

Coastal and urban habitat investigations

Problem statement

Human activities have physically altered and chemically contaminated fish habitat in estuaries and nearshore environments, and traditional land-use management strategies have led to habitat fragmentation throughout the Northwest.

Critical factors

- Industrial wastes have polluted many urban estuarine and marine areas in the Pacific Northwest.
- Mining activities have polluted some river systems with toxic metals.
- Pesticides used in agriculture and nutrients that run off the land (e.g. from agriculture, development) also pollute rivers.
- Research has shown that contaminant levels in some areas have deleterious effects on marine fish, marine invertebrates, and salmonids.
- Some contaminated sites lie in areas that have been designated critical habitat for listed salmon or areas that are essential to marine fish.
- Sediment-associated species, some of which form the prey base for fishery species, are often exposed to highly contaminated sediments.
- Scientists must establish threshold values for contaminant effects so that they can predict biological effects on indigenous species.
- The National Oceanic and Atmospheric Administration (NOAA) needs site-specific assessments of contaminants' effects on marine resources in order to develop claims for damages to natural resources and devise cost-effective strategies for restoration.

Status of research

Scientists at the Northwest Fisheries Science Center (NWFSC) are looking for links between degraded habitats and decreased fisheries productivity. They are using both laboratory research and field monitoring to assess contaminant effects on the reproduction, growth, development, and survival of marine and anadromous species. NWFSC scientists are using the information to determine thresholds for serious effects, develop models to estimate the impacts of toxic chemicals or hazardous materials, and make sure that sediment and water quality criteria protect the health of marine species. They are also creating a geographic information system (GIS) to identify contaminant threats to essential habitat for federally managed fish species.

Center scientists have also participated in several Natural Resource Damage Assessments to determine how much restoration is needed to meet legal requirements at sites in Puget Sound. A study in Seattle's Elliott Bay led to a consent decree between NOAA and city and county governments to restore bay resources. In other studies, NWFSC scientists have looked at sediment capping Bainbridge Island's Eagle Harbor, a Superfund site, and injuries to bottomfish and juvenile salmon in Tacoma's Commencement Bay, also a Superfund site.

Future considerations

Our ability to detect the presence and biological effects of contaminants in estuarine, freshwater, and coastal marine habitats will grow increasingly important, as will our ability to determine thresholds above which contaminants produce serious biological effects. We must also develop ways to assess the cumulative effects of human activities on habitat quality and biological productivity.



Sampling in Commencement Bay with otter trawl

Coastal and urban habitat investigations (continued)

Key Players

Environmental Conservation (EC) Division, NWFSC

Damage Assessment & Restoration Centers, NOAA

Office of Response & Restoration, NOAA

Office of General Counsel, NOAA

Coastal Ocean Program, NOAA

U.S. Environmental Protection Agency

U.S. Army Corps of Engineers

U.S. Fish & Wildlife Service

Washington Department of Fish & Wildlife

Washington Department of Health

Washington Department of Ecology

Washington Department of Natural Resources

Tacoma-Pierce County Health Department

Puyallup Indian Tribe

Muckleshoot Indian Tribe

Suquamish Indian Tribe

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