

EMERGENCY AND LONG-TERM RESTORATION PLANNING FOR THE 1999 OLYMPIC PIPE LINE COMPANY SPILL, WHATCOM CREEK, BELLINGHAM, WASHINGTON, USA¹

Douglas Helton
National Oceanic and Atmospheric Administration
Office of Response and Restoration
7600 Sand Point Way NE
Seattle, WA, 98115
Doug.Helton@NOAA.GOV

Daniel Doty
Washington Department of Fish and Wildlife
600 Capitol Way N.
Olympia, WA 98501
dotydc@dfw.wa.gov

ABSTRACT: *The restoration planning efforts for the June 10, 1999, Olympic Pipe Line Company gasoline spill illustrate the benefits of cooperative and restoration-based damage assessment. The Incident resulted in the release of approximately 236,000 gallons of gasoline into Whatcom Creek, Bellingham, Washington. The spilled gasoline ignited, burning much of the riparian vegetation including a large section of mature forest in an urban park. The combination of the spill and fire resulted in the complete elimination of terrestrial and aquatic biota in several miles of the creek. Affected biota included several species of juvenile salmonids, including chinook salmon, which are listed as threatened under the Endangered Species Act. The Incident also resulted in recreational fishing and park closures. The Oil Pollution Act regulations require the Trustees to invite the Responsible Party to participate in the damage assessment and restoration process. By working together, restoration of injured resources and services may be achieved more rapidly and cost-effectively. Shortly after the Incident, the Trustees and the Company recognized that a cooperative process would reduce duplication of studies, increase the cost-effectiveness of the assessment process, increase sharing of information, decrease the likelihood of litigation, and, most importantly, speed the restoration process. Another benefit of the cooperation was the ability to accomplish restoration goals in coordination with the emergency response activities. This paper summarizes the overall Incident and discusses the restoration planning process, including the emergency and long-term restoration actions.*

Incident description

On June 10, 1999, a rupture occurred in a pipeline owned by the Olympic Pipe Line Company. The Company operates a pipeline system that runs from Ferndale, Washington, to Portland, Oregon. The rupture occurred at a location where the pipeline crosses Whatcom Falls Park within the City of Bellingham, Washington (Figure 1). The U.S. Environmental Protection Agency and the Washington Department of Ecology report the spill volume as approximately 236,000 gallons. Released product

saturated the ground surrounding the pipeline and flowed both above ground and through subsurface pathways to nearby Hanna Creek where it proceeded downstream into Whatcom Creek. The spilled material was accidentally ignited, resulting in a fire, which, at its peak, spanned from the source location down Hanna Creek to Whatcom Creek and down the creek for a distance of approximately 1.6 miles.

Resources at risk

The pipeline release and resulting fire affected the Hanna Creek and Whatcom Creek watersheds. Whatcom Creek starts at Lake Whatcom and flows westward for approximately four miles through suburban and urban sections of the City of Bellingham before discharging into Bellingham Bay. The central stream corridor and adjacent forests, parks, and open-space areas are important ecological and recreational resources for the City of Bellingham. The Whatcom Creek watershed is also an important location for fishing, recreation, and other uses. The 240-acre Whatcom Falls Park contains a system of walking, cycling, and multi-use trails. During the past decade, a concerted effort by local governments, tribes, non-profits, and individual citizens has led to habitat improvements in and along Whatcom Creek. The creek also has important cultural and subsistence values. The creek falls within the 1855 Point Elliott Treaty Area for the Lummi Nation and Nooksack Tribe. The name Whatcom is derived from the Lummi word *Xwot'com*, and describes the sound made by "rolling waters"- a reference to the series of waterfalls on the upper reaches of the creek.

Of particular concern from the spill were potential impacts to salmon. Six species of anadromous salmonids and trout spawn and rear in the creek. Resident life-history forms of rainbow and cutthroat trout also occur in the creek. The creek and its adjacent riparian areas are included in the critical habitat designation for the Puget Sound Chinook, which are listed as threatened under the Endangered Species Act (16 U.S.C §§ 1531 *et seq.*). Large returns of chum salmon support one of the biggest recreational chum fisheries in Washington State.



Figure 1. Spill site.

Natural resource damage assessment (NRDA) process

Under the Oil Pollution Act of 1990 (OPA) (33 U.S.C. §§ 2701, *et seq.*), the responsible parties (RPs) for the discharge of oil are liable for the costs to restore natural resources. Designated Trustee agencies may conduct an NRDA to determine and quantify injuries to natural resources and to claim damages from the RPs to restore those injured resources and compensate the public for interim losses. The Trustees for this Incident included the National Oceanic and Atmospheric Administration (NOAA), the U.S. Fish and Wildlife Service (USFWS), the Washington Department of Ecology (WDOE), the Washington Department of Fish and Wildlife (WDFW), the Washington Department of Natural Resources (WDNR), the Lummi Nation, the Nooksack Tribe, and the City of Bellingham. The City of Bellingham was appointed by the Governor of Washington as a Trustee specifically for this Incident due to the proximity of the Incident.

Cooperative assessments

The goal of OPA is to make the environment and public whole after injuries to natural resources and natural resource services resulting from oil spill incidents. This goal is achieved through prompt restoration of the injured natural resources. Historically, NRDA activities have been conducted under the cloak of litigation. The litigious relationship between Trustees and RPs often delayed restoration and prevented the dissemination of information to the response community and the public. In certain cases, because of confidentiality agreements, the results of the assessment studies were never made public. The litigation process did not provide for informed public involvement early in NRDA cases, yet it is the public that owns the affected natural resources. This adversarial process has been costly as well. Both the Trustees and the RPs have conducted separate studies, hired confidential experts, and contracted technical studies for

litigation. The OPA regulations changed NRDA to be a more open restoration-based process, including making assessment results and critical documents available to the public in an administrative record, and inviting the RPs to actively participate in the assessment and restoration planning. However, although the RP may contribute to the process, final authority to make determinations regarding injury and restoration rests solely with the Trustees.

Shortly after the Incident, the Trustees and the Company recognized that a cooperative process would reduce duplication of studies, increase the cost-effectiveness of the assessment process, increase sharing of information, decrease the likelihood of litigation, and, most importantly, speed the restoration process. The Company and the Trustees agreed to a process to collect time-sensitive data and do a series of preliminary assessments to define the scope of the Incident and to identify emergency restoration options within the impacted area.

Assessment activities

Within hours of the Incident, representatives of the Trustees and the Company arrived at the spill site and initiated a preliminary investigation of the impacts of the Incident on the natural resources in the area. An “Ephemeral Data Collection Committee” was formed to identify specific sampling objectives and projects and to review the information. These activities were coordinated with and complemented information and data collected by the response agencies. The following activities, conducted by the Trustees, the Company, and/or the response agencies, were used to help evaluate which natural resources and services may have been injured and to provide a technical basis for determining the need for, type of, and scale of restoration activities. Much of the information was collected early during the Incident and was used to help identify opportunities for emergency restoration.

- Ground and Aerial Photographs and Video Records
- Fingerprinting of Contamination
- Collection of Response Information and Literature
- Water Quality Studies, including Characterization of Sediment Pore Water
- Stream Invertebrate Studies
- Stream Temperature Monitoring
- Stream Habitat Surveys
- Terrestrial Vegetation Studies
- Salmonid and Fish Recovery Studies
- Source Site Characterization and Remediation
- Documentation of Park and Recreational Closures
- Modeling of Fates and Marine Injuries

Emergency restoration

Another benefit of the cooperation was the ability to accomplish restoration goals in coordination with the emergency response activities. In an effort to establish a single focus among all Trustees and the Company, the parties agreed to develop a Joint Restoration Committee (JRC). The JRC, formed within the first few days of the Incident, worked to plan and implement emergency response and restoration activities during the summer and fall after the Incident. The JRC used information collected during the preliminary assessments and quickly identified some emergency restoration options within the impacted area. The

Company committed the resources and equipment necessary and these emergency response and restoration activities were implemented to reduce injuries to natural resources or restore injured resources. The emergency response and restoration activities included:

- Stabilization of soils within burned areas of the Park, removal of potentially dangerous trees and branches from burned areas, planting of nearly 40,000 trees, and invasive-plant control.
- Stream sediment remediation to release trapped hydrocarbon contamination, and removal of trash and debris from the banks and channel of Whatcom and Hanna Creeks.
- Reconfiguration of the channel bed and introduction of large woody debris to improve fish habitat, enhancements to fish passage, and reconstruction of Hanna Creek following removal of contaminated soils and gravels.
- Installation of trails, footbridges, pedestrian walkways, and overlooks in the Park to improve public access and understanding of environmental impacts of the event.

Summary of impacts

Fish and fish habitats. Prior to the Incident, Whatcom Creek supported a diverse suite of fish, invertebrates, and other organisms. The combination of the fire and toxic levels of hydrocarbons killed virtually all aquatic biota from the spill site to the mouth of the creek. Over 100,000 fish were killed. Most of the dead salmonids were fry and smolts. Due to the time of year, adult anadromous salmonids were not present in the stream during the Incident. The actual number of fish and aquatic organisms killed was probably much higher than that observed by survey crews. Teams could not survey all areas of the creeks due to safety closures, water depth, or limited accessibility.

The Incident and resulting response actions also disturbed the physical features of Whatcom and Hanna Creeks. Hanna Creek was completely dewatered for several months to allow for excavation of contaminated sediments and soils. Gravels in Whatcom Creek were mechanically reworked to facilitate release of trapped hydrocarbons. Contaminated natural woody debris was removed from both creeks.

The emergency restoration efforts mitigated the physical habitat impacts, and the physical habitats in the creek now are comparable or enhanced compared with habitat conditions prior to the Incident. Large woody debris was re-introduced to Hanna and Whatcom Creeks and cobbles and gravel were replaced and rearranged to create more pools and increased spawning habitat. However, there was a significant fish kill and short-term loss of stream habitats.

Terrestrial and riparian impacts. Burned terrestrial vegetation totaled approximately 26 acres, including approximately 16 acres of mature riparian forest within the Park. The response, excavation, and cleanup activities resulted in several acres of additional injury to vegetation near the break site and along upper Hanna Creek. In addition to the direct injuries to the vegetation, the loss of vegetation resulted in increased erosion, expansion of invasive species, loss of shade and increased stream temperatures, lost recreation, and lost fish and wildlife habitat.

Wildlife impacts. Wildlife impacts from the Incident included direct mortality, loss of habitat, loss of forage foods and prey, and disturbance caused by remedial activities. Although survey efforts were limited because of safety and erosion concerns, dead

beavers, river otters, other small mammals, birds, and reptiles were collected. Based on the intensity of the fire, most of the wildlife within the burn zone at the time of the explosion were presumed killed. Terrestrial or aquatic animals probably were overcome by fumes and then killed by the fire. The fire probably completely destroyed many smaller-bodied animals.

Lost recreation. The spill and fire directly impacted at least 16 acres of the Whatcom Falls Park. Services lost include direct uses such as hiking, jogging, swimming, kayaking, fishing, picnicking, bird watching, and other outdoor activities. The majority of the Park was closed in the days and weeks after the Incident. These curtailments in services were reduced through progressive re-openings, with the exception of a continuing closure of the area within the burn zone. Whatcom Creek serves as a popular fishing resource. The WDFW instituted an emergency rule closing all fisheries in the creek and its tributaries, from Lake Whatcom down to Bellingham Bay.

Long-term restoration

The response and emergency restoration actions, while beneficial, did not completely compensate for the losses from the Incident. Therefore, in addition to the emergency restoration conducted shortly after the Incident, the Trustees and the Company worked together to develop a long-term restoration program that will restore the affected natural resources to pre-Incident or baseline levels and compensate for interim losses (Figure 2)². The goals of long-term restoration are to 1) enhance recovery of vegetation; 2) enhance anadromous and resident fish

populations through habitat improvements and protection of riparian buffers; 3) protect habitats; and 4) compensate for the lost and diminished human-use services resulting from closure and injury to the Park. In developing the restoration plan, the Trustees took into consideration the restoration concepts proposed by the Company, proposals submitted by each of the Trustees, and comments received from the public. The planned restoration projects include:

Land acquisition and park enhancements. This element of the restoration plan includes acquisition of 13.5 acres of land along the creek that was slated for development for use as parklands and to protect riparian habitats. The primary purpose of these projects is to compensate for recreational losses resulting from the Incident, but the lands will also be available for long-term fish, wildlife, and riparian habitat restoration projects. An access road, parking lot, and restroom facility will be constructed on a small portion of one of the sites to facilitate park use. The acquired lands are also expected to have significant collateral benefits for salmonids by protecting water quality and maintaining a healthy riparian zone. One of the important injuries documented by the Trustees was closure and destruction of park resources and properties. The property acquisition, combined with park improvements and recreational trails, is expected to compensate for these injuries and loss of services by increasing park visitation and trail usage opportunities without increasing congestion and user density. As the plantings mature and other improvements are made, the Trustees expect that the parcels will be a seamless addition to the Whatcom Falls Park and Trail System.



Figure 2. Long-term restoration sites.

Fish habitat projects. One of the major impacts documented by the Trustees was injury to anadromous and resident salmonids, fish, and other aquatic resources. This element of the plan involves construction of two projects. One project involves construction of a backwater channel within a historic meander of the Whatcom Creek to improve winter refuge habitat for juvenile salmonids. The other project involves construction of pools, wetlands, and salmon rearing habitat on Cemetery Creek near the confluence with Whatcom Creek. These projects are expected to directly address two known limiting factors: 1) the limited availability of cool water refugia during the summer months, and 2) the limited availability of off-channel habitat that is normally provided when streams are allowed to meander onto the floodplain and form secondary channels. The projects are also expected to benefit other fish, amphibians, aquatic invertebrates, and freshwater and riparian habitats, and generate benefits for water quality, recreation, vegetation, and wildlife.

Long-term monitoring and maintenance. The final element of the long-term plan involves establishment of a dedicated fund to support monitoring of Whatcom Creek, maintenance of the emergency and long-term restoration projects, and maintenance of the burned parklands (e.g., removal of hazardous snags).

Conclusions

The Whatcom Creek Incident illustrates some of the benefits of Trustees and RPs working together towards the goal of restoration. The Olympic Pipe Line Company could have cleaned up the spill and left the restoration of the stream and park to the damage assessment process. The Trustees would have conducted studies to document the extent of the problem, prepared a restoration plan, and begun legal proceedings against the spiller. This assessment and restoration planning would have added several more years to the process, during which the salmonid populations in the stream would have continued to decline. Invasive vegetation would have spread, and increased erosion and sedimentation of spawning gravels would have exacerbated the original injury.

Instead, the Trustees and the Olympic Pipe Line Company agreed to a cooperative assessment and restoration approach early after the Incident. The Company committed its resources to the process and the restoration approach and it brought in the experts necessary to ensure that the emergency and long-term restoration objectives were met. The Trustees and the Company committed to focus on restoration and aggressively sought emergency opportunities to lessen the impacts and to promote rapid recovery of Whatcom Creek.

The prompt restoration helped to lessen the overall injury and reduce the interim lost uses of the impacted area. It made economic and environmental sense to act quickly to replant the riparian vegetation and implement other restoration actions rather than waiting until the conclusion of the damage assessment process. Even though some categories of injury and loss could not be addressed early, at least the list could be shortened, and the early cooperation created a strong foundation for a collaborative development of the long-term plan.

Biography

Douglas Helton is the oil spill coordinator for the National Oceanic and Atmospheric Administration's (NOAA) Damage Assessment Center (DAC). For the past 12 years he has headed DAC's Rapid Assessment Program which allows NOAA to place regional NOAA scientists and contractors on-scene quickly after an oil or chemical spill to collect perishable biological and economic data and to initiate damage assessment studies. Mr. Helton is the central point of emergency notification for DAC and is responsible for reviewing all incidents and developing appropriate assessment strategies. He has participated in the assessment of over 50 oil and chemical spills throughout the US Coastal Zone, including incidents such as the T/B North Cape in Rhode Island, the M/V Kuroshima in Dutch Harbor, Alaska, the T/V Julie N in Maine, and the M/V New Carissa in Coos Bay, Oregon.

¹ This article expresses the views of the authors and does not necessarily reflect the views of NOAA or WDFW.

² This restoration effort is not designed to be a punitive action toward the Company, nor is it intended to address loss of human life, loss of private property, other personal losses, or individual claims.

