

NOAA Hazardous Waste Site Report

Harbor Island (X-4)
Seattle, Washington
April 13, 1984

Location and Nature of Site:

Harbor Island is a 380-acre, man-made island created in the early 1900's at the confluence of the Duwamish River and Elliott Bay in Puget Sound and at the southern boundary of the Seattle Central Business District (Figure 1). This site includes both the land area and the surrounding waters. The primary use of the site is as an industrial park. The island has been under investigation for six years as a result of high ambient lead levels. Stack emission from an on-island secondary lead smelter and resuspension of lead dust into the atmosphere by vehicle traffic are the two main sources of lead.

Proximity of Chemical Hazard to Marine Resources:

Soil on Harbor Island at the site is contaminated with as much as 15% lead. Surface runoff from the site flows into both the east and west waterways of the Duwamish River via storm drains.

Studies of Duwamish River sediment contamination funded by NOAA, the U.S. Army Corps of Engineers, and the City of Seattle have shown elevated levels of copper (135 ppm), chromium (28 ppm), zinc (186 ppm), arsenic (44 ppm), PCB's (11 ppm), PAH's and lead (102 ppm) in the area of Harbor Island (1-13). Two shipyards and petroleum operations on the island may also contribute pollutants, in addition to the smelter. In some cases elevated levels of lead (43 ppm-12,990 ppm) in the river were associated with storm drain discharges. At times the river channel is dredged causing resuspension and transport of contaminated materials.

Marine Resources at Risk:

The Duwamish is used as a migratory route and rearing area by several salmon species. The Duwamish river system is the fourth, fifth, and sixth most important river for steelhead, chinook and coho salmon in the State of Washington (14). The estuarine area of the lower river in the vicinity of Harbor Island is vital to salmon as a transition area for migrating juvenile fish. The State of Washington maintains a salmon hatchery on the river system. Coho salmon smolts have shown both lethal and sublethal effects from exposure to copper and other metals.

A number of fish species including herring, smelt, tomcod and sole are also found in the river. Shellfish include spot shrimp, crab and mussels (15).

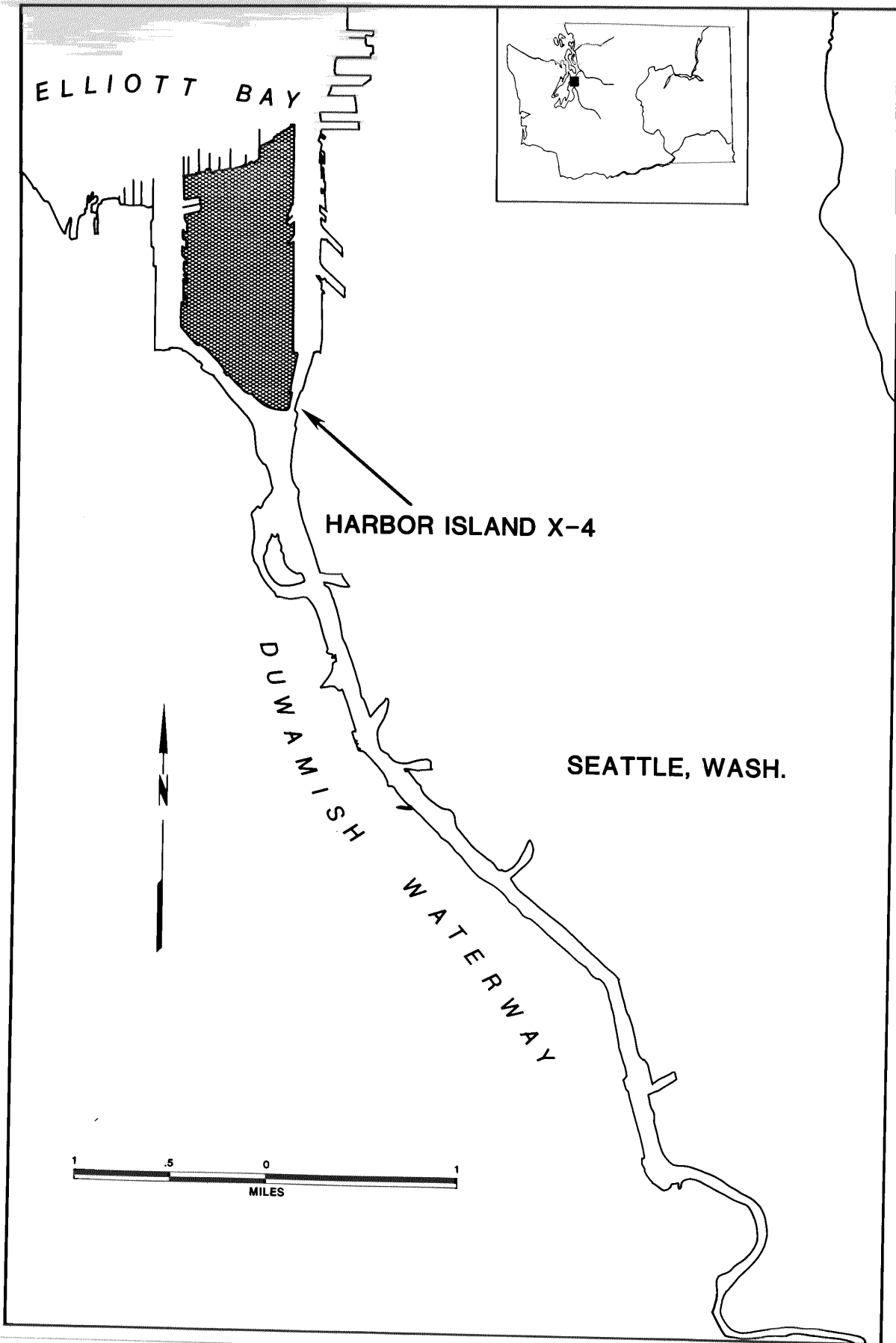


FIGURE 1. Site location.

Fishing in the waterway is a popular recreational activity. Up to 60% of the people fishing there use the fish as a dietary supplement. Fish consumption may provide a direct link for transfer of contaminants to humans.

Gulls and numerous waterfowl species utilize the waters near harbor island on both a continuous and seasonal basis.

Studies conducted at the federal, state and local levels have examined contaminant levels in the Duwamish River. Several studies by Malins and others, which specifically address the effects of pollutants on fish, have been funded by NOAA (16-20). Some studies have demonstrated biological abnormalities in fish from the Duwamish.

Summary of Site-Related Actions:

Airborne lead pollution has been the primary concern of EPA when dealing with this site. Mitigation efforts (primarily surface paving) have focused on reducing the resuspension of lead in contaminated soil. Smelter produced fugative and stack emissions provide a continuing source of lead which is deposited on the ground. The emphasis on surface paving as a mitigation method may increase the transport of lead to the river via surface runoff. Additional site investigations by EPA will include analysis of samples from the waters adjacent to the Island.

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