TITLE

Removal of Grounded, Derelict or Abandoned Vessels as Site Restoration[1]

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ABSTRACT

Many agencies and organizations in the United States are implementing habitat restoration using a wide array of methods across a variety of habitats. These efforts are often motivated by legislative actions like the Oil Pollution Act, Comprehensive Environmental Response, Compensation and Liability Act, and the Clean Water Act but may also be implemented to meet the mission statements of particular agencies and organizations. While the goals and objectives of restoration efforts vary greatly and the range of potential restoration alternatives is large, these activities fall into three general categories; direct restoration, prevention and public education.

The removal of derelict, abandoned and grounded vessels is a tool that can be used as an effective part of many habitat restoration projects. Removals, on their own or in conjunction with other actions, clearly can be used as part of direct restoration. Additionally, in almost every case a removal will also reduce or prevent the threat of future harm to natural, public, or private resources as well as public safety.

The four case studies presented highlight the benefits of removal and hazards of failing to act. The Seagull *(Guam) demonstrates how effective cooperation can successfully salvage a valuable vessel while protecting natural resources. The* M/V Kimton *(Puerto Rico) demonstrates that simply removing oil from a grounded vessel is not necessarily the best alternative. The F/V* Mwaalil Saat *(Saipan) is an example of what can happen if a vessel is identified as a threat but is not removed and the Tesoro Net Removal Project (Kauai, HI) is a valuable example of how the removal of debris unrelated to the primary incident can be a preferred restoration alternative.*

DISCUSSION

Introduction

[1] Disclaimer: The views expressed herein are solely those of the author, and do not necessarily represent the position of NOAA, the Department of Commerce, or the United States.

Many organizations in the United States are involved with habitat restoration. In general, this work is designed to improve the natural habitat in the face of some specific or general impact. While these actions often include activities like restoring seagrass and mangroves or replanting nearshore and upland environments, the full range of possible projects is diverse and a wide range of alternatives should be considered. One such area is the removal of derelict, abandoned or grounded vessels. These activities can provide significant and easily quantifiable benefits to the environment by addressing both immediate and future threats and should be considered whenever they are appropriate.

Reasons for Restoration

The reasons for planning for and implementing restoration activities are many and may or may not be motivated by law. The National Oceanic and Atmospheric Administration (NOAA), in particular, performs restoration activities under four major legislative authorities in addition to implementing a community based restoration program funded each year by a line item appropriation from Congress. The Oil Pollution Act of 1990, the National Marine Sanctuaries Act and the Comprehensive Environmental Response, Compensation and Liability Act all delegate natural resource trustee responsibility to NOAA and require the agency to work with parties responsible for environmental damage to ensure they remedy the injuries to natural resources caused by their activities. Incidents include acute oil and chemical spills, chronic pollution from waste sites as well as damages to resource within NOAA's National Marine Sanctuaries. Under the Coastal Wetland Planning, Protection and Restoration Act, NOAA, in partnership with other federal and state agencies, develop and build large scale restoration projects in coastal Louisiana. In addition to these legally mandated activities, the community

based program awards funding for restoration under cooperative agreements with state, local and tribal governments as well as non-governmental organizations. Through a competitive award process, the program increases and improves habitat for NOAA trust species and builds a community based conservation ethic.

Other federal and state agencies also have restoration mandates. The Clean Water Act (CWA) and the Endangered Species Act (ESA) are very significant. Under CWA, the Section 404 Dredge and Fill permits administered by the US Army Corp of Engineers require mitigation for any activities that involve dredging or filling in waters of the United States. Operating under a no-net-loss policy, the Corp may require habitat restoration and creation to compensate for resources harmed by permitted activities. While this is technically considered “mitigation” by the Corp, permits still require compensation for habitat damage. Finally, recovery plans under the ESA man include restoration actions to address acute, chronic and cumulative impacts to protected species.

Types of Restoration or Compensation

All these authorities and programs have different goals and objectives. OPA, CERCLA, and the NMSA all require restoration to a level similar to conditions prior to the incident. Restoration in these cases does not produce pristine habitat; it simply repairs the damage done by the incident in question. Other activities, like those geared towards restoring endangered species, restore critical habitat the greatest degree feasible given the available funds, logistics, etc. Additionally, OPA and CERCLA require responsible parties to not only restore the habitat but to compensate the public for lost use of the resource. Regardless, there are only a few overarching

methods to meet these goals including: direct restoration, public education and activities that prevent future harm (Table 1).

Table 1. A range of restoration activities and examples.

Category	Activity	Example
Direct restoration	Species Improvement	Transplant coral, seagrass
		Stock salmon, trout, lobster
		Reintroduce key species
		Construct nesting platforms
		Use decoys to attract birds to abandoned colonies
	Habitat Creation	Build salt marsh
		Build artificial or oyster reefs
		Plant riparian buffer strips
		Buy land with degraded habitat & restore
	Habitat Enhancement	Remove exotic species
		Restore sediment or tidal flow
		Reduce pollution sources
		Reconstruct channels and add woody debris to streams
	Access Projects	Remove/redesign dams and culverts
		Build fish ladders
	Debris Removal	Remove derelict fishing nets
		Remove creosote laden pilings
Public education and use	Personal Behavior	Effects of personal actions on the environment
		Best practices for watercraft operation and other outdoor activities
	Site and species specific	Appreciating a site without damaging it.
		Awareness of a specific threatened species
	Public Use & Access	Build boat ramps and fishing piers
		Build parking lots and right of ways
		Improve aesthetics / viewscapes
Prevention	Habitat Protection	Acquire healthy habitat that may be threatened in the future
		Build fencing & barriers – for the public or animals
		Increase enforcement
		Install radar beacons to prevent groundings
		Close fisheries
		Restrict resource use
	Public Access	Build dune over-walks
		Build boardwalks through sensitive habitats

The Role of Vessel Removal

The removal of derelict, abandoned and grounded vessels is clearly a tool that can be used to meet some of these restoration objectives and should be considered as an alternative when such vessels exist within the geographical scope of a restoration effort. Even while still afloat, derelict and abandoned vessels can create environmental problems in a number of ways

including: shading critical habitat and scouring the bottom as they swing on their anchor chains. Many derelict vessels are anchored illegally or in inappropriate places, increasing this risk. These vessels may also be releasing pollutants located on or within their hulls (Negri et al., 2002; Smith et al. 2003; Sunda, 1994). Unattended vessels are also potential sites for illegal waste dumping and are frequently 'eye-sores', impacting public use and enjoyment. Once deterioration or neglect leads to sinking, vessels directly damage benthic habitats through smothering and/or crushing (Precht et al., 2001). Reflected wave energy can result in increased erosion, scouring and habitat loss. As vessels break into smaller pieces these effects are amplified as are removal costs. It is also critical to note that, because of the sweep of anchor chains and the movement of grounded vessels and vessel debris, the potential impact footprint of a given vessel is much larger than the vessel itself.

Vessel removal activities can be effective as direct restoration, as prevention of future harm and as compensation for lost public use. In some cases simply eliminating a vessel is enough to allow natural recolonization of a site or to preclude damage to nearby habitats and restoration sites. In other cases more effort may be required to return a site to conditions required for healthy habitat (Aronson and Swanson, 1997; Smith et al., 1998). Nevertheless it remains a valuable goal since it opens unavailable substrate for restoration, it also reduces the future damage the vessel will cause or could potentially cause and increases the restoration potential of a site. These prevention benefits are significant and should not be overlooked. Removing a grounded or wrecked vessel prevents the continued battering and smothering of the benthos. If a vessel contains hazardous materials, removal will ensure that they are not released in a future event. It also ensures that the vessel does not become an illegal public dump site. If removal can be executed while a derelict vessel is still afloat, many of these potential impacts can be averted

in a cost effective manner. Finally, a vessel removal may be able to compensate the public for their inability to fully use the resource during an incident. Removals can reduce or entirely remove aesthetic impacts to a region. They may also be able to open substrate for other uses such as aquaculture, fishing or recreation activities.

Case Studies

The following case studies demonstrate the benefits of quickly removing vessels. They also highlight the potential hazards that may persist if vessels are left in place and provide an example of how vessel removal might be used in response to and unrelated event.

A. *Seagull* - Sasa Bay, Guam

The *Seagull* is a 58' fiberglass ketch that grounded in Sasa Bay, Guam during Supertyphoon Pongsona in December, 2002 (Figure 1). It was moored at a nearby marina, broke free during the storm and wound up hard aground adjacent to the mangroves of Sasa Bay Marine Preserve. Typhoons and hurricanes commonly result in similar incidents and in most cases the vessels sustain such damage that post-incident they are virtually worthless. In this case, however, the Seagull floated over a very shallow reef on the storm surge and came to rest on the mudflat with minimal damage, creating a situation where vessel removal was financially viable as long as the vessel did not sustain further damage.

Shortly after the grounding, the Guam Environmental Protection Agency (Guam EPA), Division of Aquatic and Wildlife Resources (DAWR), and the Army Corps of Engineers (ACOE) met with a local salvor to discuss removal options. While the vessel was in good condition and quick removal was a priority, there were a number of obstacles to overcome.

Figure 1. The 58 foot ketch Seagull, grounded in Sasa Bay Marine Preserve, Guam

Seagull was located in a marine preserve, behind one very shallow reef and surrounded by some of the islands richest mangrove areas. This made accessing the vessel from land or water difficult and potentially very costly. The vessel was owned by 5 Japanese businessmen who were not willing to pay more than the vessel was worth to remove it and repeatedly delayed salvage. There was 128 gallons of gasoline and 40 gallons of oil on board introducing the logistical complications involved with managing these substances. There was also debate over whether the submerged lands in this area were managed by Guam or the US Navy and therefore who was responsible or should be in charge of the operation.

It was Spring, 2004 before these concerns were worked out and the vessel was removed. Government of Guam and ACOE agreed to allow a 12'x60' channel to be cut as long as it was from the water side. The Navy agreed to supply a crane to lift an excavator and small barge over the reef (minimizing impact to mangroves) and to lift the barge back into the channel once the

operation was complete and DAWR threatened to issue legal abandonment papers to stimulate the owners into action

Conclusion: The threat of future physical and chemical impacts were mitigated and the vessel was salvaged in seaworthy condition. All this was done with minimal impact to the environment and made possible by a coordinated and cooperative effort.

B. *M/V Kimton* – Fajardo, PR

The *M/V Kimton* was a 110' tug boat that was abandoned in Fajardo Channel on the island of Puerto Rico in the early 1990's and was eventually pushed up onto the beach by successive storms. It was identified by the USCG abandoned vessel survey in 2000. At that time the USCG hired a contractor who removed 5000 gallons of oil and various other items. The USCG reassessed the vessel in April of 2001, found that the previously emptied tanks contained another 5000 gallons of fuel and concluded that the vessel was being used as a dump site for waste oils. Further assessment located another 10,000 gallons in the wing tanks.

This discovery resulted in a more detailed review of the vessel and the surrounding area. In addition to being a proven dump site, the *Kimton* was known to move during major storms and was located next to a shipping channel, posing a potential navigation threat. It was also in the immediate vicinity of a number of local resources including a luxury hotel, two municipal piers, the only ferry terminal accessing the islands Culebra and Vieques, six marinas as well as other infrastructure and resources. The area is also important habitat to sensitive species including brown pelicans, manatees, frigate birds and green, leatherback and hawksbill sea turtles. When all these factors were considered, the USCG decided that vessel removal was the best way to mitigate environmental risk.

In June of 2002 the operation commenced. Before the vessel could be cut up and removed, contractors had to offload 30,000 gallons of oil. While performing this task three separate caches of explosives were also discovered totaling more that 160 pounds of explosives including a large quantity of commercial C-4. Special teams from the USCG, FBI and the Puerto Rico government were brought in to handle this. In the end the vessel was cut up and disposed of inland.

Conclusion: This vessel clearly demonstrates that the seemingly simple solution of pumping off the oil on board is not always the best solution. The initial response left a large amount of fuel on board, missed a potentially deadly threat (explosives) and failed to mitigate threats to surrounding businesses, personal property, navigation and natural resources. The second response put the vessel in a broader context and successfully addressed all these threats in addition to denying the public an illegal place to dump hazardous material.

Figure 2. The M/V Kimton being dismantled in place.

C. *F/V Mwaalil Saat* – Saipan, Commonwealth of the Northern Marianas

The *Mwaalil Saat* was a 93' derelict steel hulled trawler that was tied up to the Mariana's Public Land Authority in Saipan. The vessel was surveyed by NOAA's Abandoned Vessel Program in June of 2003; a number of threats were identified and NOAA concluded that the vessel removal was a high priority. In June, 2004 the vessel broke its mooring during Typhoon Tingting and was grounded on its side in Tanapag Harbor. The vessel was leaking diesel and oil and was blocking the island's only fuel dock. The situation was critical since fuel for the island's electricity comes through that dock. The vessel rested on a sand and coral rubble bottom with low coral cover and was in close proximity to more sensitive habitats including mudflats, mangroves and coral reefs.

In response, a Unified Command was established and the US Oil Spill Liability Trust Fund was opened. The Command considered several response options including leaving the vessel in place and modifying the dock to allow ships to offload fuel from further offshore, refloating the vessel, putting the vessel on a barge and hauling it for at sea disposal and cutting the vessel up for upland disposal. The upland disposal option was eventually implemented. This option required the use of an upland staging / storage area managed by the Division of Public Lands, which required strict assurances that the vessel would be moved from the site a timely manner. The total operation cost reportedly exceeded exceed three million dollars.

Conclusion: The vessel was identified by NOAA and the local government as high priority candidate for removal but the funding was not available to dispose of it. The vessel remained in a neglected state until the next large storm which precipitated a serious incident and a very costly response. The final response option did, however, include full wreck removal,

mitigating all current threats and removing the potential for future damage to public safety, infrastructure and the environment.

Figure 3. The Mwaalil Saat during AVP vessel surveys in June, 2003

D. Tesoro Oil Spill – HI

On August 24, 1998, a hose ruptured at a transfer station owned by the Tesoro Corporation off Barber's Point near Honolulu, HI. While transferring product from a tanker to shore approximately 5000 gallons of bunker oil was spilled. Initially the responsible party believed that far less oil was spilled and that it only impacted shorelines of Oahu. Two weeks after the spill, however, tarballs and oiled birds matching the fingerprint of product from the Tesoro spill began to appear on Kauai. While the initial overflights were intended to determine the extent of the oil and to look for impacts to endangered Hawaiian monk seals, biologist from the agencies and responsible party also noted that the shallow water habitat of the island was mired with derelict trawl nets from the North Pacific. These heavy duty nets were acting as large

Figure 4. Net cleanup for 1998 Tesoro oil spill, Kauai, HI

scrubbers; tearing up benthic habitats as they moved with current and surf. They were smothering and crushing organisms and habitat as well as abrading what they didn't immediately destroy. The nets were also an entanglement hazard for fish, invertebrates, sea turtles, and marine mammals. The natural resource trustees and Tesoro representatives quickly realized that a net removal project would be extremely beneficial to the local environment, would mitigate most if not all of the damages that resulted from the oil and could provide an opportunity to cooperatively and cost-effectively resolve the situation. All parties agreed to the project and net removal operations were carried out during October, 2001. 20.68 tons of net were removed from the shores of Kawai, shipped to Oahu and recycled.

Conclusion: While the incident described above does not specifically involve a grounded or derelict vessel, gear aboard such vessels is often an additional threat and adds to the impact of many vessel incidents. It is clear from the events in this case how future responses might take a similar approach to use problematic vessels in the vicinity of other incidents. In many cases vessels are abandoned and are left to continually damage the marine environment because a responsible party can not be identified or a funding source for removal can not be secured. Removal of such vessels not only can provide significant environmental benefit but may also successfully garner good will with the local public who often come to view these vessels, with frustration, as eyesores that they feel powerless to remove.

CONCLUSION

Many agencies and organizations in the United States are implementing habitat restoration using a wide array of methods across a variety of habitats. These efforts are often motivated by legislative actions like the Oil Pollution Act, Comprehensive Environmental Response, Compensation and Liability Act, and the Clean Water Act but may also be implemented to meet the mission statements of particular agencies and organizations. While the goals and objectives of restoration efforts vary greatly and the range of potential restoration alternatives is large, these activities fall into three general categories; direct restoration, prevention and public education.

The impacts caused by derelict, abandoned and grounded vessels are significant and include physically battering and smothering benthic habitat, increasing reflected wave energy and erosion and releasing toxic materials. The physical impacts, in particular, can persist for

decades when vessels are left in the marine environment. The alleviation of these impacts through removal of derelict, abandoned and grounded vessels is a tool that can be used as an effective part of many habitat restoration projects. Removals, on their own or in conjunction with other actions, clearly can be employed as part of direct restoration. Additionally, in almost every case a removal will also reduce or prevent the threat of future harm to natural, public, or private resources as well as public safety.

BIOGRAPHY

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