DAMAGE ASSESSMENT AND RESTORATION FOLLOWING THE JULIE N OIL SPILL: A CASE STUDY

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ABSTRACT: *On September 27, 1996, the T/V JULIE N inbound with a cargo of 8.8 million gallons of #2 fuel oil struck the Million Dollar Bridge, spanning Portland Harbor between Portland and South Portland, Maine. The incident resulted in a spill of approximately 180,000 gallons of oil, which spread throughout a large area of Portland Harbor. The marine and coastal resources of Portland Harbor and the Fore River, including water resources, shellfish, wetlands, sediments, and birds were exposed and/or injured by the oil. The spill also had an adverse impact on several different public use services. The natural resource trustee agencies (including the State of Maine, NOAA, and the Department of the Interior) and Amity Products Carriers, Inc. (Responsible Party, RP) conducted a cooperative natural resource damage assessment to assess and restore natural resources exposed and/or injured by the spill. The trustees and RP operated under an initial verbal agreement to cooperate until a written agreement was executed over a year after the incident. The cooperative process and lessons learned are described in the paper. Particularly positive components included cooperative data collection and active collaboration on study design and endpoints. The trustees expended $782,860 in assessment costs. The RP expended an additional $169,101 in cooperative laboratory and field investigations, as well as $364,720 in consultant costs. The total assessment costs were $1,316,681. The trustees and the RP were then able to successfully negotiate a $1 million dollar settlement for the purpose of planning, implementing, and overseeing selected restoration projects. These projects included reducing the discharge of PAH's into the Fore River, wetland and bird habitat restoration, and construction of a recreational trail along the Fore River. The RP sought compensation from the Oil Spill Liability Trust Fund under the limitation of liability provisions of the Oil Pollution Act of 1990. Compensation included expenses beyond statutory liability for response, NRDA assessment, and damages to natural resources among others.*

Introduction

The Incident. At approximately 11:05 A.M. on September 27, 1996, the oil tanker JULIE N, inbound with a cargo of 8.8 million gallons of #2 fuel oil, struck the south side of the Million Dollar Bridge spanning Portland Harbor between Portland and South Portland as it went through the draw span (Figure 1). Following the collision, the vessel proceeded one mile up the Fore River to the Rolling Mills terminal where it was boomed off. In the collision with the bridge, the JULIE N sustained a substantial hole to its port bow area. The forward bunker tank lost approximately 93,198 gallons of IFO 380 heavy fuel oil. The #1 port cargo tank lost approximately 86,436 gallons of #2 diesel, totaling 179,634 gallons of spilled oil. High winds and extremely high tides on September 28th and 29th caused an unspecified amount of oil to be released from the boomed area and to be carried into the upper Fore River and Stroudwater Marsh area, including Long Creek. The Portland side of the river was more heavily oiled than the South Portland side, which had areas that remained almost oil-free.

Spill Response. The owners of the vessel took responsibility for the cleanup activities under the strict liability provisions of the Oil Pollution Act of 1990 (OPA'90). The responsible party (RP) activated its spill response plan, deployed initial response measures, and assembled its spill management team. Ultimately over 1,000 personnel were involved in the response. Recovery efforts continued until clean up was declared complete on December 2, 1996, 66 days after the incident. The final tally indicated that 140,976 gallons of oil, approximately 78.5 percent of the volume spilled, were recovered. Approximately 38,618 gallons of oil were lost to the environment either through evaporation, dissolution or as fugitive oil. The RP expended over 32,000,000 on the cleanup effort.

Trustee/rp cooperation

The National Oceanic and Atmospheric Administration (NOAA), Department of the Interior's Fish and Wildlife Service (FWS), and the State of Maine's Department of Environmental Protection, Department of Conservation, Department of Inland Fisheries and Wildlife, and Department of Marine Resources were identified as trustees for natural resources. The trustees determined that they needed to initiate a natural resource damage assessment to identify the nature and extent of resource and service injuries, and necessary restoration actions. Within the first 48 hours of the incident, the RP and trustees verbally agreed to cooperate in the damage assessment process. Technical representatives of the trustee agencies and the RP were identified and they immediately began to identify resources at risk and develop plans to study potential injuries. Particular emphasis was placed on the collection of perishable time sensitive data.

As part of the cooperative process, the trustees requested the RP to conduct or fund several components of those study plans. The RP was also requested to provide and pay for laboratory services associated with these studies, as well as take the lead in reopening the temporarily closed fishing grounds. Work proceeded based on verbal agreement between the parties.

The designated technical representatives of the RP participated actively in the damage assessment following the spill; they were involved in the design, performance and funding of many studies completed as part of this assessment. They also participated actively in Technical Working Groups, which were created to design and interpret the studies and evaluate potential injuries. Coordination between the trustees and the RP helped reduce duplication of studies, increase cost effectiveness of the assessment process, and increase sharing of information and experts. Input from the RP was sought and considered throughout the damage and restoration planning process by the trustees.

As required by the OPA'90, the trustees formally invited the RP to participate in the damage assessment process. Accordingly, on 3 October 1996 the trustees delivered a formal invitation pursuant to the OPA regulations for participation in the damage assessment to Amity Products Carriers, Inc., the RP for the JULIE N oil spill. The invitation was accepted by the RP on 7 October 1996.

A Memorandum of Understanding (MOU) was prepared and signed by the RP on 15 September 1997. This agreement, which is an agreement regarding cooperative injury assessment, memorialized the cooperative process that had been employed to date and clarified the process going forward including restoration planning. The MOU was signed by the last trustee on 2 March 1998, some 521 days after the incident.

Injury assessment

The trustees determined that natural resources under their trusteeship were affected by the spill, that response actions would not eliminate injury to those resources, and that feasible restoration alternatives existed to address the injuries. Unlike most natural resource damage assessments, the trustees did not collect a significant amount of additional data after the response ended. The trustees discussed the need for additional studies with the RP, and all parties agreed it would be more cost efficient to work with the available data. As a result, the trustees and the RP limited the assessment to 16 different studies and formed three technical working groups to address injuries to marine communities, wetlands, and birds, as well as impacts to the public's use of the resources.

Injured resources and services. Impacts to natural resources and the public use of these resources in the Fore River/Portland Harbor and western Casco Bay areas were varied. Injuries increased with proximity to the spill site and heavily contaminated areas, and included impacts to the macroalgae, shellfish, vertical wall communities, sediments, wetlands, birds, and several public resources such as ferry boat service, trail use, recreational fishing and boating, and tours and charters.

Macroalgae. Macroalgae are marine plants that are important as primary producers and as structural components of intertidal and subtidal marine habitat. As a result of spill response efforts, oiled macroalgae was cut and removed form shoreline areas. The total amount removed was 1,143 square feet and 340 pounds (wet weight). Additional macroalgae injury was accounted for during the assessment of the vertical wall communities discussed below.

Blue mussels. Polycyclic aromatic hydrocarbon (PAH) concentrations in mussels collected from the river were generally 10-30 times higher after the spill than concentrations found in mussels collected from the same areas in 1994. Total PAH concentrations in mussel tissue ranged from 27,000 to 290,000 ppb (dry weight). With the exception of two samples, analyses of mussel samples indicated that the PAHs were consistent with oil from the JULIE N.

Softshell clams. PAH concentrations were up to eight times higher in softshell clams collected in oiled areas relative to clams collected from areas receiving little to no oil contamination. Total PAH concentrations in softshell clam tissue ranged from 14,000 to 110,000 ppb (dry weight). Analyses of softshell clam samples indicated that the PAHs were consistent with oil from the JULIE N.

Vertical wall communities. Vertical wall communities are comprised of plants and animals (anemones, macroalgae, and other marine organisms) that attach themselves to pilings and other hard vertical surfaces. The trustee's injury estimates for these communities represent the extent of surfaces that were heavily oiled and cleaned by spraying with hot water. The linear distance of vertical wall surfaces estimated to be approximately 11,558 feet was then multiplied by the tidal range of 10 feet to provide an estimate of the extent of affected vertical wall communities, roughly 115,580 square feet.

Sediments. Sediments are a major repository for contaminants entering marine ecosystems. Sediment contamination has the potential to adversely affect resident biota (e.g. marine worms and clams) and higher food chain organisms dependent upon those biota as prey (e.g. fish, birds). The trustees observed oil in intertidal sediments and at depths ranging from two to six centimeters. Out of the 25 sediment samples collected, only four contained PAHs attributed to the JULIE N oil. Total PAH concentrations for these four samples ranged from 3,600 to 67,000 ppb (dry weight).

Wetlands and birds. A detailed analysis of oiled wetlands was conducted in 1996 and 1997 through a combined aerial survey and ground-truthing approach. Photographs and ground-truth data were used to map the extent of oiled vegetation. Approximately 25.6 acres of intertidal emergent wetlands were exposed to the JULIE N oil.

Between late September and mid-November, 1,679 cumulative observations of oiled birds (80% were seagulls and 9% were double-crested cormorants; the remainder were black ducks, wading birds, and shorebirds) were documented in the area. Eighty-seven birds were counted as "heavily oiled," 508 as "moderately oiled," and 1,084 as "lightly oiled." Twenty-eight live oiled birds were sent to a rehabilitation center; 15 died, 12 were released, and one was held because of an injury limiting its flight capability. In addition, 12 birds were already dead when they were brought to the rehabilitation center.

Ferry service. The trustees consulted with spokespersons at the two ferry lines servicing Portland Harbor. One ferry service was seriously disrupted in late September, resulting in 250 lost ferryboat passenger/person trips and 2,700 diminished use ferryboat passenger/person trips.

Trail use. The oil impacted marshes next to a school public trail system. Based on discussions with school officials, the trustees estimated that 1,380 recreational trips did not occur and 1,380 trips were diminished because of the spill.

Recreational fishing. The spill occurred as marine sport fishing approached the end of its normal season. The trustees consulted with captains of three vessels that charter recreational fishing trips. Based on data collected, an estimated 124-

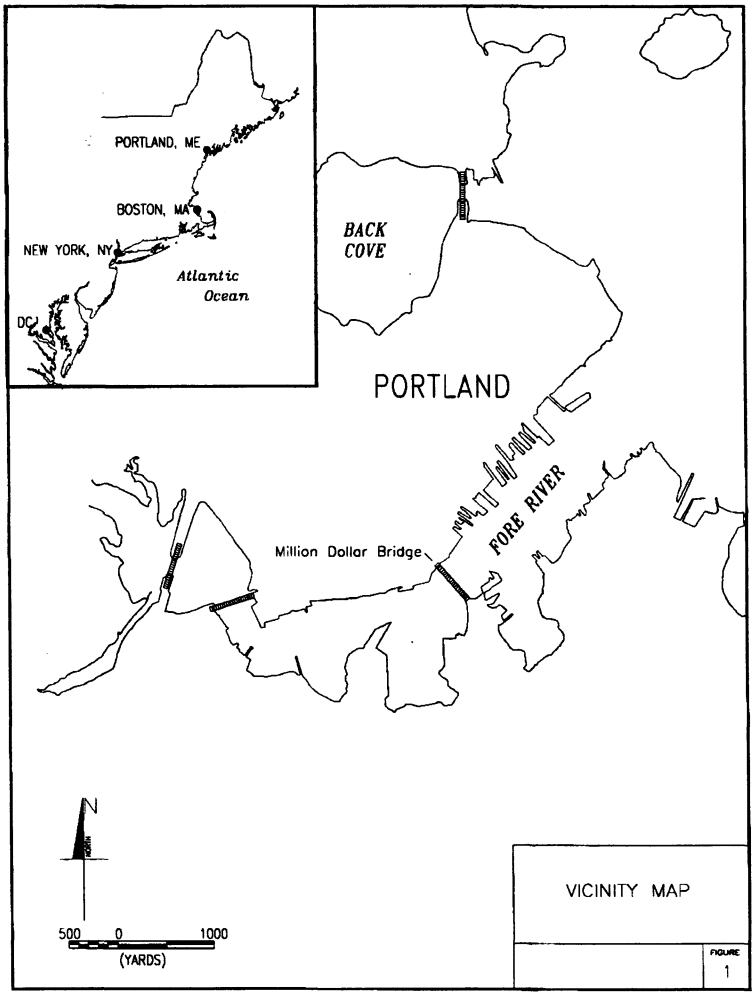

Figure 1. Million Dollar Bridge spanning Portland Harbor between Portland and South Portland.

party/charter boat recreational fishing person trips were lost in late September and October 1996.

Recreational boating. The Casco Bay recreational boating season generally ends in late September, with the season extending for another month in the Fore River/Portland Harbor area. Recreational boats docked at marinas located outside the spill response area were generally unaffected by vessel traffic restrictions. Marinas and mooring areas located within the response areas experienced closure ranging from several days to six weeks. Adjusting for uncertainties in weather, the trustees estimated that roughly 4,862 recreational boating trips did not occur because of the spill.

Tours and charters. To assess losses to tours and charters, the trustees consulted with a local owner of a tour and charter agency. Educational tour boat trips for approximately 300 secondary school students were canceled because of the oil spill.

Restoration

Considering the nature and extent of the injuries to natural resources caused by the *JULIE N* oil spill, the trustees developed a plan for restoring the injured resources and services, which is set forth in the Final Restoration Plan/Environmental Assessment. In it, the trustees identified a reasonable range of restoration alternatives, evaluate those alternatives, and selected the preferred alternatives from among them.

The trustees and RP, Amity Products Carriers, Inc., agreed to settle the natural resource damage claim resulting from this spill. The RP placed $1 million into the JULIE N Oil Spill Restoration Account, a separate account established within the U.S. Department of Interior's NRDA and Restoration Fund. All funds in the Oil Spill Restoration Account will be used by the trustees to plan, implement, and oversee the selected restoration projects identified in the Restoration Plan/Environmental Assessment.

These projects included:

Reducing the discharge of oil and grease into the Fore River by purchasing new and rehabilitating existing equipment to collect sediments contaminated with oil and grease from storm water systems throughout the Portland area;

Restoring 130 acres of coastal wetlands and bird habitat; and

Constructing a one-mile segment of recreational trail to connect two existing trail systems along the Fore River.

Status of the restoration projects. The trustees have selected a planning and design consultant for the Scarborough Marsh restoration project. Final design is expected to be completed by the end of 2002.

Portland Trails, a local non-profit organization, completed construction of the Fore River Trail in September 2001.

The State of Maine entered into an agreement with the City of Portland to purchase storm water management equipment and to monitor those discharges for 5 years. The City purchased the vactor truck units in March 2001, which have been used to remove contaminated sediments from storm drains, that discharge into Portland Harbor.

Costs

The owners, operators and insurers of the JULIE N took responsibility and control for cleanup as dictated under the Oil Pollution Act of 1990 (OPA '90). Approximately $32,000,000 was spent in cleanup operations and paid by the RP. An additional $1,000,000 was paid to restore and compensate for losses of natural resource services as determined by the Natural Resource Damage Assessment provisions of OPA '90.

Assessment costs for this case were as follows:

Trustees

NOAA $410,000	
NOAA contractor	$249,931
USFWS	$ 53,057
State of Maine	$ 48,065
RPI	$ 22,091
	$783,144

Studies and testing requested of the RP by the trustees

Analytical costs	$117,104
Friends of Casco Bay	$ 675
Contractors (7) and expenses	$ 51,522
	$169,101

RP technical contractors

Contractors (5)	**$364,436**

GRAND TOTAL:	**$1,316,681**

The JULIE N filed for limitation of liability pursuant to the OPA 90. Under OPA 90, the RP may be entitled to limit its liability to $1,200 of gross registered ton of the vessel. The RP was granted this limitation and has made a claim with the Oil Spill Liability Trust Fund (OSLTF) established under OPA 90 for the excess of expended cleanup and damage expenditures past its liability limit. In connection with the NRDA assessment costs and the NRDA settlement with the trustees, the OSLTF has agreed to pay an amount of $2,316,681.

Lessons learned

Cooperation can be extremely important, if not vital, to efficient and cost effective collection of data relative to resource injury. Most importantly it provides a positive working relationship for expediting injury assessment and execution of appropriately scaled restoration. In every case valid technical differences of opinion as well as some level of mistrust and/or apprehension occur. In this case the cooperative approach minimized these problems and led to a reasonable settlement in a reasonable amount of time.

Successful cooperation in the NRDA process cannot be legislated or dictated. It is based on the professionalism and mutual desire of the participants to reach an equitable and rational endpoint of restoration. While OPA '90 has requirements for seeking and documenting cooperation, real cooperation begins and ends with the attitude and mindset of the individuals involved. In this case, the vast majority of the time sensitive data required for injury assessment was collected prior to the memorialization of any cooperative agreement. It is understood that laws and regulations are in place to minimize the risk of being victimized by the unscrupulous. It is also good to know that it is possible to collectively act with maturity, appropriate mutual skepticism, focus, and professionalism to resolve the case fairly, efficiently, and in the benefit of the environment.

Biography

Mr. Mauseth is the President and a Principal of Polaris Applied Sciences, Incorporated with over 29 years' experience as a marine biologist dealing with marine and aquatic environmental problems. He provides scientific support and project management for oil and chemical spill and ship grounding emergency response, and Natural Resource Damage Assessment under the Oil Pollution Act and worldwide. Gary has a B.A. in Biology from Whitman College and a M.S. Marine Science from the University of the Pacific, Pacific Marine Station.