RESTORATION AND MONITORING PLAN
M/V JACQUELYN L GROUNDING SITE
WESTERN SAMBO REEF, FKNMS
JULY 7, 1991

Prepared by:

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1. DESCRIPTION OF THE INCIDENT

At approximately 9:00 am on the morning of July 7, 1991, the M/V JACQUELYN L, a 54 foot sportfishing vessel, grounded on the Western Sambo Reef in the Florida Keys National Marine Sanctuary (FKNMS). Western Sambo is located approximately 4.8 nautical miles from Key West, FL. The vessel caused extensive injury to corals along a grounding tract approximately 107.5 meters long, at a depth of 4 feet (1.2 meters).

Field personnel from the Florida Keys National Marine Sanctuary arrived on-scene on July 9, 1991 to conduct an injury assessment and document the nature and extent of the injury to sanctuary resources at the grounding site. The most severe injury was to elkhorn coral, Acropora palmata, which dominated the grounding site. Acropora palmata colonies were broken, shattered, and overturned. Impacts to other coral species included crushing of fire coral, Millepora complanata, splitting and fragmentation of starlet coral, Siderastrea siderea, dislodging of brain coral, Diploria strigosa, mustard hill coral, Porities astreoides, and uprooting of purple sea fans, Gorgonia ventalina. An associated impact of the grounding was split, fractured, cracked and crushed sections of non-living reef framework. Based upon on-scene assessment of the injured area, the grounding caused 123.31 sq. meters of total injury, 0.5 sq. meters of partial injury, and fractured 73.0 sq. meters of the reef framework.[1]

Field personnel revisited the site in April 1997 (NOAA personnel only) and September 1997 (NOAA and State of Florida personnel) to update their assessment of site conditions and restoration actions necessary or appropriate to facilitate its recovery from the impacts of the grounding. The following plan describes the restoration and monitoring activities which are appropriate to facilitate recovery based on the September 1997 site conditions.

In July 1997, NOAA and the State of Florida (hereinafter, the Trustees) reached a settlement agreement with the insurer for the responsible parties. As a result of this settlement, NOAA received $125,127.00, to implement this restoration and monitoring plan at the grounding site, based on cost estimates developed during the assessment phase. The Trustees agree that these funds will be used to implement the restoration and monitoring activities described below in this plan. The following plan describes the specific restoration and monitoring activities to be carried out by the Trustees.

[1]Memorandum from Harold Hudson to Mike McLemore thru Alan R. Bunn, entitled "Boat Grounding", September 25, 1991.

2. RESTORATION GOALS AND OBJECTIVES

2.1 Restoration Goals

The goal of the restoration for this grounding site, described below, is to restore the resources that were injured as a result of the M/V JACQUELYN L grounding and to reduce the time to full recovery.

The Trustees are cognizant that full ecological recovery of these injured resources may never occur. The massive coral reef structures in the Keys are the product of thousands of years of growth. Recolonization depends on successful recruitment and sufficient stony coral development to withstand serious natural perturbations and predation and to provide three-dimensional relief. Recovery is dependent on a number of interrelated environmental and ecological factors superimposed over time. Recolonization of Atlantic reef coral communities to injured substrate is such a slow process, especially in the Florida Keys, that natural recovery or intervention may never achieve pre-injury resource levels. Consequently, the overall restoration objective encompasses multiple goals: to restore the resources injured by the grounding; to enhance the post grounding conditions at the site to accelerate natural recovery; to prevent additional injury from the rubble remaining at the grounding site; and to monitor the restored site.

2.2 Restoration Objectives

The National Marine Sanctuary Act, §1443(d)(2) (A), (B), and (C), defines the appropriate use of recovered damages in order of priority as " (A) to restore, replace, or acquire the equivalent of the Sanctuary resources which were the subject of the action; (B) to manage and improve the national marine sanctuary within which are located the sanctuary resources which were the subject of action; and (C) to manage and improve any other national marine sanctuary." The Trustees' restoration objective for this grounding is to conduct feasible, cost-effective, on-site, in-kind restoration using the best available techniques to accelerate recovery to the pre-grounding service levels.

2.3 Project Selection Criteria

The following criteria were used to evaluate and select the restoration actions identified in this plan. These criteria satisfy the restoration objective while taking into account technical, environmental, economic and social factors. Table 1 lists these criteria and provides a definition for each.[2]

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[2]The order in which these criteria are listed in Table 1 does not reflect any measure of their relative importance.

Table 1 - Criteria for Evaluating Restoration Alternatives

	Criteria	Definition
1	Reduce Potential for Additional Injury	Reduce the potential for an increase in the nature or areal extent of the existing injury.
2	Technical Feasibility	Likelihood that a given restoration action will work at the site and that the technology and management skills exist to implement the restoration action.
3	Reduce Recovery Time	Measures that accelerate or sustain the long-term natural processes important to recovery of the affected resources and/or services injured or lost in the incident.
4	Reduce Potential for Collateral Injury	Likelihood that the requirements, materials, or implementation of a restoration action minimizes the potential for collateral injury.
5	Consistent with Restoration Objectives	Maintain a consistency with Sanctuary restoration objectives at all injured sites.
6	Aesthetic Acceptability	Restoration alternatives that create substrates and topography that most closely resemble the surrounding habitat and minimize visual degradation.

3. RESTORATION ALTERNATIVES

There are few effective restoration alternatives currently available to address injuries to coral reefs. Among those that exist, even fewer are suitable for use at the JACQUELYN L grounding site because of the shallow depth at the site, which eliminates any alternative that cannot withstand strong wave energy. Below are several types of restoration activities that have been successfully implemented in South Florida and/or the Florida Keys. Each has been considered and evaluated with the criteria described in Section 2.3. Brief explanations are provided as to why an alternative was or was not included in Section 4.0, Selected Alternative.

Alternatives fell into one of two categories, coral community restoration and structural restoration. Coral community restoration relates to the assemblages of coral colonies and to the benthic invertebrates and reef fishes that utilize mature coral colonies as habitat. Structural restoration relates to the physical reconstruction of the three dimensional complexities of the former coral assemblages and the establishment of secure foundations for recolonization and natural succession.

3.1 Coral Community Restoration

The sections below describe the alternatives considered for coral community restoration. These activities are designed to restore the individual coral colonies, destroyed or otherwise injured by the grounding, that serve as habitat for reef fishes, invertebrates and marine algae.

3.1.1 No Action Alternative/Natural Recovery

A natural recovery alternative relies on natural larval recruitment and succession of species to approach pre-injury coral assemblages. Natural recruitment of coral larvae is highly variable both spatially and temporally, and rarely results in high survivorship to adult colonies. A major factor affecting the likelihood of natural recovery is the presence of stable substrate suitable for natural recruitment. Physical insults such as vessel groundings often leave a more inhospitable substrate. These groundings diminish the natural resource services which uninjured coral reef ecosystems would provide. Small pieces of coral rubble scour the bottom when moved by storm waves, eliminating most coral recruits that do manage to become established.

Several reasons exist for rejecting this alternative. A no action alternative increases the risk of secondary injury to nearby coral colonies from the unstable rubble that exists at the JACQUELYN L grounding site. This rubble can be moved about by storm wave energy and driven into healthy coral colonies nearby. Storm energy can also peel back the reef crust in areas severely fractured and crushed by the weight of the grounding vessel. This phenomena has been witnessed at the M/V ALEC OWEN MAITLAND grounding site on Carysfort Reef in the Key Largo National Marine Sanctuary.

The unique and spectacular coral reef ecosystem in the waters off the Florida Keys is a major attraction to many tourists and year-round residents. Taking no action will prolong the time that this injury remains an unsightly scar in an area that is frequently visited by divers and snorklers. This option clearly does not promote the restoration objectives or goals nor does it meet the criteria discussed in Section 2.3.

3.1.2 Rubble Removal/Natural Recruitment

A similar alternative to no action/natural recovery is to promote the prospects for natural coral recruitment by removing coral rubble from the site. Removing rubble lowers the risk of scouring described above, but does little else. The threat of the reef crust peeling back and expanding the injury is not addressed and remains a problem.

A rubble removal, natural recruitment alternative is unacceptable for many of the same reasons a no action/natural recovery is unacceptable. Most of the restoration objectives or goals are not met following this alternative and the listed selection criteria are similarly unfulfilled.

3.1.3 *Reef Modules*[3]

Reef modules are replacement habitats that mimic areas destroyed or otherwise altered by vessel groundings. The modules currently being used by sanctuary biologists have two basic designs. The designs mimic either individual coral boulders or the natural accumulations of coral, algae, and other organisms that create the geologic formations called reefs. Coral boulders are mimicked by the design known as "hemispheric domes". Domes may be smooth or roughly textured on the exterior. Underneath, domes can be concave and rough to provide habitat for cryptic organisms[4]. Reef replacement modules mimic the three dimensional complexity of a coral reef spur or buttress, including its internal voids. A recent example of successful deep reef restoration (the Sunny Isles project) involved the placement of 50 reef modules of multiple designs in an area injured by dredging equipment during a beach renourishment project. This site is located in 50 to 60 feet of water, approximately 15 miles north of Miami, Florida.

Reef modules may be more desirable aesthetically than other types of artificial reef because they can be difficult to distinguish from natural coral assemblages over a period of years due to the growth of algae and sessile organisms. Functionally, the modules serve as: stable recruitment and colonization sites for coral and other sedentary species; three dimensional habitat for fish; and habitat for cryptic benthic invertebrates and other small organisms that are a critical component of the reef ecosystem.

Use of a particular design is dependent on physical and ecological parameters that exist at the site, such as wave energy and the community composition. The JACQUELYN L grounding site was essentially a monotypic stand of elkhorn coral with a few other coral heads interspersed around the area.

Reef modules, both replacement modules and hemispheric domes, have been eliminated as an alternative for the JACQUELYN L grounding site since such modules, as currently designed, are not representative of the coral reef community structure at Western Sambo before the grounding. Modules are by no means

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[3]Personal communication with Harold Hudson, Regional KLNMS Biologist, June 1994.

[4]Cryptic organisms refer to those species that by their form, behavior or habitat are not easily detected by predators or the untrained eye.

visually degrading to the site, but they would represent an alteration in community type. Reef modules do not meet the first, fifth and sixth listed selection criteria.

3.1.4 Coral Transplanting

Since many corals are capable of asexually regenerating complete colonies from relatively small fragments, re-establishment of adult colonies to pre-grounding abundances can be accelerated by transplanting colony fragments to injured areas. Coral transplanting involves adhering live hard or soft corals to stable substrate with quick setting lime-based cement. Transplanting coral should not be confused with reattaching broken coral fragments to the parent colonies. Broken fragments can weld or fuse themselves back onto the parent colony in a matter of months if there is mutual contact between live tissues with the attached portion of the broken fragment immobilized. In contrast, fragments from donor colonies can be relocated to areas several miles away and fixed at similar depth and light conditions.

Entire colonies are not removed from their point of attachment, rather, blades or branches are selectively pruned as donor colonies. This methodology leaves mature colonies in place to regenerate lost branches. Further, collection in this manner keeps donor colonies at sustainable levels.

Given a stable substrate, transplanting coral colonies is a viable method of more rapidly restoring species composition, colony abundance, and habitat complexity, relative to natural recovery. Almost all restoration criteria are met by transplanting. Transplanting is technically feasible, reduces recovery time, has very low potential for collateral injury, is consistent with restoration goals and objectives, and is aesthetically acceptable. Thus, transplanting meets the second, third, fourth, fifth, and sixth listed selection criteria.

3.2 Structural Restoration

The sections below describe the alternatives considered for the structural restoration of the injured reef. These alternatives reduce the potential for additional injury and increase the prospects for coral recruitment.

3.2.1 Rubble Removal and Rubble Stabilization

Rubble stabilization eliminates the threat of injury to new coral recruits, coral transplants, and nearby established coral colonies from rubble that is moved about by storm wave action. There are two options to eliminate this threat. The first is to remove the large coral rubble, defined as those pieces 25 centimeters or greater on a side. (Most small rubble has migrated out of the grounding site with seasonal storms). The second is to stabilize large cobble-sized rubble by means of specialty cement. Cementing rubble to the bottom is done selectively. The goal is not to pave the bottom, but to choose large pieces of rubble in strategic areas that will maximize recruitment success.

In-place stabilization serves at least four functions: 1) increasing optimal coral recruitment sites; 2) creating cryptic habitats for mobile animals that are important components of shallow reef communities; 3) increasing the overall three-dimensional complexity of the grounding site; and 4) creating stable transplant sites.

Rubble stabilization is a technically feasible technique and meets all of the listed selection criteria. Additional injury potential is reduced utilizing a method that minimizes potential for collateral injury. Some services, such as three dimensional habitat can be restored, thereby reducing the recovery period. No visual degradation will occur and many of the repairs will be indistinguishable from surrounding substrate in a matter of months.

3.2.2 Reef Framework Repair[5]

Open fractures in the reef framework can accelerate bioerosion and storm erosion. Living coral, dead coral, and other carbonate rock surfaces comprise the reef framework. Any split, crushed, cracked, or otherwise fractured surfaces that can be moved by hand are considered unstable and require repair. Unstable substrates may not support fully mature Acropora and may shift and destroy coral colonies in a severe storm. Only rock and coral fragments that can fit precisely into a matching void in the substrate are considered in implementing framework repair. Grouting with quick setting underwater cement stabilizes these framework fractures.

There is significant fracturing at the JACQUELYN L grounding site that merits framework repair. As finer sediments and rubble are moved out from between fractured surfaces by storm wave action, potential for secondary injuries increase.

Framework repair, like rubble stabilization meets the first five selection criteria for almost identical reasons. One difference however between framework repair and rubble stabilization, is that framework repair does not increase the three dimensional complexity of the area.

[5]J. H. Hudson and R. Diaz, *Damage Survey and Restoration of M/V WELLWOOD Grounding Site, Molasses Reef, Key Largo National Marine Sanctuary, Florida,* Proceedings of the 6th International Coral Reef Symposium, Townsville, Australia, 1988.

4. SELECTED RESTORATION

The selected restoration plan involves a combination of three alternatives described above, 3.1.4 Coral Transplanting, 3.2.1 Rubble Stabilization, and 3.2.2 Reef Framework Repair. Briefly, the project involves stabilizing broken and dislodged dead coral fragments and transplanting new colonies of elkhorn coral, pruned from healthy donor colonies onto the stable substrate, as well as repairing all major fractures in the reef framework. The combination of these activities will eliminate further secondary injury, replace lost habitat, reintroduce highly valued coral species in a manner designed to facilitate the re-establishment of those species at the grounding site, and reduce the time to recovery. All selection criteria, restoration objectives and restoration goals are similarly met.

It is assumed that all restoration activities would take place between the third week in June and the second week in September. This period represents the time of the year when the majority of hours in each week have average hourly wind speeds of less than 10 knots -- the threshold speed above which restoration activities cannot be performed.[6]

The general order of restoration activities will be to combine framework repair and rubble stabilization simultaneously with the reattachment of collected transplants. Daily harvest of transplant material will be limited to the number of A. palmata blades that can be reattached on the day they are collected. This procedure insures that in the event of equipment failure or other emergency, few, if any, loose coral transplants would be at risk until field work could be resumed.

4.1 Pre-Restoration Activities

The grounding site is presently marked with a permanent concrete benchmark and 2 strategically placed galvanized steel spikes. The spikes mark the location of aerial survey targets that were deployed during the initial injury assessment survey. Temporary spike markers will be upgraded to permanent status by slipping a 3/4" (2 cm) diameter x 24" (60 cm) long heavy-wall stainless steel pipe over each spike. Pipes will be secured with epoxy cement (pipe to spike) and a reinforcing collar of Type II Portland cement will be built up around the existing cemented spike monument to stabilize and anchor the pipe. Differential GPS coordinates will be established for each of the 3 permanent site markers.

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[6]Weeks 29 and 37 and represent very slight exceptions, with 50.12% and 50.18% of hourly average wind speeds exceeding 10 knots.

4.2 *Framework Repair*[7]

Recent visits to the grounding site indicate that at the vessel's final resting place one quarter of the area of the original 73.0 square meters of injured reef framework still requires active restoration.[8] Using the cementing procedures described in Section 4.4, *Rubble Stabilization,* divers will re-attach dislodged pieces of reef framework to corresponding voids in the substrate.

4.3 *Donor Collection*

Transplanted fragments will be pruned from large, healthy donor colonies living in physically comparable habitats (e.g. depth, light, waves, etc.). Collections will be conducted primarily on Western Sambo reef to minimize the stress associated with pruning and transporting donor colonies. Transplants will be relatively large (>50cm) in order to increase early survivorship rates after cementation. Selected blades of elkhorn coral will be dislodged with hammer and chisel. Donor transplants will be transported by boat to the grounding site in open 30-gallon plastic containers filled with fresh seawater.

Candidate donor sites will be not be greater than 1 mile distant from the grounding site to minimize stress associated with collection and transport. The greatest number of individuals will be collected from an area roughly 300 yards from the grounding site. Sanctuary biologists estimate, based on recent visits to the grounding site, that 50 transplants represent the appropriate number required to restore the site. Additionally, they have determined that this area can support 50 donations of sufficient size (≥50 cm) without significant loss of services or aesthetic value. Daily collection will be limited to the number of transplants which can be secured that day.

4.4 *Rubble Stabilization*[9]

Recent visits to the grounding site indicate that stabilization will be required for all transplant sites. A pre-restoration survey will be made of the grounding site to identify and mark stabilization/transplant sites.

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[7] J. H. Hudson and R. Diaz, *Damage Survey and Restoration of M/V WELLWOOD Grounding Site, Molasses Reef, Key Largo National Marine Sanctuary, Florida,* Proceedings of the 6th International Coral Reef Symposium, Townsville, Australia, 1988.

[8] While the remaining three quarters of the injured framework has not yet fully recovered, the extent of recovery and recolonization that has occurred on-site would render any attempts to repair to this portion of the underlying injured framework more harmful than beneficial.

[9] J. H. Hudson and R. Diaz, *Damage Survey and Restoration of M/V WELLWOOD Grounding Site, Molasses Reef, Key Largo National Marine Sanctuary, Florida,* Proceedings of the 6th International Coral Reef Symposium, Townsville, Australia, 1988.

Large coral rubble fragments will be stabilized immediately prior to securing coral transplants in place. Loose sand, gravel, and attached algae will be removed from selected sites in order for the underwater cement to bond properly.

4.5 Transplanting

A key element in restoration technology at this site is the use of Portland Type II cement that does not contain moulding plaster. This ingredient is normally added (25% by volume) to trigger rapid (4-6 minute) hardening of the cement as protection against "washout" in high energy environments. Since the grounding site can only be accessed during calm, low wave energy days, cement "washout" will be minimal, providing extended (up to one hour) working time for mixed cement. This allows the diver time to repair framework, bond rubble and/or attach corals in one operation. In practice, sufficient cement is mixed to a very stiff consistency (low water to cement ratio) and applied by the diver as an intact ball-shaped mass to a pre-cleaned restoration/transplant site. The plastic nature of the cement allows the lower half of the cement ball to flow into cracks and voids in the reef, effecting a strong repair and bond. An A. palmata blade is then pressed firmly into the upper half of the cement ball. Care is taken to align the blade in a normal growth position and restrict cement to the underside of the transplant. Where substrate conditions permit, a limited number of transplants (up to 10) will be attached with 1/16" (1.5 mm) stainless steel wire and/or plastic electrical tie wraps.

Location of each transplanted coral will be plotted on a master site map with the aid of a permanently installed concrete benchmark and removable "compass rose". Locations will be plotted according to recorded distance and compass bearings from the benchmark. With this information the diver/scientist will be able to quickly locate each transplant position. All transplants will then be photographed and documented for monitoring, described later. One site will remain undisturbed to monitor natural recruitment. This site will also be photographed and documented.

4.6 Transplant Density

Balancing the number of transplants needed to replace the services lost to the injury with the number of transplants that can be removed from donor colonies without significantly reducing donor services was carefully considered in determining the total number of transplants. Taking into account the level of recovery that has already occurred at the site, Sanctuary personnel relied on their experience with and knowledge of successful restorations, as well as their best professional judgment to make these determinations. As mentioned in Section 4.3, Donor Collection, Sanctuary biologists believe that for this project, Western Sambo Reef can withstand the removal of 50 transplants without a significant decrease in services.

Transplants will be arrayed spatially such that total colony densities ultimately will approximate the pre-grounding levels (accounting for future colony growth). To the extent possible, transplants will be interspersed with naturally occurring colonies. If multiple transplants are collected from a single donor colony, these genetically identical clones will be marked and transplanted to different areas of the grounding site, in order to maximize local genetic diversity.

Placement of the colonies will strive for not only a comparable preinjury density, but also an aesthetically comparable distribution taking into consideration the time necessary for transplants to grow into mature colonies. The number and placement of transplants throughout the restoration site will vary to mimic the natural distribution of corals.

5. ENVIRONMENTAL REVIEW, SUPERVISION AND PERMITTING

5.1 Preparation of a Categorical Exclusion

Restoration projects are subject to Federal regulations which require project review and issuance of appropriate environmental permits. However, given the relatively small scale and nature of this restoration project, NOAA restoration specialists believe that this restoration plan will qualify for a categorical exclusion under applicable National Environmental Policy Act (NEPA) regulations through the submission of a request for categorical exclusion, eliminating the need for a more detailed and costly Environmental Assessment (EA).

5.2 Environmental Permitting

Implementation of restoration projects requires environmental permitting. In this case, only Federal regulations apply, although State consistency will be sought. In addition to the relevant Federal and State permits, coastal zone management (CZM) consistency will be sought. The Department of the Army's permit program, within the Army Corps of Engineers (COE), is authorized by Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. These laws require permits authorizing activities in or affecting navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of material for the purpose of dumping it into ocean waters. Information on activities related to the above must be submitted to the COE and SRD in a permit application for evaluation.

5.3 Supervision of Restoration Activities

While staff and time constraints may require the Trustees to utilize outside contractors to implement the specified restoration activities, NOAA and the State of Florida will supervise any contractor activities to ensure compliance with restoration goal, objectives and performance criteria. Construction activities by the selected contractors (if necessary) will require on-site supervision by NOAA and/or State field staff.

6. MONITORING

Monitoring restoration projects provides information to Trustee biologists as to whether the project is functioning and providing services in a manner consistent with restoration goals. Biologists utilize monitoring data to determine if mid-course corrections of the restoration project are necessary. The design of the monitoring program must permit the detection of, and response to, significant changes in community structure as a result of external events, such as major storms.

6.1 Site Marking

The site marking is described in Section 4.1, Pre-Restoration Activities. In order to adequately assess recovery rates, the grounding site will need to be monitored regularly over the next five years. Consequently, the initial method of marking and locating the site must be standardized, easily repeatable, and not subject to error or individual variation by sequential researchers.

The "compass rose" technique will be used to locate individual corals for long-term monitoring. This technique utilizes the reference monument described in Section 4.1 as an origination point for divers to swim on a compass heading for a measured distance to locate transplants or other site markers.

6.2 Monitoring Variables

During monitoring the following monitoring parameters will be observed and/or measured for sampled transplant sites:

- incidence of algal cover,
- structural integrity of the re-cemented reef framework;
- evidence of cement toxicity on adjacent organisms;
- growth and survivorship rates of transplanted or stabilized coral fragments;
- recruitment rates of new corals and other invertebrates;
- re-establishment of previous 3-dimensional relief and habitat structure; and
- recolonization of site by typical reef-dwelling organisms other than corals (fish, crustaceans, other invertebrates).

6.3 Monitoring Techniques

Data will be collected in three ways: manually by direct count or measurement (e.g. for 3-dimensional habitat structure); with high-resolution down-looking photographs of the transplanted corals; and with a high resolution (8mm) underwater video camera. A metric scale, transplant number and north arrow will be included in photo/video documentation of each transplant. Photos will be digitized and compared statistically over time to detect change in community composition.

6.4 Monitoring schedule

The monitoring plan developed for this site assumes that a principal investigator and assistant biologist each make two field trips per year for each of the five years of the monitoring plan.

Each field trip will consist of two divers working for four days. Two divers are necessary for safety as well as for reducing the potential for errors in measurements and observations.

Following each field trip, up to eight days will be required to process the observations and measurements, enter information into a database, analyze the data and prepare a report. Also included in this period is the time necessary to transcribe field notes, develop film, and identify and record all photographic slides and/or video tapes.

7. RESTORATION AND MONITORING IMPLEMENTATION

Costs to implement on-site restoration and monitoring activities at the JACQUELYN L site were estimated during the damage assessment process undertaken by NOAA and the State of Florida following the grounding. In an August 1997 settlement, NOAA and the State of Florida recovered these estimated costs, $125,127.00, from the parties responsible/vessel's insurer.

Pursuant to Section 312(d)(3) of the National Marine Sanctuaries Act, 16 U.S.C. 1442(d)(3) and Section VII of the NOAA/Florida Civil Claims MOA, NOAA and the State of Florida agree that these recovered funds are available for use to implement the on-site restoration and monitoring actions described herein. Further, NOAA and the State of Florida agree that the actions described herein should be jointly implemented by NOAA and the State of Florida. The costs incurred to implement these actions will be reimbursed from recovered funds.

8. NOAA AND STATE OF FLORIDA APPROVAL PURSUANT TO 16 U.S.C. 1442(d)(3) AND SECTION VII OF NOAA/FLORIDA CIVIL CLAIMS MOA

NOAA and the State of Florida acknowledge that a further agreement on spending may be required in the event that any settlement funds remain after implementation of this plan.

Further, the undersigned representatives of NOAA and the State of Florida each certify that he/she is authorized under Section 312(d)(3) of the National Marine Sanctuaries Act to enter into this spending agreement on behalf of NOAA and the State of Florida, respectively.

Charles Wahle
Technical Projects Branch Chief
NOAA Sanctuaries and Reserves Division

12/15/97
Date

Edwin Conklin
Director of Division of Marine Resources
Florida Department of Environmental Protection, and
Designated Representative for Board of Trustees

12 3.97
Date

REFERENCES

Hudson, Harold. Memorandum to Mike McLemore thru Alan R. Bunn entitled 'Boat Grounding', September 25, 1991.

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