

August 12, 2004  
10077.008

Oregon Department of Environmental Quality  
Northwest Region  
2020 SW Fourth Avenue  
Suite 400  
Portland, Oregon 97201-4987

**VIA Hand Delivery**

**Subject: RI/FS Technical Memorandum  
Level 1 Ecological Risk Assessment  
Remedial Investigation/Feasibility Study  
Astoria Area-Wide Petroleum Site  
Astoria, Oregon  
DEQ ECSI File #2277**

Dear Ms. Coates:

Enclosed are four copies of the above-referenced document. This report is being submitted to you on behalf of the Astoria Area-Wide Cooperating Parties. This report is intended to comply with the terms of DEQ Order No. ECSR-NWR-01-11.

Please call me at (503)768-5121 if you have any questions or comments.

Sincerely,  
***EnviroLogic Resources, Inc.***

Thomas J. Calabrese, RG, CWRE  
Principal/Hydrogeologist  
Project Manager

cc: Distribution list attached

Ms. Anna Coates  
August 12, 2004  
Page 2

**ASTORIA AREA-WIDE PETROLEUM SITE  
Distribution List**

- 1 Anna Coates, DEQ Project Manager, Site Response
  - 1 Mike Lilly, Attorney for Port of Astoria
  - 1 Peter Gearin, Port of Astoria
  - 1 Tom Calabrese, *EnviroLogic Resources, Inc.*, Consultant for PoA and AAW PRP Group
  - 1 Max Miller, Tonkon Torp, Attorney for McCall Oil and Chemical Corporation
  - 1 Ted McCall, McCall Oil and Chemical Corporation
  - 1 John Edwards, Anchor Environmental, LLC, Consultant for McCall Oil and Chemical Corp
  - 1 Cary E. Bechtolt, Niemi Oil Company
  - 1 Allan B. Bakalian, Marten Law Group, PLLC, Attorney for Niemi Oil Company
  - 1 Kurt Harrington, AMEC, Inc., Consultant for Niemi Oil Company
  - 1 Ed Platt, Shell Oil Company
  - 1 Rick Glick, Davis Wright Tremaine, Attorney for Shell Oil Company
  - 1 Leon Lahiere, Hart Crowser, Consultant for Shell Oil Company
  - 1 Brian Harris, Harris Enterprises
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  - 1 David Bartz & Neal Hueske, Schwabe Williamson & Wyatt, Attorney for Flying Dutchman
  - 1 Jerry Hodson, Miller Nash, Attorney for Harris Enterprises
  - 1 Lon Yandell, Kleinfelder, Consultant for Harris Enterprises
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  - 1 Donna LaCombe, Tetra Tech EM, Inc., Consultant for Qwest Communications International
  - 1 Anita W. Lovely, Lovely Consulting, Inc., Consultant for Exxon Mobil Corporation
-

August 9, 2004

Anchorage

Mr. Thomas J. Calabrese, R.G., C.W.R.E.  
EnviroLogic Resources, Inc.  
PO Box 80762  
Portland, Oregon 97280-0762

**Re: Level 1 Ecological Risk Assessment  
Remedial Investigation/Feasibility Study  
Astoria Area-Wide Petroleum Site  
DEQ ECSI File #2277  
15435-00**

Denver

Dear Mr. Calabrese:

The purpose of this Level 1 Scoping Ecological Risk Assessment (ERA) is to provide a qualitative determination of whether there are any exposures or potential exposure pathways to ecological receptors presently at the Astoria Area-Wide Petroleum Site (the "Site"), located in Astoria, Oregon. This Level 1 Scoping ERA has been completed as part of the remedial investigation/feasibility study (RI/FS) being performed pursuant to a Unilateral Order issued in December 2001 by the Oregon Department of Environmental Quality (DEQ) (No. ECSR-NWR-01-11).

Edmonds

The Site is located in the SW quarter of Section 7, Township 8 North, Range 9 West; the SE quarter of Section 12, Township 8 North, Range 10 West; and the NE quarter of Section 13, Township 8 North, Range 10 West of the Willamette Meridian. The Site location relative to surrounding physical features is shown in Figure 1. The specific area of the Site investigated for this Level 1 ERA (referred to herein as the "ERA Study Area") is bounded on the north by Slip 2 (approximately 600 feet from the shore toward the Columbia River), on the east by Portway Street, on the south by West Marine Drive, and on the west by the western property boundary of the former McCall Oil Bulk Plant (Chevron) property (Figure 2).

Philadelphia

The ERA Study Area encompasses a portion of the Columbia River within Slip 2 at the Port of Astoria. There is an ongoing Interim Remedial Action Measure (IRAM) consisting of a floating boom and free product absorbent system to contain petroleum hydrocarbons that are presently seeping into the Columbia River from the filled shoreline at the head of Slip 2. Sediment inside and outside of the boom has been sampled (EnviroLogic Resources, 2003). Further upland investigations are also underway to address the source(s) of the seep.

Portland

Seattle



DEQ Guidance (Ecological Risk Assessment Guidance; Attachment 3, DEQ, 1998) was generally followed in presenting the results of the Level 1 evaluation. Attachment A presents photographs taken during the April 12, 2004, ecological scoping visit. Attachment B presents a completed DEQ's Ecological Scoping Checklist and Evaluation of Receptor-Pathway Interactions form (DEQ, 1998).

## **SENSITIVE ENVIRONMENTS**

The Site is located near the confluence of Youngs Bay and the Columbia River Estuary near the Pacific Ocean. The Columbia River is a migratory route for several species of anadromous fish. Chinook salmon (*Oncorhynchus tshawytscha*), chum salmon (*O. keta*), coho salmon (*O. kisutch*), sockeye salmon (*O. nerka*), lamprey (*Lampetra tridentata*), American shad (*Alosa sapidissima*), steelhead (*O. mykiss*), sturgeon (*Acipenser* spp.), and coastal cutthroat trout (*O. clarki clarki*) are the most common migratory fish in the Lower Columbia River. Groundwater flow beneath the site is generally to the north-northwest, toward the Columbia River, and can change as much as 10 feet in elevation during seasonal fluctuations (EnviroLogic, 2004). There are no designated wetlands within the ERA Study Area, based on the National Wetlands Inventory (NWI) map (NWI, 1989). Also as defined by Oregon Administrative Rule (OAR) 340-122-0115 (50), there are no "sensitive environments" within the ERA Study Area.

## **THREATENED AND ENDANGERED SPECIES**

The Oregon Natural Heritage Program (ONHP), which monitors rare, threatened, and endangered (RTE) plants and wildlife, conducted a data search of RTE species within a 2-mile radius of the Site. A letter from the ONHP is included as Attachment C. The ONHP identified the historical presence of the following species.

### ***Federal Species Listed as Threatened***

- *Haliaeetus leucocephalus* (bald eagle) - breeding sites last observed in 2003 in Clatsop State Forest, south of Brown Creek, off the Youngs River near Astoria; and on Coxcomb Hill, approximately 0.5 mile north of Astoria Reservoir. The bald eagle was proposed for delisting by the U.S. Fish and Wildlife Service (USFWS) on July 6, 1999.
- *Oncorhynchus keta* (chum salmon) - Columbia River Evolutionarily Significant Unit (ESU).
- *Oncorhynchus tshawytscha* (chinook salmon) - Lower Columbia River ESU.



### **Federal Species of Concern**

- *Acipenser medirostris* (green sturgeon) - adults are abundant and the numbers are stable in the Lower Columbia River. Green sturgeon are not abundant in any other Pacific coast estuary. This species is more marine-oriented than white sturgeon and spends limited time in freshwater, except perhaps as early juveniles and spawning adults.
- *Myotis yumanensis* (Yuma bat) - nursery colony of 50 bats observed in attic of a building in Hammond, Oregon, last observed in 1982.
- *Progne subis* (purple martin) - suspected nesting on south end of bridge over Youngs River in Astoria, last observed in 1998.

### **State Species Listed as Endangered**

- *Falco peregrinus anatum* (American peregrine falcon) - documented nesting site OE-052 and USFWS site 19, last observed in 2003. Data sensitive regarding location.
- *Oncorhynchus kisutch* (coho salmon) - Lower Columbia River/Southwest Washington ESU.

### **State Species Listed as Sensitive-Critical**

- *Oncorhynchus clarki* (coastal cutthroat trout) - Southwest Washington/Columbia River.
- *Oncorhynchus mykiss* (steelhead) - Southwest Washington ESU.

Critical habitat for threatened chinook and chum salmon is currently under development by NOAA Fisheries. On April 30, 2002, the U.S. District Court for the District of Columbia approved a NOAA Fisheries consent decree withdrawing a February 2000 critical habitat designation for the Lower Columbia River chinook salmon, Columbia River chum salmon, and 17 other ESUs.

## **SITE VISIT SUMMARY**

This section describes the results of Hart Crowser's April 12, 2004, Site visit to assess whether ecological receptors and/or exposure pathways are present or potentially present at or in the vicinity of the Site. The following discussion of ecological features present within the ERA Study Area is based on our field observations. Photographs taken during the Site visit are provided as Attachment A.



## ***Observed Impacts***

No impacts to the ERA Study Area and surrounding properties attributable to contaminated environmental media were observed.

## ***Ecological Features***

Ecological features were assessed by evaluating the habitat within the ERA Study Area. Attachment B presents the checklist used in this evaluation.

The area evaluated in this Scoping ERA is approximately 92 percent ruderal (disturbed land). The Site is largely graveled, paved, and occupied by industrial and commercial buildings. Railroad tracks bisect the Site in a general east-west direction. Piers on the north side of the Site are paved with asphalt and are used by the Port of Astoria as docks and temporary storage for old wooden piles and construction debris. Dominant vegetation includes weedy, invasive species such as Himalayan blackberry (*Rubus discolor*) and Scot's broom (*Cytisus scoparius*). Gulls and crows were observed in the vicinity of the dock piers.

Approximately eight percent of the Site is lotic (an actively moving water environment) and comprised of manmade slips on the south side of the Columbia River. Slip 2 was investigated half way out (approximately 600 feet from shoreline) toward the Columbia River and is armored with riprap, wooden bulkheads, and sheetpiling around the pier faces. Dock ruins and historic wooden pilings were observed in the water just offshore of the piers. An Oregon Responder Barge and associate tug are moored on the east side of Slip 2. In the mid-1980s, there was a fire on Pier 2 adjacent to the hydrocarbon seep. The fire damage is still evident from numerous burned or charred pilings and timbers (Photographs 21 through 24, Attachment A).

The slips at the Port of Astoria are dredged on an annual basis, which causes annual disturbance of the benthic community that may be present in these slips. A mudflat in the southwest corner of Slip 2 (Photograph 34, Attachment A) is exposed during low tide. Cattails and rushes are the emergent vegetation growing out of the mudflat (Photograph 35, Attachment A). Gulls and cormorants were observed in the waters of Slip 2.

## ***Ecologically Important Species and Habitats***

No ecologically important species and/or habitats were observed within the upland portion of the Site. The in-water portion of Slip 2 provides low quality habitat for aquatic fauna and infauna, including listed salmonids found in the adjacent Columbia River. The area within the current containment boom in Slip 2 is exposed as a mudflat under low tide conditions and



does not provide habitat that could be used by invertebrates that serve as prey to any of the federally listed salmonids species present in the Columbia River estuary (Figure 3).

## **EXPOSURE PATHWAYS**

A general evaluation of potential receptor-pathway interactions is provided in the checklist for Evaluation of Receptor-Pathway Interactions presented as Attachment B. As summarized on the checklist, contaminants of interest (COIs) are currently present in groundwater and seeps, sediments, and soils within the ERA Study Area.

### ***Surface Water***

It is currently uncertain whether an exposure pathway is present for contaminants in surface water to reach aquatic receptors at the Site. The ongoing IRAM at Slip 2 to address the hydrocarbon seep is designed to attempt to eliminate the seep and any subsequent discharge to surface water. There is an existing storm water collection system at the Port of Astoria that controls surface water runoff at the Site. Storm water is discharged into the Columbia River from several outfalls. Outfall #2 and outfall #6 are being sampled quarterly, as they collectively drain the north-central and central portions of the Site and no COIs have been detected in these samples. The remaining catchments do not represent areas of investigative interest or are serviced by a combined sanitary and storm sewer system. It is recommended that the various phases of the IRAM be monitored and evaluated to determine whether any additional surface water actions are warranted at this Site.

### ***Groundwater***

Exposure pathways are currently present for contaminants in groundwater and the groundwater seep at the base of Slip 2 to reach aquatic receptors at the Site. COIs potentially present in groundwater upgradient of Slip 2 include light non-aqueous phase liquids (LNAPL), primarily diesel, dissolved-phase gasoline constituents, and polycyclic aromatic hydrocarbons (PAHs). Because of the discharge of these contaminants into Slip 2, aquatic receptors have the potential for exposure as contaminants migrate and partition from the groundwater seep to sediments in Slip 2. However, the ongoing IRAM at Slip 2 to address the hydrocarbon seep, including the ongoing containment, recently completed storm sewer relocation project, and forthcoming upland source investigation, will likely eliminate or further mitigate the seep and any consequential exposure pathways.



## ***Sediments***

As noted, the present hydrocarbon seep at Slip 2 provides an exposure pathway for contaminants to reach sediments and potentially impact aquatic receptors at the ERA Study Area. No other hydrocarbon or COI seeps within the ERA Study Area along the Columbia River have been detected. The COIs potentially present in Slip 2 sediments include LNAPL (diesel) and PAHs. Aquatic receptors have the potential for exposure to contaminants in sediments through direct contact, osmotic exchange, respiration or ventilation of sediment pore waters, or regular or incidental ingestion of sediment while foraging. Habitat for listed salmonids is low quality because of the industrial nature of Slip 2, riprapped or bulkheaded shoreline, and annual dredging disturbance. The habitat is also very poor for benthic organisms for the same reasons presented above. The area of sediment contamination is exposed to air and is above the waterline regularly because of tidal fluctuation, further limiting access to the area by aquatic receptors.

## ***Soils***

Exposure pathways are not present for contaminants in soils (surficial and subsurface) to reach terrestrial receptors at the ERA Study Area. The upland portion of the Site is ruderal (disturbed) and the majority is paved or has buildings or other structures present that would eliminate exposure to soils. In addition, the disturbed, poor quality habitat limits the use of the upland portion by ecological receptors. COIs potentially present in soils include gasoline- and diesel-range petroleum hydrocarbons, select volatile organic compounds (VOCs) and PAHs. Terrestrial receptors have the potential for exposure to contaminants in soils through direct contact, grubbing for food, or burrowing. However, no ecologically important species or habitats are present at the Site for exposure to surficial and/or subsurface soils.

## **CONCLUSIONS AND RECOMMENDATIONS**

In April and May 2004, Hart Crowser completed a Level 1 Scoping ERA for possible ecological receptors and pathways at the Astoria Area-Wide Petroleum Site. The Site visit and historical research identified no ecologically important species or habitats present within the Site. Accordingly, we have concluded that no further work should be conducted to assess the potential for adverse ecological impacts to terrestrial ecological receptors at the Astoria Area-Wide Petroleum Site.

An in-water portion of the Site (adjacent to the shoreline along Slip 2) provides complete exposure pathways to aquatic species but has low quality habitat for both benthic and water



column aquatic receptors. Two sediment samples were collected from the southeast corner of Slip 2 on June 19, 2003. The results of this sediment sampling and a risk-based screening of results were presented to DEQ in the Sediment Sampling Technical Memorandum (November 6, 2003). One sediment sample was collected inside the area contained by the boom, and a second sediment sample was collected from Slip 2 outside the containment boom area. The only sediment sample that contained detected concentrations of petroleum hydrocarbons exceeding Lower Columbia River Management Area (LCRMA) screening levels (SL) was found inside the containment boom area. All detected concentrations of petroleum hydrocarbons found inside the boom area were much greater than those found in Slip 2 outside the boom area. This is indicative of successful containment of the petroleum hydrocarbon seep by the boom. To the extent there is potential exposure to benthic habitat in sediments that may be impacted by the petroleum hydrocarbon seep in Slip 2, the source of the hydrocarbon seep is being addressed, and the seep is contained.

It is recommended that no additional risk-assessment activities are required for the sediments in Slip 2 as risk-based screening of sediment sampling results has already been accomplished. Because the current IRAM activities are intended on eliminating impacts to the sediments of Slip 2, monitoring of the IRAM's effectiveness is the only actions that are recommended at this time.

## **LIMITATIONS**

Hart Crowser performed this work in accordance with generally accepted professional practices related to the nature of the work accomplished, in the same or similar localities, at the time the services were performed. This report is for the specific application to the referenced project and for the exclusive use of EnviroLogic Resources, Inc. and the Astoria Area-Wide PRP Group members. No other warranty, express or implied, is made.

## **REFERENCES**

DEQ, 1998. Guidance for Ecological Risk Assessment: Level I Scoping, Final. November 1998.

EnviroLogic Resources, 2003. Technical Memorandum, Sediment Sampling, Remedial Investigation/Feasibility Study/Interim Removal Action Measures, Astoria Area-Wide Petroleum Site, Astoria, Oregon.



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EnviroLogic Resources, 2004. Quarterly Ground-Water Monitoring First Quarter 2004 – 2nd Round. Remedial Investigation/Feasibility Study; Astoria Area-Wide Petroleum Site, Astoria, Oregon.

National Wetlands Inventory (NWI), 1989. NWI 1:100K Hoquiam SW, Astoria Map.

Sincerely,

**HART CROWSER, INC.**

**P. THOMAS PINIT**  
Senior Staff Aquatic Ecologist

**TAKU FUJI, PH.D.**  
Senior Associate Toxicologist

Attachments:

Figure 1 - Site Location Map

Figure 2 - Site Plan

Figure 3 – Slip 2 Intertidal Habitat

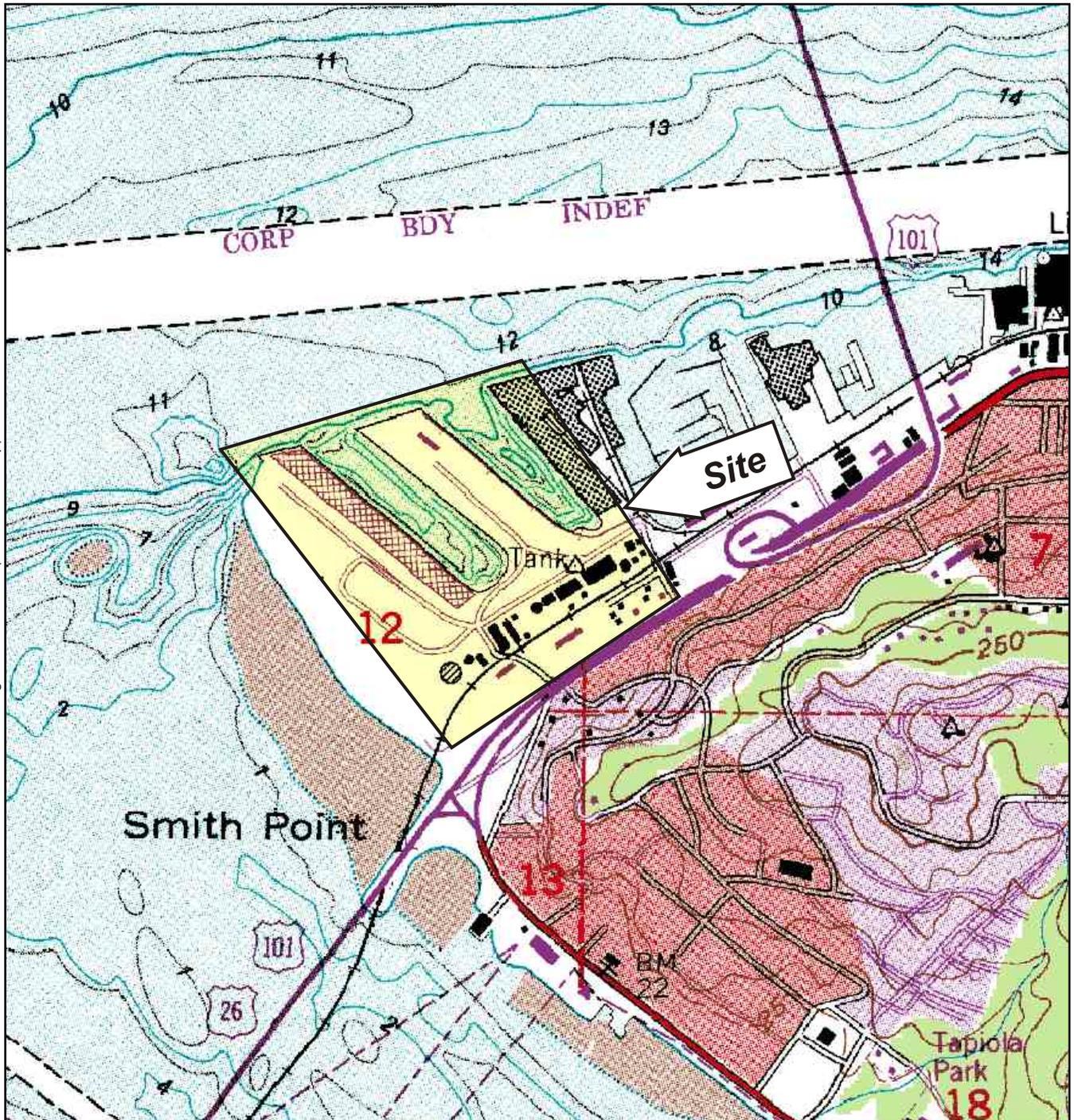
Attachment A - Photograph Log

Attachment B - Level I Ecological Risk Assessment Scoping Checklist and Evaluation of Receptor-Pathway Interactions

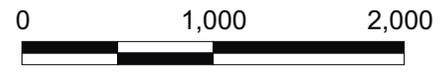
Attachment C - Results of the ONHP RTE Data Search

**Site Location Map**  
**Astoria Area-Wide Site**  
**Astoria, Oregon**

F:\DATA\Jobs\15435 - Astoria Area Wide ERA\06 - Level 1 ERA\Figures\1543500.01 (Site Location Map).cdr



**Note:** Base map prepared from the USGS 7.5-minute quadrangle of Astoria, OR-WA, photorevised 1984.

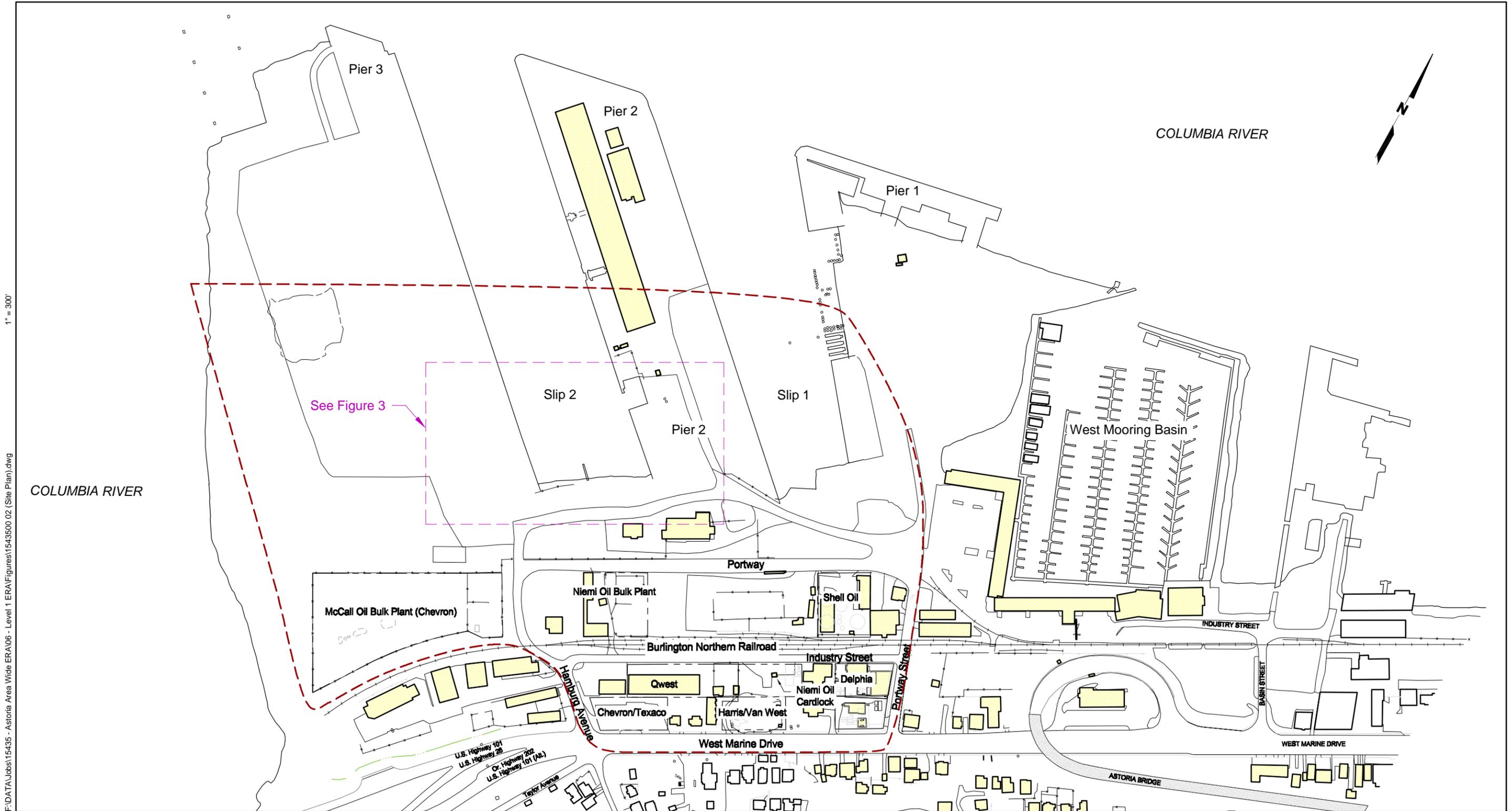


Scale in Feet  
 Contour Interval 50 Feet

**HARTCROWSER**  
 15435-00  
 Figure 1

7/04

**Site Plan**  
**Astoria Area-Wide Site**  
**Astoria, Oregon**



F:\DATA\Jobs\15435 - Astoria Area Wide ERA\06 - Level 1 ERA\Figures\1543500 02 (Site Plan).dwg 1" = 300'

**Note:** Base map prepared from AutoCAD file provided by EnviroLogic Resources, Inc., dated 5/02.

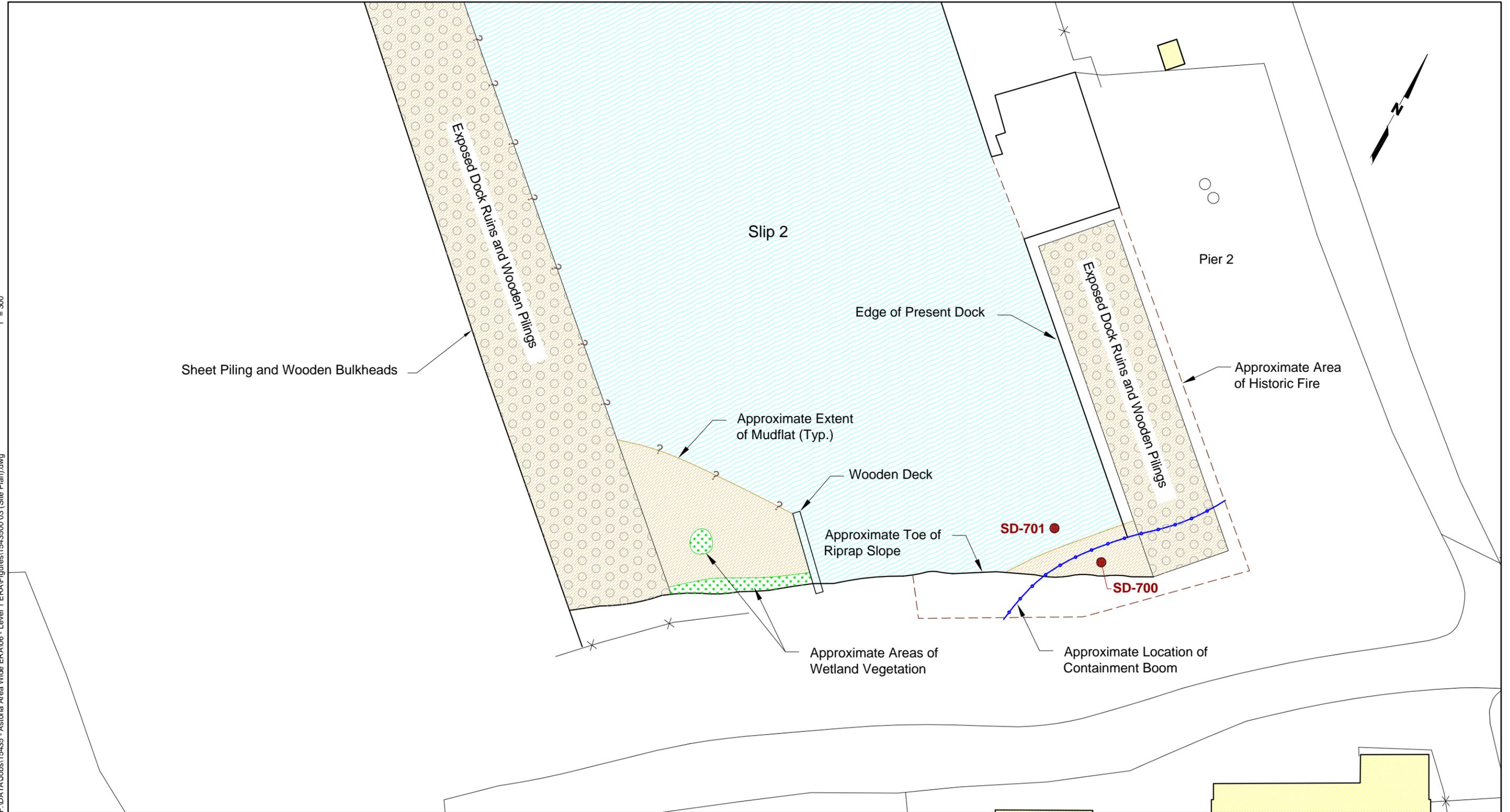
**Legend:**  
 - - - - - Area Evaluated in Level I Scoping Ecological Risk Assessment

0 300 600  
 Scale in Feet

**Slip 2 Intertidal Habitat**  
**Astoria Area-Wide Site**  
**Astoria, Oregon**

1" = 300'

F:\DATA\Jobs\15435 - Astoria Area Wide ERA\06 - Level 1 ERA\Figures\1543500 03 (Site Plan).dwg



- Notes:**
1. Base map prepared from AutoCAD file provided by EnviroLogic Resources, Inc., dated 5/02.
  2. Conditions shown as observed at approximate tidal height of + 2.5' Columbia River Datum (CRD).

**Legend:**

**SD-700** ● Approximate Sediment Sample Location and Number (EnviroLogic, June 19, 2003)

**ATTACHMENT A  
PHOTOGRAPH LOG**



Photograph 1 - Looking northwest at paved industrial area and Slip 1.



Photograph 2 - Looking southwest at paved areas (white Port of Astoria office building in distance).



Photograph 3 - Looking south at current Oregon State Police building (former Shell Oil property).



Photograph 4 - Looking southeast along Portway Street towards West Marine Drive.



Photograph 5 - Looking southwest along Burlington Northern railroad tracks between former Shell Oil and Delphia properties.



Photograph 6 - Looking south at Delphia property on Industry Street.



Photograph 7 - Looking southeast at Niemi Oil Cardlock facility on Industry Street and Harris/Van West property on West Marine Drive in the background.



Photograph 8 - Looking northwest toward former steelworks property.



Photograph 9 - Looking northwest toward former furniture manufacturing property.



Photograph 10 - Looking northeast towards Qwest facility on Industry Street.



Photograph 11 - Looking north at former Niemi Oil Bulk Plant facility (currently housing the Astoria Riverfront Trolley).



Photograph 12 - Looking east toward ChevronTexaco facility on West Marine Drive in background.



Photograph 13 - Looking northeast along West Marine Drive at ChevronTexaco property (currently a Shell gas station).



Photograph 14 - Looking southwest along boundary of former McCall Oil (Chevron) Bulk Plant location.



Photograph 15 - Looking west at former McCall Oil (Chevron) Bulk Plant location.



Photograph 16 - Looking northwest along Hamburg Avenue toward Slip 2.



Photograph 17 - Looking northeast at former Niemi Oil Bulk Plant location.



Photograph 18 - Looking south at former Niemi Oil Bulk Plant location.



Photograph 19 - Looking southeast at former Niemi Oil Bulk Plant location.



Photograph 20 - Looking east toward former furniture manufacturing location.



Photograph 21 - Looking northwest along Slip 2 and seep area. Note containment boom and charred area of historic dock fire.



Photograph 22 - Looking west along margin of Slip 2. Note Oregon Responder Barge moored on northeast side of slip.



Photograph 23 - Looking southwest along margin of Slip 2. Note riprapped banks.



Photograph 24 - Closeup view of seep area. Note old wooden pilings along margin of Slip 2 and riprapped banks.



Photograph 25 - Looking northwest at dock ruins and pilings from southwest corner of Slip 2 (Pier 3 at left).



Photograph 26 - Looking north at dock ruins at Oregon Responder barge and tug from southwest corner of Slip 2 (Pier 3).



Photograph 27 - Looking southeast at ripped and bulkheaded Pier 3. Note weedy vegetation and wooden piles stored on Pier 3.



Photograph 28 - Looking northwest at disturbed habitat in Slip 2 and on Pier 3.



Photograph 29 - Looking northeast from north end of Slip 2 (Pier 3) at Columbia River Estuary.



Photograph 30 - Looking southwest at paved Port operations area south of Slip 2.



Photograph 31 - Looking northwest along west side of Slip 1. Note wooden docks, pilings, barges, and ships docked in slip.



Photograph 32 - Looking north across Slip 1 at industrial area.



Photograph 33 - Looking northeast along face of Slip 1. Note weedy vegetation and sheetpile bulkheads.



Photograph 34 - Looking west at mudflat wetland area in southwest corner of Slip 2.



Photograph 35 - Closeup view of cattails and rushes growing out of mudflat in Slip 2.

**ATTACHMENT B**  
**LEVEL I ECOLOGICAL RISK ASSESSMENT SCOPING CHECKLIST**



### Ecological Scoping Checklist (cont'd)

Part ③

SPECIFIC EVALUATION OF ECOLOGICAL RECEPTORS / HABITAT	Finding
<b><i>Terrestrial - Wooded</i></b>	
Percentage of site that is wooded	0%
Dominant vegetation type ( <b>Evergreen, Deciduous, Mixed</b> )	
Prominent tree size at breast height, i.e., four feet (<6", 6" to 12", >12")	
Evidence / observation of wildlife ( <b>Macroinvertebrates, Reptiles, Amphibians, Birds, Mammals, Other</b> )	
<b><i>Terrestrial - Scrub/Shrub/Grasses</i></b>	
Percentage of site that is scrub/shrub	0%
Dominant vegetation type ( <b>Scrub, Shrub, Grasses, Other</b> )	
Prominent height of vegetation (<2', 2' to 5', >5')	
Density of vegetation ( <b>Dense, Patchy, Sparse</b> )	
Evidence / observation of wildlife ( <b>Macroinvertebrates, Reptiles, Amphibians, Birds, Mammals, Other</b> )	
<b><i>Terrestrial - Ruderal</i></b>	
Percentage of site that is ruderal	92%
Dominant vegetation type ( <b>Landscaped, Agriculture, Bare ground</b> ) - <i>weedy vegetation, paved and graveled roads, buildings, railroad tracks</i>	B
Prominent height of vegetation (0', >0' to <2', 2' to 5', >5')	>0' to <2'
Density of vegetation ( <b>Dense, Patchy, Sparse</b> )	P
Evidence / observation of wildlife ( <b>Macroinvertebrates, Reptiles, Amphibians, Birds, Mammals, Other</b> ) - <i>gulls and crows observed on piers</i>	B
<b><i>Aquatic - Non-flowing (lentic)</i></b>	
Percentage of site that is covered by lakes or ponds	0%
Type of water bodies ( <b>Lakes, Ponds, Vernal pools, Impoundments, Lagoon, Reservoir, Canal</b> )	
Size (acres), average depth (feet), trophic status of water bodies	
Source water ( <b>River, Stream, Groundwater, Industrial discharge, Surface water runoff</b> )	
Water discharge point ( <b>None, River, Stream, Groundwater, Wetlands impoundment</b> )	
Nature of bottom ( <b>Muddy, Rocky, Sand, Concrete, Other</b> )	
Vegetation present ( <b>Submerged, Emergent, Floating</b> )	
Obvious wetlands present ( <b>Yes / No</b> )	
Evidence / observation of wildlife ( <b>Macroinvertebrates, Reptiles, Amphibians, Birds, Mammals, Other</b> )	
<b><i>Aquatic - Flowing (lotic)</i></b>	
Percentage of site that is covered by rivers, streams (brooks, creeks), intermittent streams, dry wash, arroyo, ditches, or channel waterway	8%
Type of water bodies ( <b>Rivers, Streams, Intermittent Streams, Dry wash, Arroyo, Ditches, Channel waterway</b> ) - <i>manmade, dredged slip adjacent to Columbia River</i>	C
Size (acres), average depth (feet), approximate flow rate (cfs) of water bodies	40' deep
Bank environment (cover: <b>Vegetated, Bare</b> / slope: <b>Steep, Gradual</b> / height (in feet)) - <i>armored banks with riprap and bulkheads</i>	B / S / 10'
Source water ( <b>River, Stream, Groundwater, Industrial discharge, Surface water runoff</b> )	R
Tidal influence ( <b>Yes / No</b> )	Y



### Evaluation of Receptor-Pathway Interactions

EVALUATION OF RECEPTOR-PATHWAY INTERACTIONS	Y	N	U
<b>Are hazardous substances present or potentially present in surface waters?</b> <b>AND</b> <b>Are ecologically important species or habitats present?</b> <b>AND</b> <b>Could hazardous substances reach these receptors via surface water?</b>	X		X
When answering the above questions, consider the following: <ul style="list-style-type: none"> <li>• Known or suspected presence of hazardous substances in surface waters.</li> <li>• Ability of hazardous substances to migrate to surface waters.</li> <li>• Terrestrial organisms may be dermally exposed to water-borne contaminants as a result of wading or swimming in contaminated waters. Aquatic receptors may be exposed through osmotic exchange, respiration or ventilation of surface waters.</li> <li>• Contaminants may be taken-up by terrestrial plants whose roots are in contact with surface waters.</li> <li>• Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a drinking water source.</li> </ul>			
<b>Are hazardous substances present or potentially present in groundwater?</b> <b>AND</b> <b>Are ecologically important species or habitats present?</b> <b>AND</b> <b>Could hazardous substances reach these receptors via groundwater?</b>	X	X	
When answering the above questions, consider the following: <ul style="list-style-type: none"> <li>• Known or suspected presence of hazardous substances in groundwater.</li> <li>• Ability of hazardous substances to migrate to groundwater.</li> <li>• Potential for hazardous substances to migrate via groundwater and discharge into habitats and/or surface waters.</li> <li>• Contaminants may be taken-up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1m depth).</li> <li>• Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.</li> </ul>			

“Y” = yes; “N” = No, “U” = Unknown (counts as a “Y”)

**Evaluation of Receptor-Pathway Interactions (cont'd)**

<b>EVALUATION OF RECEPTOR-PATHWAY INTERACTIONS</b>	<b>Y</b>	<b>N</b>	<b>U</b>
<b>Are hazardous substances present or potentially present in sediments?</b>	X		
<b>AND</b>			
<b>Are ecologically important species or habitats present?</b>	X		
<b>AND</b>			
<b>Could hazardous substances reach these receptors via contact with sediments?</b>	X		
When answering the above questions, consider the following: <ul style="list-style-type: none"> <li>• Known or suspected presence of hazardous substances in sediment.</li> <li>• Ability of hazardous substances to leach or erode from surface soils and be carried into sediment via surface runoff.</li> <li>• Potential for contaminated groundwater to upwell through, and deposit contaminants in, sediments.</li> <li>• If sediments are present in an area that is only periodically inundated with water, terrestrial species may be dermally exposed during dry periods. Aquatic receptors may be directly exposed to sediments or may be exposed through osmotic exchange, respiration or ventilation of sediment pore waters.</li> <li>• Terrestrial plants may be exposed to sediment in an area that is only periodically inundated with water.</li> <li>• If sediments are present in an area that is only periodically inundated with water, terrestrial species may have direct access to sediments for the purposes of incidental ingestion. Aquatic receptors may regularly or incidentally ingest sediment while foraging.</li> </ul>			
<b>Are hazardous substances present or potentially present in prey or food items of ecologically important receptors?</b>			X
<b>AND</b>			
<b>Are ecologically important species or habitats present?</b>	X		
<b>AND</b>			
<b>Could hazardous substances reach these receptors via consumption of food items?</b>			X
When answering the above questions, consider the following: <ul style="list-style-type: none"> <li>• Higher trophic level terrestrial and aquatic consumers and predators may be exposed through consumption of contaminated food sources.</li> <li>• In general, organic contaminants with <math>\log K_{ow} &gt; 3.5</math> may accumulate in terrestrial mammals and those with a <math>\log K_{ow} &gt; 5</math> may accumulate in aquatic vertebrates.</li> </ul>			

“Y” = yes; “N” = No, “U” = Unknown (counts as a “Y”)

**Evaluation of Receptor-Pathway Interactions (cont'd)**

<b>EVALUATION OF RECEPTOR-PATHWAY INTERACTIONS</b>	<b>Y</b>	<b>N</b>	<b>U</b>
<b>Are hazardous substances present or potentially present in surficial soils?</b> <b>AND</b> <b>Are ecologically important species or habitats present?</b> <b>AND</b> <b>Could hazardous substances reach these receptors via incidental ingestion of or dermal contact with surficial soils?</b>	X	X	
When answering the above questions, consider the following: <ul style="list-style-type: none"> <li>• Known or suspected presence of hazardous substances in surficial (~1m depth) soils.</li> <li>• Ability of hazardous substances to migrate to surficial soils.</li> <li>• Significant exposure via dermal contact would generally be limited to organic contaminants which are lipophilic and can cross epidermal barriers.</li> <li>• Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces by rain striking contaminated soils (i.e., rain splash).</li> <li>• Contaminants in bulk soil may partition into soil solution, making them available to roots.</li> <li>• Incidental ingestion of contaminated soil could occur while animals grub for food resident in the soil, feed on plant matter covered with contaminated soil or while grooming themselves clean of soil.</li> </ul>			
<b>Are hazardous substances present or potentially present in soils?</b> <b>AND</b> <b>Are ecologically important species or habitats present?</b> <b>AND</b> <b>Could hazardous substances reach these receptors via vapors or fugitive dust carried in surface air or confined in burrows?</b>	X	X	
When answering the above questions, consider the following: <ul style="list-style-type: none"> <li>• Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant <math>&gt; 10^{-5}</math> atm-m<sup>3</sup>/mol and molecular weight <math>&lt; 200</math> g/mol).</li> <li>• Exposure via inhalation is most important to organisms that burrow in contaminated soils, given the limited amounts of air present to dilute vapors and an absence of air movement to disperse gases.</li> <li>• Exposure via inhalation of fugitive dust is particularly applicable to ground-dwelling species that could be exposed to dust disturbed by their foraging or burrowing activities or by wind movement.</li> <li>• Foliar uptake of organic vapors would be limited to those contaminants with relatively high vapor pressures.</li> <li>• Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces.</li> </ul>			

“Y” = yes; “N” = No, “U” = Unknown (counts as a “Y”)

**ATTACHMENT C**  
**RESULTS OF THE ONHP RTE DATA SEARCH**

# OREGON NATURAL HERITAGE INFORMATION CENTER

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*Institute for Natural Resources*



OREGON STATE UNIVERSITY  
1322 SE Morrison Street  
Portland, Oregon 97214-2423

April 14, 2004

Tom Pinit  
Hart Crowser, Inc.  
Five Centerpointe Drive, Suite 240  
Lake Oswego, OR 97035-8652

Dear Mr. Pinit:

Thank you for requesting information from the Oregon Natural Heritage Information Center (ORNHIC). We have conducted a data system search for rare, threatened and endangered plant and animal records for your Astoria Area-Wide Petroleum Site Project in Township 8 North, Range 9 West, Section 7, and Township 8 North, Range 10 West, Section 12, W.M.

Eighteen (18) records were noted within a two-mile radius of your project and are included on the enclosed computer printout. A key to the fields is also included.

Please remember that the lack of rare element information from a given area does not mean that there are no significant elements there, only that there is no information known to us from the site. To assure that there are no important elements present, you should inventory the site, at the appropriate season.

This data is confidential and for the specific purposes of your project and is **not to be distributed**.

If you need additional information or have any questions, please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'Cliff Alton', with a long horizontal flourish extending to the right.

Cliff Alton  
Conservation Information Assistant

encl.: invoice (H-041404-CWA4)  
computer printout and data key

# OREGON NATURAL HERITAGE INFORMATION CENTER

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*Institute for Natural Resources*



OREGON STATE UNIVERSITY  
1322 SE Morrison Street  
Portland, Oregon 97214-2423

Invoice Number: H-041404-CWA4  
Index: RNR105

## INVOICE

TO: Hart Crowser, Inc.  
Five Centerpointe Drive, Suite 240  
Lake Oswego, OR 97035-8652

ATTN: Accounts Payable

DATE: April 14, 2004

RE: Data system search for rare, threatened and endangered plants and animals in the vicinity of Township 8 North, Range 9 West, Section 7, and Township 8 North, Range 10 West, Section 12, W.M. Requested by Tom Pinit for the Astoria Area-Wide Petroleum Site Project.

---

For services and products:

Computer records (18 @ \$0.50/record)	\$ 9.00
Computer fee (flat rate)	\$ 20.00
Staff time (0.75 hours @ \$50.00/hour)	\$ 37.50

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**TOTAL DUE: \$ 66.50**

---

Please make checks payable to: **Oregon Natural Heritage Information Center**

Please include invoice number at top of page with payment.

Terms: **Net 30**

Scientific Name: ***Gavia immer***  
 Common Name: **Common Loon**  
 Federal Status: GRANK: G5 NHP List: Category: Vertebrate Animal  
 State Status: SRANK: SHB,S5N HP Track: N ELCODE: ABNBA01030  
 EO ID: 7356 First Obs: 1975 Last Obs: 1985- Confirmed:  
 Directions: YOUNG'S BAY; OFF OF THE COLUMBIA RIVER AT ASTORIA

County Name Ecoregion Source Feature [Uncertainty Type (Distance)]  
 Clatsop CR Point [Areal - Estimated ( 8050 m)]

Town-Range Sec Note QuadCode QuadName Watershed  
 008N010W 13 46123-B8 Warrenton 1708000601 - YOUNGS BAY TRIBUTARIES

Owner Name/Type Owner Comments Managed Area Name  
 PRIVATE PRIVATE

EO Type: Minimum Elev.(m): Annual Observations

EO Data: WINTER FORAGING AREA FOR A SMALL NUMBER OF LOONS (APPROX 4-5 BIRDS), FROM THE MID 1970'S TO 1985, PER DOUG TAYLOR, ODFW BIOLOGIST

EO Comments:

Protection:

Management:

General:

Scientific Name: ***Haliaeetus leucocephalus***  
 Common Name: **Bald Eagle**  
 Federal Status: PS:LT,PDL GRANK: G4 NHP List: 4 Category: Vertebrate Animal  
 State Status: LT SRANK: S4B, S4N HP Track: Y ELCODE: ABNKC10010  
 EO ID: 5797 First Obs: 1976 Last Obs: 2003 Confirmed:  
 Directions: South of Brown Creek, off the Youngs River, near Astoria.

County Name Ecoregion Source Feature [Uncertainty Type (Distance)]  
 Clatsop CR Point [Areal - Estimated ( 50 m)]

Town-Range Sec Note QuadCode QuadName Watershed  
 008N009W 17 46123-B7 Astoria 1708000601 - YOUNGS BAY TRIBUTARIES

Owner Name/Type Owner Comments Managed Area Name  
 STATE Department of Forestry CLATSOP STATE FOREST

EO Type: BREEDING SITE Minimum Elev.(m): 76 Annual Observations

EO Data: See annual observations.

- 2003 - 2 fledged
- 2002 - 2 fledged
- 2001 - Nesting failure
- 2000 - 2 FLEDGED
- 1999 - BREEDING FAILURE
- 1998 - BREEDING FAILURE
- 1997 - BREEDING FAILURE
- 1996 - 1 FLEDGED
- 1995 - BREEDING FAILURE
- 1994 - BREEDING FAILURE
- 1993 - 1 FLEDGED
- 1992 - 1 FLEDGED, NEW NEST
- 1991 - BREEDING FAILURE
- 1980 - NEST BLEW DOWN
- 1979 - UNOCCUPIED
- 1978 - STATUS UNKNOWN
- 1977 - UNOCCUPIED
- 1976 - NEST ACTIVE, OUTCOME UNKNOWN

EO Comments:

Protection:

Management:

General: Remapped in Section 21 per Isaacs report. Isaacs and Anthony nests 113, 136, 1069, and 1094. 1982: nest 113 no longer exists.

Scientific Name: ***Haliaeetus leucocephalus***  
 Common Name: **Bald Eagle**  
 Federal Status: PS:LT,PDL GRANK: G4 NHP List: 4 Category: Vertebrate Animal  
 State Status: LT SRANK: S4B, S4N HP Track: Y ELCODE: ABNKC10010  
 EO ID: 12632 First Obs: 2000 Last Obs: 2003 Confirmed:  
 Directions: Coxcomb Hill, approx. 0.5mi N. of Astoria Reservoir.

<u>County Name</u>	<u>Ecoregion</u>	<u>Source Feature [Uncertainty Type (Distance)]</u>
Clatsop	CR	Point [Areal - Estimated ( 50 m)]
<u>Town-Range</u> <u>Sec</u> <u>Note</u>	<u>QuadCode</u> <u>QuadName</u>	<u>Watershed</u>
008N009W 16	46123-B7 Astoria	1708000602 - BIG CREEK / GNAT CREEK
<u>Owner Name/Type</u>	<u>Owner Comments</u>	<u>Managed Area Name</u>
CITY	City of Astoria	

EO Type: BREEDING SITE Minimum Elev.(m): 152 Annual Observations  
 EO Data: See annual observations.  
 • 2003 - nesting failure  
 • 2002 - 1 fledged  
 • 2001 - breeding failure  
 • 2000 - breeding failure

EO Comments:  
 Protection:  
 Management:  
 General: Isaacs and Anthony nests 984, 1070.

Scientific Name: ***Falco peregrinus anatum***  
 Common Name: **American Peregrine Falcon**  
 Federal Status: GRANK: G4T3 NHP List: 2 Category: Vertebrate Animal  
 State Status: LE SRANK: S2B HP Track: Y ELCODE: ABNKD06071  
 EO ID: 25955 First Obs: 1997 Last Obs: 2003 Confirmed:  
 Directions: Sensitive Data - contact ORNHIC for more information

<u>County Name</u>	<u>Ecoregion</u>	<u>Source Feature [Uncertainty Type (Distance)]</u>
Clatsop		Point [Areal - Estimated ( 50 m)] Point [Areal - Estimated ( 50 m)]
<u>Town-Range</u> <u>Sec</u> <u>Note</u>	<u>QuadCode</u> <u>QuadName</u>	<u>Watershed</u>
	46123-B7 Astoria	
<u>Owner Name/Type</u>	<u>Owner Comments</u>	<u>Managed Area Name</u>
	ODOT	

EO Type: Minimum Elev.(m): Annual Observations  
 EO Data: Documented nesting site. See annual observations.  
 • 2003 - 1 young rehabed and hacked, outcome influenced by human intervention  
 • 2002 -  
 • 2001 -  
 • 2000 -  
 • 1999 -  
 • 1998 - active nest, nesting failure  
 • 1997 - active nest, nesting failure

EO Comments:  
 Protection:  
 Management:  
 General: Both nests are site OE-052 and USFWS site 19.

Scientific Name: ***Progne subis***  
 Common Name: **Purple Martin**  
 Federal Status: SOC GRANK: G5 NHP List: 2 Category: Vertebrate Animal  
 State Status: SC SRANK: S2B HP Track: Y ELCODE: ABPAU01010  
 EO ID: 15865 First Obs: Last Obs: 1998-07-26 Confirmed:  
 Directions: S END OF BRIDGE OVER YOUNG'S RIVER IN ASTORIA.

<u>County Name</u>	<u>Ecoregion</u>	<u>Source Feature [Uncertainty Type (Distance)]</u>
Clatsop	CR	Point [Areal - Estimated ( 50 m)]
<u>Town-Range</u> <u>Sec</u> <u>Note</u>	<u>QuadCode</u> <u>QuadName</u>	<u>Watershed</u>
008N009W 19	46123-B7 Astoria	1708000601 - YOUNGS BAY TRIBUTARIES

<u>Owner Name/Type</u>	<u>Owner Comments</u>	<u>Managed Area Name</u>
EO Type:	Minimum Elev.(m): 8	<u>Annual Observations</u>
EO Data:	1998: 1 PAIR PRESENT. NESTING SUSPECTED.	
EO Comments:		
Protection:		
Management:		
General:		

Scientific Name: **Acipenser medirostris**  
 Common Name: **Green Sturgeon**  
 Federal Status: SOC GRANK: G3 NHP List: 4 Category: Vertebrate Animal  
 State Status: SRANK: S3 HP Track: N ELCODE: AFCAA01030  
 EO ID: 19198 First Obs: Last Obs: Confirmed:  
 Directions: COLUMBIA RIVER AND ESTUARY, UPSTREAM TO BONNEVILLE DAM. WILLAMETTE RIVER BELOW WILLAMETTE FALLS.

<u>County Name</u>	<u>Ecoregion</u>	<u>Source Feature [Uncertainty Type (Distance)]</u>
Clatsop	CR	Line [Linear ( 8 m)]
Columbia	WC	Line [Linear ( 8 m)]
Multnomah	WV	

<u>Town-Range</u>	<u>Sec</u>	<u>Note</u>	<u>QuadCode</u>	<u>QuadName</u>	<u>Watershed</u>
008N010W			45121-E8	Tanner Butte	1708000105 - COLUMBIA GORGE TRIBUTARIES W.
008N009W			45121-F8	Bonneville Dam	1708000106 - GORDON CREEK/LOWER SANDY RIVER
008N008W			45122-C5	Oregon City	1708000302 - BEAVER CREEK
009N008W			45122-D5	Gladstone	1708000303 - PLYMPTON CREEK
009N007W			45122-D6	Lake Oswego	1708000601 - YOUNGS BAY TRIBUTARIES
008N006W			45122-E1	Multnomah Falls	1708000602 - BIG CREEK / GNAT CREEK
009N006W			45122-E2	Bridal Veil	1709000704 - ABERNATHEY CREEK
			45122-E3	Washougal	1709001201 - JOHNSON CREEK
			45122-E4	Camas	1709001202 - SCAPPOOSE CREEK/MULTNOMAH CHANNEL
			45122-E5	Mount Tabor	
			45122-E6	Portland	
			45122-E7	Linnton	
			45122-F6	Vancouver	
			45122-F7	Sauvie Island	
			45122-G7	Saint Helens	
			45122-H7	Deer Island	
			46122-A7	Kalama	
			46122-A8	Rainier	
			46122-B8	Kelso	
			46123-B1	Coal Creek	
			46123-B2	Oak Point	
			46123-B3	Nassa Point	
			46123-B4	Cathlamet	
			46123-B6	Cathlamet Bay	
			46123-B7	Astoria	
			46123-B8	Warrenton	
			46123-C4	Skamokawa	
			46123-C5	Grays River	
			46123-C6	Rosburg	
			46124-B1	Clatsop Spit	

<u>Owner Name/Type</u>	<u>Owner Comments</u>	<u>Managed Area Name</u>
STATE		
EO Type:	YEAR-ROUND - fish	Minimum Elev.(m):
EO Data:	NO COLLECTION INFORMATION AVAILABLE. GREEN STURGEON ADULTS ARE ABUNDANT AND THE NUMBERS ARE STABLE IN THE LOWER COLUMBIA RIVER. THEY ARE RARELY FOUND IN THE COLUMBIA RIVER FROM PUGET ISLAND (RM40) UPSTREAM TO BONNEVILLE DAM AND TO WILLAMETTE FALLS IN THE WILLAMETTE RIVER. (1995 ODFW BIENNIAL REPORT ON THE STATUS OF WILD FISH IN OREGON)	
EO Comments:		

Protection:  
 Management:  
 General: GREEN STURGEON NOT ABUNDANT IN ANY PACIFIC COAST ESTUARY. LITTLE IS KNOWN ABOUT ITS LIFE HISTORY. THIS SPECIES MORE MARINE ORIENTED THAN WHITE STURGEON AND SPENDS LIMITED AMOUNT OF TIME IN FRESHWATER (EXCEPT PERHAPS EARLY JUVENILES AND SPAWNING ADULTS). B91NOA01ORUS.

Scientific Name: ***Oncorhynchus keta pop. 3***  
 Common Name: **Chum Salmon (Columbia River Run)**  
 Federal Status: LT GRANK: G5T2Q NHP List: 1 Category: Vertebrate Animal  
 State Status: SC SRANK: S2 HP Track: Y ELCODE: AFCHA02023  
 EO ID: 5372 First Obs: Last Obs: 1999-PRE Confirmed:  
 Directions: YOUNGS BAY AND TRIBUTARIES

<u>County Name</u>	<u>Ecoregion</u>	<u>Source Feature [Uncertainty Type (Distance)]</u>
Clatsop		Data currently not available.

<u>Town-Range</u>	<u>Sec</u>	<u>Note</u>	<u>QuadCode</u>	<u>QuadName</u>	<u>Watershed</u>
			46123-A6	Green Mountain	1708000601 - YOUNGS BAY TRIBUTARIES
			46123-A7	Olney	
			46123-A8	Gearhart	
			46123-B6	Cathlamet Bay	
			46123-B7	Astoria	
			46123-B8	Warrenton	

<u>Owner Name/Type</u>	<u>Owner Comments</u>	<u>Managed Area Name</u>
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EO Type:	Minimum Elev.(m):	<u>Annual Observations</u>
EO Data:	HISTORIC DISTRIBUTION ONLY; ODFW DISTRIBUTION MAPS USED TO CREATE THE 1:24,000 COVERAGE	

EO Comments:  
 Protection:  
 Management:  
 General: DISTRIBUTION INFORMATION USED IN THIS EOR WAS DERIVED FROM ODFW GEOGRAPHIC RESOURCES DATA PRODUCED AND DISTRIBUTED IN 1999. UNLESS SPECIFIC DATA EXISTS IN THE DATA FIELD, THE INFORMATION PRESENTED IN THIS EOR REPRESENTS THE "BEST PROFESSIONAL JUDGMENT" BY ODFW'S DISTRICT FISHERIES BIOLOGIST; THE PRESENCE OF CHUM IN DESCRIBED AREAS SHOULD BE CONSIDERED UNDOCUMENTED BUT AS HAVING A POTENTIAL OF BEING PRESENT.

Scientific Name: ***Oncorhynchus keta pop. 3***  
 Common Name: **Chum Salmon (Columbia River Run)**  
 Federal Status: LT GRANK: G5T2Q NHP List: 1 Category: Vertebrate Animal  
 State Status: SC SRANK: S2 HP Track: Y ELCODE: AFCHA02023  
 EO ID: 17661 First Obs: Last Obs: 2000-PRE Confirmed:  
 Directions: COLUMBIA RIVER & TRIBUTARIES

<u>County Name</u>	<u>Ecoregion</u>	<u>Source Feature [Uncertainty Type (Distance)]</u>
Clatsop		Data currently not available.

Columbia  
 Multnomah



General: DISTRIBUTION INFORMATION USED IN THIS EOR WAS DERIVED FROM ODFW GEOGRAPHIC RESOURCES DATA PRODUCED AND DISTRIBUTED IN 1999. UNLESS SPECIFIC DATA EXISTS IN THE DATA FIELD, THE INFORMATION PRESENTED IN THIS EOR REPRESENTS THE "BEST PROFESSIONAL JUDGMENT" BY ODFW'S DISTRICT FISHERIES BIOLOGIST; THE PRESENCE OF COHO IN DESCRIBED AREAS SHOULD BE CONSIDERED UNDOCUMENTED BUT AS HAVING A POTENTIAL OF BEING PRESENT.

Scientific Name: ***Oncorhynchus tshawytscha pop. 21***  
 Common Name: **Chinook Salmon - Lower Columbia River Spring Run**  
 Federal Status: LT GRANK: G5T2Q NHP List: 1 Category: Vertebrate Animal  
 State Status: SC SRANK: S2 HP Track: Y ELCODE: AFCHA0205W  
 EO ID: 12375 First Obs: Last Obs: 1999-PRE Confirmed:  
 Directions: COLUMBIA RIVER & TRIBUTARY

County Name	Ecoregion	Source Feature [Uncertainty Type (Distance)]
Clatsop		Data currently not available.
Columbia		
Hood River		
Multnomah		

Town-Range	Sec	Note	QuadCode	QuadName	Watershed
			45121-E8	Tanner Butte	17070105 - Middle Columbia-Hood
			45121-F5	Hood River	17080001 - Lower Columbia-Sandy
			45121-F6	Mount Defiance	17080003 - Lower Columbia-Clatskanie
			45121-F7	Carson	17080006 - Lower Columbia
			45121-F8	Bonneville Dam	17090012 - Lower Willamette
			45122-E1	Multnomah Falls	
			45122-E2	Bridal Veil	
			45122-E3	Washougal	
			45122-E4	Camas	
			45122-E5	Mount Tabor	
			45122-E6	Portland	
			45122-F6	Vancouver	
			45122-F7	Sauvie Island	
			45122-G7	Saint Helens	
			45122-H7	Deer Island	
			46122-A7	Kalama	
			46122-A8	Rainier	
			46122-B8	Kelso	
			46123-B1	Coal Creek	
			46123-B2	Oak Point	
			46123-B3	Nassa Point	
			46123-B4	Cathlamet	
			46123-B5	Knappa	
			46123-B6	Cathlamet Bay	
			46123-B7	Astoria	
			46123-B8	Warrenton	
			46123-C4	Skamokawa	
			46123-C5	Grays River	
			46123-C6	Rosburg	
			46124-B1	Clatsop Spit	

Owner Name/Type	Owner Comments	Managed Area Name
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EO Type: MIGRATION - fish Minimum Elev.(m): Annual Observations

EO Data: SPRING RUN; ODFW DISTRIBUTION MAPS USED TO CREATE THE 1:24,000 COVERAGE

EO Comments:

Protection:

Management:

General: DISTRIBUTION INFORMATION USED IN THIS EOR WAS DERIVED FROM ODFW GEOGRAPHIC RESOURCES DATA PRODUCED AND DISTRIBUTED IN 1999. UNLESS SPECIFIC DATA EXISTS IN THE DATA FIELD, THE INFORMATION PRESENTED IN THIS EOR REPRESENTS THE "BEST PROFESSIONAL JUDGMENT" BY ODFW'S DISTRICT FISHERIES BIOLOGIST; THE PRESENCE OF CHINOOK IN DESCRIBED AREAS SHOULD BE CONSIDERED UNDOCUMENTED BUT AS HAVING A POTENTIAL OF BEING PRESENT.

Scientific Name: ***Oncorhynchus tshawytscha pop. 22***  
 Common Name: **Chinook Salmon - Lower Columbia River Fall Run**  
 Federal Status: LT GRANK: G5T2Q NHP List: 1 Category: Vertebrate Animal  
 State Status: SC SRANK: S2 HP Track: Y ELCODE: AFCHA0205Y  
 EO ID: 13855 First Obs: Last Obs: 1999-PRE Confirmed:  
 Directions: LEWIS AND CLARK RIVER

<u>County Name</u>	<u>Ecoregion</u>	<u>Source Feature [Uncertainty Type (Distance)]</u>
Clatsop		Data currently not available.

<u>Town-Range</u>	<u>Sec</u>	<u>Note</u>	<u>QuadCode</u>	<u>QuadName</u>	<u>Watershed</u>
			46123-A7	Olney	1708000601 - YOUNGS BAY TRIBUTARIES
			46123-B7	Astoria	
			46123-B8	Warrenton	

<u>Owner Name/Type</u>	<u>Owner Comments</u>	<u>Managed Area Name</u>
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EO Type: REARING & MIGRATION - fish Minimum Elev.(m): Annual Observations  
 EO Data: FALL RUN; ODFW DISTRIBUTION MAPS USED TO  
 CREATE THE 1:24,000 COVERAGE

EO Comments:

Protection:

Management:

General: DISTRIBUTION INFORMATION USED IN THIS EOR WAS DERIVED FROM ODFW GEOGRAPHIC RESOURCES DATA PRODUCED AND DISTRIBUTED IN 1999. UNLESS SPECIFIC DATA EXISTS IN THE DATA FIELD, THE INFORMATION PRESENTED IN THIS EOR REPRESENTS THE "BEST PROFESSIONAL JUDGMENT" BY ODFW'S DISTRICT FISHERIES BIOLOGIST; THE PRESENCE OF CHINOOK IN DESCRIBED AREAS SHOULD BE CONSIDERED UNDOCUMENTED BUT AS HAVING A POTENTIAL OF BEING PRESENT.

Scientific Name: ***Oncorhynchus tshawytscha pop. 22***  
 Common Name: **Chinook Salmon - Lower Columbia River Fall Run**  
 Federal Status: LT GRANK: G5T2Q NHP List: 1 Category: Vertebrate Animal  
 State Status: SC SRANK: S2 HP Track: Y ELCODE: AFCHA0205Y  
 EO ID: 14137 First Obs: Last Obs: 1999-PRE Confirmed:  
 Directions: COLUMBIA RIVER & TRIBUTARIES

<u>County Name</u>	<u>Ecoregion</u>	<u>Source Feature [Uncertainty Type (Distance)]</u>
Clatsop		Data currently not available.

Columbia  
 Hood River  
 Multnomah



Management:

General: DISTRIBUTION INFORMATION USED IN THIS EOR WAS DERIVED FROM ODFW GEOGRAPHIC RESOURCES DATA PRODUCED AND DISTRIBUTED IN 1999. UNLESS SPECIFIC DATA EXISTS IN THE DATA FIELD, THE INFORMATION PRESENTED IN THIS EOR REPRESENTS THE "BEST PROFESSIONAL JUDGMENT" BY ODFW'S DISTRICT FISHERIES BIOLOGIST; THE PRESENCE OF CHINOOK IN DESCRIBED AREAS SHOULD BE CONSIDERED UNDOCUMENTED BUT AS HAVING A POTENTIAL OF BEING PRESENT.

Scientific Name: ***Oncorhynchus clarki pop. 2***

Common Name: **Coastal Cutthroat Trout - Southwestern Washington/Columbia River**

Federal Status: GRANK: G4T2Q NHP List: 1 Category: Vertebrate Animal

State Status: SC SRANK: S2 HP Track: Y ELCODE: AFCHA0208F

EO ID: 13624 First Obs: Last Obs: 2001-PRE Confirmed:

Directions: COLUMBIA RIVER

County Name	Ecoregion	Source Feature [Uncertainty Type (Distance)]
Clatsop		Data currently not available.
Columbia		
Hood River		
Multnomah		
Wasco		

Town-Range	Sec	Note	QuadCode	QuadName	Watershed
			45121-E2	The Dalles South	1707010504 - COLUMBIA GORGE TRIBS E.
			45121-E8	Tanner Butte	1707010505 - HOOD RIVER MAIN STEM TRIBS
			45121-F2	The Dalles North	1707010506 - MILL CREEK
			45121-F3	Lyle	1707010507 - FIVE MILE CREEK
			45121-F4	White Salmon	1708000105 - COLUMBIA GORGE TRIBUTARIES W.
			45121-F5	Hood River	1708000106 - GORDON CREEK/LOWER SANDY RIVER
			45121-F6	Mount Defiance	1708000302 - BEAVER CREEK
			45121-F7	Carson	1708000303 - PLYMPTON CREEK
			45121-F8	Bonneville Dam	1708000601 - YOUNGS BAY TRIBUTARIES
			45122-E1	Multnomah Falls	1708000602 - BIG CREEK / GNAT CREEK
			45122-E2	Bridal Veil	1709001202 - SCAPPOOSE CREEK/MULTNOMAH CHANNEL
			45122-E3	Washougal	
			45122-E4	Camas	
			45122-E5	Mount Tabor	
			45122-E6	Portland	
			45122-F6	Vancouver	
			45122-F7	Sauvie Island	
			45122-G7	Saint Helens	
			45122-H7	Deer Island	
			46122-A7	Kalama	
			46122-A8	Rainier	
			46122-B8	Kelso	
			46123-B1	Coal Creek	
			46123-B2	Oak Point	
			46123-B3	Nassa Point	
			46123-B4	Cathlamet	
			46123-B6	Cathlamet Bay	
			46123-B7	Astoria	
			46123-B8	Warrenton	
			46123-C4	Skamokawa	
			46123-C5	Grays River	
			46123-C6	Rosburg	
			46124-B1	Clatsop Spit	

Owner Name/Type	Owner Comments	Managed Area Name
EO Type: MIGRATION - fish	Minimum Elev.(m):	Annual Observations
EO Data: SEA-RUN.		
EO Comments:		
Protection:		
Management:		
General:		

Scientific Name: ***Oncorhynchus mykiss pop. 35***  
 Common Name: **Steelhead - Southwest Washington Winter Run**  
 Federal Status: GRANK: G5T3Q NHP List: 2 Category: Vertebrate Animal  
 State Status: SC SRANK: S2 HP Track: Y ELCODE: AFCHA0213A  
 EO ID: 18732 First Obs: Last Obs: 1999-PRE Confirmed:  
 Directions: YOUNGS BAY, LEWIS AND CLARK RIVER, YOUNGS RIVER, SKIPANON WATERWAY & TRIBUTARIES

<u>County Name</u>	<u>Ecoregion</u>	<u>Source Feature [Uncertainty Type (Distance)]</u>
Clatsop		Data currently not available.

<u>Town-Range</u>	<u>Sec</u>	<u>Note</u>	<u>QuadCode</u>	<u>QuadName</u>	<u>Watershed</u>
			46123-A7	Olney	1708000601 - YOUNGS BAY TRIBUTARIES
			46123-A8	Gearhart	
			46123-B7	Astoria	
			46123-B8	Warrenton	

<u>Owner Name/Type</u>	<u>Owner Comments</u>	<u>Managed Area Name</u>
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EO Type: REARING & MIGRATION - fish Minimum Elev.(m): Annual Observations  
 EO Data: WINTER RUN; ODFW DISTRIBUTION MAPS USED TO  
 CREATE THE 1:24,000 COVERAGE

EO Comments:  
 Protection:  
 Management:  
 General: DISTRIBUTION INFORMATION USED IN THIS EOR WAS DERIVED FROM ODFW GEOGRAPHIC RESOURCES  
 DATA PRODUCED AND DISTRIBUTED IN 1999. UNLESS SPECIFIC DATA EXISTS IN THE DATA FIELD, THE  
 INFORMATION PRESENTED IN THIS EOR REPRESENTS THE "BEST PROFESSIONAL JUDGMENT" BY ODFW'S  
 DISTRICT FISHERIES BIOLOGIST; THE PRESENCE OF STEELHEAD IN DESCRIBED AREAS SHOULD BE  
 CONSIDERED UNDOCUMENTED BUT AS HAVING A POTENTIAL OF BEING PRESENT.

Scientific Name: ***Oncorhynchus mykiss pop. 35***  
 Common Name: **Steelhead - Southwest Washington Winter Run**  
 Federal Status: GRANK: G5T3Q NHP List: 2 Category: Vertebrate Animal  
 State Status: SC SRANK: S2 HP Track: Y ELCODE: AFCHA0213A  
 EO ID: 23988 First Obs: Last Obs: 1999-PRE Confirmed:  
 Directions: COLUMBIA RIVER & TRIBUTARIES

<u>County Name</u>	<u>Ecoregion</u>	<u>Source Feature [Uncertainty Type (Distance)]</u>
Clatsop		Data currently not available.
Columbia		

<u>Town-Range</u>	<u>Sec</u>	<u>Note</u>	<u>QuadCode</u>	<u>QuadName</u>	<u>Watershed</u>
			45122-G7	Saint Helens	1708000302 - BEAVER CREEK
			45122-H7	Deer Island	
			46122-A7	Kalama	
			46122-A8	Rainier	
			46122-B8	Kelso	
			46123-B1	Coal Creek	
			46123-B2	Oak Point	
			46123-B3	Nassa Point	
			46123-B4	Cathlamet	
			46123-B6	Cathlamet Bay	
			46123-B7	Astoria	
			46123-B8	Warrenton	
			46123-C4	Skamokawa	
			46123-C5	Grays River	
			46123-C6	Rosburg	
			46124-B1	Clatsop Spit	

<u>Owner Name/Type</u>	<u>Owner Comments</u>	<u>Managed Area Name</u>
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EO Type: MIGRATION - fish Minimum Elev.(m): Annual Observations  
 EO Data: WINTER RUN; ODFW DISTRIBUTION MAPS USED TO  
 CREATE THE 1:24,000 COVERAGE

EO Comments:  
 Protection:  
 Management:

General: DISTRIBUTION INFORMATION USED IN THIS EOR WAS DERIVED FROM ODFW GEOGRAPHIC RESOURCES DATA PRODUCED AND DISTRIBUTED IN 1999. UNLESS SPECIFIC DATA EXISTS IN THE DATA FIELD, THE INFORMATION PRESENTED IN THIS EOR REPRESENTS THE "BEST PROFESSIONAL JUDGMENT" BY ODFW'S DISTRICT FISHERIES BIOLOGIST; THE PRESENCE OF STEELHEAD IN DESCRIBED AREAS SHOULD BE CONSIDERED UNDOCUMENTED BUT AS HAVING A POTENTIAL OF BEING PRESENT.

Scientific Name: ***Myotis yumanensis***  
 Common Name: **Yuma Bat**  
 Federal Status: SOC GRANK: G5 NHP List: 4 Category: Vertebrate Animal  
 State Status: SRANK: S3 HP Track: N ELCODE: AMACC01020  
 EO ID: 35 First Obs: 1982 Last Obs: 1982 Confirmed:  
 Directions: HAMMOND; ATTIC OF BUILDING

County Name Ecoregion Source Feature [Uncertainty Type (Distance)]  
 Clatsop CR Point [Areal - Estimated ( 8050 m)]

Town-Range Sec Note QuadCode QuadName Watershed  
 008N010W 05 46123-B8 Warrenton 1708000601 - YOUNGS BAY TRIBUTARIES

Owner Name/Type Owner Comments Managed Area Name

PRIVATE  
 EO Type: NURSERY COLONY - bats Minimum Elev.(m): 8 Annual Observations  
 EO Data: 1982: 50 BATS OBSERVED  
 EO Comments: ATTIC OF BUILDING  
 Protection:  
 Management:  
 General: OBSERVER: MARK PERKINS

Scientific Name: ***Hemphillia glandulosa***  
 Common Name: **Warty Jumping-slug**  
 Federal Status: GRANK: G3 NHP List: 2 Category: Invertebrate Animal  
 State Status: SRANK: S2 HP Track: Y ELCODE: IMGAS59050  
 EO ID: 26146 First Obs: Last Obs: Confirmed:  
 Directions: Astoria

County Name Ecoregion Source Feature [Uncertainty Type (Distance)]  
 Clatsop CR Point [Areal - Estimated ( 50 m)]

Town-Range Sec Note QuadCode QuadName Watershed  
 008N009W 08 46123-B7 Astoria 1708000602 - BIG CREEK / GNAT CREEK

Owner Name/Type Owner Comments Managed Area Name

EO Type: Minimum Elev.(m): Annual Observations  
 EO Data: Species found at this location. See additional topics.  
 EO Comments:  
 Protection:  
 Management:  
 General: Distribution information for this EO was derived from ISMS mollusk database produced and distributed in 2003. There is one record for this EO, rated as better in ISMS mollusk database (better = in same sixth field watershed as verified specimen), no observation date given. Possibly a historical record.

18 records total

## Key to Oregon Natural Heritage Information Center Data

Field Name	Description
Scientific Name	The scientific name of the species.
Common Name	The common name of the species.
Category	Value that indicates the broad biological category for each species.
ELCODE	Unique Heritage Program code for identifying this element. 1st and 2nd byte (PD=Plant dict, PM=Plant monocot, PG=Plant gymnosperm, PP=Plant pteridophyte, AA=amphibian, AB=bird, AF=fish, AM=mammal, AR=reptile, I=invertebrate. 3rd-5th byte (family abbreviation). 6th-7th (genus code). 8th-9th (species). 10th (tie breaker).
Federal Status	US Fish and Wildlife Service or National Marine Fisheries Service status. <b>LE</b> =listed endangered, <b>LT</b> =listed threatened, <b>PE</b> or <b>PT</b> =proposed endangered or threatened, <b>C</b> =candidate for listing with enough information available for listing, <b>SOC</b> =species of concern, <b>-PD</b> =proposed delisting, <b>-NL</b> =not listed (in part of the range).
State Status	For animals, Oregon Department of Fish and Wildlife status; <b>LE</b> =listed endangered, <b>PE</b> =proposed endangered, <b>PT</b> =proposed threatened, <b>SC</b> or <b>C</b> =sensitive-critical, <b>SV</b> or <b>V</b> =sensitive-vulnerable, <b>SP</b> or <b>P</b> =sensitive-peripheral, <b>SU</b> or <b>U</b> =sensitive-undetermined status. For plants, Oregon Department of Agriculture status; <b>LE</b> =listed endangered, <b>LT</b> =listed threatened, <b>C</b> =candidate.
GRANK/SRANK	ORNHC participates in an international system for ranking rare, threatened and endangered species throughout the world. The system was developed by The Nature Conservancy and is now maintained by NatureServe in cooperation with Heritage Programs or Conservation Data Centers (CDCs) in all 50 states, in 4 Canadian provinces, and in 13 Latin American countries. The ranking is a 1-5 scale, primarily based on the number of known occurrences, but also including threats, sensitivity, area occupied, and other biological factors. In this book, the ranks occupy two lines. The top line is the Global Rank and begins with a "G". If the taxon has a trinomial (a subspecies, variety or recognized race), this is followed by a "T" rank indicator. A "Q" at the end of this line indicates the taxon has taxonomic questions. The second line is the State Rank and begins with the letter "S". The ranks are summarized as follows: <b>1</b> = Critically imperiled because of extreme rarity or because it is somehow especially vulnerable to extinction or extirpation, typically with 5 or fewer occurrences; <b>2</b> = Imperiled because of rarity or because other factors demonstrably make it very vulnerable to extinction (extirpation), typically with 6-20 occurrences; <b>3</b> = Rare, uncommon or threatened, but not immediately imperiled, typically with 21-100 occurrences; <b>4</b> = Not rare and apparently secure, but with cause for long-term concern, usually with more than 100 occurrences; <b>5</b> = Demonstrably widespread, abundant, and secure; <b>H</b> = Historical Occurrence, formerly part of the native biota with the implied expectation that it may be rediscovered; <b>X</b> = Presumed extirpated or extinct; <b>U</b> = Unknown rank; <b>?</b> = Not yet ranked, or assigned rank is uncertain.
NHP list	All rare species in Oregon are assigned a list number of 1, 2, 3 or 4, where <b>1</b> =threatened or endangered throughout range, <b>2</b> =threatened or endangered in Oregon but more common elsewhere, <b>3</b> =Review List (more information is needed), <b>4</b> =Watch List (currently stable). A null value indicates the species is not currently on our rare species list.
HP Track	We currently obtain and computerize locational information for only those elements marked with <b>Y(es)</b> . Those species marked with <b>N(o)</b> or <b>W(atch)</b> have incomplete data because we do not actively track them at this time.
EO ID	Unique identifier for the Element Occurrence (EO).
First_obs	First reported sighting date for this occurrence in the form YYYY-MM-DD.
Last_obs	Last reported sighting date, usually in the form YYYY-MM-DD.
Confirmed	Indication of whether taxonomic identification of the Element represented by this occurrence has been confirmed by a reliable individual. Blank=unknown, assumed to be correctly identified. Y=Yes, confident identification. ?=identification questions.
Directions	Site name and/or directions to site.
County	County name(s) in which EO is mapped.
Ecoregion	Physiographic Province in which EO is mapped: <b>CR</b> =Coast Range, <b>WV</b> =Willamette Valley, <b>KM</b> =Klamath Mountains, <b>WC</b> =West slope and crest of the Cascades, <b>EC</b> =East slope of the Cascades, <b>BM</b> =Ochoco, Blue and Wallowa Mts., <b>BR</b> =Basin and Range, <b>CB</b> =Columbia Basin, <b>SP</b> =Snake River Plains.

## Key to Oregon Natural Heritage Information Center Data

Field Name	Description
Source Feature	<p>A Source Feature is the initial translation of a discrete unit of observation data as a spatial feature. Creation of a Source Feature requires an interpretive process. The likely location and extent of an observation is determined through consideration of the amount and direction of any variability between the recorded and actual locations of the observation data. In most cases, the Source Feature is delineated to encompass locational uncertainty.</p> <p>A Source Feature can be a point, line, or polygon. The type of Source Feature developed depends on both the preceding conceptual feature type and the locational uncertainty associated with the feature.</p>
Uncertainty Type (Distance)	<p>The recorded location of an observation of an Element may vary from its true location due to many factors, including the level of expertise of the data collector, differences in survey techniques and equipment used, and the amount and type of information obtained. This inaccuracy is characterized as locational uncertainty, and is assessed for Source Feature(s) based on the uncertainty associated with the underlying information on the location of the observation.</p> <p>Four categories of locational uncertainty have been identified, as follows:</p> <p><u>Negligible</u> uncertainty is less than or equal to 6.25 meters in any dimension. Source Features with negligible uncertainty are based on a comprehensive field survey with high quality mapping and a high degree of certainty.</p> <p><u>Linear</u> uncertainty is greater than 6.25 meters, and varies along an axis (e.g., a path, stream, ridgeline). The true location of an observation with linear uncertainty may be visualized as effectively sliding along a line that delineates the uncertainty.</p> <p><u>Areal delimited</u> uncertainty is greater than 6.25 meters, and varies in more than one dimension. The true location of an observation can be visualized as floating within an area with a boundary that can be specifically delimited. Boundaries can be defined using roads, bodies of water, etc.</p> <p><u>Areal estimated</u> uncertainty is greater than 6.25 meters, and varies in more than one dimension. A boundary cannot be specifically delimited based on the observation information, i.e., the actual extent is unknown. The true location of the observation can be visualized as floating within an area for which boundaries cannot be specifically delimited. Source Features with areal estimated uncertainty require that the user specify an estimated uncertainty distance to be used for buffering the feature to incorporate the locational uncertainty.</p>
Town-Range, Sec, and Note	United States rectangular land survey (also known as the Public Land Survey System) legal township, range, and section descriptions that best define the location of the Element Occurrence. Township first (4 bytes), range second (4 bytes). For example: 004S029E = Township 4S, Range 29E. All locations are with reference to the Willamette Meridian. Fractional ranges or townships are indicated in the Note field.
Quadcode	USGS code for the USGS topographic quadrangle map(s) where the record is mapped.
Quadname	Name of the USGS topographic quadrangle map(s) where the record is mapped.
Watershed	Watershed(s), identified according to the U.S. Geological Survey (USGS) Hydrologic Unit Map 10-digit code, within which the Element Occurrence is located.
Owner Name/Type and Comments	Federal, State, Private, etc.
Managed Area Name	BLM District, USFS Forest, Private Preserve
EO Type	For animals, type of occurrence, eg. roost, nest, spawning, etc.
EO Data	Species and population biology - numbers, age, nesting success, vigor, phenology, disease, pollinators, etc.
EO Comments	Habitat information, e.g. aspect, slope, soils, associated species, community type, etc.
Minimum Elevation	Minimum elevation of the area covered by the range of the taxon, in meters. -339 or blank=not determined.
Annual Observation	Summary of yearly observation.
Protection	Comments on protectibility and threats.
Management	Comments on how the site is managed.
General	Miscellaneous comments.