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FINAL REPORT

TNC/QIN Washington Coast Derelict Fishing Gear Removal Pilot Project 2012

PREPARED FOR:

THE NATURE CONSERVANCY &
NORTHWEST STRAITS FOUNDATION

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Introduction

Abandoned, lost and discarded fishing gear can present safety, liability, nuisance and environmental impact issues in all marine, estuarine and riverine waters where it is found. Identification, location and safe removal of derelict fishing gear can reduce these impacts. In 2002 the Northwest Straits Initiative (NWSI) teamed with the National Oceanic and Atmospheric Administration (NOAA) and the Washington Department of Fish and Wildlife (WDFW) to address the issue of derelict fishing gear in Puget Sound and the Strait of Juan de Fuca. This collaboration resulted in state-approved guidelines for the safe and environmentally responsible removal of derelict fishing gear. Subsequently, the NWSI developed and currently implements a comprehensive derelict fishing gear program which includes removal, research, and prevention. While the NWSI program focuses on the inland marine waters of Washington State, there are many other locations where derelict fishing gear has been identified as a problem. The Quinault Indian Nation (QIN) and The Nature Conservancy (TNC) partnered on a pilot project to perform surveys and removal of derelict crab pots on the outer Washington Coast, in the popular fishing grounds of the QIN Dungeness crab fishery. This report describes efforts performed during the pilot project. Additionally, the efforts described in this report are the first of a multi-year project designed to address derelict crab pots WA coast-wide, from Neah Bay to Willapa Bay.

Funding from the NOAA Marine Debris Program was provided to the QIN with matching funds from TNC to conduct derelict fishing gear survey and removal work on the WA Coast. Additional funds were provided by U.S. Fish and Wildlife Service. The Northwest Straits Foundation (NWSF) along with Natural Resources Consultants, Inc. (NRC), were contracted by TNC and QIN to provide sidescan sonar surveys, dive removals and data collection and maintenance for derelict fishing gear targets. The survey and removal operations were coordinated with the QIN, TNC and NRC.

Scope of Work

The project included two days of sidescan sonar surveys and post-survey data processing, followed by three days of dive removal for derelict pot targets in the survey area on the WA State Outer Coast. During the pre-project planning, QIN and TNC personnel defined a general area of operations between Point Grenville and Moclips, off the outer WA Coast where efforts would be focused (Figure 1). The scope of work included the complete survey of one square mile of seafloor within the work area defined above. All data collected from the sidescan sonar survey and subsequent target investigation and removals were added to the Washington State Derelict Fishing Gear Database maintained by the NWSI.

Gear retrieved during the course of this project was stored on the QIN support/recovery vessel F/V *Whisper* on the dock in Westport, WA. When owner identification was present on derelict pots, the owners were notified and pots were returned. Derelict

fishing gear that was unsalvageable was disposed of in the dumpster at the Westport commercial fishing marina.

Methodology

Sidescan Sonar Survey

Fenn Enterprises conducted two days of sidescan sonar surveys on the 8 meter (26 feet) research vessel R/V *Research* to locate derelict crab pots in the WA Coast survey area defined by QIN and TNC. Surveys were conducted using a Marine Sonics® 600 kHz transducer, mounted in a heavy stainless-steel tow fish. The survey track lines were geo-referenced with a Trimble® differential global positioning system antenna (DGPS), and integrated into the survey records generated by the Marine Sonics sidescan system. Nobeltec®, a marine navigation software system was also used to track the progress of the survey vessel during operations.

Survey operations were conducted during excellent to fair weather and sea conditions in order to maximize the quality of data collected and the area surveyed. Once the survey vessel and crew were on site, the tow fish was deployed from the bow of the vessel and the depth of the tow fish was controlled by a hydraulic winch with cable. This method of derelict fishing gear detection has been proven most effective when the tow fish altitude is as close to the seafloor as possible. As a general rule, this translates to the tow fish flying off the seafloor at a distance equaling 10% of the sonar's signal range on a single channel (i.e., 50 meter signal, tow fish at five meters above seafloor). The survey image was displayed on a video monitor onboard the vessel and recorded onto a computer hard drive for post-survey data processing. Survey speed and swath width varied with depth of water, weather conditions and proximity to land and structures. The majority (93%) of the sidescan sonar surveys were conducted using signal from both port and starboard channels, however, at times only a single channel was used. The swath width of the surveys ranged from 30 meters to 100 meters and the overall average was 97 meters. The average survey speed over the course of the survey was 6.5 km/hr (3.5 knots). Targeted surveys covered a range of the depths from six to 18 meters (20 – 60 feet), with specific focus in areas of high-density lost pot accumulation.

The sidescan sonar images were examined in detail during post-survey processing and counts of precise locations of derelict net targets were recorded. The products from the sidescan sonar survey included a track line file of the area surveyed, calculation of the amount of the seafloor area covered and the positions (latitude and longitude) of derelict pot targets detected.

Additionally, derelict pot buoys on the sea surface were identified visually by survey vessel personnel during survey operations and transit to and from the survey area. Visually observed targets were recorded by collecting a waypoint on the Nobeltec® navigation software, and later added to the survey target file.

Derelict Fishing Gear Removal

Two vessels were utilized for the derelict fishing gear removals during this phase of the project; one dive vessel, and one QIN recovery/support vessel.

Fenn Enterprises was contracted to conduct dive recovery operations for derelict pots during the project. Two divers equipped with SCUBA operated off the 8 m (26 feet), R/V *Research* for three days in the defined work area. A list of precise locations of derelict pot targets detected during the sidescan sonar survey was used by the onboard biologist and dive team to locate derelict pots using a wide area augmentation (WAAS) GPS and electronic navigation software (Nobeltec®). Derelict gear targets derived from the sidescan sonar surveys and other sources were transferred into the Nobeltec software as waypoints and plotted over navigation charts of the WA Outer Coast.

Additionally, a house-forward, 12.8 m (42 feet) QIN Dungeness crab vessel was employed for three days of derelict gear recovery alongside the dive vessel. The hydraulic-powered pot puller on the recovery vessel was equipped with heavy braided line (recovery line) used to connect to the derelict pot to be removed. During target investigation by the diver, the QIN vessel was staged a safe distance away until the diver returned to the surface, and was retrieved by the dive vessel. After which, the QIN vessel recovered the crab pot buoy and line. Additionally a separate QIN crab vessel was employed for two days to remove sanded in derelict pot targets using a hydraulic pot pump.

Using the WAAS-GPS system, the dive support vessel was directed to the exact location of the derelict pot target. When the vessel arrived at the target location, the crew assessed variables such as; ocean current, swell height, water clarity and depth. Once the situation was assessed, pre-dive safety checks were conducted and a single diver using SCUBA was deployed to investigate the target, while a safety backup diver stood by on deck. The work diver would descend down the crab pot line attached to the target then investigate the target location in search for the derelict pot. In all cases, the crab pot was buried in the substrate and the diver cut the pot line where it met the sand, then returned to the surface where he was retrieved by the dive vessel. When the diver returned to the vessel he reported all significant information regarding the gear target. Once the dive vessel securely retrieved the diver and departed the target location, the QIN recovery vessel approached the target marked by the buoy on the sea surface, retrieved the crab buoy/line and recovered the cut line using a commercial grade hydraulic pot-puller. The derelict crab pot was left buried in the seabed. Upon retrieval, lines and buoys were coiled and stored on the QIN recovery vessel deck until offloaded at the end of the three day operations. The recovered gear was weighed and stored at the commercial vessel marina in Westport, WA, and disposed of in the onsite dumpster.

Results

Sidescan Sonar Survey

Two days of sidescan sonar surveys were conducted inside the designated survey area on August 7 and 8, 2012. The total survey area covered 5.0 km² (1.94 miles²), and yielded 84 derelict pot targets (Figure 2). Because the 600 kHz sonar unit can penetrate substrate, many of the pot targets detected during the sidescan sonar surveys were identified during post-survey processing as being below the seafloor. And in some cases, where the pots were buried a significant depth in the seafloor sand, only the lines attached to the pots were detected in the sonar image. An additional 171 targets were identified by their surface floats on the fishing grounds during sidescan sonar surveys and transit to and from the survey area. Sixty (24%) of the 255 targets were investigated; of those 24 (40%) were buried derelict crab pots and 36 (60%) were not found. There is some likelihood that the targets not found were removed by their owners sometime between the surveys and the removal operations.

One non-derelict gear target was detected during the sidescan sonar surveys as a very large pinnacle (90 m wide x 8 m high) within the fishing grounds but is not shown on nautical charts of the region. This pinnacle is located at 47° 17.990' N and 124° 18.922' W.

Derelict Fishing Gear Removal

Prior to surveys, the operational plan consisted of removing crab pots from the seafloor and returning them to the owners; because all pot targets were identified to be below the seafloor, project personnel adjusted the plans of the dive removal operations to include removing the lines attached to the sanded-in crab pots, making those pots unable to be retrieved at a later time. This adjustment of removal plans prompted the QIN resource manager to inform the QIN crab fleet of the upcoming operations, giving them the opportunity to retrieve their own pots using pumps before lines were to be cut. Approximately two weeks prior to dive and pump removal operations, the QIN crab fleet was informed by their Resource Manager that crab pot and line removal was to take place and if they are interested in retrieving their pots in the area, they should do so prior to the removal project. This announcement was made after surveys were complete and, therefore, several of the derelict gear targets identified during the surveys were not present at the time of removal investigation and may have been removed by the owners.

Three days of derelict fishing gear dive removal operations were conducted on September 16 to 18, 2012. A total 41 crab pot lines were cut from buried derelict crab pots and removed, 26 of these were targets identified during surveys and 15 were identified during the dive removal operations (Figure 3). Eleven of the 15 newly identified targets were found outside the sidescan sonar survey swath range. All derelict pot lines were removed from water depths ranging from nine meters (30 ft) to 18 m (60 ft), from sand and mixed

sand/mud substrate. A total of 36 targets were not found, probably due to fisher removal prior to dive operations. Additionally, several QIN fishers were on the fishing grounds removing their pots during the dive removal operations and in many cases upon inspecting the buoy of a derelict gear target the QIN vessel captain informed the dive vessel that the pot target was owned by one of the vessels on the grounds removing gear and that it should be left for them to have the opportunity to recover their gear without the line being cut.

Two days of derelict crab pot removal operations by QIN vessel utilizing a hydraulic pot pump were conducted on October 1 and 2, 2012. A total of 18 derelict pots were removed during this operation and another two crab lines were removed after breaking free from the pot targeted to be removed.

All recovered derelict pot lines were either salvaged or disposed of in the dumpster at the commercial vessel marina in Westport, WA. The total weight was estimated at 136 kg (300 lbs).

Conclusions

The use of sidescan sonar surveys for derelict crab pots on the WA Outer Coast proved to be effective in identifying locations of derelict crab pots, however, nearly all the detected targets appeared to be buried in the substrate. Additionally, several targets were identified only by the line extending out of the sandy substrate and into the water column. We suspect that surveys conducted throughout the fishing grounds in waters deeper than 18 meters (60 feet) would detect targets on top of the seafloor, not buried by sand during the heavy sediment transport that occurs in the shallower waters during storm events. While visual surveys of pot line floats/buoys were successful in identifying many of the targets documented, this method does not account for those that have become detached from their lines or those attached to lines that are suspended throughout a portion, but not all, of the water column. Therefore, we believe that the dual method survey approach of sidescan sonar survey and visual surveys for surface floats utilized during the project is the most effective way to confidently identify all derelict pot targets within the survey area.

Derelict crab pots from the Dungeness crab fishery in the Puget Sound have been identified as a problem based mostly on their economic impacts associated with “ghost fishing”, where derelict pots continue to catch and kill the resource until they are no longer viable. Studies have shown that their “ghost fishing” can account for hundreds of thousands of dollars worth in Dungeness crab mortality (Antonelis et al. 2011). On the WA Outer Coast, based on the fact that many lost pots become buried, it is difficult to compare the Dungeness crab mortality due to lost pots without further research. However, it is likely that any crab trapped in a derelict pot is likely to be killed when the pot is buried prior to decomposition of the escape cord. It is clear, however, that derelict

crab pots on the WA Outer Coast pose a variety of other impacts that may be equally or more concerning.

Reports from recreational and commercial fishers in the region have explained the navigational hazards of transiting through the Dungeness crab fishing ground due to the probability of engine propellers and rudders becoming entangled with the lines suspended from the derelict crab pots to (or near) the sea surface. Additionally, commercial and recreational crab and finfish fishers, particularly salmon trollers, must navigate cautiously through these areas while fishing, if they decide to at all, due to the risk of entangling their fishing gear in the array of crab lines; an occurrence that inevitably leads to the loss of gear often worth thousands of dollars. Fishers in the region have reported that a large portion of the fishing fleets (pot fishers and salmon trollers) purposefully avoid these areas of pot accumulation during both transit and active fishing. Finally, marine mammal entanglements with pot lines have been well documented along the North American East and West Coasts where pot fisheries occur. These incidents often involve whales becoming entangled in pot lines from both derelict and actively fishing gear. Through human intervention, some of the animals are disentangled prior to drowning; however, without human assistance such situations may lead to mortality.

Utilizing the dive removal vessel equipped with divers and crew experienced with derelict fishing gear removals ensured that all pot targets were investigated for impacts prior to lines being cut and the pot left below the seafloor. The QIN support/recovery vessel proved to be an important resource, not only for the recovery of gear, but also for the access to local knowledge of the fishing grounds, the fishing fleet and the weather patterns and sea state.

Both sidescan sonar surveys and dive removal operations require excellent to fair sea conditions in order to collect accurate data and conduct effective removals in a safe manner. On the WA Outer Coast, there are often only small windows of opportunity to conduct more than two days of operations together when considering these constraints. This was evident in the third day of dive removals, when both the dive vessel and the QIN support/recovery vessel were forced to return to port at mid-day due to high seas, heavy winds and dense fog.

Recommendations

- A continued systematic approach to derelict gear surveys using sidescan sonar augmented by visual surveys in areas of dense derelict pot/line accumulation should be completed prior to removal operations to ensure greater survey coverage of the project area and knowledge of all existing targets.
- Divers experienced in derelict fishing gear removal operations should be used. However, the recovery of derelict gear should continue to involve experienced

QIN fishers or other fishers involved in the commercial crab fishery, as their vessels and equipment were important for the success of the pilot removal operations in 2012.

- It is recommended that further outreach and education on the impacts of derelict fishing gear occurring on the WA Outer Coast be conducted, targeting both the Treaty and non-Treaty commercial Dungeness crab fleets, with a focus on best fishing practices that minimize gear becoming derelict and best approaches to addressing gear once it has become derelict.

References

Kyle Antonelis, Daniel Huppert, Don Velasquez & Jeffrey June (2010): Dungeness Crab Mortality Due to Lost Traps and a Cost-Benefit Analysis of Trap Removal in Washington State Waters of the Salish Sea. *North American Journal of Fisheries Management*, 31:5, 880-893

Table 1. Number of removed and remaining derelict pot targets during the TNC/QIN 2012 WA Coast Derelict Fishing Gear Project. Source: NRC.

How Found	Not Found	Remain	Dive Removal	Pump Removal	Grand Total
Found During Removals			15		15
Found During Surveys	36	173	26	20	255
Grand Total	36	173	41	20	270

Figure 1. Locations of derelict fishing gear surveys and removals during the TNC/QIN 2012 Washington Coast Derelict Fishing Gear Project. Source: NRC.

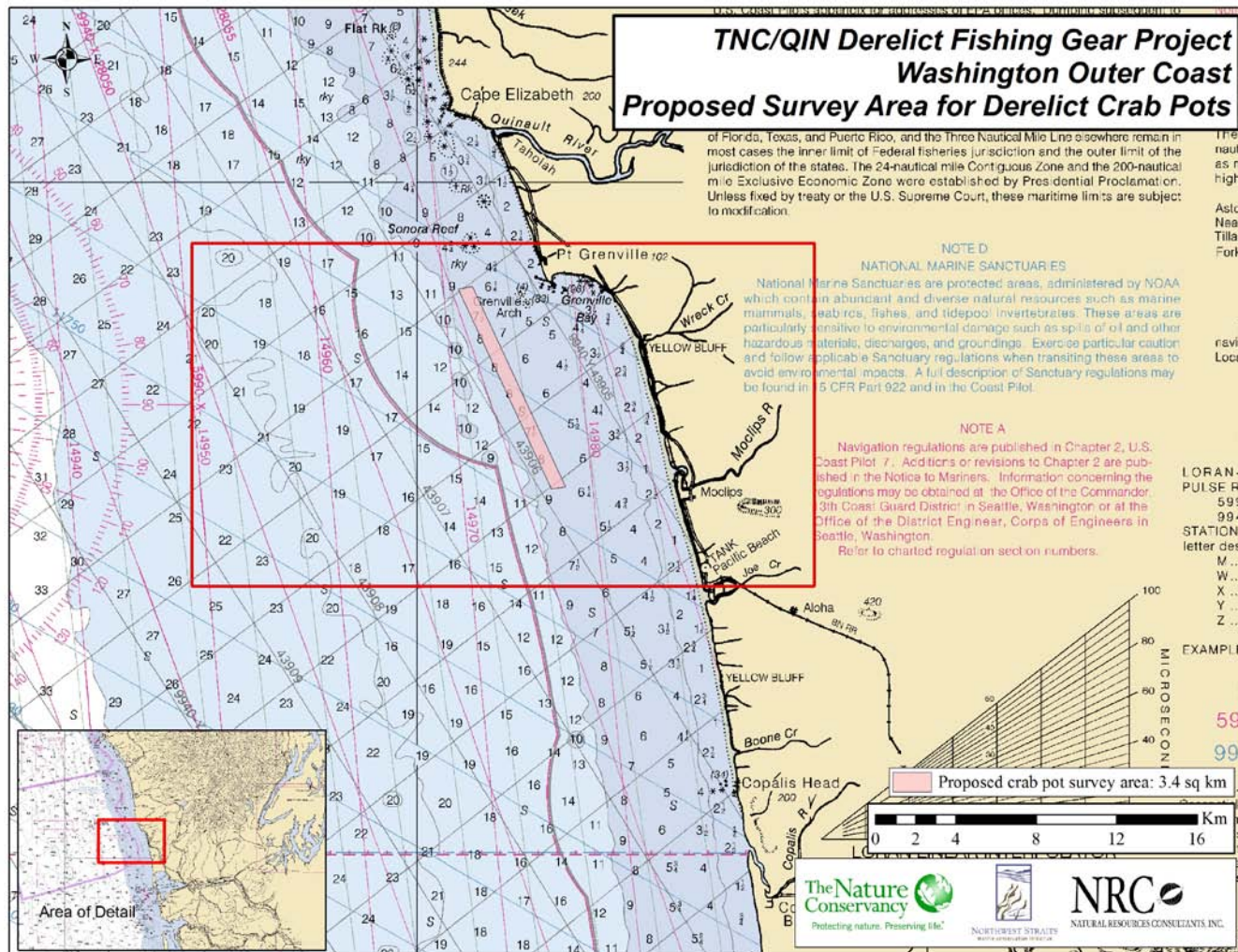


Figure 2. Sidescan sonar surveys and derelict fishing gear targets detected during the TNC/QIN 2012 Washington Coast Derelict Fishing Gear Project. Source: NRC.

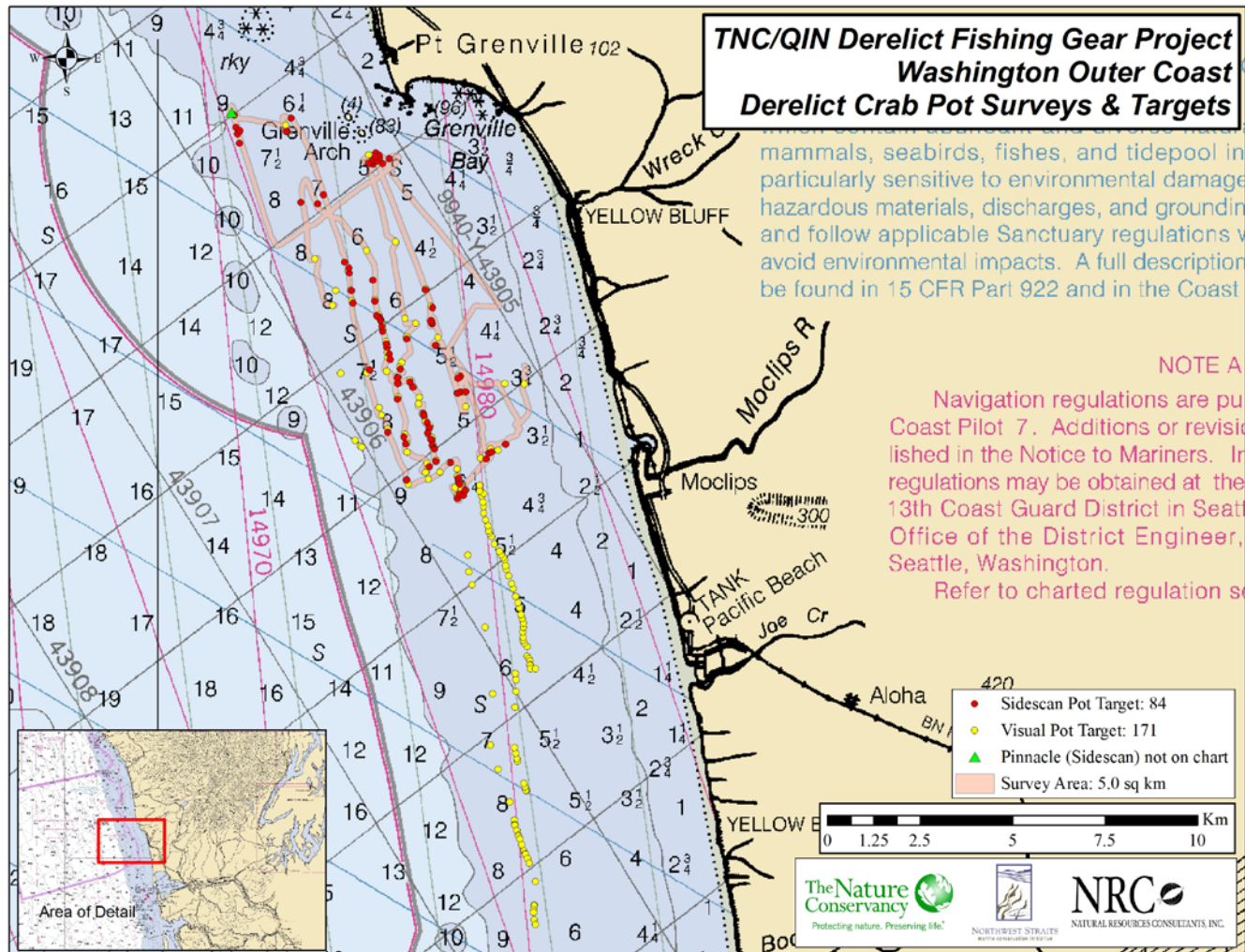


Figure 3. Locations of derelict fishing gear removals during the TNC/QIN 2012 Washington Coast Derelict Fishing Gear Project.
Source: NRC.

