 as a deeply spiritual location, as evidenced by the many wahi kūpuna, or sacred sites, on
498 Nihoa and Mokumanamana.

499 3.3.2 Maritime Heritage Significance

500 In addition to the rich Native Hawaiian cultural setting, maritime activities following Western
501 contact with the Hawaiian Islands have left behind the historical and archaeological traces of
502 a unique past. Incorporated by reference is the information from the 2008 PMNM
503 Management Plan and EA. Currently, there are over 60 known ship losses and/or confirmed
504 sites among the NWHI, the earliest loss dating back to 1818. This, combined with 67 known
505 aircraft crashes, gives a total of over 120 potential maritime heritage resource sites. Many
506 of these resources reflect the distinct phases of historical activities in the remote atolls (Van
507 Tilburg 2002).

508 As American and British whalers first made passage from Hawai'i to the seas near Japan in
509 1820, they encountered the low and uncharted atolls of the NWHI. At times the treacherous
510 nature of navigation in the region gave rise to the Western names of the islands and atolls
511 as we know them today. Pearl and Hermes Atoll is named for the twin wrecks of the British
512 whalers *Pearl* and *Hermes* lost in 1822. Laysan was reportedly discovered by the American
513 whale ship *Lyra* prior to 1828. The history of American whaling is a significant part of our
514 national maritime heritage and is a topic that encompasses historic voyages and seafaring
515 traditions set on a global stage as these voyages had political, economic and cultural
516 impacts. As a nation we were intimately involved in the whaling industry in important and
517 complex ways. There are 10 known whaling shipwrecks in the NWHI. Three of these have
518 been located (American whaler *Parker* and British whalers *Pearl* and *Hermes*) and their
519 archaeological assessment is underway. Whaling vessel wreck sites from the early 19th

520 century are quite rare, and the study and preservation of heritage resources is an important
521 concern. The NWHI provide a unique glimpse into our maritime past.

522 **3.4 PHYSICAL CONDITIONS**

523 **3.4.1 Water Quality**

524 Hawai'i's water quality standards (Chapter 11-54 HAR) are broadly based to protect both
525 terrestrial (groundwater and surface waters) and marine waters. They consist of basic
526 standards applicable to all waters, specific numerical standards for many toxic substances,
527 and specific numerical standards for a number of classes of state waters. Due to their
528 remote location and low level of human activities, the waters of the NWHI are relatively
529 pristine.

530 **3.4.2 Solid Waste**

531 Marine pollution can be defined as the direct or indirect introduction by humans, of
532 substances or energy to the marine environment resulting in deleterious effects such as
533 hazards to the health of marine life and humans, hindrance of marine activities, and
534 impaired water quality. Marine pollution may originate from land-based or sea-based human
535 activities in the form of point-source discharges or non-point source runoff. Due to their
536 remote location and low level of human activities, the waters of the NWHI are relatively
537 pristine.

538 **3.4.3 Marine Traffic**

539 Marine debris is a form of marine pollution that may originate from sea-based activities, such
540 as shipping and fishing or from land-based activities that discharge pollutants in surface
541 water runoff. Marine debris, including derelict fishing gear, cargo nets, bottles, military
542 flares, and barrels of hazardous materials, continue to wash ashore on all areas of the
543 NWHI causing potential localized adverse impacts.

544 The Monument was designated a Particularly Sensitive Sea Area (PSSA) by the
545 International Maritime Organization (IMO) on 3 April 2008. This designation effectively set
546 three shipping lanes within the deep-water areas of the NWHI; established Areas to Be
547 Avoided (ATBAs) including all shallow-water coral reef and nearshore island areas);
548 required vessel entry and exit notification reporting for all U.S. flagged vessels; and strongly
549 recommended vessel entry and exit notification reporting for all foreign flagged vessels
550 passing through the NWHI without interruption (without stopping). In conjunction with the
551 PSSA designation, a Monument Ship Reporting System (SRS) was developed to track entry
552 and exit notifications for the entire NWHI. There are an average of 133 vessel entry and exit
553 notifications for vessels passing through the Monument without stopping per year. In
554 addition an average of seven vessels obtain permits to conduct work within the Monument
555 annually, those seven vessels make an average of 18 total round trip visits per year.

556 **3.4.4 Air Quality**

557 Aside from the small garbage incinerator on Midway Atoll, aircraft and permitted sea vessel
558 operations are the only other air emissions-producing activities occurring within the
559 Monument. Two runways exist in the NWHI: Henderson Airfield on Midway Atoll and Tern
560 Island within French Frigate Shoals. An average of 57 round trip flights are conducted

561 between the two airfields per year, consisting of the following: (1) FWS-chartered
562 Gulfstream-2 jet (Midway Atoll – approximately 45 flights per year); (2) US Coast Guard C-
563 130 aircraft (Midway Atoll – approximately 4 flights per year); or (3) Small Cessna six-seat
564 plane (Tern island – approximately 8 flights per year). An average of 7 permitted vessels
565 serving as research, education, Native Hawaiian and conservation and management
566 support platforms for activities authorized within the Monument conduct 18 round trips per
567 year. Due to their remote location and low level of human activities, the air quality within the
568 NWHI is relatively pristine.

569 **3.4.5 Hazardous and Regulated Materials**

570 All hazardous material and hazardous waste management activities within the marine areas
571 of the Monument are on marine vessels. With the prohibition of commercial bottomfishing in
572 the Monument, research vessels and vessels used in restoration activities, such as the
573 removal of marine debris, make up the predominant vessel activity. In addition, no more
574 than three cruise ships per year are permitted entry to the Midway Atoll Special
575 Management Area. The controlled environment onboard these vessels allows for proper
576 containment of chemical substances. In a shipboard environment there are numerous
577 engineering and management controls that prevent hazardous chemicals or materials from
578 contaminating crew, passengers, and the environment. Any hazardous waste generated
579 aboard a marine vessel, such as mercury-containing light bulbs, waste paint, dry cleaning
580 and photo-processing operations, batteries, or solvents, is required to be offloaded at land-
581 based treatment or disposal facilities (NOAA 2004a). Monument regulations and permit
582 conditions provide additional safeguards on hazardous material and waste management
583 including requirement for VMS and reporting all incidents.

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4 ENVIRONMENTAL CONSEQUENCES

4.1 OVERVIEW

This chapter evaluates the potential environmental consequences to environmental resources with implementation of the proposed action and the no action alternative.

4.2 PROPOSED ACTION

4.2.1 Marine Biological Resources

Under the proposed action, submersible operators would implement operational practices to minimize any potential to adversely impact the environment or marine biological resources. Such mitigation measures would include avoiding deepwater corals when dropping ballast weights while performing underwater work. Submersible operators would select ballast drop sites where corals are not present. Operators would record Global Positioning System (GPS) coordinates at each drop site and ballast would not be dropped in the same location twice.

Vessel anchoring has the potential to impact the ecosystem depending on several factors, such as size of the ship or vessel, anchor system, weather conditions, and the location and vicinity of the anchorage relative to sensitive ecosystems (e.g. coral reefs). Anchors and chains can destroy coral and live rock affecting fishes, other benthic organisms and their habitat. The KOK would not drop anchor within PMNM, except in emergency situations. If an emergency occurs, efforts would be made to drop anchor in areas relatively free of coral.

Referencing the 2009 EA for the HURL permits, use of the KOK sonar system and frequency would not have any potential for adversely impacting marine mammals (K. Graham, personal communication via email, NMFS, Pacific Islands Regional Office, Protected Resources Division, October 30, 2009). On previous research cruises, spinner dolphins have been seen riding bow waves both while the sonar was in operation and while it was not in operation (J. Smith, personal communication via phone, SOEST, 30 August 2009). Additionally, there is no research that indicates the type of sonar that the KOK operates is harmful to marine mammals.

Endangered species including monk seals and sea turtles may be seen during vessel operation activities within PMNM. The presence of any vessel in an area where marine mammals and sea turtles are co-located poses a potential for ship strikes. The KOK's speed averages at 10 knots which would also minimize the potential of ship strikes on cetaceans and pinnipeds. Additionally, before any in-water work is to commence, personnel aboard the KOK would perform a visual scan of the adjacent areas to locate any endangered species or marine mammals. Crew members aboard the KOK are trained to perform these visual scans. The KOK has three to four crew members stationed at all times to visually scan the surrounding area for the safety of the vessel, crew, and PMNM resources. If an endangered species is observed, or if any such species enters the project area at any time, all in-water activities would be stopped until all endangered species leave the area. Activities that would take place as a result of the proposed action would not occur within, near, or adjacent to any known breeding or nesting areas of endangered species.

Alien and introduced species are often spread through ballast water that has been discharged from ships as vessels transit ocean areas. In response to national concerns

regarding invasive species, the National Invasive Species Act of 1996 was enacted which reauthorized and amended the Non-indigenous Aquatic Nuisance Prevention and Control Act of 1990. In order to adhere to these policies and eliminate the introduction of any species via ballast water, the KOK would use fresh potable water for ballast. In addition, a careful washing and disinfecting regimen for the KOK, submersibles, and ROV would be followed to avoid the spread of invasive species. With proper attention to these guidelines, the proposed action would not introduce or contribute to the spread of alien species.

Collection of voucher specimens would consist of a limited number of any visually observable marine organism morphotype, which cannot be visually identified or may represent a new geographic record or new species, from each of the Permitted Activity Location areas defined within the respective annual Monument collection permit, based upon the per island/atoll abundance criteria below:

- a. One (1) specimen can be taken, removed, or possessed if an abundance assessment cannot be ascertained, or fewer than ten (10) such specimens are present, cumulative during the course of the collection event per island or atoll;
- b. Up to three (3) specimens can be taken, removed, or possessed if an abundance assessment of ten (10) or more of such specimens is ascertained, cumulative during the course of the collection event per island or atoll;
- c. For clonal organisms that cannot be visually identified or may represent a new geographic record or new species, take shall be limited to no more than half the clonal organism visually observed. Up to three (3) clonal specimens of similar morphology can be taken, removed, or possessed if an abundance assessment of ten (10) or more of such specimens is ascertained, cumulative during the course of the collection event per island or atoll.

By following the Voucher Specimen Guidelines as stated above, the proposed action would not significantly affect marine biological resources as collections of new records and / or new potential species would be dictated by the aforementioned guidelines and would be included as part of each annual Monument collection permit. The Monument's Voucher Specimen Guidelines were developed by a Monument Management Board sanctioned working group consisting of leading taxonomists and scientists with expert knowledge of Pacific marine resources.

By following all established guidelines, mitigations and operating practices described here, the proposed action would not significantly affect marine biological resources.

4.3 CULTURAL RESOURCES

Under the proposed action, the actual locations of underwater work would be determined by individual research projects at depths ranging from 200-4,000m (660-13,123 ft). These underwater areas are unlikely to contain historically significant sites. Additionally, there are no known cultural sites within the PMNM at this depth range (200-4,000m). However, if any indication of a culturally or historically significant site is found during project activities, work would be halted until the proper authorities can be notified and a determination can be made that it is safe to proceed. The proposed action is temporary in nature and would not significantly impact historic or cultural resources. Traditional Native Hawaiian practices do not occur within the proposed action area.

4.4 PHYSICAL CONDITIONS

4.4.1 Water Quality

Under the proposed action, the submersibles would drop 300-400 lbs of steel as ballast per dive. With an average of 27 dives per year within the Monument, the total amount of steel washer punches dropped as ballast per year would be 10,800 lbs (5.4 tons). The steel punches would not be recovered and would slowly dissolve, adding iron to the water. Seawater contains approximately 1-3 parts per billion (ppb) of iron. For example, one drop of ink in a large tanker truck used to haul gasoline would be an ink concentration of 1 ppb. The amount of iron in seawater varies strongly, and is different in the Atlantic and the Pacific oceans (Lenntech, 1998). According to the HURL Director, the environment where the ballast is likely to be dropped is iron-limited (J.C. Wiltshire, personal communication via email, SOEST, 10 September 2007). The submersibles would drop 150-200 lbs on the initial dive and another 150-200 lbs on the return ascent. Because the submersibles are submerged 7-10 hours, the drop sites for ballast weights would occur in different areas. Most of the submersible work would occur in deeper water below the photocline, and all ballast would be dropped in the aphotic zone. The steel ballast and added nutrients would be spread over a large area (approximately 1 mi²). Due to the low-light environment, the ballast release would not cause localized phytoplankton blooms.

Marine vessels and their related activities can affect the water quality by discharging sewage or grey water effluent. Sewage discharge can contain bacteria, viruses, or medical wastes that can adversely impact the direct health of humans and wildlife or affect the ecosystem by increasing nutrient concentrations. Grey water is wastewater from sinks, showers, laundry and galleys. It can contain a number of pollutants such as suspended solids, ammonia, nitrogen, phosphates, heavy metals and detergents. All sewage aboard the KOK would be treated and the grey water retained until reaching a minimum of three nm from SPA boundaries, where it would then be discharged.

Bilge water collects in the bottom of the ship's hull, and as a result contains fuel, oil, and wastewater from engine and machine operations, including spills and leaks. Regulations for the PMNM, prohibit discharging or depositing any material into PMNM that could injure any resource. Exceptions were made to discharges incidental to vessel operations, such as deck wash, approved marine sanitation device effluent, cooling water, and engine exhaust (50 CFR 404.7(f)).

With these operational practices in place and regulations followed, the proposed action would not significantly degrade the water quality within PMNM; therefore, no significant impacts to water quality would occur as a result of the proposed action.

4.4.2 Solid Waste

Under the proposed action, degradable waste would be discharged at a minimum distance of 12 nm from shore. Degradable waste that might float would be discharged at least 25 nm from shore. All laboratory waste and plastics would be retained on board and properly disposed of at home port. Adhering to these operational restrictions, the KOK would not discharge significant amounts of solid waste within PMNM.

Under the proposed action, the submersibles would drop 300-400 lbs of steel as ballast per dive. With a maximum of 27 dives per year within the NWHI, the maximum amount of steel

washer punches dropped as ballast per year would be 10,800 lbs (5.4 tons) or 54,000 lbs over a five year period. The steel punches would not be recovered. The steel that would be used as ballast under the proposed action would have less adverse impact than the traditional lead shot ballast because it dissolves faster and does not release lead into the environment. The steel washer punches are relatively thin (10 mm) with a high surface area which minimizes the time it takes to corrode. During previous visits, anecdotal evidence is that the punches dissolve within 2 years (J.C. Wiltshire, personal communication via email, SOEST, 10 September 2007). The rapid corrosive rate of the ballast material, the small punch size and resultant increased surface area exposed to salt water, and anecdotal observations of researchers visiting areas of prior ballast releases suggest that the punches would not persist in the environment more than 2 years. Therefore, no significant impacts to solid waste would occur as a result of the proposed action.

4.4.3 Marine Traffic

Under the proposed action, the KOK would undertake a maximum of one research cruise per year over a five-year period. The existing marine traffic is minimal and one additional research cruise would not significantly increase traffic within PMNM; the KOK's speed averages at 10 knots which would also minimize the potential of ship strikes on cetaceans and pinnipeds; therefore, no significant impacts to marine traffic would occur as a result of the proposed action. Other possible impacts associated with marine vessels such as vessel discharge and oil spills have been evaluated in section 4.2.2 Physical Conditions.

4.4.4 Air Quality

Under the proposed action, the emissions from the KOK diesel engine would have no significant effect on existing air quality within the PMNM because the vessel would only be there temporarily and it is expected that emissions would dissipate quickly. The submersibles are battery-powered and there are almost no emissions under normal operating conditions. Therefore, no significant adverse impacts to air quality would occur as a result of the proposed action.

4.4.5 Hazardous and Regulated Materials

Hazardous and regulated materials include gasoline, oils, lubricants, and batteries used to operate the KOK, the submersibles and the ROV. The ship would carry up to 101,000 gallons of diesel fuel and up to 1,000 gallons of lubrication oil, ten 16-ounce cans of WD-40 and 20 gallons of an EPA approved solvent. These are kept in the designated holding tanks located in the engine room. Used oil is stored in a designated labeled drum until return to port. HURL typically generates about one gallon of used oil per dive day. The ship also carries approximately 40 gallons of paint and paint thinners that are stored in a large box on deck. Waste and excess paint is retained on board until the ship returns to port for proper disposal.

The ship would also carry about 75 gallons spare hydraulic fluid for the ROV. The hydraulic charge cart adjacent to the ROV A-frame/winch holds about 20 gallons, and the remainder is stored in 5-gallon containers on the half deck below the hangar. The A-frame/winch power pack is located in the hangar and has a capacity of about 40 gallons of hydraulic fluid. An additional 20 gallons of spare hydraulic fluid for the A-frame/winch is stored in 5-gallon containers on the half deck below the hangar.

In the event of an oil or toxic chemical spill, vessel crew would follow all established procedures detailed in the USCG approved Shipboard Oil Pollution Emergency Plan and Safety Management Manual. With these mitigation measures in place, no significant impact to resources are likely to occur as a result of the proposed action.

The vessel operations have been permitted in 2007 and 2009 for similar operations and research activities and have not had any incident with spills or the release of hazardous or regulated materials.

4.5 NO ACTION ALTERNATIVE

4.5.1 Marine Biological Resources

Under the no action alternative, the proposed action would not take place. No ballast would be dropped, no mapping would take place, no voucher specimens would be collected and there would be no anchoring by the KOK. Under the no action alternative there would be no potential damage to coral and no chance for fuel spills, vessel grounding or other vessel hazards from the submersibles, ROV or KOK. Under the no action alternative, no deep sea research projects would occur, as the KOK and submersibles would not enter the Monument. Under the no action alternative, Monument managers would not have the opportunity to gain new information about deep water areas in the Monument that may improve the health of biological resources in the future. No additional scientific information would be collected and no new knowledge on Papahānaumokuākea's deep sea marine resources would be gained.

4.5.2 Cultural Resources

Under the no action alternative, existing cultural resources and the Native Hawaiian uses of PMNM would not change; therefore, no significant impacts would occur as a result of the no action alternative.

4.5.3 Physical Conditions

Under the no action alternative, the proposed action would not take place. The existing conditions at PMNM would not change; therefore, no significant impacts would occur as a result of the no action alternative.

4.5.3.1 Water Quality

Under the no action alternative, the submersibles would not operate, therefore no ballasting or de-ballasting would occur, thereby eliminating the need to discharge the steel washer punches and water. The water quality conditions at PMNM would not change; therefore, no significant impacts would occur as a result of the no action alternative.

4.5.3.2 Solid Waste

Under the no action alternative, ballast drop-weights or effluent would not be discharged. The existing conditions at PMNM would not change; therefore, no significant increases of solid waste would occur as a result of the no action alternative.

4.5.3.3 Marine Traffic

Under the no action alternative, the KOK would not enter PMNM. The existing conditions at PMNM would not change; therefore, no significant impacts would occur as a result of the no action alternative.

4.5.3.4 Air Quality

Under the no action alternative, no vessels would operate within the PMNM, therefore nothing would be added to the air quality. The existing conditions within PMNM would not change; therefore no significant impacts would occur as a result of the no action alternative.

4.5.3.5 Hazardous and Regulated Materials

Under the no action alternative, no hazardous and / or regulated materials would be brought into PMNM. The existing conditions within PMNM would not change; therefore no significant impacts would occur as a result of the no action alternative.

1 **5 CUMULATIVE IMPACTS**

2 Cumulative impacts to environmental resources result from incremental effects of the
3 proposed action evaluated in conjunction with the effects of other government and private
4 past, present and reasonably foreseeable actions. Cumulative impacts can result from
5 individually minor, but collectively significant, actions taking place over a period of time.

6 Activities that have been considered under cumulative impacts that could potentially
7 intensify impacts of the Proposed Action are summarized in Table 4-1.

8 **5.1 MARINE BIOLOGICAL RESOURCES**

9 The proposed action may take place within marine environments 200 meters to 4,000
10 meters in depth (Figure 2-1) within PMNM. The remote nature of PMNM requires that
11 access to these areas must be supported by a well-equipped seafaring vessel. From 2007-
12 2010, there were 77 vessel access trips to Monument waters to conduct separately
13 permitted and unrelated activities. On average, 18 vessels have accessed the Monument
14 annually to conduct permitted activities. All vessels permitted to access the Monument must
15 comply with strict sanitation requirements limiting vessel grey-water discharge and must
16 have a working NOAA Office of Law Enforcement type-approved Vessel Monitoring System
17 installed, capable of tracking and displaying vessel movement within PMNM. In addition,
18 before a Monument permit is issued, the vessel must successfully complete the following
19 inspections to prevent alien or invasive species transfer to the Monument: rodent
20 inspection, hull and tender inspection and cleaning (if necessary) and ballast water
21 inspection. By following Monument regulations and aforementioned best management
22 practices, there have been no adverse impacts from the combined total number of past
23 vessel accesses to the Monument.

24 Voucher collections have occurred in deep water areas (200m – 4,000m) within the
25 Monument in 2007 and 2009. Three research permits have been issued for voucher
26 specimen collection in deep water, two in 2007 and one in 2009 with no observable negative
27 impacts to the environment. On average, 33 coral biopsy samples (each 1 cm²) and 25
28 whole invertebrate organisms (i.e., crabs, sponges, or crinoids) representing a new scientific
29 or geographic record, have been collected annually from deep water areas in 2007 and
30 2009. For example, in 2009 voucher collections in deep water areas led to the scientific
31 discoveries of one new species of shrimp, one new genus of coral, and 11 new geographic
32 records of corals never thought to have existed in such deep water areas of the Pacific.
33 Voucher collections are an integral part of scientific research in the Monument with inherent
34 beneficial impacts, aligned with the Monument Management Plan (MMP), Marine
35 Conservation Science Action Plan 1-3: Map and characterize deep water habitat (MMP
36 2008, Vol. 1, p.123). It is reasonable to expect that voucher collections would be proposed
37 on each deep water cruise aboard the KOK each year, for a five year duration. By following
38 the Monument's Voucher Specimen Guidelines (Appendix A) (which would be included each
39 year as part of the permit), the proposed action would not result in measurable cumulative
40 effects to marine biological resources.

41 Submersible research and deep sea work have been permitted and conducted in the past
42 within PMNM. The proposed action was permitted and conducted by HURL and UH Marine
43 Center in 2007 and in 2009 in separate locations with no observable negative impacts to the
44 environment. Projects that could potentially contribute to cumulative impacts with the
45 proposed action are summarized in Table 4-1. The table includes short descriptions of

46 these projects. One research project was analyzed in a separate EA entitled, “Deep Sea
 47 Camera Research Permit EA.” A Finding of No Significant Impact was signed on May 2009.
 48 When combined with the proposed action, one project does occur at the same depth, but
 49 within different habitat types. Therefore, the proposed action would not result in measurable
 50 cumulative effects to marine biological resources.

51 **5.2 CULTURAL RESOURCES**

52 It is anticipated that cultural and historical sites would not be located at the depth of
 53 operations proposed. Therefore, no cultural impacts are anticipated as a result of the
 54 proposed action. Additionally, the proposed action would not result in measurable
 55 cumulative effects to cultural resources.

56 **5.3 PHYSICAL CONDITIONS**

57 No significant adverse impacts to existing physical conditions are anticipated as a result of
 58 the proposed action. Additionally, the proposed action would not result in cumulative
 59 impacts.

60 **5.3.1 Water Quality and Solid Waste**

61 Since 2007, there have been 20 submersible dives within PMNM (16 in 2007 and 4 in 2009).
 62 Each submersible dive requires ballast to be dropped twice; once during the descent and
 63 once during the ascent. Each ballast drop is approximately 150-200 lbs with exact amounts
 64 determined by personnel and gear weight and oceanographic conditions. The estimated
 65 ballast dropped since 2007 is approximately 7,000 lbs, or an average of approximately
 66 3,500 lbs a year. Given the corrosion rate of approximately 2 years, the ballast discharged
 67 in 2007 and 2009 would be dissolved by now. The submersible operators do not drop
 68 ballast in the same locations. When research activities (e.g. gold coral monitoring, or
 69 monitoring geological features or seamounts) require subs to visit the same locations,
 70 operators conduct dives on different tracklines and drop ballast in different locations away
 71 from research areas. Figure 4-1 is a map of all permitted submersible ballast drop sites
 72 within PMNM. Given that submersible dives would take place at different sites covering a
 73 vast area or approximately 120,000 square miles (311,000 square kilometers), the amount
 74 of ballast discharged is negligible.

75 **Table 4-1 Relevant Projects within PMNM**

Project Name	Time Frame	Purpose and Scope
NOAA Ship HI'IALAKAI as a Support Platform for Permitted Activities	June – October 2007-present	The project allows NOAA Ship HI'IALAKAI to enter PMNM under a PMNM conservation and management permit. Personnel aboard the vessel are permitted under separate Monument permits. This activity is re-evaluated and permitted annually.
Submersible dives to collect and study deep sea corals	October 2007 – November 2007	This project (PMNM research permit PMNM-2007-052) allowed collection of 5 coral colonies (each 2cm in diameter); and 4 coral biopsies (each 1cm ²) which were collected, identified and curated at pre-approved museums including Bishop Museum and the

Project Name	Time Frame	Purpose and Scope
		Smithsonian Institution.
Support for Permitted Research activities using the <i>Pisces</i> submersibles and ROV and the UH R/V KOK	October 2007 – November 2007	The project allowed the UH research vessel (R/V) <i>Ka'imikai-o-Kanaloa</i> (KOK) to serve as a support platform (PMNM conservation and management permit PMNM-2007-049) for separately permitted research personnel and the HURL submersibles and ROV to serve as a support platform (PMNM research permit PMNM-2007-051) for separately permitted deep sea research.
Multibeam mapping and deep water surveys	October 2007 – November 2007	This project (PMNM research permit PMNM-2007-052) allowed collection of 34 coral biopsies (each 1cm ²); 17 whole organisms including sponges, ophiuroids, crinoids, and crabs which were collected, identified, and curated at pre-approved museums including Bishop Museum and the Smithsonian Institution.
Support for Permitted Research activities using the <i>Pisces</i> submersibles and ROV and the UH R/V KOK	November 2009 – December 2009	The project allowed the UH research vessel (R/V) <i>Ka'imikai-o-Kanaloa</i> (KOK) to serve as a support platform (PMNM conservation and management permit PMNM-2009-057) for separately permitted research personnel and the HURL submersibles and ROV to serve as a support platform (PMNM research permit PMNM-2009-053) for separately permitted deep sea research.
Characterization of Large Deep-sea Scavenging Fauna, General Habitat Associations and their Relationship to Depth	June 2009 – December 2009	The project (PMNM research permit PMNM-2009-018) allowed deployment of 15-20 cameras and baited traps (collected 17 whole fishes), anchored with chain links near Nihoa, Lisianski, Laysan, and Pearl and Hermes Atoll at depths between 1,000m to 4,000m. The iron anchors were abandoned at each site.
Multibeam mapping surveys and voucher specimen collections	November 2009 – December 2009	This project (PMNM research permit PMNM-2009-052) allowed collection of 32 coral biopsies (each 1cm ²); and 33 whole organisms including sponges, ophiuroids, crinoids, and crabs.

76

77 It is reasonable to expect that one deep water submersible cruise would occur per year for
 78 the next five years which would discharge 10,800 lbs of steel washer punchers per year for
 79 a five year duration. Based on past deep water activities within the Monument, submersible
 80 operators would be conducting activities at different sites during each dive and the same site
 81 would not be visited twice, therefore no significant measurable cumulative effects would
 82 occur.

83 **5.3.2 Marine Traffic**

84 There are an average of 133 vessel entry and exit notifications for vessels passing through
85 the Monument without stopping per year. In addition an average of seven vessels obtain
86 permits to conduct work within the Monument annually, those seven vessels make an
87 average of 18 total round trip visits per year. No significant cumulative impacts to marine
88 traffic are anticipated as a result of the proposed action, as the proposed action involves
89 entry and exit of one additional vessel into the Monument from the 140 that operate in the
90 area a year and operation of two submersibles and one ROV, especially given the large
91 area of the Monument.

92 **5.3.3 Air Quality**

93 No significant adverse cumulative impacts to marine traffic are anticipated as a result of the
94 proposed action, as the proposed action involves the addition of one additional research
95 vessel into the Monument to the average 140 vessels that operate in the area annually. The
96 submersibles and ROV are battery operated and therefore do not emit anything.

97 **5.3.4 Hazardous and Regulated Materials**

98 No significant adverse cumulative impacts to the environment are anticipated as a result of
99 the KOK bringing small amounts of properly contained hazardous and regulated materials.
100 Again, the addition of one additional research vessel per year, for a five-year period would
101 not cause cumulative impacts. All hazardous and regulated materials would be contained
102 properly and appropriate spill mitigation plans would be kept current and on file with the
103 Monument office and the U.S. Coast Guard.

Figure 4-1. Submersible Ballast Drop Sites within PMNM

104 **6 ENVIRONMENTAL PERMITS, APPROVALS, AND COMPLIANCE**

105 **6.1 PERMITS**

106 The University of Hawaii Marine Center and the University of Hawaii Undersea Research
107 Laboratory have submitted two permit applications (one conservation and management
108 application and one research application) to conduct vessel operations (KOK, *Pisces IV* and
109 V submersibles, and ROV) in the PMNM. Permit applications would be submitted each year
110 for a five-year duration for the proposed action.

111 **6.2 OTHER PERMITS**

112 No other permits are necessary for these activities, as the activities contained herein would
113 not result in incidental disturbance or take of Hawaiian monk seals or cetaceans. UH
114 Research Vessel KOK and HURL would obtain separate, respective permits.

115 **6.3 OTHER LAWS AND AUTHORITIES CONSIDERED**

116 **6.3.1 Magnuson-Stevens Fishery Conservation and Management Act**

117 The site for the proposed action comprises soft bottom substrate. Large precious corals,
118 such as gold, pink and black corals, are found in the depth range considered in this
119 proposed action, however, all are primarily found on rocky substrate such as submerged
120 banks. Soft bottoms such as the areas targeted for ballast discharge by the submersibles
121 do not have a suitable surface for the coral to attach to (NOAA, 2006; Drazen, personal
122 communication, May 31, 2007). The bottom habitat surrounding the project drop areas are
123 inhabited by invertebrate fauna, burrowing fish, and bottom-dwelling fish and no adverse
124 impacts to the habitat or the species present (see section 3.2.2) are expected. No adverse
125 impacts to Essential Fish Habitat are anticipated. Also, cumulative or synergistic impacts
126 are not expected as a result of the proposed action because a vast amount of similar habitat
127 lies within the PMNM.

128 **6.3.2 Endangered Species Act**

129 The National Marine Fisheries Service (NMFS) has determined that the proposed action
130 would not adversely affect the Hawaiian monk seal or green sea turtle occurring within the
131 PMNM. The short-tailed albatross, an endangered species under USFWS' purview, has
132 been observed on land at French Frigate Shoals and Midway Atoll in the past. The
133 proposed action would take place greater than 3nm from shore at a depth range of 200m –
134 4,000m. Therefore, NMFS has determined that the proposed action would not affect the
135 short-tailed albatross since it is highly unlikely that this seabird would occur in the vicinity of
136 the submersible deployment areas. All precautions would be taken not to disturb Hawaiian
137 monk seals or green sea turtles.

138 In 2009, PMNM conducted an informal consultation with NMFS Pacific Islands Regional
139 Office (PIRO) on the proposed action – procedures which included operation of UH
140 Research Vessel KOK and deployment of submersibles and ROV. In the analysis, NMFS
141 PIRO concluded that: 1) disturbance from humans and equipment to protected species is
142 temporary and insignificant and does not exceed those actions previously consulted on; 2)
143 the likelihood of an entanglement or hooking with a protected species is discountable; 3) the
144 likelihood of a vessel colliding with a monk seal or green turtle is discountable.

145 **6.3.3 National Historic Preservation Act (NHPA)**

146 Under the provisions of Section 106 of the National Historic Preservation Act of 1966, the
147 Secretary of the Interior has compiled a national register of sites and buildings of significant
148 importance to America’s history. Sites in the NWHI include cultural sites on Nihoa Island
149 and Mokumanamana Island, and historic sites on Midway Atoll. The proposed action would
150 not cause any negative impacts to registered sites, buildings, or potentially historically
151 significant sites given the mitigation measures proposed, on shore, or on any submerged
152 sites, such as shipwrecks.

153 **6.3.4 Marine Mammal Protection Act**

154 The Marine Mammal Protection Act authorizes NMFS to take measures to protect marine
155 mammals that may involve setting aside habitat required by various life stages, although the
156 chief provision is the prohibition of “taking” marine mammals directly or indirectly. None of
157 the activities proposed herein should directly or indirectly interact with monk seals or other
158 protected species such as dolphins or whales.

159 **6.3.5 Executive Order 12898 on Environmental Justice**

160 Consistent with the President’s Executive Order on Environmental Justice (February 11,
161 1994) and the Department of Commerce’s Environmental Justice Strategy, the proposed
162 research activities would not have any disproportionately high and adverse human health or
163 environmental effects on minority or low income populations.

164 **6.3.6 Executive Order 12866**

165 Implementation of the activities herein described does not constitute a “significant regulatory
166 action” as defined by Executive Order 12866 because (1) it would not have an annual effect
167 on the economy of \$100 million or more, or adversely affect in a material way the economy,
168 a sector of the economy, productivity, competition, jobs, the environment, public health or
169 safety, or State, local, or tribal governments or communities; (2) it would not create a serious
170 inconsistency or otherwise interfere with an action taken or planned by another agency; (3) it
171 would not materially alter the budgetary impact of entitlements, grants, user fees, or loan
172 programs or the rights and obligations of recipients thereof; and (4) it would not raise novel
173 legal or policy issues arising out of legal mandates, the President’s priorities, or the
174 principles set forth in the Executive Order.

175

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9 APPENDIX A

VOUCHER SPECIMEN GUIDELINES

Papahānaumokuākea Marine National Monument

Preamble

These guidelines have been prepared by members of the Monument Management Board's Voucher Specimen Working Group to assist Monument Permit Coordinators in considering issues related to voucher specimens. The guidelines are not meant to be inclusive of all collection activities that may occur in Papahānaumokuākea Marine National Monument (Monument).

1.0 Definition

A 'voucher specimen' is any specimen that serves as a basis of study and is retained as a reference. Whenever possible a voucher should be in an accessible university or museum collection.

'Specimen' means the whole animal or a part thereof.

'Type' specimen is a particular voucher specimen which serves as a basis for taxonomic description of that species or subspecies.

2.0 Purpose

Collection of voucher specimens is a legitimate and important part of scientific research. However, the taking of any resource within the Monument is strictly regulated.

The aims of these guidelines are:

- 2.1 to provide permit language guidelines for voucher collections that satisfy the policies and regulations of the Monument Co-Trustee agencies and Monument Management Board;
- 2.2 to standardize permit language that authorizes voucher collections from the Monument; and
- 2.3 to scrutinize and limit voucher collection activities in the Monument.

3.0 Disclaimer

These guidelines do not replace the Monument's joint-permitting system. These guidelines may be applied to permit applications that are requesting voucher collections *subsequent to* the application's review and approval by the Monument Management Board and State of Hawai'i Board of Land and Natural Resources as required.

All permittees are subject to existing federal, state, and local laws and regulations regarding species collections. These guidelines do not exempt applicants proposing to collect specimens that are determined to be an endangered, threatened, or regulated species formally designated on an agency approved list (see appendices), from conforming to Federal and State regulations and mandates, such as the Endangered Species Act of 1973; Migratory Bird Treaty Act; or Marine Mammal Protection Act. As such, other permit conditions and language may apply.

4.0 Baseline Taxonomic Collection Clause

4.1 Criteria when this clause may be used:

- Applicant requests to collect specimens that cannot be visually identified or that may represent a new geographic record, new species, or would clarify the taxonomic status of a described species;
- Applicant has the taxonomic expertise that would warrant such an activity – (evident in CV, published peer-reviewed manuscripts, and prior permitted research in the NWHI);
- Field PI/Applicant is aware of the required abundance assessment, performed visually in the field; and
- Applicant is working on poorly documented taxonomic groups, or conducting work in previously un-surveyed or under-surveyed areas.
- This clause is not appropriate for birds or marine mammals without additional permits.

4.2 Permit language for use in the Permitted Activity Descriptions section:

- Removing, moving, taking, harvesting, possessing, or attempting to move, take, harvest, or possess a set number of any visually observable marine or terrestrial organism morphotype, which cannot be visually identified or may represent a new geographic record or new species, from each of the Permitted Activity Location areas defined, based upon the per island/atoll abundance criteria below:
 - a. One (1) specimen can be taken, removed, or possessed if an abundance assessment cannot be ascertained, or fewer than ten (10) such specimens are present, cumulative during the course of the collection event per island or atoll;
 - b. Up to three (3) specimens can be taken, removed, or possessed if an abundance assessment of ten (10) or more of such specimens is ascertained, cumulative during the course of the collection event per island or atoll;
 - c. For clonal organisms that cannot be visually identified or may represent a new geographic record or new species, take shall be limited to no more than half the clonal organism visually observed. Up to three (3) clonal specimens of similar morphology can be taken, removed, or possessed if an abundance assessment of ten (10) or more of such specimens is ascertained, cumulative during the course of the collection event per island or atoll.

5.0 Molecular / Genetic Sampling Clause

5.1 Criteria when this clause may be used:

- Applicant requests to collect samples for the purpose of genetic or molecular analysis;
- Applicant has the taxonomic expertise that would warrant such an activity – (evident in CV, published peer-reviewed manuscripts, and prior permitted research in the NWHI);
- Applicant has a plan in place that includes laboratory facilities/funding necessary to process samples; and
- Collections table is based on research objectives and reviewed during permit review process.

5.2 Other notes to consider when reviewing Molecular / Genetic Sampling Clause:

- Desired number of samples for effective analysis is 50 samples per targeted species per island/area.
- For sessile clonal species (i.e., coral, plants, algae) – Desired standard is 1 cm in length, to fit in a 2 ml sampling tube.

5.3 Permit language for use in the Permitted Activity Descriptions section:

[Non-lethal]:

- Removing, moving, taking, harvesting, possessing, or attempting to move, take, harvest, or possess non-lethal genetic samples, where one (1) sample is defined as up to 5

centimeters in length per individual organism. Total samples permitted shall be in accordance with the following collections table:

Species	No. of Samples	Location of take (i.e., Lat/Long; SPA; or depth zone)
Total samples shall not exceed #####.		

- Collecting, as defined in Permitted Activity #X, shall be performed manually by hand using pliers, forceps, knife blade, scalpel, scissors, or hammer and chisel. (*Or method of collecting derived from permit application*)

[Lethal] – Genetic and molecular sampling for some organisms may require the take of the whole-organism (i.e., lethal methods):

- Removing, moving, taking, harvesting, possessing, or attempting to move, take, harvest, or possess specimens for the purpose of genetic or molecular analysis, where one (1) sample specimen is defined as the whole-organism. Total specimens permitted shall be in accordance with the following collections table:

Species	No. of Specimens	Location of take (i.e., Lat/Long; SPA; or depth zone)
Total specimens shall not exceed #####.		

- Collecting, as defined in Permitted Activity #X, shall be performed mechanically by trapping/grabbing devices deployed from remotely operated vehicle. (*Or method of collecting derived from permit application*)

6.0 Morphologically Targeted Sampling Clause

6.1 Criteria when this clause may be used:

- Applicant requests to collect samples for the purpose of referencing into a publicly available museum collection, i.e. accessioning;
- Applicant has the taxonomic expertise that would warrant such an activity – (evident in CV, published peer-reviewed manuscripts, and prior permitted research in the NWHI);
- Applicant has a plan in place that includes curation expertise/funding/museum space necessary to accession specimens; and
- Collections table is based on research objectives and reviewed during permit review process.

6.2 Permit language for use in the Permitted Activity Descriptions section:

- Removing, moving, taking, harvesting, possessing, or attempting to move, take, harvest, or possess up to three (3) specimens per species type morphologically identifiable in the field for the purpose of accessioning into a museum collection in accordance with _____ (*applicant's accessioning plan attachment*), from each of the Permitted Activity Location areas defined. Total specimens permitted shall be in accordance with the following collections table:

Species	Location of take (i.e., Lat/Long; SPA; or depth zone)
Total specimens shall not exceed #####.	

- Collecting, as defined in Permitted Activity #X, shall be *(insert method defined in application)*.

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FINDING OF NO SIGNIFICANT IMPACT

Papahānaumokuākea Marine National Monument Research and Conservation and Management Permits to the University of Hawaii, Hawaii Undersea Research Laboratory and the University of Hawaii Marine Center for vessel support operations for permitted research activities.

The National Oceanic and Atmospheric Administration (NOAA), National Ocean Service, Office of National Marine Sanctuaries (ONMS) drafted an environmental assessment (dated September, 2011) to evaluate the impacts of allowing the University of Hawai'i (UH), Hawai'i Undersea Research Laboratory (HURL) program and the UH Marine Center use of the Pisces IV and Pisces V submersibles, the Remotely Operated Vehicle (ROV) and the UH research vessel KA'IMIKAI-O-KANALOA (KOK) as support platforms for permitted research activities in the Papahānaumokuākea Marine National Monument (PMNM or Monument). The activities require the issuance of annual permits from NOAA's ONMS, the United States Fish and Wildlife Service, and the State of Hawai'i, co-trustee management agencies for the PMNM. NOAA's (ONMS) drafted the environmental assessment as a basis for this finding of no significant impact for its issuance of one annual Monument research permit and one annual Monument conservation and management permit per year for a five-year period.

NOAA Administrative Order (NAO) 216-6 (revised May 20, 1999) provides eleven criteria for determining the significance of the impacts of a proposed action. These criteria are discussed below with respect to the proposed action. Based on the analysis in the adopted environmental assessment, PMNM finds that:

1. Can the proposed action reasonably be expected to cause both beneficial and adverse impacts that overall may result in a significant effect, even if the effect will be beneficial?.

There are both beneficial and adverse impacts of the proposed action that, when combined result in a net benefit through the activities associated with this research. ONMS does not expect these effects to be significant. This section is divided into three areas: 1) Subs and ROV operations and 2) KOK vessel operations and 3) Voucher specimen collections.

SUBMERSIBLE and REMOTELY OPERATED VEHICLE OPERATIONS

The Pisces IV and Pisces V submersibles (subs) and the ROV would serve as research platforms for separately permitted research projects in the PMNM. The research projects include multibeam mapping, deep water habitat surveys, and voucher specimen collections at depths between 200m – 4000m. The research projects would collect data that would assist Monument managers in making future management decisions in the deep water regions of the Monument. The research projects would utilize the subs and/or ROV a maximum of 135 times (maximum of 27 times per year) over the duration of five research cruises (one per year) scheduled over the course of five years. It is noted that since 2007 approximately 20 submersible dives total have occurred within PMNM, substantially less than the maximum capability (defined as 40 submersible dives per year) of the submersibles.



The subs and ROV are the only means available to collect, survey, and map in deep water areas of the Monument. Without the use of subs and the ROV, these research projects would not happen. Thus, sub and ROV operations play an integral role in supporting these projects which would have significant benefit to management of the Monument.

The subs would use steel washer punches for ballast. The punches are made of uncoated low-carbon steel, and washed before use. To land on the sea floor, the sub pilot drops one round of weights (150-200lbs), and when the sub is ready to return to the surface, the pilot drops a second round of weights (150-200lbs). The steel washer punches are relatively thin with a high surface area (10mm) which minimizes the time it takes to corrode. The maximum amount of steel washer punches that would be discharged per year would equate to approximately 10,800 lbs, or 54,000 lbs total over a five year period. During previous visits, anecdotal evidence indicates that the punches dissolve within two years. The rapid corrosive rate of the ballast material, the small punch size and resultant increased surface area exposed to salt water and anecdotal observations of researchers visiting areas of prior ballast releases suggest that the punches would not persist in the environment more than two years.

There are mitigation measures in place to address the discharging of ballast on the sea floor. Sub operators would avoid sensitive areas when landing and dropping weights. The Monument would also require that sub operators mark the locations of ballast drops with a small piece of rebar for easy location upon return in future years.

Unlike the subs, the ROV does not drop ballast on the sea floor and therefore no adverse impacts are associated with ROV operations.

VESSEL OPERATIONS – KOK

There are both beneficial and minimal adverse impacts associated with KOK vessel operations for this respective cruise. The KOK is the transport research vessel that would carry all crew, subs and the ROV into the Monument. The KOK would serve as the support vessel and provide accommodations to all the researchers and respective crew for the duration of the cruise. Without the KOK, the subs, ROV and researchers would not be able to undertake their research projects within the Monument.

Vessel anchoring has the potential to impact the ecosystem depending on many factors, such as the size of the ship and anchor system, weather conditions, and the location and vicinity of the anchorage relative to sensitive ecosystems. The KOK would not drop anchor within the PMNM except in emergency situations. Even in emergency situations, efforts would be made to drop anchor in areas relatively free of coral.

The KOK would have completed all required inspections prior to departure for the Monument. These inspections include: hull, ballast water, tender and gear inspections, and rat inspections. The KOK would have its hull spot-cleaned to eliminate any invasive species, prior to departure for the Monument. The KOK also has an approved Marine Sanitation Device (MSD) capable of treating black water, and a holding tank for gray water. The KOK would abide by all Monument discharge regulations and policies for all vessel discharge including treated MSD effluent and biodegradable solid waste associated with galley use.

In summary, the beneficial and minimal adverse impacts, when combined, do result in a net benefit. Monument managers will greatly benefit from increased knowledge (gained by the undertaking of the aforementioned research projects) about the deep water regions of the Monument. These research projects would not be possible without the vessel support of the subs, ROV and the KOK.

VOUCHER SPECIMEN COLLECTIONS

In addition to bathymetric mapping conducted by the KOK, operation of the two submersibles and ROV, the final component of each research cruise is the collection of deep water voucher specimens. Scientists specially trained in the identification of sponges, deep water corals and invertebrates travel in the submersibles to depth and guide the submersible operator to utilize the submersibles' manipulator arms to collect voucher samples of specimens that cannot be visually identified or may represent a new geographic record or new species in accordance with the Monument's Voucher Specimen Guidelines included in the environmental assessment as Appendix A.

The proposed action would not significantly affect marine biological resources as collections of new records and / or new potential species would be dictated by the aforementioned guidelines and would be included as part of each annual Monument collection permit.

Voucher collections are an integral part of scientific research in the Monument with inherent beneficial impacts, aligned with the Monument Management Plan (MMP), Marine Conservation Science Action Plan 1-3: Map and characterize deep water habitat (MMP 2008, Vol. 1, p.123). By following the Monument's Voucher Specimen Guidelines (Appendix A), which would be included each year as part of the permit, the proposed action would have beneficial impact to deep water marine biological resources as the proposed action would contribute to the Monument's knowledge about deep water marine habitat.

2. What is the degree to which public health or safety is affected by the proposed action?

The proposed action would occur at depths ranging from 200m - 4000m, and involve the use of subs and an ROV. These vessels would be piloted by highly skilled operators with many years of experience. Use of the KOK would involve actions in which the vessels and their respective crew are routinely engaged with the inherent challenges involved (weather, deployment and retrieval of subs and ROV, etc.). These actions do not involve the public in any way and as such would have no effect on public health or safety.

3. Are there unique characteristics of the geographic area in which the proposed action is to take place?

The PMNM contains one of the healthiest coral reef ecosystems in the world. However, the proposed action is to be conducted well away from coral reef habitats; the proposed activities would be conducted in deep water (200m – 4000m), outside of the NWHI Hawai'i State Marine Refuge. The subs and ROV would land on non-coral substrate and away from sensitive areas known to contain deep-sea coral colonies. Voucher specimens would not be taken from coral substrate and would be collected in accordance with the Monument's Voucher Specimen Guidelines (Appendix A in the environmental assessment). The KOK would anchor only in

emergency situations away from sensitive locations and would comply with all Monument discharge regulations and policies.

4. What is the degree to which effects on the human environment are likely to be highly controversial?

None of the effects on the quality of the human environment are considered highly controversial. Sub, ROV and vessel operations have been ongoing in the NWHI and in other locations with no controversy or adverse impacts on the environment. The environmental assessment prepared for this research was on the Monument website (<http://papahanaumokuakea.gov/>) for public comment for thirty days (17 August – 31 August and again on 16 September – 30 September). No comments were received.

5. What is the degree to which effects are highly uncertain or involve unique or unknown risks?

The procedures, methods, and mitigation measures that are used in the existing research are accepted standard operating procedures in the scientific community and proven to be effective with minimal adverse impact to wildlife or individuals. Submersible, ROV operations, and voucher specimen collections were conducted within PMNM in 2007 and 2009 with no adverse impacts to the environment. Therefore, environmental effects are neither uncertain, unknown nor unique.

6. What is the degree to which the action establishes a precedent for future actions with significant effects or represents a decision in principle about a future consideration?

The research and conservation and management activities are ongoing in the PMNM. This action does not establish a precedent or a decision in principle. Although the environmental assessment analyzes the maximum possible impacts to the environment, permit applications will be considered on an annual basis.

7. Does the proposed action have individually insignificant but cumulatively significant impacts?

None of the research activities would have cumulatively significant impacts on Monument species or habitats. No significant cumulative impacts have been observed from the previous 20 dives within PMNM which occurred in 2007 and 2009. Due to the corrosion estimate of two years, the washer ballast that was discharged in 2007 and 2009 would be dissolved by now. No significant adverse marine biological impacts are anticipated as a result of the proposed action. All other vessels entering the PMNM would adhere to Monument regulations and policies summarized in the respective environmental assessment; no significant adverse cumulative impact is anticipated.

8. *What is the degree to which the action adversely affects entities listed in or eligible for listing in the National Register of Historic Places, or may cause loss or destruction of significant scientific, cultural, or historic resources?*

The proposed action would not adversely affect areas listed in or eligible for listing in the National Register of Historic Places, or cause loss or destruction of significant scientific, cultural or historic places. Implementation of the proposed action would have no effect on archaeological, social, or cultural resources, as all research would be conducted in the deeper ocean where few, if any shipwrecks or downed planes would be found or affected. If any were found, all research would cease until the proper authorities were notified and a determination was made by the Office of Hawaiian Affairs and the Hawaii State Historic Preservation Division that it was safe to proceed.

9. *What is the degree to which endangered or threatened species, or their critical habitat as defined under the Endangered Species Act of 1973, are adversely affected?*

Although six species of cetaceans listed under the Endangered Species Act (ESA) are in the Western Pacific Ocean, no reported or observed adverse interactions with the KOK, subs or ROV have been observed or reported and no future adverse interactions are anticipated. Therefore, no impact to listed species of cetaceans would occur. The same is expected for the remaining seventeen species protected under the Marine Mammal Protection Act. All research, conservation and management activities and vessel operations would temporarily cease, should the researchers encounter any endangered species, including the Hawaiian monk seal.

10. *Is a violation of Federal, state, or local law for environmental protection threatened by the proposed action?*

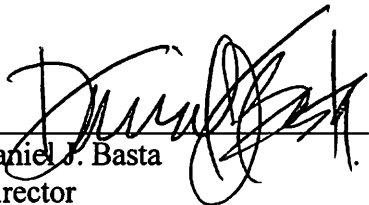
The proposed action does not threaten a violation of federal, state, or local law requirements imposed for the protection of the environment. The captain of the KOK and HURL researchers would continue to operate with all necessary and required permits and approvals from federal, state, and local agencies.

11. *Will the proposed action result in the introduction or spread of a nonindigenous species?*

Mitigation measures to prevent the spread of invasive species to the PMNM, including marine algae *Hypnea musciformis* as recommended by Dr. Isabella Abbott of the University of Hawai'i Department Of Botany, would be continually implemented, making it unlikely that any invasive species would be introduced into the Monument. These measures include hull inspection and cleaning of the KOK, disinfection of all scientific collecting equipment, and wipe down of the subs and ROV with Simple Green™ after each dive.

FONSI Statement

In view of the analysis presented in this document, the environmental assessment of HURL and UH Marine Center vessel operations dated August, 2011, the proposed action will not significantly affect the quality of the human environment with specific reference to the criteria contained in Section 6.01 of NAO 216-6, Environmental Review Procedures for Implementing the National Environmental Policy Act (NEPA). Accordingly, the preparation of an environmental impact statement for the proposed action of issuing two annual Monument permits is not necessary.



Daniel J. Basta
Director
Office of National Marine Sanctuaries
National Oceanic and Atmospheric Administration

10/11/11
Date
