Appendix C: Habitat, Vegetation, Fish, and Wildlife Assessment Report

HABITAT, VEGETATION, FISH, AND WILDLIFE ASSESSMENT REPORT FOR FIVE PROPOSED TUUSSO SOLAR PROJECT SITES, KITTITAS COUNTY, WASHINGTON

January 26, 2018

SWCA ENVIRONMENTAL CONSULTANTS
SEATTLE, WASHINGTON

HABITAT, VEGETATION, FISH, AND WILDLIFE ASSESSMENT REPORT FOR FIVE PROPOSED TUUSSO SOLAR PROJECT SITES, KITTITAS COUNTY, WASHINGTON

Report Prepared for

TUUSSO Energy, LLC

January 26, 2018

Project Number 38727.05

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1 INTRODUCTION

This Habitat Assessment Report identifies and assesses the biological resources that could potentially be affected by the five proposed TUUSSO Energy, LLC (TUUSSO), solar photovoltaic projects. The project sites are defined as the footprint of the five proposed solar projects, and also the generation tie line corridors associated with two of the sites (Figure 1). Surveys were conducted April 3 to 12, 2017, to document flora and fauna at the project sites, as well as different vegetation communities and habitat. Prior to the surveys, biologists reviewed the potential for any federal- or state-listed threatened or endangered species to occur on the sites, and evaluated sites for appropriate habitat. This report summarizes the findings of the biological resources survey and discusses environmental commitments that could avoid or reduce impacts for TUUSSO's consideration.

1.1 Project Description

TUUSSO is proposing to construct five solar photovoltaic projects near Ellensburg, in Kittitas County, Washington. Each photovoltaic project site would be located in the Kittitas Valley, east of the Cascade Range, and would generate up to 5 MW alternating current (MW_{AC}). The names and locations of each of the projects are described below. See Figure 1 for the location of each project.

1.1.1 Camas Solar Project

The Camas Solar Project would include the installation of a photovoltaic solar facility on 52.6 acres of private agricultural land, and the construction of a switchyard with a short generation tie line into an existing on-site Puget Sound Energy (PSE) distribution transmission line. The project site is composed of actively farmed alfalfa agricultural land, associated irrigation lines and ditches, an underground natural gas pipeline in the northwest portion of the site crossing from northeast to southwest, and Little Naneum Creek forming the eastern property boundary. The project site is located southeast of the city of Ellensburg. It is in Sections 18 and 19, Township (T) 17 North (N), Range (R) 19 East (E), Willamette Meridian, and in the southeast corner of where the Tjossem Road overpass crosses Interstate 82 (I-82).

1.1.2 Fumaria Solar Project

The Fumaria Solar Project would include the installation of a photovoltaic solar facility on 41.6 acres of private agricultural land, and the construction of a switchyard and an approximately 2.5-mile-long generation tie line (25.4 acres) into an existing PSE substation and distribution transmission line. The project site is composed of agricultural land and a ditch along the western boundary. It is located northwest of the city of Ellensburg. It is in the southeast portion of Section 9, T 18 N, R 18 E, north of Hungry Junction Road and east of Lower Green Canyon Road. The associated 2.5-mile generation tie line would exit the southwest portion of the project site in Section 9, run west along the border of Sections 9 and 16, then south through the central portion of Section 16, west along the borders of Sections 16 and 21 and then Sections 17 and 20, and terminate in the northeast portion of Section 20.

1.1.3 Penstemon Solar Project

The Penstemon Solar Project would include the installation of a photovoltaic solar facility on 37.0 acres of private agricultural land, and the construction of a switchyard with a short generation tie line into an existing PSE distribution transmission line. The project site is composed of actively farmed alfalfa or hay agricultural land, associated irrigation lines and ditches, and Coleman Creek forming the eastern property boundary. The project site is located southeast of the city of Ellensburg. It is in Section 17, T 17 N, R 19 E, at the corner of the intersection of Tjossem Road and Moe Road.

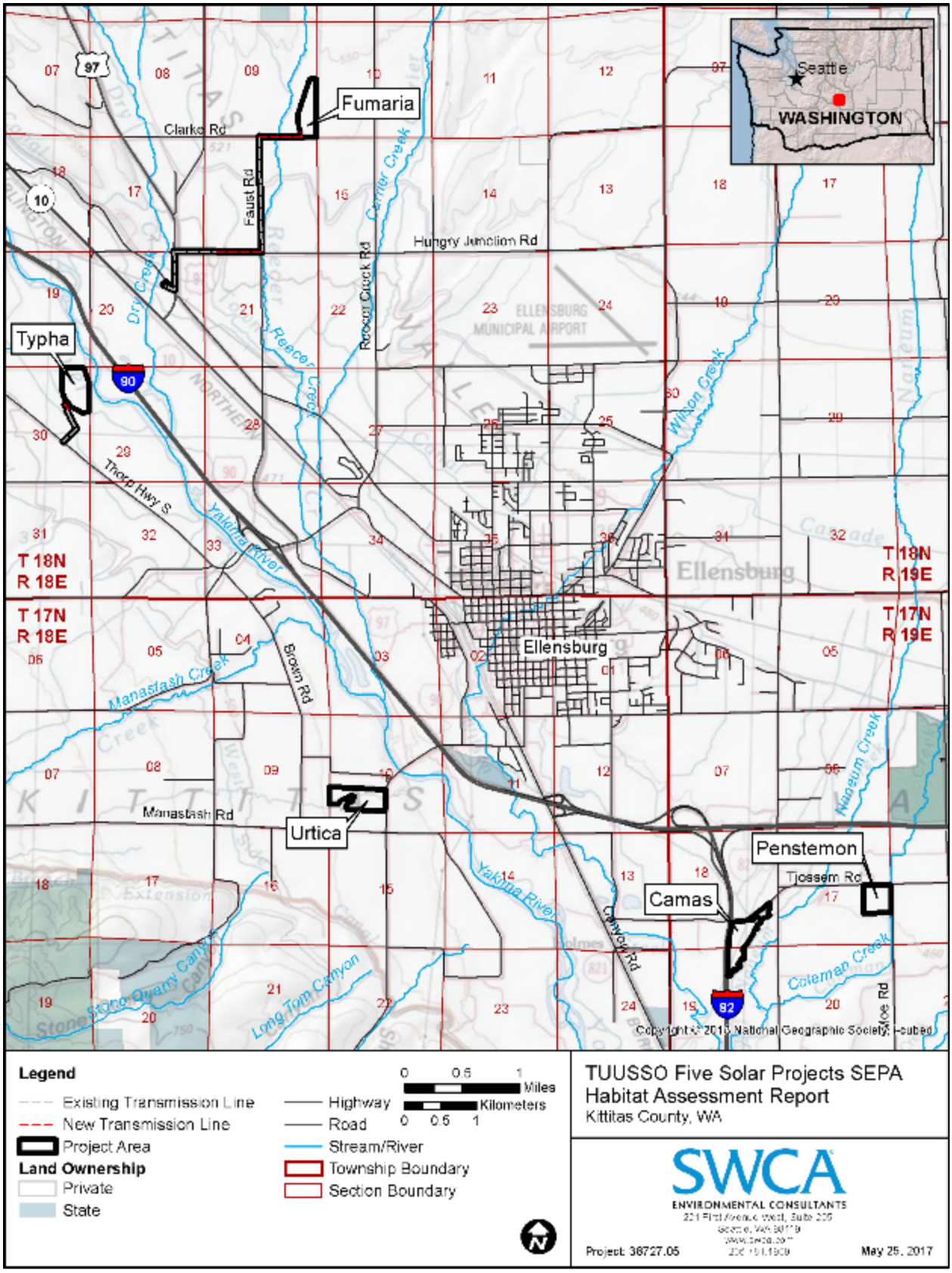

Figure 1. Project locations.

1.1.4 Typha Solar Project

The Typha Solar Project Site would include the installation of a photovoltaic solar facility on 49.7 acres of private agricultural land, and the construction of a switchyard with a short generation tie line (4.4 acres) into an existing PSE distribution transmission line. The site is composed of fallow agricultural land, associated irrigation ditches and a circular irrigator, and small wetlands. The site is located northwest of the city of Ellensburg. It is in Section 30, T 18 N, R 18 E, with the Yakima River running near the northeast border of the site, a wetland along the southern border, I-90 to the northeast, and Thorp Highway South to the southwest.

1.1.5 Urtica Solar Project

The Urtica Solar Project would include the installation of a photovoltaic solar facility on 51.1 acres of private agricultural land, and the construction of a switchyard with a short generation tie line into an existing PSE distribution transmission line. The project site is composed of actively farmed hay agricultural land, associated irrigation lines and ditches, and McCarl Creek running through the center of the site. The project site is located southwest of the city of Ellensburg. It is in Section 10, T 17 N, R 18 E, bordered on the west side by Umptanum Road and located north of Manastash Road.

1.2 Proposed Schedule

The projects are currently planned to begin construction in the second quarter of 2018 and begin operation in in the fourth quarter of 2018. This schedule is contingent upon completion of outstanding technical studies required to interconnect the projects to the local utility grid, but minimal schedule impacts are anticipated. The schedule also depends on the ability and timing of obtaining permits, as well as local weather conditions.

The projects would be built out in a single phase and are anticipated to take roughly 6 to 8 months, in total, to complete. Anticipated implementation dates are:

- Engineering and Permitting: February 2017 through April 2018
- Construction: spring through summer 2018
- Operation: fourth quarter 2018

1.3 Project Setting

U.S. Geological Survey topographic maps of the region indicate that the projects are located within the Kittitas Valley, just east of the Cascade Range and south of the Wenatchee Mountains. The valley drains centrally toward the Yakima River, which then flows to the southeast and leaves the valley through a gap in Manastash Ridge. Terrain on each site is generally flat, at an elevation of about 1,540 feet above mean sea level. Annual precipitation in the area is approximately 9 inches.

The projects are located in the Columbia Plateau Level III ecoregion area made up of arid sagebrush steppe and grassland, and surrounded on all sides by mountainous regions dominated by ponderosa pine (*Pinus ponderosa*) and Douglas-fir (*Pseudotsuga menziesii*) forests. The Columbia Plateau is underlain by basalt up to 2 miles thick, and is covered in some places by loess soils that have been extensively cultivated for wheat, particularly in the eastern portions of the region that receive more precipitation. Aromatic shrubs such as sagebrush (*Artemisia* spp.) and bitter-bush (*Purshia tridentata*) dominate the shrub-steppe habitat, while native grasslands consist of forbs and bunchgrasses, which are

being increasingly displaced by downy cheat grass (*Bromus tectorum*) and other invasive species. Aquatic plants, rushes, and thickets of shrubs are present in herbaceous wetlands found throughout the Columbia Plateau (LandScope America 2017).

1.4 Regulatory Framework

1.4.1 Federal Approvals

Section 7 of the federal Endangered Species Act (ESA) of 1973 (as amended) requires an analysis of the effects of major construction projects on any federally listed or proposed threatened or endangered species that may use the project sites, if there is a federal nexus. Consultation with the U.S. Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration (NOAA) Fisheries is necessary if any threatened or endangered species would be affected by a project. Applicable regulations are found in the Code of Federal Regulations (50 CFR 17).

The Migratory Bird Treaty Act (MBTA) (16 USC 703-711) prohibits the taking, killing, or possession of migratory birds, except as allowed by the Secretary of the Interior. The list of migratory birds is found in 50 CFR 10, and permit regulations are found in 50 CFR 21.

The federal Bald Eagle Protection Act (BGEPA) (16 CFR 668-668c) prohibits the taking, possession, purchase, sale, barter, transport, export, or import of any bald or golden eagle or any part, nest, or egg of a bald or golden eagle, except for certain scientific, exhibition, and religious purposes. Eagle permit regulations are found in 50 CFR 22.

1.4.2 State Guidelines

The State of Washington regulates fish and wildlife with Title 77 of the Revised Code of Washington (RCW) and Title 220 of the Washington Administrative Code (WAC). State and protected species regulations are defined in WAC 220-610, which includes provisions for endangered, threatened, and sensitive wildlife species, ESA-listed fish, and bald eagle protection rules. Fish and aquatic habitats are protected under RCW 77.55, commonly referred to as the Hydraulic Code. Any environmental impacts that could occur in waters of the state below the ordinary high water mark would need to be addressed in a Hydraulic Project Approval process.

Washington's State Wildlife Action Plan (SWAP) is a comprehensive plan for conserving the state's fish and wildlife and their habitats. The purposes of the SWAP are to inform conservation priorities and to guide conservation actions statewide.

2 METHODS

2.1 Analysis Areas

The project sites are defined as the footprint of the five proposed solar projects, and the generation tie line corridors associated with two of the sites (see Figure 1). To provide a baseline for future analysis of potential impacts to biological resources from the proposed solar projects, this habitat assessment report evaluates two analysis areas, at a project-scale and at a landscape-scale. These areas are further described below.

2.1.1 Project-scale Analysis Area

The project-scale analysis areas include each project site and an associated surrounding 500-m buffer (Figure 2). These analysis areas include the habitat that would be directly impacted from construction and operation of each project, through ground disturbance, noise, and habitat alteration. A project-scale analysis area is appropriate for evaluating the potential impacts on species with small home ranges or territories, such as small birds, rodents, mammals, and amphibians.

2.1.2 Landscape-scale Analysis Area

The landscape-scale analysis area includes all five of the project-scale analysis areas, as well as the surrounding sub-watersheds (Figure 3). This analysis area is intended to evaluate the indirect impacts of project construction and operation on habitat in the region, and is appropriate for evaluating the potential impacts on migratory species or those species with larger home ranges such as raptors and larger mammals. Although biotic effects could occur outside of the selected sub-watersheds, they become more difficult to accurately predict with increased distance from the source of the impact.

2.2 Review of Existing Information

Prior to conducting field surveys, available scientific and technical literature regarding floral and faunal resources was reviewed for the project sites and the surrounding vicinity. Background research was also conducted to determine the potential occurrence, distribution, abundance, and life history of state or federally listed threatened and endangered species.

The USFWS Information, Planning, and Consultation system (IPaC) was queried to provide a list of federally proposed, candidate, threatened, and endangered species with potential to occur in and near the project-scale analysis areas (Appendix A). Additionally, the Washington Department of Fish and Wildlife's (WDFW's) Priority Habitats and Species (PHS) database was reviewed to determine whether any federal or state special-status species were documented as occurring in and near the project-scale analysis areas (Appendix B).

2.3 Field Investigation

Field surveys were conducted April 3 to 12, 2017, to document flora and fauna in the vicinity of the project sites, as well as different vegetation communities and habitat. Visual observations were recorded within 200 feet of each project site, and included wildlife and habitat data. A Trimble Geo XT global positioning system (GPS) unit was used by the biologist field team to assist in identifying the site boundaries and to record site spatial data. This device is capable of submeter accuracy. The full extent of each solar site was covered by the biologist field team. Photographs were taken and wildlife observations and vegetation characteristics were documented. The spatial location of some features observed outside of a project sites were approximated using field observations and aerial imagery to determine their extent. Geographic information system (GIS) software was used to analyze data and to produce the following habitat map figures.

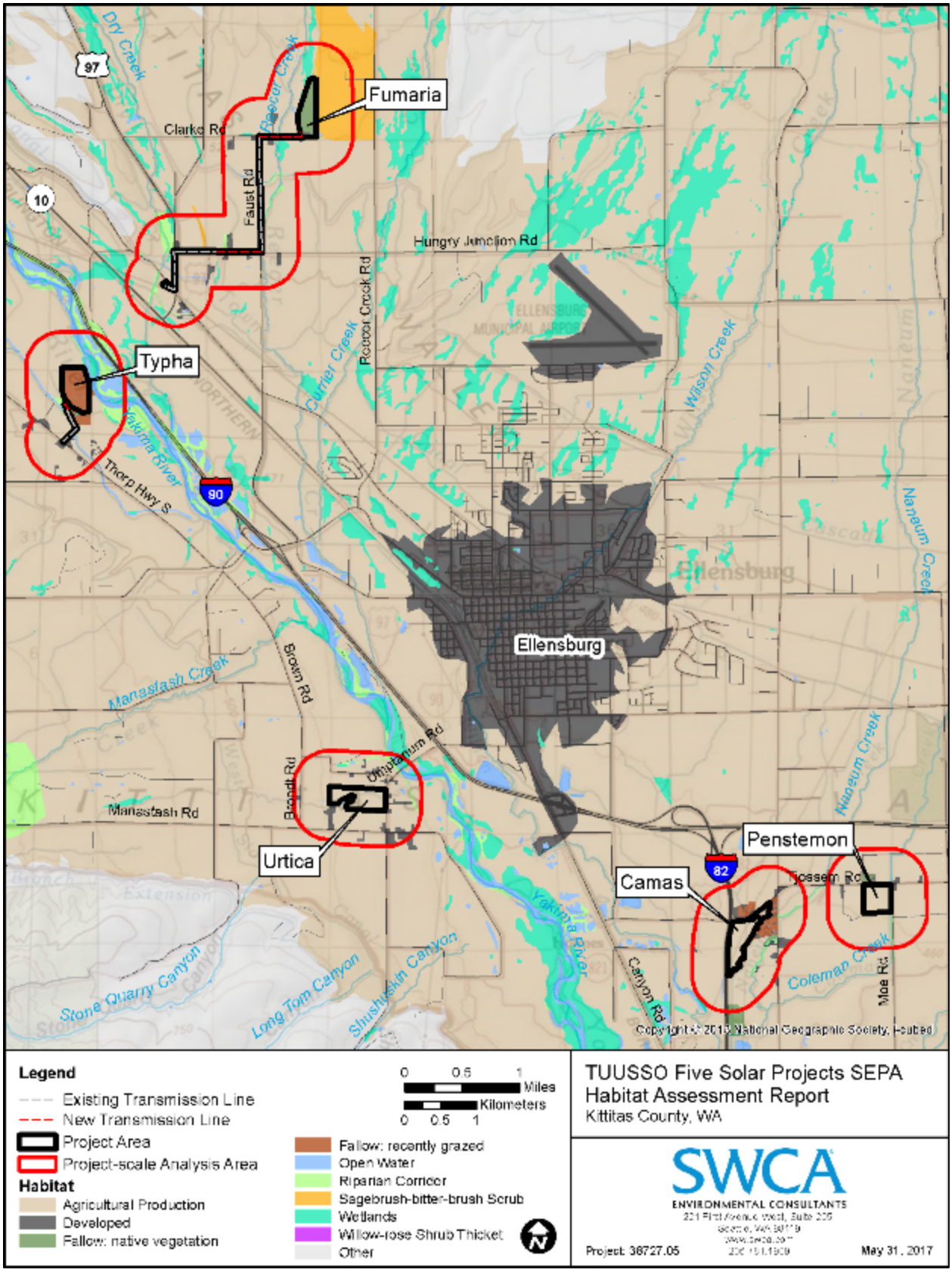

Figure 2. Project-scale analysis areas.

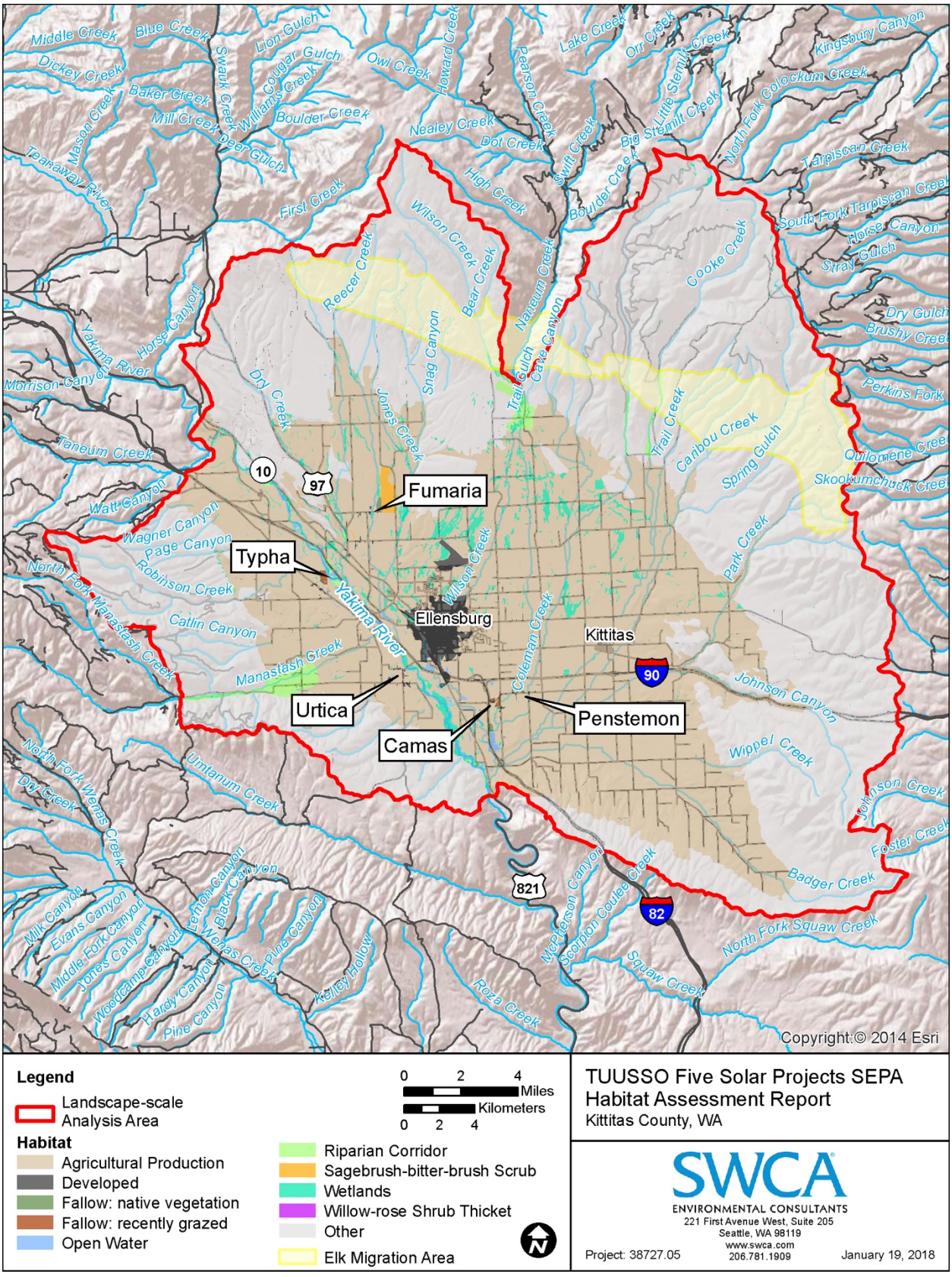

Figure 3. Landscape-scale analysis area.

3 VEGETATION AND HABITAT

Available habitats within the analysis areas were mapped based on dominant vegetation type as well as past and present land use, and habitat maps were used to determine the potential impacts from the proposed project activities. Site-specific descriptions of habitat and vegetation species documented during the April 3 to 12, 2017, field survey are provided to characterize the general habitat, and are considered representative of similar habitats found throughout the landscape-scale analysis area. Areas not surveyed were characterized using vegetation data from the Gap Analysis Project (GAP) (University of Washington, Washington Cooperative Fish and Wildlife Research Unit 1997).

3.1 Habitat Types

The majority of the project-scale analysis areas were made up of productive agricultural areas, fallow fields, recently grazed areas, and natural vegetation with several riparian, wetland, and open-water areas present. Wetlands and open-water areas have been described in detail in separate critical areas reports, and are not anticipated to be affected by the proposed solar projects. Developed areas were mostly located outside or adjacent to the project sites, but are common in the landscape-scale analysis area. Other habitats not observed during the field visit are found in the landscape-scale analysis area, but are not represented in the project-scale analysis areas, and do not provide habitat that is similar to areas potentially impacted by the projects.

The following sections provide detailed descriptions of the habitat types found in the analysis areas.

3.1.1 Agricultural Production

Three of the proposed solar project sites are primarily utilized for agricultural production (shown in Figure 4), including the production of alfalfa (*Medicago sativa*) on the Camas Solar Project site, Sudangrass (*Sorghum bicolor*) on the Penstemon site, and the production of common timothy (*Phleum pratense*) for hay on the Urtica site. These sites are dominated by the crop being produced, but often have other species encroaching into the crops in the space between plantings, which usually include bluegrass (*Poa* spp.), tall false rye grass (*Schedonorus arundinaceus*), hairy cat's-ear (*Hypochaeris radicata*), and common dandelion (*Taraxacum officinale*). In addition, these areas may go through periods during the production lifecycle in which they are unvegetated with exposed soil. Along the edges of these areas, more weedy species usually dominate, including garden yellow-rocket (*Barbarea vulgaris*), downy cheat grass, sticky-willy (*Galium aparine*), prickly lettuce (*Lactuca serriola*), great mullein (*Verbascum thapsus*), and Canadian thistle (*Cirsium arvense*).

3.1.2 Developed

This habitat type occurs throughout the landscape-scale analysis area, borders most of the solar project sites, and is composed of buildings, roads, and driveways (see Figure 2). Vegetation in this habitat is comprised mostly of ruderal species (species that colonize and thrive in disturbed areas), such as the noxious weeds documented in Section 3.3.1.

Figure 4. Example of agricultural production (alfalfa) at the Camas Solar Project.

Many areas near the proposed sites are partially developed or heavily manicured. The vegetation communities in these areas are either planted ornamental trees and shrubs or routinely mowed grass, and include rural residential landscaping, road rights-of-way (ROWs), and manicured golf course areas. Planted trees observed near the proposed sites include quaking aspen (*Populus tremuloides*), ponderosa pine, and grand fir (*Abies grandis*). The maintained lawns and golf course areas are dominated by a mix of grass species likely to include tall false rye grass, bluegrass, and creeping wild rye (*Elymus repens*). In addition, various weeds and non-native species could dominate roadside areas.

3.1.3 Fallow

Fallow fields are areas that were previously under agricultural production, or were regularly grazed, that have had these management practices removed for a period of time, long enough to allow other non-native, invasive, and native species to become dominant. This habitat type is dominant at the Fumaria and Typha Solar Project sites.

Native Vegetation

At the Fumaria Solar Project (shown in Figure 5), the majority of the vegetation community is returning to the native vegetation of the surrounding area and is partially dominated by native species, including common spring-gold (*Crocidium multicaule*), spring draba (*Draba verna*), Gorman's desert-parsley (*Lomatium gormanii*), and bitter-brush, and partially dominated by weedy species, including downy cheat grass, garden yellow-rocket, shepherd's-purse (*Capsella bursa-pastoris*), chicory (*Cichorium intybus*), common dandelion, prickly lettuce, and yellow salsify (*Tragopogon dubius*).

Figure 5. Example of the fallow–native vegetation habitat type at the Fumaria Solar Project.

Recently Grazed

At the Typha Solar Project (shown in Figure 6), the vegetation community is dominated by mostly low-growing weedy species, including tall false rye grass, remnant common timothy, hairy cat's-ear, common dandelion, and bluegrass, with patches of Canadian thistle and scotch thistle (*Onopordum acanthium*) scattered throughout the site, as well as Baltic rush (*Juncus balticus*), curly dock (*Rumex crispus*), and Rocky Mountain iris (*Iris missouriensis*) in the lower elevation areas.

Figure 6. Example of the fallow–recently grazed habitat type at the Typha Solar Project.

3.1.4 Open Water

The open water habitats found in the project-scale analysis areas are the Yakima River, streams, canals or ditches, and ponds. Representative photographs are provided below in Figures 7 to 9. For more information about the open-water areas documented during the April 3 to 12, 2017, field survey, refer to each project site's critical areas report.

Figure 7. The Yakima River with a great blue heron rookery in the cottonwoods east of the river, east of the Typha Solar Project.

Figure 8. McCarl Creek, a stream flowing through the Urtica Solar Project, from west to east.

Figure 9. One of two ponds in the southwest corner of the Urtica Solar Project.

3.1.5 Riparian Corridor

Riparian corridors generally occur along every river, stream, and some ditches and canals, in and adjacent to the proposed sites. Some of these areas are lacking mature trees, but where present the dominant trees typically include crack willow (*Salix* X *fragilis*), quaking aspen, balsam poplar (*Populus balsamifera*), and occasionally ponderosa pine. The herbaceous species that often accompany these riparian corridors include reed canary grass (*Phalaris arundinacea*), Fuller's teasel (*Dipsacus fullonum*), Canadian thistle, stinging nettle (*Urtica dioica*), tall scouring-rush (*Equisetum hyemale*), true forget-me-not (*Myosotis scorpioides*), curly dock, and great mullein. Figures 7 through 11 and 14 provide examples of this habitat type.

Figure 10. A riparian corridor along a ditch southwest of the Fumaria Solar Project.

Figure 11. A riparian corridor along a ditch southwest of the Fumaria Solar Project.

3.1.6 Sagebrush-bitter-brush Scrub

The upland sagebrush-bitter-brush scrub community (shown in Figure 12) is dominant to the east of the Fumaria Solar Project site and is beginning to return to that site. This community is characterized by the dominance of native shrubs, including bitter-brush and big sagebrush (*Artemisia tridentata*), and a low growing herbaceous community, including common spring-gold, spring draba, yellow bell (*Fritillaria pudica*), and various small bunchgrasses.

Figure 12. Example of sagebrush-bitter-brush scrub habitat type east of the Fumaria Solar Project.

3.1.7 Wetlands

Wetlands surveyed within the project-scale analysis areas ranged from <0.01 to 8.45 acres. The wetlands inventoried were depressional, riverine, and slope. Wetland ratings, based on the *Washington State Wetland Rating System for Eastern Washington – Revised*, were typically II, III, or IV (Hruby 2014). For more information about the wetlands documented during the April 3 to 12, 2017, field survey, refer to the each project site's critical areas report.

3.1.8 Willow–rose Shrub Thicket

Shrub thickets are often found along smaller drainages (i.e., small streams and ditches) and are dominated by narrow-leaf willow (*Salix exigua*) and rose (*Rosa* spp.), with occasional inclusions of red osier dogwood (*Cornus alba*) and black hawthorn (*Crataegus douglasii*). This vegetation community often lacks an herbaceous layer because the shrubs are too thick to allow adequate light penetration to the understory. Willow–rose shrub thickets occur in the southeast corner of the Fumaria Solar Project site, as well as along this site's northwest boundary (shown in Figures 13 and 14), and just outside of the northeast corner of the Typha Solar Project site and along the Ellensburg Power Canal.

Figure 13. A willow–rose shrub thicket in the southeast corner of the Fumaria Solar Project.

Figure 14. A rose shrub thicket along the northwest boundary of the Fumaria Solar Project.

3.1.9 Other

The habitat types grouped into the "other" category in this report are located within the landscape-scale analysis area, but were not observed during the field survey. These types include 1) conifer forest; 2) areas that are non-forested, but are apparently natural, parkland meadows with scattered trees; and 3) areas that are non-forested because they've been logged, and are in various stages of regrowth to herbs or small shrubs. Some of this habitat category is likely sagebrush-bitter-brush scrub, but because SWCA did not field survey these areas, we did not alter their mapping.

3.2 Available Habitat within the Analysis Areas

The acreage for each habitat type and the percent of the total available habitat has been calculated for both the landscape-scale and project-scale analysis areas, and are presented in Table 1. As shown in Table 1, the majority of the landscape-scale analysis area contains the "other" habitat category (60%) and agricultural production (36%). The majority of the project-scale analysis areas are a mix of agricultural production and developed areas, interspersed with a variety of the remaining habitat types. Available habitat types in the project-scale analysis areas are shown in Figures 15 to 21.

Table 1. Available Habitat Types within the Analysis Areas

Habitat Type	Landscape-scale Analysis Area		Project-scale Analysis Areas (500-meter buffer surrounding each solar site)									
			Camas		Fumaria		Penstemon		Typha		Urtica	
	Acres	% of Total	Acres	% of Total	Acres	% of Total	Acres	% of Total	Acres	% of Total	Acres	% of Total
Agricultural Production	115,057	36%	469	82%	1,098	76%	393	93%	345	59%	431	84%
Developed	4,805	1%	51	9%	56	4%	19	5%	33	6%	48	9%
Fallow: native vegetation	72	<1%	6	1%	41	3%	5	1%	-	-	-	-
Fallow: recently grazed	94	<1%	29	5%	-	-	-	-	64	11%	-	-
Open Water	1,247	<1%	4	1%	12	1%	2	<1%	68	12%	13	3%
Riparian Corridor	2,801	1%	13	2%	41	3%	3	1%	53	9%	13	3%
Sagebrush-bitter-brush Scrub	442	<1%	-	-	158	11%	-	-	-	-	-	-
Wetlands	5,315	2%	2	<1%	42	3%	<1	<1%	18	3%	9	2%
Willow-rose Shrub Thicket	4	<1%	-	-	4	<1%	-	-	<1	<1%	-	-
Other	193,188	60%	-	-	-	-	-	-	-	-	-	-
Total Acres	**323,025**		**574**		**1,452**		**422**		**583**		**513**	

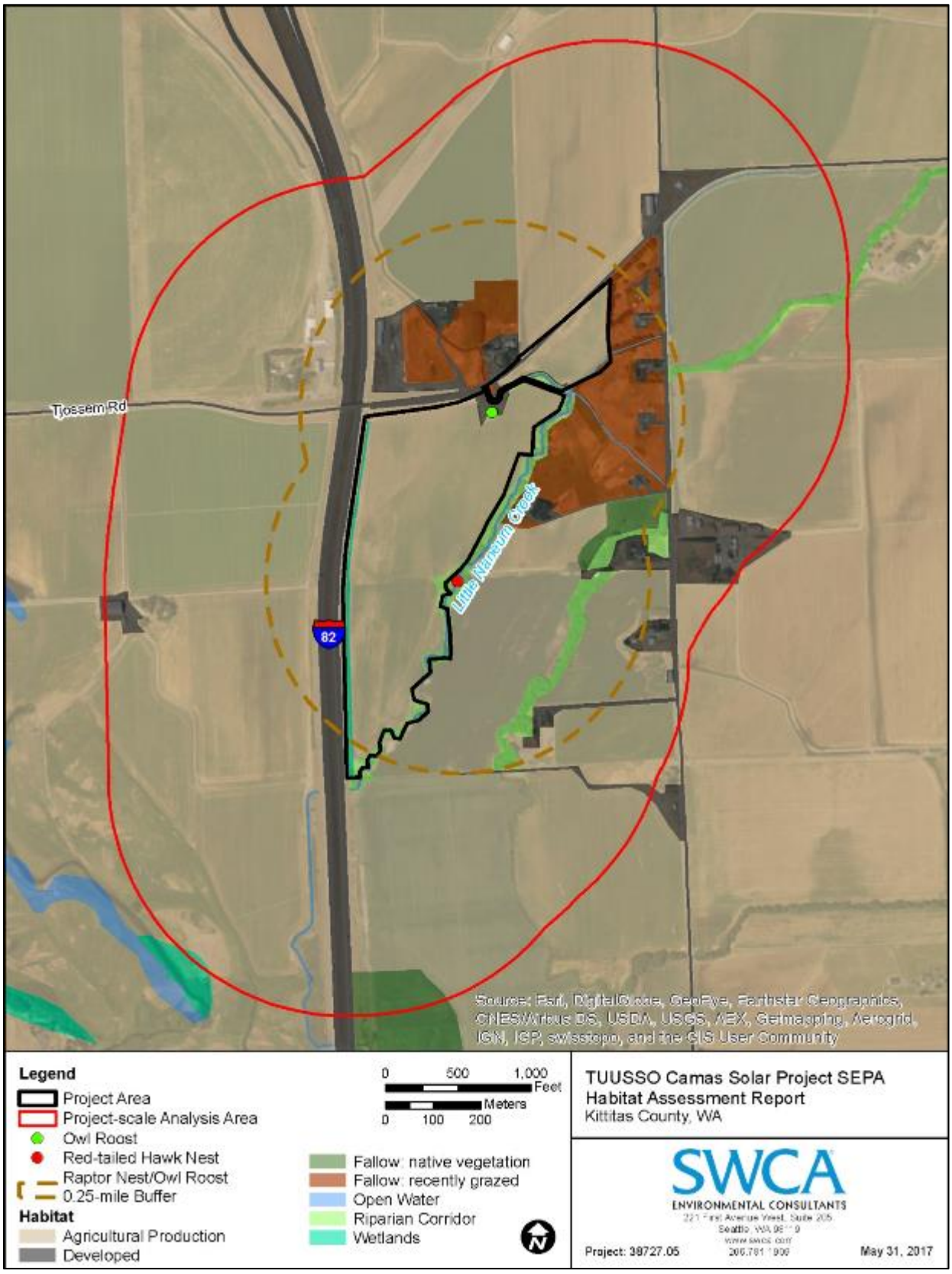

Figure 15. Habitat types within the project-scale analysis area for the Camas Solar Project.

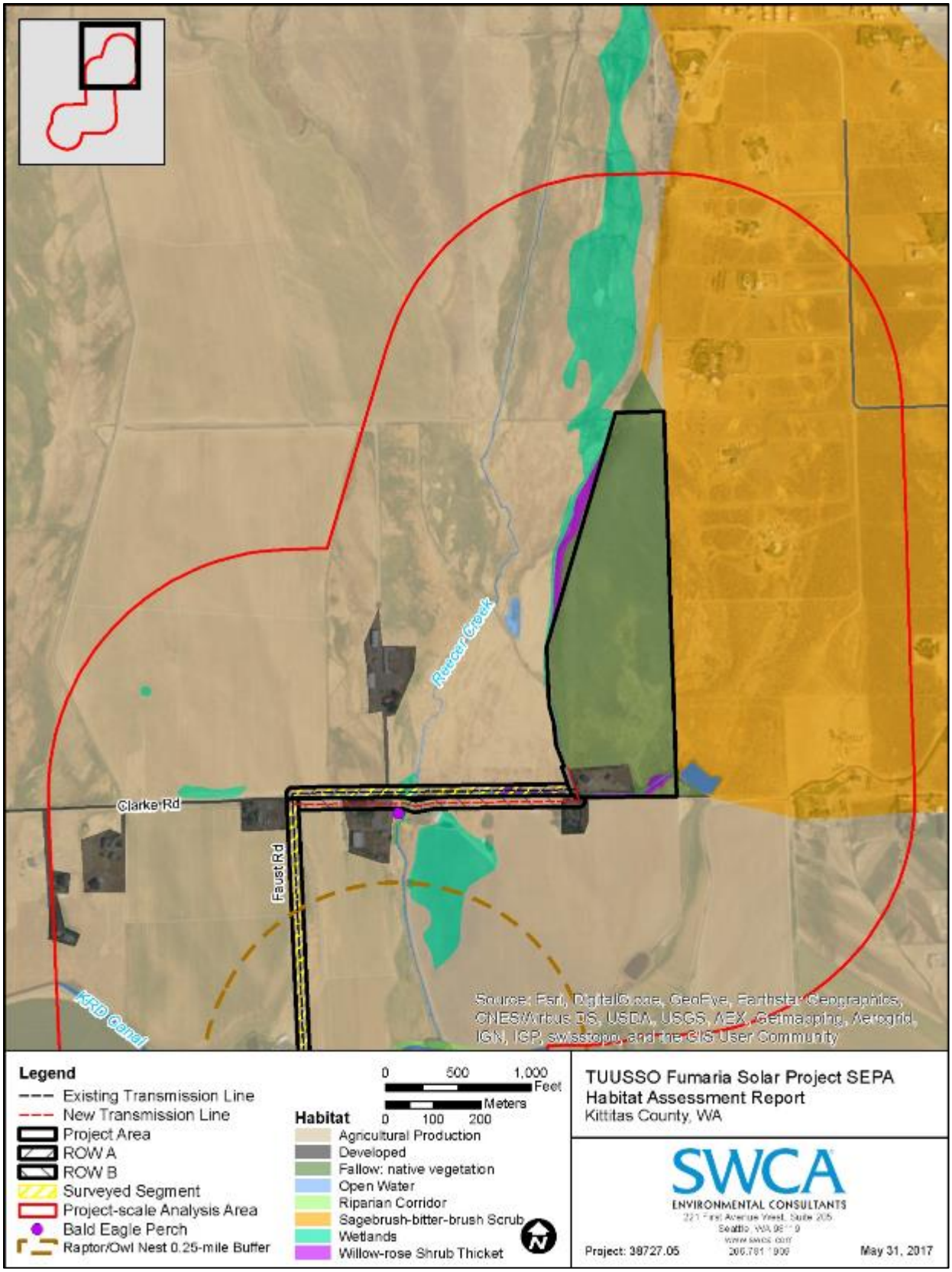

Figure 16. Habitat types within the project-scale analysis area for the Fumaria Solar Project.

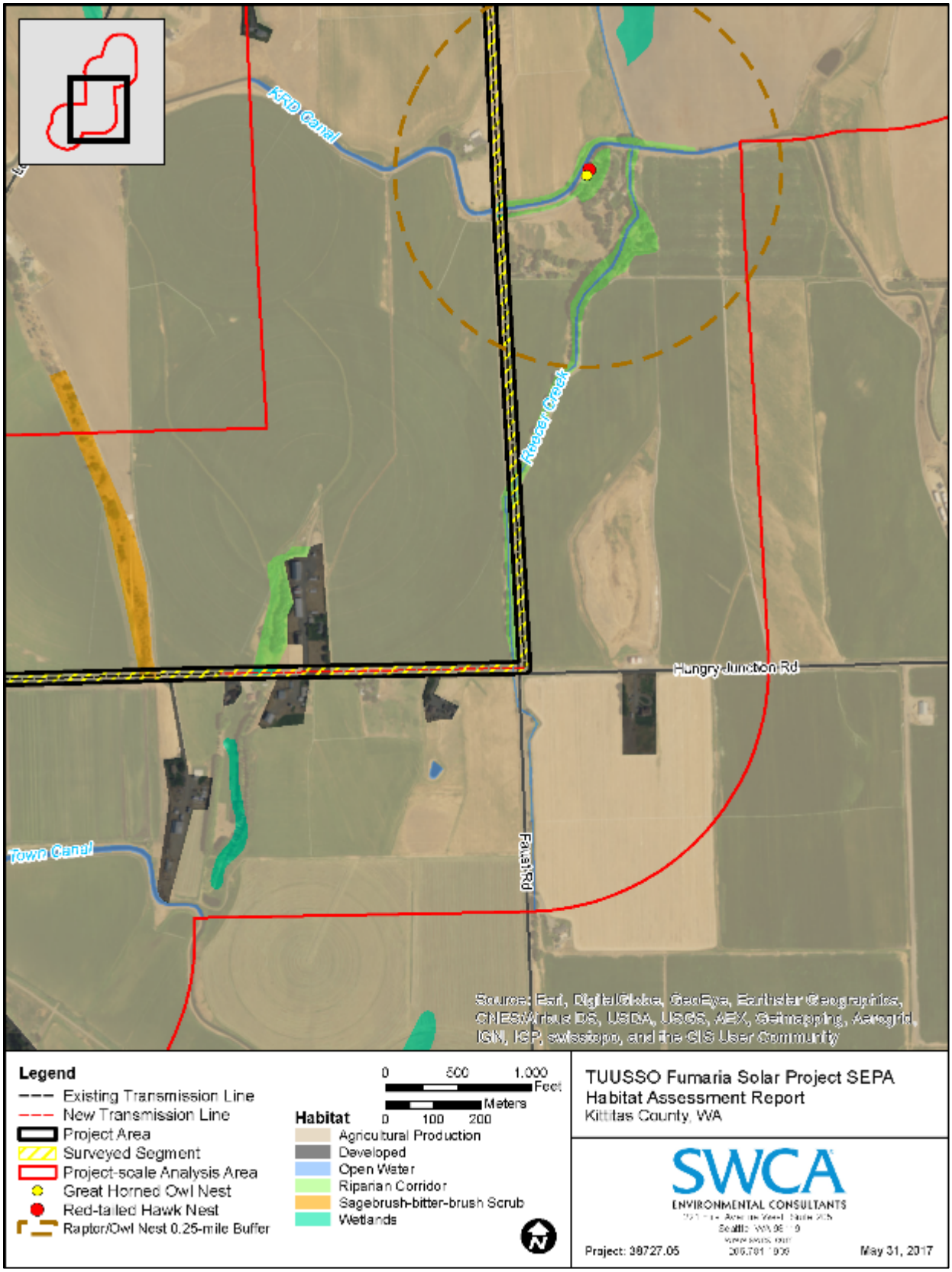

Figure 17. Habitat types within the project-scale analysis area along the north half of the Fumaria generation tie line corridor.

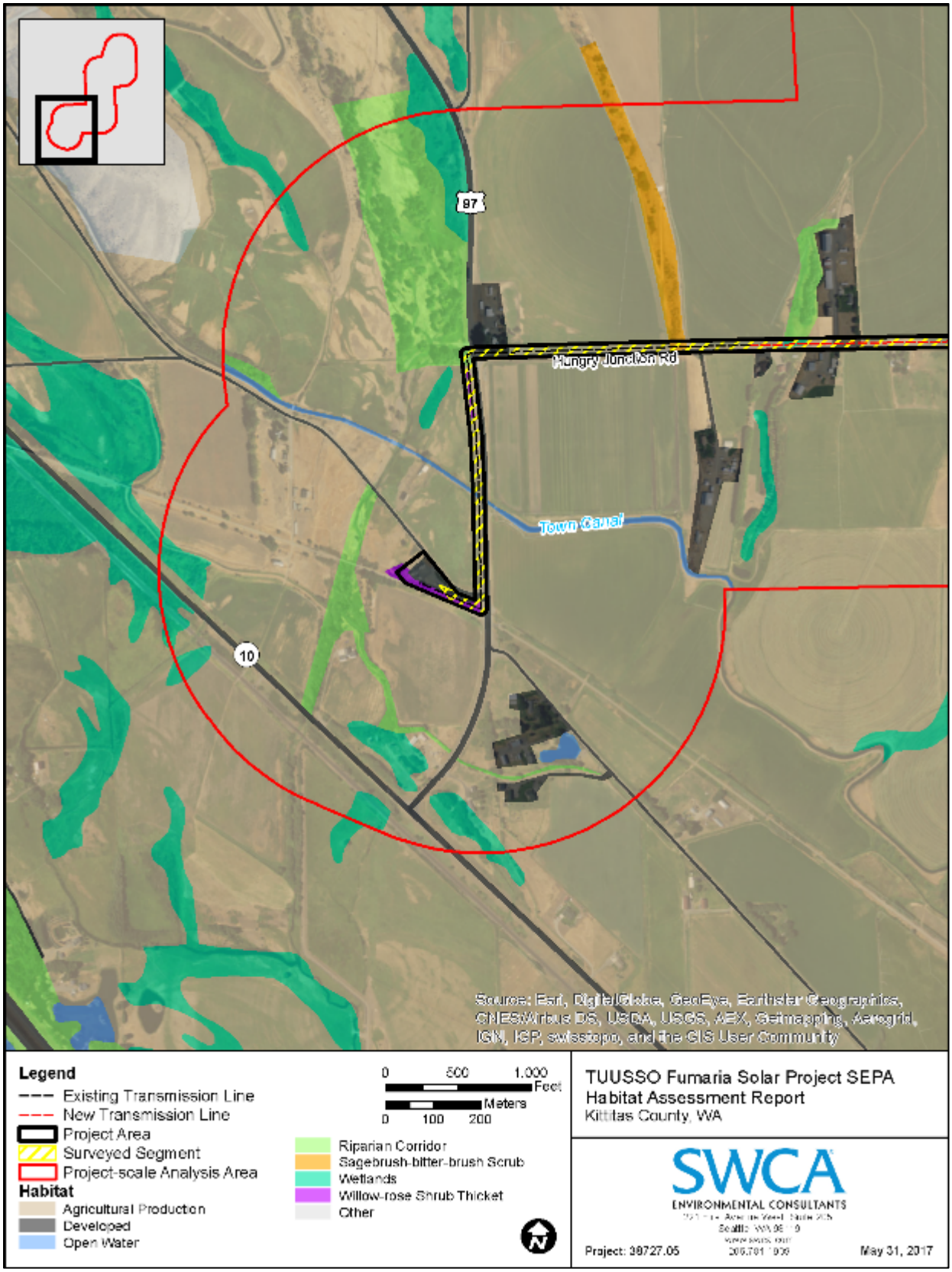

Figure 18. Habitat types within the project-scale analysis area along the south half of the Fumaria generation tie line corridor.

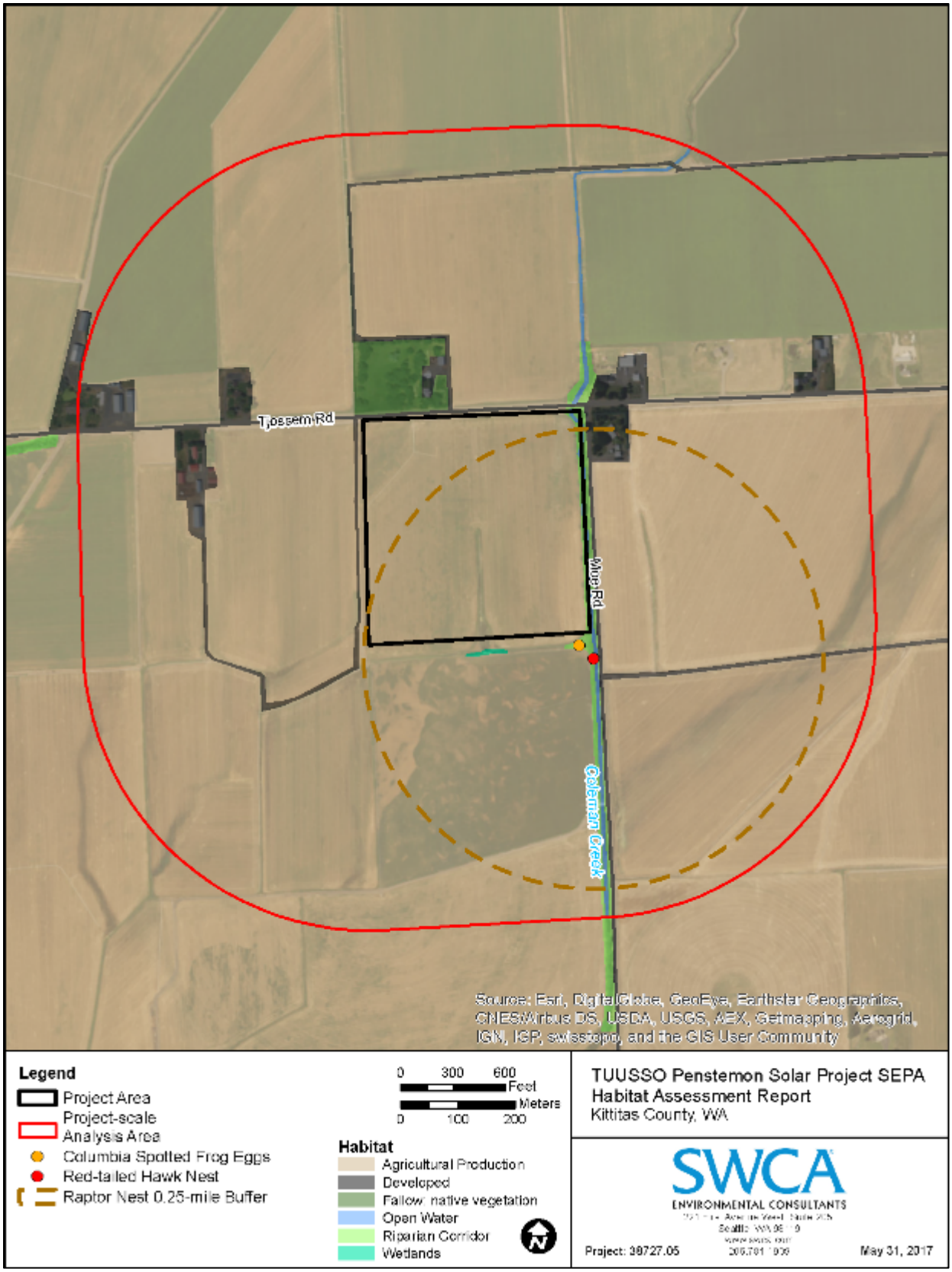

Figure 19. Habitat types within the project-scale analysis area for the Penstemon Solar Project.

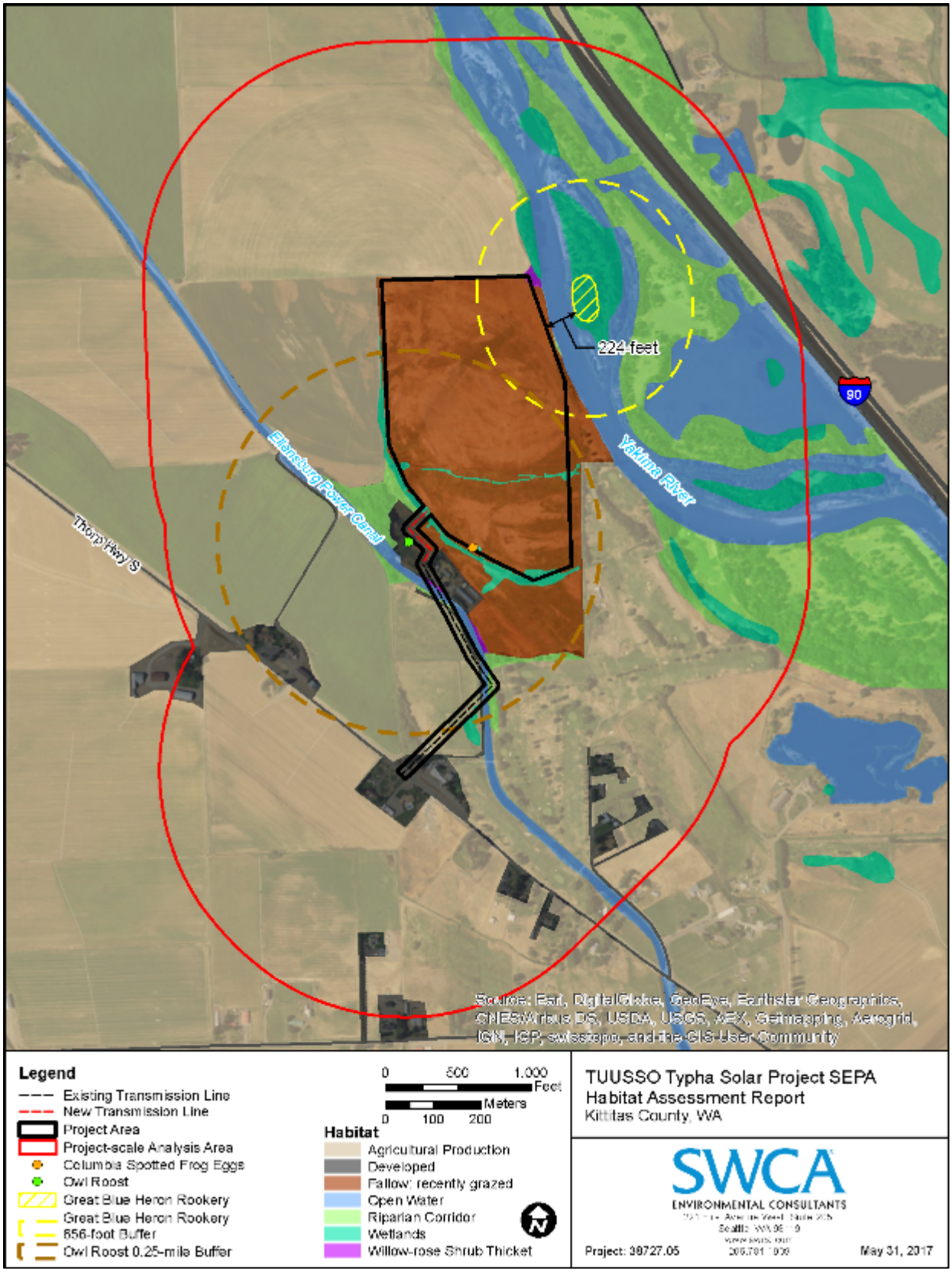

Figure 20. Habitat types within the project-scale analysis area for the Typha Solar Project.

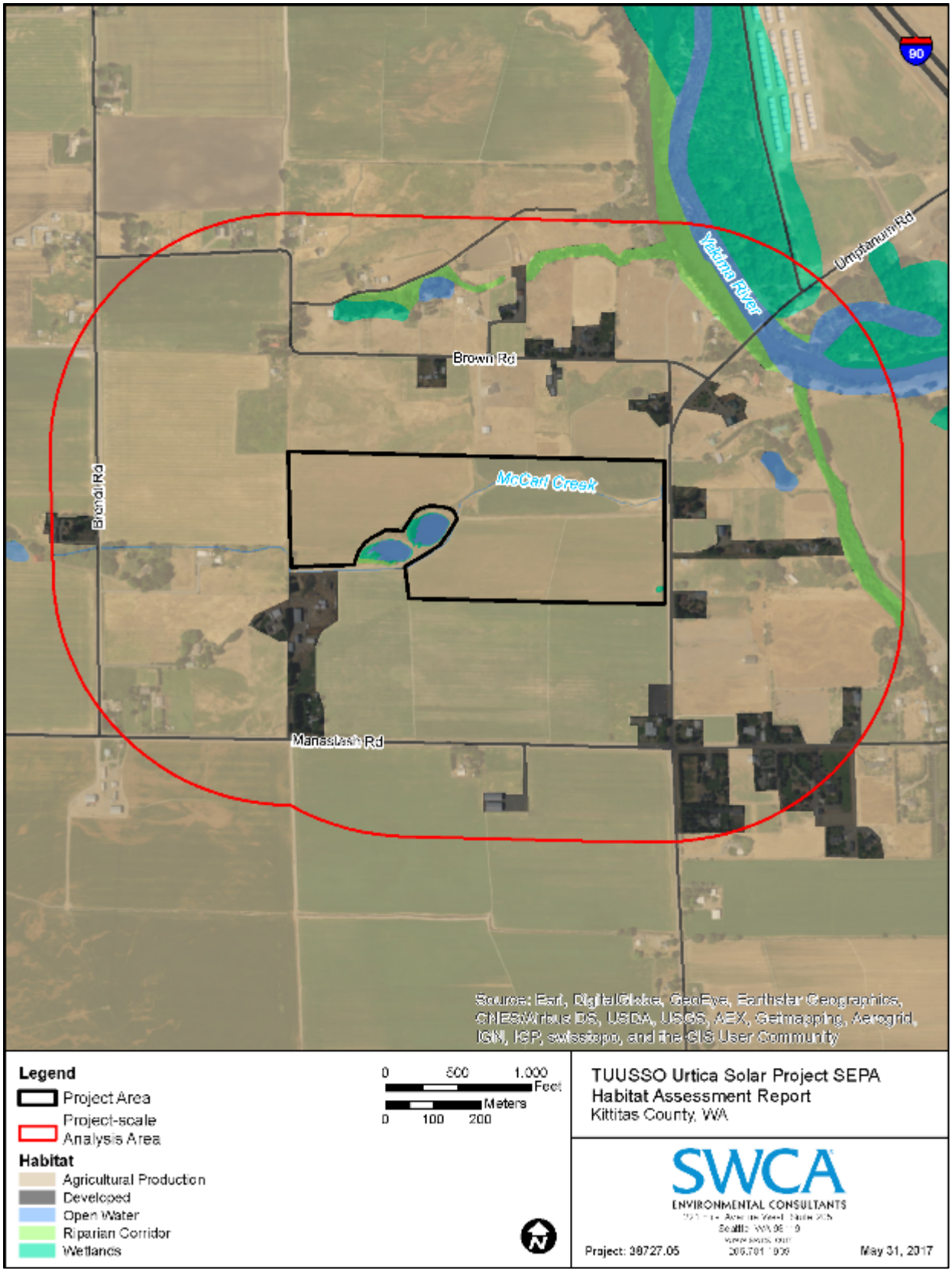

Figure 21. Habitat types within the project-scale analysis area for the Urtica Solar Project.

3.3 Special-status Plants

No sensitive or special-status plant species occur on any of the solar project sites. The plant species typically observed in each habitat type are discussed in Section 3.1. TUUSSO will prepare a Vegetation Management Plan through coordination with the landowners, WDFW, and Kittitas County.

The Washington State (WA) Noxious Weed Control Board has produced a noxious weed list for the state that categorizes weeds into three classes: A, B, and C (WA Noxious Weed Control Board 2017). A-Listed species are non-native species whose distribution in Washington State is still limited. B-Listed species are non-native species whose distribution is limited to portions of Washington State. C-Listed noxious weeds are widespread in Washington or are of special interest to the agricultural industry. Eleven noxious weeds have been identified in the project scale analysis areas, all B- or C-Listed species. A list of noxious weeds identified in the project-scale analysis areas, and a ranking of their relative prevalence at each site, is provided in Table 2.

Table 2. Noxious Weeds Documented in the Project-scale Analysis Areas

Common Name	Scientific Name	Status[1]	Weed Class[2]	Weed Relative Prevalence at Each Solar Project Site (1 = low, 5 = high)				
				Camas	Fumaria	Penstemon	Typha	Urtica
Canadian thistle	*Cirsium arvense*	Invasive, noxious	C	2	1	2	3	1
Chufa (yellow nutsedge)	*Cyperus esculentus*	Native, noxious	B		1		1	
False mayweed	*Tripleurospermum maritimum*	Non-native, noxious	C	1			1	
Field sow-thistle	*Sonchus arvensis*	Non-native, noxious	C		1			
Fuller's teasel	*Dipsacus fullonum*	Invasive, noxious	C	1	1	1	1	2
Hairy cat's-ear	*Hypochaeris radicata*	Non-native, noxious	C	3	3	1	3	3
Pale-yellow iris	*Iris pseudacorus*	Noxious	C	2				
Queen Anne's lace	*Daucus carota*	Non-native	C					1
Reed canary grass	*Phalaris arundinacea*	Invasive, noxious	C	3	1	2	2	3
Scotch thistle	*Onopordum acanthium*	Noxious	B	1			3	1
Spotted knapweed	*Centaurea stoebe*	Noxious	B		1			1

Sources:
1. Native per Hitchcock and Cronquist 1973 and USDA 2017; Noxious per WA Noxious Weed Control Board 2017
2. WA Noxious Weed Control Board 2017

4 FISH AND WILDLIFE

In all, 39 bird species were documented in the project-scale analysis areas during field surveys conducted from April 3 to 12, 2017, including raptors, passerines, near-passerines, and water birds (Appendix C). The list of documented bird species is not comprehensive and only includes those that were readily identifiable. Of the 39 bird species documented in the project-scale analysis areas, 35 are protected under the MBTA. Signs of several mammals, including of mule deer (*Odocoileus hemionus*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), and Virginia opossum (*Didelphis virginiana*), were observed throughout the project-scale analysis areas. Several burrows that were likely associated with American badger (*Taxidea taxus*) were observed at the Camas and Fumaria Solar Project sites, but the exact source of the burrows could not be identified. Columbia spotted frog (*Rana lutreveinus*) egg masses and Pacific tree frogs (*Pseudacris regilla*) were documented in the project-scale analysis areas.

No state- or federally-listed threatened or endangered species were observed in the project-scale analysis areas, but bald eagles (*Haliaeetus leucocephalus*) were observed at the Fumaria and Penstemon Solar Project sites and are a federal species of concern. Of the bird species documented in the project-scale analysis areas, four are currently being monitored by the State of Washington: great blue heron, prairie falcon, osprey, and turkey vulture. The American badger is also being monitored by the State of Washington, and the Columbia spotted frog is a state candidate for listing.

To evaluate the potential project impacts on fish and wildlife habitat, a list of representative species known or suspected to occur in the analysis areas was compiled and their preferred habitat was compared to the habitat types available in the analysis areas. The results of this evaluation are shown in Table 3.

Table 3. Representative Species Observed or Likely to Occur in the Analysis Areas

Common Name	Scientific Name	Management Category	Habitat Description	Habitat Types Used[1]									
				AP	DEV	FG	FN	RIP	SBB	WRS	OW	WET	OTH
Birds													
Bald eagle	*Haliaeetus leucocephalus*	MBTA, BGEPA, and Federal Species of Concern	Habitat generalist, associated with most aquatic habitats. Prefer rivers, lakes, and reservoirs with lots of fish and surrounding forests.					X				X	X
Canada goose	*Branta canadensis*	MBTA	Habitat generalists that occur near water, grassy fields, and grain fields. Always nests near water and winters where feeding areas are within short distances of water.	X	X	X	X	X		X	X	X	X
Great blue heron	*Ardea herodias*	MBTA, State Monitored	Found in a wide variety of habitats, including sheltered, shallow bays and inlets, sloughs, marshes, wet meadows, shores of lakes, and rivers. Nesting colonies are typically found in mature forests, on islands, or near mudflats, and do best when they are free of human disturbance and have foraging areas close by.					X			X	X	X
Great horned owl	*Bubo virginianus*	MBTA	Prefers secondary-growth woodlands, swamps, orchards, and agricultural areas, but are found in a wide variety of deciduous, coniferous, or mixed forests. Home range usually includes some open habitats, such as fields, wetlands, pastures, or croplands, in addition to forested areas.	X		X	X					X	X
Killdeer	*Charadrius vociferus*	MBTA	Inhabits open areas such as sandbars, mudflats, and grazed fields with vegetation generally no taller than 1 inch. Often found near water, but also common in dry areas.			X		X	X		X	X	

Table 3. Representative Species Observed or Likely to Occur in the Analysis Areas

Common Name	Scientific Name	Management Category	Habitat Description	Habitat Types Used[1]									
				AP	DEV	FG	FN	RIP	SBB	WRS	OW	WET	OTH
Northern Harrier	*Circus cyaneus*	MBTA	Breeds in freshwater and brackish marshes, lightly grazed meadows, old fields, tundra, dry upland prairies, drained marshlands, high-desert shrub-steppe, and riverside woodlands. Winter habitat includes areas with low vegetation, including deserts, coastal sand dunes, pasturelands, croplands, dry plains, grasslands, old fields, estuaries, open floodplains, and marshes.	X		X	X	X	X			X	X
Red-tailed hawk	*Buteo jamaicensis*	MBTA	Occupy most open habitat, including desert, scrublands, grasslands, roadsides, fields and pastures, parks, broken woodland, and (in Mexico) tropical rainforest.	X	X	X	X		X				X
Sandhill Crane	*Grus canadensis*	MBTA, State Endangered	Prefers open shallow waters along river channels, on alluvial islands of braided rivers, or in natural basin wetlands, but can sometimes occur in fields and agricultural lands during feeding and resting. They typically avoid visual obstructions, such as houses and bridges, and paved or gravel roads.	X		X	X	X			X	X	
Herptiles													
Columbia spotted frog	*Rana luteiventris*	State Candidate	Occurs in a variety of still-water habitats, as well as in some streams and creeks. Breeding habitat includes seasonally flooded margins of wetlands, ponds, and lakes, and even some flooded pools and still-water edges of creeks. Most often found in association with wetland plant communities consisting primarily of non-woody plants, such as sedges, rushes, and grasses.					X			X	X	

Table 3. Representative Species Observed or Likely to Occur in the Analysis Areas

Common Name	Scientific Name	Management Category	Habitat Description	Habitat Types Used[1]									
				AP	DEV	FG	FN	RIP	SBB	WRS	OW	WET	OTH
Pacific treefrog	*Pseudacris regilla*	None	Found in wetlands, meadows, woodlands, and brushy areas. Breed in shallow ponds, slow moving streams, seasonal pools, watering tanks, and roadside ditches, and spend the rest of the year in surrounding upland areas.	X				X		X	X	X	
Sharp-tailed snake	*Contia tenuis*	State Candidate	Prefers forest openings dominated by Garry oak, particularly with rock accumulations, and riparian deciduous woodlands with accumulations of decaying down woody logs within ponderosa pine, oak, or shrub-steppe.					X				X	X
Fish													
Bull trout	*Salvelinus confluentus*	Federal Threatened; State Candidate	Both resident or migratory varieties, with migratory bull trout spawning in tributary streams where juvenile fish rear for 1 to 4 years before migrating to either a larger river (fluvial) or lake (adfluvial) as adults. Successful egg incubation and survival requires very cold, clear, well-oxygenated waters, as found in pristine headwater stream habitats.								X		
Spring chinook (Upper Columbia River)	*Oncorhynchus tshawytscha*	Federal Endangered; State Candidate	Require sufficient invertebrate organisms for food; cool, flowing waters free of pollutants; high dissolved oxygen concentrations in rearing and incubation habitats; water of low sediment content during the growing season (for visual feeding); clean gravel substrate for reproduction; and unimpeded migratory access to and from spawning and rearing areas.								X		

Table 3. Representative Species Observed or Likely to Occur in the Analysis Areas

Common Name	Scientific Name	Management Category	Habitat Description	Habitat Types Used[1]									
				AP	DEV	FG	FN	RIP	SBB	WRS	OW	WET	OTH
Steelhead (Middle Columbia River	*Oncorhynchus mykiss*	Federal Threatened; State Candidate	Require sufficient invertebrate organisms for food; cool, flowing waters free of pollutants; high dissolved oxygen concentrations in rearing and incubation habitats; water of low sediment content during the growing season (for visual feeding); clean gravel substrate for reproduction; and unimpeded migratory access to and from spawning and rearing areas.								X		
Summer steelhead (Upper Columbia River)	*Oncorhynchus mykiss*	Federal Threatened; State Candidate	Require sufficient invertebrate organisms for food; cool, flowing waters free of pollutants; high dissolved oxygen concentrations in rearing and incubation habitats; water of low sediment content during the growing season (for visual feeding); clean gravel substrate for reproduction; and unimpeded migratory access to and from spawning and rearing areas.								X		
Mammals													
American badger	*Taxidea taxus*	State Monitored	Found in open habitats including semi-desert, sagebrush, grasslands, and meadows. Also found in forested areas with grassy cover.	X		X	X		X				X
Coyote	*Canis latrans*	None	Habitat generalists found in desert, scrub, grassland, foothills, populated neighborhoods, and urban environments.	X	X	X	X	X	X				X
Mule deer	*Odocoileus hemionus*	Big game	Use dense conifer forests with sufficient cover for thermal regulation and resting. Also may be found in pockets of dense brush or trees and rugged, broken terrain. Seasonal migration occurs.				X	X		X			X

Table 3. Representative Species Observed or Likely to Occur in the Analysis Areas

Common Name	Scientific Name	Management Category	Habitat Description	Habitat Types Used[1]									
				AP	DEV	FG	FN	RIP	SBB	WRS	OW	WET	OTH
Raccoon	*Procyon lotor*	None	Habitat generalists that traditionally prefer heavily wooded areas with access to trees, water, and vegetation. Often found in urban and suburban environments.		X			X		X		X	X
Small rodents (mice, voles, etc.)	Various	None	Large group of small mammals that are habitat generalists and provide prey for other species such as raptors, great blue heron, and badger.	X	X	X	X	X	X	X		X	X
Striped skunk	*Mephitis mephitis*	None	Habitat generalists, particularly associated with open areas with a mix of habitats such as wooded areas, grasslands, or meadows. Usually in close proximity to a source of water.		X		X	X		X			X
Virginia opossum	*Didelphis virginiana*	None	Habitat generalist, ranging from wooded areas to open fields. Prefer environments near streams or wetlands. Shelter in burrows of other animals, tree cavities, brush piles, or other cover.		X			X		X		X	X

1. AP = Agricultural production; DEV = Developed; FG = Fallow, recently grazed; FN = Fallow, native vegetation; RIP = Riparian corridor; SBB = Sagebrush-bitter-brush shrub; WRS = Willow–rose shrub thicket; OW = Open water; WET = Wetlands; OTH = Other

4.1 Special-status Species

Federal and state online databases were accessed to obtain current lists of sensitive species that may occur in or near the project-scale analysis areas, including the USFWS IPaC system (see Appendix A). The USFWS IPaC database provides county-level lists of Endangered Species Act (ESA) listed species, including species proposed or candidates for listing, and designated critical habitat within a defined project area. No ESA-listed species are anticipated to be affected by the proposed solar projects.

The WDFW PHS mapper, which lists sensitive wildlife species and habitats within the proposed solar project sites, was also accessed (Appendix B). Table 4 lists state-listed species that have the potential to occur in the proposed solar sites, and is followed by a brief discussion of each one. As the PHS mapper is dependent on existing records of species, other sensitive species may occur in the vicinity of the solar project sites, if suitable habitat is present. Based on the existing condition of the sites as developed agricultural lands, it is unlikely that other sensitive species occur in the project-scale analysis areas.

Table 4. Special-status Species with Potential to Occur in the Project-scale Analysis Areas

Common Name	Scientific Name	Status	Sites with Potential Occurrence	Likelihood to Occur in Project-scale Analysis Areas
Birds				
Bald Eagle	*Haliaeetus leucocephalus*	Federal Candidate; MBTA and BGEPA Protected	Fumaria	High
Greater sage-grouse	*Centrocercus urophasianus*	Federal Candidate, State Threatened	Camas, Penstemon	Low
Sandhill Crane	*Grus canadensis*	State Endangered	Camas, Fumaria, Penstemon, Urtica	Low
Fish				
Bull trout	*Salvelinus confluentus*	Federal Threatened	Typha	None
Spring Chinook salmon (Upper Columbia River)	*Oncorhynchus tshawytscha*	Federal Endangered	Penstemon	None
Steelhead (Middle Columbia River)	*Oncorhynchus mykiss*	Federal Threatened	Typha	None
Summer Steelhead (Upper Columbia River)	*Oncorhynchus mykiss*	Federal Threatened	Penstemon	None
Herptiles				
Columbia spotted frog	*Rana luteiventris*	State Candidate	Camas, Penstemon	High
Sharp-tailed snake	*Contia tenuis*	State Candidate	Camas, Fumaria	Low
Invertebrates				
Giant Palouse earthworm	*Driloleirus americanus*	State Candidate		Low

4.1.1 Bald Eagle

The bald eagle is a Federal Species of Concern, in addition to being BGEPA- and MBTA-protected. They are habitat generalists, typically associated with aquatic habitats, preferring forested areas that surround fish-bearing lakes and rivers.

The PHS mapper did not document any bald eagle occurrences or nests in the analysis areas, but eagles were observed during the field survey at the Fumaria and Penstemon sites. Both sites are within 3 miles of the Yakima River (potential nesting habitat). Bald eagles are also scavengers, and calves were observed near both sites; it is likely that the observed eagles were scavenging afterbirth in the vicinity of these sites. As requested by the USFWS, an Avian Protection Plan (APP) will be developed to encompass all mitigation measures proposed to protect migratory birds, including bald eagles. The APP will include pre-construction surveys for raptor nests to establish if buffers would be required during construction activities.

4.1.2 Greater Sage-grouse

The greater sage-grouse (*Centrocercus urophasianus*) is classified as a Federal Candidate by USFWS and a State Threatened species by WDFW. This species lives only on the sagebrush steppe of western North America, and uses several types of sagebrush habitat during different parts of year (Sage Grouse Initiative 2017). Leks, or breeding areas, are located in clear areas such as grassy swales or dry lakebeds. Nesting habitats are usually made up of areas with dense cover from big sagebrush (*Artemisia tridentate*), but can also occur in areas with rabbitbrush, greasewood, and grassy areas (Cornell 2017).

According to the PHS mapper, an occurrence of this species was recorded within the township that includes the entire area of the proposed Camas and Penstemon Solar Project sites (WDFW 2017b). However, the proposed sites do not fit the description for this species' preferred habitat. Therefore, it is unlikely that this species occurs within these two sites.

4.1.3 Sandhill Crane

The sandhill crane (*Grus canadensis*) is classified as a State Endangered species by WDFW. Klickitat and Yakima Counties hold the primary breeding grounds within the State of Washington for sandhill cranes. This species prefers open shallow waters along river channels, on alluvial islands of braided rivers, or in natural basin wetlands, but can sometimes occur in fields and agricultural lands during feeding and resting (California Department of Fish and Game 1990). They typically avoid visual obstructions, such as houses, bridges, and paved or gravel roads (Norling et al. 1992).

4.1.4 Bull Trout

The bull trout is classified as a Federally Threatened species by USFWS. Bull trout exhibit a number of life history strategies. Stream-resident bull trout complete their entire life cycle in the tributary streams where they spawn and rear. Most bull trout are migratory, however, spawning in tributary streams where juvenile fish usually rear for 1 to 4 years before migrating to either a larger river (fluvial) or lake (adfluvial) where they spend their adult life, returning to the tributary stream to spawn (Fraley and Shepard 1989). Successful egg incubation and survival requires very cold, clear, well-oxygenated waters as found in pristine headwater stream habitats (Wydoski and Whitney 2003). Bull trout in fresh water feed primarily on whitefish, sculpins, and young salmonids, although they also consume insects, amphibians, crayfish, and other available food (Kraemer 1994). The bull trout has been documented in the Yakima River by PHS, SalmonScape, and StreamNet (Pacific States Marine Fisheries Commission

2016; WDFW 2017a, 2017b). In addition, the part of the Yakima River that is adjacent to the Typha Solar Project site contains designated critical habitat for bull trout (see Appendix A).

4.1.5 Chinook Salmon and Steelhead

The Upper Columbia River Spring Chinook and Summer Steelhead are classified as Federally Endangered and Federally Threatened, respectively, by NMFS. All salmonids require sufficient invertebrate organisms for food; cool, flowing waters free of pollutants; high dissolved oxygen concentrations in rearing and incubation habitats; water of low sediment content during the growing season (for visual feeding); clean gravel substrate for reproduction; and unimpeded migratory access to and from spawning and rearing areas (Spence et al. 1996). Both the Upper Columbia River Spring Chinook and Upper Columbia River Summer Steelhead have been documented in Coleman Creek along the eastern boundary of the Penstemon Solar Project site, by PHS, SalmonScape, and StreamNet (Pacific States Marine Fisheries Commission 2016; WDFW 2017a, 2017b). In addition, the part of Coleman Creek adjacent to the Penstemon site contains designated critical habitat for the Upper Columbia River Steelhead (see Appendix A). The Middle Columbia River steelhead has been documented in the Yakima River by PHS, SalmonScape, and StreamNet (Pacific States Marine Fisheries Commission 2016; WDFW 2017a, 2017b). In addition, the part of the Yakima River that is adjacent to the Typha Solar Project site contains designated critical habitat for Middle Columbia River steelhead (see Appendix A).

4.1.6 Columbia Spotted Frog

The Columbia spotted frog (*Rana luteiventris*) is classified as a State Candidate species by WDFW. This species is rarely found far from water and occurs in a variety of still-water habitats, as well as in some streams and creeks. Their breeding habitat includes seasonally flooded margins of wetlands, ponds, and lakes, and even some flooded pools and still-water edges of creeks. They are most often found in association with wetland plant communities consisting primarily of non-woody plants, such as sedges, rushes, and grasses (Leonard et al. 1993). The egg masses are typically laid in shallow water with little or no shading from vegetation. They are most active in lowland habitats from February through October and hibernate in muddy bottoms near their breeding site in the winter (Licht 1974). Spotted frog tadpoles have been shown to be very sensitive to chemical fertilizers, which may have contributed to the species' decline (Marco 1997).

According to the PHS mapper, an occurrence of this species was recorded within 300 feet of the proposed Camas Solar Project site in a waterway to the northeast, and within 1 mile of the proposed Penstemon Solar Project site in a waterway to the southeast (WDFW 2017b). Egg masses from this species were observed at the Typha and Penstemon Solar Project sites during the April 3 to 12, 2017, field survey. A preconstruction clearance survey may be recommended by WDFW for developments in or near potential spotted frog habitat, but since current plans are to buffer and avoid water bodies, this is unlikely to be necessary.

4.1.7 Sharp-Tailed Snake

The sharp-tailed snake is classified as a State Candidate species by WDFW. This species prefers forest openings dominated by Garry oak (*Quercus garryana*), particularly with rock accumulations, and riparian deciduous woodlands with accumulations of decaying woody logs within ponderosa pine (*Pinus ponderosa*), oak, or shrub-steppe (Hallock 2009).

According to the PHS mapper, an occurrence of this species was recorded within the quarter-township that includes the entire area of the proposed Camas and Fumaria Solar Project sites (WDFW 2017b).

However, the proposed sites do not fit the description for this species' preferred habitat. Therefore, it is unlikely that this species occurs within these two project sites.

4.1.8 Giant Palouse Earthworm

The only special-status invertebrate species known to occur in Kittitas County is the giant Palouse earthworm (*Driloleirus americanus*), a state candidate species. Known habitats for this species include deep, loamy soils characteristic of the Palouse bunchgrass prairies, and gravelley sandy loam or other rocky soils in forested areas. They have been observed in open forest, shrub-steppe, and prairie habitats and are typically associated with native vegetation (WDFW 2015).

4.2 Site-specific Observations

4.2.1 Camas Solar Project Site

A review of the PHS database showed that the Camas Solar Project site has historically provided habitat for Columbia spotted frog (*Rana luteiventris*), a State Candidate species. A Pacific treefrog was observed at this site. This site is also located within a township known to support greater sage-grouse (*Centrocercus urophasianus*), a State Threatened and Federal Candidate species. Greater sage-grouse are closely associated with large uninterrupted areas of sagebrush, native bunchgrasses, wildflowers, and wet meadows. Because the Camas site does not provide this type of habitat, greater sage-grouse are unlikely to occur in this project-scale analysis area.

During field surveys, an active red-tailed hawk nest was observed in a large willow along Little Naneum Creek (see Figures 15 and 22). Additionally, the floor of the barn in the northeast part of the site was littered with owl pellets and the rafters contained whitewash (see Figures 15 and 23). This barn would remain in place following solar project construction, based on current design plans. If nesting activity is observed at the nest and barn, then a 0.25-mile seasonal construction avoidance buffer may be requested by WDFW until the young have fledged (see Section 5.1.1 and Appendix D).

During a site visit on April 12, 2017, WDFW biologists stated that Little Naneum Creek is likely fish-bearing. Dace (*Leuciscus* spp.) were observed during the site visit in the irrigation ditch that flows north to south along the west side of the solar site, into Little Naneum Creek.

Figure 22. Red-tailed hawk nest in willows along the Little Naneum Creek riparian corridor.

Figure 23. Barn in the northwest corner of the Camas Solar Project that provides owl roosting habitat.

4.2.2 Fumaria Solar Project Site

A review of the PHS database showed that the Fumaria Solar Project site is located within a quarter-township known to support sharp-tailed snake (*Contia tenuis*) a State Candidate species. Sharp-tailed snake can occur in a wide variety of habitats, but are most commonly associated with wetter soils in coniferous or mixed woodland forests. Because this site does not provide this type of habitat, sharp-tailed snake are unlikely to occur in this project-scale analysis area.

Pacific treefrogs were observed at this site (see Figures 24 and 25). A bald eagle was seen perching in the willows near the northernmost Reecer Creek road crossing along the Fumaria generation tie line (see Figures 16 and 26). East of Fumaria's generation tie line (along North Faust Road), two active raptor nests were observed: a red-tailed hawk and great horned owl (see Figures 17 and 27). If nesting activity is observed at the nests, then a 0.25-mile seasonal construction avoidance buffer may be requested by WDFW until the young have fledged (see Section 5.1.1 and Appendix D).

During the field surveys, dace were observed in the irrigation ditches that are south of the site and are connected to Reecer Creek. Reecer Creek is known to be fish-bearing, containing rainbow trout (*O. mykiss*), a non-anadromous form of steelhead. In the past, the landowner has stocked the ponds (southeast of the site) with triploid rainbow trout.

Figure 24. Pacific treefrog observed in the fallow–native vegetation at the Fumaria Solar Project.

Figure 25. Pacific treefrog observed in the ditch along the west boundary of the Fumaria Solar Project.

Figure 26. Willows near the Fumaria generation tie line crossing of Reecer Creek, where a bald eagle was observed perching downstream (south) of the crossing.

Figure 27. Red-tailed hawk nest to the left (north) and great horned owl nest to the right (south), observed east of the Fumaria generation tie line along North Faust Road.

4.2.3 Penstemon Solar Project Site

A review of the PHS database showed that the Penstemon Solar Project site is located within a township known to support greater sage-grouse, a State Threatened and Federal Candidate species. Greater sage grouse are closely associated with large uninterrupted areas of sagebrush, native bunchgrasses, wildflowers and wet meadows. Because the site does not provide adequate greater sage-grouse habitat, they are unlikely to occur in this project-scale analysis area.

An active red-tailed hawk nest was observed southeast of the southeast site corner, in a cottonwood tree along Coleman Creek (Figure 28). If nesting activity is observed at the nest, then a 0.25-mile seasonal construction avoidance buffer may be requested by WDFW until the young have fledged (see Section 5.1.1 and Appendix D). Several egg masses, thought to be from Columbia spotted frog, were observed in an irrigation ditch that connects with Coleman Creek south of the southeast corner of the site (Figure 29). Additionally, Coleman Creek is known to be fish-bearing, containing steelhead, Chinook, and rainbow trout.

Figure 28. Red-tailed hawk nest in cottonwoods along the Coleman Creek riparian corridor.

Figure 29. Columbia spotted frog egg masses in a ditch south of the Pentsemon Solar Project.

4.2.4 Typha Solar Project Site

A review of the PHS database showed that no priority habitats or species are documented on the Typha Solar Project site. The Yakima River, located adjacent to the northeast corner of the site, is a fish bearing stream containing mountain sucker (*Catostomus platyrhyncus*), Coho (*O. kisutch*), Chinook, resident and anadromous bull trout (*Salvelinus malma*), Westslope cutthroat (*O. clarki lewisi*), and rainbow trout and summer steelhead. The portion of the Yakima River adjacent to the northeast corner is designated as a shoreline of the state based on the Washington Water Typing Criteria (WAC 222-16-030), and the Shoreline Management Act's list of streams and rivers constituting shorelines of the state for Kittitas County (WAC 173-18-230). Two egg masses, thought to be from Columbia spotted frog, were observed in TW04, a wetland located along the southern boundary of the site (see Figure 30).

A documented great blue heron (*Ardea herodias*) breeding area is 224 feet east of the site, on a landform within the Yakima River (see Figures 20 and 31). The great blue heron nesting season is February through September. WDFW may request a seasonal avoidance buffer during the first half of the season, i.e. February through May (Appendix D).

Figure 30. Columbia spotted frog egg masses in a TW01, a wetland along the southern boundary of the Typha Solar Project.

Figure 31. Great blue heron rookery along the Yakima River, located east of the Typha Solar Project.

The floor of the barn, located south of the southwest corner of the site, was littered with owl pellets and the rafters contained whitewash (see Figures 20 and 32). Current project plans include leaving this barn in-place. If nesting activity is observed at the barn, then a 0.25-mile seasonal construction avoidance buffer may be requested by WDFW until the young have fledged (see Section 5.1.1 and Appendix D).

Figure 32. Barn south of the southwest corner of the Typha Solar Project that provides owl roosting habitat.

4.2.5 Urtica Solar Project Site

A review of the PHS database showed that no priority habitats or species are known to occur on the Utica Solar Project site. During an April 12 site visit, WDFW biologists stated that McCarl Creek is likely fish-bearing. In the past, the landowner has stocked the ponds with triploid rainbow trout. A Canada goose was observed nesting near the ponds.

5 RECOMMENDED ENVIRONMENTAL COMMITMENTS FOR TUUSSO'S CONSIDERATION

The proposed solar projects have the potential to negatively affect the vegetation communities and plant species in the project-scale analysis areas where ground disturbance would occur for construction of the solar sites, including a reduction in the size of the vegetation communities. Vegetation clearing or grubbing activities could also increase or introduce noxious plant populations in undisturbed habitat, contribute to soil erosion, lead to slope destabilization, or result in movement of material beyond the grading activities. Soil erosion from ground-disturbing activities may result in a negative effect on streams in the project-scale analysis areas, by increasing sedimentation into the streams.

Potential impacts to fish and wildlife may result from construction and operation of the solar projects. Ground disturbance, vegetation clearing, and noise could result in temporary impacts on wildlife species present in the project-scale analysis areas during construction. Long-term effects of the solar projects would be limited to the long-term modification of habitat in each project-scale analysis area.

The following sections describe potential best management practices (BMPs) and mitigation measures that could reduce or minimize the impacts on vegetation, fish, and wildlife.

5.1 Buffers and Seasonal Timing

5.1.1 Migratory Birds and Bald and Golden Eagles

To ensure compliance with MBTA, vegetation clearing would ideally be undertaken from August 1 through the end of February. If construction or vegetation clearing is required between March 1 and August 1, nest surveys would be required in the proposed area of disturbance. If active migratory bird nests are encountered during the surveys, land-disturbing construction activities should be avoided while the birds are allowed to fledge. An appropriate species avoidance buffer, as determined in conjunction with WDFW and local agencies, would apply to all active nests for migratory bird species. As requested by the USFWS, an APP would be developed to encompass all mitigation measures proposed to protect migratory birds.

As discussed in Section 4, the project-scale analysis areas have the potential to provide nesting habitat to raptors and bald and golden eagles. All raptor species are protected under the MBTA, and bald and golden eagles are additionally protected under the BGEPA. If active raptor nests occur within 0.25 mile of the solar project construction activities, noise and construction activities could disturb nesting and fledgling raptors, potentially causing nest abandonment. Based on WDFW guidance (Appendix D), a nest survey within 0.25-mile of construction activities would be conducted within the same year that construction is scheduled, to determine whether nests could be occupied during construction. The nesting seasons vary by species as shown in Table 5. WDFW's 0.25-mile buffer is inclusive of the distance recommended by the National Bald Eagle Management Guidelines (USFWS 2007), which specifies a 660 foot (0.125 mile) buffer of active eagle nests. If active raptor nests are observed, then TUUSSO would coordinate with WDFW to determine approaches to minimize disturbance to the nesting raptors. Buffer distances and timing restrictions would collaboratively be developed by WDFW and TUUSSO, dependent upon the sound levels produced by the construction equipment and the sensitivity of the nesting raptors.

Table 5. Nesting Seasons for Raptor Species Likely to Occur in the Analysis Areas

Species	Nesting Season
Bald eagle	January 1–August 31
Golden eagle	January 1–August 31
Red-tailed hawk	March 15–June 30
Great horned owl	February 1–May 15
Swainson's hawk	April 15–July 31

Source: Personal Communication with Scott Downes, WDFW Habitat Biologist, 2017 (see Appendix D)

5.1.2 Riparian Corridors

Rivers and streams in Kittitas County are classified according to the Washington State stream typing system, as defined in Chapter 222-16-030 WAC. The Department of Ecology and the Washington DNR recognize the WAC stream typing system. Kittitas County has established riparian habitat buffer ranges for each stream type to reflect the impact of certain intense land uses on riparian habitat functions and values. The performance standard buffers are defined in KCC 17A.070.010.

Table 6 shows the surface waters that were identified in the project-scale analysis areas, their DNR stream type, and the applicable buffers. See also each project site's critical areas report for recommended buffer and setback distances from the wetlands identified within the sites.

Table 6. Surface Waters in the Project-scale Analysis Areas and Applicable Buffers

Stream ID	Water Type	Flow Type	DNR Stream Type[a]	Kittitas County Buffers (feet)	
				Minimum	Maximum
Yakima River	River	Perennial	S	40	200
Ellensburg Power Canal (TS01)	Canal	Perennial	N/A	-	-
FS01	Ditch	Ephemeral	N/A	-	-
FS02	Ditch	Ephemeral	N/A	-	-
Reecer Creek	Stream	Perennial	F	20	100
Kittitas Reclamation District Canal (FS03)	Canal	Perennial	N/A	-	-
FS04	Stream	Intermittent	Ns	0	15
Town Canal (FS05)	Canal	Perennial	N/A	-	-
US01	Stream	Intermittent	F	20	100
Little Naneum Creek (CS01)	Stream	Perennial	F	20	100
Bull Ditch (CS02)	Ditch	Perennial	N/A	-	-
Coleman Creek	Stream	Perennial	F	20	100

[a] As defined in WAC 222-16-030: S = shoreline of the state, F = fish-bearing, Ns = non-fish-bearing. N/A = not applicable, due to ditches and canals being excluded from the WAC typing system.

To additionally protect riparian corridors and habitats, it is recommended that peak construction activities be conducted during the dry season as much as possible, to minimize erosion, sedimentation, and soil compaction. If any in-water work is required for construction of access roads, construction in fish bearing streams would need to occur during the agency-approved work windows.

5.2 Noise

Most construction activities would take place during the normal business hours of 8 a.m. to 6 p.m. and be conducted in accordance with local bylaws and noise ordinances, including but not limited to Kittitas County Code Section 9.45.010: Public Disturbance noises. Additionally, all noise generating construction activities would be conducted between the hours of 7 a.m. and 10 p.m., in accordance with WAC 173-60-050. These practices would avoid night-time noise disturbances to wildlife species.

5.3 Other Measures

Additional mitigation measures and BMPs to protect fish and wildlife in the project-scale analysis areas could include the following:

Design and Construction Techniques

- Avoid, when possible, construction in sensitive areas such as riparian zones and wetlands.
- Flag sensitive habitat areas (e.g., raptor nests, wetlands, etc.) near proposed areas of construction activity, and designate such areas as "off limits" to all construction personnel.

- During the nesting season, monitor raptor nests within 0.25-mile of the sites for nesting activity; coordinate construction timing and activities with WDFW to avoid impacts to nesting raptors.
- Minimize new road construction by improving and using existing roads and trails, instead of constructing new roads.
- Develop and implement a Fire Control plan, in coordination with local fire districts, to minimize the risk of accidental fires during construction, and respond effectively to any fire that does occur.
- Designate an environmental monitor during construction to monitor construction activities and ensure compliance with mitigation measures.
- Implement a trenching protocol during the installation of underground electrical facilities, to allow for conservation of surface soils.
- Require construction personnel to avoid driving over or otherwise disturbing areas outside of the designated construction areas.
- Properly store and manage all wastes generated during construction.
- Use certified "weed free" straw bales during construction to avoid introduction of noxious or invasive weeds.
- For poles installed by TUUSSO, when feasible:
    - equip overhead power lines with raptor perch guards to minimize risks to raptors; and
    - space overhead power line conductors to minimize potential for raptor electrocution.
- Design PV panels with anti-reflective coatings to minimize impacts from the "lake effect" on passing migratory birds.

Erosion and Sediment Control

- Use BMPs to minimize construction-related surface water runoff and soil erosion.
- Implement temporary erosion and sediment control measures, as appropriate, both during and after construction.
- Flag sensitive habitat areas (e.g., riparian zones, wetlands, etc.) near proposed areas of construction activity, and designate such areas as "off limits" to all construction personnel.
- Limit disturbances to the minimum necessary when working in or near waterbodies and install stakes or flagging to restrict vehicles and equipment to designated routes and areas.
- Delineate construction limits within 200 feet of waterbodies, as specified in the stormwater pollution prevention plan (SWPPP), with a sediment fence, straw wattles, or similarly approved methods to eliminate sediment discharge into waterways and wetlands, minimize the size of construction disturbance areas, and minimize removal of vegetation, to the greatest extent possible.

Post-construction Restoration and Noxious Weed Control

- Quickly revegetate habitats temporarily disturbed during construction with native species.
- Reseed all temporarily disturbed areas with an appropriate mix of native plant species as soon as possible after construction is completed, to accelerate the revegetation of these areas and to prevent the spread of noxious weeds.
- Improve riparian areas within the Penstemon and Urtica Solar Project boundaries using native riparian plants where the existing vegetation has been reduced or eliminated due to agricultural practices.
- Consult with WDFW regarding the appropriate seed mixes to include in the Vegetation Management Plan for revegetation of the project sites.

- As further detailed in the Vegetation Management Plan, implement noxious weed control measures.
    - Develop a noxious weed control plan prior to construction, and implement the plan over the life of the project as mitigation. Herbicide application could be a noxious weed control method used.

6 CONCLUSIONS

6.1 Habitat Impacts

As shown in Table 1, habitat similar to the types available in the project-scale analysis areas is readily available in the landscape-scale analysis area. Long-term modification of vegetation communities would not result in a significant change to the overall habitat available to species in the analysis areas. Some species, such as small rodents, snakes, and insects, could be affected by the ground-disturbing activities due to temporary habitat alteration and could suffer mortalities from direct contact with construction equipment. More commonly, wildlife would be displaced to adjacent habitat areas. The effects from ground disturbance during construction would be considered low with respect to common wildlife species, all of which can be expected to have robust populations that would be minimally affected by the temporary and localized construction activities associated with the solar projects.

6.2 Special-status Species Impacts

No special-status plant species are known to occur within the construction areas. The proposed solar projects have the potential to affect the following special-status species:

- Bald eagle (BGEPA- and MBTA-protected; Federal Species of Concern)
- Columbia spotted frog (Washington State Candidate)

Bald eagles were observed near the Fumaria and Penstemon Solar Project sites, and are likely present throughout the project-scale analysis areas. If nests are present in the project vicinity, they have the potential to be affected by noise and visual disturbances during construction. No bald eagle nests have been identified near the solar project sites; if nests are identified near the sites, construction outside of the critical use period (January 1 – May 31) is recommended. If construction near active bald eagle nests might occur during the critical use period, local USFWS biologists would be consulted.

Columbia spotted frog is known to occur near the Typha, Camas, and Penstemon Solar Project sites, and could be affected by construction and operation in and around ponds and canals that provide breeding habitat. To avoid impacts to aquatic and semi-aquatic species, setback distances from aquatic habitats will be incorporated into site layouts, and appropriate erosion and sediment control measures would be implemented to protect wetlands and streams from sediment and other contaminants.

Recommended mitigation measures for special-status species are described in Section 5.0.

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8 LIST OF PREPARERS

Table 7. List of Preparers

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APPENDIX A: USFWS IPAC TRUST RESOURCES REPORT FOR FIVE TUUSSO SOLAR PROJECT SITES

APPENDIX B: WASHINGTON STATE PRIORITY HABITATS AND SPECIES LIST FOR FIVE TUUSSO SOLAR PROJECT SITES

APPENDIX C: BIRD OBSERVATION LIST FOR FIVE TUUSSO SOLAR PROJECT SITES

Table C-1. Bird Observations

Common Name	Scientific Name	Solar Sites Where Observed				
		Camas	Fumaria	Penstemon	Typha	Urtica
American Crow	*Corvus brachyrhynchos*	x	x			x
American Kestrel	*Falco sparverius*					x
American Robin	*Turdus migratorius*		x	x	x	
Bald Eagle	*Haliaeetus leucocephalus*		x	x		
Belted Kingfisher	*Megaceryle alcyon*				x	x
Black-billed Magpie	*Pica hudsonia*	x	x		x	x
Black-capped Chickadee	*Poecile atricapillus*	x	x	x	x	
Brewer's Blackbird	*Euphagus cyanocephalus*	x	x			x
California Quail	*Callipepla californica*		x		x	
Canada Goose	*Branta canadensis*		x	x	x	x
Common Merganser	*Mergus merganser*				x	
Common Raven	*Corvus corax*		x	x	x	x
Downy Woodpecker	*Picoides pubescens*	x			x	
Eurasian Collared-Dove	*Streptopelia decaocto*		x		x	x
European Starling	*Sturnus vulgaris*					x
Great Blue Heron	*Ardea herodias*	x			x	x
Green-winged Teal	*Anas carolinensis*				x	
House Finch	*Haemorhous mexicanus*		x		x	
House Sparrow	*Passer domesticus*		x			
Killdeer	*Charadrius vociferus*	x	x	x	x	x
Mallard	*Anas platyrhynchos*		x		x	x
Mourning Dove	*Zenaida macroura*	x	x	x	x	
Northern Flicker	*Colaptes auratus*					x
Northern Harrier	*Circus cyaneus*		x	x	x	x
Olive-sided Flycatcher	*Contopus cooperi*		x			
Osprey	*Pandion haliaetus*	x				x
Prairie Falcon	*Falco mexicanus*		x			
Red-tailed Hawk	*Buteo jamaicensis*	x	x	x	x	
Red-winged Blackbird	*Agelaius phoeniceus*	x	x	x	x	x
Savannah Sparrow	*Passerculus sandwichensis*		x			

Common Name	Scientific Name	Solar Sites Where Observed				
		Camas	Fumaria	Penstemon	Typha	Urtica
Say's Phoebe	*Sayornis saya*				x	
Song Sparrow	*Melospiza melodia*		x			
Tree Swallow	*Tachycineta bicolor*	x		x	x	x
Turkey Vulture	*Cathartes aura*		x			
Western Meadowlark	*Sturnella neglecta*		x			
White-crowned Sparrow	*Zonotrichia leucophrys*	x				
Wilson's Snipe	*Gallinago delicata*		x		x	
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*		x			
Yellow-rumped Warbler	*Setophaga coronata*	x	x	x		

APPENDIX D: CORRESPONDENCE TO-DATE WITH WDFW REGARDING THE FIVE TUUSSO SOLAR PROJECT SITES