PREASSESSMENT REPORT FOR M/V JIREH GROUNDING IN MONA, PUERTO RICO

IAG Number: M12037-OC01 DCN: 34/13/46/3/V/X3/001

I. PURPOSE

This is the Final Report for The Interagency Agreement (IAG) between the National Pollution Funds Center (NPFC) and the Department of Commerce (DOC), acting as the Federal Lead Administrative Trustee (FLAT) for the following oil spill incident:

Name of Incident: M/V JIREH
FPN: M12037
Date Occurred: June 21, 2012
Location: Mona Island, Puerto Rico

II. INTRODUCTION AND INCIDENT BACKGROUND

At approximately 0700 on 21 June 2012, M/V Jireh, a 202' coastal freighter, ran aground on the south shore of Isla de Mona in Carabinero. Mona Island is located 40 miles off the west coast of the main island of Puerto Rico and is a designated Puerto Rico Natural Reserve surrounded by a no-take marine protected area extending 1 mile from shore. The vessel grounded on a rocky shoreline near a known coral reef and sea turtle nesting

beaches. The U.S. Coast Guard (USCG) determined the vessel posed a substantial threat for a discharge/release of oil and other hazardous materials into or on the navigable waters of the U.S. due to large quantities of oil and other hazardous substances on board and the deteriorated condition of the vessel. Sector San Juan opened the Oil Spill Liability Trust Fund and established a Unified Command to manage the response. On July 31, the USCG determined that removal of the M/V Jireh was necessary to eliminate the threat of discharge.

Immediately following the vessel grounding, the National Oceanic Atmospheric Administration (NOAA) mobilized personnel to get a preliminary assessment of the reef in the area where response actions were going to occur and establish baseline reef condition for purposes of natural resource damage assessment (NRDA). Shortly after these initial assessment efforts, the USCG Federal On-Scene Coordinator (FOSC) requested NOAA assistance with identifying response actions that would minimize resource impacts. The FOSC also requested that NOAA permanently relocate corals away from areas where they may be injured by response activities. Both activities in support of the response were authorized and funded by a Pollution Removal Funding Authorization (PRFA) agreement between NOAA and the FOSC. At the FOSC's request, NOAA suspended its NRDA work while supporting the response.

Based on initial observations, NOAA believed impacts to natural resources may have resulted from response actions (i.e., impacts from response vessel anchors and cables) (Figure 1), specifically to reef resources, including endangered coral (*Acropora spp.)*, sea turtle and bird nesting habitat, and designated protected areas. With the conclusion of response actions on October 5, 2012, and the associated removal of response vessels, barges, high tension cables, and the vessel M/V Jireh, the trustees were able to complete preassessment activities to identify actual or potential types of injuries that resulted from the response activities, including physical injury from response and salvage vessels and activities, mortality of corals relocated out of the response area, and other impacts associated with increased human activity during the response.

Figure 1: Photographs of areas damaged by anchors and cables along with damaged corals in the vicinity of the M/V Jireh.

III. NOTIFICATIONS

The following is a list of trustee agencies contacted by NOAA about initiating an assessment of potential natural resource injuries resulting from this incident, as well as the trustee agency response regarding their desire to participate in the assessment:

	Contacted	*Participating (Yes/No)*
Department of Agriculture	No	
Department of Defense	No	
Department of Energy	No	
Department of the Interior	Yes	Yes
Department of Commerce	Yes	Yes
Commonwealth of Puerto Rico	Yes	Yes
Indian Tribe	No	

The participating trustees worked together to initiate assessment activities for this incident. These trustees have agreed that NOAA will serve as the Federal Lead Administrative Trustee (FLAT), with responsibilities for coordinating assessment activities. NOAA coordinated with other participating trustees to make sure that no activities overlap.

IV. REQUEST FOR FUNDS

Total Amount Obligated by this Agreement **$98,866.93**

These funds are obligated for preassessment of natural resource damages resulting from this incident. Preassessment activities are defined generally under 15 C.F.R 990, Subpart D and, specifically under Section V of this Agreement.

V. FLAT'S ALLOCATION AND USE OF FUNDS

Activity 1: Preassessment characterization of coral reef resources

The trustees conducted the preassessment actions below to further identify any actual and potential injuries resulting from response activities. The preassessment techniques and methods are commonly used in the region to assess the effects of and/or restore for injuries to coral reefs.

1a. Conduct diver surveys and map reef resources in the vicinity of the vessel to provide a baseline prior to response.

During salvage operations, additional injury occurred to coral reef resources in two reef areas on the coast of Mona Island (Carabinero and Sardinera). Near the Carabinero section of Mona Island (adjacent to and offshore of the Jireh) movement of anchors and cables used to stabilize the barge RMG 400 dislodged, damaged and broke corals at

different points during the salvage operations. To the west of where the Jireh grounded, a patch reef in Sardinera was damaged by an anchor deployed for the Tug *Don Raul* and the Barge *Caribbean Lifter*. This anchor was placed on the reef at 69.94258° N, 18.09308° W outside the recommended anchor zone for salvage vessels (Figure 2). Approximately 44 corals were damaged or dislodged at the Sardinera location. These are the only locations the trustees are aware of that were damaged during the Response.

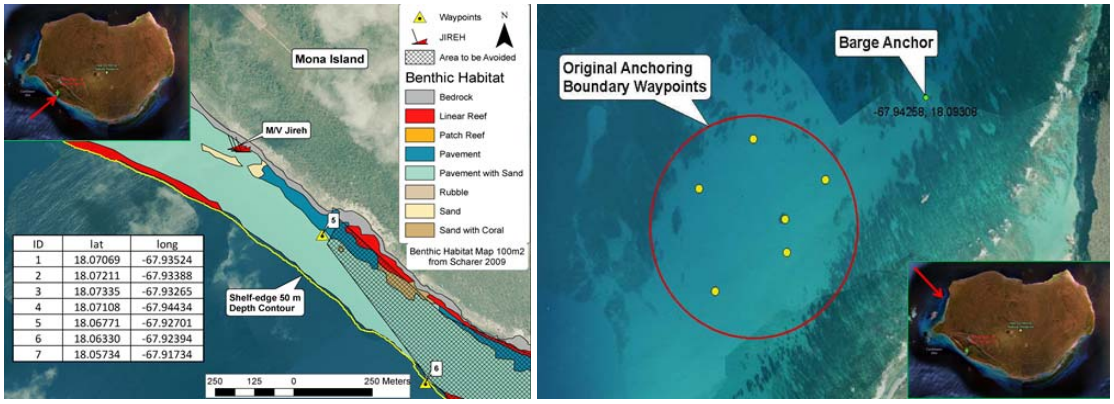

Figure 2: On the left is the location of M/V Jireh grounding site on Mona Island (inset) and close-up view of the habitat adjacent to the M/V Jireh grounding site. On the right is the location of Sardinera on Mona Island (inset) and the location of anchor and mooring locations in Sardinera for tugs, vessels and barges involved in the salvage response (red circle) and the location where the Tug *Don Raul* and Barge *Caribbean Lifter* anchored.

During December, 2012, the trustees conducted comprehensive surveys and mapping of resources that were impacted by response actions. The surveys took 8 days and required a vessel charter, captain and crew, 4 divers, agency staff, and necessary materials, such as tank rentals, generator, cameras, etc.

Coral surveys were performed using AquaMap™, a SONAR (Sound Navigation and Ranging) based survey system, which consists of four baseline transducers and a diver station. The three baseline transducers are stationary units moored to the bottom of the ocean floor around the dive site. The diver station is a mobile transducer and is moved around the dive site to areas of interest. The diver station transmits a brief sonar signal which travels to all four baseline stations. Upon receipt of a signal, each baseline station transmits a reply back to the diver station. The diver station is then able to compute its distance from each of the baseline stations. A relative coordinate system is developed and precise positions (about 0.15 m) can be recorded within the site. A buoy is attached to the baseline stations and geo-referenced with a Global Positioning System. This position, along with a bearing to another baseline station, is used to produce a chart of the estimated injury.

The results of the Aquamap surveys can be seen in Figure 3. The total area that was indirectly impacted during the Response covered approximately 48,000 m^2 or about 12 acres. This includes the entire area where Response actions were taking place around the vessel and out to the shelf edge. Damage to coral reef resources in this area was patchy

with injuries to individual colonies or partial impacts scattered throughout resulting from prop wash, anchors, cables or other causes. 4,655 m^2 of coral reef in this area was heavily impacted, having 100% damage, primarily from anchor and cable scars. This includes 1,719 m^2 that were fully impacted (100% damage) by the anchors and cable near the shelf edge where there are higher densities of corals, and 2,936 m^2 of reef adjacent to the vessel where there are low densities of corals. All of the corals (108 total) in the area adjacent to the vessel were removed prior to any major Response work. The figure also shows isolated individual coral colonies (54 total) and *Xestospongia muta* sponges (49 total) that were damaged outside of the fully impacted areas along with partially impacted areas (18 total).

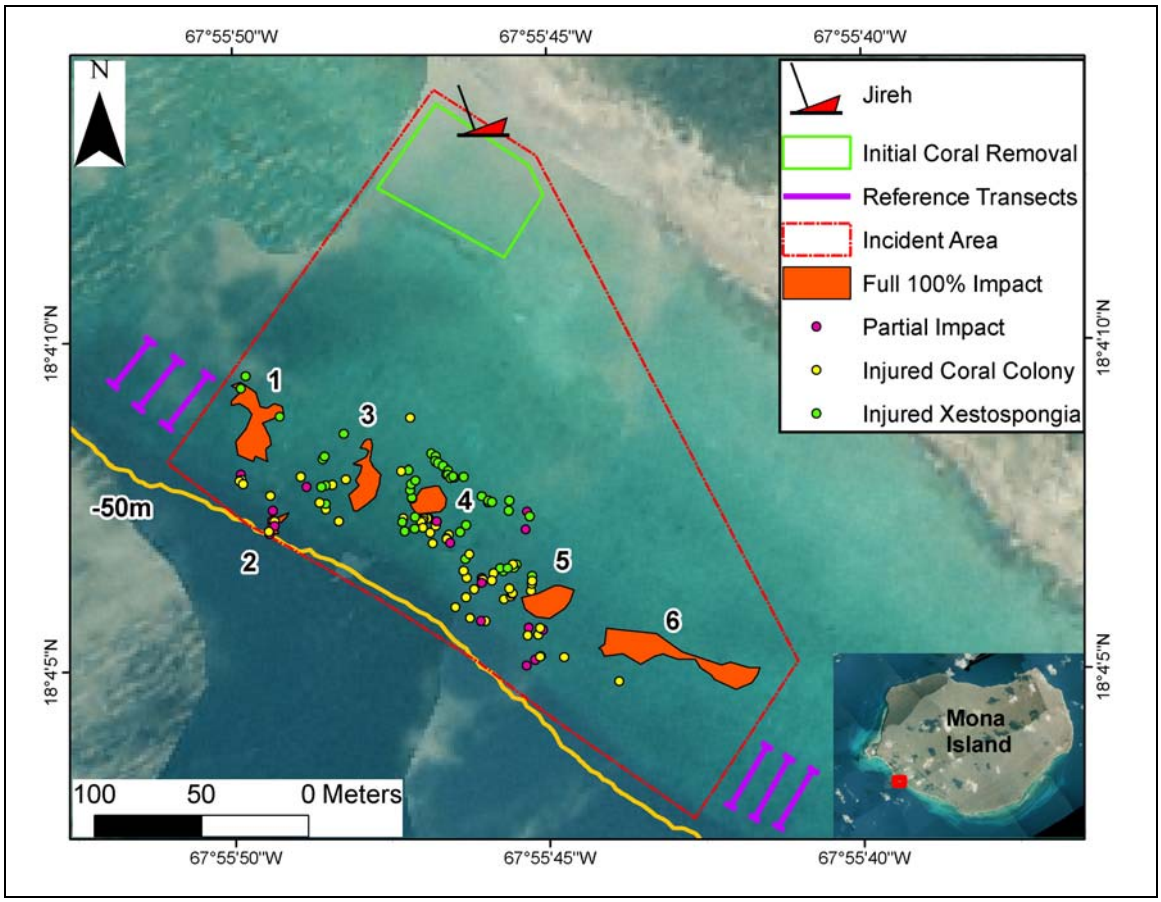

Figure 3: Results from the Aquamap surveys showing the location of the M/V Jireh on Mona Island, the area where corals were initially removed adjacent to the vessel, and areas that were directly impacted by anchors and cables during the Response.

Reference data was collected just outside the impacted areas to provide an estimate of hard and soft corals and other organisms that were within the fully impacted areas. Six 30m transects were set up perpendicular to the shelf edge at the same depth as the anchor and cable injuries. Three transects were placed to the northwest of the impacted area, and three were set up on the other side of the impact to the southeast (Figure 3). Each transect tape was set up approximately 10m apart. For each 30m transect, two $10m^2$ belt transects were performed at either end of the transect line (one from 0-10m and another from 20-30m). Within each $10m^2$ belt transect the following data was recorded:

- The number and species of each Scleractinian coral
- The number and genus of each Octocoral
- The number and species of each Sponge
- The size class of each colony (maximum height or width)

The data collected provides a description of the coral community (the density of organisms and their size distribution) in the areas adjacent to the impacts and can be used to estimate what was lost in the fully impacted areas. The average number of organisms per m^2 is multiplied by the total area impacted (1,719m^2) to estimate the number of organisms that were lost (Table 1). This does not take into account the additional impacts that were incurred outside the fully impacted areas. The additional impacts includes the corals that were initially cleared from the reef adjacent to the M/V Jireh, the corals that were impacted in Sardinera and individual colonies or partially impacted areas that were identified during the Aquamap surveys. These are listed in Table 2.

All Size Classes	Average/m^2	Area of Direct Impact (m^2)	Estimated # of Organisms in Direct Impact
Scleractinians	2.58	1,719	4,441
Octocorals	0.23	1,719	401
Sponges	0.24	1,719	415
All Species	3.06	1,719	5,257

Table 1: Results from the reference transects (Averages/m^2) used to estimate the number of organisms that were in the fully impacted areas by multiplying with the area of Direct Impact (m^2).

Additional Impacts	Aquamap Data	Initial Clearing	Sardinera	Total
Scleractinians	54	108	44	206
Partial Impact	18			18
Sponges	49			49
Total	121			273

Table 2: Additional impacts outside the fully impacted areas. This includes the corals that were initially cleared from the reef adjacent to the M/V Jireh, the corals that were impacted in Sardinera and individual colonies or partially impacted areas that were identified using the Aquamap.

1b. Monitor the survival of corals moved out of the immediate incident area, as directed by the FOSC

As discussed above, in an effort to minimize Response caused injury, the FOSC directed corals to be removed from the area immediately adjacent to the M/V Jireh and where the salver, Resolve, was deploying anchors and cables farther out near the shelf edge (Figure 3). During the months of July through September, approximately 1,000 corals were

proactively removed to prevent additional injury. These corals were reattached in Sardinera or in Carabinera outside the area where Response activities were taking place.

Approximately 10% of the transplanted corals were tagged to monitor health, survival and stability. Reference corals that were not impacted during the Response were also tagged and monitored to provide a comparison for the health and survival between the proactively transplanted corals, and unimpacted corals. A total of 99 transplanted corals (52 in Carabinera and 47 in Sardinera) and 75 reference corals (50 in Carabinera and 25 in Sardinera) were tagged. As of July 2013, 100% of the proactively transplanted corals that were tagged for monitoring are alive and stable. This includes the corals that were transplanted to Sardinera and the corals that were reattached in Carabinero outside of the impacted area during the Response. This also includes the colony of *Acropora palmata* that was removed from under the hull.

The transplanted corals were tagged during the December 2012 survey work described above in Section 1a. The follow up monitoring to determine the corals' health and survival was performed in July 2013. It took 3 days and required vessel charter, captain and crew, 2 divers, agency staff, and tank rentals.

Summary for Activity 1: Preassessment characterization of coral reef resources

Coordination between the USCG, the trustees and the salvers during the Response allowed for 968 corals to be removed and saved prior to being injured by salvage operations. After the successful removal of the vessel, another 825 corals that had been damaged during the Response were reattached during the Emergency Restoration. Between the two phases of Restoration activities, a total of 1,795 corals were saved (Table 3). This represents 32% of the organisms that were impacted during the Response. Considering that restoration activities focused on corals that are over 10cm in diameter, approximately 70% of the corals greater than 10cm that would otherwise have been lost were saved (Table 4). Most Emergency Restoration efforts following groundings like the M/V Jireh are only able to save around 10% of the corals. Given the current high survival rate (100%) of the corals that were proactively transplanted during the Response, the trustees consider the entire operation (salvage and emergency restoration) to have been highly successful in preventing significant additional damage to coral reef resources in the area.

Location	Injury Description	# of Corals Reattached
Reef adjacent to the Jireh	Colonies proactively removed during Response and reattached in Sardinera.	108
Anchor & Cable area offshore the Jireh	Colonies proactively removed during Response and reattached in Sardinera and Carabinero	862
Sardinera	Patch reef damaged by Tug Don Raul during Response and reattached during Emergency Restoration	44
Anchor & Cable area offshore the Jireh	Colonies damaged by anchor and cable movements during salvage operations and reattached during Emergency Restoration	781
All Locations	Total # of colonies reattached during the Response and Emergency Restoration	**1,795**

Table 3: List of corals proactively removed during the response and reattached elsewhere; and the corals damaged during the response via anchor and cable deployments that were reattached during the Emergency Restoration.

	Average/m^2	Area of Direct Impact (m^2)	Estimated # of Organisms Impacted (All Sizes)	Estimated # of Organisms Impacted (Biota > 10 cm)
Scleractinians	0.91	1,719	4,441	1,561
Octocorals	0.23	1,719	401	401
Sponges	0.20	1,719	415	344
Additional Impacts			273	273
Total			**5,530**	**2,579**
			(All Sizes)	**(Biota > 10 cm)**
# of Reattached Corals			**1,795**	**1,795**
% Restored			**32%**	**70%**

Table 4: Total number of organisms impacted during the Response, and the number of corals reattached during the Response and Emergency Restoration.

Activity 2: Assessment of Turtle Impacts

The trustees believe that high light intensity from the tugs and barges anchored in Sardinera may have disrupted turtle nesting along those beaches. Bright lights have been reported to disorient nesting turtles, causing them to abort a nesting attempt. Successful nesting rates for the ESA listed Hawksbill turtle fell to 30% in Sardinera compared to 50% on other beaches in Mona during that same time period and historical averages. Once the vessel captains were notified on July 19, the lights were reduced and nesting activity appeared to resume to normal. Upon further review of the information available, no more investigation was put into this.

The reefs around Mona are designated critical habitat for hawksbill turtles. Additional adverse effects from Response activities on this species include degradation of foraging habitat in Carabinero and Sardinero where reefs were damaged during the Response.

Sponges are one of the major components of the hawksbill's diet. There were impacts to these resources off of Carabinero, but no damaged sponges were observed at the Sardinero site. According to the data collected during the preassessment mapping presented in Tables 1 and 2, approximately 464 sponges were damaged or destroyed in the Sardinero area during the Response. Only 5% of these sponges were able to be saved proactively prior to deployment of anchors and cables. About 10% of these sponges were cleaved in half by the cables and while this represents a loss in biomass, the part of the colonies that were left behind were starting to recover after a couple months. The rest of the sponges that were damaged by anchors and cables during the Response were not able to be saved. Once the sponges are broken free from the reef, they tend to be carried away by currents because of their light weight.

Activity 3: Case coordination, management, and reporting

In addition to general coordination, planning and reporting to the NPFC, the trustees needed to compile the data generated during the preassessment and generate a report based on this data. Based on the results of the data and the report presented here, the Trustees believe that enough information is available to make a determination if further restoration planning is required for this case.

Summary of IAG Activities

Table 5 provides a summary of NOAA's preassessment costs. NOAA's cost documentation package for this work can be found in Appendix 1. Christopher Plaisted served as legal counsel for this case for NOAA's General Council. Tom Moore was the case lead and representative from NOAA's Restoration Center. Dan Hahn was the technical representative from NOAA's Assessment and Restoration Division who participated in injury assessment coordination with NOAA and co-Trustees; review of documents such as extraction plans in order to assure minimal collateral injuries as part of the salvage process; and early interactions with NPFC to scope initiate funding. Sean Griffin, who was contracted previously through IMSG and currently through ERT, served as the on the ground technical oversight throughout the project and was in charge of data collection, analyses and reporting. Sea Ventures, Inc. provided the contractual services to provide vessel and dive support for work in Mona during preassessment. Activity 1a was completed in December, 2012 and Sea Ventures provided 8 days of vessel, crew and dive support which cost $32,471.40. Activity 1b was completed in July, 2013 and took 4 days. Logistical support from Sea Ventures for this part of the work cost $12,521.73 for a total of $44,993.13 in contractual services during preassessment.

Cost Components	GCNRS	ARD	RC	Total
Personnel	$7,323.18	$4,330.92	$7,795.29	$19,449.39
Contractual Services (Sea Ventures)			$44,993.13	$44,993.13
Contractual Labor (IMSG/ERT)			$33,477.01	$33,477.01
Contractual Labor		$3,134.37		$3,134.37
Total	**$7,323.18**	**$7,465.29**	**$86,265.43**	**$101,053.90**

Table 5: Summary of NOAA's preassessment costs.

VI. FINAL REPORTING

As of this final report, all preassessment activities for the Jireh case have been completed. Based on the results presented in this report, the Trustees will be able to make a determination if further restoration planning is needed. A budget summary has been provided in the previous section and a more detailed cost documentation can be found in the Jireh Preassessment Certified cost package with the timeframe of June 21, 2012 through December 27, 2014 provided with this report. The NPFC originally obligated $98,866.93. NOAA spent $101,053.90 on this preassessment. NOAA will work with the NPFC transfer funds.