TR-08 SPECIAL-STATUS AMPHIBIAN STUDY INTERIM REPORT

SKAGIT RIVER HYDROELECTRIC PROJECT FERC NO. 553

Seattle City Light

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> March 2022 Initial Study Report

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AISaquatic inv	vasive species
BMPbest mana	gement practice
BPABonneville	e Power Administration
°CCelsius	
City LightSeattle Cit	y Light
COSEWICCommitte	e on the Status of Endangered Wildlife in Canada
DNAdeoxyribo	nucleic acid
eDNAenvironme	ental DNA
FEMAFederal En	nergency Management Agency
FERCFederal En	nergy Regulatory Commission
GISGeograph	c Information System
GPSGlobal Po	sitioning System
HGMhydrogeor	norphic
ISRInitial Stud	dy Report
LiDARLight Dete	ection and Ranging
LPlicensing	participant
NPSNational F	Park Service
O&Moperations	and maintenance
PABpalustrine	aquatic bed
PEMpalustrine	emergent
PFOpalustrine	forested
PHrperson how	ır
PMEprotection	, mitigation, and enhancement
POWpalustrine	open water
ProjectSkagit Riv	er Hydroelectric Project
PSSpalustrine	shrub-scrub
PUBpalustrine	unconsolidated bottom
RSPRevised S	tudy Plan
RMriver mile	
ROWright-of-w	ay
SGCNSpecies of	Greatest Conservation Need

SnoPUD No. 1	Snohomish County Public Utility District #1
SR	State Route
USFWS	U.S. Fish and Wildlife Service
USR	.Updated Study Report
VES	.visual encounter survey
WDFW	.Washington Department of Fish and Wildlife
WNHP	.Washington National Heritage Program
WSDOT	.Washington State Department of Transportation

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The TR-08 Special-Status Amphibian Study is being conducted in support of the relicensing of the Skagit River Hydroelectric Project (Project), Federal Energy Regulatory Commission (FERC) No. 553, as identified in the Revised Study Plan (RSP) submitted by Seattle City Light (City Light) on April 7, 2021 (City Light 2021). On June 9, 2021, City Light filed a "Notice of Certain Agreements on Study Plans for the Skagit Relicensing" (June 9, 2021 Notice)¹ that detailed additional modifications to the RSP agreed to between City Light and supporting licensing participants (LP) (which include the Swinomish Indian Tribal Community, Upper Skagit Indian Tribe, National Marine Fisheries Service, National Park Service [NPS], U.S. Fish and Wildlife Service [USFWS], Washington State Department of Ecology, and Washington Department of Fish and Wildlife [WDFW]). The June 9, 2021 Notice proposed no changes to the Special-Status Amphibian Study as described in the RSP.

In its July 16, 2021 Study Plan Determination, FERC approved the Special-Status Amphibian Study without modification.

This interim report on the 2021 study efforts is being filed with FERC as part of City Light's Initial Study Report (ISR). City Light will perform additional work for this study in 2022 and include a report in the Updated Study Report (USR) in March 2023.

1.1 Background

The Special-Status Amphibian Study is focused on the potential occurrence of three special-status amphibians—Columbia spotted frog (*Rana luteiventris*), Oregon spotted frog (*Rana pretiosa*), and western toad (*Anaxyrus boreas*)—in non-forested wetlands and littoral areas where they may be affected by the Project. The Oregon spotted frog is a federal threatened and Washington State endangered species. Columbia spotted frog and western toad are State candidate species that are also listed as Species of Greatest Conservation Need (SGCN; WDFW 2015), both because of regional declines (Columbia spotted frog in areas of shrub-steppe, and western toad in lowlands of the Puget Trough and lower Columbia River Gorge).

There are no known historical or verified extant occurrences of Columbia spotted frog or Oregon spotted frog within the study area. Columbia spotted frog occurs mostly east of the Cascade Crest in Washington and near Hart's Pass and Rainy Pass west of the Crest. However, frogs identified as Columbia spotted frog have been reported in Big Beaver Valley west of Ross Lake and no other ranid species (i.e., frogs of the family Ranidae) have been documented (Bury and Adams 2000; Holmes and Glesne 2000). The study area south of Big Beaver Valley (i.e., the Diablo and Gorge developments, the transmission line, other Project facilities south of Ross Lake, and fish and wildlife mitigation parcels) is not within the known or expected range of Columbia spotted frog (Dvornich et al. 1997; Washington National Heritage Program [WNHP] et al. 2009; NatureServe Explorer 2021). Ovaska et al. (2019) found genetic evidence of Columbia spotted frog from multiple sites in the Skagit and adjacent Similkameen watersheds north and northeast of Ross Lake in British Columbia, Canada. The same study reported genetic evidence of Oregon spotted frog from swabs of one captured frog and evidence for Columbia spotted frog from swabs of three frogs.

¹ Referred to by FERC in its July 16, 2021 Study Plan Determination as the "updated RSP."

at a site less than 2 miles north of Ross Lake and 2.75 miles north of the international border, an area outside of the expected range of the species (Hallock 2013).

Both Columbia spotted frog and Oregon spotted frog require presence of permanent water associated with low gradient streams, ditches, ponds, small lakes, or springs, although seasonal aquatic habitats are often used for breeding. WNHP et al. (2009) describes Columbia spotted frog as "relatively aquatic" and "rarely found far from water." Annual movements between essential aquatic habitats of some Columbia spotted frog populations may occur through terrestrial habitats. The known physical and biological features of Columbia spotted frog and Oregon spotted frog habitats for each life stage are detailed in Section 2.3.1 and 2.3.2 of the RSP, respectively.

Oregon spotted frog is highly aquatic, rarely found more than a few leaps from water, and adults are not known to move long distances over land. As summarized by Hallock (2013), there are verified records of Oregon spotted frog at sites in the Puget Trough and southern Cascades ecoregions in Washington within at least 15 stream drainages. However, known extant populations are confined to the following six sub-basins, none of which are within the study area: Sumas River and lower South Fork Nooksack in Whatcom County; upper Samish River in Whatcom and Skagit County; upper Black River in Thurston County; and lower Trout Lake Creek and Outlet Creek in Klickitat County. The known occurrences nearest to the Project, which are considered extirpated, were near the confluence of the Skykomish and Snoqualmie rivers 3 miles south of Monroe in Snohomish County (based on a 1939 museum collection record) and 2 miles northwest of Concrete within the lower Skagit River sub-basin about 5 river miles (RM) downstream of the Sauk River confluence (1930 museum collection record). These extirpated occurrences were at least 7.5 and 11 miles, respectively, from the nearest point on the Project transmission line right-of-way (ROW). Surveys at sites near Concrete and other locations near the Skagit River, including wetlands on City Light fish and wildlife mitigation lands between Marblemount and Concrete, did not find evidence of Oregon spotted frog (McAllister et al. 1993; Bohannon et al. 2016).

Nevertheless, this study follows a cautious approach, carefully evaluating wetlands within the study area for the potential occurrence of Oregon spotted frog even in drainages with no known historical occurrences. Habitats in most of the study area have not been evaluated previously, with surveys limited to the fish and wildlife mitigation lands near the Skagit River, as noted above. Similarly, non-forested wetlands on Ross Lake, a portion of which is within the potential range of Columbia spotted frog, were evaluated.

As summarized in Section 2.3 of the RSP, western toad was known or expected to occur at Ross Lake (exact sites not determined) and also occurs in Big Beaver Valley west of the study area (Holmes and Glesne 1997). Numerous young-of-year western toads were incidentally observed along Big Beaver Valley trail on August 20, 2020 by City Light biologists (Tressler 2021), indicating dispersal from breeding sites in the large wetland complex in Big Beaver Valley. The same City Light biologist also observed western toad tadpoles, including some in final stages of metamorphosis, in a backwater area on the south bank of the Skagit River across from Bacon Creek on June 26, 2009. Museum and sight records summarized by McAllister (1995), Nussbaum et al. (1983), and WNHP et al. (2009) show no records along the Project transmission line ROW, but the area is within the general range of the species. Western toad may no longer occur in parts of its former range in the urbanized lowlands of the Puget Trough (WNHP et al. 2009), and the Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2002) reported a similar

pattern of decline and disappearance in southwestern British Columbia documented by numerous sources. Reflecting the scarcity of the western toad in developed areas, Nussbaum et al. (1983) remarked, "We have almost no information on life history features of this toad in western lowlands and coastal populations." Known extant populations are mostly associated with permanent ponds and lakes, and backwater or side-channel habitats of large streams.

The goals of this study are to: (1) identify areas of potentially suitable breeding habitat for the special-status amphibians, Columbia spotted frog and Oregon spotted frog, within the study area; (2) assess the likelihood that either species occurs in areas where there is activity related to Project operations and maintenance (O&M), including at Project recreation facilities; (3) document occurrences of a third special-status species, western toad, and the locations and types of habitats used around the study area; and (4) collect relevant information on populations where these species are found, including numbers, life stages, habitat, and locations.

Study results will provide information on special-status and other amphibian species present in the study area that will be combined with results of other studies (e.g., TR-02 Wetland Assessment [City Light 2022h], GE-01 Reservoir Shoreline Erosion [City Light 2022b], GE-02 Erosion and Geologic Hazards at Project Facilities and Transmission Line Right-Of-Way [Erosion and Geologic Hazards Study; City Light 2022c], GE-03 Sediment Deposition in Reservoirs Affecting Resource Areas of Concern [Sediment Deposition Study; City Light 2022d], and FA-03 Reservoir Fish Stranding and Trapping Risk Assessment [Stranding and Trapping Assessment; City Light 2022a]) to develop appropriate best management practices (BMP) to protect wetlands, streams, and other sensitive habitats, or other protection, mitigation, and enhancement (PME) measures, if warranted.

Specific study objectives are listed below:

- Develop a preliminary, working map of potentially suitable breeding habitat (i.e., habitats used for oviposition [egg-laying] and larval rearing) for special-status amphibians within the study area using existing, publicly available aerial imagery, wetland and soil maps, and vegetation data. Potential habitat will also be identified by the results of the TR-01 Vegetation Mapping Study and the TR-02 Wetland Assessment (City Light 2022g and 2022h) and analyses of Light Detection and Ranging (LiDAR) data by the FA-03 Stranding and Trapping Assessment (City Light 2022a). The preliminary map will indicate discernible wetlands and topographic depressions, as well as general areas, such as gently sloping shorelines, that might support special-status amphibian breeding and could strand and trap amphibians in different life stages. For this preliminary map, habitat suitability will be broadly defined by reference to literature accounts that describe habitats successfully used by each special-status species.
- Conduct field reconnaissance in areas where additional information is needed to verify or correct preliminary assumptions of habitat suitability.
- Catalog and map incidental observations of special-status amphibians and other amphibians (including non-native bullfrogs) recorded during the wetland study and other studies during the relicensing.
- Perform a special-status amphibian field survey in areas identified as potentially suitable habitat where there is activity related to Project O&M or at Project recreation facilities and where additional information is needed on species occurrence, relative abundance, and life history timing.
- Prepare a study report including narrative descriptions of field reconnaissance and survey areas and relevant habitat characteristics, information regarding potentially suitable areas that were

not surveyed, and final maps. The final maps will show habitat categories mapped by the TR-01 Vegetation Mapping Study and the TR-02 Wetland Assessment (City Light 2022g and 2022h); locations of field reconnaissance and amphibian surveys; and amphibians by life stage detected during surveys, field reconnaissance, and by incidental observation. This study occurred within the Project Boundary with emphasis on locations where suitable habitat and potential Project effects may intersect (Figure 3.0-1). This may include areas on the fringes of the Project reservoirs (including depressions in drawdown zones and littoral zones), Project recreation facilities (as defined in the RA-01 Recreation Use and Facility Assessment [City Light 2022f]), areas adjacent to Project facilities and study routes,² within the transmission line ROW, wetlands affected by ongoing Project operations, and wetlands hydrologically connected to the Skagit River between Diablo Powerhouse and the Sauk River confluence. Except as noted below, the study area does not include the fish and wildlife mitigation lands because no Project effects occur in these areas. In addition, previous amphibian egg mass surveys completed by City Light in 2011-2012 focused on detection of Oregon spotted frog covered wetlands on the properties and did not document Oregon spotted frog or any other special-status amphibians. Field reconnaissance and survey locations were determined based on the occurrence of suitable or possibly-suitable habitat, intersection with potential Project effects, and logistical constraints (e.g., safely accessible and permitted by the landowner, if located on private lands).

Based on these criteria, study sites were identified in the following categories:

- The fringes of the Project reservoirs. This category includes areas mapped as wetlands by the TR-02 Wetland Assessment (City Light 2022h) and seasonally-available habitats in the drawdown zone of Ross Lake (e.g., borrow pits that may hold pools of water when amphibians are breeding). Borrow pits and other features that hold water during drawdowns are discernible on available aerial imagery. Seasonal availability of habitat is based on LiDAR-derived elevation contours compared to lake water surface elevation data.
- Within the transmission line ROW. All the wetlands mapped by the TR-02 Wetland Assessment that occur at least in part within the ROW were evaluated (City Light 2022h). Certain aspects of the study, including mapping, habitat assessment, and (at some sites) surveys, were also applied to adjacent or contiguous areas of these wetlands extending outside of the Project Boundary. This approach provided for comparison of habitats within and outside of the ROW and additional opportunities for amphibian species detection. Most of the wetlands intersected by the ROW are situated on private property where field study required landowner permission to access. Final study sites were not located on private property unless requested landowner permission was first granted.
- Wetlands hydrologically connected to the Skagit River between Diablo Powerhouse and the Sauk River confluence. A hydrologic connection to the Skagit River was inferred for wetlands that were within the Federal Emergency Management Agency (FEMA) mapped 100-year floodplain. Study sites in this category included flooded borrow pit ponds on City Light land (i.e., the County Line Ponds and Newhalem Ponds [also known as the "Agg Ponds"]) and in the area between the confluences of the Sauk River and Illabot Creek. Within the latter area,

Study routes include segments of roads and trails within the Project Boundary maintained by City Light plus non-public roads and trails outside the Project Boundary that City Light uses to access the transmission line ROW and other City Light facilities that support the Project that are inside or outside of the Project Boundary. Segments of roads that are abandoned or serve to access private residences or farms were not included as study routes. The specific study routes included in the Special-Status Amphibian Study are based on the defined study area and objectives of this study.

the only areas within the Project Boundary are the fish and wildlife mitigation lands. Although there are no documented or suggested potential Project effects on these City Light properties, study sites were nonetheless designated at selected locations in or adjacent to some of the properties here to characterize the potential for special-status amphibians to occur. In addition, some study sites in this area were located on State-owned and other conservation lands (e.g., Skagit Land Trust) outside of the Project Boundary where access permission was granted, and at one site on private property that adjoined City Light fish and wildlife mitigation land where landowner permission was requested and granted.

No study sites were located in Big Beaver Valley upstream of the confluence with Ross Lake. Big Beaver Valley is included in the Project Boundary only due to the High Ross Treaty; current Project operations have no effect on the hydrology of these wetlands, which are located between about 0.85 to 2 miles from Ross Lake and 10 to 15 feet above the normal maximum water surface elevation of the lake, and no Project effects on amphibian populations have been documented.





4.0 METHODS

Potentially suitable habitat for special-status amphibians was identified and mapped within the study area using available information from a variety of sources listed below (as described in Section 2.6.1 of the RSP). Sites were then selected for additional field reconnaissance to collect more information on habitat conditions to verify or correct the preliminary habitat assessment (as described in Section 2.6.2 of the RSP) and to perform formal surveys where warranted (as described in Section 2.6.3 of the RSP). Maps and summary findings of the habitat assessment phase of the study were distributed to LPs for review and comment on June 9, 2021.³ For identified potential sites on private property, City Light contacted landowners to request access permission for the study. Sites for which access permission was not granted were not visited. Amphibians were identified and handled as necessary as described in Section 2.6.4 of the RSP.

4.1 Identify and Map Potentially Suitable Habitat

To identify habitats in the study area that might be suitable for special-status amphibians, the following primary information sources were reviewed to develop a preliminary, working map to inform the initial habitat assessment and guide the subsequent field phase of the study:

- Preliminary maps of wetlands from the TR-02 Wetland Assessment (City Light 2022h), which synthesized National Wetland Inventory, soil map, vegetation, and LiDAR-derived topographic data, in addition to information from other sources.
- Historical reservoir pool data for Ross Lake, aerial imagery during the 2018 drawdown, and LiDAR-derived contour maps to identify pools in the drawdown zone that might be seasonally suitable when amphibians are breeding.
- Site photographs from wetlands and other habitats visited to-date from the TR-02 Wetland Assessment, the TR-01 Vegetation Mapping Study, and the FA-03 Stranding and Trapping Assessment (City Light 2022g, 2022h, and 2022a).
- Previous amphibian surveys conducted by City Light biologists.
- Incidental observations reported other studies (e.g., TR-01 Vegetation Mapping Study and TR-02 Wetland Assessment fieldwork) and City Light work crew observations.
- Publicly available (Google Earth) aerial imagery.
- Landscape and watershed characteristics (pertinent to potential occurrence of Oregon spotted frog; described further below).

The Geographic Information System (GIS) map platform included data from the preliminary TR-02 Wetland Assessment maps with links to field photos and datasheets. Information derived from aerial imagery and the other sources listed above was used to review each mapped wetland. This working map also included property ownership categories and a separate road and trails map was

³ To conduct surveys within the appropriate and relatively brief period when amphibian egg masses can be detected, this information was provided to LPs after the surveys at lowland sites were completed; however, no comments were received objecting to the selected sites or suggesting alternate or additional sites.

reviewed. Key information for the subsequent habitat assessment (Section 4.4.1) was annotated to the map.

City Light also fully considered information provided by NPS Aquatic Biologist Ashley Rawhouser on June 24, 2021 and thereafter (Rawhouser 2021), regarding amphibian observations from NPS surveys at sites on Ross Lake in 2021. The information provided was general in nature and did not include photographs.

4.2 Habitat Assessment

Prior to field work and to help determine where field work should occur, City Light assessed the existing information for the potential presence of suitable habitat for the three special-status species. This included use of screening criteria developed for Oregon spotted frog, which may also be generally applicable to the related Columbia spotted frog. The screening criteria were applied loosely and did not preclude subsequent surveys even when all criteria were not met. Field sites included the best available habitats within the study area, as well as sites that were clearly deficient to minimize possibility of a false negative and to provide information that may later be used to develop appropriate BMPs or PMEs. Comparable screening criteria have not been developed for western toad, although primary factors may include large wetlands with lakes or permanent ponds and presence of shallow, sloping edges. All wetlands mapped on the Project reservoirs, except those that are entirely forested, were evaluated and most (including all at Ross Lake) were field investigated, as described in Section 4.3 of this study report.

A GIS-based assessment for the potential presence of suitable habitat for Oregon spotted frog was performed, primarily focused on wetlands along the Project transmission line ROW and Skagit River floodplain between Gorge Powerhouse and the confluence of Sauk River. Because there are no known current or historical occurrences of Oregon spotted frog in these areas, wetland and landscape-level characteristics were compared to the same features of current, occupied areas; historical conditions, if known, at Washington sites where Oregon spotted frog is considered extirpated; and known features of current or historical sites in Oregon and British Columbia. This assessment was performed manually (i.e., not using a GIS model) with screening criteria adapted from Germaine and Cosentino (2004), updated with information from more recent summaries of occurrence patterns and discoveries of Oregon spotted frog in western Whatcom County since 2011 (Bohannon et al. 2012, 2016; Hallock 2013; Nyman, unpublished data; WDFW, unpublished data). The assessment was performed in late winter 2021 so that study site decisions and requests to landowners for access could be completed in time to allow field work during the appropriate period for detection of Oregon spotted frog egg masses—expected to occur approximately mid-March to the first week of April at lowland sites.

All wetlands along the transmission line ROW mapped by the TR-02 Wetland Assessment (City Light 2022h) were evaluated to determine whether they met the criteria for potential Oregon spotted frog habitat and whether a field visit was warranted. As indicated above, decisions regarding field visits were also informed by the potential for effects from Project operations (e.g., vegetation management in the ROW), but did not preclude examining wetlands that extended outside of the Project Boundary. Consistent with known habitat requirements and patterns of occurrence (historical and current), the assessment focused on the following factors:

- The presence of a palustrine emergent (PEM) Cowardin class wetland ("marsh") component with shallow water areas, particularly with openings or with short-statured vegetation and the potential to develop relatively warm water conditions (20-35 Celsius [°C] in late spring to summer). The required prevalence of the PEM component compared to other Cowardin classes within a wetland complex is unknown but presumably should be one of the predominant classes, with other seasonally suitable habitats associated with PSS (palustrine shrub-scrub), PAB (palustrine aquatic bed), PUB (palustrine unconsolidated bottom), POW (palustrine open water), PFO (palustrine forested), and certain associated lacustrine open water and riverine classes. Wetlands entirely comprised of PFO are not known to be used by Oregon spotted frog in the absence of adjacent and connected PEM wetlands.
- Presence of permanent water in at least part of the wetland or an aquatic connection to permanent water. Oregon spotted frog is highly aquatic and does not occur where there is no access to permanent water.
- Wetland area of at least 8.9 acres or aquatic connection to other wetlands totaling at least 8.9 acres. This criterion was developed by Germaine and Cosentino (2004), who applied a 25 percent buffer to the smallest known wetland (11.9 acres) with a known Oregon spotted frog population. Smaller wetlands were considered possible if other habitat factors were favorable or if there was evidence that wetland area had been recently reduced.
- The presence of an aquatic connection in the form of a low-gradient stream of sufficient size to be represented in the available GIS stream data (i.e., a "mapped stream") was also considered separately as a habitat element. All the currently known occupied sites in Washington are associated with perennial and intermittent streams, which provide seasonal life stage habitats and are used as movement corridors.
- Landscape and watershed characteristics comparable to known historical or currently occupied watersheds. All known Oregon spotted frog populations in western Washington are or were associated with areas of low topographic relief, including relatively wide valleys of large streams or tributaries of large streams, as well as the margins of lowland lakes. This apparent association may be related to the relative abundance of wetlands in these watersheds and the likelihood that suitable habitats have existed in these watersheds over very long periods, even if conditions at individual wetlands within the watershed have changed over time.
- Site history that could have maintained suitable oviposition habitats since the onset of Euro-American habitation, and particularly since the introduction of invasive reed canarygrass (*Phalaris arundinacea*). Suitable oviposition habitat is associated with sun-exposed, shallow water with low-growing vegetation or taller-growing but matted-down, annual stems. This includes areas maintained as non-forested by hay production, grazing, or agriculture. Beaver (*Castor canadensis*) activity may also help maintain suitable habitat at some sites.
- Relatively low level of landscape development for residential, commercial, industrial, or transportation. For this study and based on a visual estimate, wetlands surrounded by more than 9.8 percent of the area within a radius of 1 mile in these developed categories were assigned low potential suitability. This criterion was developed by Germaine and Cosentino (2004) based on low levels of development (primarily rural residential and associated roads) at known occupied sites.

Maps and summary findings of the habitat assessment were distributed to LPs for their review and comment on June 9, 2021.

4.3 Field Reconnaissance and Surveys

Initial field work for the study was timed to correspond to the season in which Oregon spotted frog egg masses, if present, could be detected.⁴ Field timing was also appropriate for the detection of egg masses of other common amphibian species, especially Pacific chorus frog (*Hyliola* [*Pseudacris*] regilla), northern red-legged frog (*Rana aurora*), and northwestern salamander (*Ambystoma gracile*). Because of logistical considerations and the need to complete egg mass surveys within the appropriate period, site descriptions and surveys were typically completed on the same visit. At some sites, effort was limited to a field reconnaissance where additional information was needed to verify the results of the GIS-based habitat assessment, consistent with the study plan. Field reconnaissance differs from a formal survey (described below), as field reconnaissance allows for a relatively quick assessment of site conditions and logistical considerations, prioritization of areas for sampling, and initial species observations. Potentially suitable habitats were sufficiently surveyed to determine species occurrence, identify the target species, and collect additional information on life history habitat use and relative abundance.

Prior to initiating field surveys, NPS and Washington State Scientific Collection Permits were obtained specific to the study, and all the surveyors adhered to the guidelines stipulated in the permits. Qualifications included prior amphibian survey experience, familiarity with the target species and other amphibian species that may occur, and identification of species by life stage. Field activities adhered to accepted field-gear cleaning and disinfection procedures to prevent the spread of amphibian pathogens (e.g., Murray et al. 2011) and aquatic invasive species (AIS), including AIS plants. Procedures are described in City Light's AIS Prevention Best Management Practices plan (City Light 2019). The plan includes procedures for inspection and decontamination of boats and field gear. Dip-nets, boots, waders, and other field gear were cleaned and disinfected prior to each field period with a freshly prepared solution of an approved disinfectant (quaternary ammonium [Quat-128] or Virkon-S). Gear used at multiple sites during a day were cleaned and disinfected between sites, unless the sites were associated with the same water body (e.g., the same reservoir or the same stream system). Felt-soled wading boots were not used. For work on Ross Lake, the City Light permanently moored boat was used.

Formal amphibian survey methods included visual encounter surveys (VES) and dip-netting, following procedures described in Olson et al. (1997).⁵ VES is a general methodology for detection and enumeration of target species and life stages in suitable habitat if appropriately timed. A VES for amphibians provides data on the number and developmental stages of egg masses, larvae, and post-metamorphic stages (juveniles and adults) of each species observed in situ or captured by dip-

⁴ In 2021, Oregon spotted frog egg laying occurred at sites in western Whatcom County (Samish River and lower South Fork Nooksack River basins) from March 7 until about March 30, 2021, and egg masses were still detectable until at least mid-April, including locations where hatchlings were concentrated on egg masses (Nyman, personal observation).

Section 2.6.3 of the RSP noted that City Light may supplement VES and dip-netting with use of aquatic funnel traps to capture larvae. Aquatic funnel traps were not used because NPS, the primary permitting authority for sites within the North Cascades National Park Complex, did not authorize their use in the park complex. Surveys outside of the park complex were not affected but also did not require use of trapping because surveys in those areas emphasized detection of egg masses before hatching.

net by searching for a prescribed period. Survey timing was based on when and how easily target species and life stages can be detected, especially in areas not previously surveyed. The primary species and life stage targets for surveys along the Project transmission line ROW and in the Skagit River floodplain upstream of the Sauk River confluence were (1) egg masses of Oregon spotted frogs and (2) egg masses of other common spring-breeding amphibian species (these areas are not within the known or expected range of Columbia spotted frog). At sites in the latter areas where surveys were warranted, methods followed the egg mass survey procedures of WDFW's (undated) "Survey Protocol for Detecting Presence of Oregon Spotted Frogs by Identifying Oviposition Sites." This methodology is recommended and accepted by WDFW and USFWS in Washington State, is effective, can be performed with little or no handling, has low risk of adversely affecting the species or its habitat, and provides information on Oregon spotted frog presence and an estimate of adult population size. With this method, presence of Oregon spotted frog may be detected with a single, well-timed survey or may require multiple surveys if the first survey occurs too early. All observations of amphibian species of any life stage, including auditory detections of adult frogs, were documented. Except for one site within the Illabot Slough fish and wildlife mitigation property that was not surveyed during the spring breeding period, surveys along the transmission line ROW did not include dip-netting for larvae.

At lowland sites west of the Cascade Crest outside of the range of Columbia spotted frog, photographs of ranid egg mass clusters are considered definitive evidence of Oregon spotted frog, especially if tracked to hatching (WDFW, undated). (Oregon spotted frog is the only ranid species in lowland western Washington that lays eggs communally.) An experienced surveyor can differentiate Oregon spotted frog egg masses from egg masses of the northern red-legged frog, the only similar egg masses at lowland sites.

Site visit timing along the Project transmission line ROW was not specifically designed to detect western toad breeding. A summary account of western toad in the Washington Herp Atlas (WNHP et al. 2009; primary sources not indicated), which is repeated elsewhere (e.g., WDFW 2015), indicates that "in general breeding starts in mid-April" in lowland western Washington. The accuracy or applicability of this general statement to the study area is uncertain, particularly given the variety of habitats used by western toad and this species' apparent flexibility in breeding phenology. However, adult and juvenile western toads can be detected at aquatic sites after spring emergence prior to breeding.

On Ross Lake, target species included Columbia spotted frog and western toad. For spotted frogs of both species at higher elevation and within interior regions (which may be applicable to Ross Lake), adult and juvenile stage frogs are considered the most easily detected stage and for the longest period; larval stages may be localized, but can be detected for three months or more; and egg masses are most difficult to detect because they may be present at some sites for only two to four weeks, a period sometimes difficult to predict, and may be concentrated in one or just a few locations (Pearl et al. 2010; Rombough 2012). Appropriate survey timing at Ross Lake may be complicated by rising water levels during the spring to early summer that flood pools in the drawdown zone if these areas are used by breeding amphibians. Because available information was inadequate to predict the expected timing of western toad breeding at Ross Lake or other locations in the study area (including no prior reported detections of breeding activity or egg strings), surveys emphasized detection of tadpoles, as well as sightings of adult and juvenile toads during surveys. Additional surveys in 2022 will build on information collected in 2021, including

detections of aggregations of adult males exhibiting pre-breeding activity as reported to City Light by NPS (Rawhouser 2021).

All amphibians found during surveys, as well as incidental detections during other studies, were identified and recorded, including numbers of observations by species, life stage and location information and, if possible, documented by photographs and photographs of habitat. Although field methods were focused on the two spotted frog species, they were generally applicable to detecting other species that may occur.

Field surveys were conducted under appropriate temperature and weather conditions that allow for observations, avoiding periods of heavy rain or wind. Surveys on warm (20-30°C), sunny or partial sunny days with minimal wind, generally provide the best opportunity to observe post-metamorphic spotted frogs of either species. Multiple survey visits were performed at some sites to account for seasonal differences in detection and to describe timing of major life history events. A subsequent survey was not performed if the first site visit indicated the site was unsuitable for the target species. In addition to the surveys performed herein, the study-lead accompanied NPS Aquatic Biologist, Ashley Rawhouser, on a July 8, 2021 night survey along the edge of Ross Lake between the international border and the mouth of Hozomeen Creek.

Data recorded during amphibian surveys included macrohabitat type description, survey method(s), weather (current and within past 24 hours), air temperature (start and end), water temperatures, and search area or distance. Search paths were typically recorded as Tracks by a handheld consumer-grade Global Positioning System (GPS) unit, although some search paths were not recorded where the field personnel searched separately or where complete area searches were performed. In these cases, start and end points were recorded by GPS. Habitat data included primary substrate, dominant vegetation, emergent vegetation cover (percentage), water color and turbidity (qualitative).

As described in Section 2.6.4 of the RSP, amphibians were identified in the field based on information contained in Jones et al. (2006), Altig et al. (undated), Rombough (2012), and authoritative on-line sources (e.g., <u>https://whatfrogs.wordpress.com</u>), as well as personal experience of the lead investigator. Identification of ranid tadpoles includes reference to labial tooth row formulae and other technical differences, which may vary according to stages of development. To provide for vouchered identification, enumeration, and measurement, samples of tadpoles were photographed in a glass bowl along with a ruler.

The following protocols applied to documenting survey results and incidental sightings, including proper handling of amphibians. Prior to possible capture and handling of amphibians, the surveyor's hands were cleaned of any chemicals (e.g., insect repellant, perfumes, lotions, etc.) or residue of a previous amphibian capture, rinsed with water, and kept moist during handling. Tadpoles are delicate and were handled as little as possible (e.g., tadpoles captured by dip-net were viewed within the net or a smaller aquarium net and transferred directly to a water-filled glass tray or clean zip-lock plastic bag). All captured amphibians were released alive at collection sites immediately after data collection.

Additional surveys following (as applicable) the same methods described in the RSP and herein will be performed in 2022 to complete the investigation of specific sites where more information

is needed. This includes sites on Ross Lake, especially at the north end, beginning earlier in the year than in 2021 and building on information collected to-date. City Light has requested information from NPS regarding the locations, dates, and findings of amphibian surveys at Ross Lake in 2021 to plan the amphibian study efforts in 2022. If provided, this information may inform the survey schedule and locations and would be referenced in the USR. The surveys in 2022 will focus on lakeshore wetlands and pools in the drawdown zone at the north end of the lake up to the international border at or near where NPS reported observing unidentified ranids (adult frogs or tadpoles). In addition, surveys will be performed to collect more information regarding presumed western toad breeding locations at Ross Lake, Newhalem Ponds, and County Line Ponds. Additional, follow-up field work could also be warranted if there are incidental observations of special-status amphibians at other locations in the study area early in 2022 that require further investigation.

Site findings in 2021 did not warrant consideration of the use of environmental deoxyribonucleic acid (DNA; eDNA) sampling to detect spotted frogs but remains an option if site results are inconclusive and might be resolved by use of this method. At each site where warranted, three replicate 1-liter water samples will be collected, and each sample will be passed through filter membranes and analyzed for eDNA by a qualified genetics laboratory.

If spotted frog life stages are not found at sites associated with Project reservoirs with suitable breeding habitat, these sites or a representative sub-sample of these sites will be sampled for the presence of Columbia spotted frog and Oregon spotted frog eDNA (as described in Section 2.6.3 of the RSP).

If possible, and if detections of either spotted frog species occur in 2022, the following documentation procedures will be followed as appropriate (as described in Section 2.6.4 of the RSP). In practice, spotted frogs are typically distinguished by differences in geographic range of the two spotted frog species, not by differences in morphology, coloration, or behavior, because the two species are presumed to occur in different areas, without overlap or a zone of contact. However, the findings of Ovaska et al. (2019) suggest there may be a limited area of contact, requiring other approaches to differentiate the species.

To address identification issues in areas within the range of Columbia spotted frog, ranid frogs found during the study in 2022 will be documented, when possible, with photographic vouchers that include dorsal, ventral, and lateral views. For spotted frogs (adults, juveniles or young-of-year) found at sites associated with the Project reservoirs, the surveyors will also take a skin swab sample for DNA analysis.

Similarly, where identification is uncertain, tissue samples will be collected from tadpoles (i.e., the tip of the tail removed with sterile dissecting scissors) and from egg masses (i.e., a small number of individual embryos removed from the egg mass jelly). These tissue samples or skin swabs will be collected in separate, labeled, sterile vials when spotted frog life stages are found and will be preserved for genetic analyses. Samples will be provided to a laboratory recommended by WDFW that is qualified to make identifications. If embryos are collected for genetic analysis, the number of embryos will include no more than five per egg mass.

Where possible, observations in 2022 will be supported by photographs of the animal *in situ* prior to capture. Oregon spotted frog and Columbia spotted frog are remarkably tolerant of a gradual, close approach for photographing and capture. A well-practiced surveyor will slowly approach and capture the frog by hand or dip-net (depending on the size of the frog, water depth, skill of the surveyor, etc.). Captured frogs may be temporarily held (ideally for 30 minutes or less) in separate, clean containers (e.g., zip-lock plastic bags) through which initial photographs may be taken. When handled for photographs, spotted frogs will be held gently, but securely around or slightly below the "waist" with the legs outstretched on the palm, so that the frog cannot kick or twist itself free and, for large frogs, using the other hand to support the upper part of the frog. Frogs will be photographed from multiple views and measured.

For frogs being sampled for DNA, the surveyor will use a new pair of disposable gloves when handling frogs. Frogs will be swabbed 30 times on the underside with a sterile cotton swab to dislodge skin cells. Swabs will be air-dried and placed within individual, labeled, pre-sterilized vials. Frogs will then be released at the original capture location. Samples will be held in a dark, cool place (e.g., a cooler) until analysis.

5.0 **PRELIMINARY RESULTS**

5.1 Transmission Line Right-of-Way

5.1.1 Oregon Spotted Frog Habitat Assessment

All 75 mapped wetlands intersected by the Project transmission line ROW are shown in the Attachment A mapbook. None of these mapped wetlands met all the criteria for potential Oregon spotted frog habitat (Table 5.1-1). Although a majority of the wetlands (50 of 75, or 66.7 percent) had a discernible PEM component, they included (1) pastures and hayfields with no indication of substantial standing water or apparent connection to other suitable seasonal habitat; (2) small wetlands that did not meet the area criterion; (3) isolated wetlands not connected to a stream or adjacent to other wetlands; (4) sites surrounded by high levels of landscape development; or (5) sites where PEM did not represent potential habitat (e.g., areas dominated by common cattail [*Typha latifolia*] and/or unmanaged reed canarygrass). Farmland was categorized as outside the area of potential Project effects because the vegetation characteristics in the ROW are maintained by agricultural land use and no Project vegetation management occurs. Most of the mapped wetlands (about 80 percent of the total) include areas outside of the Project Boundary, often a much larger area than within the ROW.

Overall, the most common vegetation type on wetlands within the ROW was a dense cover of hardhack (*Spiraea douglasii*), which does not represent suitable oviposition habitat for Oregon spotted frog. Many of these shrub areas may only be non-forested because of ROW vegetation maintenance or have developed wetland characteristics since the line was constructed, including areas where the access roads have impeded drainage or where roadbed construction required excavation. In addition, some wetlands associated with roadbeds or railroad-beds unrelated to the Project are likely of relatively recent origin, and there are no other habitats nearby that could have supported an Oregon spotted frog population before that time.

None of the wetlands share the landscape and historical characteristics of known occupied watersheds in western Washington that allow for extensive and persistent emergent wetlands. These occupied watersheds feature low gradient streams in wide, flat valleys, historical and current land use dominated by livestock grazing or hay production, and low levels of development. Glacial-era connections between the Nooksack, Samish, and Skagit basins, and between the Nooksack, Sumas, and lower Fraser basins, formed oversized, connected valleys along the lower South Fork Nooksack, Samish, and Sumas rivers, where populations of Oregon spotted frog were discovered in 2011-2012—the only watersheds added to the species' known range since 1990.

Only 14 of the 75 wetlands (28 percent) met both the 8.9-acre area criterion (or were connected to other wetlands to meet the area criterion) and had a discernible PEM component, but, even here, none of the remaining wetlands were comparable to any known Oregon spotted frog sites. Excluding wetlands that were located on farmland or were not accessible for field work, and a wetland located within the impact area of the 2017 Oso landslide, seven sites that met the area and PEM component criteria were selected for a field visit to confirm the assessment and, if warranted, to perform an egg mass survey. Four other wetlands smaller than 8.9 acres were also considered for a field visit based on apparent suitability for common amphibians. Three of these locations were accessible (requested landowner permission for the fourth site, located on private property,

was not granted). The 10 sites identified for field work included five sites at least partly on City Light property. All 10 sites had a high probability for the presence of common amphibian species.

Table 5.1-1.	Summary of GIS-based habitat assessment results for the occurrence of potential Oregon spotted frog habitat along the
	Project transmission line ROW.

Wetland ID ¹	Wetland Class(es) ²	Area ³ (acres)	Required Habitats Present? Summary of Other Considerations	Field Visit Warranted	Site
3695	PSS	4.18	No. Small area, shrub-dominated; lacks permanent water or significant emergent wetland component. No mapped stream connection. In area with high level of landscape development.	No	N/A
50	PSS	1.83	No. Small area, shrub-dominated; lacks significant emergent wetland component. No mapped stream connection. In area with high level of landscape development.	No	N/A
3693	PEM/PSS	0.15	No. Small area of seasonally flooded depression with mowed grass. Appears to lack permanent water. No mapped stream connection. In area with high level of landscape development.	No	N/A
60	PEM - NR	12.70	No. Cultivated fields with ditches. No Project vegetation management within the wetland. (Not visited during TR-02.)	No	N/A
100	PFO/PSS/ PEM	6.94	No. Small wetland is mostly forested outside of the ROW and shrub-dominated in the ROW. Primary emergent class species are common cattail and reed canarygrass. No mapped stream connection. In area with high level of landscape development.	No	N/A
122	PFO/PSS/ PEM	0.40	No. Small, probably seasonal wetland between industrial area and US 2. Primary emergent class species are common cattail and reed canarygrass. No mapped stream connection.	No	N/A
130	PEM/PSS	3.22	No. Small area, mostly shrub-dominated; probably lacks permanent water. Primary emergent class species is common cattail. No mapped stream connection. In area with high level of landscape development.	No	N/A
3961	PEM/PSS	0.74	No. Small area, mostly shrub-dominated and probably lacks permanent water. No mapped stream connection. In area with high level of landscape development. (Not visited during TR-02.)	No	N/A
3957	PEM/PSS	4.42	No. Small area, mostly shrub-dominated and some common cattail. No mapped stream connection. In area with high level of landscape development.	No	N/A
3956	PSS	5.98	No. Small area with emergent component, but with no apparent suitable shallow edge. No mapped stream connection. In area with high level of landscape development.	No	N/A
3955	PEM/PSS	1.20	No. Small area, mostly shrub-dominated; emergent consists of unmanaged reed canarygrass; likely lacks permanent water. No mapped stream connection. In area with high level of landscape development.	No	N/A
3954	PEM/PSS	4.12	No. Small area, shrub-dominated, with common cattail in the emergent component. Likely lacks permanent water. No mapped stream connection. In area with high level of landscape development.	No	N/A
214	PFO/PSS/ PEM	18.37	Unlikely. Within a forested corridor where wetland area is limited by a narrow valley; between Lake Stevens and Snohomish River sloughs; surrounded by high level of landscape development, including major roads. However, is beaver-influenced habitat with a significant emergent wetland component and located on a mapped stream. Probable habitat for other amphibians and is accessible. (Not visited during TR-02.)	Yes	T1

Wetland ID ¹	Wetland Class(es) ²	Area ³ (acres)	Required Habitats Present? Summary of Other Considerations	Field Visit Warranted	Site
225	PEM/PSS	1.12	No. Small, isolated wetland with limited habitat value located proximate to State Route (SR) 9. No mapped stream connection. In area with high level of landscape development.	No	N/A
229	PFO/PSS	10.53	No. Shrub-dominated (with unmanaged reed canarygrass) within ROW and forested outside of ROW. No mapped stream connection. In area with high level of landscape development including major roads. No water visible in field photos from TR-02.	No	N/A
276	PSS	4.49	No. Small area, shrub-dominated with no discernible emergent component; connected to forested wetlands. May be connected (at headwaters) to a mapped stream. Except for area near Martha Lake, wetland is surrounded by high level of landscape development. (Not visited during TR-02.)	No	N/A
290	PSS	1.59	No. Small, shrub-dominated wetland with no discernible emergent component. No mapped stream connection. Except for area near Martha Lake and north of Lake Cassidy, surrounded by high level of landscape development. (Not visited during TR-02.)	No	N/A
302	PEM/PSS	0.66	No. Small, mostly shrub-dominated wetland with cattail. No mapped stream connection. Surrounded by moderately high level of landscape development, including major roads.	No	N/A
318	PEM/PSS	17.59	Unlikely. No mapped stream connection. Surrounded by moderately high level of landscape development, including major roads. However, is beaver-influenced habitat with a significant emergent wetland component. Probable habitat for other amphibians and is accessible.	Yes	T2
323	PEM	13.56	Unlikely. Categorized as farmland with no Project vegetation management. No mapped stream connection, but likely connected to wetlands 327 and 326. Surrounded by moderately high level of landscape development, including major roads. (Not visited during TR-02.)	No	N/A
327	PEM	5.08	Unlikely. Categorized as farmland with no Project vegetation management. Appears to be a grazed field within the ROW, wetter outside of the ROW. No mapped stream connection but likely connected to wetlands 323 and 326. Surrounded by moderately high level of landscape development, including major roads. (Not visited during TR-02.)	No	N/A
326	PEM/PSS	11.56	No. Mostly shrub-dominated in the ROW with an emergent component west of the ROW. No mapped stream connection but likely connected to wetlands 323 and 327. Surrounded by moderately high level of landscape development, including major roads. (Not visited during TR-02.)	No	N/A
4016	PEM/PSS	4.55	No. Small, shrub-dominated wetland with an emergent component (seasonal?). No mapped stream connection. Surrounded by moderately high level of landscape development, including major roads. However, probable habitat for other amphibians and is accessible (located on City Light land, in part).	Yes	Т3
363	PFO/PSS	19.75	No. Shrub-dominated within ROW, with no discernible emergent component. No mapped stream connection. Surrounded by moderately high level of landscape development, including major roads.	No	N/A

Wetland ID ¹	Wetland Class(es) ²	Area ³ (acres)	Required Habitats Present? Summary of Other Considerations	Field Visit Warranted	Site
379	PEM/PSS	13.23	No. Categorized as farmland with no Project vegetation management. Appears to be a grazed field with ditches. No mapped stream connection. Surrounded by moderately high level of landscape development, including major roads. (Not visited during TR-02.)	No	N/A
441	PFO/PSS/ PEM	185.25	Unlikely. Surrounded by moderately high to high level of landscape development except for forested or shrub-dominated areas northwest and southeast of Olson Lake. In part connected to a mapped stream. Mostly shrub-dominated within ROW, with significant emergent and open water components (including Olson Lake) more than 500 feet from the ROW. Probably beaver-influenced. Mapped area appears to combine wetlands in two adjacent watersheds. Very large wetland area with probable habitat for other amphibians but may not be fully accessible (multiple private properties).	Yes ⁴	T4
437	PFO/PSS	6.88	Unlikely. Small area but includes two deep ponds with apparently steep edges. No mapped stream connection. Surrounded by moderately high level of landscape development. Probable habitat for other amphibians. May not be accessible (private property).	Yes ⁵	N/A
458	PEM/PSS	2.67	No. Small area with no significant discernible emergent component. Proximate to S.F. Stillaguamish River. Surrounded by moderately high level of landscape development. (Not visited during TR-02.)	No	N/A
4010	PEM/PSS	4.26	No. Small area categorized as potential farmland with no Project vegetation management. Connected or adjacent to a mapped stream. Surrounded by commercial forest land and rural development. (Not visited during TR-02.)	No	N/A
485	PEM	11.45	No. Categorized as farmland with no Project vegetation management. Area is a wet pasture or hayfield, with no indication of substantial standing water. Connected or adjacent to a mapped stream. Surrounded by commercial forest land and rural development. (Not visited during TR-02.)	No	N/A
483	PFO/PSS	1.52	No. Small area wetland which is almost entirely outside of ROW. Appears to be shrub-dominated within the ROW with no discernible emergent component. Connected or adjacent to a mapped stream. Surrounded by commercial forest land and rural development. (Not visited during TR-02.)	No	N/A
497	PFO	13.97	No. No discernible emergent component. Occurs along a mapped stream. Surrounded by commercial forest land and rural development.	No	N/A
514	PFO/PSS	6.42	No. Small area of forested and shrub-dominated wetland outside of ROW but includes emergent or open water areas in the ROW associated with beaver impoundments. Presumably connected at headwaters to a mapped stream. Mostly surrounded by commercial forest land. Probable habitat for other amphibians. Accessible (located on City Light land in part).	Yes	T5
519	PFO/PSS	8.61	No. Shrub-dominated within ROW, with no significant emergent component. Primary emergent class species are reed canarygrass and common cattail. Occurs on a mapped stream. Mostly surrounded by commercial forest land.	No	N/A

Wetland ID ¹	Wetland Class(es) ²	Area ³ (acres)	Required Habitats Present? Summary of Other Considerations	Field Visit Warranted	Site
535	PFO/PSS	7.81	No. Shrub-dominated within ROW, with no significant emergent component. Primary emergent class species is reed canarygrass. Occurs on a mapped stream. Surrounded by commercial forest land.	No	N/A
613	PFO-NR	14.58	No. Forested with no discernible emergent component. No mapped stream connection. No Project vegetation management within the wetland. No amphibians or reptiles observed. (Not visited during TR-02.)	No	N/A
625	PFO/PEM	18.54	No. Appears to be mostly shrub-dominated within ROW with a small emergent component associated with a drainage (probably beaver-influenced). Wetland is slope/depressional. No mapped stream connection. Mostly surrounded by commercial forest land except around Riley Lake and Riley Lake Road. (Not visited during TR-02.)	No	N/A
633	PEM/PSS	27.64	No. Shrub-dominated, lake fringe wetland around Riley Lake. No significant emergent component in the ROW; emergent component outside of the ROW (west end of lake) is part of the lake fringe. Mostly surrounded by commercial forest land except around Riley Lake and Riley Lake Road. No mapped stream connection. May be worth examining for other amphibians (but probably not suitable for western toad). May not be accessible (multiple private properties) except on ROW.	Yes	T6
3891	PFO/PSS/ PEM	1.33	No. Small area of shrub-dominated wetland with no indication of substantial standing water. Primary emergent class species are reed canarygrass, soft rush (<i>Juncus effusus</i>), and small-fruited bulrush (<i>Scirpus microcarpus</i>). May be connected to a mapped stream by wetland 650. Located on the margin of the N.F. Stillaguamish Valley but no large wetlands in the area. Surrounded by rural development and commercial forest land.	No	N/A
650	PSS-NR	5.16	No. Small wetland area categorized as potential farmland (wet pasture or hayfield) with no Project vegetation management. Includes a pond (stock pond?) in the ROW, which may be amphibian habitat. Occurs on a mapped stream. May be connected to wetland 650. Located on the margin of the N.F. Stillaguamish Valley but no large wetlands in the area. Surrounded by rural development and commercial forest land. (Not visited during TR-02.)	No	N/A
684	PSS-NR	3.47	No. Small wetland area categorized as farmland (wet pasture or hayfield) with no Project vegetation management. No indication of substantial standing water. No mapped stream connection. Located on the margin of the N.F. Stillaguamish Valley but no large wetlands in the area. Surrounded by rural development and commercial forest land. (Not visited during TR-02.)	No	N/A
717	PEM/PSS- NR	1.60	No. Small wetland area categorized as farmland (wet pasture or hayfield) with no Project vegetation management. No mapped stream connection. Located on the margin of the N.F. Stillaguamish Valley but no large wetlands in the area. Surrounded by rural development and commercial forest land. (Not visited during TR-02.)	No	N/A

Wetland ID ¹	Wetland Class(es) ²	Area ³ (acres)	Required Habitats Present? Summary of Other Considerations	Field Visit Warranted	Site
696	PFO/PEM	3.25	No. Small wetland area appears to be wet meadow proximate to pasture or hayfield. Adjacent or connected to a mapped stream. Located on the margin of the N.F. Stillaguamish Valley but no large wetlands in the area. Surrounded by rural development and commercial forest land. (Not visited during TR-02.)	No	N/A
713	PFO/PEM	1.65	No. Small wetland area appears to be mostly shrub-dominated. Adjacent or connected to a mapped stream. Located on the margin of the N.F. Stillaguamish Valley but no large wetlands in the area. Surrounded by rural development and commercial forest land. (Not visited during TR-02.)	No	N/A
848	PFO/PEM	12.93	No. Adjacent or connected to a mapped stream. Within the impact area of the 2014 Oso landslide. Primary emergent class species were common cattail, reed canarygrass, and soft rush.	No	N/A
818	PFO/PSS	10.47	No. Shrub-dominated in ROW and forested outside of ROW. No mapped stream connection. Within the impact area of the 2014 Oso landslide. Primary emergent class species were common cattail, lady-fern (<i>Athyrium filix-femina</i>), and soft rush.	No	N/A
971	PFO	1.06	No. Small wetland area, forested or shrub-dominated, with no discernible emergent component. No mapped stream connection. Located on the margin of the N.F. Stillaguamish Valley but no large wetlands in the area. Surrounded by rural development and commercial forest land. (Not visited during TR-02.)	No	N/A
884	PFO/PSS	1.37	No. Small wetland area, forested or shrub-dominated, with no significant emergent component. No mapped stream connection but includes area of flowing water with western skunk cabbage (<i>Lysichiton americanus</i>), hardhack, and slough sedge (<i>Carex obnupta</i>). Located on the margin of the N.F. Stillaguamish Valley but no large wetlands in the area. Surrounded by rural development and commercial forest land.	No	N/A
962	PFO/PSS	9.14	No. Forested or shrub-dominated, with no discernible emergent component within the ROW (ditches occur in cleared area outside of the ROW). No mapped stream connection. Located on the margin of the N.F. Stillaguamish Valley but no large wetlands in the area. Surrounded by rural development and commercial forest land. (Not visited during TR-02.)	No	N/A
918	PEM/PSS	15.19	No. Shrub-dominated but with a pond and emergent areas evidently associated with an unmapped drainage (possible beaver influence?). Surrounded by rural development and commercial forest land, with an open water and emergent feature on the south side of SR 530. Probable habitat for other amphibians. (Not visited during TR-02.)	No	N/A
915	PEM-NR	4.12	No. Small wetland area on a cleared site (land use uncertain) with no permanent water. No Project vegetation management within the wetland. No mapped stream connection. Surrounded by rural development and commercial forest land. (Not visited during TR-02.)	No	N/A
923	PSS-NR	0.14	No. Very small shrub wetland area separated by road from wetland 915. No Project vegetation management within the wetland. Surrounded by rural development and commercial forest land. (Not visited during TR-02.)	No	N/A

Wetland ID ¹	Wetland Class(es) ²	Area ³ (acres)	Required Habitats Present? Summary of Other Considerations	Field Visit Warranted	Site
858	PSS	7.71	No. Shrub-dominated in ROW and forested outside of the ROW with no discernible emergent component. No mapped stream connection. Surrounded by rural development and commercial forest land, with the other Fortson Pond to the east and N.F. Stillaguamish River to the north. (Not visited during TR-02.)	No	N/A
807	PFO	10.66	Unlikely. Although mapped as PFO, the wetland includes a large permanent pond. This and the proximate Fortson Mill Pond are presumably of anthropogenic origin. No mapped stream connection. Surrounded by rural development and the N.F. Stillaguamish River. Probable habitat for other amphibians. Although the ROW overlaps the south edge of the wetland, the ROW is located on higher ground and the pond is outside of the vegetation management area. (Not visited during TR-02.)	Yes	T7
776	PFO/PSS	38.58	No. Shrub-dominated in ROW, but with large area of deeper water (seasonal?) and an emergent component. No mapped stream connection. Surrounded by sparse rural development and WDNR forest land. Probable habitat for other amphibians.	Yes	Τ8
774	PSS	5.26	No. Shrub-dominated and with areas of early-stage regenerating forest within the ROW. Likely not as wet as wetland 776.	No	N/A
4007	PSS	2.63	No. Small wetland area, shrub-dominated with no significant discernible emergent component. Adjacent or connected to a mapped stream. Surrounded by commercial forest land and area with moderately high level of landscape development. (Not visited during TR-02.)	No	N/A
1529	PFO/PSS	1.87	No. Small riverine wetland area, with no discernible emergent component. Associated with flood water channel of the Sauk River. Surrounded by commercial forest land. (Not visited during TR-02.)	No	N/A
1564	PFO/PSS/ PEM	232.82	Unlikely. However, a very large and diverse wetland system, with significant emergent components. Parts are adjacent or connected to a mapped stream (Hilt Creek). Located at higher elevation (~1,000 feet on the ROW) and unlikely terrain for the target species. Surrounded by commercial forest land. Undoubtedly habitat for other amphibians.	Yes	T9
1584	PFO	3.74	No. Small wetland area, forested with no discernible emergent component. No mapped stream connection. Surrounded by commercial forest land. (Not visited during TR-02.)	No	N/A
1607	PSS	1.13	No. Small wetland area, shrub-dominated with no discernible emergent component. Adjacent or connected to a mapped stream. Surrounded by commercial forest land. (Not visited during TR-02.)	No	N/A
3999	PFO/PSS	0.02	No. Very small wetland area mostly outside of the ROW but connected to larger stream- or slough- associated wetlands west of the ROW. Surrounded mostly by forested fish and wildlife mitigation lands and commercial forest land.	No	N/A
3947	PFO/PSS	0.47	No. Very small wetland area mostly outside of the ROW but connected to larger stream- or slough- associated wetlands west of the ROW. Surrounded mostly by forested fish and wildlife mitigation lands and commercial forest land.	No	N/A

Wetland ID ¹	Wetland Class(es) ²	Area ³ (acres)	Required Habitats Present? Summary of Other Considerations	Field Visit Warranted	Site
3998	PFO/PSS	0.98	No. Very small riverine wetland in forested setting west of Illabot Slough, with emergent and shrub edges. Surrounded by forested fish and wildlife mitigation lands.	No	N/A
2297	PEM/PSS	0.89	No. Excavated permanent pond with mostly steep edges. No mapped stream connection but is connected by a channel to the proximate Skagit River. Surrounded by forested fish and wildlife mitigation lands and the Skagit River to the north. Surveyed by City Light in 2012, with detections of common amphibian species.	Yes	T10
2353	PEM-NR	7.42		No	N/A
2349	PEM-NR	4.02		No	N/A
3914	PEM-NR	3.19		No	N/A
3913	PEM-NR	1.49	No. All these wetlands on private properties appear to be pastures or hayfields, with no indication	No	N/A
2383	PEM-NR	2.14	of substantial standing water. Some are situated close to one another and may be connected. Most	No	N/A
2426	PEM-NR	10.49	are adjacent or connected to small, mapped streams, some of which are difched. Aerial imagery		N/A
2409	PEM-NR	1.52	within any of the wetlands. Surrounded by rural development, SR 20, and National Forest. (None	No	N/A
2442	PEM-NR	1.69	of these wetlands were visited during TR-02.)	No	N/A
2474	PEM-NR	8.80		No	N/A
2467	PEM-NR	1.40		No	N/A
2617	PEM-NR	5.72		No	N/A
2801	PFO-NR	1.89	No. Small wetland area, mostly outside of the ROW; forested with no discernible emergent component. Proximate to small, mapped stream. No Project vegetation management. Surrounded by rural development, SR 20, commercial forest land, and National Forest. (Not visited during TR-02.)	No	N/A

1 "Wetland ID" numbers correspond to labelled wetlands in the TR-02 Wetland Assessment (City Light 2022h). Also see Attachment A of this study.

2 "Wetland Classes" from TR-02 Wetland Assessment data (City Light 2022h): PEM - palustrine emergent; PSS - palustrine shrub-scrub; PFO - palustrine forested; NR - not rated by the Study (for wetlands intersected by the transmission line ROW, no Project-related vegetation management occurs).

3 "Area" is the total area of each wetland mapped by the TR-02 Wetland Assessment including the area within the Project Boundary and extending up to 0.5 miles from the Project Boundary (three mapped wetlands, Wetlands 214, 441, and 1564, extend beyond 0.5 mi and are larger than mapped) (City Light 2022h).

4 Requested access to multiple private properties. Access was granted to one property, which may not be representative of the larger wetland complex.

5 Requested access to private property which was not granted.

5.1.2 Site Descriptions and Survey Results

Field examinations were completed at 10 sites along the Project transmission line ROW (Attachment A) to describe habitats and to collect additional information, which is summarized in Table 5.1-2 and illustrated with representative photographs of habitats and other findings in Attachment B. With the exception of T7, which was outside of the area of potential Project disturbance and was not accessible to further survey without a boat, the field examinations were followed by a VES, even if sites were determined unsuitable for special-status species but suitable for other amphibians. Site visits were conducted on the following dates (in 2021): March 23, 24, 25, 26, and April 1, with one site (T9) surveyed on March 26 and revisited on April 5. As indicated above, this timing was consistent with the period when Oregon spotted frog egg masses were present at Oregon spotted frog sites in western Whatcom County, the nearest known extant populations. One of the selected transmission line ROW sites (T10) was overlooked during this early period and was not surveyed until June 24. Because of the later date, that survey focused on detection of amphibian larvae and post-metamorphic stages, not egg masses. T10 had been surveyed previously for amphibian egg masses by City Light on March 27, 2012, with no detection of Oregon spotted frog.

Sites were associated with wetlands that ranged in area from 0.9 to 232.8 acres. There were sites at the four largest wetlands: T9 at wetland 1564 (232.8 acres), T4 at wetland 441 (185.3 acres), T8 at wetland 776 (38.6 acres), and T6 at wetland 633 (27.6 acres). T1 and T2 were also associated with relatively large wetlands (18 and 17.6 acres, respectively). At two of these sites in Snohomish County (T4 north of Sisco Heights and T6 at Riley Lake), both of which occur on multiple private properties and extend far beyond the ROW, field investigation was limited to a small area on the ROW.

No special-status amphibians were detected during site visits along the Project transmission line ROW (Table 5.1-3). Also, there were no reported incidental observations of special-status species or other amphibians from other relicensing field efforts in this area in 2020 or 2021. Survey results were consistent with the expectations from the habitat assessment that common amphibian species would be found at the sites but not Oregon spotted frog. Although western toad was not detected at any of the sites, the most likely sites for this species include T4 and T9, the two largest wetland areas, which both include large permanent ponds well outside of the Project Boundary, and possibly T6, if suitable oviposition habitat occurs in areas not examined.

As expected, Pacific chorus frog, the most common amphibian in Washington, was detected at all 10 sites. Detections of Pacific chorus frog at four of the sites (TI, T2, T5, and T6) did not include egg masses, most likely because visits preceded the start of breeding. The detection of northwestern salamander at eight sites was also not surprising, although the habitat requirements of this species are more specialized. Northwestern salamander sometimes breeds in small numbers at sites that may not be suitable (i.e., at wetlands that dry before larvae can metamorphose), particularly if conditions that support successful reproduction occur elsewhere within the vicinity. This species was not detected at T7, where field work was limited to a site reconnaissance; the presence of northwestern salamander at this site can be safely assumed. The other site with no detection was T8, a large wetland that was only explored near the maintenance access road. However, T8 may not be suitable if the wetland dries annually, because northwestern salamander larvae usually require a second year to reach metamorphosis.

Northern red-legged frog was documented at only 4 of the transmission line ROW sites: T1, T5, T7, and T9. The species may also occur at other sites where surveys were limited in extent (e.g., T2, T4, and T6). In addition, northern red-legged frog often breeds in relatively deep water (e.g., attached to vegetation in water 1 to 2 m deep or occasionally deeper), areas that were not the focus of surveys because they do not represent potential oviposition habitat for Oregon spotted frog. The species likely occurs at T10, which was not surveyed during the period when egg masses would be present but was found during surveys by City Light in 2012 (when 1 egg mass was found). However, regardless of these sites, northern red-legged frog is likely absent from parts of the study area because of high levels of development, loss of forested habitat in the surrounding area, and fragmentation by roads, factors unrelated to the Project.

Noteworthy incidental wildlife observations at sites along the ROW were limited to observations of American beaver dams or other signs of beaver at three sites: T1, T2, and T5. Information regarding these observations was provided for the TR-09 Beaver Habitat Assessment (City Light 2022i).

Site	TR-02 Data ¹	TR-01 Data ²	Watershed	Land Ownership ³	Site Description		
T1	ID=214 PFO/PSS/PEM	G322, G851, G237	Snohomish	WSDOT, Private	Site is comprised of a series of beaver ponds associated with an unnamed drainage		
					west of Lake Stevens. Most of this 18.4-acre wetland is downstream (west) of the Project Boundary where no vegetation management or other Project-related activities are performed. Wetland is within ravine with steep slopes inside the ROW. Beaver dams were in poor condition (possibly abandoned) and water level appeared to have recently declined within the main pond in the ROW. Amphibian habitat may be better quality downstream west of the ROW, an area that was not surveyed. Shorelines along the main pool at the time of the survey were either steep and covered with reed canarygrass or gradually sloped with little or no vegetation. As such, areas of vegetated shallow water were largely absent. Reed canarygrass was the predominant emergent species in the ROW; other species included common cattail, soft rush, and small-fruited bulrush. Shrubs and sapling trees occurred on the edge of the ravine bottom. Water was turbid and primary substrate was silt/mud. Maximum depth estimated to be less than 1 meter (deep mud precluded wading into deepest areas). Main pool presumably holds water year-round. Water temperature during the March 23, 2021 survey was 10°C; air temperature was 14-16°C.		
T2	ID=318 PEM/PSS	G322, G851	Snohomish	SnoPUD No. 1	This 17.6-acre wetland is an active beaver impoundment on a small, unnamed		
					drainage. The impoundment is an active ocaver impoundment on a shiah, unhanced drainage. The impoundment is formed by a berm and beaver dam on the east side of the ROW and a former railroad bed on the north side of the wetland (now a community trail). Shorelines were mostly steeply sloped along the east berm/beaver dam and the north side, except west of the ROW where slopes were more gradual and shallower water occurred, although even here water was mostly more than 30 cm deep. Within the ROW where flooded, reed canarygrass, hardhack, common cattail, and water-purslane (<i>Ludwigia palustris</i>) were the predominant species. West of the ROW emergent vegetation included reed canarygrass, mannagrass (<i>Glyceria</i> sp.), and possibly other grasses, and the wetland is bordered by a mixed conifer-hardwood (red alder [<i>Alnus rubra</i>]) forest. Large snags also occurred west of the ROW in the flooded area. Water was clear and the primary substrate was silt/mud with a deep layer of organic material. Maximum depth was not determined but may exceed 2 meters. Site presumably holds water year-round. Water temperature during the March 23, 2021 survey was 10°C; air temperature was 16-22°C.		

Table 5.1-2. Summary habitat descriptions of study sites along the Project transmission line ROW.

Site	TR-02 Data ¹	TR-01 Data ²	Watershed	Land Ownership ³	Site Description
Т3	ID=4016 PEM/PSS	G322	Snohomish	City Light, Private	
					This is a relatively small (4.6 acre) wetland with no apparent stream connection or evidence of beaver presence; possibly associated with an excavation, soil compaction, and/or drainage that is impeded by the ROW service road. Vegetation was predominantly hardhack (approximately 80 percent of the mapped wetland) and common cattail, with no observed reed canarygrass. Shoreline was mostly steep except for a small part along the north edge. Water was clear and the primary substrate was sand/gravel. Maximum depth was about 1 meter. May dry seasonally, at least in some years. Water temperature during the survey was 5.5°C but likely develops warm water conditions early in the season (as evidenced by the large number of Pacific chorus frog egg masses observed during the March 24, 2021 survey); air temperature was 7°C.
T4	ID=441 PFO/PSS/PEM	G322, G524, G523, G240, G851, Open Water	Snohomish/ Stillaguamish	Private, BPA, City Light	Site 4 (where surveyed) is a depressional wetland with no stream connection or evidence of beaver presence. Vegetation was predominantly hardhack, with less than 10 percent reed canarygrass cover. Other low-growing species occurred,
					including hairyleaf rush (<i>Juncus supiniformis</i>), daggerleaf rush (<i>J. ensifolius</i>), western mannagrass, creeping buttercup (<i>Ranunculus repens</i>), and thumbweed (<i>Polygonum</i> sp.). The surveyed property included areas mowed or grazed by a donkey. Shoreline was mostly shallow and gradually sloped. Water was clear and primary substrate was silt/mud and organic material. Maximum depth was less than 1 meter. Likely dries seasonally or is greatly reduced. Water temperature on the April 1, 2021 survey was 14°C; air temperature was 12.5-14°C. <u>Note</u> : This site description is based on field examination of one property to which reite access was granted. The property may not be representative of the mapped
	ALL ALL ALL ALL ALL ALL ALL ALL ALL ALL				185.3-acre wetland, which appears to combine two separate systems, one in the Snohomish and the other in the Stillaguamish watershed. Aerial imagery suggests that other parts of the wetland to the north are mostly shrub-dominated within the ROW (except for a pond, possibly excavated) and more closely stream-associated. The north part of the mapped wetland also includes substantial emergent and open water areas all more than 500 feet from the ROW. The latter includes Olson Lake, which is in the Stillaguamish watershed.

Site	TR-02 Data ¹	TR-01 Data ²	Watershed	Land Ownership ³	Site Description
Т5	ID=514 PFO/PSS	G322, G237, Open Water	Stillaguamish	City Light, WDNR	Site 4 is comprised of a series of four impoundments along a small drainage that
					crosses the ROW; the largest pool (on the upstream/southeast side of the ROW) may be a borrow pit created during construction of the service access road, which acts a dam. The other pools are formed behind beaver dams. The beaver dams were good condition and other evidence of active beaver presence was observed. Most the 6.4 acre mapped wetland is within the ROW or southeast of the ROW. Shorelin of the pools were mostly steeply sloped with deep water. Although site vegetation included reed canarygrass, this species generally did not occur at the water's edg Predominant emergent and aquatic species included sedges (<i>Carex</i> spp pondweeds (<i>Potamogeton</i> spp.), soft rush, and common cattail, the latter two species mostly downstream of the service road. Maximum depth of pools was 1-2 meter Water was clear. Primary substrate was undetermined (obscured by silt an abundant submerged wood). All the pools appear to hold water perennially. Wat temperature during the March 25, 2021 survey was 7°C; air temperature was 10. 11°C.
Т6	ID=633 PEM/PSS	G322, G851, G648, Open Water	Stillaguamish	Private, WDFW	This is a shruh dominated, lake frings wetland that surrounds Pilay Lake. The field
					survey was confined to the ROW through which there is a paved public road and did not include the private properties around the lake. A small parcel owned by WDFW provides boater access to the lake. Although most of the 27.6-acre wetland was not examined in the field, aerial imagery suggests that dense hardhack is predominant, along with scattered willows or small trees, except at the west end of the lake where emergent species (possibly reed canarygrass and/or common cattail) are apparent. Shallow nearshore areas with low-growing vegetation on the margin of the lake are not evident. The only shallow flooded edge in the ROW was on the road shoulder, which may be periodically mowed. Otherwise, nearly all the ROW is covered with dense hardhack with scattered red-osier dogwood (<i>Cornus stolonifera</i>), except on either end of a culvert crossing where deeper open water occurred, bordered by reed canarygrass and a few small-fruited bulrushes. Water temperature during the March 24, 2021 survey was 6°C; air temperature was 7.5°C.

Skagit River Hydroelectric Project FERC No. 553
Site	TR-02 Data ¹	TR-01 Data ²	Watershed	Land Ownership ³	Site Description
Т7	ID=807	G322, G851,	Stillaguarnish	Stillaguamish	
1/	PFO	Open Water	Sunaguannish	Tribe, Private	Wetland 807 is situated almost entirely north of the ROW and was categorized by
					Study TR-02 as being outside of the areas of potential Project disturbance because no Project-related vegetation management occurs within the wetland. The 10.7-acre wetland was not visited during TR-02 but was rated by TR-02 as a Category II wetland. The transmission line towers are located on private residential properties on higher ground south of the wetland; if vegetation management occurs here at all, it may be limited to the top of the wooded slope that borders the wetland. Although the wetland was classified by TR-02 as palustrine forested, a large open water area occurs and is part of the Fortson Mill Ponds complex. The site was subject to a reconnaissance level examination of a limited area on the west shore well outside of the Project Boundary and remote viewing from the ROW. Viewed from a distance, the east shore of the pond may include areas of relatively shallow water; emergent vegetation appears to include reed canarygrass and a large patch of either small- fruited bulrush or slough sedge. Marsh cinquefoil (<i>Comarum palustre</i>) occurred on the west side of the pond, where egg masses of northern red-legged frog were found attached.
	ID=776 PFO/PSS	G322, G853, G240	Skagit (Sauk)	Private, WDNR, City Light, Sauk- Suiattle Tribe	This site is associated with a 38.7-acre wetland, large portions of which are outside of the ROW and were not examined in the field. Contiguous areas of forested wetlands mostly south of the ROW were also not examined. The entire wetland complex is bounded to the north and east by the prism of a road and to the south by an abandoned railroad line, which may impede drainage, although the wetland is not associated with a mapped stream. Construction of the ROW service road may have also contributed to wetland formation. Within the ROW the west half was mostly shallow (i.e., 30-35 cm deep and no more than 60 cm during the survey). Although wetland indicators in this section included beaked sedge (<i>Carex utriculata</i>) and hardhack, areas of bracken (<i>Pteridium aquilinum</i>), shallon (<i>Gaultheria shallon</i>), and terrestrial mosses suggested that flooding here is not persistent. The east half of the ROW was deeper (more than 1 meter deep) and presumably is flooded for a longer period. Vegetation in the east half was predominantly hardhack, but there were also large areas (deeper?) where no vegetation protruded above the surface of the water. The presence of Oregon fairy shrimp (<i>Eubranchipus oregonus</i>) in this part of the wetland suggests seasonal drying. The substrate was firm, and water was clear. Water temperature during the March 25, 2021 survey was 10°C; air temperature was 15°C.

Site	TR-02 Data ¹	TR-01 Data ²	Watershed	Land Ownership ³	Site Description
Т9	ID=1564 PFO/PSS/PEM	G322, G853, Open Water, G851	Skagit	Private, City Light, City of Seattle	Wetland 1564 is the largest wetland (i.e., 232.8 acres) that is intersected by the Project transmission line ROW, although most of the area is outside of the Project Boundary where no Project-related activities occur. Parts of the mapped wetland are
					closely associated with Hilt Creek and are presumed to be beaver influenced. The site is at or above 1,000 feet elevation. Along with locations in or proximate to the ROW, Hilt Lake and accessible road crossings outside the Project Boundary were examined in the field to characterize habitats and provide additional opportunities for species detection. Within the ROW the best conditions for amphibians were at the location depicted in the photo here, where vegetation was diverse and included low-growing species with annual stems (e.g., toad rush [<i>Juncus bufonius</i>] and scouring-rush [<i>Equisetum</i> sp.]), along with yellow pond lily (<i>Nuphar polysepala</i>), pondweeds, and common cattail; reed canarygrass was not apparent at this location. Water was clear. The primary substrate was a deep layer of silt/mud and organic material, often with abundant submerged wood. Maximum depth at this location was 9°C and air temperature was 12°C. (Other locations examined in the field outside of the Project Boundary included areas [e.g., Hilt Lake] with deeper water and fish.)
T10	ID=2297 PEM/PSS	G322, Open Water	Skagit	City Light	
					At 0.9 acre this was the smallest wetland area surveyed along the transmission line ROW. Most of the wetland area is a steep-sided, presumably excavated, permanent pond with a narrow fringe of associated emergent vegetation, mostly reed canarygrass. Upland shrubs, including Himalayan blackberry (<i>Rubus bifrons</i>), also closely overhang the edge of the pond. Most of the pond was too deep for emergent vegetation and aquatic vegetation was sparse. A channel at the west end of the pond connects to the Skagit River. Water was clear. The primary substrate was cobble with organic material. Maximum depth was more than 2 meters. Water temperature during the June 24, 2021 survey was 12°C; air temperature was 26°C. Fish (Coho [<i>Oncorhynchus kisutch</i>] and three-spine stickleback [<i>Gasterosteus aculeatus</i>]) were numerous.

Information from TR-02 Wetland Assessment (City Light 2022h): ID - Wetland ID number; PEM - palustrine emergent; PSS - palustrine shrub-scrub; PFO - palustrine forested.

- 2 Mapped vegetation types within wetlands from TR-01 Vegetation Mapping Study (City Light 2022g): G240 North Pacific Maritime Douglas-fir-Western Hemlock Forest Group; G322 - Vancouverian Wet Shrubland; G851 - North Pacific Lowland Riparian Forest and Woodland Group; G853 - North Pacific Maritime Hardwood-Conifer Swamp; G648 - Southern Vancouverian Lowland Ruderal Grassland and Shrubland.
- 3 Land Ownership: WSDOT Washington State Department of Transportation; WDFW Washington Department of Fish and Wildlife; SnoPUD No. 1 Snohomish County Public Utility District #1; BPA Bonneville Power Administration.

		Survey	E	gg Masso	es ²	Othe	r Life S	tages ²	
Site	Survey Date(s)	Type/ Survey Effort ¹	NWS	PCF	RLF	NWS	PCF	RLF	Survey Notes
T1	03/23/21	VES 3.0 PHr	8	0	2	-	A (1) V	A (1)	Surveyed throughout the ROW but not downstream west of the ROW. Heard a few Pacific chorus frogs.
T2	03/23/21	VES 2.0 PHr	13	0	0	-	A (3) V	-	Surveyed from the edge of long berm/beaver dam at east end of the wetland and shallow areas accessed from the trail on north side. Water in most of the site was too deep to survey. Heard a few Pacific chorus frogs.
Т3	03/24/21	VES 1.5 PHr	2	>50	0	-	-	-	Surveyed site within City Light property. Steady light rain during the survey.
T4	04/01/21	VES 1.25 PHr	2	>80	0	-	A (1)	-	Surveyed one private property on ROW within large wetland site (landowner permission to survey was not granted elsewhere).
T5	03/25/21	VES 3.0 PHr	31	0	29	-	A (1) V	-	Surveyed throughout the ROW and outside the ROW to the east. Heard a few Pacific chorus frogs.
T6	03/24/21	VES 0.5 PHr	2	0	0	-	V	-	Survey limited to ROW next to road. Most of the wetland is on private properties surrounding Riley Lake. Light rain during the survey. Heard a few Pacific chorus frogs.
Τ7	04/01/21	Recon	0	1	5	-	-	-	Did not do formal survey (reconnaissance only) because the wetland was almost entirely outside of the ROW (the maintained ROW line is located on higher ground east of the wetland); survey would also require a boat.
T8	03/25/21	VES 4.0 PHr	0	>>100	0	-	A (>20) V	-	Surveyed accessible areas in the ROW proximate to service road; some areas were too deep to survey. Pacific chorus frogs egg masses were abundant so did not attempt to enumerate. Oregon fairy shrimp present.
Т9	03/26/21	VES 3.5 PHr	0	0	11	-	V	-	Surveyed within and proximate to the ROW and more distant areas accessible from roads. Heard large chorus of Pacific chorus frogs, which had not yet begun to breed. Because northern red-legged frog egg masses were very recent, decided to survey the site again the following week.
	04/05/21	VES 3.5 PHr	5	13	14	-	A (3) V	-	Repeated survey proximate to the ROW. Also surveyed at Hilt Lake (fish observed) which is within the same wetland but distant from the ROW.
T10	06/24/21	Dip-net 1.75 PHr	N/A	1	N/A	L (2)	L (3)	-	VES and dip-netting along the north and east margins of a deep pond with mostly steep shorelines. City Light performed an egg mass survey of the site on 3/27/12, when 23 northwestern salamander (<i>Ambystoma gracile</i>) and 1 northern red-legged frog egg mass were found. Fish numerous.

Table 5.1-3.	Summary of amphibian survey results at sites along the Project transmission line ROW.
	Summary of amphibian survey results at sites along the respect transmission me rest.

- 1 Survey type: VES visual encounter survey (at T1-T9 focused on detection of egg masses); Recon reconnaissance; Dip-net -VES with intensive dip-netting performed later in the year. Survey effort: PHr person hours (i.e., search time multiplied by the number of surveyors).
- 2 Species and life stages: NWS northwestern salamander; PCF Pacific chorus frog; RLF northern red-legged frog; A adult; L larval stage; V frog vocalizations heard; N/A not applicable (egg masses of early breeding amphibians were already hatched and undetectable by the time of the survey).

5.2 Skagit River Floodplain Wetlands

Mapped wetlands in the area associated with the Skagit River floodplain in the section between Gorge Powerhouse and the confluence of the Sauk River are shown in the Attachment A mapbook. Nine sites were identified for field investigation in this area, which were performed between March 31 and April 6, 2021, with later follow-up visits at some sites. Information from the field investigation, including species findings, is summarized in Table 5.2-1 and illustrated with representative photographs of habitats and other findings in Attachment C (Table 5.2-1). The sites include permanent ponds on City Light land (i.e., County Line Ponds and the two Newhalem Ponds) and sloughs presumably connected to the Skagit River by surface water or hyporheic infiltration. Some of the slough sites are on fish and wildlife mitigation properties. Sites were selected for the potential presence of shallow, emergent edges that might be suitable for Oregon spotted frog, and that were also accessible.

The field investigations of sites S1 to S6 documented three amphibian species: northwestern salamander, northern red-legged frog, and Pacific chorus frog. Key features of Oregon spotted frog habitat, particularly the presence of shallow, emergent edges with low-growing or submerged vegetation and the potential to develop warm water conditions, were generally scarce or absent. The Barnaby and Harrison Slough sites were among those sites surveyed by City Light for the presence of Oregon spotted frog in 2012. The species found at that time were the same three species documented in 2021.

The County Line and Newhalem Ponds are of relatively recent origin and are not potential Oregon spotted frog habitat. Western toad was found at the County Line Ponds and at the large Newhalem Pond (NP1). Pre-breeding activity observed at the County Line Ponds on April 2 and April 6, 2021 (i.e., males floating and moving about near an oviposition site, making twittering "release calls" upon contact) suggests that oviposition occurred soon afterwards. Although adult toads were not observed at NP1, the subsequent finding of tadpoles on June 22, 2021 near the northeast shoreline likely indicates an oviposition site along this shore, which includes a gently sloping edge and is southwest facing, a common setting for western toad oviposition.

Northern red-legged frog and Pacific chorus frog also occurred at the County Line Pond and NP1. Only northern red-legged frog was found at the small Newhalem Pond (NP2). Northwestern salamander was not found at any of the three ponds.

Western toad breeding also likely occurs in the Skagit River where isolated or partially isolated pools or backwaters form. Incidental observation of metamorphosing western toad tadpoles in a backwater area on the south bank of the Skagit River across from Bacon Creek on June 26, 2009 suggests that oviposition may occur at about the same time as in the Newhalem and County Line ponds. No additional incidental observations were reported from sites in the river channel in 2021.

Noteworthy incidental wildlife observations at sites included observations of American beaver dams or other signs of beaver at S1 and S3 (information provided for the TR-09 Beaver Habitat Assessment; City Light 2022i) and the County Line Ponds, where information on beaver sign had already been provided by the TR-02 Wetland Assessment. A black bear (*Ursus americanus*) was also observed near the large Newhalem Pond.

Site	TR-02 Data ¹	TR-01 Data ²	Site Description and Survey Results
S1	ID=1942, PEM/PSS/PEM	G237, G322, G851	
			This site proximate to Lower Lucas Slough was selected based on mapping under TR-2 and aerial imagery that suggested the presence of shallow emergent wetlands. The site is not located on a fish and wildlife mitigation property and no Project-related activities occur. Field investigation on March 31, 2021 indicated that the area is a field densely vegetated with reed canarygrass. No areas with water occurred. The field contained scattered stumps, few live sapling size trees, and indications that planted trees had failed to survive, perhaps due to saturated soils. The slough immediately south of the field is a channel bordered by forest or shrubdominated habitat (including Himalayan blackberry) in places. The predominant emergent vegetation along the channel where forest cover had been removed by logging was reed canarygrass, with water too deep to represent potential habitat for Oregon spotted frog. One juvenile northern red-legged frog was observed on the edge of the channel. No other amphibians were found.
S2	ID=1881, PFO/PSS/PEM	G237, G249, G322, G648, G851, G853, Open Water	
			S2 is associated with False Lucas Slough within a fish and wildlife mitigation property. No Project-related activities occur. The northwest end was investigated on April 6, 2021. Water in most of the slough was too deep to traverse (>2 meters) and only aquatic plants occurred (e.g., floating-leaved pondweed and yellow pond-lily). Emergent vegetation was predominantly comprised of reed canarygrass, with slough sedge and common cattail; areas of flooded hardhack also occurred. The lateral margins of the slough were not gently sloped, but there was a shallower edge at the north end and a large area with little or no standing water. These shallows were densely vegetated except for a few open areas. No amphibians were observed in this part of the site. Amphibian detections at S2 were limited to northwestern salamander egg masses (n=3) in water 0.5 to 0.75 meters deep. Search effort was 2.0 Person Hours (PHr). Water temperature was 7°C; air temperature was 13°C.

Table 5.2-1.Summary habitat descriptions of Skagit River floodplain study sites.

Site	TR-02 Data ¹	TR-01 Data ²	Site Description and Survey Results
S3	ID=N/A, PFO/PSS/PEM	G237, G322, G648, G851, Open Water	
			S3 is associated with the northeastern end of Barnaby Slough off of fish and wildlife mitigation land and was investigated on March 31, 2021. Maximum water depth was undetermined. Within areas of emergent vegetation, observed depths were between 1 to 2 meters, but deeper water may occur in areas of open water areas and aquatic beds of yellow pond lily and floating-leaved pondweed. The lateral margins of the slough were not gently sloped, but there was a shallower edge on the north end with reed canarygrass and sedge. Overall, the site contained an expansive area of dense common cattail. A beaver lodge was observed from a distance in the cattails. Amphibian detections included northwestern salamander egg masses (n=4) and auditory detection of Pacific chorus frog. Search effort was 1.5 PHr. Water temperature ranged from 3 to 6.5°C; air temperature was 6-9°C.
S4	ID=N/A, PFO/PSS/PEM	G237, G240, G322, G851, Open Water	
			S4 is associated with the northeast end of Harrison Slough on a fish and wildlife mitigation property where no Project-related activities occur. The site was investigated on April 5, 2021. Maximum water depth exceeded 2 meters, but parts of the site were shallow. Areas with gradually sloping shorelines were investigated. Emergent vegetation was predominantly reed canarygrass, with common cattail, slough sedge, and common scouring-rush (<i>Equisetum hyemale</i>), along with areas of flooded hardhack. Amphibian detections included northwestern salamander egg masses (n=24) and an adult northwestern salamander; northern red-legged frog egg masses (n=15); and adult Pacific chorus frog (observed and heard). Search effort was 3.0 PHr. Water temperature ranged from 4.5 to 8°C; air temperature was 5-15°C.

Site	TR-02 Data ¹	TR-01 Data ²	Site Description and Survey Results
S5	ID=2205, PFO/PSS/PEM	CGR022, G237, G322, G524, G648, G851, Open Water	
			S5 is located at the east end of Harrison Slough on private property where the surrounding area is non-forested and the edge of the proximate forested fish and wildlife mitigation property. The site was investigated and surveyed on March 31, 2021. Maximum water depth was generally less than 1.5 meters on the private property but deeper further west. Emergent vegetation was mostly comprised of slough sedge, mannagrass, soft rush, and bur-reed (<i>Sparganium</i> sp.), with a minor component of reed canarygrass. Amphibian detections included egg masses of northwestern salamander (n=9), northern red-legged frog (n=7), and Pacific chorus frog (n=2). Search effort was 2.0 PHr. Water temperature ranged from 6.5-8°C; air temperature was 10°C.
S6	ID=2138, PFO/PSS/PEM	G237, G240, G322, G648, G851, Open Water	
			S6 is located on the north side of the Skagit River in a group of proximate properties at Washington Eddy upstream of Rockport owned by WDFW and the Skagit Land Trust adjacent to a City Light mitigation property. The site was investigated and surveyed on April 6, 2021. Maximum water depth in the proximate slough was >2 meters but the survey was confined to shallower accessible inlets. "Mudflats" with little or no standing water were observed in much of the area, most of the emergent class vegetation was not flooded, and there were tall tussocks of reed canarygrass— all evidence of water level fluctuation and deeper water than observed. Vegetation in areas that may be flooded by shallow water at other times included reed canarygrass, beaked sedge, and hairy-leaf rush. The only amphibian egg masses observed were northwestern salamander (n=11 in water about 0.5 meters deep. Numerous juvenile northern red-legged frogs were also observed on the edges of a channel in a forested area at the east end of the site and Pacific chorus frogs were heard. Search effort was 2.0 PHr. Water temperature was 12°C; air temperature was 22°C.

Site	TR-02 Data ¹	TR-01 Data ²	Site Description and Survey Results
CLP	ID=3170	G517, G318, G237, G240, G851	The County Line Ponds are multiple, flooded borrow pits created during Project construction which have since developed natural characteristics. Much of the shoreline is steeply sloped but several areas of shallower water were explored. Emergent vegetation in the shallows included soft rush, multiple species of sedge, common spike-rush (<i>Eleocharis palustris</i>), and mannagrass. Signs of beaver occurrence included dams, a possible lodge, and gnawed standing trees; generally,
			these signs were old. The site was surveyed for egg masses following most of the convoluted shorelines on April 2, 2021. The only species documented by egg masses was northern red legged frog egg masses (n=36), but male western toads were found in two locations, including a group of 4 exhibiting pre-breeding activity. Based on this finding, the site was re-visited on April 6, when one of the locations now had a large group of males (20-30?) interacting. Subsequently on June 14, 2021 a large school of western toad tadpoles was found at the latter location, along with northern red-legged and Pacific chorus frog tadpoles. Search effort on April 2 was 3.0 PHr. Water temperature on April 2 was 14°C; air temperature was 21°C.
NP1	ID=3237, 3240, 3247, PFO/PEM	G517, G318, G237	
			The larger Newhalem Pond is a flooded borrow pit created during Project construction which has since developed natural characteristics. Much of the shoreline is steeply sloped with relatively deep water near shore except in a few areas which corresponded to mapped areas of emergent vegetation comprised of common cattail, reed canarygrass, wool-grass (<i>Scirpus cyperinus</i>), soft rush, common spike-rush, and hardhack. Maximum depth presumably exceeds 2 meters. The site was surveyed for egg masses along the entire shoreline on April 2, 2021 and surveyed for amphibian larvae along the north and west shoreline on June 14. Amphibian detections on April 2 included northern red-legged frog egg masses (n=85), mostly attached to submerged twigs. Pacific chorus frogs were also heard. Search effort was 3.5 PHr. The survey on June 14 documented a large school of western toad tadpoles; tadpoles of northern red-legged frog (n=7) and Pacific chorus frog (n=26); and a common gartersnake (<i>Thamnophis sirtalis</i>). Search effort was 13-15°C. Water temperature on June 14 was 18°C; air temperature was 21°C.



- 1 Information from TR-02 Wetland Assessment (City Light 2022h): ID Wetland ID number; PEM palustrine emergent; PSS palustrine shrub-scrub; PFO palustrine forested.
- 2 Mapped vegetation types within wetlands (data from TR-01 Vegetation Mapping Study [City Light 2022h]): G237 North Pacific Red Alder-Bigleaf Maple-Douglas-fir Rainforest Group; G240 - North Pacific Maritime Douglas-fir-Western Hemlock Rainforest Group; G318 - North Vancouverian Montane Bedrock, Cliff, and Talus Vegetation; G322 - Vancouverian Wet Shrubland; G517 - Vancouverian Freshwater Wet Meadow and Marsh Group; G648 – Southern Vancouverian Lowland Ruderal Grassland and Shrubland; G851 - North Pacific Lowland Riparian Forest and Woodland Group; G853 – North Pacific Maritime Hardwood-Conifer Swamp.

5.3 **Project Reservoirs**

5.3.1 Gorge Lake

Descriptions of sites on Gorge Lake were derived from information in the TR-01 Vegetation Mapping Study and the TR-02 Wetland Assessment reports (City Light 2022g and 2022h) and field reconnaissance on July 22, 2021 summarized in Table 5.3-1. Only two small mapped wetlands occur on Gorge Lake, neither of which appears to be amphibian habitat. These include a small PFO (deciduous forested) area downstream of Diablo Powerhouse on the inaccessible far shore and a small area categorized as PEM/PSS on a low-lying terrace (i.e., at the upstream end of Reflector Bar) on the south side of the Diablo town site. The latter area was designated as site G2 to be evaluated as potential breeding habitat for western toad. Unsuitable habitat was confirmed by a field reconnaissance on June 22, 2021. On the same date, the shoreline downstream of the Gorge Campground, which is not a mapped wetland but was designated as site G1, was examined. The area was characterized by a gently sloping, sandy beach with no emergent vegetation. No amphibians were observed at either site.

5.3.2 Diablo Lake

Site D1 was in the Thunder Arm of Diablo Lake, where the margins are mapped as PFO, PFO/PSS, or PSS Cowardin class and riverine by hydrogeomorphic (HGM) determination (Table 5.3-1). These wetlands are predominantly forested or characterized by a tree/tall shrub mixture. Only small areas of emergent vegetation occur, and separate depressional features were not observed in the field or on aerial imagery. Potential habitat for lentic-breeding amphibians is likely limited by flowing persistently cold water and few, if any, separate areas of standing water. No amphibians were observed.

5.3.3 Ross Lake

Mapped wetlands on the fringe of Ross Lake occur in 10 locations (Attachment A mapbook). Each of these locations has a single mapped wetland, except at Roland Point inlet, where three wetlands are mapped. The locations were designated as sites (R1-R10) for field visits beginning on June 15, 2021. Based on information collected and described below, additional field investigation will be performed at some of the sites in 2022.

The characteristics of the sites varied but some key features were shared among all or most of the 10 locations (Table 5.3-1). With a few exceptions, these are lake-fringe wetlands where aquatic habitat is not present above the water surface elevation of Ross Lake at any time. One exception is a shrub-dominated wetland at the north end of wetland 3712 in site R3 that is separated by surrounding upland forest from Ross Lake and is situated at a higher elevation where it is presumably unaffected by Ross Lake water level. Pools within wetland 3722 (R4) are also separated from Ross Lake during drawdown. Whether these pools are perched above the water surface of Ross at any time or when they first fill in the spring could not be determined by the information collected in 2021. Seasonally separate areas of standing water were also indicated at the north end of wetland 3860 (R9) near the international border associated with a borrow pit and inflow from a tributary stream. All the wetlands are categorized as PEM or, at three of the sites (R3, R7, and R10), also include a PSS or PFO component. Emergent vegetation included reed canarygrass at all sites, often with low-growing annuals and ruderal forbs. Sedges were most prominent at sites R1 and R6.

Some of the sites were contiguous with large areas that are seasonally exposed during the drawdown and were sparsely vegetated when first examined (and documented by site photographs under the GE-03 Sediment Deposition Study on May 13, 2021 [City Light 2022d] and under the FA-03 Stranding and Trapping Assessment on March 24, 2021 [City Light 2022a]), often by small annuals and other ruderal, low-growing species. During drawdown, at least at the north end of Ross Land between R9 and R10, these contiguous areas include borrow pits or other depressions that hold water before they are inundated by Ross Lake as it fills (see Page 2 and 3 of Attachment A, and Figures 19 and 20 of Attachment D). Those features that may provide seasonally-suitable habitat for amphibian breeding will be identified from LiDAR data and investigated in 2022.

Most of the sites are not directly associated with a tributary stream or, if they are, do not connect upstream to other areas that would be considered potential amphibian habitat. R1 at the mouth of Big Beaver Creek is about one mile downstream from an area of extensive emergent and open water habitats with known populations of amphibians and, therefore, within potential seasonal dispersal distance. R9 and R10 are also connected to more extensive wetlands north of the U.S.-Canada border at the extreme north end of Ross Lake, which is outside of the study area. Sites characterized by a relatively steep shoreline and flooded only at or near full pool include R2, R5, and R7.

Suitable conditions for spotted frogs were not observed at most of the sites, which are associated with small, isolated lake-fringe wetlands that do not hold water separate or above the water surface elevation of Ross Lake for part of the year, including the period when spotted frogs breed, and that are not connected to other potential habitats. The exposed fringe of the lake at these sites, with large numbers of redside shiners (*Richardsonius balteatus*), is not comparable to known oviposition habitats elsewhere in Washington. Borrow pits and pools at the north end of Ross Lake between R9 and R10 are only sparsely vegetated, a condition also unlike known spotted frog oviposition habitat.

Survey results (Table 5.3-2) include no detections of spotted frogs at any of the sites at Ross Lake, nor were other ranid frog species detected (e.g., northern red-legged frog). Statements from NPS (Rawhouser 2021) that indicate observations of multiple ranid frogs on Ross Lake north of the international border and one detection south of the border in 2021 did not include details as to dates, methods and locations; or descriptions and photographs of sightings to identify species, which City Light has requested. To City Light's knowledge, information associated with the NPS sightings has not been reviewed by experts in ranid identification or species determined by genetic analyses. Having this information from NPS will facilitate accurate planning for additional surveys that City Light will perform at the north end of Ross Lake south of the international border in April-May 2022.

Adult western toads were found during the study surveys at R1 (mouth of Big Beaver Creek) and R6 (Dry Creek inlet). In addition, an adult western toad was observed at R10 during a brief exploration on July 8 accompanying NPS Aquatic Biologist Ashley Rawhouser. A subsequent night survey of the north part of R9 also detected two adult toads on floating logs. Observations of juvenile western toads were similar, with sightings at R1, R9, and R10. There were no detections of western toad tadpoles at Ross Lake during the study in 2021. However, prior to the study on August 4, 2020, a City Light biologist observed metamorphosing tadpoles at the Hozomeen boat launch (i.e., within R9). General information provided to City Light indicated that western toad

breeding activity was detected earlier by NPS night surveys at R3 and R6, and a photograph from R4 showed a few western toad tadpoles with Pacific chorus frog tadpoles (Rawhouser 2021). No other information was provided, including the dates of NPS surveys, the number and exact nature of observations, surveyed locations where western toads were not found, or other details. However, the disclosed information indicates two breeding periods based on when suitable conditions developed at each site. The potential effects of storage of large woody material to areas used by western toad at R3 and R6 are unknown. City Light will revisit these sites in 2022.

Adult Pacific chorus frogs were found at R4, R6, R9, and R10. Tadpoles were found at the same sites, first at R4 (June 15, 2021) and subsequently at the other sites (August 4 and 5, 2021). The numbers of Pacific chorus frog tadpoles found by dip-netting at R6, R9, and R10 were small and localized in areas where large logs resting on the bottom appeared to be a barrier to fish. Large numbers of calling Pacific chorus frogs were noted at R9 on the night of July 8, 2021, probably in advance of breeding, and were associated with areas of emergent vegetation and floating wood. No egg masses or larvae were observed on this date, although they could have been hidden by the floating wood. Larval long-toed salamanders were also found at R4 on June 15, 2021. Identification as long-toed salamander and not northwestern salamander was tentative based on relatively large head size, blunt snout, long gill rachis, apparent absence of mottled coloration, and relatively advanced stage of development (full-sized hind legs). In contrast, northwestern salamander larvae typically have a smaller head, tapered snout, do not have a long gill rachis, have yellow mottled coloration, and would not be expected to be as developed. City Light plans to revisit this site earlier in the season in 2022 to collect more information regarding western toad, and also to verify or correct the species identification.

Black bear scat was observed at R4. No other noteworthy incidental wildlife observations occurred.

Site	TR-02 Data ¹	TR-01 Data ²	Site Description
G1 G2	ID=3992 (G2) PEM/PSS	G517, G851, G237	A field reconnaissance of Site G1 and G2 was performed on June 22, 2021. G2
			(illustrated here) is a small, lake fringe PEM/PSS wetland at Gorge Lake located on Reflector Bar, a low-lying terrace that is likely subject to periodic flooding. The site included a lower area that may be flooded more persistently but only as an inlet connected to the lake. The site has a cobble substrate and only a small patch of emergent vegetation, which included woolly sedge (<i>Carex pellita</i>). Otherwise, the vegetation was mostly shrubs and upland forbs.
			Site G1 (see Attachment D, Figure D-1), not a mapped wetland, was the shoreline downstream of the Gorge Campground. The area was characterized by a gently sloping, sandy substrate and was shaded by trees in places. There was no emergent vegetation. The site is not likely suitable for western toad.
			No amphibians were observed at either site.
D1	ID=3372, 3379, 3381,3385, 3389, 3921 PFO, PFO/PSS, PSS	G240, G318, G322, G517, G851, Water	
			Site D1 is located along the Thunder Arm of Diablo Lake and is predominantly forested or a tree/tall shrub mixture. A field reconnaissance was performed on June 22, 2021 mostly as viewed from the proximate trail. Potential habitat for special-status amphibians was not observed. Potential habitat for other lentic-breeding amphibians is likely limited by flowing and relatively cold water (9.8°C in a flowing channel), and few if any suitable side channels. The small, connected, floodwater side channel proximate to the Colonial Creek Campground illustrated here held warmer (23°C) standing water, but no amphibians were observed, which may suggest fluctuating water levels and periodic access by fish. Emergent vegetation was diverse and included multiple species of sedge and rush (<i>Juncus</i> spp.), and small-fruited bulrush. Air temperature was not recorded but the weather was warm and sunny.

Table 5.3-1. Summary habitat descriptions of amphibian survey sites at Gorge Lake, Diablo Lake, and Ross Lake.

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Site	TR-02 Data ¹	TR-01 Data ²	Site Description
R1	ID=3716 PEM	G322, G517, G318, G851, G237, G240, Open Water	Mapped wetland (11.65 acres) is located on either side of the mouth of Big Beaver Creek. The site was examined on three dates in 2021 (June 15 and 23, and August
			5). The north side is more expansive and gently sloped, with a large area of Sitka sedge (<i>Carex aquatilis</i> var. <i>dives</i>). As observed on June 15, vegetation at and below the shoreline (water surface elevation approximately 1585 feet) was sparse, but vegetation higher on the slopes was dense. R1 is one of several areas, including R6, where NPS had undertaken efforts to remove reed canarygrass and establish sedges and other native species. No areas of water were observed perched higher than Ross Lake surface on any of the site visits; higher depressions or channels are unlikely to hold water because of sandy soils. On June 15 the low, flooded shoreline was mostly exposed to wind-driven waves but subsequently on June 23, the higher shoreline (1592 feet) extended into small, protected coves and channels with emergent vegetation, although all these areas were surface-connected to the lake and accessible to fish. On August 5, most of the wetland was underwater. Amphibian habitat is primarily associated with areas mapped as G517. G318 at this site included patches of exposed rock. Proximate forested and tall shrub areas included in the mapped wetland were G322, G851, G237, and G240.
R2	ID=3701 PEM	G318, G237, G240, Open Water	
			This is a small, mapped wetland (2.85 acres) associated with a narrow, deep inlet south of the larger Roland Point inlet (see Site R3). Much of the mapped area is comprised of forested areas (G237 and G240) that were not wet when observed on June 15, 2021. The rest of the wetland includes the steep, sparsely vegetated slopes of the deep inlet, an area of reed canarygrass at the upper point of the inlet, and a small gully with seepage when observed, all of which are represented as G318 or Open Water.

Site	TR-02 Data ¹	TR-01 Data ²	Site Description
R3	ID=3967, 3703, 3712 PEM/PSS	G517, G318, G240, G521, G851, G237, G322	The mapped wetland (16.27 acres) at Site R3 surrounds the inlet on the south side
			of Roland Point and extends north through a forested area, much of which is probably not wetland. Potential amphibian habitat mapped as G318 is associated with the upper point of the inlet and G318 and G517 around the mouth of Roland Creek, with steeper slopes elsewhere. In addition, a separate basin filled with dense hardhack (mapped as G521) occurs at the north end of the mapped wetland and appeared to be situated above the lake elevation when observed on June 15, 2021. No other areas of water were observed perched higher than Ross Lake surface except possibly in the forested area near the mouth of Roland Creek. Vegetation at the point of the inlet was mostly sparse and low growing, comprised of reed canarygrass, Sitka sedge, and small forbs such as lesser spearwort (<i>Ranunculus</i> <i>flammula</i>) and water-pepper (<i>Persicaria hydropiper</i>). Proximate forested areas included in the mapped wetland are G240, G237, G851, and G210. Most of the inlet was underwater when viewed on July 8, 2021. Roland inlet is one of the sites where floating logs and other large woody material gathered from other locations on the lake by City Light crews are stored until they can be transported to Ross Dam for removal.
R4	ID=3722 PEM	G517, Open Water	R4 is in the seasonally exposed isthmus that connects Roland Point to Jerusalem
			(or Spencer's) Island to the north. The mapped wetland (3.90 acres) includes two depressions that hold water before they are connected by surface water to the lake. The site was examined on three dates in 2021 (June 15 and 23, and August 5). On June 15 Ross Lake surface water elevation was approximately 1585 feet and higher ground on both ends of the isthmus were dry, but the larger depression held water up to about 1 meter deep. The timing and means by which the depressions are first flooded are uncertain—they may be filled by rainwater retained by an impermeable substrate or they may be filled by hyporheic infiltration from the lake. The substrate of the large depression pool was a thick layer of silt/mud, probably with a high clay content creating turbid water conditions. Both pools were largely devoid of vegetation. On June 15 water temperature in the large pool was 19°C (21°C air temperature) compared to 16°C at the margin of Ross Lake. On June 23 the higher water surface of Ross Lake had overtopped the north end of the isthmus to create a single pool more than 2 meters deep. On August 5 the entire isthmus was under deep water.

Site	TR-02 Data ¹	TR-01 Data ²	Site Description
R5	ID=3754 PEM	G517, G318, G240	
			R5 is located at Rainbow Point. When examined on June 17, 2021, most of the mapped wetland (2.26 acres) was above the water surface of Ross Lake and was entirely dry, except along the shoreline which was exposed to wind-driven waves, with no emergent vegetation, and quickly graduated to deep water away from the shore. No areas of water are ever likely to occur perched higher than the lake water surface elevation. The mapped wetland is a mostly relatively flat or gently sloping, although a September 24, 2020 photo from TR-02 shows a flooded depression. The area was vegetated with Sitka sedge, blister sedge (<i>Carex vesicaria</i>), common horsetail (<i>Equisetum arvense</i>), lesser spearwort, and reed canarygrass in the area mapped as G517.
R6	ID=3788 PEM	G517, G318, Open Water	The mapped wetland (24.28 acres) at Site R6 is associated with a wide inlet near the Dry Creek Campground. Potential amphibian habitat is mapped as G318 and
			G517, including the largest patch of sedge-dominated habitat on Ross Lake. When observed on June 15, 2021, most of the vegetated habitat was dry, above the water surface of Ross Lake. The shoreline on this date was exposed to wind-driven waves, with no emergent vegetation. No areas of water perched higher than Ross Lake surface were observed during any of the site visits and are unlikely to occur. A low area near the point of the inlet reportedly holds water before there is a surface water connection to the lake. Emergent class vegetation occurs in a relatively flat or gently sloping area; observed species included blister sedge, Sitka sedge, reed canarygrass, common spike-rush, and multiple species of rush. On August 5, 2021 most of the vegetated areas were flooded by the lake, but not completely submerged. Dry Creek inlet is one of the sites where floating logs and other large woody material gathered from other locations on the lake by City Light crews are stored within log pens until they can be transported to Ross Dam for removal. On August 5, some of the large logs near the margin of the flooded area were only partially in the water and rested on the bottom. Small fish were generally common throughout the flooded area, but not here, suggesting the logs are a barrier to fish.



R9 ID=3860 GiS17, Gi32, Gi318, Open Water FM Open Water Image: Construct of the state of the st	Site	TR-02 Data ¹	TR-01 Data ²	Site Description
PEMOpen WaterImage: Performing and the international border connected by a marrow fringe to an allowial defta at the mouth of Hozomene Creck. R9 i contiguous with a larger wetland area north of the border outside the study area area at the hozensen creck. R9 i contiguous barren or sparsely vegetated expanse stretche 	Rð	ID=3860	G517, G322, G318,	The mapped wetland (96.20 acres) at R9 consists of a broad, relatively flat or gently
Image: 10 an antivity define a memory of the study area10 a flattow flat area11 and the flat a		PEM	Open Water	sloping area at the northeast end of Ross Lake at the international border connected
Vegetated emergent areas (G517) are mostly reed canarygrass and ruderal forbs we denote that the north sets edge. A deep perennia channel is located on the north side. When surveyed on June 16, 2021, a smalle channel held shallow water and isolated pools. A borrow pit in the northeast corne of the wetland may hold water perennially. A small stream discharges at the northeast corner and may maintain shallow water before the area is connected by surface water on June 16 wass flowing and cold (9°C, compared to 17°C in the shallow margin of the lake). The site includes an area where floating log and other large woody material gathered from other locations on the lake by City Light crews are stored within log pens until they can be transported to Ross Dan for removal.R10ID=3861 PFO/PEMG517, G318, G237, G322, G851, Open WaterR10 is associated with a relatively flat or gently sloping area at the northwest end of Ross Lake south of the international border. The mapped wetland (18.28 acres is contiguous with a much larger area of wetland to the north outside of the study area, dring drawdown a similar barren or sparsely vegetated area extends eas across the lake except where divided by channels. Old logging roads may imped drainage in some areas east of the wetland and create pools during the drawdown Most of the emergent wetland is flooded at full pool and the fringe of a shrub vegetation type (G32) was also flooded on August 4, 2021. Along the east cege a strip about 200 feet wide was not mapped as vegetated by TR-01. On June 17 2021, shallow water (slope scepage?) was flowing across the site toward the lake International Creek discharges i used for storage of logs and other woody material gathered from other locations on the lake by City Light crew so ther woody material gathered from other locations on the lake by City Light crew				by a harrow fringe to an antivial defa at the mouth of Hozonicen Creek. K9 is contiguous with a larger wetland area north of the border outside the study area. During drawdown a contiguous barren or sparsely vegetated expanse stretches across the lake area except where divided by channels. Old logging roads may impede drainage. Most of the wetland is flooded at full pool and was not mapped as vegetated by TR-01. This is by far the largest emergent wetland on Ross Lake.
 channel is located on the north side. When surveyed on June 16, 2021, a smalle channel held shallow water and isolated pools. A borrow pit in the northeast corne of the wetland may hold water personally. A small stream discharges at the northeast corner and may maintain shallow water before the area is connected by surface water to the lake. Hozomeen Creek flows into the site at the south end bu be under bare personal cold (9°C, compared to 17°C in the shallow margin of the lake). The site includes an area where floating logs and other large woody material gathered from other locations on the lake by City Light crews are stored within log pens until they can be transported to Ross Dan for removal. R10 ID=3861 G517, G318, G237, G322, G851, Open Water R10 is associated with a relatively flat or gently sloping area at the northwest end of Ross Lake south of the international border. The mapped wetland (18.28 areas is contiguous with a much larger area of wetland to the north outside of the study area; during drawdown a similar barren or sparsely vegetated area extends eas across the lake except where divided by channels. Old logging roads may impedd rainage in some areas east of the wetland and create pools during the drawdown Most of the emergent wetland is floaded an August 4, 2021. Along the cast edge a strip about 200 feet wide was not mapped as cost the is torward the lake arity about 200 feet wide was not mapped as G318, is used for storage of logs and rule road area for sub road as G318, since Morg storage of logs and rule road areas for the wetland and recate pools during the drawdown Most of the emergent areas, which contained sparse reed canarygrass ruderal forbs, and Sifka sedge on June 17, are primarily mapped as G317. The north end of the site, including an area mapped as G318, is used for storage of logs and other woody material gathered from other locations on the lake by City Light crew. 		Washington and the second		Vegetated emergent areas (G517) are mostly reed canarygrass and ruderal forbs, with one patch of small-fruited bulrush at the northeast edge. A deep perennial
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- 1 Information from TR-02 Wetland Assessment (City Light 2022h): ID Wetland ID number; PEM palustrine emergent; PSS palustrine shrub-scrub; PFO palustrine forested.
- 2 Information from TR-01 Vegetation Mapping Study (City Light 2022g). Mapped vegetation types within wetlands: G210 Central Rocky Mountain Douglasfir-Pine Forest Group; G237 - North Pacific Red Alder-Bigleaf Maple-Douglas-fir Rainforest Group; G240 - North Pacific Maritime Douglas-fir-Western Hemlock Rainforest Group; G318 - North Vancouverian Montane Bedrock, Cliff, and Talus Vegetation; G322 - Vancouverian Wet Shrubland; G517 -Vancouverian Freshwater Wet Meadow and Marsh Group; G851 - North Pacific Lowland Riparian Forest and Woodland Group.

	Survey Date(s)	Survey Effort (PHr) ¹	Species/ Stage(s) ²			
Site			LTS	PCF	WT	Survey Notes
R1	06/15/21	1.50	N/A	0	J: 1, A: 1	Surveyed on the north side of the site. Adult western toad had loose skin, possibly indicating a female that had recently deposited eggs. Weather: Partly sunny with light breeze, 16°C.
	06/23/21	1.50	N/A	0	0	Surveyed throughout north and south sides of the site. Observed 4 common gartersnakes on the north side. No observations on south side. Weather: Sunny and calm, >26°C (temperature not recorded).
	08/05/21	0.75	N/A	0	A: 1	Surveyed on the north side of the site. Most of the site was now under water. Western toad observed on edge of flooded wooded area. Weather: Sunny and calm, 28°C.
R2	06/17/21	0.33	N/A	0	0	Surveyed shoreline and point of inlet. Did not survey proximate forest that was included in the mapped wetland, which appeared dry. No amphibians or reptiles observed. Weather: Sunny and calm, 28°C.
R3	06/15/21	0.50	N/A	0	0	Surveyed shoreline to the point of inlet. Included occasional dip-netting. Most of the dry areas had sparse potential hiding cover for amphibians, so were not extensively searched. No amphibians or reptiles observed. Redside Shiners abundant. Weather: Overcast with light breeze, 16°C.
	08/05/21	2.00	N/A	0	0	Surveyed shoreline, complicated by abundance of large floating wood. No amphibians or reptiles observed. Weather: Sunny and breezy at times, 30-34°C.
R4	06/15/21	1.00	L: 23	L: 4, A: 1	0	Survey included VES along edge of pools and dip-netting in the large pool. Dip-netting results corresponded to visual detection (i.e., few Pacific chorus frog larvae were observed compared to long-toed salamander larvae [<i>Ambystoma macrodactylum</i>]). No amphibians observed in the smaller pool. Weather: Mostly cloudy with light breeze, 21°C.
	06/23/21	1.25	0	L: 3	0	Survey included VES, dip-netting, and looking under logs surrounding the pool. Because of deeper water in the pool, long-toed salamander larvae may have escaped detection in areas too deep for wading. Weather: Sunny and calm, 26°C.
	08/05/21	1.00	N/A	0	0	Survey shoreline, but mostly too deep. No amphibians or reptiles observed. Weather: Sunny and calm, 27°C.
R5	06/17/21	0.33	N/A	0	0	Surveyed along shoreline. The rest of the site was dry and potential hiding cover was sparse. Observed common gartersnake swimming offshore. No amphibians observed. Weather: Sunny and calm, 28°C.

Table 5.3-2.Summary of amphibian survey results at sites at Ross Lake.

		Survey	Species/ Stage(s) ²			
Site	Survey Date(s)	Effort (PHr) ¹	LTS	PCF	WT	Survey Notes
R6	06/15/21	0.50	N/A	0	0	Surveyed mostly along shoreline, the only area where water was observed. Conditions probably not suitable for occurrence of amphibian egg masses or larvae. No amphibians or reptiles observed. Weather: Increasing clouds and breezy, 19°C.
	08/05/21	2.50	N/A	L: 5, J: 1	A:1	Survey area included the west and east side of the mapped wetland, complicated by abundance of large floating wood. The Pacific chorus frog larvae and juvenile (young-of-year) were all found in one area on the west side where large logs appeared to exclude small fish from the margin of the flooded area. No larvae were found in similar areas where small fish occurred. Adult western toad was shown to the survey crew by a camper who discovered it partially buried in the soil in the shade of a kayak at the Dry Creek campground. Also observed a common gartersnake and northern alligator lizard (<i>Elgaria coelurea</i>). Weather: Sunny and calm, 25°C.
R7	06/15/21	0.33	N/A	0	0	Surveyed along shoreline and away from waters' edge. No amphibians or reptiles observed. Weather: Increasing clouds and breezy, 19°C.
R8	06/17/21	2.50	N/A	0	0	Surveyed along entire shoreline and, on return, along the wooded edge. No amphibians or reptiles observed. Weather: Sunny and calm, 20°C.
R9	06/16/21	3.50	N/A	A: 2	J: 1	Surveyed along entire shoreline, including along flooded channels and a channel with intermittent pools; seepage areas near the toe of the proximate hillside; around the mouth of Hozomeen Creek; around an unnamed creek near the international border; and a borrow pit and smaller ponded area associated with an old logging road near the international border. Survey effort for the site was estimated by accounting for group survey in parts and separate surveys in other parts. Redside Shiners abundant in the shallow margins of the lake (water temperature about 17°C). Weather: Partly sunny and calm, 17-22°C.
	08/04/21	3.50	N/A	L: 1	0	PCF tadpole found in area of flooded emergent reed canarygrass with small-fruited bulrush near the international border. Large logs resting on the ground may prevent or limit small fish from entering this area. Water temperature at this location was 21°C, compared to 25°C along the lake shoreline elsewhere. Weather: Sunny and calm, 34°C.
R10	06/17/21	1.50	N/A	A: 2	J (1)	Surveyed entire shoreline of the site, as well as an area with shallow inflow or slope seepage, and, on return, searched away from the waters' edge. The juvenile western toad and one of the adult Pacific chorus frogs were near the shoreline, and the other was found near the wooded edge. Redside Shiners were abundant. Weather: Sunny and calm, 28°C.
	08/04/21	1.25	N/A	L: 4	0	Survey included extensive dip-netting. Pacific chorus frog larvae were found in two locations near the upper edge of the flooded area where small woody debris and emergent reed canarygrass occurred. Weather: Sunny and calm, 36°C.

1 PHr - person hours (i.e., search time multiplied by the number of surveyors).

2 LTS – long-toed salamander; PCF - Pacific chorus frog; WT – western toad; A - adult; J – juvenile, L - larval stage, V - frog vocalizations heard; N/A – larvae of this species not expected because no suitable larval habitat present and/or no dip-netting performed.

6.0 SUMMARY

6.1 Transmission Line Right-of-Way

Field work at sites along the Project transmission line ROW was completed in 2021 and no further field work is planned. No wetlands intersected by the ROW fully met the criteria for potential Oregon spotted frog habitat, and subsequent field work verified the results of the initial habitat assessment. Oregon spotted frog was not detected and almost certainly does not occur. The area along the ROW is outside of the known or expected range of Columbia spotted frog, which does not include lowlands of western Washington. However, three common amphibian species—northwestern salamander, Pacific chorus frog, and northern red-legged frog—were found and likely occur widely at other locations at wetlands along the ROW. Another common species, long-toed salamander, was not detected but may be similarly widespread. Long-toed salamander is the earliest breeding species in the study area, with small egg masses that do not persist long after hatching. As such, a lack of egg mass detections was unsurprising. The presence of this or other common species (e.g., northern red-legged frog) not detected at certain sites where habitats appear suitable can be assumed without further field work.

The surveys also did not detect western toad, but the results may not indicate an absence. Several sites were identified as being potentially suitable for this species, particularly the two largest wetlands, which contain permanent ponds and are away from busy roads, sites T4 (wetland 441) and T9 (wetland 1564). The survey results are sufficient to develop appropriate BMPs to avoid potential effects on lentic-breeding amphibians that may be associated with vegetation management or other Project-related activities along the ROW.

6.2 Skagit River Floodplain Wetlands

Field work was completed in 2021 at sites associated with the Skagit River floodplain in the section between Gorge Powerhouse and the confluence of the Sauk River. No further field work is planned at the slough sites, which includes sites on several of the fish and wildlife mitigation properties. Habitat information indicates key features of Oregon spotted frog habitat are scarce or absent, at least in part because these areas do not develop warm water conditions during the oviposition season and may tend to remain cool subsequently. Oregon spotted frog was not detected, was not detected by City Light surveys at some of the same sites in 2012, and there have been no reports of this species occurring. Nor is the area potential habitat for Columbia spotted frog as it is outside of the species' known or expected range. The combined survey results are sufficient to develop management plans for these lands. City Light may wish to collect additional site-specific occurrence or population data to inform specific management objectives. City Light currently performs no Project-related activities on the fish and wildlife mitigation lands.

The surveys documented western toad at the County Line Ponds and at the large Newhalem Pond and are sufficient to identify the likely general location of oviposition sites. Additional site visits to be performed in 2022 will aim to verify oviposition locations and to estimate the size of the breeding population or at least the magnitude of reproductive effort (i.e., the total clutch size at each oviposition site).

Western toad breeding is also likely associated with isolated or partially isolated shallow pools or backwaters within the active channel of the Skagit River (i.e., areas with no flow or low flow velocity that develop warm water suitable for tadpole development). In 2022, City Light will review information developed by the GE-04 Skagit River Geomorphology Between Gorge Dam and the Sauk River study (City Light 2022e) to identify potentially suitable habitat by sub-reaches of the study area and will include an updated Attachment A mapbook in the study report included in the USR.

6.3 **Project Reservoirs**

6.3.1 Gorge Lake

Habitat data and field investigation completed at Gorge Lake in 2021 did not indicate likely suitable habitat for special-status amphibians. No further field work is planned in 2022.

6.3.2 Diablo Lake

Habitat data and field investigation completed at Diablo Lake in 2021 did not indicate likely suitable habitat for special-status amphibians. No further field work is planned in 2022.

6.3.3 Ross Lake

All the identified sites at Ross Lake were field investigated in 2021 but additional field work is required at some sites, which will be performed in 2022. Although most of the sites were determined to be unsuitable for spotted frogs, and are far from any other potential habitats, further investigation at the north end of Ross Lake in the April-May period is necessary to assess amphibian use of borrow pits, pools, or other habitats that could be available to spotted frogs or other amphibians during the oviposition period. The north end of Ross Lake is within the expected range of Columbia spotted frog and is situated near extensive suitable habitat north of the international border. An iNaturalist observation from Skagit Provincial Park is reported as Columbia spotted frog with photographs that are consistent with this species but may not be definitive if Columbia spotted frog is not the only spotted frog species present. If warranted by uncertain visual identification, skin swabs or embryo samples will be collected and analyzed for DNA as described in Section 4.3. Because the north end of Ross Lake will be difficult to access at the time of these additional surveys during the annual lake drawdown, and may require multiple site visits, City Light will communicate with NPS about coordinating closely on any parallel amphibian surveys to maximize survey coverage. Detailed information from NPS 2021 amphibian surveys in this part of the study area would also aid in survey planning.

Neither western toad egg strings nor western toad tadpoles were observed. However, NPS has provided approximate locations for apparent western toad breeding detections at the Roland Point inlet and the inlet north of Dry Creek, as well as evidence of breeding in a pool on the isthmus between Roland Point and Jerusalem Island. City Light will revisit these areas in 2022 to collect more information during the expected western toad breeding periods, and City Light hopes to coordinate with any parallel NPS efforts to maximize survey coverage. More detailed information on the NPS 2021 observations, including survey dates, accurate locations, and descriptions and photographs of findings, would help assure that surveys occur at the correct times and locations.

The study report to be included in City Light's USR will include narrative descriptions of all additional field work and analyses performed in 2022. This will include information regarding any new survey areas and updated information, as needed, at sites that are revisited in 2022. The USR

will summarize survey locations, effort, timing, weather conditions, species and life stages documented, and other related details. Maps will also be updated to show any new survey sites and locations of new findings. Supporting information will include photographs of amphibians and habitats. Incidental noteworthy wildlife observations will be listed.

7.0 VARIANCES FROM FERC-APPROVED STUDY PLAN AND PROPOSED MODIFICATIONS

There are no variances from or proposed modifications to the FERC-approved methodology for the Special-Status Amphibian study. Two aspects of the study may be seen as positive variances to increase efficacy of surveys. First, at some sites along the Project transmission line ROW, field work extended beyond the Project Boundary, but only within the same mapped wetland. Second, some of the study sites were on fish and wildlife mitigation properties, which were otherwise excluded from the study area because no Project-related activities occur, but only at wetlands hydrologically connected to the Skagit River between Diablo Powerhouse and the Sauk River confluence. The schedule at Section 2.8 of the RSP has been modified because field surveys will continue into 2022 to meet the goals and objectives of the study. The LPs have been notified that field work for the study will be completed in 2022. City Light will include a study report as part of City Light's USR to be filed in March 2023.

Additional field work extending the study schedule is necessitated by multiple factors. Provision for a second year of surveys under some circumstances is recognized in Section 2.6.3 of the RSP:

If surveys at sites do not detect spotted frogs but the results are inconclusive (e.g., survey timing was compromised or there were possible sightings that could not be verified), additional visits may be conducted later in the season or a second year of surveys at the site (up to two visits) may be warranted.

Sightings of unidentified ranids at sites surveyed at night by NPS at the north end of Ross Lake were reported to City Light on June 24, 2021 and, subsequently, too late to assess sites in the drawdown zone in 2021. The limited information that was provided suggests that whichever species of *Rana* is or are represented by these sightings may occur at Ross Lake mostly north of the international border, with a peripheral occurrence south of the border which should be further investigated and will be addressed in 2022. Similarly, NPS findings of western toad breeding activity at several sites on Ross Lake, reported on the same date, were too late for follow-up visits in 2021 before rising water levels flooded these sites, and therefore will occur in 2022. City Light will confer with NPS so that, if feasible: (1) detailed information from the NPS 2021 amphibian surveys can be shared with City Light in time to facilitate accurate planning for the 2022 Special-Status Amphibian study field season, which may require field work as early as April 2022; and (2) survey efforts can be coordinated with parallel NPS surveys in 2022.

In addition, the one-year field schedule in the RSP anticipated that aspects of the study would occur as early as summer 2020 in coordination with the TR-02 Wetland Assessment (City Light 2022h). However, field work for the TR-02 Wetland Assessment could not begin until September 2020 and mapped results were not available until 2021. Because access to the north end of Ross Lake is particularly difficult during the drawdown, appropriate survey timing in this area was impractical in April 2021 but will occur in 2022.

Additional field work at the County Line Ponds and the large Newhalem Pond, where the Special-Status Amphibian study surveys found western toad tadpoles, is not strictly required but will be beneficial to understanding western toad habitat use at these sites, and will therefore be included in the Special-Status Amphibian study field schedule in 2022. In summary, the following field work will be performed in 2022 to meet study goals and objectives:

- Investigation of borrow pits and other pools in the drawdown zone at the north end of Ross Lake south of the international border that may provide seasonally suitable habitats for spotted frog breeding before pools are flooded by rising water levels. Pools in this category may include those used by other amphibians in spring. These investigations may require multiple site visits in the April-May period and tissue sampling (i.e., embryos or skin swabs) and, if observed ranids cannot be reliably identified visually, subsequent DNA analyses.
- Investigation of three locations where western toad breeding is suspected: the Roland Point inlet (in Site R3), the pool on the isthmus between Roland Point and Jerusalem Island (Site R4), and the inlet north of Dry Creek (in Site R6). Site visits will be timed to the expected time of breeding (expected to occur earlier at R4 than the other sites) and to estimate reproductive effort (the number or area covered by egg strings). If western toad eggs are found at R3 and R6, a visit will be performed after the sites are flooded by rising water level to compare conditions. In addition, the site visit(s) to R4 will be used to resolve the identification of the salamander species (i.e., long-toed salamander or northwestern salamander).
- One or more follow-up visits to suspected western toad breeding locations at the County Line Ponds and the large Newhalem Pond timed to detect egg mass strings and estimate the magnitude of reproductive effort.

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SPECIAL-STATUS AMPHIBIAN STUDY INTERIM REPORT

ATTACHMENT A

STUDY AREA WETLANDS AND STUDY SITES MAPBOOK





TR-08 SPECIAL-STATUS AMPHIBIAN STUDY SITES AND RESULTS

FERC Project Boundary
 Project River Miles (PRM)
 Inset Map Extent
 Streams
 Other Road
 Amphibian Study Site
 Amphibian Observation (Date)
 Pacific Chorus Frog (PCF) Tadpoles
 Pacific Chorus Frog (PCF) Juvenile(s)
 Pacific Chorus Frog (PCF) Adult
 Western Toad (WT) Tadpoles
 Western Toad (WT) Juvenile(s)
 Open Water Extent (TR-02 Map Data)
 '1234' = Wetland ID



Land Ownership

National Park / National Recreation Area Boundary



Seattle City Light

SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553)

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- G517 Vancouverian Freshwater Wet Meadow &
- G851 North Pacific Lowland Riparian Forest &



- G517 Vancouverian Freshwater Wet Meadow &


- G517 Vancouverian Freshwater Wet Meadow &





FERC Project Boundary
+ Project River Miles (PRM)
Inset Map Extent
Streams
Amphibian Study Site
Amphibian Observation (Date)
• Pacific Chorus Frog (PCF) Tadpoles
• Pacific Chorus Frog (PCF) Juvenile(s)
• Western Toad (WT) Adult(s)
Open Water Extent (TR-02 Map Data)
Wetland Type (TR-02 Map Data)
'1234' = Wetland ID
PEM
PFO: Not Rated
PFO/PEM
Land Ownership
National Park / National Recreation Are Boundary



- G237 North Pacific Red Alder Bigleaf Maple -Douglas-fir Rainforest Group





- G517 Vancouverian Freshwater Wet Meadow &

- G849 North-Central Pacific Mountain Hemlock







- G521 Vancouverian-Rocky Mountain Montane



































TR-08 SPECIAL-STATUS AMPHIBIAN STUDY SITES AND RESULTS

- FERC Project Boundary
- StreamsSecondary Highway
- + Amphibian Study Site

Wetland Type (TR-02 Map Data)

- '1234' = Wetland ID
 PEM/PSS: Not Rated
- PEM/PSS
- PFO: Not Rated
- PFO/PEM
- PFO/PSS/PEM

1,000 2,000 0 - Feet Page 29 of 36 CANADA Blaine USA Bellingham Whatcom Rockport-Concrete Burlington Sedro Woolley Skagit Skagit Arlington Darrington Miles Everett 讲 Snohoi 👝 0 10 20

Seattle City Light

SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553)

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TR-08 SPECIAL-STATUS AMPHIBIAN STUDY SITES AND RESULTS

- FERC Project Boundary
- ---- Streams
- = Secondary Highway
- Other Road
- + Amphibian Study Site

Wetland Type (TR-02 Map Data)

- '1234' = Wetland ID
- PEM/PSS
- PFO/PSS
- PSS
- PFO/PSS/PEM (extends beyond mapped area)



Seattle City Light

SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553)

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