Wildlife Baseline Inventory Report

Gateway Pacific Terminal Project

Whatcom County, Washington

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PREFACE

Pacific International Terminals, Inc. (Pacific International Terminals) proposes to develop the Gateway Pacific Terminal (the "Terminal"), a multimodal terminal for transfer of dry bulk commodities, at Cherry Point in Whatcom County, Washington. Construction and operation of the Terminal and associated facilities require the approval of local, state, and federal agencies. Agency decision makers are to be informed of the potential environmental impacts of the proposed project by preparation of environmental impact statements (EISs). An EIS will be prepared by the U.S. Army Corps of Engineers under the National Environmental Policy Act and, and a second EIS will be prepared by Whatcom County in cooperation with the Washington State Department of Ecology.

This report is one of several technical reports prepared on behalf of Pacific International Terminals that provide scientific technical information about the existing conditions of the proposed project area and, in some cases, the projected effects of project operations. It is provided to the lead federal, state, and local agencies for their use in preparation of the EISs. Several of the technical reports have also been prepared to support specific project permit applications submitted to local, state, and federal agencies, or as part of the consultation process with resource agencies and affected Indian nations.

EXECUTIVE SUMMARY

AMEC Environment & Infrastructure, Inc. (AMEC) conducted field surveys to assess wildlife habitat and the presence of wildlife species on property owned or controlled by Pacific International Terminals, Inc and the adjacent portion of the Strait of Georgia. The study area is in Whatcom County, Washington approximately 18 miles northwest of the city of Bellingham. Wildlife family groups assessed were reptiles, amphibians, raptors (hawks and owls), waterbirds, bats, terrestrial mammals, and select invertebrates (butterflies). A terrestrial bird survey was presented in an earlier report.

The purpose of the report is to provide overview baseline information about the defined wildlife groups that use the study area; 1) in support of project environmental documentation and permitting compliance, and 2) for use in preparation environmental impact statements in accordance with the National Environmental Policy Act and Washington's State Environmental Policy Act.

The study area lies within the Cherry Point Industrial Urban Growth Area (UGA). Major industrial facilities currently operate within the Cherry Point UGA, including ALCOA-Intalco Works, the British Petroleum (BP) Cherry Point Refinery, and the ConocoPhillips Ferndale Refinery. Other land uses include single family residential areas and open space areas that are managed by the State and/or County for wildlife, including the Cherry Point State Aquatic Reserve and the Whatcom Wildlife Area.

The wildlife study focused on Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS). Priority wildlife species include wildlife classified as endangered, threatened, sensitive, and/or candidate by state and/or federal regulatory agencies. Habitats supporting these species and areas of primary association were evaluated. Reptiles, amphibians, raptors, waterbirds, bats, terrestrial mammals and butterflies identified during field surveys for each wildlife group were documented, including incidental sightings.

Eleven waterbird species that are included on the WDFW PHS list (WDFW 2013) were identified in the study area during the field surveys of 2012–2013. The marbled murrelet *(Brachyramphus marmoratus*), a federal and state threatened species, was identified in the marine study area. The Western toad (*Anaxyrus boreas*), a federal species of concern and state candidate species, also was identified in the study area.

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1.0 INTRODUCTION

AMEC Environment & Infrastructure, Inc. (AMEC) conducted field surveys to assess wildlife habitat and species presence on a property owned or controlled by Pacific International Terminals, Inc. (Pacific International Terminals). Wildlife family groups assessed included reptiles, amphibians, raptors (hawks and owls), waterbirds, bats, terrestrial mammals, and select invertebrates (butterflies).

The study area consists of approximately 1,500 undeveloped acres at Cherry Point, which is a small promontory of land situated along the southeast margin of the Strait of Georgia in Whatcom County, Washington. The study area lies approximately 18 miles northwest of Bellingham, Washington, 5 miles west of the city of Ferndale, and 17 miles south of the United States–Canada border (Figure 1).

There are several previously completed wildlife reports and other reports with relevant information regarding habitat conditions in the study area:

- *Avian Baseline Inventory Report* (AMEC 2012a);
- *Wetland Determination and Delineation Report* (AMEC Earth & Environmental 2008);
- *Freshwater Streams Baseline Inventory Report* (AMEC 2012b);
- *Marine Biology Baseline Inventory Report* (AMEC 2012c);
- *Wetland Identification and Delineation – Parcel 14* (AMEC Earth & Environmental 2011)*;* and
- *Wetland Determination and Delineation – Parcel 15* (AMEC 2013)*.*

1.1 Study Purpose

The wildlife surveys were performed to achieve the following goals:

- Establish baseline confirmatory information on reptiles, amphibians, raptors, waterbirds, bats, terrestrial mammals, and select invertebrate species present in the study area;
- Characterize wildlife habitats and assess wildlife use by the defined families above within the study area for any or part of their life stages or life cycle requirements; and
- Identify federal and state wildlife priority species and their potential habitats in the study area.

This report is intended to provide overview baseline information about the defined wildlife groups that use the study area 1) in support of environmental documentation and permitting compliance, and 2) for use in preparation environmental impact statements (EISs) in accordance with the National Environmental Policy Act (NEPA) and Washington's State Environmental Policy Act (SEPA).

1.2 Regulatory Context

Management of wildlife is regulated through a variety of federal, state, and local regulations. This section summarizes the laws and regulations relevant to wildlife conservation and management on the site.

1.2.1 Federal Regulations

National Environmental Policy Act (42 United States Code [USC] 4321 *et seq.*): requires federal agencies to evaluate potential project environmental impacts whenever federal (or federally permitted) or federally funded actions affect the environment.

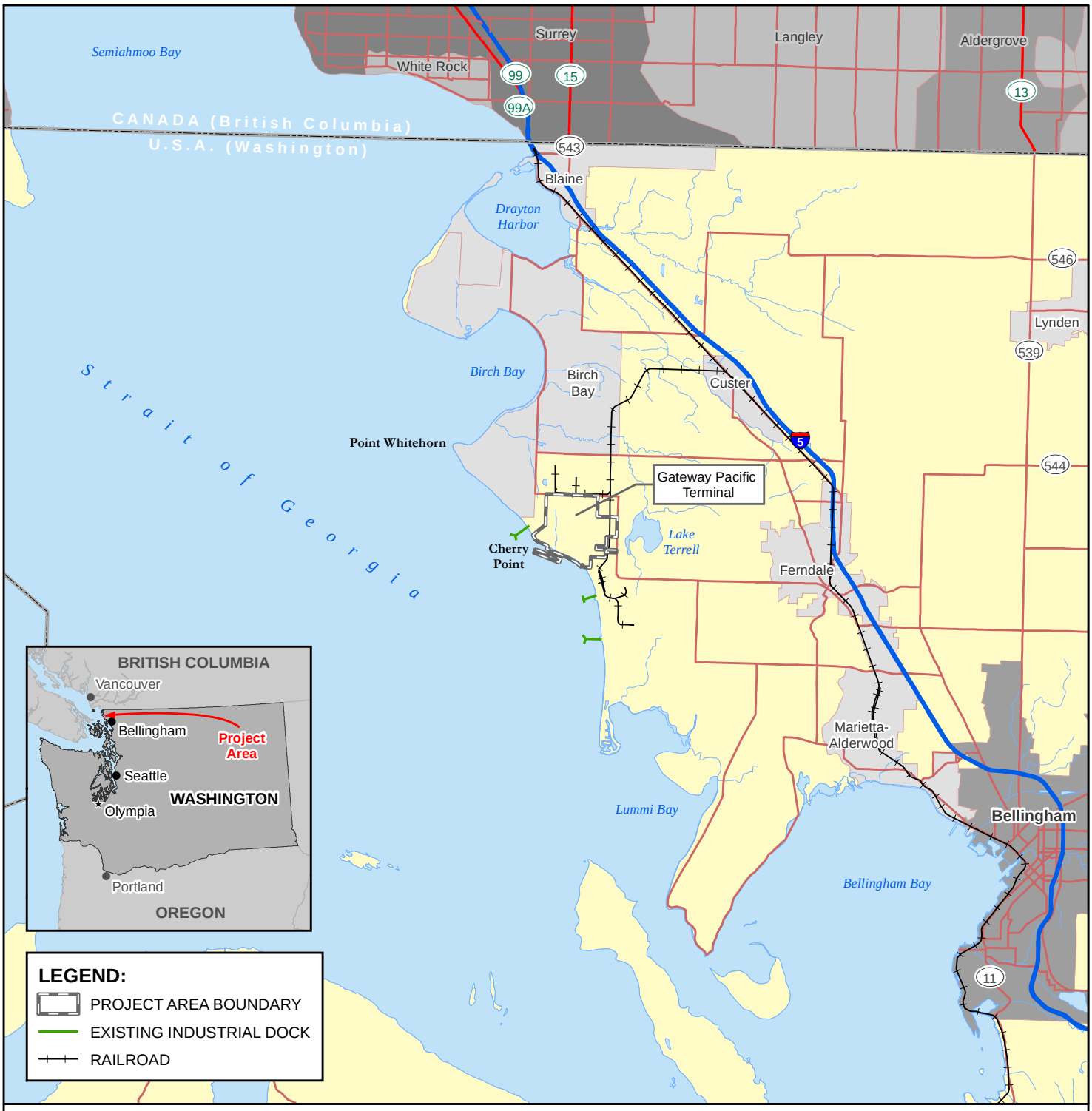
Endangered Species Act (ESA) of 1973, as amended (16 USC §1531 *et seq.*): provides for the identification and protection of threatened and endangered plants and animals and their critical habitats. The ESA directs federal agencies to ensure that actions authorized, funded, and/or conducted by them are not likely to jeopardize the continued existence of any federally proposed or listed species, candidate species, or critical habitats. Compliance with Section 7 of the ESA is overseen by the US Fish and Wildlife Service (USFWS) for terrestrial species and by the National Oceanic and Atmospheric Administration (NOAA) Fisheries Division for marine species.

Fish and Wildlife Conservation Act (16 USC §2901): provides for the protection of non-game fish and wildlife by mandating states to make conservation plans that include an inventory of nongame fish and wildlife within the state that are deemed valuable for ecological, educational, aesthetic, cultural, recreational, economic, or scientific benefits by the public.

Bald and Golden Eagle Protection Act (16 USC §668a-d): prohibits taking or harming bald eagles (*Haliaeetus leucocephalus*) or golden eagles (*Aquila chrysaetos*), their eggs, nests, or young without an appropriate permit.

Migratory Bird Treaty Act, as amended (16 USC §703-712): prohibits the taking or harming of a migratory bird, its eggs, nests, or young without the appropriate permit.

Lacey Act (16 USC §3371 – 3378): makes it a Federal offense to take, possess, transport, sell, import, or export nests, eggs, and parts that are taken in violation of any state, tribal or U.S. law.



AMEC 11810 North Creek Parkway N Bothell, WA 98011	amec	Pacific International Terminals	CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.

PROJECT: WILDLIFE BASELINE INVENTORY REPORT	DWN BY: SD	DATUM: NAD83	DATE: APRIL 2013
TITLE: VICINITY MAP	CHK'D BY: JG	REV. NO.: 1	PROJECT NO.: 091515338C-04-12
	PROJECTION: WA SP North, Ft.	SCALE: 1 inch=3 miles	FIGURE NO.: FIGURE 1

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-04-12 - Parcel 15 Rare Plant Survey\Wildlife_Baseline_Inventory_Report\Figure 1 - Vicinity Map.mxd

1.2.2 State Regulations

State Environmental Policy Act (Washington Administrative Code [WAC] 197-11): requires state agencies to prepare detailed evaluations that assess project environmental impacts and recommend alternatives to major state (or state-permitted) actions that may have a significant effect on the environment.

Growth Management Act (Revised Code of Washington [RCW] 36.70A): requires comprehensive land use planning by Counties and Cities to protect the environment through the designation and protection of critical areas in order to prevent harm to the community from natural hazards and to protect natural resources, including wetlands and fish and wildlife habitat conservation areas.

Bald Eagle Protection Rules (WAC 232-12-292): protect eagle habitat so that the species is not classified as threatened, endangered, or sensitive in Washington State. Habitat protection is typically achieved through bald eagle management plans.

Bald Eagle Protection Act (RCW 77.12.655): requires the establishment of rules defining buffer zones around bald eagle nest and roost sites. The law states that the rules shall take into account the need for variation of the extent of the zone from case to case.

1.2.3 Local Regulations

Whatcom County Critical Areas Ordinance (Whatcom County Code [WCC] Chapter 16.16): regulates wildlife and wildlife habitat through a variety of mechanisms required to conserve species listed as federally or locally sensitive or important. The code protects any habitat deemed important to the preservation of the local and regional environment. Whatcom County protects habitats and the species that use the habitats as Fish and Wildlife Habitat Conservation Areas (FWHCAs).

Whatcom County Shoreline Management Program (WCC Title 23): identifies the significance of Whatcom County's shorelines to birds.

1.3 Priority Species, Priority Areas, and Priority Habitats

Whatcom County, Washington Department of Fish and Wildlife (WDFW), USFWS, and NOAA – Fisheries Division assess the potential effects of proposed actions on priority species (e.g., endangered, threatened, sensitive, and candidate species) that could occur at a proposed development site. The WDFW protects wildlife through the WDFW Priority Habitat and Species (PHS) Program, regulating both species and the habitats they require for their life cycle requirements. The PHS Program maintains the PHS database of these important habitats and species, and provides maps showing the geographic location of documented priority habitats and species. The following provides more information on priority species, priority areas and priority habitats.

1.3.1 Priority Species

Priority species in the state of Washington include wildlife species classified as endangered, threatened, sensitive, and/or candidate by Washington regulatory agencies, as well as federally classified endangered, threatened, candidate, and species of concern (USFWS classification as provided by the Federal Endangered Species Act).

These classes are defined as follows:

- *Federally Endangered*: A species that is in danger of extinction throughout all or a significant portion of its range.
- *Federally Threatened:* A species likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.
- *Federal Candidate:* Formally proposed endangered or threatened species and candidate species with enough or some information to indicate biological vulnerability and threat.
- *Federally Species of Concern:* A species that is informally considered a species of concern but for which more information is required before it can be listed.
- *State Endangered:* A species native to the state of Washington that is seriously threatened with extinction throughout all or a significant portion of its range within the state (WAC 232-12-297).
- *State Threatened:* A species native to the state of Washington that is likely to become endangered in the foreseeable future throughout a significant portion of its range within the state without cooperative management or the removal of threats (WAC 232-12-297).
- *State Sensitive:* A species native to the state of Washington that is vulnerable or declining and which is likely to become endangered or threatened in a significant portion of its range within the state without cooperative management or the removal of the threats (WAC 232-297).
- *State Candidate:* A species that the WDFW will review for possible listing as State Endangered, Threatened, or Sensitive (WDFW Policy M-6001).

The list of the priority species known to occur within the entire boundary of Whatcom County (WDFW 2013) is provided as Appendix A.

Priority species also include vulnerable aggregations of animals that—by virtue of their inclination to congregate in one location in high numbers—are susceptible to significant population declines either within a certain area, or statewide. Vulnerable aggregations that occur within Whatcom County are provided in Appendix A (WDFW 2013). In addition, priority species may include species of important recreational, commercial, or tribal value (WDFW 2008).

1.3.2 Priority Areas

Species are sometimes considered a priority only when they occur within certain habitats or areas (for example, breeding areas, foraging areas, or migration corridors), or within habitat areas that support a relatively high number of individuals (called “regular large concentrations”). These areas are known as **priority areas**. For example, great blue herons (*Ardea herodias*) are often found feeding along shorelines, but the habitat is considered a *priority area* only in areas used for breeding (WDFW 2012a).

Designated priority areas (and standard abbreviations) that are defined for certain species include:

- Any occurrence of the species (A)
- Breeding areas (B)
- Regular concentration locations (C)
- Foraging areas (F)
- Migratory stopover locations (M)
- Regular occurrences (O)
- Communal roost locations (R)
- Occupied mineral sites (S)
- Regular occurrences in winter (W)

1.3.3 Priority Habitats

Priority habitats are described by WDFW as habitats with unique or significant value to many species, and with one or more of the following attributes:

1. Comparatively high fish and wildlife density and species diversity;
2. Important fish and wildlife breeding habitat, seasonal ranges, and movement corridors;
3. Limited availability of the habitat;
4. High vulnerability to habitat alteration; or
5. Unique or dependant species.

A priority habitat may be described by a unique vegetation habitat type or by a dominant plant species that is of primary importance to fish and wildlife. A priority habitat also may be described by a successional stage (for example, old growth forest), or a specific habitat feature (for example, Oregon white oak woodlands) of key value to fish and wildlife.

As mentioned in Section 1.2.3, Whatcom County regulates wildlife through the establishment and management of FWHCAs. These areas are defined as habitats or geographic areas that are of critical importance to maintaining certain fish, wildlife, and/or plant species populations (WCC 16.16.710), and by definition include:

- Streams,
- Areas that support federally- and/or state-listed species,
- State priority habitats and areas with state priority species,
- Commercial and recreational fishing areas,
- Kelp and eelgrass beds,
- Forage fish spawning areas,
- Naturally occurring ponds under 20 acres,
- Naturally occurring lakes and other waters of the state,
- Natural area preserves, and
- Locally-important species and habitat with recreational, cultural, and/or economic value.

FWHCAs are regulated by Whatcom County with the following goals (WCC 16.16.700):

1. Maintain fish and wildlife populations through protection and conservation of the natural distribution, connectivity, and quality of valuable fish and wildlife habitat and the ecological processes that sustain these resources.
2. Protect marine shorelines, valuable terrestrial habitats, rivers and streams, their associated riparian areas, and the ecosystem processes that they depend on.
3. Avoid creating isolated populations of species, and avoid habitat degradation and fragmentation.

Fish and Wildlife Habitat Conservation Areas previously identified within the study area include streams and their riparian zones, as well as the marine nearshore.

1.4 Background Review

A background literature search was performed prior to fieldwork to identify wildlife species and habitats that may occur within the study area. Information on wildlife in the study area and vicinity was compiled based on a review of the following sources:

- *Whatcom Wildlife Area Management Plan* (WDFW 2006): This management plan has several purposes; however, it specifically pertains to birds in regards to the maintenance of nesting and wintering habitat for water birds and the protection, restoration, and enhancement of wetland and riparian habitats in the vicinity.
- *Cherry Point Natural Resources Technical Reports* (Shapiro 1994): These reports identified important habitats including wetlands, and reported results of a bird survey performed in the study area.
- *Listed and Proposed Endangered and Threatened Species and Critical Habitat; Candidate Species; and Species of Concern in Whatcom County* (USFWS and WDFW 2008): The document provides a joint list between WDFW and USFWS that identifies and describes listed and proposed species and designated critical habitat, candidate species, and species of concern within Whatcom County.
- *Priority Habitats and Species List* (WDFW 2008): The document identifies and describes PHS and describes priority areas for each listed species.
- *Priority Habitats and Species Database* (WDFW 2012b): Prior to the start of the fieldwork in 2012, the WDFW PHS database was consulted for occurrences of PHS-listed wildlife species in the study area and the vicinity. Where suitable habitat existed, the PHS-listed species were specifically searched for during field investigations.
- *Whatcom County Critical Areas Maps* (Whatcom County 2005): As discussed above, the Critical Areas Ordinance specifically identifies FWHCAs and priority species associated with FWHCAs.

1.5 Potential Priority Species

Table 1 presents a list of federal and state-listed priority species that could potentially occur in the study area and which this study evaluated. This list is a subset of the list for the entire Whatcom County area presented in Appendix A. Priority species were not included if they were very unlikely to occur in the study area because habitat conditions to support the species do not exist. Also, this study did not evaluate marine mammals, fish, marine invertebrates, or most terrestrial birds (raptors and owls were evaluated).

Table 2 provides the list of priority species aggregations. These are aggregations occurring during either breeding, roosting or feeding.

Table 1 Priority Species that Could Potentially Occur in the Study Area

Common Name	*Scientific Name*	Animal Type	State Status	Federal Status	Priority Area	Potential Study Area Use	Known to be in the Study Area Prior to this Study
Western Toad	*Anaxyrus boreas*	Amphibian	Candidate	Concern	Any occurrence	Breeding / Foraging	Not known
Oregon Spotted Frog	*Rana pretiosa*	Amphibian	Endangered	Candidate	Any occurrence	Breeding / Foraging	Not known
Bald Eagle	*Haliaeetus leucocephalus*	Bird	Sensitive	Concern	Breeding areas Communal roosts Regular concentrations	Breeding / Foraging	Nesting and over-wintering
Brandt's Cormorant	*Phalacrocorax penicillatus*	Bird	Candidate	None	Breeding areas Regular concentrations	Foraging	Winter foraging
Clark's Grebe	*Aechmophorus clarkii*	Bird	Candidate	None	Breeding areas Regular concentrations	Foraging	Winter foraging
Western Grebe	*Aechmophorus occidentalis*	Bird	Candidate	None	Breeding areas Migratory stopovers Regular concentrations Regular occurrence in winter	Foraging	Winter foraging
Common Loon	*Gavia immer*	Bird	Sensitive	None	Breeding areas Migratory stopovers Regular concentrations	Foraging	Winter foraging
Common Murre	*Uria aalge*	Bird	Candidate	None	Breeding areas Regular concentrations	Foraging	Winter foraging
Marbled Murrelet	*Brachyramphus marmoratus*	Bird	Threatened	Threatened	Any occurrence	Foraging	Winter foraging

Table 1 Priority Species that Could Potentially Occur in the Study Area (Continued)

Common Name	*Scientific Name*	Animal Type	State Status	Federal Status	Priority Area	Potential Study Area Use	Known to be in the Study Area Prior to this Study
Great Blue Heron	*Ardea herodias*	Bird	None	None	Breeding Concentration	Foraging / Breeding	Year-round foraging
Brant	*Branta bernicla*	Bird	None	None	Regular concentrations Migratory stopovers	Foraging	Winter foraging
Harlequin Duck	*Histrionicus histrionicus*	Bird	None	None	Breeding concentrations Regular concentration in salt water	Foraging	Winter foraging
Peregrine Falcon	*Falco peregrinus*	Bird	Sensitive	Species of Concern	Breeding areas Regular occurrence	Foraging	Foraging
Cavity-nesting ducks: Wood Duck, Barrow's Goldeneye, Common Goldeneye, Bufflehead, Hooded Merganser	*Aix sponsa, Bucephala clangula, Bucephala islandica, Bucephala albeola, Lophodytes cucullatus*	Bird	None	None	Breeding	Foraging	Winter foraging
Townsend's Big-eared Bat	*Corynorhinus townsendii*	Mammal	Candidate	Species of Concern	Any occurrence	Foraging	Not known
Keen's Long-eared Bat (formerly Keen's Myotis)	*Myotis evotis keenii*	Mammal	Candidate	None	Any occurrence	Foraging	Not known

Notes: Modified from WDFW 2013 for Whatcom County, see text for explanation of species inclusion in table.

Table 2 Priority Areas: Bird and Bat Aggregations

Type of Aggregation	Animal Type	Priority Area Characteristic	Potential Study Area Use
Western Washington nonbreeding concentrations of: Barrow's Goldeneye, Common Goldeneye, and Bufflehead	Bird	Regular Concentrations	Foraging
Western Washington nonbreeding concentrations of: Loons, Grebes, Cormorants, Fulmar, Shearwaters, Storm-petrels, and Alcids	Bird	Regular Concentrations	Foraging
Western Washington breeding concentrations of: Cormorants, Storm-petrels, Terns, and Alcids	Bird	Breeding Concentrations	Breeding / Foraging
Western Washington nonbreeding concentrations of: Charadriidae (plovers), Scolopacidae (sandpipers), Phalaropodidae (phalaropes)	Bird	Regular concentrations	Foraging
Roosting concentrations of: *Myotis* species Bats, Big-brown Bat, and Pallid Bat	Mammal	Roosting concentrations	Roosting

Source: WDFW (2013)

2.0 DESCRIPTION OF STUDY AREA

The study area for terrestrial species was defined as the approximately 1,500-acre Pacific International Terminals property (Figure 2). Terrestrial species include reptiles, amphibians, raptors, bats, terrestrial mammals, and butterflies. For the waterbird survey, the study area included the marine shoreline and nearshore up to approximately 1,500 feet offshore. This section presents background information regarding the study area location and setting, and describes the existing land uses, wetlands and streams, and vegetation habitats within the study area.

2.1 Location and Setting

The study area covers portions of Sections 17, 18, 19, and 20 of Township 39 North, Range 1 East, in Whatcom County, and is located on the Strait of Georgia.

The study area is zoned for heavy-impact industrial use within Whatcom County. The BP Cherry Point Refinery borders the study area to the north and west, and ALCOA Intalco Works (an aluminum smelter plant) is located adjacent to the southeast. The Strait of Georgia lies to the south and southwest. The nearest residential areas are located on Kickerville Road to the east. The Lake Terrell Wildlife Refuge lies east of Kickerville Road.

County roads, pipelines, power-line corridors, and a railroad line define the study area. The BNSF Railway Company (BNSF) Custer Spur Line and a Bonneville Power Administration (BPA) transmission line run north-south in the eastern portion of the site. An oil pipeline runs through the northernmost and eastern vicinity of the property.

2.1.1 Cherry Point State Aquatic Reserve

The Cherry Point State Aquatic Reserve is located in the Strait of Georgia adjacent to the property. The reserve was established in 2000 for the long-term protection of aquatic resources at Cherry Point by the Washington Department of Natural Resources (WDNR) (WDNR 2010). The Strait of Georgia, including the Cherry Point area, is known to provide wintering habitat for a variety of migratory bird species, including the brant (*Branta bernicla*), harlequin duck (*Histrionicus histrionicus*), loons (*Gavia* spp.), and surf scoters (*Melanitta perspicillata*). The Cherry Point Aquatic Reserve boundary is shown on Figure 3.

2.1.2 Whatcom Wildlife Area

The WDFW manages the Whatcom Wildlife Area, which includes seven management units totaling 4,960 acres (WDFW 2006). Five of the seven units are in the vicinity of the study area and shown on Figure 4. The Lake Terrell Unit, BP Unit, and Intalco Unit are in proximity to the study area. The Tennant Lake Unit and Nooksack Unit are located approximately 4 miles southeast of the study area

in the Nooksack River watershed, and make up the largest contiguous portion of the Whatcom Wildlife Area. The Pine Lake Unit is located approximately 15 miles southeast of the study area, and the Point Roberts Unit is located approximately 15 miles northwest of the study area on Point Roberts. The Whatcom Wildlife Area supports habitat for wintering waterfowl, and is located on the north-south Pacific Flyway for migratory birds.

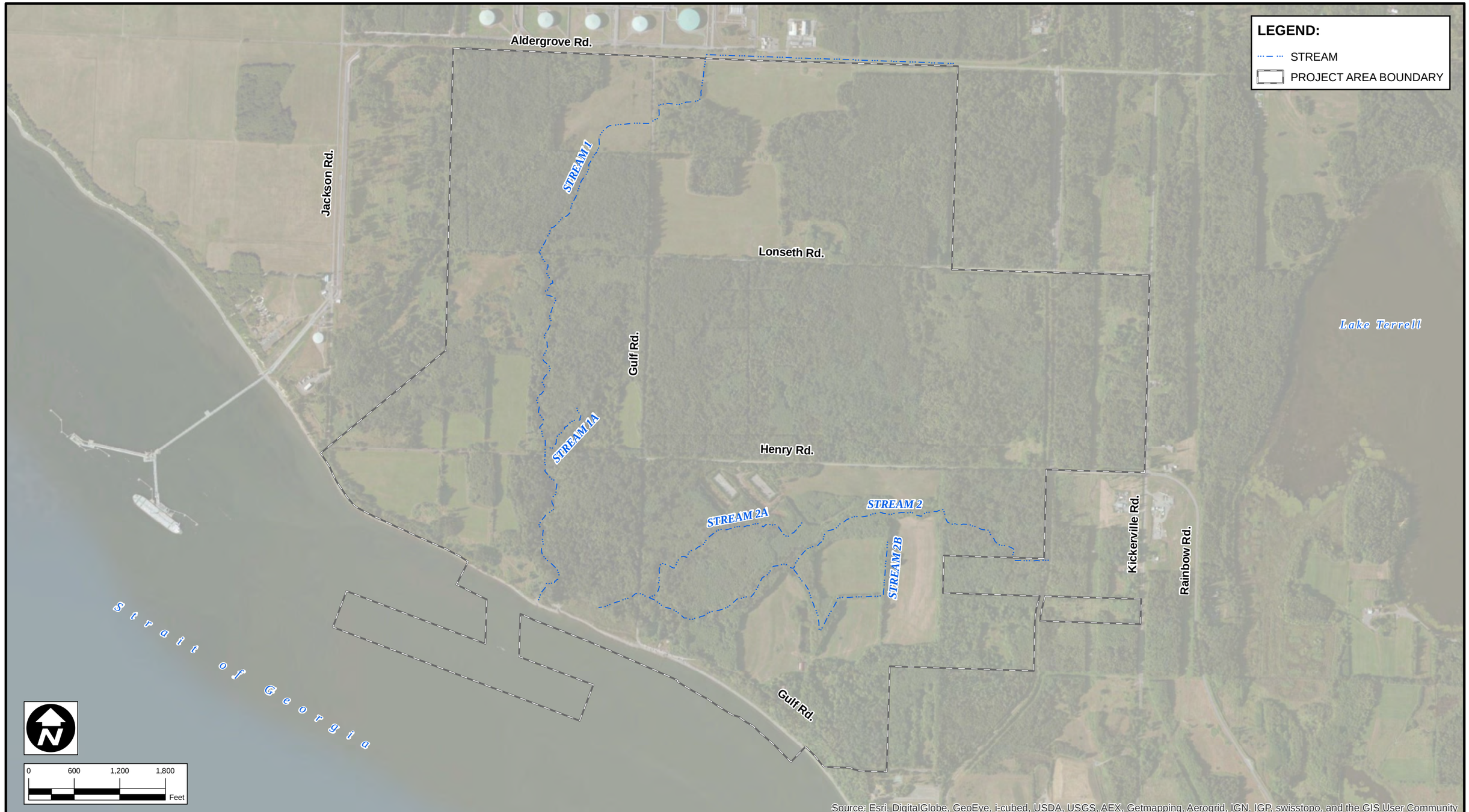
Habitat types in the Lake Terrell Unit include submergent and emergent wetlands, open water areas, and deciduous and mixed forest vegetation communities. The area supports waterfowl concentrations. The area surrounding open water provides breeding habitat for loons, which are listed as state sensitive (WDFW 2012b).

Habitat types in the BP Unit include wetlands and streams that drain to Birch Bay and Drayton Harbor, which are located north of the study area. The Intalco Unit includes several water impoundments and constructed wetlands.

2.1.3 Shoreline and Strait of Georgia

The June 2011 Whatcom County Comprehensive Plan identified the shoreline of the site as an area within which listed waterbird species have a primary association. It also has been identified as an FWHCA and is subject to Whatcom County regulations. Cherry Point is also considered one of 18 areas of significant bird habitat identified for the Strait of Juan de Fuca and Georgia Strait (WDNR 2010). Furthermore, terrestrial bird species are found along the Cherry Point Aquatic Reserve among the many waterbird species. Prominent terrestrial species include bald eagles and peregrine falcons.

Peak avian activity levels occur in late winter through early spring, and bird numbers have been known to coincide with herring spawning activities in March through May, when huge concentrations of birds, particularly scoters and gulls, feed along the shoreline (WDNR 2010). The nearshore area from Sandy Point north to Birch Bay once supported one of the largest concentrations of wintering marine birds known to occur in Washington (Wahl et al. 1981). Studies conducted over the past 30 years have shown that wintering populations of most species of marine birds throughout the Salish Sea and Puget Sound have been declining (Wahl 2002, Bower 2009).



Pacific International Terminals
A Carrix Enterprise

CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.

AMEC
11810 North Creek Parkway N
Bothell, WA 98011

amec

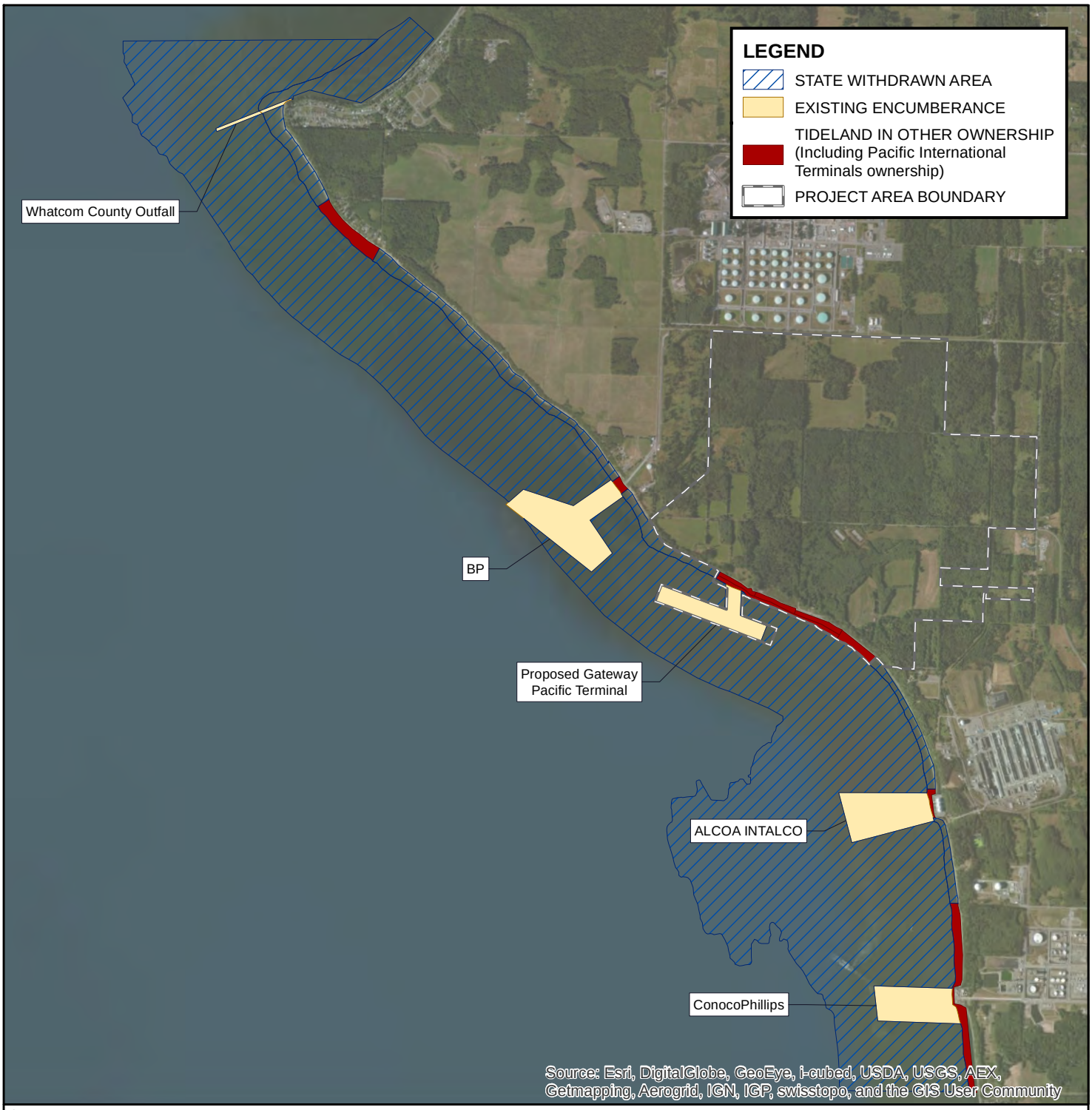
DWN BY:	SD
CHK'D BY:	JG
DATUM:	NAD83
PROJECTION:	WA SP North, Ft.
SCALE:	1 inch = 1,200 feet

PROJECT: WILDLIFE BASELINE INVENTORY REPORT

TITLE: STUDY AREA

DATE:	APRIL 2013
PROJECT NO.:	091515338C-04-12
REV. NO.:	-
FIGURE NO.:	FIGURE 2

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-04-12 - Parcel 15 Rare Plant Survey\Wildlife_Baseline_Inventory_Report\Figure 2 - Study Area.mxd

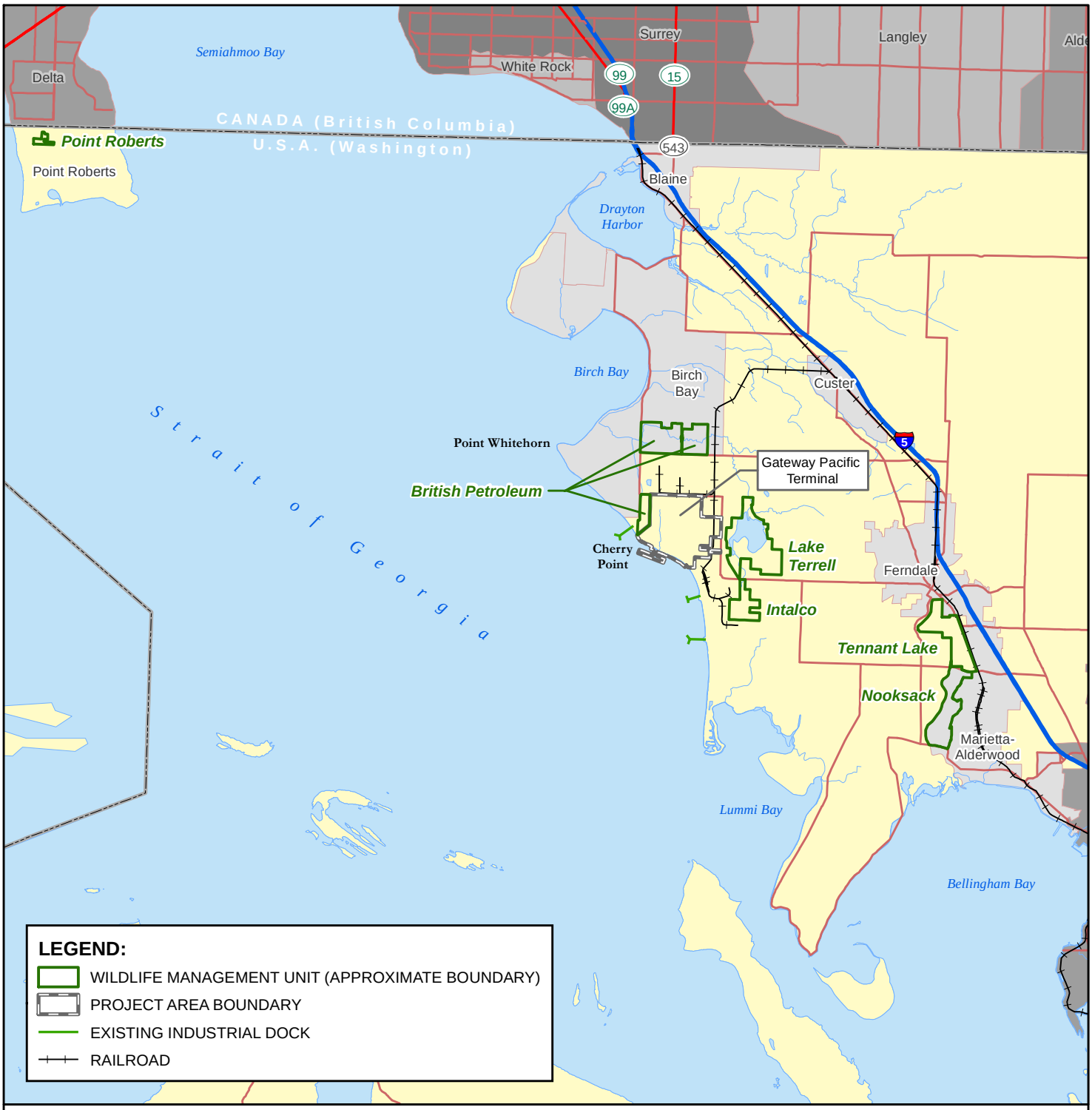


Source:
'State withdrawn area', 'Existing encumberance' and 'Tideland in other ownership' data obtained from Washington Department of Natural Resources on 11/03/2010:
http://fortress.wa.gov/dnr/app1/dataweb/dmmatrix.html

0 2,000 4,000 8,000 Feet

		CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.	
PROJECT: WILDLIFE BASELINE INVENTORY REPORT	DWN BY: SD	DATUM: NAD83	DATE: APRIL 2013
TITLE: CHERRY POINT AQUATIC RESERVE BOUNDARY	CHK'D BY: JG	REV. NO.: 1	PROJECT NO.: 091515338C-04-12
	PROJECTION: WA SP North, Ft.	SCALE: 1 inch=4,000 feet	FIGURE NO.: FIGURE 3

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-04-12 - Parcel 15 Rare Plant Survey\Wildlife_Baseline_Inventory_Report\Figure 3 - Cherry Point Aquatic Reserve Boundary.mxd



SOURCE: Wildlife Management Units approximated from Washington Department of Fish & Wildlife: http://wdfw.wa.gov/lands/wildlife_areas/whatcom/

0 1.5 3 6 Miles

N

AMEC 11810 North Creek Parkway N Bothell, WA 98011	amec	Pacific International Terminals	CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.
PROJECT: WILDLIFE BASELINE INVENTORY REPORT		DWN BY: SD	DATUM: NAD83 / DATE: APRIL 2013
TITLE: WHATCOM COUNTY WILDLIFE AREAS MAP		CHK'D BY: JG	REV. NO.: 1 / PROJECT NO.: 091515338C-04-12
		PROJECTION: WA SP North, Ft.	SCALE: 1 inch=3 miles / FIGURE NO.: FIGURE 4

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-04-12 - Parcel 15 Rare Plant Survey\Wildlife_Baseline_Inventory_Report\Figure 4 - Whatcom County Wildlife Areas Map.mxd

2.2 Existing Land Uses

The dominant land cover includes secondary growth deciduous forest with pastures and hayfields. Evidence of previous logging activities is present within all of the forested areas. Active agricultural operations such as hayfields and pasture occur in the study area (Figure 2). The pastures in the southeast portion of the study area were last grazed in 2012, whereas the northern pastures continue to be used during summer months. Hayfield harvests occur annually.

The southeastern portion of the study area has a single-family house, driveway, barn with feeding areas for cattle, and three stock ponds. Near the intersection of Henry Road and Gulf Road is an abandoned industrial development that includes two large concrete pads (approximately 54,600 square feet each), stormwater ditches and underground drainage systems, gravel roads, soil mounds, and a stormwater retention pond. These features were installed in 1992–1993 and subsequently abandoned.

2.3 Topography

Site terrain is generally flat with gently rolling slopes. Elevation ranges from sea level to approximately 210 feet above mean sea level. The highest site elevation occurs near the eastern study area boundary and gradually decreases generally to the west and south. Both moderate slopes and steep bluffs border portions of the shoreline along the Strait of Georgia. Stream 1 runs through a ravine in the south-central portion of the study area, and Stream 2 runs through another shallower ravine in the eastern portion (Figure 2).

2.4 Aquatic Habitats in the Study Area

Certain wildlife groups, such as amphibians, require aquatic habitats for various uses, including reproduction. Aquatic habitats in the study area are described below.

2.4.1 Wetlands and Watercourses

Wetlands, streams, and ditches occur throughout the study area. Field investigations from 2006 through 2013 resulted in the delineation of approximately 605 acres of wetlands (Figure 5). Wetlands were classified as riverine, slope, and depressional according to the hydrogeomorphic classification. Palustrine forested wetlands are most common, followed by palustrine emergent wetlands used as pastures, hayfields, and mowed utility easements. Shrub-vegetated wetlands occur in areas of abandoned pastures and in linear strips at the boundaries between forest and emergent wetland areas or between forest and roadways. Seasonally-saturated emergent wetlands in areas with frequent disturbance (mowing and grazing) generally support a prevalence of nonnative herbaceous plant species. Seasonally-saturated forested and shrub wetlands vegetation communities are

generally made up of native plant species. One wetland is categorized as a coastal wetland system (Figure 5).

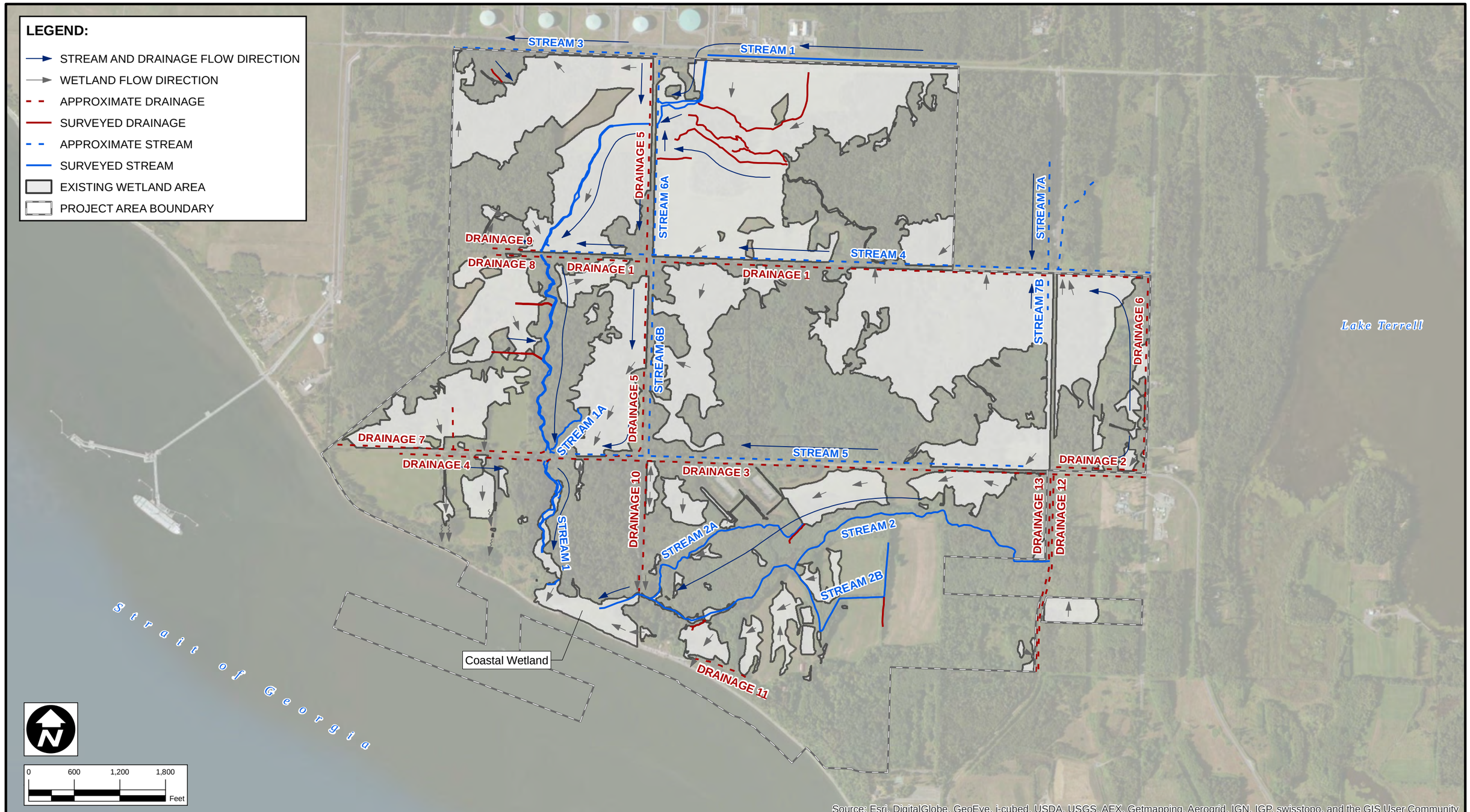
Five open water areas that retain water year-round are located within the study area. These include the three stock ponds near Stream 2B, a stormwater retention facility, and an impoundment created behind an earthen dam across Stream 2. These aquatic habitats are shown on Figure 6.

Ten streams were identified within the study area (Figure 5). Seven of these streams (Stream 1, 1A, 2, 2A, 2B, 4, and 6) are regulated by WDFW under the state's Hydraulic Code (WAC 220-110). Stream 1 (Reaches 1, 2, and 3), 1A, 2, 2A, and 2B occur in natural stream channels, whereas Streams 3 through 7, and the upper reaches of Stream 1, flow in roadside ditches.

Surface water in the study area drains to the Strait of Georgia. Stream 1 drains the north, central, and western portions of the study area, while Stream 2 drains the southeastern portion. Surface water in the northwest corner of the study area (Stream 3) drains north to Birch Bay via Terrell Creek.

2.5 Vegetation Habitats in the Study Area

The study area lies within the Puget Sound Area of the Western Hemlock Zone (Franklin and Dyrness 1988). As stated, vegetation communities in the study area consist mostly of early seral deciduous forest along with areas that have managed vegetation, including mowed right-of-ways and either active or abandoned agricultural fields. This section describes these vegetation communities and the presence of relevant wildlife habitat features (e.g., large woody debris and cavity trees). The importance of these features is discussed in each of the wildlife family sections. Figure 6 shows the vegetation habitat units, and representative photographs of each habitat type are provided in Appendix B.



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AMEC
11810 North Creek Parkway N
Bothell, WA 98011

amec

DWN BY:	SD
CHK'D BY:	JG
DATUM:	NAD83
PROJECTION:	WA SP North, Ft.
SCALE:	1 inch = 1,200 feet

PROJECT: WILDLIFE BASELINE INVENTORY REPORT

TITLE: EXISTING STREAM NETWORK, WETLANDS, AND HYDROLOGIC FLOW

DATE:	AUGUST 2013
PROJECT NO.:	091515338C-04-12
REV. NO.:	-
FIGURE NO.:	FIGURE 5

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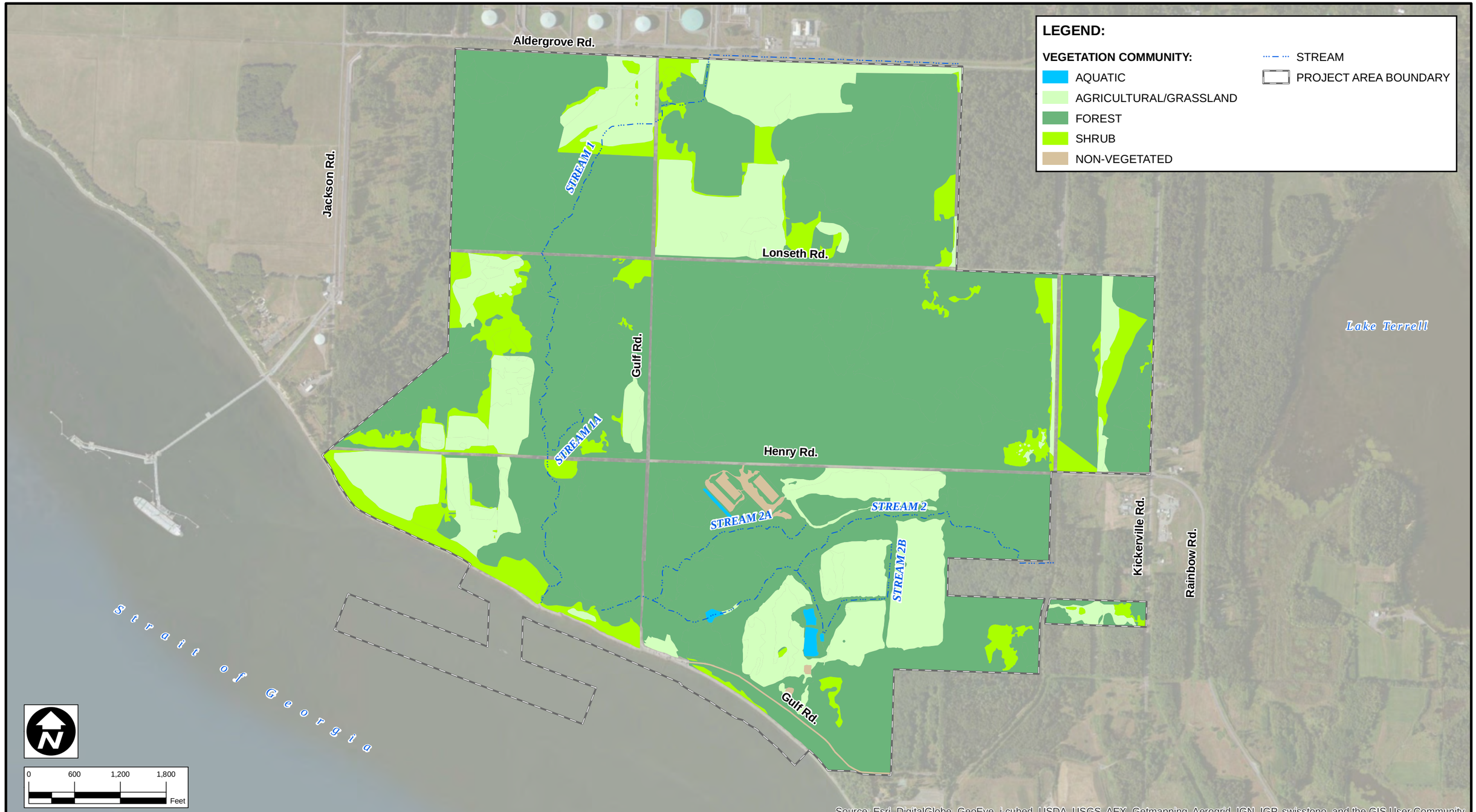

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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DWN BY:	SD
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DATUM:	NAD83
PROJECTION:	WA SP North, Ft.
SCALE:	1 inch = 1,200 feet

PROJECT: WILDLIFE BASELINE INVENTORY REPORT

TITLE: VEGETATION HABITAT UNITS

DATE:	APRIL 2013
PROJECT NO.:	091515338C-04-12
REV. NO.:	-
FIGURE NO.:	FIGURE 6

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-04-12 - Parcel 15 Rare Plant Survey\Wildlife_Baseline_Inventory_Report\Figure 6 - Vegetation Habitat Units.mxd

2.5.1 Forest Habitat

This habitat type covers approximately 1,060 acres (70.7 percent) of the study area and is relatively homogeneous. It is primarily second growth forest and composed of an overstory of red alder (*Alnus rubra*) and black cottonwood (*Populus balsamifera*) trees with a few western red cedar (*Thuja plicata*), western hemlock (*Tsuga heterophylla*), and Douglas-fir (*Pseudotsuga menziesii*) trees. Forested wetlands have a higher proportion of red alder and black cottonwood trees, whereas forested uplands include big leaf maple (*Acer macrophyllum*). Approximately 370 acres (34.9 percent) of the forested habitat are wetlands.

Very few snags (i.e., standing dead trees) or downed logs (i.e., coarse woody debris) larger than 8 inches in diameter that could be used by wildlife species are present in the forested areas. Downed logs larger than 8 inches in diameter typically show extensive decay, are fully settled on the ground, and most branches and bark are absent. Heartwood decomposition is present in these decaying, downed logs.

The understory shrub layer in the forest habitat is generally dense. Common understory shrub species in forested wetlands include salmonberry (*Rubus spectabilis*), twinberry (*Lonicera involucrata*), prickly currant (*Ribes lacustre*), and Nootka rose (*Rosa nutkana*), whereas common understory shrub species in forested uplands include vine maple (*Acer circinatum*), holly (*Ilex aquifolium*), snowberry (*Symphoricarpos albus),* Himalayan blackberry (*Rubus armeniacus*), and Indian plum (*Oemleria cerasiformis*).

Common herbaceous species in the forested wetland habitat include slough sedge (*Carex obnupta*), ladyfern (*Athyrium felix-femina*), and creeping buttercup (*Ranunculus repens*). Swordfern (*Polystichum munitum*) and false lily-of-the-valley (*Maianthemum dilatatum*) are common ground covers in the forested uplands.

Wetlands in the forested habitat include ephemeral pools that form in winter. During these wetter months, small depressions fill with water via precipitation and a seasonally-shallow groundwater table. Roughly one quarter of the pools last through the spring and have vegetation providing breeding habitat suitable for amphibians.

2.5.2 Shrub Habitat

Shrub habitat includes areas that have dense thickets of shrubs (less than 20 feet high) found along forest and road edges, areas of wetlands, and patches in abandoned fields. Shrub habitat covers approximately 116 widely dispersed acres, or 7.7 percent of the study area. The understory of the shrub habitat generally contains leaf litter, a few grasses or sedges, and/or bare soil. Common shrubs

in this habitat include Nootka rose, Himalayan blackberry, Douglas spirea (*Spiraea douglasii*), willow (*Salix* spp.), snowberry, and young red alder saplings.

2.5.3 Agricultural Fields/Grassland Habitats

Agricultural fields and grassland habitats are composed of managed areas, including hayfields, seasonally active pastures, mowed areas that contain pipelines or power lines, and a few areas of unmanaged abandoned fields. Figure 6 shows the location of agricultural/grassland habitats in the study area. This habitat covers approximately 278 acres, or 18.5 percent of the study area, most of which is either in large blocks (fields) or narrow linear features (utility corridors).

The hayfields are harvested annually and re-seeded when needed. In general, hayfield vegetation consists of a dense cover of mixed grass species, including red fescue (*Festuca rubra*), bentgrass (*Agrostis* spp.), sweet vernalgrass (*Anthoxanthum odoratum*), and common velvetgrass (*Holcus lanatus*). Pasture areas generally have more weeds than the hayfields and include other grass species, such as meadow foxtail (*Alopecurus pratensis*), quackgrass (*Elymus repens*), and orchard grass (*Dactylis glomerata*). Wetland areas within pastures and hayfields typically include many of the grasses above and also soft rush (*Juncus effusus*). In mowed areas that provide easements for pipelines and power lines, reed canarygrass (*Phalaris arundinacea*) is most common.

Abandoned fields have less uniform herbaceous vegetation, and generally include patches of shrubs or young saplings. Pastures, hayfields, mowed areas, and abandoned fields are generally bordered by forests or roads, and young saplings and dense shrubs generally grow along these boundaries.

2.5.4 Riparian Forest Habitat

A network of streams, roadside ditches, and other drainages are present in the study area. Forested riparian areas surround Streams 1, 1A, 2, 2A, and 2B for most of their lengths (Figure 6).

The riparian forest along Stream 1 has a higher degree of structural complexity than other forest locations of the study area. Trees of various ages are present, some of which are 32 inches in diameter at breast height. Large snags and coarse woody debris are also more common in the along Stream 1 than in other forests in the study area.

Overall, the plant community in the riparian forest habitat includes a mix of upland and wetland species. Trees present generally include red alder, black cottonwood, and big leaf maple, with a few western red cedar and Douglas fir. The understory in this habitat is generally dense, especially where light is able to penetrate through the canopy. The shrub layer consists primarily of salmonberry, red elderberry (*Sambucus racemosa*), twinberry, and Indian plum. The herbaceous layer may include

skunk cabbage (*Lysichiton americanus*), false lily-of-the-valley, lady fern, and sword fern, or may be entirely absent.

2.5.5 Freshwater Aquatic Habitat

Freshwater aquatic habitat includes areas that have ponded water year-round and the potential to support floating-rooted and free-floating aquatic plants. Freshwater aquatic habitat covers approximately 3.3 acres, or 0.2 percent of the study area. This habitat is manmade, and occurs as three stock ponds, an unmaintained stormwater retention facility, and an impoundment behind an earthen dam across Stream 2. Aquatic vegetation only occurs in the two largest of the three stock ponds, and includes yellow pond-lily (*Nuphar polysepala*), floating pondweed (*Potamogeton natans*), and common waterweed (*Elodea canadensis*).

Freshwater aquatic habitat likely supports breeding amphibians. Shallow water edges around the ponds include some woody debris and thin-stemmed plants that provide structure on which amphibians could lay their eggs.

2.5.6 Marine Shoreline

The southern boundary of the study area lies along the shoreline of the Strait of Georgia (Figure 2) and the shoreline is approximately 5,115 feet long. Steep bluffs border approximately 2,895 feet of the shoreline. Gulf Road and a parking area have been developed along 680 feet of the shoreline, and approximately 1,540 feet of shoreline is occupied by a coastal wetland, stream, and forested riparian complex. Coniferous and deciduous trees overhang the bluffs. Along the gravel beach are patches of low, herbaceous vegetation and abundant large woody debris above mean higher high water. Dune wildrye (*Elymus mollis*) is common on the gravely shoreline above mean higher high water.

The coastal wetland (shown on Figure 5 and in Appendix B, Photograph 12) is located west of the parking area and is separated from the beach by a gravel barrier. Large woody debris and vegetation are present and probably stabilize the barrier.

Hydrologic conditions in the coastal wetland are dynamic, with inflow/outflow rates, water depth, and salinity dependant on a combination of groundwater discharge through the gravel barrier, freshwater seeps, and surface flows from Streams 1 and 2. Strong storms and tidal surges also can lead to overwash of the barrier beach. At the north end of the wetland, a channel cuts through the barrier beach, providing the outlet to the Strait.

The coastal wetland comprises approximately 5.4 acres of shrub and emergent wetland habitat that segues into forested wetlands toward the north and western portions. Pockets of open water are intermixed amongst the emergent vegetation. Common shrubs in the coastal wetland include Douglas

spirea and Nootka rose. Emergent vegetation includes patches of common cattail (*Typha latifolia*) and seacoast bulrush (*Schoenoplectus robustus*), with more salt tolerant species located near the channel, including: fat hen saltbush (*Atriplex patula*), saltgrass (*Distichlis spicata*), pickleweed (*Salicornia virginica*), seaside arrowgrass (*Troglochin maritima*), and Pacific silverweed (*Argentina egedii*). This vegetation community is supported by the brackish conditions at this portion of the wetland.

The tidal area of the shoreline consists primarily of cobble and overlying gravels and coarse sand. Below mean low lower water (MLLW), the sediments transition to mixed cobble and gravel, becoming predominantly mixed with sand and silt. No intertidal mud flats exist along the marine shoreline of the study area.

3.0 WILDLIFE SURVEYS

Section 3 presents details on the wildlife surveys performed in the study area. Information is presented by wildlife group: reptiles, amphibians, raptors, waterbirds, bats, terrestrial mammals, and invertebrates. Each subsection details the methods and results of the surveys, along with a discussion of significant habitat, if needed.

3.1 Reptile Surveys

No targeted surveys for reptiles were performed, as the diversity of reptiles is anticipated to be limited within the study area; however, any reptiles observed were recorded as incidental sightings throughout the duration of all the specific wildlife surveys. No turtles have been observed in the ponds or elsewhere in the study area.

Two garter snakes were observed on April 13, 2012 (Table 3). One was observed along the margin of the coastal wetland near Location 5 (Figure 7), and another along the ditch near Location 2 at the north end of Gulf Road. Garter snakes were commonly encountered during wetland field delineation and are assumed to be common across the study area.

The three garter snake species in western Washington are similar in general appearance and require capture to confirm species identification by observing scale counts. Coloration and pattern indicated the two snakes observed were likely the common garter snake. However, this remains unconfirmed as all identification traits, especially scale counts, in addition to color and pattern, must be examined to correctly identify a garter snake to species.

Table 3 Reptiles Observed in the Study Area

Survey Location	Common Name	Scientific Name	Date	Number	Age Class	Comments
2	garter snake	*Thamnophis* sp.	13-Apr-12	1	Adult	Roadside ditch
5	garter snake	*Thamnophis* sp.	13-Apr-12	1	Adult	Coastal wetland

3.2 Amphibian Surveys

3.2.1 Introduction

The amphibian survey focused on sampling habitat for the priority amphibian species with potential to be in the area. In addition, amphibian surveys were conducted for other amphibians, such as salamanders.

As mentioned in Section 1.3, general background research and the PHS database (WDFW 2012b) indicated that the Oregon spotted frog (*Rana pretiosa*) and the Western toad (*Anaxyrus boreas*) could

potentially occur in the study area, based on their life cycle requirements and the presence of suitable habitat in the study area. The Western toad is a candidate species in the state and a species of concern under the ESA. This species would potentially use open freshwater areas for breeding and the surrounding uplands for foraging. The Oregon spotted frog is considered endangered in the state and is a candidate species under the ESA. This frog, if present, would use open water areas for breeding and foraging. More details regarding the life cycle and habitat requirements of the Western toad is provided in Appendix C.

The objectives of the amphibian surveys were to:

- Determine the presence of amphibian habitat suitable for the amphibians, specifically Western toad and the Oregon spotted frog, within the study area;
- Sample potential amphibian habitats and search for evidence and presence of the Western toad and Oregon spotted frog; and
- Sample potential amphibian habitats to determine a general census of the breath of amphibian species present.

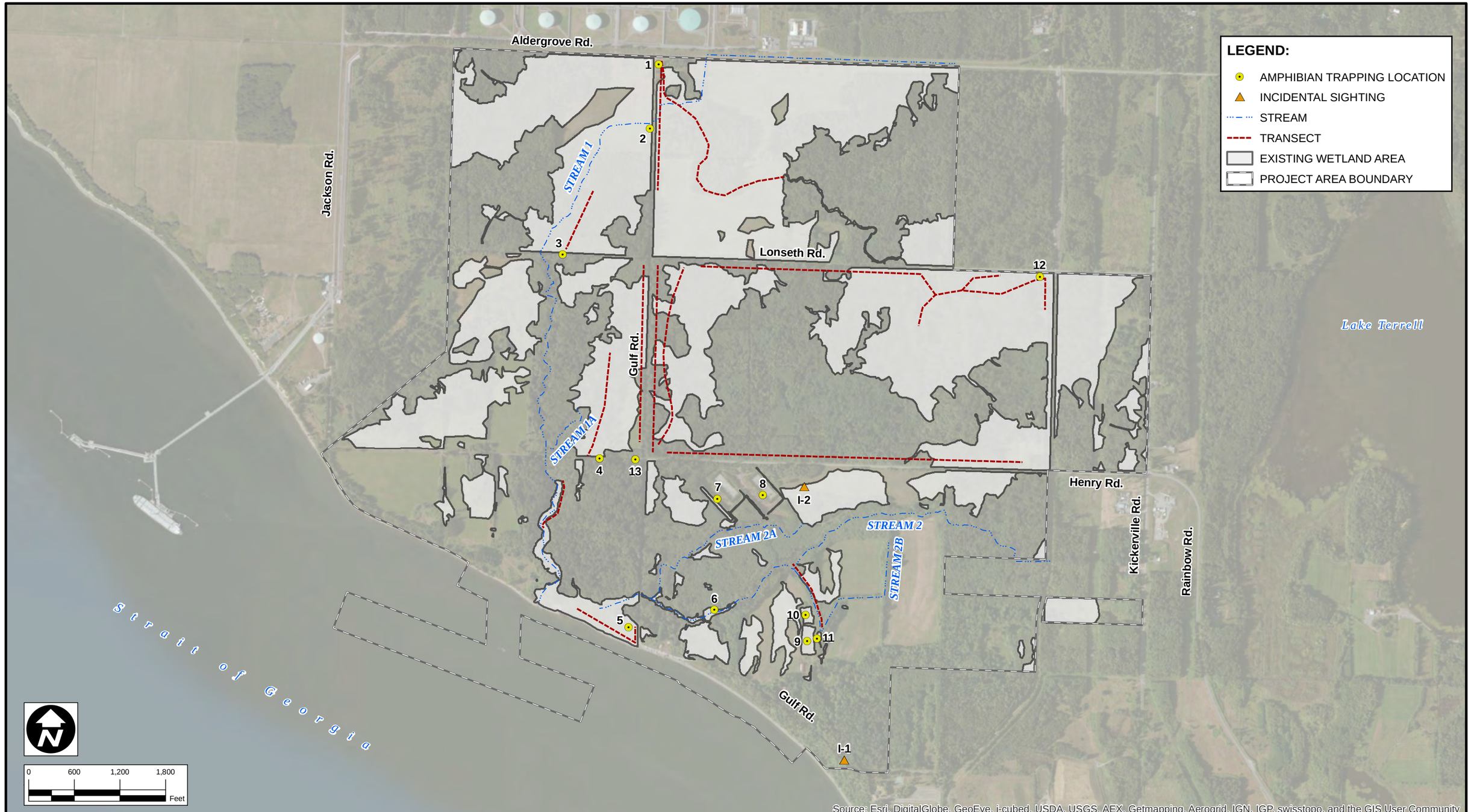
3.2.2 Methods

Potential amphibian habitat was determined by aerial photograph interpretation, as well as knowledge of the site. Habitats surveyed were chosen based on an assessment of the ability of the habitat to support foraging and breeding habits of the Western toad, Oregon spotted frog, and other amphibians. Potential habitat included the permanent open water of four fresh water ponds. Other areas with seasonally ponded water and suitable vegetation included forested and shrub wetlands, streams, and some roadside ditches.

The amphibian surveys included four different observed/not detected survey methods:

- Auditory surveys,
- Road surveys,
- Visual encounter surveys, and
- Trapping.

Survey methods for a particular area were applied based on the suitability of the method for the habitat present. For example, the large forested wetlands were surveyed using auditory and visual encounter survey methods, whereas the permanent freshwater ponds were surveyed using auditory, visual encounters, and trapping. To comprehensively cover the entire site, driving road surveys were used.



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DWN BY:	SD
CHK'D BY:	JG
DATUM:	NAD83
PROJECTION:	WA SP North, Ft.
SCALE:	1 inch = 1,200 feet

PROJECT: WILDLIFE BASELINE INVENTORY REPORT

TITLE: AMPHIBIAN SURVEY LOCATIONS

DATE:	APRIL 2013
PROJECT NO.:	091515338C-04-12
REV. NO.:	-
FIGURE NO.:	FIGURE 7

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-04-12 - Parcel 15 Rare Plant Survey\Wildlife_Baseline_Inventory_Report\Figure 7 - Amphibian Survey Locations.mxd

3.2.2.1 Auditory Surveys

Auditory surveys included listening for calling species of male frogs and toads. Methods followed those of the *North American Amphibian Monitoring Program* (USGS 2013). Auditory surveys were performed at listening sites along roads around dusk, beginning approximately one half hour before dusk, and continuing for 2 to 3 hours, or until midnight. Auditory surveys were performed on April 26 and 27, 2012.

Listening sites were selected using relevant project mapping (e.g., aerial photography, mapped locations of wetlands, streams and vegetation communities) to identify potential habitat locations, such as wetlands, ditches, and streams. The surveys were carried out within 24 hours of the most recent rainfall event, and the wind speed was less than Force 3 on the Beaufort scale so that calls were not masked. Listening occurred at each listening site for 3 to 5 minutes, and for up to 2 minutes longer if noise from traffic, rain, or wind interfered with the ability to hear calls.

3.2.2.2 Road Surveys

Road surveys involved spotlighting amphibians on or alongside the roadway from a slow-moving vehicle. Surveys commenced just after dark. Vehicles were driven at approximately 10 to 15 mph using low headlight beams, flashlights, and headlamps to detect amphibians crossing roads. Because there is very little traffic on the study area roads, frequent stops were possible. Road surveys were completed on April 4 and 14, 2012.

3.2.2.3 Visual Encounter Surveys

Visual encounter surveys were used in habitats and other areas that had a lower potential for breeding amphibians, such as forested wetlands with ponded water. Searches were completed during the day on April 27, 2012, and in combination with the walking raptor nest surveys (described in Section 3.3.3.2) on April 13 and May 11. Approximate locations of transects walked are shown on Figure 7 (April 27) and on Figure 9 in Section 3.3 (April 3 and May 11).

Visual encounter surveys involved searching areas by foot (Ministry of Environment RIC 1998a). Efforts included turning over downed woody debris or dismantling decaying woody debris and visually inspecting the habitat. Visual encounter surveys also involved searching aquatic habitats for egg masses, tadpoles, and adults, including shallow margins of the ponds, slow-moving or ponded areas in streams, and roadside ditches with vegetation. When amphibians were encountered, the species, number, and age class were documented.

Standing water areas that had high potential for breeding amphibians were surveyed by wading through the edges of ponds and through areas of standing water using dipnets to capture any

amphibians encountered (Ministry of Environment RIC 1998a). These surveys were done generally along curvilinear transects that encircled the entire pond.

Amphibians seen were recorded along with habitat information. Visual observations of egg masses and larvae were recorded. Observed adult amphibians were captured for identification. Captured individuals were identified by visual characteristics and immediately released in the same vicinity. Surveyors' hands were free of potential toxics (for example, insect repellent) before capturing amphibians.

3.2.2.4 Amphibian Trapping

The majority of pond-dwelling amphibians are most conspicuous at breeding ponds, and surveys conducted at breeding sites are therefore especially effective (Scott and Woodward 1994). The purpose of trapping was to capture and identify larvae and adults, and then release them in the same location. Minnow trapping is particularly effective in the spring when amphibian spawning is at its height, and is effective for identifying larval, neotenic[1], and adult aquatic salamanders and frogs. Trapping surveys were timed to coincide with the breeding season in the early spring.

For the trapping survey, 13 trapping locations were selected based on identified likely breeding and or foraging habitat. Trapping for amphibians occurred in roadside ditches and streams with ponded water (Locations 1, 2, 3, 4, 12, and 13), the ponds (Locations 6, 9, 10, and 11), coastal wetland (Location 5) and abandoned stormwater facilities (Locations 7 and 8) (Figure 7). Minnow traps were left in place overnight for an approximately 18 to 24-hour sample period. Trapping occurred overnight on April 12–13 and April 26–27, 2012.

Trapping locations were recorded using a Garmin® GPSmap 62s hand-held global positioning system. Trapped amphibians were identified and released at the same location.

3.2.3 Results

Table 4 summarizes the species and numbers of amphibians observed during the investigation, including incidental encounters. As anticipated based on habitat characteristics, many individual adult amphibians were identified in the larger two of the four ponds (Locations 9 and 10; Figure 7), where rough skinned newts (*Taricha granulosa*) were abundant. No rough skinned newt egg masses were identified in the study area during this survey. The smaller two ponds did not have as many individuals, with two adults identified in Location 11 and no individuals identified in Location 6. The abandoned stormwater facilities area (Locations 7 and 8) had abundant northwestern salamander (*Ambystoma gracile*) eggs, one of the two species of salamander identified in the study area. One

1 Neotenic: Attaining reproductive maturity while in the larval state by delayed somatic development. The larva fails to metamorphose into an adult form, resulting in a permanent, sexually mature larva (neotene).

adult long-toed salamander (*Ambystoma macrodactylum*) was identified at the northern end of the study area in a roadside ditch.

Two species of frog were identified in the study area, with northern red-legged frogs (*Rana aurora*) near the ponds, and Pacific tree frogs more dispersed. During auditory surveys, Pacific tree frogs were heard along ditch margins, in forested areas, and in the coastal wetland. No other calls were heard. Eggs of three species: red-legged frog, Pacific tree frog (*Pseudacris regilla*), and Northwestern salamander, were recorded in wetland areas and roadside ditches. No amphibians were observed on the roadways during the driving road surveys.

Table 4 Amphibians Recorded in the Study Area

Survey Location	Common Name	Scientific Name	Date	Number	Age Class	Comments
1	Long-toed Salamander	*Ambystoma macrodactylum*	April 13, 2012	1	Adult	Trapped within a roadside ditch with ponding water.
1	Northwestern Salamander	*Ambystoma gracile*	April 13, 2012	2	Adults	Trapped within a roadside ditch.
1	Northwestern Salamander	*Ambystoma gracile*	April 13, 2012	>300 eggs	Eggs	On branch in roadside ditch.
1	Red-legged Frog	*Rana aurora*	April 13, 2012	1	Adult	Minnow trap.
3	Red-legged Frog	*Rana aurora*	April 13, 2012	1	Adult	Minnow trap.
3	Pacific Tree Frog	*Pseudacris regilla*	April 13, 2012	1	Adult	Roadside ditch.
3	Red-legged Frog	*Rana aurora*	April 13, 2012	3	Adults	Roadside ditch.
4	Red-legged Frog	*Rana aurora*	April 13, 2012	2	Adults	Roadside ditch.
5	Red-legged Frog	*Rana aurora*	April 12, 2012	>50 egg	Eggs	On vegetation in coastal wetland.
5	Pacific Tree Frog	*Pseudacris regilla*	April 12, 2012	>50 eggs	Eggs	On vegetation in coastal wetland.
5	Pacific Tree Frog	*Pseudacris regilla*	April 12, 2012	1	Adult	Coastal wetland.
6	Rough-skinned Newts	*Taricha granulosa*	April 27, 2012	5	Adults	Minnow trap.
6	Northwestern Salamander	*Ambystoma gracile*	April 27, 2012	1	Adults	Minnow trap.
7	Northwestern Salamander	*Ambystoma gracile*	April 27, 2012	>250 eggs	Eggs	Abandoned stormwater facilities area.

Table 4 Amphibians Recorded in the Study Area (Continued)

Survey Location	Common Name	Scientific Name	Date	Number	Age Class	Comments
8	Northwestern Salamander	*Ambystoma gracile*	April 27, 2012	>250 eggs	Eggs	Abandoned stormwater facilities area.
9	Red-legged Frog	*Rana aurora*	April 27, 2012	>100 eggs	Eggs	Pond.
9	Red-legged Frog	*Rana aurora*	April 27, 2012	>40 eggs	Eggs	Pond.
9	Rough-skinned Newts	*Taricha granulosa*	April 27, 2012	4	Adults	Pond.
10	Rough-skinned Newts	*Taricha granulosa*	April 27, 2012	85	Adults	Minnow trap.
10	Northwestern Salamander	*Ambystoma gracile*	April 27, 2012	1	Adults	Minnow trap.
11	Rough-skinned Newts	*Taricha granulosa*	April 27, 2012	5	Adults	Minnow trap.
11	Northwestern Salamander	*Ambystoma gracile*	April 27, 2012	1	Adults	Minnow trap.
12	Red-legged Frog	*Rana aurora*	April 13, 2012	1	Adult	Roadside ditch.
13	Red-legged Frog	*Rana aurora*	April 13, 2012	4	Adults	Minnow trap.
I-1	Western Toad	*Anaxyrus boreas*	April 13, 2012	1	Adult	Incidental; on forest floor.
I-2	Western Toad	*Anaxyrus boreas*	August 16, 2012	1	Adult	Incidental; in field near abandoned stormwater facilities area.
Incidental	Pacific Tree Frog	*Pseudacris regilla*	April 27, 2012	Approxi-mately 5	Adult	Various locations visually observed and heard within forested wetlands.

3.2.4 Incidental Sightings

Locations of two incidental sightings of western toad are shown on Figure 7. One sighting occurred during a vegetation survey in the vicinity of the abandoned industrial area on August 16, 2011, and the second occurred in an upland forest setting on April 13, 2012 during a raptor nest survey.

3.2.5 Significant Amphibian Habitat

As stated earlier, based on their known distribution, life cycle requirements, and the habitats present on and adjacent to the study area, the Oregon spotted frog and the Western toad are the two priority amphibian species that could potentially breed and/or forage on or in association with the site.

No evidence was found supporting the presence of Oregon spotted frog in the study area.

Two Western toads were encountered incidentally during surveys for other species. These were identified by a project botanist working on a rare plant survey. No collection or photographs were made. Western toad breeding habitat is usually permanent fresh water bodies, but ephemeral water bodies have also been known to be used. Western toads are known to disperse up to 1,000 feet from breeding sites, and are reported to return to the same breeding locations. After breeding has taken place, adults disperse into forested areas and shrub lands. Western toads appear to favor dense shrub cover where they are protected from desiccation and predation. Edges of forests may be favored over the closed canopy areas. The toads do not appear to depend on mature or old-growth forest and are frequently found within cut-over or cleared areas (Wind and Dupuis 2002). No breeding sites for Western toads were identified in the study area during this survey; however, foraging habitats appear to be present.

During 2013, the Whatcom County Amphibian Monitoring Program identified two Western toad breeding sites in the Cascade foothills, but none close to the study area. The program did not monitor the Whatcom Wildlife Area (adjacent to the study area), which could potentially provide a breeding location due to extensive open water and vegetation.

General concern about this species is due to rapid and unexplained declines in the western U.S. and British Columbia. Local declines have been documented in Washington. However, the species remains locally common in many areas.

3.3 Raptor Surveys

3.3.1 Introduction

Raptors, also known as birds of prey, are a group of birds composed of the orders *Falconiformes* (diurnal birds of prey) and *Strigiformes* (owls, nocturnal birds of prey). Due to differences in their behavior, raptors are split into diurnal and nocturnal groups for surveying purposes. Baseline surveys were designed to investigate the presence of diurnal and nocturnal raptors within the study area. Specific objectives were to determine the presence and distribution of nocturnal and diurnal raptor species and assess the habitat.

Although all diurnal raptors are active during the day, they vary in detectability. Some, like red-tailed hawks (*Buteo jamaicensis*), are readily observed if soaring over open fields. Others, notably the *Accipiters*, like the Cooper's hawk (*Accipiter cooperi*), tend to be more difficult to reliably detect, due to their preference for vegetation cover. Inconspicuous diurnal raptors were targeted for inventory purposes using call playback surveys. The majority of owls are nocturnal; therefore, detection surveys are conducted between dusk and dawn.

During the breeding season, many birds use species-specific calls and songs to establish and defend territories, attract mates, and communicate with their young. Using pre-recorded calls or call playbacks to simulate the presence of an "intruder" in an already claimed territory elicits a defensive response in the target species. The response of the bird, whether it is a close approach, accompanied by an aggressive behavior, or a distant vocalization, allows the observer to record the presence of the species. Call playbacks are used for inconspicuous, scarce (e.g., northern goshawk) or nocturnal (e.g., barred owl) species known to respond to calls during the breeding season.

3.3.2 Methods

Two methods were used to identify diurnal and nocturnal raptors in the study area: call playback station surveys and transect surveys. Both of these methods were used for diurnal and nocturnal raptors. Each method is described below.

3.3.2.1 Call Playback Station Surveys

The survey effort focused on forests within the study area, as these areas are more likely to support nesting habitat for raptors. Broadcast equipment included a megaphone linked to a digital voice recorder via a mono cable and a digital game caller. Recordings of adult alarm calls were used for surveys. Present/not detected surveys were completed once in April and May at night between 9:00 pm and 11:00 pm.

Surveys involved the observer playing a broadcast and listening for a response during the interval of silence between each broadcast. Additionally, a wait of 5 minutes after a broadcast round was completed to record any potential response before moving on. At each station the broadcasts consisted of 4 x 30-second recordings with 30-second listening interval following each broadcast. Thus, it took a total of approximately 9 minutes to complete a call playback survey for each species at a station.

If a response from a raptor was elicited, the time, species, sex, age, and type of response (visual/aural) was recorded. In addition, the initial distance and compass bearing to the bird from the call playback station was estimated, and direction of departure (if a bird is observed), as these provide clues to the proximity and direction of a possible nest. Responses of other hawks, owls, and mimics (e.g., jays) to a broadcast also were recorded.

Broadcasts for the nocturnal raptor calls were performed in the following order:

- Northern pygmy owl (*Glaucidium gnoma*);
- Northern saw-whet owl (*Aegolius acadicus*);

- Western screech owl (*Megascops kennicottii kennicottii*);
- Barred owl (*Strix varia*); and
- Great horned owl (*Bubo virginianus*).

3.3.2.2 Transect Surveys

The presence or absence of any active or existing abandoned raptor nests were noted by walking transects in forested areas on April 13 and May 11, 2012. Any cavity trees and/or wildlife trees with the potential to serve as roosting sites were investigated for diurnal and nocturnal bird presence and/or use. Transects spaced approximately 30 to 150 feet apart were walked so that the overlapping canopy of the previous transect was visible from each transect walked. The transect surveys were performed to collect information such as direct nest identification, fecal wash, prey remains, feathers, or any other signs indicating that raptors may inhabit the area. Nests incidentally detected during other wildlife field inventories also were recorded. Approximate locations of the transects are shown on Figure 9 (Raptor Transects and Nests) in the results section.

3.3.3 Results

Two raptor species responded to call playbacks, and three raptor nests and one nest cavity tree were identified in the study area during transect surveys (Table 5). Bald eagles, which are considered to be priority species in Washington, were identified during the surveys. No other priority raptor species were identified.

Table 5 Raptors Observed in the Study Area

Common Name	Scientific Name	Number	Notes
Bald eagle	*Haliaeetus leucocephalus*	Varied: 2 to 6	Nest and Adults
Cooper's hawk	*Accipiter cooperi*	1	Call response, Nest
Western screech-owl	*Megascops kennicottii kennicottii*	2	Call response, Nest cavity (bird not seen)
Great horned owl	*Bubo virginianus*	?	Nest and possible Adult seen (bird not identified)
Barn owl	*Tyto alba*	1	Nest in nest box in barn and Adult seen

On April 14, 2012, a single Cooper's hawk (*Accipiter cooperi*) responded to call playbacks at survey station 1 (Figure 8). It is unknown whether this is a nesting individual in the area. A pair of Western screech-owls responded to the nocturnal calls broadcasted from survey station 11 (Figure 8). No other diurnal or nocturnal raptors were identified during the call playback surveys.

Three raptor nests were observed and identified via walking transects on April 13 and May 11, 2012. The nests included a possible Great horned owl (*Bubo virginianus*) nest, Cooper's hawk nest, and confirmed bald eagle nest (Figure 9). A possible Great horned owl nest was identified in the top of a snag along Stream 2; an owl (identification unconfirmed) flew out of the snag when it was approached. A bald eagle (*Haliaeetus leucocephalus*) nest was observed in the Stream 1 riparian area near the shoreline. This nest is the same as that documented in the Avian Baseline Inventory Report (AMEC 2012a).

A single potential Western screech-owl (*Megascops kennicottii kennicottii*) nest cavity was identified in a tree along the northern portion of Stream 1 (Figure 9) during the transect survey. The cavity tree was investigated after an owl was recorded calling from this location during the April 14, 2012 call survey. However, no Western screech-owl was visually observed.

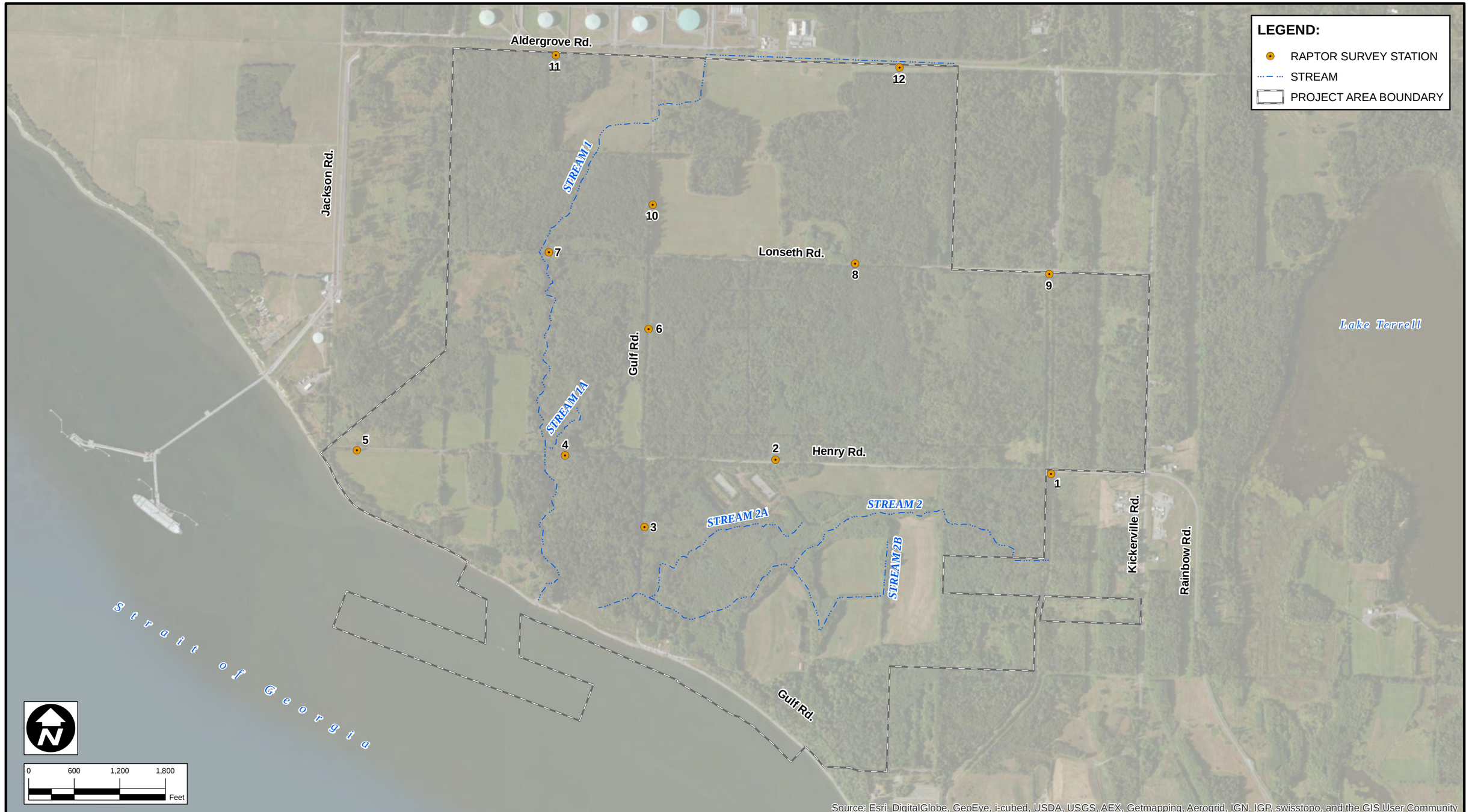
In addition to these three natural nests, an owl nest box is located in the barn and on one occasion a female barn owl (*Tyto alba*) was observed leaving the nest box.

Bald eagles have been observed year-round within the study area, which is consistent with previous reports (Shapiro 1994, WDNR 2010). Bald eagles were observed flying overhead or perched on tall trees along the shoreline bluffs, and occasionally on other tall trees in forested areas of the site. Some of the large trees along the bluffs appear to provide suitable nesting habitat. More details regarding the life cycle and habitat requirements of the bald eagle is provided in Appendix C.

3.3.4 Significant Raptor Habitat

Forest and riparian forest habitats are generally considered important for both diurnal and nocturnal raptor nesting, as these areas provide nesting and roosting opportunities. The shrub and agricultural fields/grassland habitats provide habitats for raptor prey such as songbirds, insects, amphibians, and small mammals.

Larger forest patches associated with the riparian corridors of Streams 1 and 2 may be considered suitable for raptor nesting. These areas have standing dead trees (snags) and decaying live trees. The shrub and grass habitat in the study area provides good habitat for foraging for some raptor species.



Pacific International Terminals
A Carrix Enterprise

CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.

AMEC
11810 North Creek Parkway N
Bothell, WA 98011

amec

DWN BY:	SD
CHK'D BY:	JG
DATUM:	NAD83
PROJECTION:	WA SP North, Ft.
SCALE:	1 inch = 1,200 feet

PROJECT: WILDLIFE BASELINE INVENTORY REPORT

TITLE: RAPTOR SURVEY STATIONS

DATE:	APRIL 2013
PROJECT NO.:	091515338C-04-12
REV. NO.:	-
FIGURE NO.:	FIGURE 8

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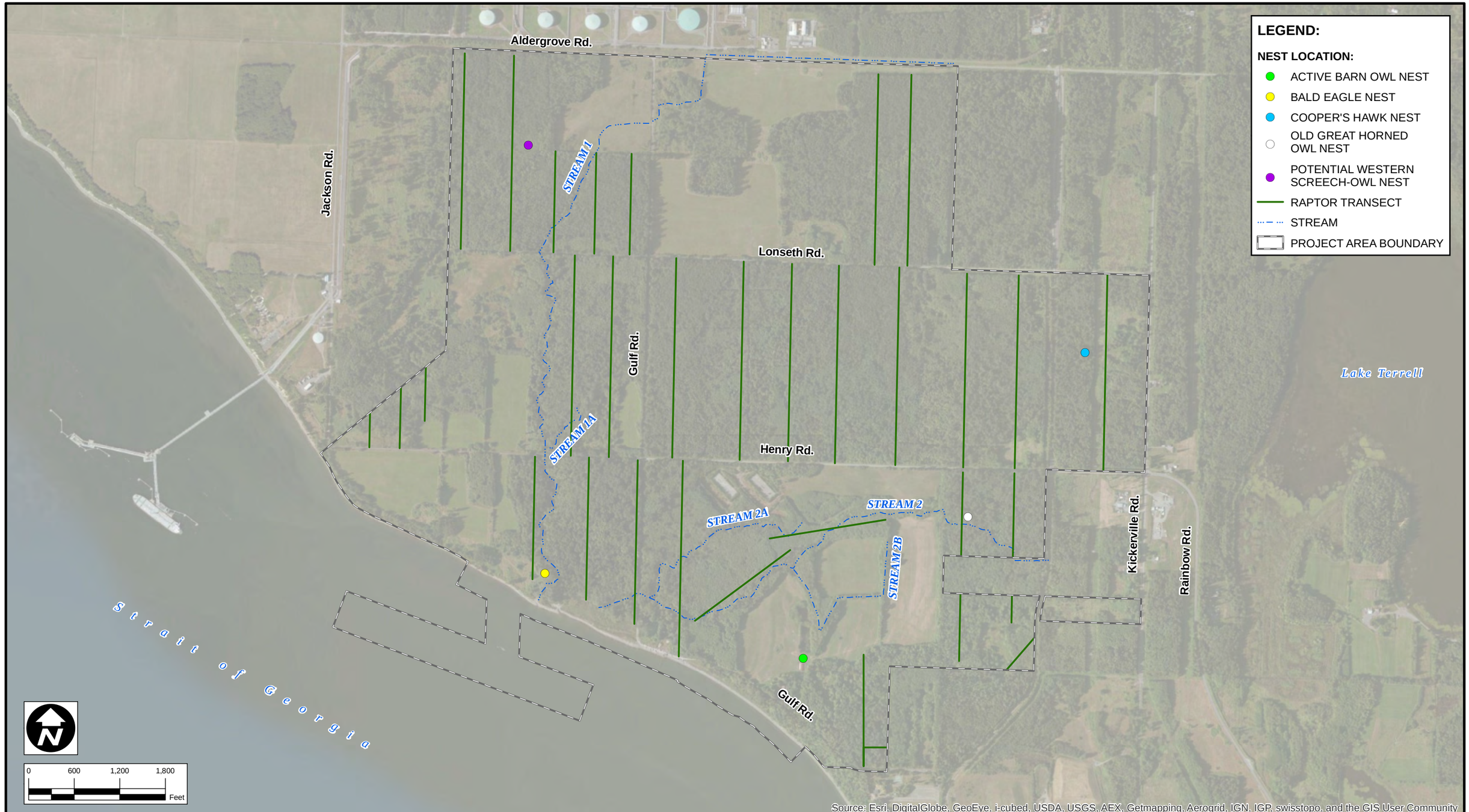

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PROJECT: WILDLIFE BASELINE INVENTORY REPORT

TITLE: RAPTOR TRANSECTS AND NESTS

DATE:	APRIL 2013
PROJECT NO.:	091515338C-04-12
REV. NO.:	-
FIGURE NO.:	FIGURE 9

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-04-12 - Parcel 15 Rare Plant Survey\Wildlife_Baseline_Inventory_Report\Figure 9 - Raptor Transects and Nests.mxd

Priority nesting and roosting areas for bald eagles are considered to exist along the shoreline and riparian areas of the study area. No other priority raptor species were identified or are believed to nest at the site. While peregrine falcons (a priority raptor species) have been seen previously in the vicinity, none were observed during this study. The shoreline of the study area is part of the Lummi Flats Peregrine Falcon Wintering Area (WDFW 2011) and is the most likely location to contain this bird regularly throughout the year as a migrant or while feeding.

3.4 Waterbird Surveys

3.4.1 Introduction

"Waterbirds" is an umbrella term used to encompass species that use shorelines of water bodies and wetlands for foraging, breeding, or staging during the year. They include species such as gulls, dabbling and diving ducks, loons, geese, swans, cormorants, herons, and shorebirds such as sandpipers and plovers. The objectives of the waterbird surveys were to:

- Investigate the composition of the waterbird community using the shoreline and nearshore of the study area throughout the year; and
- Identify any priority species or habitats present.

3.4.2 Methods

The study area for waterbirds is shown on Figure 10 and includes the shoreline and nearshore up to approximately 1,500 feet offshore from the Alcoa Intalco facility in the southeast to Cherry Point and the BP dock in the northwest. Waterbird numbers and species were recorded along the nearshore from approximately daylight to 11:00 am during each field visit. During each assessment, groups or individual waterbirds were recorded as either loafing (resting) or foraging (diving for food). Range-finding binoculars were used to assess the approximate distance from the shoreline. A spotting scope was used to help clearly identify birds. Species recorded during the field surveys were separated into foraging guilds (groups of birds that forage in the same way or on the same food).

3.4.3 Results

From April 12, 2012 to March 15, 2013, species composition and number of waterbirds in the waterbird study area were counted approximately once every two weeks (Table 6). Surveys were discontinued during the summer from June 9 to August 23, 2012 because the shoreline contained a very small number of individuals, as many had left the area for their breeding grounds.

Table 6 Waterbird Survey Dates

12 April 2012	26 October 2012
26 April 2012	09 November 2012
11 May 2012	30 November 2012
25 May 2012	31 December 2012
08 June 2012	18 January 2013
24 August 2012	15 February 2013
07 September 2012	01 March 2013
21 September 2012	15 March 2013
01 October 2012	29 March 2013

3.4.3.1 Species present

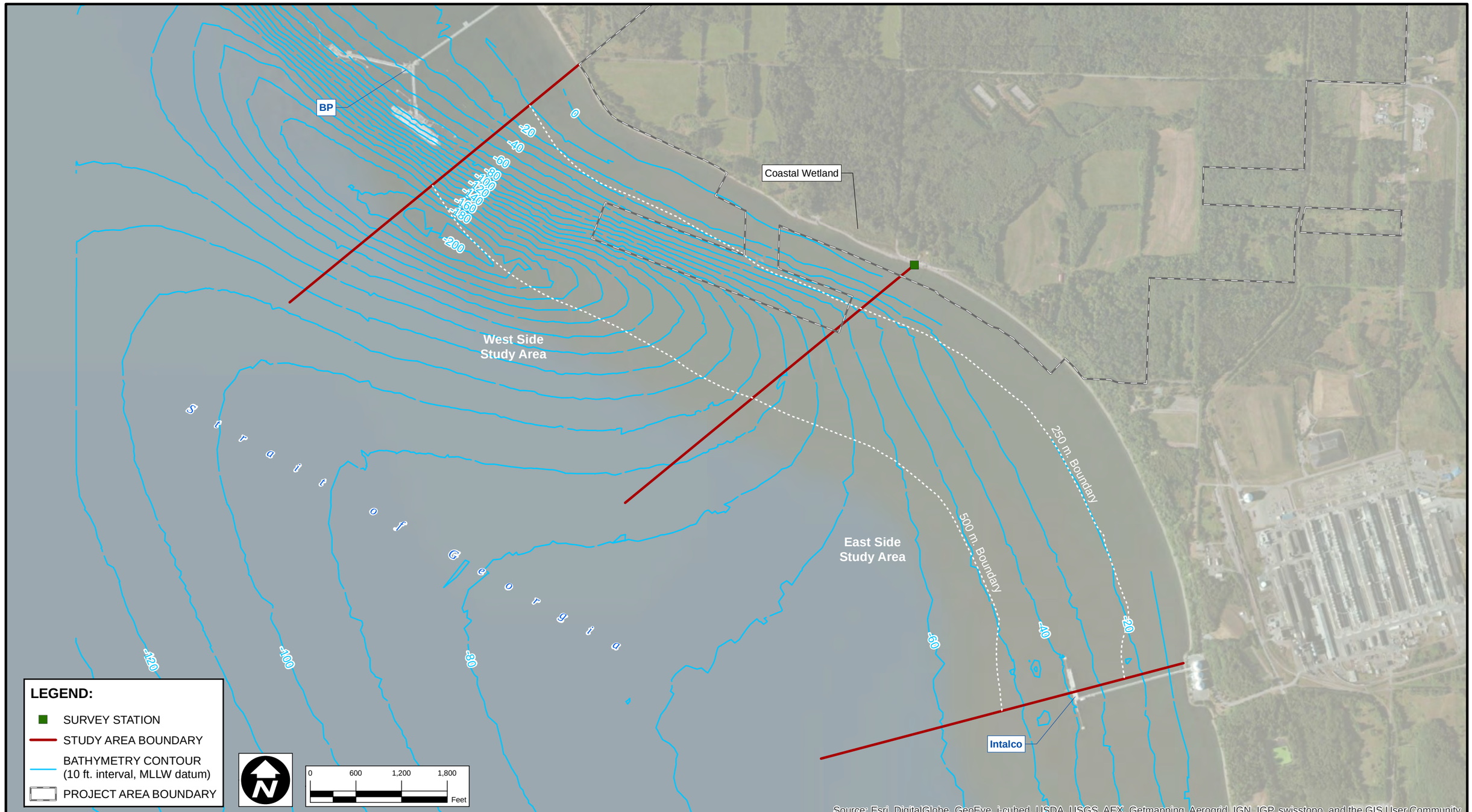
A total of 50 bird species were recorded in the study area during the field surveys (Table 7). None of these birds were confirmed as breeding or are considered likely to be breeders on the study site. Of the 50 species recorded throughout the year, 19 species were recorded on less than five survey dates and of these, many were recorded only once.

3.4.3.2 Priority Species

As stated earlier, several species of waterbirds are considered to be priority species (See Table 1) and would potentially use the study area for foraging and resting. None are expected to breed in the study area. Table 8 lists waterbird species identified in the study area.

Table 8 identifies priority waterbird species that were recorded in the study area during the 2012 to 2013 surveys. One individual Brant's cormorant and one individual Western grebe were observed, and a snow goose was detected as a fly-over. The marbled murrelet, a federally-listed species, was identified during the field surveys. It is federally listed as Threatened under the ESA and as such, any occurrence in suitable habitat is considered significant.

Sections 3.4.2.1 through 3.4.2.7 discusses priority species identified during the 2012 to 2013 survey period.



SOURCE: 154199-A100-42S01.dwg (Rev. J), Ausenco Sandwell, 12/24/2010.

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11810 North Creek Parkway N
Bothell, WA 98011

amec

DWN BY:	SD
CHK'D BY:	JG
DATUM:	NAD83
PROJECTION:	WA SP North, Ft.
SCALE:	1 inch = 1,200 feet

PROJECT: WILDLIFE BASELINE INVENTORY REPORT

TITLE: WATERBIRD SURVEY STUDY AREA

DATE:	APRIL 2013
PROJECT NO.:	091515338C-04-12
REV. NO.:	-
FIGURE NO.:	FIGURE 10

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Table 7 Waterbirds Observed in the Study Area

Common Name[1]	Scientific Name	Repeated Sightings	Sighted on fewer than 5 dates
American coot	*Fulica americana*	X	—
American widgeon	*Anas americana*	X	—
Barrow's goldeneye	*Bucephala islandica*	X	—
black oystercatcher	*Haematopus bachmani*	—	X
black scoter	*Melanitta americana*	X	—
Bonaparte's gull	*Larus philadelphia*	X	—
Brandt's cormorant	*Phalacrocorax penicillatus*	—	X
bufflehead	*Bucephala albeola*	X	—
California gull	*Larus californicus*	X	—
Canada goose	*Branta canadensis*	X	—
Caspian tern	*Hydroprogne caspia*	X	—
common goldeneye	*Bucephala clangula*	X	—
common loon	*Gavia immer*	X	—
common merganser	*Mergus merganser*	X	—
common murre	*Uria aalge*	—	X
common snipe	*Gallinago gallinago*	—	X
double-crested cormorant	*Phalacrocorax auritus*	X	—
dunlin	*Calidris alpine*	—	X
eared grebe	*Podiceps nigricollis*	X	—
Eurasian widgeon	*Anas penelope*	X	—
gadwall	*Anas strepera*	X	—
glaucous-winged gull	*Larus glaucescens*	X	—
great blue heron	*Ardea herodias*	X	—
greater scaup	*Aythya marila*	X	—
greater yellowlegs	*Tringa melanoleuca*	—	X
harlequin duck	*Histrionicus histrionicus*	X	—
herring gull	*Larus argentatus*	—	X
horned grebe	*Podiceps auritus*	X	—
killdeer	*Charadrius vociferus*	—	X
least sandpiper	*Calidris minutilla*	—	X
long-tailed duck	*Clangula hyemalis*	—	X
mallard	*Anas platyrhynchos*	X	—
marbled murrelet	*Brachyramphus marmoratus*	—	X
mew gull	*Larus canus*	X	—
northern pintail	*Anas acuta*	—	X
Pacific loon	*Gavia pacifica*	—	X
pelagic cormorant	*Phalacrocorax pelagicus*	X	—

Table 8 Waterbirds Observed in the Study Area (Continued)

Common Name[1]	Scientific Name	Repeated Sightings	Sighted on fewer than 5 dates
pied-billed grebe	*Podilymbus podiceps*	X	—
pigeon guillemot	*Cepphus columba*	—	X
red-breasted merganser	*Mergus serrator*	X	—
red-necked grebe	*Podiceps grisegena*	X	—
red-throated loon	*Gavia stellata*	—	X
surf scoter	*Melanitta perspicillata*	X	—
Thayer's gull	*Larus thayeri*	X	—
rhinoceros auklet	*Cerorhinca monocerata*	—	X
Western grebe	*Aechmophorus occidentalis*	—	X
Western gull	*Larus occidentalis*	—	X
Western sandpiper	*Calidris mauri*	X	—
white- winged scoter	*Melanitta delandi*	X	—
TOTALS		**31**	**19**

[1] Bolded common names indicate priority species or species that are members of priority aggregations.

3.4.3.3 Marbled Murrelets

The marbled murrelet (*Brachyramphus marmoratus*) is a small seabird that nests in the coastal, old-growth forests of the Pacific Northwest, and flies as far as 45 miles inland to nest in older coniferous forest, where they exhibit high fidelity to their nesting areas (Marks and Bishop 1999). Marbled murrelets feed relatively close to shore on small forage fish and invertebrates, and are threatened by habitat loss and fragmentation, as well as by other human disturbance such as gill nets, overfishing, oil spills, and other pollution (WDFW 2005). Marbled murrelets forage within 2 to 5 kilometers of shore in coastal and nearshore waters, and within the top 50 meters of the water.

Marbled murrelets have been consistently recorded along the shorelines near the site during previous studies (Shapiro 1994, WDNR 2010). No suitable breeding habitat is present on the project site or in the vicinity, as habitat structure is lacking. The nearest known breeding area is probably that located on Canyon Creek, approximately 37 miles from Cherry Point (WDNR 2010).

A total of seven marbled murrelets more than 1,500 feet from the shoreline in deep water were observed over three site visits:

- Two on November 9, 2012,
- One on December 31, 2012,
- Three on January 18, 2013, and

- One on February 15, 2013.

All individuals were resting in the water during the non-breeding season.

The shoreline and adjacent marine waters is considered a priority area for marbled murrelet.

Table 9 Priority Waterbird Species Observed in Study Area

Common Name	Scientific Name	Priority Area present on Site?	Notes
Barrow's goldeneye	*Bucephala islandica*	None	Fewer than 5 observed together in 2009–2011 survey
Brandt's cormorant	*Phalacrocorax penicillatus*	Aggregations/regular concentrations	Single individual. None observed in 2009–2011 survey
Bufflehead	*Bucephala albeola*	None	Also observed in 2009–2011 survey
Common goldeneye	*Bucephala clangula*	None	Also observed in 2009–2011 survey
Common loon	*Gavia immer*	Aggregations/regular concentrations, migratory stop-over	Also observed in 2009–2011 survey
Common murre	*Uria aalge*	Aggregations/regular concentrations	Not observed in 2009–-2011 survey
Great Blue Heron	*Ardea herodias*	None	No rookery in the study area. Also observed in 2009–2011 survey
Harlequin duck	*Histrionicus histrionicus*	Aggregations/regular concentrations	Also observed in 2009–2011 survey
Marbled murrelet	*Brachyramphus marmoratus*	Any occurrence	Several observed in deep water, while none observed in 2009-2011 survey
Snow Goose	*Chen caerulescens*	None	Fly-over only
Western grebe	*Aechmophorus occidentalis*	Migratory stop-over	Single individual observed, single individual observed in 2009–2011 survey
Nonbreeding concentrations of: Barrow's goldeneye (*Bucephala islandica*), Common goldeneye (*Bucephala clangula*), and Bufflehead (*Bucephala albeola*).		Yes	Observed small groups of fewer than 5 individuals which was similar to 2009–2011 survey
Nonbreeding concentrations of Loons (Gaviidae), Grebes (Podicipedidae), Cormorants (Phalacrocoracidae), Fulmar (Procellariidae), Shearwaters (Procellariidae), Storm-petrels (Hydrobatidae), Alcids (Alcidae)		Yes (for loons, grebes, and cormorants only)	Observed small groups of fewer than 5 individuals of loons grebes or cormorants. Similar to 2009–2011 survey

3.4.3.4 Common Murre

The common murre (*Uria aalge*) nests in dense colonies along rocky shorelines on the outer Washington coast, but spends the rest of its life on water (SAS 2008). Mostly fish-eaters, they are also known to feed on a variety of sea creatures, including crustaceans, marine worms, and squid. The common murre is listed by the WDFW as a candidate species in Washington State, and locations of regular concentrations of common murre are listed as Priority Areas (WDFW 2008).

A total of six common murre were detected during the field investigations, all in deep-water marine habitats (i.e., 1,500 feet from shore):

- One on September 21, 2012,
- Two on October 26, 2012, and
- Three on February 15, 2013.

Previous studies have also noted their occurrence in the area (Shapiro 1994, AMEC 2012). More than 85 individuals were recorded in the area during the non-breeding season in 1992–1993 (Shapiro 1994).

3.4.3.5 Common Loons

Common loons (*Gavia immer*) prey mostly on fish and typically spend the winter on salt water. Common loons are listed as a sensitive species in Washington State with breeding sites, regular concentrations, and migration stopovers listed as priority areas (WDFW 2008). They have been known to occur in large concentrations during the non-breeding season in and around the site (Shapiro 1994). They have also been documented breeding at nearby Lake Terrell (Whatcom County 2005).

Common loons were observed on a regular basis within the study area during the non-breeding season and in late April, which is assumed to be the peak period of migration for common loons (SAS 2008). A total of 56 common loons were detected throughout the survey period. Common loons use the nearshore at the site (from approximately 60 feet to approximately 1,000 feet from the shoreline). Individuals were generally scattered at various distances, resting and foraging/diving.

3.4.3.6 Goldeneyes and Buffleheads

Common goldeneyes (*Bucephala clangula*), Barrow's goldeneyes (*Bucephala islandica*), and buffleheads (*Bucephala albeola*) are tree cavity-nesting ducks. They are relatively common in Puget Sound, particularly during the non-breeding season, when they can be found in large concentrations

(SAS 2008). Limited numbers of all three species are known to breed in Washington (Lewis et al. 2004).

These species are not listed as a federal or state species of concern; however breeding areas and regular concentrations are listed as Priority Areas (WDFW 2008). Common goldeneyes and buffleheads were observed at the site during field surveys in 1992 and 1993 (Shapiro 1994), 2009, and 2011.

Common goldeneyes, Barrow's goldeneyes, and buffleheads were observed within the study area during the non-breeding season (Table 9). Buffleheads were primarily recorded during the winter period (November to February) and mostly along the northern and central shore of the study area. These species were observed as individuals and in small groups of less than five individuals during the 2012 field surveys. Priority Areas for these species exist within marine shoreline habitat.

Table 10 Goldeneyes and Buffleheads Recorded in the Study Area

Common Name	Scientific Name	Date(s) detected	Approximate Number of individuals	Est. Distance from Shoreline (meters)
Barrow's goldeneye	*Bucephala islandica*	01/18/2013	5	250
		04/12/2013	1	200
		04/26/2013	1	400
		12/31/2013	1	300
		02/15/2013	2	50
Bufflehead	*Bucephala albeola*	11/09/2012	4	100
		11/30/2012	5	250
		12/31/2012	7	100 (south of study area near Intalco)
		02/15/2013	7	
		03/01/2013	5	100 (south of study area near Intalco)
				75
Common goldeneye	*Bucephala clangula*	10/26/2012	5	150 (south of study area near Intalco)
		11/09/2012	6	
		12/31/2012	10	150 (south of study area near Intalco)
		01/18/2013	4	
		02/15/2013	3	150 (south of study area near Intalco)100
				200

3.4.3.7 Cormorants and Grebes

Three species of cormorants inhabit the waters off of Cherry Point (double-crested, Brant's, and pelagic), and two (double-crested and pelagic) are located there year-round. Double-crested

cormorants are found on both coastal and inland waters. Two species of grebes were identified during the study period (Table 1).

Brandt's cormorants (*Phalacrocorax penicillatus*) are considered common in the upper Puget Trough. Studies have shown that local numbers have remained relatively stable within the vicinity of the site (WDNR 2010). Brandt's cormorants are listed by the WDFW as a Species of Concern in Washington, and breeding areas and locations of regular concentrations are listed as Priority Areas (WDFW 2008). A single Brandt's cormorant was observed during the field investigations on April 12, 2012 as a fly-over more than 300 meters from the shoreline (Table 10). No suitable breeding habitat is present on the site for Brandt's cormorant due to a lack of adequate rocky shoreline and no concentrations were observed.

Western Grebe

The Western grebe (*Aechmophorus occidentalis*) is a fish-eating bird (SAS 2008). In winter, Western grebes are found mostly on saltwater. More than 900 individuals were recorded during field studies in 1992 and 1993 (Shapiro 1994). Western grebes are listed as a Candidate species in Washington, and breeding areas, locations of regular concentrations, migratory stopovers, and locations of regular occurrences in winter are listed as Priority Areas.

A group of 10 western grebes were observed more than 1,500 feet from the shoreline on January 18, 2013 (Table 10).

3.4.3.8 Harlequin Ducks

Harlequin ducks (*Histrionicus histrionicus*) are a Washington State Game Species that are known to over-winter in the Strait of Georgia (Lewis and Kraege 2004). Harlequin ducks prey primarily on invertebrates—in coastal environments mollusks and crustaceans make up the bulk of their diet (SAS 2008). Harlequin ducks are not listed as a federal or state species of concern; however, breeding areas and locations of regular concentrations are listed as Priority Areas (WDFW 2008). Large numbers of harlequin ducks have been recorded at the site previously (Shapiro 1994), and harlequin ducks are known to be common in the vicinity of the site (SAS 2008).

Harlequin ducks was observed along the shoreline foraging on five dates:

- Seven individuals on April 12, 2012,
- Seven individuals on April 26, 2012,
- Eight individuals on May 11, 2012,
- One individuals on January 18, 2013, and

- Two individuals on February 15, 2013.

This bird was always associated with the immediate nearshore area along the rocky and cobble substrates.

Table 11 Grebes, and Cormorants Recorded in the Study Area

Common Name	Scientific Name	Date(s) detected	Approximate Number of individuals	Location
Double crested cormorant	*Phalacrocorax auritus*	Each survey date	>10 each time	Either as fly-over or resting on water
Brant's cormorant	*Phalacrocorax penicillatus*	12/04/2012	1	Fly-over >1,500 feet from shore
Unidentified cormorant	*Phalacrocorax spp.*	05/11/2012 11/30/2012 12/31/2012	5	As fly-over
Horned grebe	*Podiceps auritus*	04/12/2012 04/26/2012 05/11/2012 09/07/2012 09/21/2012 10/01/2012 10/26/2012 11/09/2012 11/30/2012 12/31/2012 01/18/2013 02/15/2013 03/01/2013 03/15/2013 03/29/2013	35	Resting on water and diving
Pelagic cormorant	*Phalacrocorax pelagicus*	09/21/2012 10/01/2012 10/26/2012 11/09/2012 01/18/2013 02/15/2013 03/01/2013 03/15/2013	18	Either as fly-over or resting on water
Western grebe	*Aechmophorus occidentalis*	01/18/2013	10	More than 1,500 feet from shore

3.4.3.9 Great Blue Herons

The great blue heron (*Ardea herodias)* is common throughout Puget Sound and can be found foraging for a variety of prey items along freshwater and marine shorelines, slow-moving rivers, sloughs, marshes, ponds, ditches, and agricultural fields. This heron eats fish, amphibians, reptiles, invertebrates, small mammals, and other birds (SAS 2008*.).* This species was recorded in low numbers during the 1992 and 1993 field surveys (Shapiro 1994) and has been observed using margins of pasture areas for feeding. Great blue herons are not listed as a federal or state species of concern, but great blue heron breeding colonies are listed as Priority Areas (WDFW 2008).

A total of ten great blue herons were recorded using the foreshore area in the study area during the surveys (Table 11). Great blue herons are not known to breed in the study area and no heron colony was identified during any of the field surveys. No Priority Areas for the heron are considered to exist in the study area.

Table 12 Great Blue Herons Observed in the Study Area

Date recorded	Number of individuals	Location
04/12/2012	1	Wading in water along shoreline
05/11/2012	2	Wading in water along shoreline
08/06/2012	1	Wading in water along shoreline, coastal wetland
08/24/2012	1	Wading in water along shoreline
10/26/2012	1	Wading in water along shoreline
02/15/2013	1	Wading in water along shoreline
03/01/2013	2	Wading in water along shoreline
03/29/2013	1	Wading in water along shoreline

3.4.3.10 Foraging Guilds

This section presents the results of the survey by foraging guilds (groups of birds that forage in the same way or on the same food). Waterbird species recorded in the study area were separated into the following six foraging guilds:

- Dabbling ducks,
- Shorebirds,
- Diving ducks,
- Gulls,
- Piscivorous diving birds, and

- Geese and Swans.

3.4.3.11 Dabbling Ducks

Six species of dabbling ducks were identified in the study area and a total of 387 individuals were recorded during the survey period and included American widgeon, Eurasian widgeon, gadwall, mallard, northern pintail, American coot, an unidentified duck and unidentified dabbler. Dabbling ducks were most abundant in October through December. Numbers decreased in June through August, likely due to individuals migrating to breeding grounds. Numbers increased again in October.

Foraging and resting is the primary use of the study area for this guild. Dabbling ducks were observed to rest along the south section of the survey area near the Intalco wharf, where water was regularly calm, especially during higher wind times. The majority of dabbling ducks grazed within 500 feet of the shoreline from November to March. The remainder of the year, groups were observed scattered throughout the nearshore area.

3.4.3.12 Shorebirds

Shapiro (1994) recorded three species of shorebirds during site investigations: dunlin (*Calidris alpine)*, semipalmated plover (*Charadrius semipalmatus)*, and killdeer (*Charadrius vociferus*). The site's shoreline consists mostly of cobbles and boulders. No mudflats are present.

Eight species of shorebirds were identified, with three unidentified in this guild, and with a total of approximately 518 individuals recorded during the survey period. These included dunlin, greater yellowlegs, killdeer, least sandpiper, western sandpiper, black oystercatcher, common snipe, long-billed dowitcher, unidentified calidrid, unidentified shorebird, and peep; however, almost all were observed as flyovers. Shorebirds observed included greater yellowlegs, killdeer, least sandpiper, semi-palmated plover, western sandpiper, common snipe, long-billed dowitcher, and spotted sandpiper.

Foraging along the shoreline and possible resting on rocks along the shoreline is the primary use of the study area for this guild. During the surveys *Calidrid* species were found resting from flight primarily along the shoreline, generally in the vicinity of the Intalco wharf.

3.4.3.13 Diving Ducks

Ten species of diving ducks totaling approximately 1,027 individuals were recorded during the survey period. These included bufflehead, surf scoter, black scoter, Barrow's goldeneye, common goldeneye, common merganser, greater scaup, harlequin duck, long-tailed duck, white-winged scoter. There were three unidentified: unidentified diving duck, unidentified scaup, and unidentified scoter.

Foraging and resting/roosting is the primary use of the study area for this guild. A majority of the ducks consisted of scoters (surf and white-winged). Many were observed diving, presumably to locate small invertebrates in the nearshore area, especially in the calm water areas around the Intalco wharf. Groups of 20 (on average) were commonly observed in winter (November through to February). Numbers remained relatively consistent throughout the fall to spring; however, once the breeding season (June to August) began they exhibited a drastic decline in number.

3.4.3.14 Gulls

Eight species of gull (Table 7) were identified in the study area and a total of 785 individuals were observed. Many more were observed as fly-overs and did not appear to use the area for resting or foraging. Gulls were so common that only gulls that landed or were present in the water of the study area were recorded. Gulls included Bonaparte's gull, California gull, glaucous-winged gull, mew gull, ring-billed gull, Thayer's gull, Western gull, herring gull, and one unidentified gull.

Foraging and resting is the primary use of the study area for this guild. Generally, this guild was observed scattered throughout the study area opportunistically hunting along the shoreline scavenging/hunting for food. On some dates, aggregations of Bonaparte's gulls congregated more than 600 feet from shoreline to rest or to forage on schools of fish. Many individuals were recorded perched on structures of the Intalco port facility and resting on ships that berthed in the area. June and October accounted for the greatest use of the study area by this guild. Conversely, numbers appear to be the lowest during April and May.

3.4.3.15 Piscivorous Diving Birds

Sixteen species of piscivorous (fish-eating) diving birds were identified in the study area, with a total of 201 individuals were recorded during the survey period. The greatest numbers of individuals of piscivorous birds were observed in September, October and November and included pelagic cormorant, Caspian tern, common loon, horned grebe, red-breasted merganser, common murre, pelagic cormorant, Brandt's cormorant, pigeon guillemot, red-necked grebe, red-throated loon, western grebe, marbled murrelet, pied-billed grebe, and tufted puffin. Also observed but unidentified were a diver, loon, grebe, cormorant, merganser, and a murre.

Foraging and resting appears to be the primary use of the study area for this guild. While this guild could potentially use any portion of the study area that supports fish for foraging, the largest numbers of piscivorous diving birds were recorded near the Intalco wharf in areas where the water was calm. Also, many individuals were observed as flyovers, but generally individuals of this guild were observed swimming and diving for food throughout the nearshore habitat of the study area at various distances from the shoreline. When they were observed less than 300 feet from shore, many were

recorded swimming and resting. Terns were observed as flyovers and do not appear to use the study area. All murre, auklets, and guillemots observed were recorded more than 1,500 feet from the shore.

3.4.3.16 Geese and Swans

Three species of geese and one swan species were identified in the study area, and a total of 33 individuals were recorded during the survey period. These included snow goose, Canada goose, Brant, trumpeter swan, and an unidentified goose.

Individuals of snow geese and trumpeter swan were observed as flyovers and did not stop to use the study area. These species were observed primarily in November. Scattered individual sightings also occurred through December, January, and April.

Canada geese were observed within the 1,500-foot nearshore area on a number of occasions, with individuals scattered throughout the nearshore foraging and resting/roosting in the coastal wetland. Brant geese were recorded resting more than 1,000 feet from the shore during April as groups of 10 to 20 individuals.

3.4.4 Significant Waterbird Habitat

The study area is an important foraging and resting location for waterbirds. In general, many birds that rest and forage appear within the 1,500 nearshore area to do so in groups of less than 30 individuals. Larger rafts of birds were primarily abundant more than 1,500 feet from the shoreline, especially from approximately October 2012 to May 2013. Small (fewer than 5 birds) non-breeding congregations of Barrow's goldeneye, common goldeneye, and bufflehead were identified. Small congregations of non-breeding loons, grebes, and cormorants were present in the winter months.

The results from this study also show that large numbers of birds (e.g., dabbling and diving ducks) congregated around the Intalco wharf structures, especially during inclement weather periods. The open water up to approximately 800 feet from the shoreline generally tended to be avoided by waterbirds during windy and rainy times.

3.5 Bat Surveys

Bats are considered to be one of the most important predators of night-flying insects, and are of particular importance in areas where the abundance of insect pest species is high (Whitaker 1996). In Washington there are a number of priority bat species, including some with indeterminate distributions. All bat species in Washington are largely insectivorous (Hayes and Wiles 2013).

Bats use a combination of habitat types during the year with wetland, estuarine, and riparian areas for foraging, snags and other structures for roosting, and caves and other concealed areas for

hibernation (Nagorsen and Brigham 1995, Ormsbee 1996, Sasse and Pekins 1996, Grindal et al. 1999).

We performed an inventory directed at identifying the presence of bats near suitable foraging habitat in the study area. The survey was undertaken in August 2013. The principal objective was to determine whether, and to what extent, bats exist in the study area.

3.5.1 Methods

A list of potentially occurring bat species was compiled before initiation of field surveys, based on range maps and species habitat requirements, which resulted in nine bat species being identified as likely or possible in the study area. Priority bat species listed for Whatcom County include Townsend's big-eared bat (*Corynorhinus townsendii*) and Keen's long-eared bat (*Myotis evotis*).

Surveys were timed to occur between dusk and dawn, when bats are most active. Survey sites were selected based on their potential to have foraging habitat which attracts flying insects. All sites were next to forest that may provide sites suitable for day time roosts.

Bats were surveyed using three methods—mist net captures, recording ultrasonic calls used by bats for echolocation, and a visual count of observed flying bats.

Ultrasonic calling is how foraging bats locate food. Foraging bats emit calls with varying frequencies (cycles per second or kHz) and durations (milliseconds [ms]), which are separated into three phases: search, approach, and terminal (Simmons et al. 1979; Fenton and Bell 1981). Search phase calls tend to be fairly evenly spaced apart from one another, as the animal actively searches for prey. During the approach and terminal phases, calls are emitted progressively closer to one another, as the bat identifies and targets the prey item (Simmons et al. 1979; Fenton and Bell 1981). A SongMeter Model: 2+ (SM2BAT™, Wildlife Acoustics) broad range detector was used, which recorded the frequencies of bat calls and allows species identification using known sonograms.

Table 12 gives characteristics for the basis of sonogram analysis for species identification for the five species ultimately identified. The information presented in this table provides examples of call characteristics from samples collected within a limited geographic range; the extent of call variation associated with regional differences or dialects is unknown.

Table 13 Bat Species Present in the Study Area as Determined by Sonogram Match

		Examples of Call Characteristics[1]		
Common Name	**Scientific Name**	**High Frequency (kHz)**	**Low Frequency (kHz)**	**Maximum Duration (ms)**
California bat	*Myotis californicus*	67–80	37–40	2–6
Little brown bat	*Myotis lucifugus*	78–>60	38–40	2–5
Yuma bat	*Myotis yumanensis*	>60	40–46	3–5
Silver-haired bat	*Lasionycteris noctivagans*	37–30	25–26	3–6
Big brown bat	*Eptesicus fuscus*	33	28	10

kHz = kilohertz

ms = milliseconds

Sources: Nagorsen and Brigham 1995, Fenton and Bell 1981, Ministry of Environment RIC 1998b, O'Farrell, et al. 1999.

3.5.1.1 Mist Net Captures

Three 2.6 × 9 meter, 38 millimeter mesh mist nets designed specifically for bat capture were set at each survey site. Nets were placed on 3-meter aluminum poles. Mist nets were set up after sunset and constantly monitored for two hours. Captured bats were photographed and keyed to species using the key provided in Nagorsen and Brigham (1995). Inventory methods adhered to Ministry of Environment Resources Information Committee standards (Ministry of Environment RIC 1998b). Location, weather conditions, and time of operation were recorded at each survey site.

3.5.1.2 Sonogram Analysis

Recorded sonograms of bat echolocation calls were produced from downloaded sonogram files using Kaleidoscope® software. To differentiate between species, the frequency and duration of the recorded calls were compared with available voucher sonograms for several species (Fenton and Bell 1981; Ministry of Environment RIC 1998b; Madison et al. 2003; McCaffrey et al. 2003). Search and approach phase calls are most diagnostic for species identification. In particular, the lowest or fundamental frequency of search and approach phase calls has been used to distinguish between species (Fenton and Bell 1981; O'Farrell et al. 1999). For example, silver-haired bat search phase calls have exhibited a fundamental frequency of around 25 kHz in several studies (Madison et al. 2003; McCaffrey et al. 2003).

However, reliable differentiation between species in the genus *Myotis* ("mouse-eared bats") is difficult. A number of *Myotis* species are classified as "40 kHz *Myotis*" because various species in this genus have overlapping characteristics of echolocation calls in this range. These species share a search phase call that descends to a fundamental frequency of 40 kHz over a duration of 1 to 2 ms (Madison et al. 2003; McCaffrey et al. 2003). The list of potentially-occurring species was used to refine the

selection of species identified as a 40 kHz *Myotis*. Species that were categorized as likely to occur were given greater consideration than those that were categorized as possibly occurring.

3.5.2 Results

Sonogram surveys were performed on the nights of August 14 and 15, 2013 from 7:00 pm to 4:00 am. Mist net sampling was performed on the night of August 15, 2013 for two hours, from 9:45 to 11:45 pm. Weather was warm (15 to 20°C) and there was no precipitation during the surveys.

Bats were detected at two sites: near the three stock ponds along Stream 2B (Figure 6) and at the coastal wetland (Figure 5). Five species were identified based on analysis of the ultrasonic recordings of echolocation calls (Table 13), and it was determined that the following species were likely present:

- California bat (*Myotis californicus*);
- Yuma bat (*Myotis yumanensis*);
- Silver-haired bat (*Lasionycteris noctivagans*);
- Little brown bat (*Myotis lucifugus*); and
- Big brown bat (*Eptesicus fuscus*).

Table 14 Bats Recorded in the Study Area

Common Name	Date of Recorded Echolocation	Location	Captured?
California bat	August 14 and 15	Ponds	No
Yuma bat	August 14 and 15	Ponds, Coastal Wetland	Yes
Silver-haired bat	August 14	Ponds	No
Little brown bat	August 14 and 15	Ponds	No
Big brown bat	August 14 and 15	Ponds	No

At the ponds, more than 100 calls were recorded with a few discernable to species. At the coastal wetland, around 50 calls were recorded, of which most were discernable by the sonogram software. Echolocation sonograms need to be used cautiously when identifying bat species, as little is known about variation in calls, differences in regional dialect, influence of environmental variables (e.g., humidity, direction) on echolocations, and sonogram development; however, there is moderate confidence in the results as bats were visually observed as well.

A visual estimate of bat numbers at the ponds for both survey nights indicated approximately 20 individuals, while no bats were visually observed at the coastal wetland. However, a single Yuma bat was captured by the mist net at the coastal wetland sampling location.

3.5.3 Significant Bat Habitat

Riparian and open-water areas provide habitat elements both for foraging and adjacent forests for roosting by bats. Open riparian areas are particularly important foraging habitat for some *Myotis* species, with bat activity documented as being 10 to 40 times higher in riparian areas (Grindal et al. 1999), and activity decreasing with increasing distance from water (Van Den Driesshe et al. 1999). Open water provides habitat for water-breeding insects, including midges and mosquitoes. Other bats are known for consuming large quantities of moths.

Roosting concentrations of *Myotis* bats, big-brown bats, and pallid bat are considered Priority Areas. In general, roosting locations provide crucial habitat requirements and can be limiting, and are therefore a likely primary factor affecting the localized abundance and diversity of bats (Hayes and Wiles 2013). Potential roosting habitat for these species include trees, snags, caves, mines, cliffs, talus, buildings (siding, roof shingles, rafters, and attics), and bridge and similar structures. While no specific roosts were identified in the study area, it is assumed that roosting could occur in the study area for the bats identified.

Not all roosting occurs as concentrations, however, and some bats roost as individuals or in small groups. Roosting patterns may depend on the time of year, gender of the bat, and if the bat is nursing young or not (Hayes and Wiles 2013). To date, no concentration roost has been identified in the study area. Importantly, it is well known that roosts can be located several miles away from foraging areas for some bat species in Washington State (Falxa 2008).

3.6 Terrestrial Mammal Survey

3.6.1 Introduction

Terrestrial mammals within the study area potentially could consist of small mammals, large mammals, and furbearers. All of the animals that occupy the study area are common urban and agricultural species, such as black-tailed deer (*Odocoileus hemionus columbianus*), Virginia opossum (*Didelphis virginiana*), striped skunk (*Mephitis mephitis*), coyote (*Canis latrans*), North American beaver (*Castor canadensis*), and raccoon (*Procyon lotor*). No priority terrestrial mammal species were listed as potentially occurring in the study area. Based on the size of the study area and habitats present, no priority mammals are expected to use the study area for their life cycle requirements.

3.6.2 Methods

Records of mammal use in the study area were collected as incidental sightings. Signs of large (heavier than 500 grams) and small (lighter than 500 grams) mammals were recorded as incidental sightings during field visits. Mammal presence was recorded based on signs of scat, tracks, forage/browse, scrapings, and direct field observation. Field visits were made during both day and night, which increased the possibility of observation if any were present.

Also relevant to mammals is the ability for dispersion through corridors, and this was evaluated through both field observations and mapping.

3.6.3 Results

Signs (scat) of black-tailed deer were recorded along Stream 1 at Lonseth Road on April 12, 14, and 26, 2012. Black-tail deer have been observed incidentally in the pastures during site visits by other AMEC staff. Coyote scat was also identified in multiple locations throughout the study area on most field days. Coyote have been observed crossing edges of pastures and hayfields by other AMEC staff. Neither of these species is considered a priority species. No indications or observations of priority terrestrial mammal species were identified in the study area.

3.6.4 Significant Terrestrial Mammal Habitat

Habitat in the study area for small mammals includes upland forested areas that contain loamy soils devoid of water and have the larger amounts of coarse woody debris, especially areas where the coarse woody debris creates microclimate protection and cover. Other habitat areas include fields and shrub areas where small mammals harvest seeds and insects and nest under debris or in burrows. Some mammals have specific types of aquatic habitat requirements, such as that for beavers.

In general, the forest habitat in the study area (Figure 6) provides enough woody debris and hummocky terrain to support voles and shrews. In the study area, the best small mammal habitat is located in the riparian forest associated with the natural stream courses, especially Stream 1, and in portions of the coastal wetland.

Corridor connectivity between the various vegetation units (e.g., shrub to forest) form travel corridors for mammals to move from one habitat to another in relative protection from predators. Travel corridors retain stand structural elements such as large green trees, snags, and logs on the forest floor. The riparian areas associated with Streams 1 and 2 and located adjacent to forest may be considered the best for small mammals in the study area.

Multi-strata forested canopies (i.e., herbaceous, shrub, and tree) provide thermal protection and create forage areas for larger mammals. In addition, forest habitat is the most likely to contain older

trees with exposed root crevices, as well as tree snags and stumps, that can provide potential denning opportunities for some large mammals.

3.7 Butterfly Surveys

3.7.1 Introduction

Butterflies were the groups of invertebrates considered for inventory in the study area. We did not locate any previous records of invertebrate surveys for the vicinity. Priority species in Whatcom County included the Johnson's Hairstreak butterfly. This species is understood to be closely associated with late-successional and old-growth coniferous forests (Pyle 2002; Miller and Hammond 2007) that are infected with dwarf mistletoe (*Arceuthobium spp*.). To date, the primary host trees for dwarf mistletoes that are associated with this butterfly's presence are western hemlock (*Tsuga heterophylla*), white fir (*Abies concolor*), and ponderosa pine (*Pinus ponderosa*), none of which occur as old growth stands in the study area or vicinity. Thus, this species was not anticipated to use the study area.

3.7.2 Objectives

Specific objectives were to document the presence and distribution of butterfly species using the study area.

3.7.3 Methods

Butterfly sampling methodology used chase-and-net methods. Sampling generally targeted species-specific habitats and locations, defined by the vegetation mapping (see Figure 6), available knowledge of key habitat relationships (i.e., species life cycle requirements). All open areas with no forest habitat of the study area were visited at least once (Figure 11); however, some areas were visited two times during the survey period. All sampling was conducted during favorable weather conditions (i.e., sunny and warm), since adult activity is related to weather conditions.

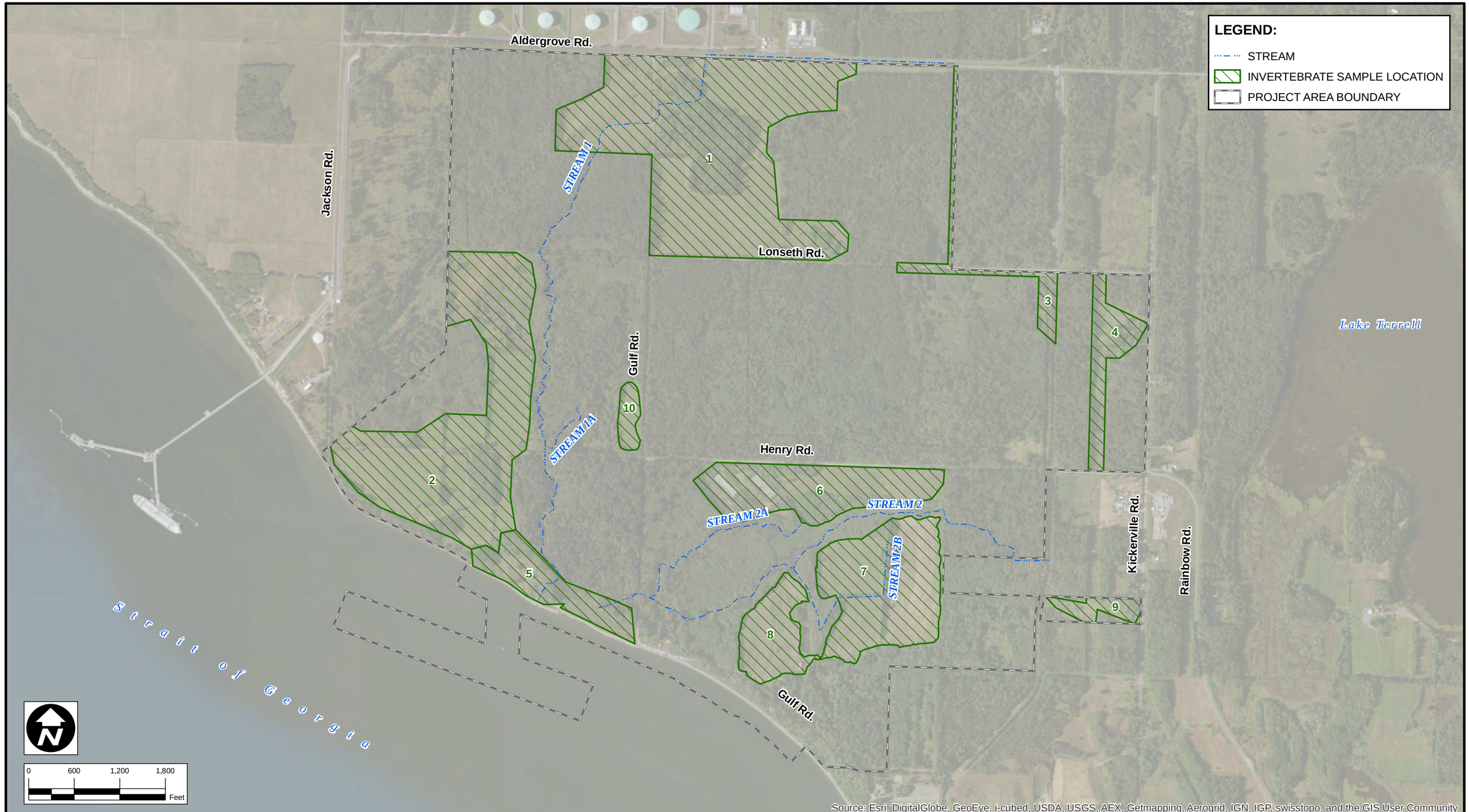
The main sampling method for these surveys consisted of transecting the chosen habitats within the study area, noting and/or capturing butterflies encountered. Visual observation, both unaided and using binoculars, was used to identify species at rest or easily recognizable species. Chase-and-net methodology, using lightweight nets, was employed during manual collection. When netted, invertebrate species were identified and released, or photographs were taken to later confirm species identification back at the office. All sampling and on-site identifications were conducted by an experienced butterfly surveyor. All butterflies observed were recorded, including species identification. Butterfly surveys were completed on July 4 and August 2, 2012. Sample areas were accessed from the existing roads.

3.7.4 Results

Figures 6 and 11 present the shrub, agricultural fields/grassland, and edge riparian habitats that were surveyed. Table 14 presents the total 23 species and number of individuals recorded throughout the area. As anticipated, no Johnson's Hairstreak butterflies were identified during the surveys. All the species identified in Table 14 are common and can occur anywhere in the vicinity. Many may be considered transient through the area. All adults were observed in the fields and open areas of the study area, as shown on Figure 11.

Table 15 Butterflies and Skippers Recorded in the Study Area

		Number of Individuals	
Species Common Name	**Species Scientific Name**	**July 4, 2012**	**August 2, 2012**
Anise Swallowtail	*Papilio zelicaon*	1	—
Clodius Parnassian	*Parnassius clodius*	1	—
Western Tiger Swallowtail	*Papilio rutulus*	3	—
Western White	*Pontia occidentalis*	—	6
Cabbage White	*Pieris rapae*	8	13
Sara's Orangetip	*Anthocharis sara*	1	—
Western Sulphur	*Colias occidentalis*	9	12
Purplish Copper	*Lycaena helloides*	—	1
Silvery Blue	*Glaucopsyche lygdamus*	5	—
Western Tailed Blue	*Everes amyntula*	1	—
Echo Blue	*Celastrina echo echo*	4	—
Green Comma	*Polygonia faunus*	—	2
Satyr Comma	*Polygonia satyrus*	—	4
Compton's Tortoiseshell	*Nymphalis l-album*	1	3
California Tortoiseshell	*Nymphalis californica*	—	1
Mourning Cloak	*Nymphalis antiopa*	1	2
West Coast Lady	*Vanessa annabella*	—	1
Milbert's Tortoiseshell	*Nymphalis milberti*	2	4
Lorquin's Admiral	*Limenitis lorquini*	—	1
Pacific Fritillary	*Boloria epithore*	3	2
Common Ringlet	*Coenonympha tullia*	—	2
Silver Spotted Skipper	*Epargyreus clarus*	1	—
Woodland Skipper	*Ochlodes sylvanoides*	1	—



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CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.

AMEC
11810 North Creek Parkway N
Bothell, WA 98011

amec

DWN BY:	SD
CHK'D BY:	JG
DATUM:	NAD83
PROJECTION:	WA SP North, Ft.
SCALE:	1 inch = 1,200 feet

PROJECT: WILDLIFE BASELINE INVENTORY REPORT

TITLE: INVERTEBRATE SAMPLE LOCATIONS

DATE:	APRIL 2013
PROJECT NO.:	091515338C-04-12
REV. NO.:	-
FIGURE NO.:	FIGURE 11

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-04-12 - Parcel 15 Rare Plant Survey\Wildlife_Baseline_Inventory_Report\Figure 11 - Invertebrate Sample Locations.mxd

3.7.5 Significant Invertebrate Habitat

Habitats associated with the road network (e.g., ditches) may be considered important for adult invertebrates as a food source of flowers. Larval stages may be present where host plants are present, especially along forest to shrub and open field transition areas. Plant species present in the study area that could serve as larval hosts for some of these species include spirea, willows, nettles (*Urtica dioica*), lupine, vetch, bleeding heart (*Dicentra formosa*), alder, cottonwood, maple, plum (*Prunus spp*.), and various umbelliferous plants. For example, the flowers of bleeding heart (*Dicentra spp.*) are plentiful in some portions of the forested habitats and are used by larvae of Clodius Parnassian butterflies (*Parnassius clodius*) for food.

4.0 SUMMARY

This wildlife study focused on waterbirds, raptors, bats, butterflies, amphibians and incidental sightings of reptiles and small mammals during 2012–2013 in the study area.

Priority wildlife species include wildlife classified as either endangered, threatened, sensitive, and/or candidate by state and/or federal regulatory agencies. Habitats supporting these species and other areas of primary association also were evaluated for presence. Amphibians, reptiles, raptors, waterbirds, bats, terrestrial animals, and butterflies identified during systematic surveys for each wildlife group were documented, including incidental sightings.

Eleven priority waterbird species included on the WDFW PHS list were identified in the study area during the field surveys of 2012–2013. The marbled murrelet *(Brachyramphus marmoratus*), an ESA-listed and state-listed threatened species, was identified using the marine waters in the study area.

Several diurnal and nocturnal raptors were identified. Bald eagles, a priority species, routinely use the study area, and priority habitats for this species include the shoreline cliffs and riparian areas.

One amphibian species, Western toad (*Anaxyrus boreas*), an ESA-listed species of concern and state-listed candidate species, was observed incidentally in the study area on two dates. No breeding areas in the study area were identified for this species.

Confirmed priority areas in the study area include riparian areas, shorelines, and waterbird concentrations.

No priority terrestrial mammals, invertebrates (butterflies), bats, or reptiles were identified.

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APPENDIX A

Priority Species Known to Occur within Whatcom County, Washington, 2013

Table A1 Priority Species Known to Occur within Whatcom County, Washington, 2013

Common Name	*Scientific Name*	State Status	Federal Status
	Amphibians		
Western Toad	*Anaxyrus boreas*	Candidate	Concern
Columbia Spotted Frog	*Rana luteiventris*	Candidate	None
Oregon Spotted Frog	*Rana pretiosa*	Endangered	Candidate
	Bird		
American White Pelican	*Pelecanus erythrorhynchos*	Endangered	None
Shore-Tailed Albatross	*Phoebastria albatrus*	Candidate	Endangered
Snow Goose	*Chen caerulescens*	None	None
Trumpeter Swan	*Cygnus buccinator*	None	None
Tundra Swan	*Cygnus columbianus*	None	None
Golden Eagle	*Aquila chrysaetos*	Candidate	
Bald Eagle	*Haliaeetus leucocephalus*	Sensitive	Concern
Northern Goshawk	*Accipiter gentilis*	Candidate	Concern
Peregrine Falcon	*Falco peregrinus*	Sensitive	Concern
Spotted Owl	*Strix occidentalis*	Endangered	Threatened
Brandt's Cormorant	*Phalacrocorax penicillatus*	Candidate	None
Clark's Grebe	*Aechmophorus clarkii*	Candidate	None
Western Grebe	*Aechmophorus occidentalis*	Candidate	None
Common Loon	*Gavia immer*	Sensitive	None
Common Murre	*Uria aalge*	Candidate	None
Marbled Murrelet	*Brachyramphus marmoratus*	Threatened	Threatened
Great Blue Heron	*Ardea herodias*	None	None
Brant	*Branta bernicla*	None	None
Harlequin Duck	*Histrionicus histrionicus*	None	None
Peregrine Falcon	*Falco peregrinus*	Sensitive	Concern
Cavity-nesting ducks: Wood Duck, Barrow's Goldeneye, Common Goldeneye, Bufflehead, Hooded Merganser	*Aix sponsa, Bucephala clangula, Bucephala islandica, Bucephala albeola, Lophodytes cucullatus*	None	None
	Mammals		
Townsend's Big-eared Bat	*Corynorhinus townsendii*	Candidate	Concern
Keen's Long-eared Bat (formerly Keen's Myotis)	*Myotis evotis keenii*	Candidate	None
Cascade Red Fox	*Vulpes vulpes cascadensis*	Candidate	None
Fisher	*Martes pennanti*	Endangered	Candidate
Gray Wolf	*Canis lupus*	Endangered	Endangered
Grizzly Bear	*Ursus arctos*	Endangered	Threatened

Table A1 Priority Species Known to Occur within Whatcom County, Washington, 2013 (Continued)			
Common Name	***Scientific Name***	**State Status**	**Federal Status**
Lynx	*Lynx canadensis*	Threatened	Threatened
Marten	*Martes americana*	None	None
Columbia Black-Tailed Deer	*Odocoileus hemionus columbianus*	None	None
Mountain Goat	*Oreamnos americanus*	None	None
Elk	*Cervus elaphus*	None	None
	Invertebrates		
Johnson's Hairstreak	*Mitoura johnsoni*	Candidate	None

Source: WDFW (2013)

APPENDIX B

Photographs of Habitat Types in the Study Area

APPENDIX B

HABITAT PHOTOGRAPHS
Whatcom County, Washington

Photo 1 Forest habitat in the northeast corner of the study area north of Lonseth Road.

Photo 2 Forest habitat in the northwest corner of the study area just south of Aldergrove Road.

APPENDIX B

HABITAT PHOTOGRAPHS
Whatcom County, Washington

Photo 3 Forest habitat in the southwest quadrant of the Gulf Road and Lonseth Road intersection.

Photo 4 Riparian forest habitat along Stream 1 south of Henry Road.

APPENDIX B

HABITAT PHOTOGRAPHS
Whatcom County, Washington

Photo 5 Shrub habitat near the western study area boundary north of Henry Road and south of Lonseth Road.

Photo 6 Typical shrub habitat within the study area.

APPENDIX B

HABITAT PHOTOGRAPHS
Whatcom County, Washington

Photo 7 Agricultural grassland habitat from the intersection of Gulf Road and Lonseth Road; view northeast.

Photo 8 Agricultural/grassland habitat west of Gulf Road and south of Henry Road; view west.

APPENDIX B

HABITAT PHOTOGRAPHS
Whatcom County, Washington

Photo 9 Marine shoreline habitat at low tide; view east from shoreline adjacent to coastal wetland.

Photo 10 Marine shoreline habitat at low tide; view southwest from shoreline adjacent to coastal wetland.

APPENDIX B

HABITAT PHOTOGRAPHS
Whatcom County, Washington

Photo 11 Marine shoreline habitat; view south from shoreline adjacent to coastal wetland.

Photo 12 Coastal wetland along the Strait of Georgia coast; view west.

APPENDIX C

Life Cycle Requirements and Critical Habitat of Bald Eagle and Western Toad

WESTERN TOAD

High-value habitat for the Western toad consists of aquatic habitats with permanent, non-flowing shallow water bodies for breeding, and moist, shaded terrestrial sites with abundant leaf litter and coarse woody debris for the growing season (Matsuda et al. 2006).

The Western toad is an explosive breeder, congregating along the shallow margins of standing water breeding sites for a one- to two-week period each spring. Toads breed in a variety of natural and artificial aquatic habitats, with or without tree or shrub canopy cover, coarse woody debris, or emergent vegetation. They breed in ponds, stream edges, or shallow margins of lakes (Corkran and Thoms 1996), as well as in ditches and road ruts (Wind and Dupuis 2002). They are highly philopatric; most males return to breeding sites annually whereas females return every one to three years. Females travel farther from breeding sites, moving 400 to over 600 meters upland to summer ranges; occasional long-distance excursions of up to 7.2 kilometers have been noted (Wind and Dupuis 2002). Summer home ranges are distinct and approximately 3 to 7 hectares in size. Toads are found in a variety of habitats including forests, wetlands, clearcuts, and grasslands, with summer ranges usually including a combination of upland and wetland areas.

After breeding has taken place, adults disperse into forested areas and wet shrub lands, and they appear to favor dense shrub cover where they are protected from desiccation and predation (Davis 2000). Fragmented forests such as clearcuts are favored over closed canopy forests in coastal habitats (Dupuis 1998, Davis 2000). They do not appear to depend on mature or old-growth forest and are frequently found within cut-over areas (Wind and Dupuis 2002). Populations on the south coast may in part be declining in response to a combination of urbanization and a decreased proportion of early seral stands (Davis 2000).

Toads require decaying logs on the forest floor with moist interiors, including those beginning to break apart, because these areas provide protection from predators and a source of prey, while maintaining a microclimate with more constant temperature and humidity (Ward and Chapman 1995).

Western toads travel from natal ponds to other suitable habitats. Young toads move to upland areas after natal dispersal and seek wetland areas. As adults, they move from their terrestrial habitat during the growing season to wetland ponds for breeding. They regulate their body temperature by moving between habitat types of varying temperatures, and are attracted to clear cuts and roads, when these open areas are at a higher temperature than sheltered habitats (Wind and Dupuis 2002). Successful metamorphosis of young toads from road ditches is unlikely, given that these ditches and ruts often dry out early, and usually lack vegetation for shade and predatory cover (Wind and Dupuis 2002).

Western toads hibernate for four to six months each year, depending on their location, in burrows up to 1.3 meters underground (Wind and Dupuis 2002). Toads use a variety of habitats for their hibernacula as long they are deep enough to avoid freezing and moist enough to avoid desiccation.

BALD EAGLE

The bald eagle (*Haliaeetus leucocephalus*) is relatively common in the Puget Sound region (SAS 2008). As fish are important prey, bald eagles nearly always nest near fishable waters, typically within 500 metres (Campbell et. al. 1990). Although their primary prey is fish, they also frequently prey on waterbirds and small mammals (SAS 2008). Livingston et al. (1990) showed that marine mainland nesting habitats were associated with a high diversity of fish, large shallow water areas at low tide (less than1.8 meters of water), and few roads. In winter, eagles prefer to roost in large trees with stout, easily accessible branches, and protection from strong winds (Southern 1963, Steenhof 1978, Hansen 1987).

A variety of human activities can affect the bald eagle's ability to forage, nest, roost, breed, or raise young. The bald eagle was recently down-listed to sensitive in Washington (WDFW 2008), and removed by the US Fish and Wildlife Service from the Federal List of Endangered and Threatened Wildlife and Plants (USFWS 2011). Breeding areas, communal roosts and regular concentrations are listed as Priority Areas for eagles in Washington.

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