

F/V Seahawk 68 Ship Grounding in American Samoa: Environmental Report, October 2020

On May 22, 2015 the Taiwanese longliner F/V Seahawk #68 ran aground on the reef at Avatele Point near the Pago Pago Airport causing major damage to the coral reef at that site. Approximately 1,200 – 1,500 gallons of diesel fuel, 200 gallons of lube oil, and 75 tons of fish were on board. Within one month of running aground the fuel, oil, and other hazardous materials were removed by a local contractor, SOLAR Inc. In June 2015, DMWR, assisted by NPS, also conducted a rapid biological assessment and removed debris that posed an entanglement hazard for marine organisms. Refer to Appendix 3 for the report from

Figure 1: Map showing movement of the vessel. The previous location of vessel is indicated in black and current location indicated in red.



this assessment. There has been no attempt to remove the vessel prior to 2020 due to its dangerous and challenging location and the lack of available funding.

In September 2020, DMWR received multiple reports from local community members that the grounded vessel had shifted significantly and large pieces of debris from the ship had broken off and were getting lodged on the reef and around the Pala Lagoon. On October 2, 2020, staff from

DMWR, NPS, and AS-EPA with support from Marine Patrol conducted both an in-water and on-shore assessment. The goals of this assessment were:

1. Map current location of the vessel;
2. Determine the structural integrity of the vessel;
3. Assess any damage to surrounding habitat caused by the movement of the vessel and potential damage should the vessel continue to shift;
4. Map any large pieces of debris (>3ft) on the reef flat and shoreline;
5. Use the findings of the assessment to make recommendations on the removal plan and determine the urgency.

Current Location of Vessel

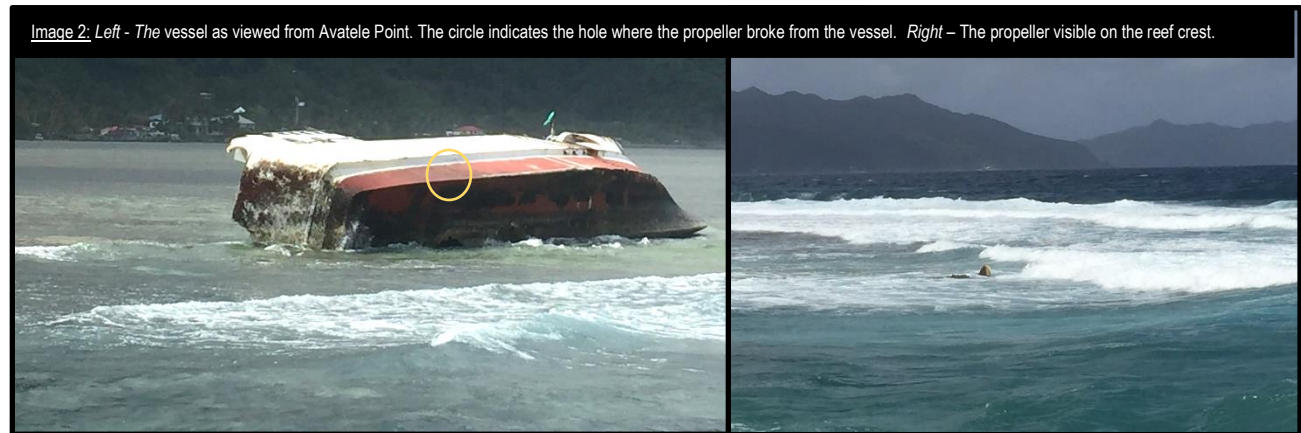
The assessment confirmed that the vessel had moved significantly from the original grounding location (Figure 1, Image 1). Following the assessment, it is believed that the movement occurred because the propeller which is still lodged in the original location had been acting as an anchor and holding the vessel in place (Image 2). Over time, high wave and wind action caused degradation to the hull and the propeller subsequently broke free creating a large hole in the hull and freeing the vessel. This allowed the vessel to move further onto the reef flat, towards the shore. The deck of the vessel is now parallel to Coconut Point with the deck facing towards shore

Image 1: Above - Orientation of the vessel (as seen from Coconut Point) prior to it shifting. Below - Present orientation of the vessel from the same vantage point.

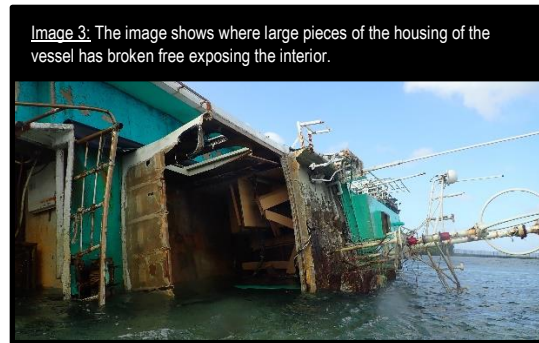


and the stern facing towards Pago Pago Airport.

Without the propeller anchoring the vessel to the reef it was visibly moving during the assessment and appears highly unstable. This increases the urgency for removal, particularly as we approach cyclone season (November 2020 – April 2021).

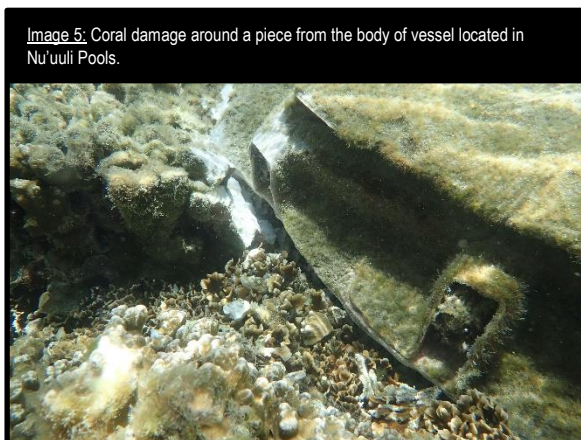


Structural Integrity of Vessel



exposed due to sizeable, structural pieces breaking off.

Despite debris removal efforts in 2015, there are still large amounts of monofilament line, plastic sheeting, ropes, and other debris inside the vessel (Image 4).



The Seahawk has sustained significant damage due to its exposure to strong wave energy and high winds (Image 3). The stern of the vessel, which had been most exposed in its previous location, has begun to break apart and large pieces have been visibly removed by the elements. The fuel tank has separated from the vessel and now lies adjacent to the body of vessel. Several sections of the interior

are now



These may have been previously inaccessible but have become exposed as the vessel body breaks apart.

It is likely that the vessel will continue to break up and large pieces will continue to be deposited on the surrounding reef flat and shoreline (Image 5). This could cause direct physical damage to the surrounding coral communities and pose entanglement hazards for

marine organisms in the area, particularly turtles that utilize the area for feeding. Of particular concern is the fishing line which poses a high risk of entanglement. Thus, this is a high priority for removal.

Surrounding Habitat

The vessel currently sits atop a rubble field (Image 6). This area is highly exposed with strong wave action for most of the year. As a result, the reef crest and immediate reef flat are primarily composed of rubble with only isolated colonies of *Porites*, *Pavona*, and *Sinularia*. Therefore, we believe that the damage to the surrounding habitat through vessel movement has been minimal to date.

The biological assemblage changes from crest to shore, with higher coral diversity and percent coverage. Further, with increasing distance to the shoreline, the density of vast *Sinularia* colonies, *Acropora* thickets, and larger *Porites* colonies increases. Should the vessel continue to move in its current direction and path, the level of damage to the biological communities could be significant.



Image 6: Habitat surrounding the present location of the vessel.

Debris Assessment

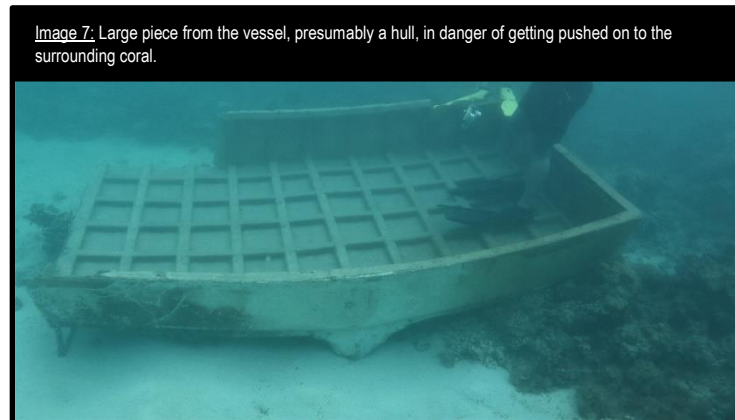


Image 7: Large piece from the vessel, presumably a hull, in danger of getting pushed on to the surrounding coral.

piece (8' X 12'), presumed to be a hatch from the vessel (Image 7). This piece was found in a sandy patch adjacent to a large *Acropora* thicket. Another large piece from the body of the vessel was found by Nu'uuli Pools lodged in living coral and there is evidence of physical damage to coral surrounding the debris.

The onshore assessment was conducted by walking the fence line of the airport from Lion's Park to the end of Avatele Point. Debris were documented along the entire shoreline including one very large piece (possibly a

To conduct the in-water assessment, teams snorkeled the reef flat from Nu'uuli Pools to the end of Coconut Point peninsula to identify any large pieces of debris from the vessel. For the purposes of this assessment, large pieces are defined as any debris over 3 feet in length. A waypoint and photos were taken of any piece located. The majority of pieces were between the vessel and the end of Coconut Point. Of note was one large

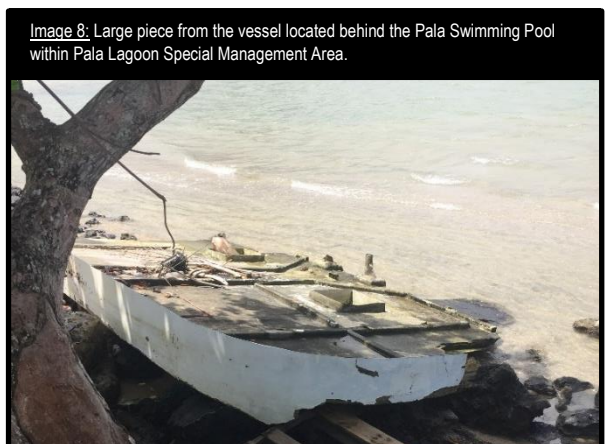


Image 8: Large piece from the vessel located behind the Pala Swimming Pool within Pala Lagoon Special Management Area.

hatch) from the vessel adjacent to the swimming pool (Image 8).

Many of the debris pieces found both onshore and in the water were fiberglass from the body of the vessel. These pieces pose a significant threat to the coral reef and mangrove ecosystems of the area as they fragment, especially as they continue to shift, and would require significant effort to remove.

Recommendations

1. The vessel should be removed as soon as possible due to the instability of the vessel and high potential for continued migration onto the reef flat, as well as, a high likelihood of pieces from the vessel continuing to break off and damage coral reef habitats.
2. Due to the exposed nature of the location and the instability of the vessel, it would be inadvisable to build a permanent structure on the reef. This would potentially minimize the need for additional permits as well, thus expediting the process.
3. Due to the challenging location of the vessel, a well thought out plan with strict safety procedures incorporated (e.g. mandatory PFDs for those working in and around the vessel and boat support) is strongly advised.
4. The removal could be undertaken in two phases. The first phase would prioritize the remaining monofilament line, large debris on the reef flat, and any loose pieces in danger of breaking from the vessel. The second phase would target the remaining pieces of the vessel.
5. The removal plan must include removal of all pieces identified within the report, as well as any identified by CRAG Agencies in the future.

This report was prepared on October 20, 2020 by Georgia Coward and Katie Nalesere (Dept. Marine and Wildlife Resources- Coral Reef Advisory Group) with support from the National Park of American Samoa (Eric Brown, Bert Fuiava, Ian Moffitt).

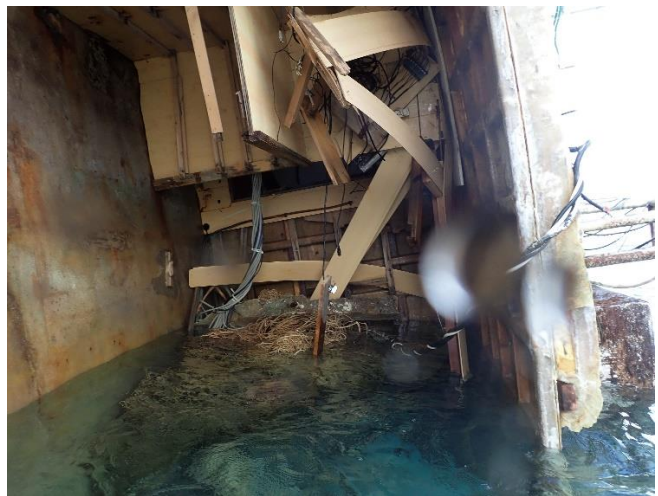


Appendix 1: Map of Vessel and Large Debris

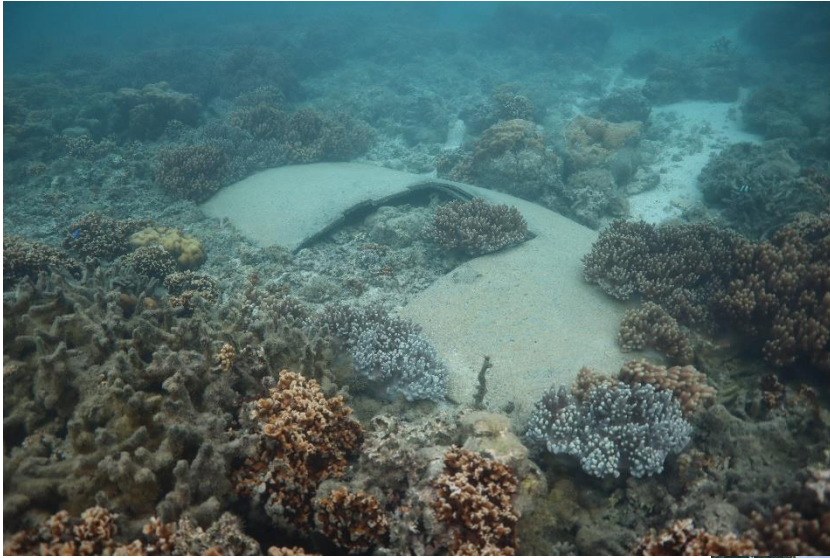


Appendix 2: Additional Images

Images of the Vessel



Images of Vessel Debris



Appendix 3: 2015 Rapid Assessment

F/V Seahawk 68 Ship Grounding in American Samoa: Environmental Report, June 2015

On May 22, 2015 the Taiwanese longliner F/V Seahawk #68 ran aground onto the reef at Avatele point near the Pago Pago Airport, causing major damage to the coral reef at that site. Approximately 1200-1500 gallons of diesel fuel, 200 gallons of lube oil, and 75 tons of fish were on board. To date, removal of the fuel and oil have been undertaken by local oil spill contractors, SOLAR Inc, including removal of other hazardous waste on board. DMWR and NPS assisted by conducted removal of debris likely to cause entanglement hazard to marine organisms.



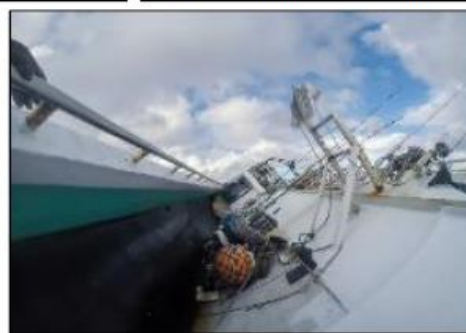
1: F/V Seahawk #68 grounded at Avatele Point, Nu'uuli



2: View from vessel towards front deck



3: View from vessel towards front deck



4: View from vessel towards front deck

The vessel is currently laying on its port side, partially on the shallow reef and partially in deep water and in the middle of the surf zone. The impact of the ship grounding to the surrounding coral reef environment includes:

- Gouging large grooves into the reef and pulverizing reef into dead coral rubble
- Killing many invertebrates including corals and sea urchins
- Continuously spilling ship material and trash into the water that affect the nearby reefs and its inhabitants (corals, fishes and sea turtles)
- Bad weather and strong surf has continued to hit the vessel causing breakup of the fiberglass hull into small pieces which are being deposited on the nearby coral reef area
- The ship-related debris will continue to be washed into the mangroves (Pala Lagoon) and along the coast as well as being carried offshore causing marine debris, hazardous to marine life and navigation
- Salvage operations have pulverized a wide path across the reef to dead coral rubble due to personnel walking back and forth with a small aluminum vessel to the grounded vessel (photo 8)

The following photos show the reef damage directly caused by the grounded vessel (© NPSAS):



5: Reef pulverized to rubble by the hull



6: Reef pulverized to rubble



7: Vessel gouged large grooves into the reef



8: Part of the hull resting on the substrate



9: Plastic debris getting stuck on the coral



10: Broken coral wrapped in fishing lines

Due to heavy wave action in the area, the grounded vessel continues to shift slightly, grinding back and forth over the reef and so continuing to cause damage to the reef substrate (including any surviving coral nearby). Parts breaking off the vessel will be washed around by the waves breaking coral and scarring the substrate until washed up onto the reef flat.

The following photos show the debris and damage on the reef surrounding the vessel (© DMWR):



11: Debris from the grounded boat on the coral reef



12: Fiberglass pieces from the boat hull



13: Fiberglass pieces and debris from the vessel



14: Electronic debris from the vessel



15: Large metal objects cause physical damage to coral colonies during strong currents and high surf



16: Hazardous waste (oil filter)



17: Clothing and material entangled with coral



18: Damage to coral directly in front of the vessel



19: Wire and plastic pieces wrapped around coral



20: Fish hooks and fishing line entangled on the reef

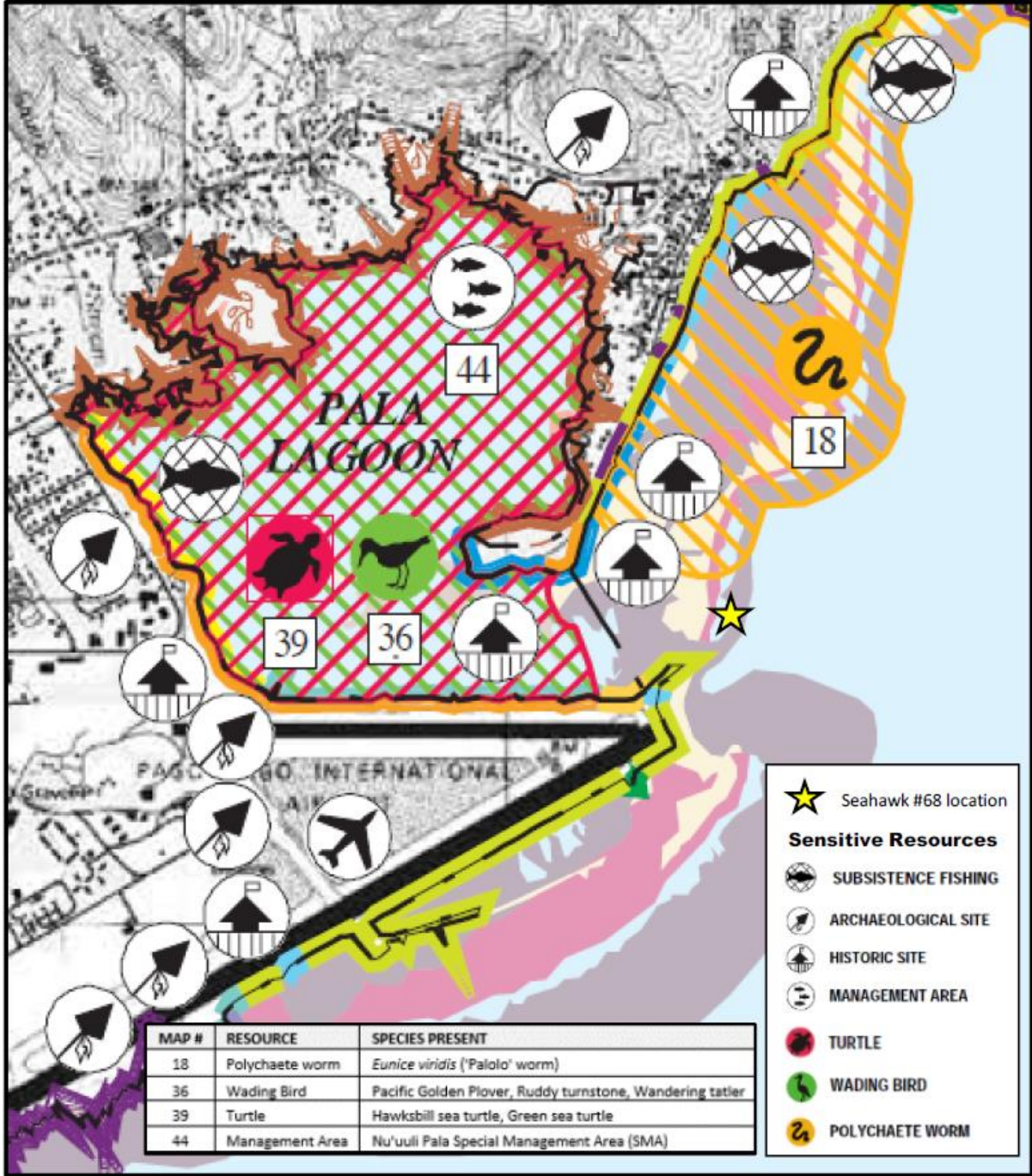
Impacts to Biological Resources

Debris from the grounded vessel continue to dissipate across the reef including major entanglement hazards for turtles, coral colonies and other marine organisms. Bundles of longline, derelict fishing gear armed with hooks, clothing, and other items hung up on the reef will pose a threat to turtles as they forage in and around them. Additionally, plastics and pieces of fiberglass can be ingested as they become covered in algae. The coral reef ecosystem will be impacted by the debris, in the short-term through direct physical damage and in the longer term through changes to the functioning of the coral reef ecosystem. Species of Concern that are known to be present in the surrounding area, and are threatened by entanglement hazards and loss of habitat include the following species:

| Common Name | Scientific Name | Protected Status |
|---------------------------------------|-------------------------------|---|
| Green turtle | <i>Chelonia mydas</i> | listed as 'Threatened' under the Endangered Species Act |
| Hawksbill turtle | <i>Eretmochelys imbricata</i> | listed as 'Endangered' under the Endangered Species Act |
| Humphead wrasse 'Tagafi / Malakea' | <i>Cheilinus undulatus</i> | listed as 'Endangered' under the Endangered Species Act |

The following habitat map indicates the location of sensitive coastal and marine habitats and cultural resources in the area surrounding the vessel:

Environmental Sensitivity Index (ESI) map of the Pala Lagoon area (extracted from NOAA (2004) American Samoa ESI atlas: Sensitivity of Coastal Environments and Wildlife to Spilled Oil)



Case study: Grounding of the Taiwanese longliner at Rose Atoll in 1993



- Destroyed a large section of the reef
- High volume of **ship-related debris** on the reef slope and reef flat
- Leaking **diesel fuel** polluted the water
- The ship broke apart within 6 weeks due to strong wave action
- Surveys found that much of the wreckage and its debris remained on the reef slope and reef flat for years after the grounding
- Over time the iron corroding from the wreckage (structural steel, engine block, zinc anodes, copper) maintained an **algal bloom** that **inhibited recovery of the reef system** (spreading the entire length of the SW reef)
- Multiple salvage operations removed as much debris and wreckage as possible
- After over a decade, the grounding of this ship was still impacting algal growth and herbivorous reef-fish populations
- **“In the event of future groundings, containment of the contaminant spill and prompt removal of all debris is recommended to preserve ecosystem integrity.”** (Schroeder et al 2008)
- After removal of nearly all of the major ship-debris the reef started to slowly recover (years after the grounding).

References

Green A., Burgett J., Molina M., Palawski D., Gabrielson P. (1997) The impact of a ship grounding and associated fuel spill at Rose Atoll National Wildlife Refuge, American Samoa. Report US Fish and Wildlife Service. 65pp

Maragos J. and Burgett J. (2003) Monitoring and partial cleanup at Rose Atoll National Wildlife Refuge (NWR) after a shipwreck – Case study 14. In: Monitoring coral reef marine protected areas. Report Australian Institute of Marine Science and the IUCN Marine program. Pp 40 - 41

NOAA (2004) Sensitivity of Coastal Environments and Wildlife to Spilled Oil, American Samoa. NOAA National Ocean Service, Office of Response and Restoration, Hazardous Materials Response, Division, Seattle, Washington. 40pp

Schroeder R. E., Green A. L., DeMartini E. E., Kenyon J. C. (2008) Long-term effects of a ship-grounding on coral reef fish assemblages at Rose Atoll, American Samoa. *Bulletin of Marine Science* 82(3):345-364.

Report prepared by DMWR on 06/26/2015: Mareike Sudek, Alice Lawrence, Mark MacDonald