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# **Overview:**

The Geographic Annex groups information by island as well as ports on each island. The Geographical Response Strategies (GRS) are broken down by island and provide the information and strategies needed to respond to pollution.

As plans are developed, additional strategies will be added. As work is completed on the other islands covered by the Plan, like the U.S. Territories and the Northwestern Hawaiian Islands, they will be added.

# Areas of Sensitivity:

Environmental Sensitivity Index (ESI) maps provide a concise summary of coastal resources that are at risk if an oil spill occurs nearby. ESI maps are create by NOAA's Office of Response and Restoration (OR&R) researchers, working with colleagues in state government agencies, federal government agencies, and industry. Responders can access NOAA's ESI products through:

https://erma.noaa.gov/pacific/erma.html#/layers=3+11829&x=-157.92576&y=21.52009&z=11&panel=layer

# **Access Legend:**

Each GRS diagram includes an "Access Legend". This legend defines the access limitations and capabilities in various parts of the area covered by the diagram.

There are 7 access areas identified.

- *Foot Access* -- these are areas that can only be accessed by foot along the shoreline. These areas are designated with a circled number one -- 1.
- *Lt. Duty* -- these are areas that only light duty vehicles and equipment can use. These areas are designated with a circled number two -- 2.
- *Paved Access* -- these area areas that have a paved road leading to them. These areas are designated with a circled number three -- 3.
- **Boat Ramp** -- these are places were a trailered boat can put into the water. These areas are designated with a circled number four -- 4.
- *Marina* -- these are areas were small to medium sized boats can moor and be loaded. These areas are designated with a circled number five -- 5.
- *Staging* -- these are areas with large open areas that can be used to stage and setup equipment. These areas are designated with a circled number six -- 6.
- *Helicopter* -- these are areas that could accommodate a helicopter. These areas are designated with a circled number seven -- 7.



Figure 1: Legend - Environmental Response Management Application (ERMA)

# **GRS Validation:**

The US Coast Guard Maritime Environmental Response Manual (COMDTINST M16000.14A) describes five tiers of GRS validation. GRS validation will be documented in the following format:

Goographic Porponeo State	Data of	Loval of	Date of ESA	Date ESA Consultation -	Date of EFH	Date of NHPA	
(cps)	Validation	Validation	Consultation - USFWS;	NMFS; LOC Date or No	Consultation; LOC	Consultation; LOC	Notes / Lessons Learned
(GK3)	valuation	valuation	LOC Date or No Effects	Effects Determination	Date or No Effects	Date or No Effects	
Kahului Harbor							
Kahului Harbor Commerical Basin							
Kaunakakai Harbor							
Ma'alaea Harbor (proposed)	2/15/2022	111					
Honolulu Bunkering Anchorage							
Barbers Point							
Honolulu Harbor to Keehi Lagoon							
Honolulu Harbor Pier 17							
Kapalama Basin							
Keehi Lagoon and Kapalama Basin							
Barbers Point Moorings							
Pearl Harbor Overview							
Pearl Harbor Entrance							
Pearl Harbor North Channel							
Pearl Harbor Middle Loch							
Pearl Harbor East Loch							
Pearl Harbor West Loch							
Hilo Bay							
Hilo Bay Fueling Pier							
Honokohau Harbor (proposed)	1/5/2022	ш					ESA/EFH completed; letter of concurrence was
							not rec'd
Kawaihae Harbor							
							Due to large cruise ship
							in port; OSRO was short
							about 200' of boom to
Nawiliwili Harbor	1/25/2022						complete GRS; ESA/EFH
							completed; letter of
							concurrence was not
							rec'd
Nawiliwili Commerical Basin							
Port Allen							
Kaumalapau Harbor							

Figure 2: GRS Validation Table

Key: Endangered Species Act (ESA), Letter of Concurrence (LOC), Essential Fish Habitat (EFH), National Historic Preservation Act (NHPA)

Validation Level	Name	Description	Requirements	
I	Desktop	Evaluation of GRS data by subject matter experts (i.e., natural resource trustees) in an office or workshop setting. Can be supplemented with computer cimulations:	All data should attain Level I validation.	
п	Visual Confirmation	Deployment of subject matter experts to specified geographic area. Visual inspection of operational environment and verification of factical strategies. No equipment deployment. Can be supplemented with computer simulations.	Targeted for moderate to high-risk areas where a degree of uncertainty exists.	
ш	Equipment Deployment	Deployment of identified equipment to verify its performance in the specified operating environment.	Targeted for inconclusive Level II validation strategies. Performed in high-risk areas where rapid and efficient response is critical.	
IV	Full Scale Exercise (FSE)	Deployment of all appropriate response personnel and equipment under an area full scale exercise setting.	As dictated by the area exercise design/objectives.	
v	Incident	Deployment of all appropriate response personnel and equipment for an actual incident.	Real world event.	
Table 4-1: Geographic Response Strategies (GRS) Tiered Validation Levels				

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# Maui

#### Kahului Harbor (Kahului, Maui)

Kahului Harbor is located on the south side of Kauhului Bay on the north coast of the island of Maui. The commercial deep-water port of Kahului is on the southeast side of Kahului Harbor. The harbor is protected by two rubble mound breakwaters which extend outward from the east and west shores and enclose and area of about 200 acre. The entrance to the harbor is in deep water from the north through a 600-foot-wide opening between the outer ends of the breakwaters. The channel then turns sharply southeast to the Kahului Piers. The channel and basin are maintained at or near a 35-foot depth. The west part of the inner harbor is shallow.

Waihee Reef extends 0.7-mile northwest of the breakwaters, and Spartan Reef extends 1.2 miles northeast of the breakwaters. The shoreline between the piers consists of fine-grained sand beaches. The southwest shoreline is gravelly. The prevailing winds are the northeast trades, and harbor currents are weak.

Kahului has regular interisland barge service and is a port of call for transpacific vessels. The Kahului Airport is nearby. Large vessels may anchor outside the breakwaters. Small craft have plenty of anchorage room in the unimproved areas behind the breakwaters. Vessels approaching the harbor entrance need to avoid the reefs.

Product loading at Kahului Harbor occurs at Pier 3 located on the eastern side of the harbor within the commercial basin.

# Equipment

Located in the State Harbors Pilot Boat house shore end of Pier 1.

# **Response Plan**

#### **General Comments**

- The prevailing wind is the northeasterly trade winds which will tend to push the spill toward Pier 2.
- Initial efforts should be designed to contain the spill at the source or within the commercial basin area of the Harbor.
- Additional efforts may be required to prevent the spill from moving beyond the end of Pier 2.
- Additional efforts may be required to divert spill away from hotel beaches and contain and recover the spill offshore.

#### **Response Action Points**

In the event of a spill of typical historical proportions the initial response is to:

- Deploy boom to contain source at fuel dock. Deploy boom-anchoring systems to hold the back end of the boom and contain the spill within the commercial basin. (It is important to work with the prevailing wind.)
- In the event that Kona winds are blowing, boom should be anchored to anchor point at Pier 1 and pulled across the commercial basin toward Pier 2.
- Conduct open water containment and recovery operations.
- Contain and control spill movement along shoreline with sandbag groins.

# **Areas of Sensitivity**

- Sandy beaches are located along southern portions of the harbor near the hotels.
- Outside the harbor there are Green Sea Turtle nesting areas.
- The Kahana Waterfowl Refuge Area is located just inland.



Figure 3: Kahului Harbor GRS

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# Hawaii Area Contingency Plan

Figure 5: Kahului Harbor ESI



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# Molokai

#### Kaunakakai Harbor

The Kaunakakai Harbor is located on the eastern end of the southern side of Molokai. Because of shallow water, the pier extends to the underwater edge of the island, approximately a half of mile.

Gasoline, diesel fuel and water can be obtained on the Kaumalapau wharf.

#### Equipment

A response container is on-scene.

#### **Response Plan**

#### **General Comments**

- The prevailing wind is northeasterly trade wind which will tend to push the oil past the pier in to the shallow waters and toward the shore.
- Initial efforts should be designed to contain spill at source at the transfer point.
- Additional efforts may be required to protect small boats moored on pier and from migrating toward the shoreline.
- Shallow water between the pier-head and the shoreline restricts response efforts adjacent to the shore to small-boats only.

#### **Response Action Points**

- In the event of a spill of typical historical proportions the initial response is to:
  - 1. Deploy boom to contain spill at source or in vicinity of mooring area. Mooring buoys may be satisfactory for boom anchoring.
  - 2. For larger events it may be necessary to deploy boom from the end of the pier to contain spill in the inner harbor.
  - 3. In the event that the spill escapes from the commercial area consider deploying boom to divert the spill to the seawall for collection.

#### Areas of Sensitivity:

None



Figure 6: Kaunakakai Harbor GRS

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# Hawaii Area Contingency Plan

Figure 7: Kaunakakai Harbor ESI



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# Oahu

# Honolulu Bunkering Anchorages

Several anchorages are located outside of Keehi Lagoon and Honolulu Harbor west of the entrance to Kalihi Channel. The anchorages are used for bunkering vessels and extend for a distance of approximately 2.5 miles along the 11-fathom line. There is also an Explosive Anchorage in this area about 1.3 miles west of the Kalihi Channel entrance.

Marine mammals, seabirds, and sea turtles are present in the coastal waters. The nearshore waters between the Bunkering Anchorages and Keehi Lagoon/Honolulu Harbor are very shallow due to extensive shoaling and coral reefs.

# Equipment

OSRVs Marine Spill Response Corporation (MSRC) and Hawaii Responder are docked at Pier 35. Additional equipment is available at Honolulu Harbor.

# **Response Plan**

# **General Comments**

- The prevailing wind is the northeasterly trade winds, which will tend to push the spill offshore. However surface currents in this area are diurnal and seasonally influenced.
- Initial efforts should be designed to contain the spill at the bunkering location.
- Dispatch response vessels from Honolulu, Harbor to the bunkering area.
- Track spill movement visually and electronically. Perform spill trajectory simulation modeling (using NOAA and/or the MSRC WCOSSM Oahu software.)
- Evaluate the potential for spill impact in highly sensitive areas such as Waikiki Beach.

# **Response Strategy Action Points**

In the event of a spill of typical historical proportions the initial response is to:

- 1. Deploy containment boom to contain the spill at the anchorage. It may be possible to use either the barge or the ship as part of the containment.
- 2. Conduct open water containment/recovery operations.
- 3. In the event of a larger spill it may be necessary to put exclusionary boom in place to protect the interior of Keehi Harbor.
- 4. In the event of a larger spill it may be necessary to boom off the entrance to Pearl Harbor.

# Areas of Sensitivity

- Keehi Lagoon. Exposed title flats with bird concentrations Recreational boating and fishing
- Pearl Harbor, Oahu. Mangrove swamps, marshes, and sheltered tidal flats, prime habitats for waterfowl and juvenile shellfish. An oil spill could impact commercial bait fishing.



Figure 8: Honolulu Bunkering Anchorage GRS

Hawaii Area Contingency Plan

#### Barbers Point Deep Draft Harbor

Barbers Point Deep Draft Harbor is a commercial harbor located 2 miles north of Barbers Point. The harbor has undergone recent expansion and improvement involving construction of a new basin, entrance channel, and wave absorber.

The offshore entrance channel has been dredged through the nearshore reef to a depth of 38 to 42 feet, a length of 4,280 feet, and a width of 450 to 650 feet. The 92-acre area inshore harbor basin has a depth of 38 feet at mean low tide. It includes two main berthing areas, ship and cargo handling facilities, and 4,600 linear feet of wave absorbing structures. The waterfront consists of rocky shores and coastal structures.

Vessel and heavy land access is available. Small craft launching ramp is available at the Ko'Olina small boat harbor. The concrete storage yard located at Piers 5 & 6 is appropriate for use as a major staging base.

Product loading predominantly occurs at Piers 5 and 6 on the southeastern side of the deep draft harbor. Occasional barge loading may occur in the smaller barge harbor located on the southerly side of the entrance channel.

#### Equipment

Initial Response Equipment is stored at Par Hawaii refinery. Additional equipment is available from Honolulu.

#### **Response Plan**

# **General Comments**

- Prevailing wind is a northeasterly trade wind, which will tend to push the spill against the southwesterly sides of the deep draft harbor or potentially beyond and into the adjoining yacht harbor or out the main harbor channel.
- Initial efforts will be designed to contain the spill at the source.
- Additional efforts may be required to prevent the spill from leaving the commercial basin.

# **Response Action Points**

In the event of a spill of typical historical proportions the initial response is to:

- 1. Deploy boom across the harbor entrance to contain the spill within the commercial basin. Use harbor boom stored beside the ferry pier to implement any of these strategies.
- 2. Deploy boom around vessels at pier to contain discharge, boom may be attached to ferry pier or around vessel and attached to installed boom under the pier.
- 3. Deploy exclusionary boom at the marina entrance.
- 4. Deploy exclusionary/containment boom to protect barge harbor from discharge, or contain discharged product originating at the barge pier.

Figure 9: Barbers Point GRS



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Figure 10: Barbers Point ESI



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#### **Honolulu Harbor**

Honolulu Harbor is located midway along the southern coast of the island of Oahu and is the principal deep-water port for the State of Hawaii. The harbor is roughly crescent shaped and is protected from the open sea by Sand Island and adjacent coral reefs. Sand Island is Government-owned and has been built up mostly from harbor dredging. There is a Coast Guard base on the northeast side of Sand Island.

The south shore of Sand Island consists of medium to coarse-grained sand and gravel beaches, and exposed rip-rap. The west shore is a combination of sheltered rocky shores and coastal structures, and fine-grained sand beaches. There are extensive near-shore shallow coral reefs and shoals along the south and west-side of Sand Island. The inner waterfront of Sand Island and the harbor consist of sheltered rocky shores and harbor structures.

The prevailing wind throughout the year is the northeast trade wind from which Honolulu Harbor is safe. The southwest Kona winds, which occur most frequently from October through April, can cause unsafe conditions for anchoring; however, weather severe enough to interfere with shipping or travel is uncommon. A tidal current floods west and eddies off the reef are reported to accompany the west flood. Strong west currents have been reported off Honolulu.

Marine mammals, seabirds, and sea turtles are present in coastal waters. Honolulu Harbor has over 60 Piers and wharves and numerous warehouses around its harbor waterfront. Waterfront wharf facilities for deep-draft vessels are located along the sides of the Main and Kapalama Basins, the connecting Channel, and easterly side of the Honolulu Entrance Channel.

Honolulu is a major port of call for transpacific vessels, and there is commercial barge service to and from the other islands. Product transfers occur between piers 29 through 34, and pier 51A. The products being transferred include fuel oils, diesel and jet fuels, gasolines and the occasional mid-distillate blending stocks. Fueling of vessels is common. Occasional bunkering of larger vessels may occur at Pier 1 or 2.

#### Equipment

The OSRV (Oil Spill Response Vessel) Hawaii Responder is docked at Pier 35. Shoreline mounted boom reels are located at Pier 30 and Pier 34.

# **Response Plan**

# **General Comments**

- The prevailing winds are northeasterly trade winds, which tend to push a spill across the harbor channel to Sand Island.
- Initial efforts should be designed to contain the spill at the transfer piers.
- Permanent fence boom is positioned underneath the primary product transfer Piers 29 through 34 to help provide initial spill containment.
- Transfers in Honolulu Harbor have containment boom pre-deployed in accordance with Harbor regulations.
- Additional efforts may be required to contain the spill within the commercial basin. It may be desirable to boom off the Kalihi Channel to prevent the spilled oil from migrating into Keehi Lagoon.

# **Response Strategy Action Points**

In the event of a spill of typical historical proportions the initial response is to:

- 1. The primary Transfer areas between piers 29 and 34 can be boomed off by use of the boom reels located on the piers 30 and 35. Boom can be deployed from one or both reels in many configurations depending upon the location and size of the spill. The entire transfer basin can be boomed off either by placing boom directly across the channel at both ends or by connecting the boom ends together.
- 2. In the event that a spill occurs or migrates beyond the transfer basin area, selective boom deployment to contain or exclude the spill will take place. Boom from either boom reel can be towed to other areas of the harbor as required.
- 3. Boom may be deployed at the fixed bridge to seal off the western end of the Harbor and protect the Kalihi Channel and small boat harbor.

# Areas of Sensitivity

# Honolulu Harbor, Oahu

• There are no significant sensitive areas in the harbor except commercial shipping interests and the fresh water intake to the Honolulu Power Plant.

# Keehi Lagoon, Oahu

• Exposed tidal flats with bird concentrations recreational boating and fishing.



Figure 11: Honolulu Harbor to Keehi Lagoon GRS



Figure 22: Honolulu Harbor Pier 17 GRS

Figure 33: Kapalama Basin GRS



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Figure 44: Keehi Lagoon and Kapalama Basin GRS

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#### Kaneohe Bay

Located on the windward side of Oahu is Kaneohe Bay. The Bay is approximately eight miles across and protected by a barrier reef ranging between one and one and one half miles from shore. The barrier reef effectively blocks the normal windward wave action except for occasional strong northwest swells in the Chinaman's Hat area at the northern end of the bay. On the eastern end of the bay is Mokapu Peninsula, which is approximately one mile wide and separates Kaneohe Bay from Kailua Bay. The Bay is generally between 30-40 feet deep. There is, however, a vast maze of coral heads, shoreline fringing reef, and a central sand bar area which occupies approximately 60% - 70% of the navigable waters of the bay. In these areas the depth can range from two to three feet to exposed sandbar and reef.

The bay is a popular ocean recreation area with, commercial and recreational fishing, boating, and camping. Most of the bay shoreline has private housing with sea walls. Several marinas are located in the bay. Primarily the University of Hawaii Marine Technologies Department uses Coconut Island. Several marine mammal cages are located on the west side of Coconut Island.

The Bay has an abundance of marine life including Nehu (a small bait fish) which is fished commercially for bait. Sea turtles, dolphins, and hammerhead sharks occupy the bay. The Mokapu Peninsula area has extensive protected wetlands (Nuupia Ponds - which are a wildlife refuge) extending in segments across its width. Bird sanctuaries are located on various small islands located in and adjacent to the bay.

Refined products are unloaded from a tank barge at the MCBH fuel docks located in the northeast portion of the bay. Barges enter the main channel near Chinaman's Hat and travel the full length of the bay to reach the fueling area.

#### Equipment

Boom, work-boats and sorbents are located at the KMCAS Waterfront Operations boathouse located just east of the fuel pier.

- 1000 feet of 18" containment boom.
- Prepackaged barrier to block the culverts leading from the bay to Nuupia Ponds. Plywood will be available through resources on KMCAS.
- On-water skimming system.
- 400 feet of 18" harbor scale containment/protection boom for Coconut Island protection strategy.
- In the event of a larger spill additional resources will be brought in from Honolulu.

# **Response Plan**

# **General Comments**

- The prevailing winds are northeasterly trades which usually blow between 15 to 25 knots.
- Initial efforts should be designed to contain the spill at the source.
- Early efforts should be made to block the culverts leading to nearby Nuupia Ponds Wildlife Refuge.

# **Initial Response Strategy Action Points**

In the event of a spill of typical historic proportions the initial response is to:

- 1. Deploy secondary containment boom to reinforce as necessary the predeployed containment boom at the barge.
- 2. Block the culverts leading to Nuupia Pond Refuge (MCAS to provide precut sheets of plywood placed on the culverts to act as a weir).
- 3. Begin on-water collection and skimming operations.
- 4. Contact Coconut Island. Deploy prepositioned boom at Coconut Island to protect the dolphins located there.

# Areas of Sensitivity

- Nuupia Ponds and various bird sanctuaries located in and around the Bay.
- Community recreational areas located in the bay.
- Coconut Island dolphin cages.

# **Related Contacts**

- University of Hawaii. Hawaii Institute of Marine Biology, Coconut Island Branch
  - Telephone: (808) 236-7401
- MCBH, Environmental Compliance & Protection Dept.
  Telephone: (808) 257-6920
- MCBH Officer of the Day
  - Telephone: (808) 257-7700

For Kaneohe Bay GRS refer to the MCBH Immediate Response Guide included as Annex B, Tab 2.

#### Offshore Marine Terminals, Barbers Point

Offshore marine terminal and anchorages that serve refineries in the Campbell Industrial Park are located off Barbers Point. Onshore, land use is primarily industrial, although a county park and a commercial luau exist in the vicinity of the lighthouse. A commercial deep draft harbor, resort development (Ko'Olina) and power plant (HECO Kahe Plant) cooling water intake are located up the coast to the north. The Barbers Point Naval Air Station exists to the east of the Industrial Park.

Shorelines in the area are largely composed of wave-cut fossil reef with local sand deposits, particularly in the backshore zones. The nearshore waters are very shallow, with reefs extending up to 0.6 miles offshore. Marine mammals, seabirds and turtles are present in the coastal waters; and reef fish, lobsters, crabs and algae are present and harvested locally.

There is a generally westerly current along the coast from Honolulu to Barbers Point with velocities up to 0.8 knots. This current follows the coastline northward to Kaena Point. The anchorage is generally safe from the prevailing northeast trade winds but can be unsafe during the southwest Kona winds, which occur most frequently from October through April.

Vehicle access is available for most of the Campbell Industrial Park shoreline. This access ranges from improved roads to jeep trails. Marine access, including a small boat launch ramp, is available at the Deep Draft Harbor. Numerous sites, including the harbor and County Park, are available for staging activities. Access to the NAS airspace, shoreline and nearshore waters is restricted. The Duty Officer, Barbers Point NAS, must be contacted regarding access.

Crude and refined product offloading and loading occurs in the offshore mooring/terminal facilities owned by Par Hawaii.

#### Equipment

Some initial response ocean containment boom is located at the moorings. Honolulu Harbor is the current storage area for additional resources.

#### **Response Plan**

#### **General Comments**

- The prevailing wind is the northeasterly trade wind, which will tend to push the spill in a southwesterly direction away from Oahu. Surface currents in this area are diurnal and are seasonally influenced.
- Initial efforts should be designed to contain the spill at the moorings.
- Dispatch response vessels from Honolulu Harbor to the mooring area.
- Dispatch additional equipment as necessary to the Deep Draft Harbor for deployment. Deploy diversionary, exclusionary or containment boom based on the spill events.

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- Notify Barbers Point Naval Air Station and the HECO Kahe Power Plant of the Potential Exposure.
- Track spill movement visually and electronically. Perform spill trajectory simulation modeling using NOAA software.
- Evaluate weather conditions over the next 24 hours.
- Additional efforts to divert the flow around the Kahe Power Plant intake may be taken if required.
- Additional manpower and equipment may need to be cascaded to the spill from other regional response entities.

# **Response Action Points**

In the event of a spill of typical historical proportions the initial response is:

- 1. Deploy on-scene boom to contain spill at the mooring.
- 2. Initial secondary actions may be directed toward gathering free-floating product for offshore recovery at sea.
- 3. In the event of larger spills, take actions along the shoreline in accordance with Worst Case Scenario strategies. Construct short sand bag groins across the beach to retard the long shore low of the spill until recovery is possible. Predesignated possible containment areas are outlined in Annex I related to the Worst Case Scenario. Emphasis should be placed on offshore containment and recovery efforts.
- 4. Additional Efforts may be required to protect the Ko'Olina Marina entrance or the beaches along the front of the Ko'Olina Resort area. Diversion booming to direct the spill into the commercial basin of the deep draft harbor may take advantage of this natural containment area and allow for future recovery efforts.

Figure 66: Barber's Point Moorings GRS



Annex B-Tab 1-32 Version 2024.0 Figure 77: Barber's Point Moorings ESI



Annex B-Tab 1-33 Version 2024.0 Pearl Harbor

#### **Strategic Objectives Map Key**

Read the following definitions and identify them with their corresponding letters and number on the following Pearl Harbor series of charts.

#### Numbers 1-12

1) 2 Deflection legs of 1300 ft boom. Anchored on shore adjacent to range marker connected to Jetty. UT boat OK. SUPSALV per ICP approval.

2) 2 Deflection legs of 800 ft boom. Anchored on Waipio Pt across fence at inlet of fishpond. UT boat OK / wading required.

3) 2 deflection legs of 600 ft boom. Connected shore side of Nav Aid 5, and from range marker. Anchor in Harbor. UT boat OK.

4) 2 deflection legs of 1100 ft of boom. On shore adjacent to old boat landing and from rocky point. Anchor in Harbor. UT boat OK.

5) 2 deflection legs of 1200 ft boom. Connected to V-1 pier and from shore at crane landing. Anchor in Harbor. UT boat OK.

6) 2 deflection legs of 900 ft of boom. Connected to shore side of F-9 pier, and from V-3 pier. Anchor in Harbor. UT boat OK.

7) 2 deflection legs of 1200 ft of boom. Connected to shore side of F-12 pier, and from V-4 pier. Anchor in Harbor. UT boat OK.

8) 2800 ft of staged boom. 1000 ft along west spans. 1800 ft along east spans connect to shores. UT boat / Work boat required.

9) 1500 ft of deflection boom. Connect to Ford Island bridge span #8 flanked towards K-10. Anchor in Harbor. UT boat OK.

10) 2 deflection legs of 1200 ft of boom. Connect to shore side of F-5 (Missouri pier), and K-3 pier. Anchor in HBR. UT boat OK.

11)2 deflection legs of 800 ft of boom. Anchored on B-22 berth across to Y-3B to secure Southeast Loch. UT boat OK.

12)2 deflection legs of 1300 ft of boom. Connect to shore side of F-1, and west side of DD3. Anchor in Harbor. UT boat OK.

# Letters A-K

- A) 200 ft of boom. Anchored from mangrove to fence to secure inlet to fishpond. UT boat OK / wading required.
- B) 200 ft of boom. Anchored from mangrove to fence to secure inlet to fishpond. UT boat OK / wading required.
- C) 200 ft of boom anchored from mangrove to mangrove to secure inlet to Harbor. UT boat OK punt required / wading required.
- D) 200 ft of boom. Anchor from mangrove to mangrove to secure inlet to Harbor. UT boat OK punt required / wading required.
- E) 200 ft of Boom. Anchor from mangrove to mangrove to secure inlet to Harbor. UT boat OK. Punt required / wading required.
- F) 200 ft of boom. Anchor on pier across to jetty to secure inlet from factory. UT boat OK.
- G) 200 ft of boom. Anchor from mangrove to mangrove to secure inlet to Harbor. UT boat OK punt required / wading required.

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- H) 200 ft of boom. Anchor from mangrove to mangrove to secure inlet to Harbor. UT boat OK punt required / wading required.
- I) 200 ft of boom. Anchor from mangrove to mangrove to secure inlet to Harbor. UT boat OK punt required / wading required.
- J) 700 ft of boom, Anchor from shore to shore to wrap USS Bowfin memorial. UT boat OK.
- K) 400 ft of boom anchor from shore to shore to secure inlet from Halawa Stream. UT boat OK.



Figure 88: Pearl Harbor - Overview GRS



Figure 99: Pearl Harbor - Entrance GRS

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Figure 20: Pearl Harbor - North Channel GRS

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Figure 101: Pearl Harbor - Middle Loch GRS

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Figure 22: Pearl Harbor - East Loch GRS



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Figure 113: Pearl Harbor - West Loch GRS

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# Hawaii Area Contingency Plan

Figure 124: Pearl Harbor ESI



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# Hawaii

#### Hilo Harbor

The Port of Hilo is located on the southwest side of Hilo Bay on the northeast side of the island of Hawaii. The channel to the inner harbor leads from deep water on the north, between a coral reef (blond reef) on the east and the west shores of Hilo Bay, then turns sharply east and follows the south edge of Blonde Reef to the wharves in Kuhio Bay. The entrance channel depth and harbor basin depth in Kuhio Bay is maintained at 35 feet. A 10,800-foot long rubble mound breakwater extends in an arc along the reef from the shore east of Kuhio Bay.

Blonde Reef extends 1.5 miles in a northwest direction from the southeast side of Hilo Bay. The reef has depths of 4 to 25 feet with abrupt shoaling on all sides. Opposite Blonde Reef are two small islands on a reef that extends 0.3 miles from the south shore. Kaulainaiwi Island is near the outer end of the reef. Coconut Island is wooded, close to shore, and connected to the Waiakea Peninsula by a footbridge. Coconut Island and the southeast portions of the mainland are composed of sheltered rocky shores and coastal structures with a fine-grained sand beach and adjacent small wetland area on the east bank of Reeds Bay.

The west shore of Hilo Bay is bluff and consists of exposed rocky shores and seawalls with steep gravel beaches. Wailuku River, adjoining the bluffs on the west, has estuarine fish at its mouth; and reef fish, lobsters, and crabs are present in near-shore waters. The shallow reef is locally exposed in many places along the south and west shores. The south shore is a low gravel beach with Bayfront Beach Park, a fine-grained sand beach, and Wailoa River estuary on the south at the head of the bay just west of Waiakea Peninsula.

The outer bay is exposed to the northeast trade winds, but the breakwater protects the inner harbor. A heavy swell is frequently deflected east by the west shore and causes considerable surge at the wharves behind the breakwater. Pacific or Kona storms may generate seas that cause heavy swell and surf along the north and east shores. Hilo Bay is subject to heavy surge, particularly between October and mid-April. A north-northwest current of about 1 knot has been reported in the approach to the harbor. After heavy rains, currents from Wailoa River and Wailuku River set north in the inner harbor.

A large fishing fleet operates in outer Hilo Bay. Hilo has regular interisland barge service and is a port of call for transpacific vessels. A large commercial airport is located south of the marine terminal in Kuhio Bay.

Anchorages may be obtained anywhere under the lee of the breakwater where depths are suitable. Good anchorage is available west of Kaulainaiwi Island in depths of 25 to 35 feet over good holding ground. Special anchorages are on the south side of Hilo Bay and in the east part of Kuhio Bay at the south end of the breakwater. The Hilo harbormaster usually assigns deep-draft anchorages. Well-protected small-craft anchorages with fair holding ground may be found in south Kuhio Bay, and in the basin east of pier 1. Most of the small craft on the area berth

at facilities 0.1 mile south of Wailoa River mouth. Product loading at the Hilo Harbor occurs at Pier 3 on the eastern side of the harbor.

#### Equipment

• The harbor response boom boat/recovery vessel is located along the State Harbor's boat house in "Radio Bay".

#### **Response Plan**

#### **General Comments**

- The prevailing wind is the northeasterly trade wind which will tend to push the spill beyond Pier 2 into Reeds Bay and Hotel Row.
- Initial efforts should be designed to contain spill at source or within the Pier 3 eddy.
- Additional efforts may be required to prevent the spill from entering Reeds Bay and impacting upon the Banyan Drive (Hotel Row) area.
- Deploy boom to exclude the spill from sensitive or recreational areas to the west. If exclusion is impossible, efforts will be conducted to contain product at the natural collection points.

# **Response Action Points**

In the event of a spill of typical historical proportions the initial response is to:

- 1. Deploy boom to either direct oil into the Pier 3 eddy area or contain the spill which has entered that area.
- 2. Conduct open water containment/recovery operations. If spill is moving quickly, effort is probably better spent in protection of the sensitive areas to the west.
- 3. Additional effort may be required in deploying to protect the boat harbor.
- 4. Additional effort may be required to deploy boom to divert oil onto the beach at Reed's Bay to protect Hotel Row.
- 5. Hotel beaches use boom or sandbags to contain spill which has impacted shoreline and is contained by shoreline configuration.
- 6. Deploy boom along footbridge to contain spill.
- 7. Additional effort may be required to deploy boom to close off entrance to Waihaiu Pond.
- 8. Additional effort may be required to deploy boom to protect the entrance of Wailoa River.
- 9. Contain product moving along shoreline with sandbag groins.

# Areas of Sensitivity

- Hotel Beaches and Wailoa State Park
- Wetlands and mangroves along portions of the outer bay shoreline.
- Humpback Whales frequent the outer Hilo Bay area.
- Coral reef habitat along the area outside the breakwater.

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Figure 135: Hilo Bay GRS



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Figure 146: Hilo Bay Fueling Pier GRS



Figure 157: Hilo Bay ESI



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#### Kawaihae Harbor

Kawaihae is a commercial deep-water harbor at the north end of Kawaihae Bay, on the northwest coast of the island of Hawaii. The harbor is protected by a 2,650foot-long rubble mound breakwater parallel; to the west and southwest shores. The breakwater extends from the other side of a large, open, stone revetment and fills area on the south side of the harbor basin. The main basin has a depth of 35 feet behind the breakwater. There is a small-boat basin just north of the main channel with a depth of around 10 feet. Reefs, locally above water in places, extend up to 0.5 mile from the outer side of the breakwater and from the shore to the south. There is a strong north current off Keahole Point and Makolea Point that passes offshore at Kawaihae, where there is practically no current.

Kawaihae has inter-island barge service and is a port of call for transpacific vessels, Good anchorages, except in Kona winds, can be found in depths of 8 to 15 fathoms between Honokaa Gulch and the outer end of the entrance channel. Vessels maneuvering in Kawaihae Harbor must be on the alert for sudden strong offshore gusts caused by the trade winds drawing over the mountains.

Product loading occurs along the main pier located along the easterly side of the harbor.

#### Equipment

Located within the State Harbors and Hamakua Sugar Storage sheds on the main Pier.

#### **Response Plan**

#### General

- The prevailing wind is the northeasterly trade wind which will tend to push the spill in a southwesterly direction across the harbor and into the breakwater.
- Initial efforts should directed toward containing the spill in the main pier area.
- Additional efforts may be required to boom off the marina at the northern end of the harbor.

#### **Response Action Points**

In the event of a spill of typical historical proportions the initial response is to:

- 1. Deploy boom at the main pier area to contain the spill near the source.
- 2. Additional efforts may be required to deploy exclusion boom to protect the small boat harbor entrance.
- 3. This is a debris collection area. Allow spill to collect and contain with booms within this basin until recovery is possible.
- 4. Spill can be contained and recovered along the south shoreline on the harbor using sandbag/groin techniques.
- 5. Additional efforts may be required to deploy deflection/containment boom as necessary to facilitate recovery.

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# Areas of Sensitivity

- Birdlife and fish,
- Green Sea Turtle concentrations in the area N.W. of the small boat anchorage breakwater. There is an extensive coral reef offshore of the entire breakwater.



Figure 168: Kawaihae Harbor GRS

Hawaii Area Contingency Plan

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Figure 179: Kawaihae Harbor ESI

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# Kauai

#### Nawiliwili Harbor

Nawiliwili is one of two commercial deep-water ports on the island of Kauai. It is located on the north side of Nawiliwili Bay on the southeast side of the island. Nawiliwili Bay has a 0.8 mile-wide entrance between Carter and Ninini points and extends about 1 mile. Waterfront facilities at the port are along the north side of a dredged harbor basin in the west side at the head of the bay.

The inner harbor basin is protected by a rock-faced jetty which extends southward parallel to the east, and by a 2,150-foot-long rubble-mound breakwater extending northeast from Carter Point. There is a large, open, riveted fill area located parallel to the west side. The harbor entrance is from deep water via a 40-foot-deep dredged channel which bends to the southwest between the breakwater and Kukii Point, then bends sharply to the west and northwest at the south end of the jetty. The harbor basin is dredged to 35-feet-deep except where there is shoaling along the edges.

The shoreline consists of rocky bluffs, except at the mouth of Huleia Stream on the southwest side of the bay where shoaling has created a sand bar. A rocky ledge with a depth of 12 feet extends about 100 yards south of Ninini Point on the north side of the entrance of the inner harbor, has a low rocky shelf at its base. There is a bight between Kukii Point and the seawall north of the jetty. The bottom is sand and coral and there is a sand beach at the head of the bight. Southeast winds produce some surge but the harbor is safe otherwise.

Product loading at Nawiliwili Harbor occurs at Pier2 on the northern side of the harbor.

# Equipment

There is a container of boom on scene.

# **Response Plan**

#### **General Comments**

- The prevailing wind is northeasterly trade wind which will tend to push the oil into the western side of the Harbor.
- Initial efforts should be designed to contain spill at source or within the inner harbor.
- Additional efforts may be required to prevent spill from entering boat harbor and stream/wetlands.
- Additional efforts may be required to prevent spill from containing Kalapaka Beach.

# **Response Action Points**

In the event of a spill of typical historical proportions the initial response is to:

1. Deploy boom to contain spill at source or in vicinity of mooring area. Mooring buoys may be satisfactory for boom anchoring.

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- 2. Deploy exclusionary boom across the harbor (small boat) entrance.
- 3. Deploy boom near the entrance to Huleia Stream as necessary to exclude the spill from entering wetland areas.
- 4. For larger events it may be necessary to deploy boom from the end of the pier to contain spill in the inner harbor.
- 5. In the event that the spill escapes from the commercial area consider deploying exclusionary boom to prevent oil from impacting beach area.

# **Areas of Sensitivity**

- There are several hotels near Kalapaki Beach.
- The Haleia (National Wildlife Refuge) wetlands are upstream of Huleia Stream.



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Figure 181: Nawiliwili Commercial Basin GRS

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Figure 192: Nawiliwili Harbor ESI

# Port Allen Harbor

Port Allen is one of two commercial deep-water ports on the island of Kauai. It is approximately 0.4 miles long and 0.6 miles wide. It is protected by a 1,200-foot-long rubble mound breakwater parallel to the south side of the harbor basin and extending to the southwest towards Paakahi Point. The shores are low, rocky bluffs except for a gravelly beach at the head of the bay. Breakers may extend 350 yards offshore from the northwest side of the bay and 50 to 150 yards offshore on the southeast side of Puolo point during heavy weather. The Hanapepe River enters the bay from the north and is a habitat for mangrove and estuarine fish and crabs. Its entrance is used for recreational purposes.

Waterfront facilities at the port are on the east side of the basin and include a pier having commercial and military deep-draft access and a small craft marina.

Product loading at Port Allen occurs on the southerly side of the pier.

#### Equipment

Located at the IES Port Allen Terminal

#### **Response Plan**

#### **General Comments**

- The prevailing wind is the northeasterly tradewind which will tend to push the spill to the western side of the harbor.
- Initial efforts should be designed to contain the spill at source or within the inner harbor.
- Additional efforts may be required to prevent the spill from entering boat harbor and Hanapepe River mouth.

#### **Response Action Points**

In the event of a spill of typical historical proportions the initial response is to:

- 1. **Commercial/Military Pier**. This pier is constructed on piles, and spills can be expected to pass under it. For safety reasons, distillate fuel spills should not be contained under the pier. Possible initial response is to deploy boom in areas of the spilled product to corral and contain it. Anchoring the boom into a position to contain the spill will allow time for primary recovery.
- 2. **Marina Entrance**. Close entrance with coastal boom backed by sorbent boom. Use sorbent to seal boom/breakwater interface.
- 3. **Hanapepe River Mouth**. Product exposure to the estuary is dependent on the presence of a river mouth sandbar and the level of streamflow. If the mouth is open consideration should be given to blocking the estuary by diking it with sand (if the seaward flow is low enough) or with inland boom placed in quiet water inside the stream mouth. Dikes or booms could by backed on the inland side with sorbent boom. Under storm conditions, location of the sand bar by sand berming may be required. Accesses for diking is appropriate from the

marina, while booms may require access from both sides. Boom lengths will depend on the current size of the stream mouth.

4. **Beach Collection Area (north end of Hanapepe Bay)**. This area may form a natural collection point under normal conditions (past spills have been reported to ground here). Early response should include rapid manual recovery of grounded product and use of booms to contain product in the general area.

# **Areas of Sensitivity**

- Hanapepe River to wetlands, mangroves and estuarine fish, crabs and high recreational use areas.
- The Hanapepe River has wetlands and estuarine fishes up river.
- Turtles have been seen within the harbor basin.



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Figure 214: Port Allen Harbor ESI

# Lanai

# Kaumalapau Harbor

Kaumalapau is on the west side of Lana`i, 3.5 miles north of Palaoa Point. It is a small bight at the mouth of the most prominent gulch in the vicinity. A shoal area, marked by unlighted buoys at the outer extremity, extends along the south and the east sides of the harbor.

Kaumalapau is the best harbor on Lana`i in all but westerly and Kona weather. The commercial barge landing is on the north side of the harbor.

A 250-foot breakwater is on the north side of Kaumalapau Harbor. A lighted buoy, marking the north side of the entrance, is about 50 yards west-southwest of the outer end of the breakwater. There is no entrance channel but a 600-foot opening leads to a turning basin that is 30 to 50 feet deep and about 500 feet by 800 feet. The private wharf provides cargo sheds and about 400 feet of berthing space. Private facilities also include two 35-ton and one 30-ton crane, bulk handling and storage for petroleum products.

Gasoline, diesel fuel and water can be obtained on the Kaumalapau wharf.

# Equipment

A response container is on-scene.

# **Response Plan**

# **General Comments**

- The prevailing wind is northeasterly tradewind which will tend to push the oil into the western side of the Harbor.
- Initial efforts should be designed to contain spill at source or within the inner harbor.
- Additional efforts may be required to prevent spill from entering boat harbor and stream/wetlands.
- Additional efforts may be required to prevent spill from contaminating Kalapaka Beach.

# **Response Action Points**

In the event of a spill of typical historical proportions the initial response is to:

- 1. Deploy boom to contain spill at source or in vicinity of mooring area. Mooring buoys may be satisfactory for boom anchoring.
- 2. Deploy exclusionary boom across the harbor entrance.
- 3. Deploy boom near the entrance to Huleia Stream as necessary to exclude the spill from entering wetland areas.
- 4. For larger events it may be necessary to deploy boom from the end of the pier to contain spill in the inner harbor.
- 5. In the event that the spill escapes from the commercial area consider deploying boom to divert the spill to the seawall for collection.

Areas of Sensitivity: None.





Figure 236: Kaumalapau Harbor ESI



# Wake Island

# Wake Island Atoll Harbor

Wake Island lies about 340 miles NNW of Taongi Atoll, the northern most of the Marshall Islands, and approximately 2300 miles WSW of Honolulu. It is a U.S. possession with an area of only 3 square miles, consisting of three islands about 6.4m (21ft.) high, which form a horseshoe shaped atoll enclosing all but the NW side of a shallow lagoon. The NW side of the lagoon has a barrier reef that is visible at low tides and prevents entry into the lagoon. The higher parts of the islands are covered with a heavy growth of scrub bush. A shallow reef, interspersed with coral pinnacles, surrounds the entire island group. There is no natural freshwater source.

Wake Atoll consists of three islands: Wake Island, Peale Island and Wilkes Island. Wilkes and Peale Islands are migrant bird sanctuaries. Parts of both of these islands are used to house personnel and have other official uses but are off limits to transient personnel. The majority of base operations, housing and services are located on Wake Island.

Tank vessels offload fuel between A and B buoys on the Southwest side of the island through a floating 8" hose which is connected to a header on the fuel pier. Vessels fuel the island approximately once a quarter. Transfer operations are terminated by Base Operations personnel if the weather or sea conditions are deteriorating, and the wind blows from the southwest.

# **Response Plan**

- Prevailing wind and currents should push the spilled product west (270), which will aid response efforts, by pushing the slick out to sea away from the atoll.
- Deploy boom from prepositioned location (in container) around the mouth of the channel. One end of the boom will be anchored to shore and the other anchored in the vicinity of buoy "B". This boom will deflect oil away from the surf zone and Wilkes Island. This technique should direct oil away from critical areas and either into the open ocean where it will be dispersed into the water column or evaporate. An alternate strategy is to deflect into the boat harbor channel for collection (if weather conditions are different from the prevailing patterns).
- A 5000-barrel tank, which is currently not in use, can be used as temporary storage for recovered oil.

# Equipment

- Approximately 1,000 feet of boom is on hand in a warehouse near the fuel dock. There are also several lengths of floating 8" fuel line that could also be used as boom. The extra fuel hose is stored in the same warehouse as the boom and would also be easily accessible in the event of an emergency.
- Small boats will be required to tend boom and help in other response strategies. There are currently 3 LCM's available to use as response platforms; the boats are moored pierside in the harbor. There are 2-3 small morale boats that could be used if necessary.

- Aircraft fueling trucks can be used to store and transport both recovered and possibly lightered oil in the event of an incident. There are four trucks on hand at base operations.
- There is good supply of sorbant pads, boom and pillows in the warehouse.
- For the temporary storage of recovered oil:
- o 16 85 gallon drums
- $\circ$  12 55 gallon drums

# **Related Contacts**

- U.S. Fish and Wildlife Service, Refuge Manager.
  Telephone: (808) 792-9550
- 15th Logistic Group (Hickam)
  - Telephone: (808) 449-7110

# **Johnston Atoll**

#### Johnston Atoll Harbor

Johnston Atoll, a possession of the United States, consists of four islets that lie on a reef about 9 miles long in a NE-SW direction. Johnston Island (16°45'N., 169°31'W.), the largest island, lies about 2 miles inside the SW end of the reef. Sand Island and Hikina Island lie about 1 and 2 miles, respectively, NE of Johnston Island; Akau Island is about 1 mile N of Sand Island.

The main entrance channel is entered SE of Johnston Island and is marked by buoys, beacons, and range lights. It is dredged to a depth of 35 feet. Maximum draft for vessels entering the harbor under normal conditions is 28 feet. The channel includes a turning basin within the lagoon about midway between Johnston and Sand Islands.

Johnston Atoll is a NAVAL DEFENSE SEA AREA AND AIRSPACE RESERVATION, and is closed to the public. The airspace entry control has been suspended, but is subject to immediate reinstatement without notice. The administration of Johnston Atoll is under the jurisdiction of the Defense Nuclear Agency.

Johnston Atoll has been designated as a National Wildlife Refuge. Though the shallow reefs of the atoll are lush and varied the deep surrounding ocean is biological desert. In the warm westwardly flowing stream of the North Equatorial Current, few nutrients rise to the surface and the microscopic plant life that supports all other marine creatures is sparse. Flowing around the atoll, the current is diverted and turbulence brings the nutrients of deeper water to the surface. This creates a wake of richer marine life downstream (west) and a feeding ground for the thousands of seabirds that roost and breed on the islands.

# **Atoll Ecology**

As the only shallow water and dry land area in millions of square miles of ocean, Johnston is an oasis for reef and bird life. Corals and coralline algae are responsible for the existence of the atoll. Though corals are true animals, colonies of microscopic symbiotic algae are contained in their tissues. The algae contribute their photosynthetic production to the coral, receiving in return secure space in the sun and the coral's waste as nutrients. While fewer species of coral are found here than in Hawaii, a few species not found in Hawaii dominate the reefs of the atoll. The diversity of other reef life such as mollusks, crabs, and urchins is also less than in Hawaii. The reduced fauna, however, does include some species from the western and south Pacific not found in Hawaii. About 280 species of fish have been recorded from the reefs and inshore waters of Johnston Atoll. This is a much smaller number of species than the estimates for Hawaii (820 species). The lack of species is probably due to the atoll's isolation, small size and lack of habitat diversity.

#### **Endangered Species**

Two unique forms of marine life found at Johnston Atoll are protected under Federal laws controlling threatened and endangered species. These species are the green sea turtle (Chelonia Mydas), and the Hawaiian monk seal (Monachus Schauinslandi).

#### Birds

Most of the birds that occur at Johnston Atoll are seabirds. Seabirds obtain their food from the sea and generally possess webbed feet and beaks adapted for feeding on fish. They also have characteristic internal salt glands that make it possible for them to drink sea water. Long narrow wings efficient for soaring are found in many species. Seabirds evolved on islands where natural predators were absent. Compared to other birds, they produce fewer young over their lifetime. Seabirds mate for life and both males and females incubate, brood and feed their young.

Migratory birds also occur at Johnston Atoll. These include species that breed in Alaska, Canada, the mainland United States and Asia and migrate to the Central Pacific for wintering. These include shorebirds and waterfowl.

#### **Response Plan**

• Available boom should be deployed in the vicinity of the small boat pier from the wharf to the point on the opposite side of the small boat pier. This boom will contain the majority of the discharged oil so that clean-up operations can start when the skimmers are deployed.

#### Equipment

- Currently Johnston Island is equipped with 1,900 feet of oil containment boom (900 feet stored in containers on the Navy Pier, the rest deployed along the seawall near tank 49 to contain chronic seepage from subsurface fuel contamination). All of the boom can be used in the event of a discharge.
- Four MIKE (LCM) boats are available for use (Marine Department).
- The Recreation Department has 6 16 foot Boston Whalers available.
- Numerous Trucks and Heavy Equipment have been identified for use from several departments. Earth moving equipment will be required to build protective sand beach berms.
- There is good supply of sorbant pads, boom and pillows on the island.
- For the temporary storage of recovered oil:
  - 25 85 gallon drums
  - $\circ$  20 55 gallon drums
  - 20 55 gallon composite drums
  - 20 30 gallon drums
  - $\circ$  10 8 gallon drums

# **Related Contacts**

• U.S. Fish and Wildlife Service, Refuge Manager.

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