

## STRATUS CONSULTING

### **Portland Harbor Pacific Lamprey Ammocoete Study: Sediment Collection and Analysis Plan**

*Prepared for:*

Stan Van de Wetering and Tom Downey, Siletz Indians  
Mike Karnosh, Grand Ronde Community  
Rob Neely, National Oceanic and Atmospheric Administration  
Jeremy Buck and Stephen Zylstra, U.S. Fish and Wildlife Service

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SC11889

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# **1. Introduction**

Sediments will be collected from Portland Harbor, near Portland, Oregon, and from locations from which Pacific lamprey ammocoetes will be collected.<sup>1</sup> This sampling plan contains objectives and approaches for anticipated sediment collection activities.

## **1.1 Objectives**

The purpose of this activity is to collect sediment for use in initial toxicity evaluations of Pacific lamprey ammocoetes and to guide study design for further sediment toxicity evaluations to be conducted in the Spring/Summer of 2010.

Descriptions of sample site selection, sampling design and documentation, and environmental sample collection methods are provided in the subsequent sections of this plan. A Health and Safety Plan (HSP) covering sediment collection is provided in Appendix A.

# **2. Methods**

## **2.1 Proposed Sample Site Selection**

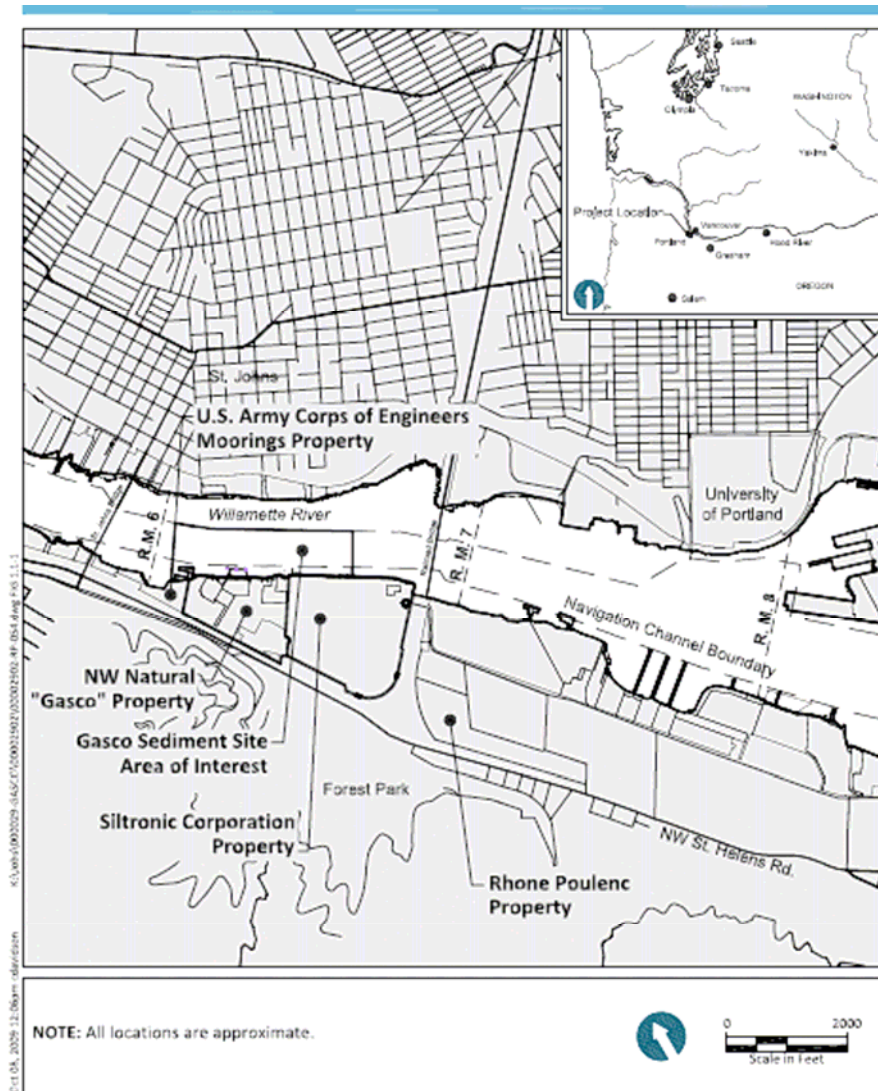
Contaminated sediments will be collected in Portland Harbor from the Gasco site (Figure 1). Reference sediments will be collected from up to three ammocoete collection sites on the Nestucca, Siletz, and (or) Alsea rivers. The precise locations of these sites will be determined during ammocoete collection activities. Site descriptions and coordinates, obtained using a handheld global positioning system (GPS) unit, will be recorded in the field logbook.

## **2.2 Sampling Design and Documentation**

Surface water pH, specific conductance, and temperature will be measured at each sampling location prior to collection of the sediment sample. The pH will be measured using an Orion Research Model 290A handheld or similar pH meter. Specific conductance will be measured using a VWR Model 2052 or similar meter. The pH and conductivity meters will be calibrated at the beginning of each day, and measurements will be taken according to manufacturers' instructions. Measurements will be recorded on field datasheets and/or field logbooks. An example of the field datasheets is contained in Appendix B.

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1. Ammocoete collection will be conducted by employees of the Siletz and Grand Ronde Tribes pursuant to sampling procedures developed by the Siletz Tribe.



**DRAFT**

Figure 1.1-1  
Site Vicinity Map  
NW Natural "Gasco" Site  
Gasco Sediment Cleanup Action

**Figure 1. General location of sediment collection near Gasco site in Portland Harbor, OR.**

Source: Anchor QEA, 2009.

## Sediment collection

Approximately 30 gallons of sediment will be collected from the Portland Harbor site. Approximately 50 gallons of sediment will be collected from one of the three ammocoete collection sites and 20 gallons of sediment will be collected from each of the additional two ammocoete collection sites. The coordinates of each sediment collection location will be recorded in the field logbook. Sediment will be collected from a depth of approximately 0 to 10” at each site using a scoop, shovel, or dredge, depending on overlying water depth. Sediments will be transported and stored in 5-gallon plastic buckets with resealable lids.

Following sediment collection, a composite sample will be collected from each sediment collection location for analytical chemistry. Composite samples for each site will be obtained by subsampling from each 5-gallon bucket of sediment collected and homogenizing the subsamples in a stainless steel bowl. Homogenized composite samples will be placed in appropriate containers provided by Columbia Analytical Services (CAS) and shipped on ice to CAS. Field samples requiring refrigeration will be stored at approximately 4°C in coolers or refrigerators. Chain of custody (COC) procedures will be utilized during sampling, storage, and shipping. All collected samples will be shipped to CAS by overnight delivery. Samples will be analyzed for the constituents listed in Table 1.

**Table 1. Sediment sample analytes and methods**

Analysis	Analytical methods	Number of analytes	Containers	Preservation	Maximum holding time
Metals and metalloids	EPA 6020/7471A	3	Two 16-oz glass jars	4°C	6 months (28 days for mercury)
Pesticides	EPA 8081A	6	With metals	4°C	14 days
PCB Aroclors	EPA 8082	9	With metals	4°C	14 days
Acid volatile sulfide	EPA 821/R-91-100	1	One 4-oz glass jar	4°C	14 days
Sediment particle size analysis	PSEP Grain Size	1	With metals	4°C	NA
Organotins	Krone et al., 1988	4	With metals	4°C	14 days
TPH	NWTPH-Dx	3	With metals	4°C	14 days
Total solids	TS-MET	1	With metals	4°C	28 days
TOC	PSEP TOC	1	With metals	4°C	7 days
Ammonia	EPA 350.1M	1	With metals	4°C	7 days

PCB: polychlorinated biphenyl.

TPH: total petroleum hydrocarbons – gas, diesel, and residual range hydrocarbons.

TOC: total organic carbon.

## Collection documentation

The field sampling team will document its sampling activities in a field logbook and on data recording sheets (Appendix B). Entries will be made in indelible waterproof ink, and corrections will be made with a single line through the correction with the corrector's initials. The notebook and datasheets will be kept in the possession of the field sampling team at all times. After each day's field sampling, the field recorder will review the notes and make any necessary corrections.

Photographs may be taken in the course of field activities to record activities, observations, and events. Photographs should include a date and time stamp with the image. The photographic log should contain the photograph number, date, time, orientation, and a description of the subject.

All environmental chemistry samples will be labeled with a unique identification code using an alphanumeric system and recorded in the field notebook. The identification code will contain information on site location and replicate number as follows:

xx-yy-zz-ddmmyy

where:

xx =	water body: Portland Harbor (PH), Nestucca River (NR), Siletz River (SR), Alsea River (AR)
yy =	sampling station: 01, 02, 03, etc.
zz =	replicate number: 01, 02, etc.
ddmmyy =	date: two digit day, month, year

For example, the identification code SR-02-01-051109 would correspond to the Siletz River sampling station 2, first replicate sampled on November 5, 2009.

All samples collected during this study will be maintained under COC, which is the documentation of a sample's history from the time of collection through sample analysis to final disposal. A COC record will be maintained for each sample starting at the time it is labeled.

The field recorder of each crew is personally responsible for the care and custody of the samples that are in that crew's possession. A sample is considered to be in custody of the field recorder when any of the following occur:

- ▶ The sample is in the individual's possession
- ▶ The sample is within view after being in possession
- ▶ The sample is in a locked or sealed container that prevents tampering after being in possession
- ▶ The sample is in a designated secure area.

A COC transfer occurs when the sample's custody is transferred from one crew to another (e.g., from the sample collection crew to a sample packing/shipment crew), or when the samples are shipped to and received by the laboratory. COC transfers that occur in the field will be documented in the field notebooks of each crew. The date and time of transfer will be recorded in the field notebooks.

When the samples are packed in coolers or other containers for shipment to the laboratory, the samples will be accompanied by completed COC records. The COC record will contain the following information:

- ▶ Project name
- ▶ Sample identification (unique for each sample)
- ▶ Date and time of sample collection
- ▶ Sample matrix (e.g., sediment)
- ▶ Analysis required for each sample
- ▶ Name and signature of individual relinquishing custody
- ▶ Inclusive dates and times of possession for each person
- ▶ Sample shipping date and mode.

Each shipping container containing samples will be accompanied by an original COC record (in a sealed plastic bag taped to the inside of the cooler lid) and sealed with custody seals. Custody seals are used to detect unauthorized tampering with samples after sample collection until the time of use or analysis. Signed and dated gummed paper seals may be used for this purpose. The seals will be attached so that they must be broken to open the shipping container.

Coolers or other containers containing samples will be opened at the analytical laboratory only by a person authorized to receive the samples. The containers will first be inspected for integrity of the custody seals or other signs of tampering. The receipt of each sample in the coolers or containers will be verified on the COC forms. The signed COC forms will be photocopied, and the photocopy will be mailed to the sending party. Samples will be stored in a secure area according to procedures documented for each analytical facility.

The field recorder will be responsible for the care and custody of the samples until shipment to the analytical laboratory. All samples will be packed with enough ice to keep the samples cooled to approximately 4°C until receipt by the laboratory. Ice will be in gel packs, water frozen in excess sample bottles, and/or ice cubes within multiple resealable plastic bags. All sample coolers will be sealed using custody seals and shipped as soon as practicable after collection, by overnight delivery, to the laboratory analyzing the samples. All sample coolers will be shipped in accordance with all applicable regulations.

The samples will be shipped overnight to CAS in Kelso, Washington. The shipping address is:

Columbia Analytical Services  
1317 South 13th Avenue  
Kelso, WA 98626  
800-695-7222 (telephone)

## Bibliography

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USGS. 1997. *Methods for Collection and Analysis of Aquatic Biological and Microbiological Samples*. Book 5. Chapter A4. Techniques of Water-Resources Investigations. U.S. Geological Survey.



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## A. Health and Safety Plan

**Project title:** Pacific Lamprey Ammocoete Study

**Site name:** Portland Harbor, Nestucca, Siletz, and Alsea Rivers

**Dates of proposed activities:** November 2009

### Objectives

- ▶ Collect sediment for chemical characterization and for laboratory bioassay testing from 1 site in Portland Harbor and 3 ammocoete collection sites
- ▶ Measure water pH, temperature, and conductivity at each sediment sampling location.

**Prime contractor:** Stratus Consulting Inc.

Stratus Consulting Program Manager: Joshua Lipton (303-381-8000)

Stratus Consulting Project Manager: Jennifer Peers (303-381-8000)

Stratus Consulting Field Sampling Coordinator, Field Team Leader, and Site Safety Coordinator (SSC): Jeff Morris (303-381-8000)

**Client:** The Siletz, Grand Ronde, Nez Perce, Warm Springs, and Umatilla Tribes

### Task descriptions

- ▶ Collect several gallons of sediment by wading and from a boat

### Level of protection (personal protection equipment, PPE)

- ▶ Level D
  - Standard chest waders or hip boots
  - Standard wading boots (felt soles recommended)
  - Gloves: rubber when working near electricity and nitrile when working with chemicals

### Hazards of concern and mitigating actions:

#### ► Drowning

- **Mitigating action:** Wear hip boots or chest waders. Boots and waders provide protection against cold, contaminants, and underwater objects. Do not attempt to wade in a stream where the depth multiplied by the velocity is greater than 10 ft<sup>2</sup>/s (1 m<sup>2</sup>/s) (USGS, 1997). Although a stream may appear safe for wading, depressions, holes, or loose footing may cause a fall. Be aware of the possibility of slipping and going underwater (feet up, head down) while wearing waders. Avoid hip boots with tight ankles and waders with tight-fitting tops. They are difficult to remove in an emergency. Watch for floating debris and areas of quick sand and pools. Fieldwork should be done in pairs (TCEQ, 2003).

The following requirements apply to personnel working in boats to collect river water and sediment samples:

- Only experienced staff should operate the boat
- U.S. Coast Guard boating safety guidelines or equivalent should be adhered to when operating a boat during sampling activities
- All staff must wear personnel flotation devices when aboard the boat
- The boat must be equipped with the required running lights for nighttime and poor visibility conditions
- The boat must be equipped with a safety line and life preservers
- The boat must be equipped with an anchor and alternative means of locomotion (extra motor, floatable oars)
- The boat must be equipped with suitable signaling devices, such as an air horn and signal light
- Weather and water conditions must be monitored (e.g., marine weather radio forecasts for storm, wave, current conditions, and watercraft warnings) to determine if it is safe to be out on a water body.

#### ► Contact with contaminated water or sediments when collecting environmental samples

- **Mitigating action:** Contaminants suspected or known to exist at the site include a wide suite of metals and organic constituents, including alcohols, semi-volatile and volatile organic compounds, acids, lime, PCBs, pesticides, and iron oxide. Protect yourself (skin, eyes) from exposure to contaminated water and sediment by wearing adequate protective clothing. Avoid unnecessary exposure by not eating, drinking, or smoking at a site or after leaving the site without taking proper sanitary precautions.

- ▶ Cold stress
  - **Mitigating action:** Protect exposed skin surfaces with appropriate clothing (such as face masks, gloves, and footwear) that insulates, stays dry, and blocks wind. Use adequate insulating clothing to maintain a body core temperature of above 36°C. Have extra insulating clothing onsite. If wind is an issue, shield the work area with windbreaks to reduce the cooling effects of wind.
- ▶ Heat stress/sun exposure
  - **Mitigating action:** Have appropriate fluids readily available onsite and drink often. Wear a hat and clothing that breathe well and protect the head and body from sun exposure. Apply sunscreen with an appropriate protection factor early in the day before sun exposure occurs, and reapply as necessary.
- ▶ Automobile traffic in parking lots and near roadways
  - **Mitigating action:** Clearly delineate any sample locations that are located in traffic areas using appropriate items (e.g., barricades, traffic cones, delineators). Wear high visibility clothing such as safety vests when working near traffic.
- ▶ Chemical products stored and used onsite include, but may not be limited to, nitric acid and Alconox® detergent
  - **Mitigating action:** Refer to the material safety datasheet (MSDS) for each chemical product. Appropriate PPE should be worn at all times when working with hazardous or unknown chemical products (including appropriate gloves and safety glasses).
- ▶ Slip, trip, and fall hazards may be present in all areas of the site
  - **Mitigating action:** Keep all walkways clear of obstructions. Survey the area for any of these hazards upon entering an area. Clean up liquid spills immediately. Avoid clutter at sample locations and work areas.

### Site personnel and responsibilities

All Stratus Consulting personnel will be responsible for familiarizing themselves with, and following, all procedures and guidelines described in this Health and Safety Plan.

Jeff Morris, the SSC, will be present as a member of the field sampling team. He will be responsible for ensuring that all field personnel adhere to the project Health and Safety Plan and that the appropriate PPE be utilized and available to all field personnel. The SSC will also conduct a health and safety meeting for all field personnel prior to initiation of field activities.

**Medical emergency*****Portland Harbor***

Hospital name/address: Legacy Good Samaritan Hospital & Medical Center  
1015 NW 22nd Ave  
Portland, OR 97210

Hospital telephone number: 503-413-7711

Ambulance/police/fire emergency: 911

***Nestucca, Siletz, and Alsea Rivers***

Locations will vary.

Ambulance/police/fire emergency: 911

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## **B. Field Sampling Sheets**

Page 1			
Portland Harbor Ammocoete Study 2009 Environmental Sampling Field Datasheet			
<b>Sampling Location (Site ID)</b>			
<div style="border: 2px solid black; height: 60px; width: 100%;"></div>		BOAT or BANK sampling location?	
		Duplicate Sediment Location: YES NO	
		Date: _____	
		Time: _____	
Site Description/Access/Other Notes:			
GPS Coordinates:			
Weather Conditions, Air Temperature:			
<b>Personnel Present</b>			
Name		Affiliation	
<b>Photographic Documentation</b>			
Photo	Date	Time	Subject
Field Recorder:			Date:

Site ID					Page 2	
<b>Sample Log for Sediment Samples</b>						
Interval	Analysis	Bottle Size	# Bottles	Date/Time	Duplicate Taken?	All samples collected?
0-10"	Metals/Pesticides/ PCBs/SVOCs/Organotins/ TPH/TOC/Total solids/ Particle size/Ammonia	16-oz glass	2			
0-10"	Acid volatile sulfide	4-oz glass	1			
<b>Calibration</b>						
Calibrated at this location? YES NO						
<i>pH Calibration</i>						
Model/electrode:						
Buffers used: 4 7 10						
Slope:						
With ATC? YES NO						
<i>Conductivity Calibration</i>						
Model/electrode:						
Standard used:						
<b>Field Measurement Results</b>						
Analysis	Result	Location (Beaker/Stream)	Comments/Operator			
pH	_____ S.U.		Operator_____			
Conductivity	_____ $\mu$ S/cm		Operator_____			
Temperature (from pH meter)	_____ °C		Operator_____			
Field Recorder:				Date:		

Site ID	Page 4
Portland Harbor Ammocoete Study 2009 Environmental Sampling Field Datasheet	
<b>Volume of sediment collected for lamprey bioassay tests:</b> _____	
<b>Additional Field or Analysis Notes</b>	
Field Recorder:	Date:



