Botanical Report for the Nason Creek SR207 Realignment Project

Overview of northern forested-wetland pond complex and surrounding conifer forest of the Nason Creek SR207 Realignment Project.

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1. Introduction

Yakama Nation Fisheries, Upper Columbia Habitat Restoration Project, (UCHRP) is performing habitat restoration projects in the Upper Columbia Basin of Washington to restore aquatic and riparian habitats to support the recovery of Endangered Species Act- (ESA-) listed fish species. Preliminary plans for the Nason Creek SR207 Realignment Project (Project) includes realignment of SR207 roadway and increasing floodplain connectivity along Nason Creek.

A botanical inventory was conducted for the project in 2026 to identify and document any state or federal listed vascular plants (rare plants), state or county listed noxious weeds and document and describe the existing plant communities within the Project Area. The purpose of this document is to support review by the Yakama Nation and follows methods consistent with the Washington State Natural Heritage Program (WNHP). Botanical inventory surveys were performed at the Project by Hamer Environmental for Yakama Nation Fisheries Program.

The Nason Creek SR207 Realignment Project is located in Chelan County, Washington, just east of Nason Creek between River Mile 3.4 and 4.1. The proposed Project is 0.3 miles northeast of Coles Corner, Washington and accessed from SR207 along the west and FS 6603 Rd (syn. Reiche Rd) along the east end (T 26N, R 17E, S 9). The Project Area of Potential Effect, (APE) is 60 acres in size (Figure 1).

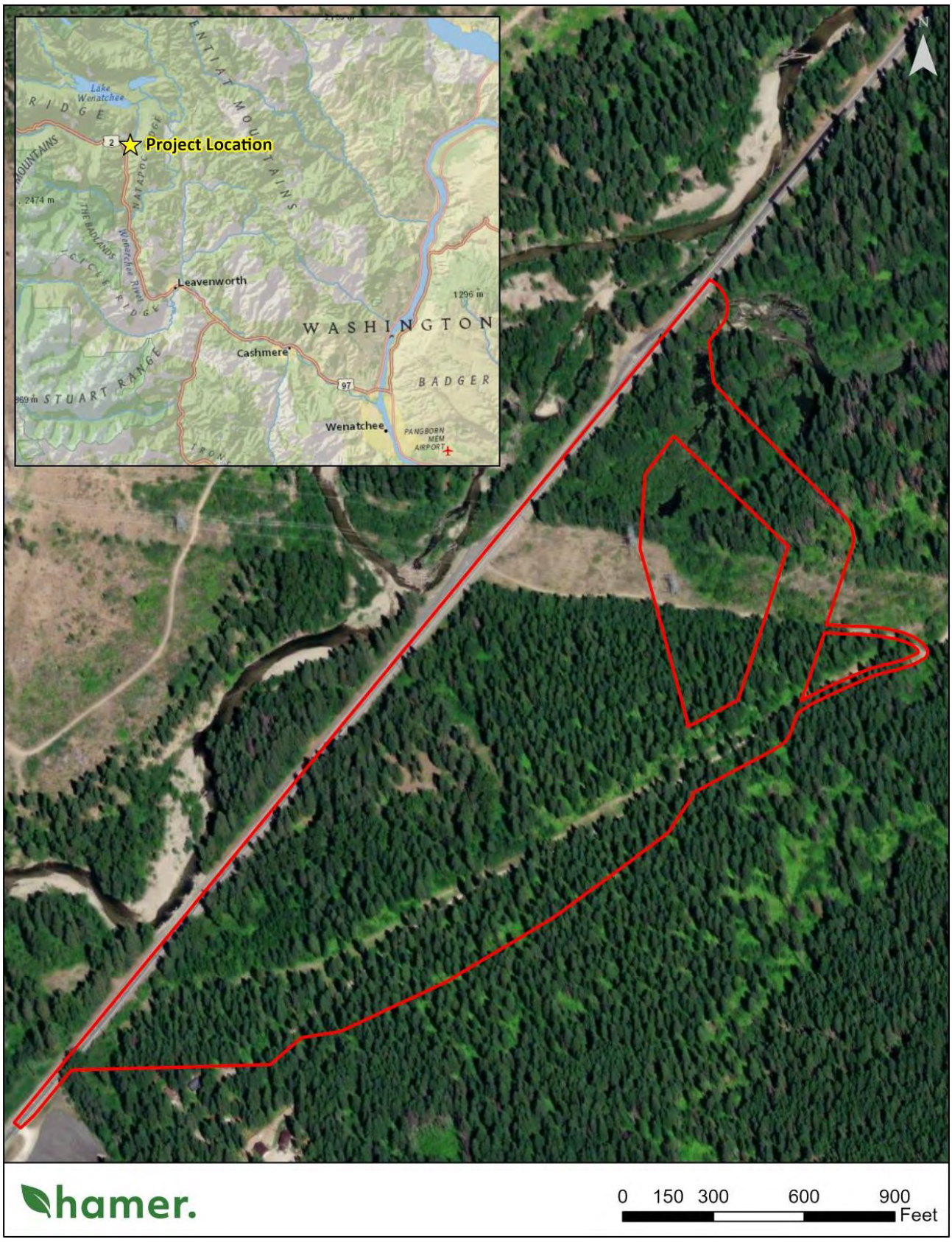

Figure 1. Nason Creek SR207 Realignment Project Vicinity Map, Chelan County, Washington.

2. Methods

2.1 Pre-field Review of Rare Plants with Potential to Occur in the Project Area

A pre-field desktop review was conducted to create a priority list of rare vascular plant species with potential to occur in the Nason Creek Project vicinity. This refined rare plant list was also used to determine best timing for field botanical surveys based on flowering times of those plant species. The WNHP of the Washington Department of Natural Resources, maintains records of all rare plants and the rare plant list for Chelan County, WA served as the baseline (WNHP 2026a). The WNHP rare plant list was refined to exclude those rare plants found only at high elevations or other habitats not found at the Nason Creek Project (Appendix A). Secondly, a GIS dataset of rare plants maintained by the WNHP was used to identify rare plants and high-quality ecosystems located within a 10-mile radius of the Project Area (WNHP 2026b). These plants and plant communities have a higher likelihood of occurrence due to their proximity to the Project but were similarly excluded if range or habitats had no potential for occurrence at the Nason Creek SR207 Realignment Project (Table 1).

Table 1. Rare Plants and Plant Communities within 10-miles of the Nason Creek SR207 Realignment Project[1] (WNHP 2026b).

Common Name	Scientific Name	State Status	USFS Status
Thompson's chaenactis	Chaenactis thompsonii	S	
bulb-bearing water-hemlock	Cicuta bulbifera	S	
Wenatchee larkspur	Delphinium viridescens	T	
Rone's biscuitroot	Lomatium roneorum	E	
false mountain willow	Salix pseudomonticola	S	
strawberry saxifrage	Saxifragopsis fragarioides	T	
marginate splashzone moss	Scouleria marginata (moss)		
Wenatchee Mountain checkermallow	Sidalcea oregana var. calva		
Douglas's catchfly	Silene douglasii var. rupinae		
Seely's catchfly	Silene seelyi	S	
Urn lichen	Tholurna dissimilis	S	
Bog Willow / Beakrush / Sphagnum Shrub Fen	Salix pedicellaris / Rhynchospora alba / Sphagnum Shrub Fen	-	-
Buxbaum's Sedge Fen	Carex buxbaumii Fen	-	-
Lesser Panicled Sedge / Hamatocaulis Moss Fen	Carex diandra / Hamatocaulis vernicosus Fen	-	

Common Name	Scientific Name	State Status	USFS Status
Mud Sedge / Sphagnum spp. Fen	Carex limosa / Sphagnum spp. Fen	-	

[1]Rare Plants – Several high-elevation WNHP rare plant detections were excluded from table due to lack of habitat at Project Area.

Surveys were conducted in May to meet project timing requirements, though timing surveys to the flowering period of likely rare plants is ideal, and due to the early timing of the survey, some later flowering species may be excluded. Three sources in order of preference were consulted for flowering period of rare plants: WNHP Rare Plant Field Guide, Burke Herbarium Image Collection and the Consortium of Pacific Northwest Herbaria Specimen Database (WNHP 2011, Burke Museum Herbarium 2026, Consortium of PNW Herbaria 2026).

The 35 plant species on this rare plant list were the focus of the botanical inventory surveys, and timing of surveys was determined based on the flowering period of these rare plants (Appendix A, Table 1).

2.2 Field Botanical Surveys

The field botanical inventory surveys included one visit conducted in late spring, May 18-22, 2026, and included:

1. A full walk-through of all potential project APEs and access routes, including a 20-foot buffer surrounding project APE.
2. A botanical inventory of the project was performed by conducting meandering transects throughout the site and associated buffer following an intuitive controlled approach accepted by WNHP. All vascular plant species observed were recorded, and extra time was spent in areas with habitats suitable for rare plants (wetlands, upland shrub meadow, etc.).
3. Plant communities comprising the site were documented and described, noting general conditions. Existing plant communities were identified in the field, using plant community associations from *Classification and Management of Aquatic, Riparian, and Wetland Sites on the National Forests of Eastern Washington* when possible (Kovalchik and Clausnitzer 2004).
4. When a rare plant or rare plant community was observed, a WNHP rare plant/plant community data form was completed, the location documented by GPS, and photos collected.
5. Any Washington state noxious weeds encountered during the surveys were documented, and all large Class A and B weed infestations were mapped (Washington State Noxious Weed Control Board 2020).

Any plants that could not be positively identified in the field were collected for later identification with a dissecting microscope and additional botanical references.

3. Results

Botanical inventories of the Nason Creek Project and associated buffers were conducted, by Hamer Environmental botanist, Erin Colclazier. May 18-22, 2026. A total of 172 plant species were identified at the site (Appendix B). Incidental wildlife observed during the botanical inventory were also documented (Appendix C).

3.1 Existing Plant Communities

The Project Area consists primarily of an upland conifer forest bordered on the northwest by State Route 207 (SR207), with some hydrologic connectivity to Nason Creek through culverts under SR207. The northeastern area is a wetland forest-pond complex with multiple beaver ponds (Figure 2). Additional smaller wetlands of shrubs occur at the north central and southwest edges of the project area, both with some shallow ponding (10-20 in depth) at time of survey. A transmission corridor runs east-west through the northern part of the project, and the vegetation is maintained as shrubs, with trees removed. Lastly, an upland shrub meadow was found in the central Project Area, surrounded by conifer forest.

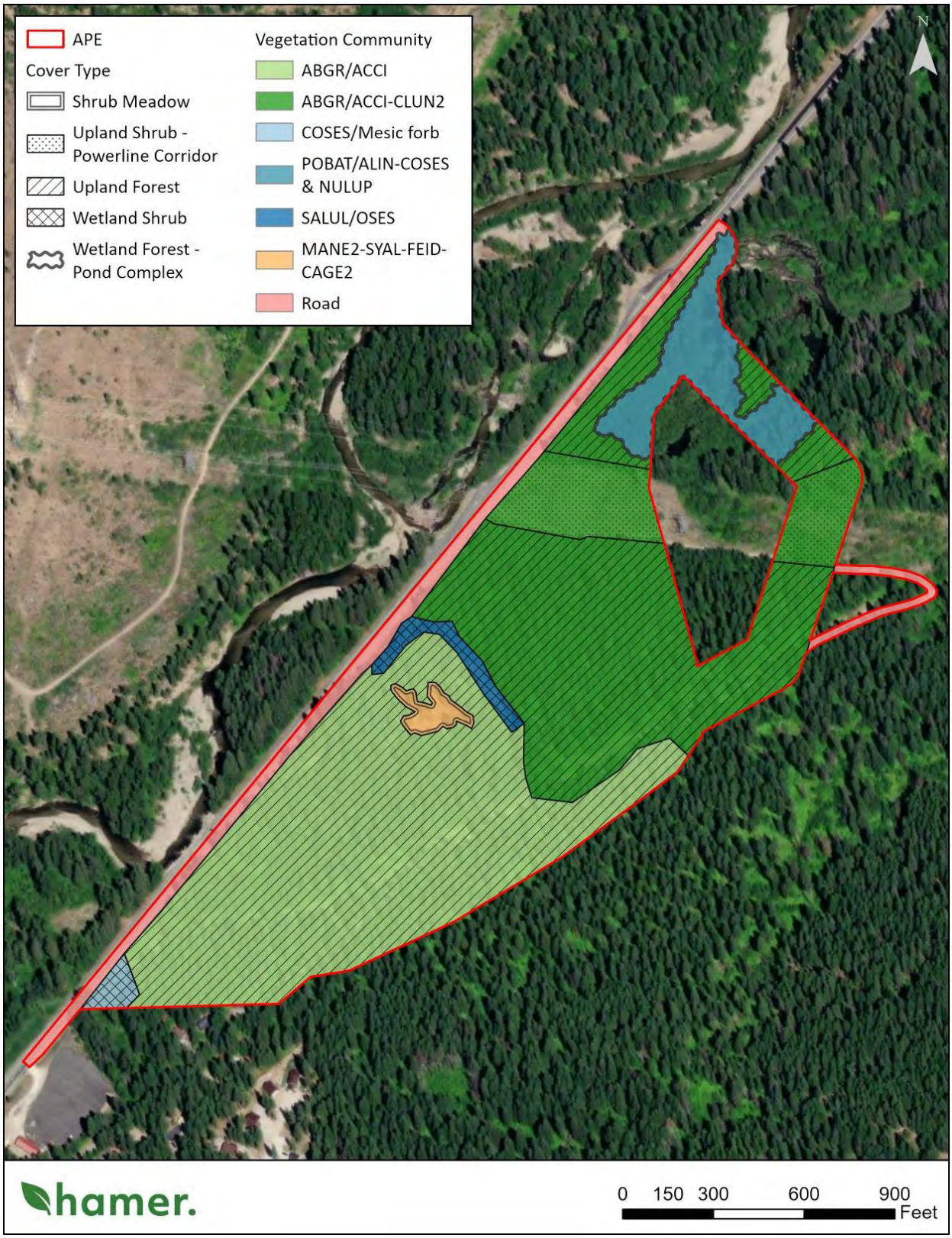

Figure 2. Vegetation Types within the Nason Creek SR207 Realignment Project Area, Chelan County, WA.

Upland and Riparian Forests

Upland conifer forest comprised the majority of the project area, covering the majority of lands south of the transmission line corridor that bisects the site. A smaller powerline corridor cuts through the forest and just west of FS 6603 Rd but contains similar understory species as adjacent forest, so is included (Figure 3). Upland forest habitat contained mostly mid-succession conifers (8-20" DBH [diameter at breast height]) with some mature trees. Common conifers include dominant Douglas fir (*Pseudotsuga menziesii*), with grand fir (*Abies grandis*) comprising 20-40% of the tree canopy, and ponderosa pine (*Pinus ponderosa*) comprising 10% cover and occasional western red cedar (*Thuja plicata*). Deciduous trees black cottonwood (*Populus trichocarpa* ssp. *balsamifera*) and bitter cherry (*Prunus emarginata*) were present, particularly at forest/road and forest/powerline corridor edges. Vine maple (A*cer circinatum*) was the dominant understory, dense in many areas with no other species present in the understory. In some areas, patches of Cascade barberry (*Mahonia nervosa*) were codominant with vine maple in the understory, and Oregon boxwood (*Paxistima myrsinites*), red-osier dogwood (*Cornus stolonifera*), and baldhip rose (*Rosa gymnocarpa*) shrubs sparsely present. Common groundcover species were often limited to sparse patches but included starry false lily of the valley (*Maianthemum stellatum*), western starflower (*Trientalis borealis* [syn. *Lysimachia latifolia*]), and native white hawkweed (*Hieracium albiflorum*). The upland forest area east of FS 6603 Road, while still within the same plant association, contained a higher proportion of ponderosa pine canopy cover and a more varied understory with vine maple still dominant but more extensive patches of Oregon boxwood, baldhip rose and serviceberry (*Amelanchier alnifolia*) shrubs, and herbaceous bride's bonnet (syn. queenscup, *Clintonia uniflora*), American trailplant (syn. pathfinder plant, *Adenocaulon bicolor*), and bunchberry dogwood (*Cornus canadensis*).

Upland Plant Association[1]: Grand fir/vine maple-WEN (Abies grandis/Acer circinatum-WEN)
[1]Lillybridge et al. 1995

Figure 3. Upland conifer forest with vine maple understory from powerline corridor (left) and within stand (right) showing dense shrub understory (Grand fir/vine maple-WEN), Chelan County, WA.

The upland forest north of the large transmission line corridor was bisected by a large stream channel hydrologically connected to Nason Creek through a culvert under SR207 and a forested wetland – beaver dammed pond complex and was typified by steeper slopes in the east and a more diverse understory than the forest south of the transmission corridor. This plant association also includes forest south of the transmission corridor in the central Project Area (Figure 4). Conifers included dominant Douglas fir, with codominant ponderosa pine and grand fir comprising between 15-30% canopy cover. Grand fir trees consisted of mid-succession trees with early seral grand fir present as 4-8 in DBH trees as well as seedlings and saplings. Understory shrub layer included vine maple as a dominant, with other shrubs sparsely present, including Oregon boxwood, both Cascade barberry and hollyleaved barberry (*Mahonia aquifolium*), common snowberry (*Symphoricarpos albus*), California blackberry (*Rubus ursinus*) and a more robust herbaceous understory of bride's bonnet, starry false lily of the valley (*Maianthemum stellatum*), wild ginger (*Asarum caudatum*), and more sparsely, American trailplant, bunchberry dogwood, small enchanter's nightshade (*Circea alpina*), trillium (*Trillium ovatum*), and bracken fern (*Pteridium aquilinum*).

Upland Plant Association[1]: Grand fir/vine maple-bride's bonnet (Abies grandis/Acer circinatum-Clintonia unifoliata)

[1]Lillybridge et al. 1995

Figure 4. Upland conifer forest with vine maple and patches of herbaceous species, like bride's bonnet (Grand fir/vine maple-bride's bonnet), Chelan County, WA.

Upland Shrub-Meadow

Native dry shrubs and graminoids were co-dominant in the shrub-meadow with short, dispersed shrubs denser at the forest edges and located within the central-western portion of the Project Area (Figure 5). Dominant shrubs were Cascade barberry and common snowberry, and graminoids and herbaceous plants included Idaho fescue (*Festuca idahoensis*), elk sedge (*Juncus geyeri*), rosy pussytoes (*Antennaria rosea*), yarrow (*Achillea millefolium*), red clover (*Trifolium pratense*), and starry false lily of the valley. More sparsely present included herbs Lyall's mariposa (*Calochortus lyalli*), field chickweed (*Cerastium arvense*), little collomia (syn. Tiny trumpet, *Collomia linearis*) and grasses, bluebunch wheatgrass (*Pseudoroegnaria spicata*), and pinegrass (*Calamagrostis rubescens*). Soils were sandier in this meadow but with small black cottonwood and grand fir seedlings at the margins of the shrub meadow, it was naturally maintained by periodic fires from converting to forest. The shrub meadow is part of the Northern Rocky Mountain Montane-Foothill Deciduous Shrubland ecological group (Roccio and Crawford 2015).

> Plant Community[2]: Cascade barberry-common snowberry-Idaho fescue-elk sedge Shrub-meadow (*Mahonia nervosa-Symphoricarpos albus-Festuca idahoensis-Carex geyeri*)
> [2]Roccio and Crawford 2015

Figure 5. Upland Shrub-Meadow of low-growing shrubs, graminoids and forbs, surrounded by conifer forest (Cascade barberry-common snowberry-Idaho fescue-elk sedge Shrub-meadow), Chelan County, WA.

The large transmission corridor runs west-east bisecting the Project Area contains similar vegetation as the understory of adjacent conifer forests (Figure 6). Since conifers and large deciduous trees are removed, most areas are dominated either by vine maple and other tall shrubs or in drier areas by a mixture of low-growing Cascade barberry and common snowberry, annual grasses, and annual and perennial forbs. Oregon boxwood, Nootka rose (*Rosa nutkana* ssp. *macdougalii*), Saskatoon serviceberry (*Amelanchier alnifolia*), red flowering currant (*Ribes sanguineum*), California blackberry (*Rubus ursinus*), oceanspray (*Holodiscus discolor*), and Douglas spirea (*Spirea douglasii*) were common shrubs. Stinging nettle (*Urtica dioica*), barestem biscuitroot (*Lomatium nudicaule*), bride's bonnet, common dandelion (*Taraxacum officinale*), maiden blue eyed Mary (*Collinsia parviflora*), woodland strawberry (*Fragaria vesca*) and common yarrow were common forbs. Seedling, sapling, and young conifers and deciduous trees were patchily throughout, mostly in edges and low draws when larger-sized. These trees included black cottonwood, ponderosa pine, grand fir, Douglas fir, bitter cherry (*Prunus emarginata*), and quaking aspen (*Populus tremuloides*). Although the community contains a much higher diversity of species than

adjacent forests, consistently present at all forest margins are young grand fir, Douglas fir and vine maple, indicating this area would revert to conifer forest if not actively maintained, and so is described under the forested plant association.

> Upland Plant Association[1]: Grand fir/vine maple-bride's bonnet (Abies grandis/Acer circinatum-Clintonia unifoliata)
> [1]Lillybridge et al. 1995

Figure 6. Upland shrub dominated transmission line corridor with dense vine maple like adjacent forests and more open areas with smaller shrubs Cascade barberry, Oregon boxwood, grasses and forbs (Grand fir/vine maple-bride's bonnet), Chelan County, WA.

Wetland Forest-Pond

A culvert running under SR207 hydrologically connects Nason Creek to a creek side channel at the north end of the Project Area on the east side of SR207. The side channel has heavy beaver influence, with developed ponds, two beaver lodge structures, continues east and north outside of the Project Area but hydrologically connects to a forested wetland pond and channel complex at the north central edge of the Project Area (Figure 7). While surrounded by conifer forest, deciduous trees black cottonwood, gray alder (*Alnus incana*), bitter cherry (*Prunus emarginata*), and Pacific willow (*Salix lasiandra*) are dominant along channels and pond fringes, with shrubby yellow willow (*Salix lutea*], vine maple, and red-osier dogwood (*Cornus sericeus* ssp. *stolonifera*). At more stagnant edges and within the forest wetland channel, skunk cabbage was dominant (*Lysichiton americanus*) with lady fern (*Athyrium filix-femina*).

Plant Association: Black cottonwood/Mountain alder – red-osier dogwood (*Populus balsamifera* ssp. *trichocarpa/ Alnus incana- Cornus sericeus* ssp. *stolonifera*)

A large open pond complex maintained by beaver, consisted of multiple ponds with some small islands of vegetation and floating logs with sedges. Yellow pond lily (*Nuphar lutea* ssp. *polysepala*) was the dominant floating aquatic species, with buckbean (*Menyanthes trifoliata*) growing in small patches, small patches of invasive reed canarygrass (*Phalaris arundinacea*) on islands or pond edges, water horsetail (*Equisetum fluviatile*), creeping spikerush (*Eleocharis palustris*), skunk cabbage, American speedwell (*Veronica americanum*), duckweed (*Lemna minor*), seep monkeyflower (*Mimulus guttatus*), slough sedge (*Carex obnupta*), water sedge (*C. aquatilis*), Cusick's sedge (*C. cusickii*), and water parsley (*Oenanthe sarmentosa*) most commonly with dense, submerged plant, common water moss (*Fontinalis antipyretica*) within many portions of the pond.

Aquatic Plant Association: Yellow pond lily (*Nuphar lutea* ssp. *polysepala*)

Figure 7. Wetland Forest-pond complex altered by beaver showing wetland pond at north end of Project Area with yellow pond lily (left), and wetland forest along back channel with gray alder, vine maple, skunk cabbage and ponding (right) (Black cottonwood/Mountain alder – red-osier dogwood and Yellow pond lily), Chelan County, WA.

Wetland Shrub

The Pacific willow (*Salix lucida* ssp. *lasiandra*) and red-osier dogwood wetland was located along the north central Project Area with SR207 along the northern boundary and a culvert connecting the wetland as an overflow channel to Nason Creek (Figure 8). Other common plants included shrubs undergreen willow (*S. commutata*), rose spirea (*Spirea douglasii*), seedling black cottonwoods, scouring rush (*Equisetum hyemale*), water horsetail (*E. fluviatile*), Siberian springbeauty (*Claytonia sibirica var. sibirica*), red clover (*Trifolium pratense*), and small patches of noxious weed, oxeye daisy (*Leucanthemum vulgare*).

Plant Association: Pacific willow – Red-osier dogwood (*Salix lucida* ssp. *lasiandra - Cornus sericeus* ssp. *stolonifera*)

Figure 8. Wetland shrub in north central project area, overflow channel to Nason Creek with culvert, showing seedling cottonwood in foreground and undergreen willows (left), ponding and red-osier dogwood at SR207 culvert (right) (Pacific willow – Red-osier dogwood), Chelan County, WA.

A small shrub wetland was located at the southwest corner of the Project Area, with a culvert and SR207 along the north edge (Figure 9). Patchy red osier dogwood was dominant, but skunk cabbage, stinging nettle, and American speedwell were common. Common cowparsnip (*Heracleum maximum*), seedling black cottonwood, and sparse noxious weeds like reed canarygrass, Dalmatian toadflax (*Linaria dalmatica* ssp. *dalmatica*), and oxeye daisy were also present at the wetland.

Plant Association: Red-osier dogwood – Mesic forb (*Cornus sericeus* ssp. *stolonifera* – Mesic forb)

Figure 9. Wetland shrub with ponding in southern project area with culvert, showing ponding and red-osier dogwood and SR207 in background (left), ponding, skunk cabbage and red-osier dogwood (right) (Red-osier dogwood – Mesic forb), Chelan County, WA.

3.2 Rare Plants and Noxious Weeds

No rare plants were documented during this study. Suitable habitat was not observed for any of the eleven state listed plant species, except one, or for the four priority plant communities documented within 10 miles of the Project Area (Table 1). Suitable habitat for one rare plant species, bulb-bearing water-hemlock

(*Cicuta bulbifera*), did occur within the northern wetland forest-pond complex of the Project Area, but no plants in the water-hemlock genus were found.

No rare WNHP Ecological Communities were found, but one high quality WNHP community, Grand fir/Vine maple Forest (*Abies grandis/Acer circinatum* Forest) was documented within the Project Area. This riparian forest type has a conservation status rank by WNHP as G4, Apparently Secure globally (Rocchio and Crawford 2015). Forested wetland-pond complex, black cottonwood/mountain alder-red-osier dogwood has a rank of S3, G3, vulnerable both globally and in Washington State, though not rare (NatureServe Explorer 2026).

Washington state noxious weed species documented in the Project Area included nine state listed noxious weeds: three Class B, and six Class C weeds (Table 2, Figure 10). Eradication of noxious weeds is required for all Class A weeds and some Class B weeds by Washington State but is recommended for all noxious weed infestations (Washington State Noxious Weed Control Board 2026). In Chelan County, seven of the state noxious weeds are designated for control. Spotted knapweed (*Centaurea stoebe*), diffuse knapweed (*C. diffusa*), and Dalmatian toadflax (*Linaria dalmatica* ssp. *dalmatica*) are Class B noxious weeds designated for control in Chelan County (Chelan County Weed Control Board 2026). Canada thistle (*Cirsium arvense*), common St. Johnswort (*Hypericum perforatum*), oxeye daisy (*Leucanthemum vulgare*), and common tansy (*Tanacetum vulgare*) are Class C noxious weeds also designated for control in Chelan County.

Noxious weed infestations were limited to small areas and limited numbers of individual plants, and most were found along maintained road shoulder areas. Noxious weeds, spotted knapweed, oxeye daisy, Dalmatian toadflax, and diffuse knapweed were identified along road shoulders where vegetation was maintained primarily through brushing (Figure 10, Figure 11). Class C non-designate, reed canarygrass was found in limited small patches along SR207 roadways, usually in close proximity to culvert-fed wetlands, and was also found, though heavily browsed, as a small patch within the northern wetland forest-pond complex at the edge of a vegetated island. Class C weed, English hawthorn, was identified within the interior of the site at the edge of the upland shrub meadow, as a single 3-foot tall sapling tree. Canada thistle was found in small numbers of 5-10 plants (vegetative) along the SR207 road edges of the southern and central shrub wetlands, and the northern forest-pond wetland.

Table 2. Noxious Weed Species documented at Nason Creek SR207 Realignment Project, Chelan County, WA.

Scientific Name	Common Name	Plant Type	USDA Plants Code	State Weed Class[w]
Centaurea diffusa	diffuse knapweed	Forb	CEDI	B[w]
Centaurea stoebe	spotted knapweed	Forb	CEST8	B[w]
Cirsium arvense	Canada thistle	Forb	CIAR4	C[w]
Crataegus monogyna	English hawthorn	Shrub/Tree	CRMO	C
Hypericum perforatum	common St. Johnswort	Forb	HYPE	C[w]
Leucanthemum vulgare	oxeye daisy	Forb	LEVU	C[w]

Scientific Name	Common Name	Plant Type	USDA Plants Code	State Weed Class[w]
Linaria dalmatica ssp. dalmatica	Dalmatian toadflax	Forb	LIDAD	B[w]
Phalaris arundinacea	reed canarygrass	Grass	PHAR3	C
Tanacetum vulgare	common tansy	Forb	TAVU	C[w]

State Weed Class[w]: [w] indicates plant species designated for control in Chelan County.
Class A weeds = species with limited distribution and establishment in WA.
Class B weeds = species with distribution limited to some portions of WA.
Class C weeds = species with widespread distribution in WA or of special interest to the agricultural industry.

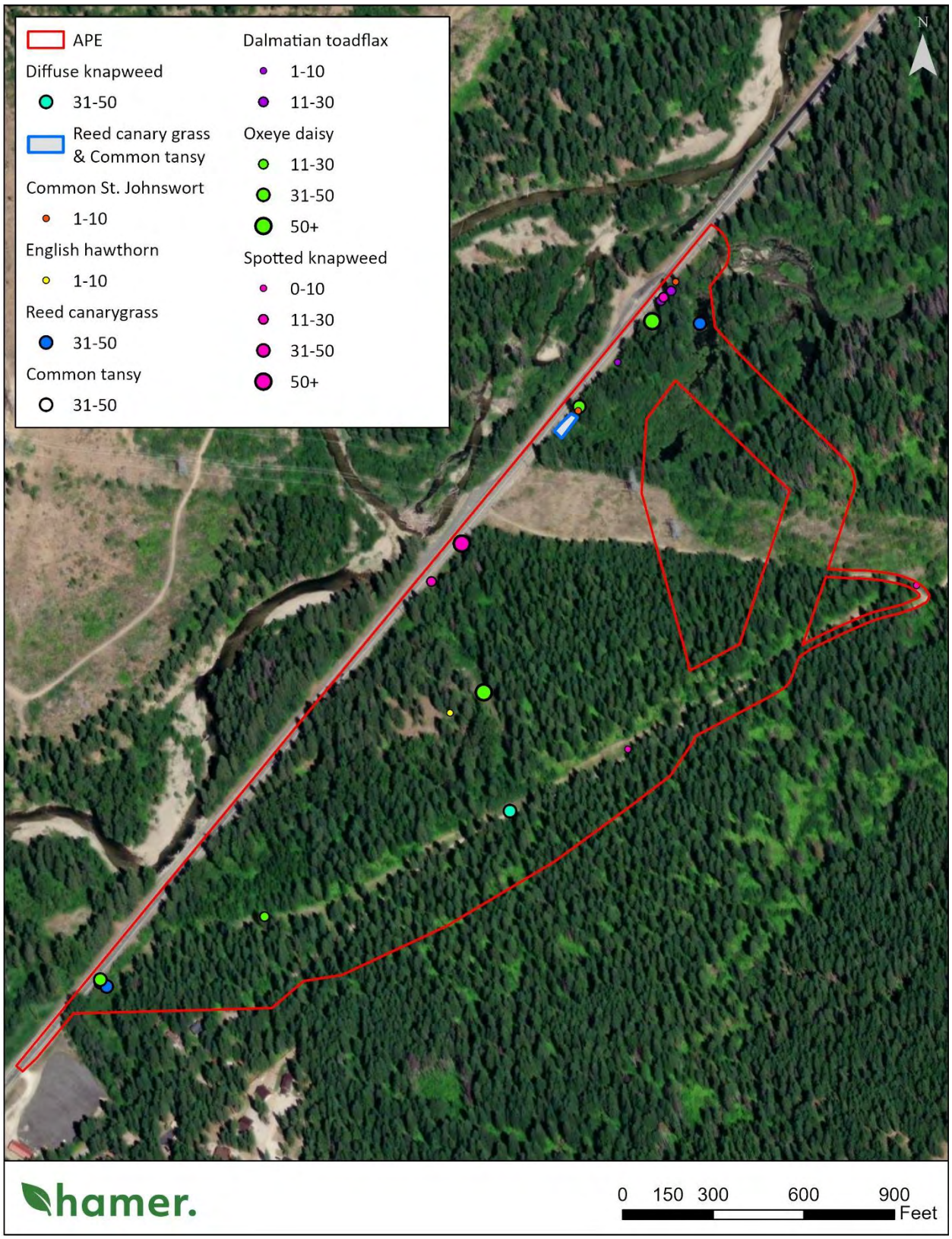

Figure 10. Overview of Class B and C Noxious Weeds documented at Nason Creek SR207 Realignment Site, Chelan County, WA.

Figure 11. Noxious weeds spotted knapweed (left) and Dalmatian toadflax (right) documented in the Nason Creek SR207 Realignment project area, Chelan County, WA.

4. Discussion

4.1 Rare Plants and Plant Communities

No rare plants were documented during this study (Table 1). Suitable habitat for one rare plant species, bulb-bearing water-hemlock (*Cicuta bulbifera*), did occur within the northern wetland forest-pond complex of the Project Area, but no plants in the water-hemlock genus were found. Ponded and wet meadow habitats are suitable for the bulb-bearing water-hemlock and associated species included: rose spirea, related western water-hemlock (*C. douglasii*), and water horsetail. All Carrot (*Apiaceae*) Family plants observed in this area were thoroughly identified as non-rare species and confirmed not to have the purple splotching on stems characteristic of water-hemlocks (*Cicuta spp.*).

No rare WNHP Ecological Communities were found, but one forested wetland-pond complex, black cottonwood/mountain alder-red-osier dogwood had a rank of S3G3, vulnerable both globally and in Washington State, though not rare (NatureServe Explorer 2026). Changes to hydrologic regime, including but not limited to removal of beaver, could result in conversion of forested wetland to other plant communities. These communities are also typically susceptible through grazing to be converted to introduced grasses, though this is not a concern at this site, where grazing will not occur (NatureServe 2026).

4.2 Noxious Weeds

Nine noxious weed species were documented during the 2026 botanical inventory, including zero Class A, three Class B, and six Class C designated species (Table 2). Of the nine weed species, seven are designated for control in Chelan County: spotted knapweed, diffuse knapweed, Canada thistle, common St. Johnswort, oxeye daisy, Dalmatian toadflax, and common tansy (Chelan County NWCB 2020). The NWCB recommends treatment of all listed noxious weeds (WNWCB 2020).

When prioritizing control and management of weeds, an assessment of surrounding areas for additional noxious weed infestations and vectors for spread and reintroduction of noxious weeds like roads, waterways and construction equipment is important. Targeted treatment of weeds in small-isolated patches may also be a more effective use of limited resources over that of widespread treatment of weeds based solely on species. Lastly, prioritization of noxious weeds with only one or a limited distribution may dramatically reduce cost and effort of managing for these weeds in future years. In the Project Area, reintroduction of weed infestations from SR207 road shoulders are highly likely, particularly for spotted knapweed, oxeye daisy, common St. Johnswort, reed canarygrass and other weeds found along road shoulders. Coordination of weed control efforts with neighboring landowners and Chelan County Noxious Weed Control Board will have a more impactful result.

Noxious Weed Infestations & Control Methods

Consult Chelan County Noxious Weed Control Board for further information regarding Best Management Practices for treating noxious weed infestations, and the Pacific Northwest Pest Management Handbook for herbicide use (Chelan NWCB 2020). The following recommendations are based on site-specific knowledge of weed infestation size and accessibility for treatment but are not intended to supersede Yakama NWFG, US Forest Service, or Chelan County guidelines for treatment.

Class B Designated Weeds:

- **Spotted knotweed** (*Centaurea stoebe*) was the most common noxious weed encountered during field surveys, with infestation numbers small but common along road shoulders bordering the Project Area. Chemical treatments or manual removal are recommended based on the limited number and distribution within the site.
- **Diffuse knapweed** (*Centaurea diffusa*) was limited to one infestation along the FS 6603 Rd shoulder in the eastern Project Area. Spot chemical treatments of the infestation or hand pulling are recommended for this minimal infestation.
- **Dalmatian toadflax** (*Linaria dalmatica* ssp. *dalmatica*) infestations are small, and patchy, and limited to the northwestern edge of the Project Area in the road shoulder area maintained by brush cutting. Mechanical removal of individual plants by hand is possible, due to the small infestation sizes. However, hand pulling will need to be repeated annually. Chemical treatment is also possible, but proximity to water and reintroduction of the plants along the road corridor should be considered.

Class C Designated Weeds:

- **Canada thistle** (*Cirsium arvense*) infestations were minimal, found sparsely in numbers of 5-10 along the managed (brush cut) SR207 road edge and wetlands in the south, central and north project area. Mechanical or chemical treatments are recommended due to the small quantity of plants and accessible road-side location. Either method would require multiple rounds for eradication and any herbicides selected will need to be safe for use along waterways.

- **Common St. Johnswort** (*Hypericum perforatum*) infestations were minimal and limited to two SR207 road shoulders at north and central wetlands with culverts (Figure 10). Mechanical removal is recommended due to the limited number of plants in the two small infestations.
- **Oxeye daisy** (*Leucanthemum vulgare*) infestations are common along road shoulders, both SR207 and FS 6603 Rd in the Project Area, frequently co-occurring with spotted knapweed and common St. Johnswort. Due to the widespread but road-edge, accessible areas, chemical control is recommended. Coordination treatment with adjacent landowners is recommended for this widespread weed.
- **Common tansy** (*Tanacetum vulgare*) was limited to one patchy-dispersed infestation intermixed with reed canarygrass along the SR207 road shoulder north of the transmission corridor (Figure 10). Mechanical or chemical treatments are recommended due to the small quantity of plants and accessible road-side location.

4.3 Next Steps

The following will be completed by UCHRP contractors or US Forest Service at the Nason Creek SR207 Realignment Project:

1. Develop and implement a Weed Management Plan. Continued active weed management is recommended along roadways to reduce the risk of new weed infestations from establishing and existing infestations from spread. Noxious weeds identified for control in Chelan County were limited in infestation size and distribution to roadway areas only.

2. Develop and implement a Revegetation and Plant Survival Plan to restore areas of temporary project impacts, including staging areas and equipment access paths. The plant community descriptions and botanical species list should be referenced for revegetation planning. The Revegetation Plan should determine site specific revegetation goals, maintenance, adaptive management, and annual progress monitoring to ensure successful vegetation establishment and plant survival requirement rates are met.

3. If a federal or state-listed plant is found during project activities, immediately cease activity in vicinity of plant and contact the project manager, as required under UCHRP permits. To verify identification of the rare plant and determine best mitigation measures, consult with Hamer Environmental or another qualified botanist.

Literature Cited

Burke Museum Herbarium. 2025. Burke Herbarium Image Collection - Species descriptions accessed online June 16, 2025 by Erin Colclazier of Hamer Environmental. Available online: http://biology.burke.washington.edu/herbarium/imagecollectionnew/browse.php?Classification=Vascular%20Plants

Camp, P., J.G. Gamon, WNHP and WDNR. 2011. *Field Guide to the Rare Plants of Washington*. University of Washington Press, Seattle, WA.

Chelan County Noxious Weed Control Board. 2026. Noxious Weed List and County Designations. Chelan County, WA. Available online: https://www.co.chelan.wa.us/files/noxious-weed/documents/2026%20Chelan%20County%20Weed%20List.pdf

Consortium of Pacific Northwest Herbaria. 2026. Specimen Records accessed online May 2026 by Erin Colclazier of Hamer Environmental. Available online: http://www.pnwherbaria.org/data/search.php

Kovalchik, Bernard L.; Clausnitzer, Rodrick R. 2004. Classification and management of aquatic, riparian, and wetland sites on the national forests of eastern Washington: series description. Gen. Tech. Rep. PNW-GTR-593. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 354 p. In cooperation with: Pacific Northwest Region, Colville, Okanogan, and Wenatchee National Forests. Available online: https://www.fs.fed.us/pnw/pubs/pnw_gtr593.pdf

Lillybridge, T.R.; Kovalchik, B.L.; Williams C.K.; Smith, B.G. 1995. Field guide for forested plant associations of the Wenatchee National Forest. Gen. Tech. Rep. PNW-GTR359. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 335 p. In cooperation with: Pacific Northwest Region, Wenatchee National Forest. Available online: https://www.fs.fed.us/pnw/pubs/pnw_gtr359.pdf

NatureServe. 2026. NatureServe Explorer [web application]. NatureServe, Arlington, Virginia. Available https://explorer.natureserve.org/pro/. (Accessed: May 27, 2026 by Erin Colclazier, Hamer Environmental).

Rocchio, F.J. and R.C. Crawford. In Progress. Ecological Systems of Washington State. A Guide to Identification. Natural Heritage Report 2015-04. Washington Dept. of Natural Resources, Natural Heritage Program. Olympia, WA. Available online: https://www.researchgate.net/publication/282980489_Ecological_Systems_of_Washington_State_A_Guide_to_Identification

Washington Natural Heritage Program (WNHP). 2026a. Washington Vascular Plant Species of Special Concern by County. Washington Natural Heritage Program, Washington Department of Natural Resources. Olympia, WA. Available online: https://www.dnr.wa.gov/publications/amp_nh_county_plants.pdf?gn8v6t

WNHP. 2026b. GIS Dataset of Rare Plants and High-Quality Ecosystems. Washington Natural Heritage Program, Washington Department of Natural Resources. Olympia, WA. Available online: https://data-wadnr.opendata.arcgis.com/search?groupIds=266f0b3bdc014f5ab2a96ad4ea358a28

Washington State Noxious Weed Control Board (WNWCB). 2026. (http://www.nwcb.wa.gov/). 2026 Washington State Noxious Weed List and Monitor List accessed online June 10, 2020 by Erin Colclazier, Hamer Environmental.

Washington State University (WSU) Extension. 2026. Biological Control Agents by Weed. Integrated Weed Control Project, WSU Extension, Puyallup, WA, accessed online 28 May 2026 by Erin Colclazier of Hamer Environmental. Available online: http://invasives.wsu.edu/biological/weed.htm

Whiteaker, L., J. Henderson, R. Holmes, L. Hoover, R. Lesher, J. Lippert, E. Olson, L. Potash, J. Seevers, M. Stein and N. Wogen. 1998. Survey Protocols for Survey and Manage Strategy 2 Vascular Plants – V 2.0. US Forest Service, R-6 and Bureau of Land Management OR/WA/CA. Portland, OR.

Wilson, B. L., R. E. Brainerd, D. Lytjen, B. Newhouse and N. Otting. 2014. Field Guide to the Sedges of the Pacific Northwest, Second Edition. Oregon State University Press, Corvallis, Oregon.

Appendix A. Rare Plants with Potential to Occur in the Project Area.

Scientific Name	Common Name	State Status	Federal Status	Habitat Description	Flowering Period	Plant Family
Agoseris elata	Tall agoseris	S		Meadow, open woods, rocky ridges, 500-7800 ft; Assoc spp. herbaceous but vary	June-Aug	Asteraceae
Anemone patens var. multifida	Pasqueflower	T	BS, FS	Prairies and grasslands, open alpine slopes and ridges in loose, sandy well-drained soil and open woods; 2300-6600 ft	late May-Aug	Ranunculaceae
Astragalus arrectus	Palouse milkvetch	T	BS, FS	Grassy hillsides, sagebrush flats, river bluffs and grassy or shrub-dominated openings; 1000-4000 ft	late Apr-early July	Fabaceae
Botrychium hesperium	Western moonwort	S	BS, FS	Sage shrubland, moist and dry meadows, forest edges; dry, gravelly or sandy loams; 2500-6300 ft	May-August	Ophioglossaceae
Botrychium paradoxum	Paradoxical moonwort	T	BS, FS	Forests, moist meadows, riparian areas, compacted old roadbeds	year round	Ophioglossaceae
Carex capillaris	Hair sedge	T	BS, FS	wet meadows, streambanks, wetlands; 2800-6500 ft	June-Aug	Cyperaceae
Carex rostrata	Northern beaked sedge	S	BS, FS	Fens, bogs, quaking or floating peat, lake and stream shores, wet meadows, often in shallow water/floating mats; 3200-5120 ft	July-Aug	Cyperaceae
Carex tenera	Slender broom sedge	S	BS, FS	Dry to moist meadows, open forests, shrub wetlands and lake shores; assoc. spp. paper birch, black cottonwood, willow, field horsetail	May-Sept	Cyperaceae
Cicuta bulbifera	Bulb-bearing water-hemlock	S	BS, FS	Obligate wetland species found at edges of marshes, slow moving streams, lake margins, bogs, wet meadows and shallow standing water; 240-3700 ft	Aug-Sept	Apiaceae
Cryptantha spiculifera	Bristly cryptantha	S	BS	Dry, open, flat or sloping areas in stable or stony soils, with low vegetative cover; 450-3500 ft	May-July	Boraginaceae

Scientific Name	Common Name	State Status	Federal Status	Habitat Description	Flowering Period	Plant Family
Delphinium viridescens	Wenatchee larkspur	T	BS, FS	Moist meadows, seasonally wet openings in aspen groves, hardwood thickets, with seasonal inundation; 1240-5700 ft	June-July	Ranunculaceae
Eleocharis atropurpurea	Purple spike-rush	X		Wetland species of pond and lake margins, canal banks, irrigation ditches, and maritime shores; 0-5900 ft, once found on lake Chelan	June-Sept	Cyperaceae
Erythranthe pulsiferae	Candelabrum monkeyflower	S	BS, FS	Seasonally wet or moist open areas; often in exposed mineral soil or in grass/forb openings in ponderosa pine, Douglas fir and oak forests; 1580-4000 ft	June-July	Scrophulariaceae
Erythranthe suksdorfii	Suksdorf's monkeyflower	S	BS, FS	Open, moist or dry places, from valleys and foothills to mod. or high elevations in the mountains; in seasonally moist swales, drainages or vernal pools within sage steppe habitat, with disturbed microhabitats; 430-7100 ft	Apr-June	Scrophulariaceae
Hackelia cinerea	Gray stickseed	T	BS, FS	Open or sparsely forested areas, esp. on cliffs, talus or other exposed rock, often mossy cracks; 1040-2520 ft	May-July	Boraginaceae
Hackelia venusta	Showy stickseed	E	E	Dry, loose granitic sand and crevices in granite or talus; 1500-7400 ft	May-July	Boraginaceae
Juncus howellii	Howell's rush	T	BS, FS	Moist meadows and riparian zones at various montane elev; 2840-3500 ft	July-Aug	Juncaceae
Lathyrus torreyi	Torrey's peavine	T		Open areas, trail edges and open woods, usually at low-elev sites dominated by Doug fir; 320-2025 ft	May-July	Fabaceae
Lomatium roneorum	Leavenworth desert-parsley	E		Open, rocky slopes in ponderosa pine forest openings	Apr-June	Apiaceae

Scientific Name	Common Name	State Status	Federal Status	Habitat Description	Flowering Period	Plant Family
Nicotiana attenuata	Coyote tobacco	S	BS, FS	Dry sandy bottomlands, rocky washes and other dry open places; 320-2640 ft	June-Sept	Solanaceae
Ophioglossum pusillum	Adder's-tongue	S	BS, FS	Seasonally wet areas in pastures, old fields, roadside ditches, bogs, fens, wet meadows, flood plains, moist woods; assoc. spp. Lodgepole pine, spirea, sedges, grasses, strawberry, yarrow; 40-3200 ft	June-Sept	Ophioglossaceae
Parnassia cirrata var. intermedia	Cascade grass-of-Parnassus	T		Marshes, seeps, bogs, wet meadows and along streams from 6000 ft+	Aug-Sept	Parnassiaceae
Pediocactus nigrispinus	Dark-spine ball cactus	S	BS	Lowland to montane sage desert, grasslands and coniferous forests	May-July	Cactaceae
Pellaea brachyptera	Sierra cliffbrake	S	BS, FS	Arid sites with little vegetation, including open south & west-facing slopes in rocky soils; 1100-3500 ft	year round	Pteridaceae
Penstemon eriantherus var. whitedii	Fuzzy-tongue penstemon	T	BS, FS	West-facing slopes of small canyons, ridgetops, dry, rocky places in the Cascade foothills; 500-4000 ft elev	May-June	Scrophulariaceae
Rotala ramosior	Lowland toothcup	S	BS, FS	Damp areas in fine sand and silt, wet swampy mudflats, lake and pond margins and along free-flowing river reaches; 200-2260 ft	June-Aug	Lythraceae
Salix pseudomonticola	False mountain willow	S	BS, FS	Wet meadows, streambanks, lake edges, hummocks in fens, and floodplains; 2950-5500 ft	May-Sept	Salicaceae
Schizachyrium scoparium var. scoparium	Little bluestem	T	BS	Open places, in sand, silt, cobble and gravel, above and below highwater line; in high qual riparian habitat; 610-1320 ft	July-Sept	Poaceae

Scientific Name	Common Name	State Status	Federal Status	Habitat Description	Flowering Period	Plant Family
Sidalcea oregana var. calva	Wenatchee checkermallow	E	E	Moist meadows with surface water or saturated soil into early summer; in open coniferous stands with Doug fir, ponderosa pine; 1900-3200 ft	June-July	Malvaceae
Silene scouleri ssp. scouleri	Scouler's catchfly	S	BS, FS	Valley and foothill grassland; prairies and open timberland; low to moderate elev;	June-early Sept	Caryophyllaceae
Silene seelyi	Seely's catchfly	S	BS, FS	Shaded crevices in ultramafic, granitic, or basaltic cliffs and rock outcrops, and occ. Among boulders in talus; 1120-6300 ft	May-Aug	Caryophyllaceae
Spiranthes diluvialis	Ute ladies-tresses	E	T	Low elev wetland complexes and moist meadows; Assoc. spp. Ponderosa pine, sagebrush, bitterbrush, willows, and sedges; 720-1830 ft	mid July-Aug	Orchidaceae
Spiranthes porrifolia	Western ladies-tresses	S	BS, FS	Wet meadows, bogs, streams and seepage slopes; 10-6800 ft; sedges, white brodiaea and seep monkeyflower.	Jul-Sept	Orchidaceae
Sporobolus compositus var. compositus	Composite dropseed	S	BS	Riverbanks and lake sides	Aug-Sept	Poaceae
Trifolium thompsonii	Thompson's clover	T	BS, FS	Lower mountain slopes and ridges in grasslands dominated by bunchgrasses and herbs; 1140-3760 ft	May-July	Fabaceae

State Status of plant species is determined by the Washington Natural Heritage Program. Factors considered include abundance, occurrence patterns, vulnerability, threats, existing protection, and taxonomic distinctness. Values include:

E = Endangered. In danger of becoming extinct or extirpated from Washington.
S = Sensitive. Vulnerable or declining and could become Endangered or Threatened in the state.
T = Threatened. Likely to become Endangered in Washington.
X = Likely extirpated from Washington State.

Federal Status under the US Endangered Species Act (ESA):

LE = Listed Endangered. In danger of extinction.
LT = Listed Threatened. Likely to become endangered.
C = Candidate species. Sufficient information exists to support listing as Endangered or Threatened.
BS = Bureau of Land Management Agency Sensitive species.
FS = US Forest Service Agency Sensitive species.

Appendix B. Comprehensive Plant Species List

Scientific Name	Common Name	ALL	Up Con Forest (Central - South)	Up Con Forest (North)	Up Shrub -Meadow	Up Shrub T-line (Nor-Central)	Wet For-Pond (North)	Wet Shrub overflow channel (Central)	Wet Shrub (South)	Wetland Status	Native/ Introduced	Plant Form	NRCS Code
Abies grandis	grand fir	x	x	x	x					FACU	N	TR	ABGR
Acer circinatum	vine maple	x	x	x	x	x	x	x	x	FAC	N	SH	ACCI
Achillea millefolium	common yarrow	x	x	x	x					FACU	N	FB	ACMI
Adenocaulon bicolor	American trailplant	x	x	x		x		x		NI	N	FB	ADBI
Agrostis gigantea	redtop, black bent	x		x				x		FACW	N	GR	AGGI2
Agrostis scabra	rough bentgrass	x		x		x				FAC	N	GR	AGSC5
Agrostis stolonifera	creeping bentgrass	x					x	x		FACW	I	GR	AGST2
Aira caryophyllea	common silver-hair grass	x				x				FACU	I	GR	AIPR
Alnus incana tenuifolia	mountain (thinleaf) alder	x					x			FACW	N	TR	ALINT
Amelanchier alnifolia	Saskatoon serviceberry	x	x	x		x	x	x	x	FACU	N	SH	AMAL2
Anaphalis margaritacea	western pearlyeverlasting	x	x							FACU	N	FB	ANMA
Antennaria microphylla	littleleaf pussytoes	x			x					NI	N	FB	ANMI3
Antennaria racemosa	raceme pussytoes	x	x			x				NI	N	FB	ANRA
Antennaria rosea	rosy pussytoes	x	x	x	x					NI	N	FB	ANRO2
Aquilegia formosa	western columbine	x	x	x						FAC	N	FB	AQFO
***Arabis glabra* (syn.*Turritus g.*)**	tower rockcress	x	x	x						NI	N	FB	ARGL
***Arabis hirsuta* var. *pycnocarpa* (syn. *A. pycnocarpa*)**	slender rockcress	x	x	x						FACU	N	FB	ARHIP
***Arabis holboellii* var. *retrofracta* (syn. *Boechera retrofracta*)**	reflexed rockcress	x		x						NI	N	FB	ARHOR
Arctostaphylos uva-ursi	bearberry/kinnikinnick	x		x						FACU	N	SH	ARUV

Scientific Name	Common Name	ALL	Up Con Forest (Central - South)	Up Con Forest (North)	Up Shrub -Meadow	Up Shrub T-line (Nor-Central)	Wet For-Pond (North)	Wet Shrub overflow channel (Central)	Wet Shrub (South)	Wetland Status	Native/ Introduced	Plant Form	NRCS Code
Arnica lanceolata	lanceleaf arnica	x	x							FACW	N	FB	ARLA7
Asarum caudatum	British Columbia wild ginger	x	x	x						FAC	N	FB	ASCA2
Athyrium filix-femina	common ladyfern	x		x			x	x		FAC	N	FE	ATFI
Berula erecta	cutleaf water parsnip	x								OBL	N	FB	BEER
Bromus arvensis	field brome	x	x	x		x				FACU	I	GR	BRAR5
Bromus inermis	smooth brome	x		x						FACU	N, I	GR	BRIN2
Cacaliopsis nardosmia	silvercrown	x		x				x		NI	N	FB	CANA5
Calamagrostis rubescens	pinegrass	x		x	x					NI	N	GR	CARU
Calochortus lyalli	Lyall's mariposa lily	x			x					NI	N	FB	CALY
Canadanthus modestus (Aster modestus)	Great northern aster	x		x	x		x	x		FACW	N	FB	CAMO32
Carex aquatilis	water sedge	x					x	x		OBL	N	GR	CAAQ
Carex bolanderi	Bolander's sedge	x					x			FAC	N	GR	CABO2
Carex cusickii	Cusick's sedge	x					x			NI	N	GR	CACU5
Carex deweyana	Dewey sedge	x		x	x		x			FAC	N	GR	CADE9
Carex geyeri	elk sedge	x			x					NI	N	GR	CAGE2
Carex hoodii	Hood's sedge	x		x				x		FAC	N	GR	CAHO5
Carex laeviculmis	smoothstem sedge	x						x	x	FACW	N	GR	CALA13
Carex obnupta	slough sedge	x					x			OBL	N	GR	CAOB3
Castilleja hispidula	harsh Indian paintbrush	x	x	x						NI	N	FB	CAHI9
Ceanothus sanguineus	redstem ceanothus	x	x	x				x		NI	N	SH	CESA
Centaurea diffusa[wc]	diffuse knapweed[wc]	x	x							UPL	I	FB	CEDI3
Centaurea stoebe[wc]	spotted knapweed[wc]	x	x	x				x		UPL	I	FB	CEST8
Cerastium arvense	field chickweed	x	x	x	x			x		FACU	N, I	FB	CEAR4
Cerastium nutans	nodding chickweed	x	x							FACU	N	FB	CENU2

Scientific Name	Common Name	ALL	Up Con Forest (Central - South)	Up Con Forest (North)	Up Shrub -Meadow	Up Shrub T-line (Nor-Central)	Wet For-Pond (North)	Wet Shrub overflow channel (Central)	Wet Shrub (South)	Wetland Status	Native/ Introduced	Plant Form	NRCS Code
Chamerion angustifolium ssp. circumvagum	fireweed	x	x	x	x	x	x	x	x	FACU	N	FB	CHANC
Chamerion latifolium	dwarf fireweed	x			x	x		x		FACW		FB	CHLA13
Chimaphila umbellata	pipsissewa	x	x	x						NI	N	SH	CHUM
Circaea alpina	small enchanter's nightshade	x	x	x		x	x			FAC	N	FB	CIAL
Cirsium arvense[w‹]	Canada thistle[w‹]	x		x					x	FACU	I	FB	CIAR4
Cirsium edule	edible thistle	x						x	x	FAC	N	FB	CIED
Claytonia parviflora	streambank springbeauty	x		x						FACU	N	FB	CLPA5
Claytonia sibirica var. sibirica	Siberian springbeauty	x		x	x		x	x	x	FAC	N	FB	CLSIS
Clintonia uniflora	bride's bonnet	x	x	x			x			NI	N	FB	CLUN2
Collinsia parviflora	maiden blue eyed Mary	x	x	x	x	x		x		NI	N	FB	COPA3
Collomia linearis	little collomia, tiny trumpet	x	x	x	x	x				FACU	N	FB	COLI2
Cornus canadensis	bunchberry dogwood	x	x	x		x	x	x		FAC	N	SH	COCA13
Cornus sericea* ssp. *sericea	redosier dogwood	x	x	x			x	x	x	FACW	N	SH	COSES
Crataegus monogyna	European hawthorn	x			x					FAC	I	SH	CRMO3
Dactylis glomerata	orchardgrass	x	x	x		x	x	x		FACU	I	GR	DAGL
Deschampsia danthonioides	annual hairgrass	x	x	x		x				FACW	N	GR	DEDA
Dicentra formosa	bleeding-heart	x		x			x	x		FACU	N	FB	DIFO
Digitalis purpurea	foxglove	x		x						FACU	N	FB	FRVE
Eleocharis palustris	common spikerush	x					x	x	x	OBL	N	GR	ELPA3
Elymus lanceolatus	thickspike wheatgrass	x				x		x		UPL	N	GR	ELLA3
Epilobium ciliatum ssp. watsonii	fringed willowherb	x			x		x	x	x	FACW	N	FB	EPCIW
Equisetum arvense	field horsetail	x		x			x	x	x	FAC	N	FB	EQAR
Equisetum fluviatile	water horsetail	x					x	x		OBL	N	FB	EQFL

Scientific Name	Common Name	ALL	Up Con Forest (Central - South)	Up Con Forest (North)	Up Shrub -Meadow	Up Shrub T-line (Nor-Central)	Wet For-Pond (North)	Wet Shrub overflow channel (Central)	Wet Shrub (South)	Wetland Status	Native/ Introduced	Plant Form	NRCS Code
Equisetum hyemale	scouringrush horsetail	x		x			x	x		FACW	N	FB	EQHY
Festuca idahoensis	Idaho fescue, blue bunchgrass	x			x					FACU	N	GR	FEID
Fragaria vesca	woodland strawberry	x	x	x	x	x							
Galium aparine	stickywilly	x						x		FACU	I	FB	GAAP2
Galium triflorum	three-flowered bedstraw	x	x	x	x		x	x		FACW	N	FB	GATR3
Geum macrophyllum	largeleaf avens	x		x		x				FACW	N	FB	GEMA4
Glyceria striata	fowl mannagrass	x					x	x		OBL	N	GR	GLST
Goodyera oblongifolia	western rattlesnake plantain	x	x	x						FACU	N	FB	GOOB2
Heracleum maximum	common cowparsnip	x		x			x	x	x	FAC	N	FB	HEMA80
Hieracium albiflorum	white hawkweed	x	x	x	x	x				NI	N	FB	HIAL2
Holodiscus discolor	oceanspray	x	x	x		x	x	x		FACU	N	SH	HODI
Hydrophyllum capitatum	ballhead waterleaf	x	x	x						NI	N	FB	HYCA4
Hypericum perforatum^{wc}	common St. Johnswort^{wc}	x		x				x		FACU	I	FB	HYPE
Juncus ensifolius	iris-leaf rush	x					x	x		FACW	N	GR	JUEN
Juncus filiformis	thread rush	x			x			x		FACW	N	GR	JUFI
Koeleria macrantha	prairie Junegrass	x			x					NI	N	GR	KOMA
Lapsana communis	common nipplewort	x		x		x		x		FACU	I	FB	LACO3
Lathyrus nevadensis	Sierra pea	x	x	x	x					NI	N	FB	LANE3
Lemna minor	duckweed	x					x			OBL	N	FB	LEMI3
Leucanthemum vulgare^{wc}	oxeye daisy^{wc}	x	x	x		x		x	x	FACU	I	FB	LEVU
Lilium columbianum	Columbian lily	x	x	x	x	x	x	x		NI	N	FB	LICO
Limosella aquatica	water mudwort	x					x			OBL	N	FB	LIAQ
Linaria dalmatica ssp. dalmatica^{wc}	Dalmatian toadflax^{wc}	x		x					x	UPL	I	FB	LIDAD
Lomatium nudicaule	barestem biscuitroot	x	x			x				FACU	N	FB	LONU2
Lonicera ciliosa	orange honeysuckle	x	x	x		x		x		UPL	N	SH/VI	LOCI3

Scientific Name	Common Name	ALL	Up Con Forest (Central - South)	Up Con Forest (North)	Up Shrub -Meadow	Up Shrub T-line (Nor-Central)	Wet For-Pond (North)	Wet Shrub overflow channel (Central)	Wet Shrub (South)	Wetland Status	Native/ Introduced	Plant Form	NRCS Code
Lonicera involucrata	twinberry honeysuckle	x	x	x	x		x	x	x	FAC	N	SH	LOIN5
Lupinus latifolius	broadleaf lupine	x	x	x		x		x		FACW	N	FB	LULA4
Lupinus polyphyllus	bigleaf lupine	x	x							FAC	N	FB	LUPO2
Luzula parviflora	smallflowered woodrush	x	x	x		x				FAC	N	GR	LUPA4
Lysichiton americanus	American skunkcabbage	x					x	x	x	OBL	N	FB	LYAM3
Mahonia aquifolium (syn. Berberis a.)	hollyleaved barberry	x	x	x	x	x				UPL	N	SH	MAAQ2
Mahonia nervosa	Cascade barberry	x	x	x		x				FACU	N	SH	MANE2
Maianthemum dilatatum	false lily of the valley	x	x	x	x	x				FAC	N	FB	MADI
Maianthemum racemosum	feathery false lily of the valley	x	x	x						FAC	N	FB	MARA7
Maianthemum stellatum	starry false lily of the valley	x	x	x	x	x	x	x		FACU	N	FB	MAST4
Menyanthes trifoliata	buckbean	x					x			OBL	N	FB	METR3
Mertensia ciliata	tall fringed bluebells	x		x			x	x		FACW	N	FB	MESI3
Mimulus guttatus	seep monkeyflower	x					x	x		OBL	N	FB	MIGU
Nuphar lutea* ssp. *polysepala	yellow pond lily	x					x			OBL	N	FB	NULUP
Oenanthe sarmentosa	pacific water parsley	x					x			OBL	N	FB	OESA
Osmorhiza berteroi	sweetcicely	x		x			x			FACU	N	FB	OSBE
Osmorhiza occidentalis	western sweet cicely	x	x	x		x		x		NI	N	FB	OSOC
Panicum capillare	witchgrass	x						x		FACU	N	GR	PACA6
Paxistima myrsinites	Oregon boxwood	x	x	x		x				FACU	N	SH	PAMY
Phacelia hastata	silverleaf phacelia	x			x					UPL	N	FB	PHHA
Phalaris arundinacea [w]	reed canarygrass[w]	x						x	x	FACW	I	GR	PHAR3
Philadelphus lewisii	Lewis' mockorange	x		x				x		UPL	N	SH	PHLE4
Pinus ponderosa	ponderosa pine	x	x	x		x				FACU	N	TR	PIPO
Plagiobothrys scouleri	Scouler's popcorn flower	x			x					FACW	N	FB	PLSC2
Plantago lancoelata	narrowleaf plantain	x	x			x				FACU	I	FB	PLLA

Scientific Name	Common Name	ALL	Up Con Forest (Central - South)	Up Con Forest (North)	Up Shrub -Meadow	Up Shrub T-line (Nor-Central)	Wet For-Pond (North)	Wet Shrub overflow channel (Central)	Wet Shrub (South)	Wetland Status	Native/ Introduced	Plant Form	NRCS Code
Plantago major	common plantain	x	x			x				FAC	I	FB	PLMA2
Poa annua	annual bluegrass	x			x	x			x	FAC	I	FB	POAN
Poa bulbosa	bulbous bluegrass	x	x	x		x				FACU	I	GR	POBU
Poa nervosa	Wheeler bluegrass	x	x		x			x		FACU	N	GR	PONE2
Poa pratensis	Kentucky bluegrass	x		x				x		FAC	I	GR	POPR
Poa sp.	bluegrass	x					x			NI	N, I	GR	POA
Populus balsamifera ssp. trichocarpa	black cottonwood	x	x	x	x		x	x	x	FACW	N	TR	POBAT
Populus tremuloides	quaking aspen	x	x			x	x		x	FAC	N	TR	POTR5
Prosartes hookeri	Hooker fairy-bell, Hooker's fairy bells	x	x							NI	N	FB	PRHO2
Prunella vulgaris	common selfheal	x	x			x				FACU	N	FB	PRVU
Prunus emarginata	bitter cherry, Oregon cherry	x	x			x	x		x	FACU	N	TR/SH	PREM
Pseudoroegnaria spicata	bluebunch-wheatgrass	x			x					NI	N	GR	PSSP6
Pseudotsuga menziesii	Douglas-fir	x	x	x						FACU	N	TR	PSME
Pteridium aquilinum	western brackenfern	x	x	x		x		x		FACU	N	FE	PTAQ
Ribes lacustre	prickly currant	x					x	x		FACW	N	SH	RILA
Ribes sanguineum	red flower currant	x	x			x				FACU	N	SH	RISA
Ribes viscosissimum	sticky currant	x	x	x						FAC	N	SH	RIVI3
Rosa gymnocarpa	dwarf rose	x	x	x	x					FACU	N	SH	ROGY
Rosa nutkana	Nootka rose	x	x	x		x				FAC	N	SH	RONU
Rosa woodsii	Woods' rose	x	x							FACU	N	SH	ROWO
Rubus parviflorus v. parviflorus	western thimbleberry	x		x	x			x	x	FAC	N	SH	RUPAP2
Rubus ursinus	California blackberry (syn. Dewberry, creeping blackberry)	x	x	x		x	x	x	x	FACU	N	SH	RUUR

Scientific Name	Common Name	ALL	Up Con Forest (Central - South)	Up Con Forest (North)	Up Shrub -Meadow	Up Shrub T-line (Nor-Central)	Wet For-Pond (North)	Wet Shrub overflow channel (Central)	Wet Shrub (South)	Wetland Status	Native/ Introduced	Plant Form	NRCS Code
Rumex acetosella	common sheep sorrel	x	x		x					FACU	I	FB	RUAC3
Salix amygdaloides	peachleaf willow	x	x				x			FACW	N	SH	SAAM2
Salix commutata	undergreen willow	x	x				x	x		OBL	N	SH	SACO2
Salix lucida ssp. lasiandra	Pacific willow	x					x	x		FACW	N	TR/SH	SALUL
Salix lutea	yellow willow	x					x			OBL	N	SH	SALU2
Sambucus nigra ssp. cerulea	blue elderberry	x	x	x						FACU	N	SH	SANIC5
Sambucus racemosa	red elderberry	x		x						FACU	N	SH	SARA2
Sanicula graveolens	northern sanicle	x	x	x		x				NI	N	FB	SAGR5
Scirpus microcarpus	panicled bulrush, red-tinge bulrush	x		x			x			OBL	N	GR	SCMI2
Silene menziesii	Menzies' campion	x	x	x	x	x			x	FAC	N	FB	SIME
Sisymbrium altissimum	tall tumblemustard	x		x						FACU	I	FB	SIAL2
Sium suave	hemlock waterparsnip	x					x			OBL	N	FB	SISU2
Solidago canadensis	Canada goldenrod	x	x							FACU	N	FB	SOCA6
Spiraea betulifolia	white spirea	x	x							FAC	N	SH	SPBE2
Spiraea douglasii	rose spirea	x	x	x	x	x	x	x	x	FACW	N	SH	SPDO
Stachys chamissonis	Coastal hedgenettle	x							x	FACW	N	FB	STCH
Streptopus amplexifolius	claspleaf twistedstalk	x	x	x			x			FAC	N	FB	STAM2
Symphoricarpos albus	common snowberry	x	x	x	x	x		x	x	FACU	N	SH	SYAL
Symphyotrichum eatonii	Eaton's aster	x			x			x		FAC	N	FB	SYEA2
Symphyotrichum spathulatum	western mountain aster	x			x		x			FAC	N	FB	SYSP
Tanacetum vulgare*	common tansy, tansy*	x		x		x	x		x	FACU	I	FB	TAVU
Taraxacum officinale	common dandelion	x	x	x	x	x	x	x	x	FACU	N/I	FB	TAOF
Thalictrum occidentale	western meadowrue	x		x						FACU	N	FB	THOC
Thinopyrum intermedium	intermediate wheatgrass	x			x			x		NI	I	GR	THIN6
Thuja plicata	western redcedar	x		x						FAC	N	TR	THPL

Scientific Name	Common Name	ALL	Up Con Forest (Central - South)	Up Con Forest (North)	Up Shrub -Meadow	Up Shrub T-line (Nor-Central)	Wet For-Pond (North)	Wet Shrub overflow channel (Central)	Wet Shrub (South)	Wetland Status	Native/ Introduced	Plant Form	NRCS Code
Trientalis borealis (syn. Lysimachia latifolia)	western starflower	x	x	x		x		x		FAC	N	FB	TRBO2
Trifolium pratense	red clover	x	x		x		x	x		FACU	I	FB	TRPR2
Trillium ovatum	Pacific trillium	x	x	x	x					FACU	N	FB	TROV2
Urtica dioica	stinging nettle	x		x		x	x	x	x	FAC	N	FB	URDI
Verbascum thapsus	common mullein	x		x				x		FACU	I	FB	VETH
Veronica americana	American speedwell	x					x	x	x	OBL	N	FB	VEAM2
Vicia americana	American vetch	x	x							FAC	N	FB	VIAM
Viola glabella	pioneer violet	x	x	x						FACW	N	FB	VIGL
Viola nephrophylla	northern bog violet	x					x			FACW	N	FB	VINE

[w] = Washington State Noxious Weed species
[c] = Chelan County Noxious Weed designated for control
Wetland Status: US Army Corps of Engineers (USACE) status for Western Mountain and Valleys Region

OBL = Obligate (always occurs in wetlands)
FAC = Facultative (equally likely in wetlands or non-wetlands)
FACW = Facultative Wetland (usually occurs in wetlands)
FACU = Facultative Upland (usually occurs in non-wetlands)
UPL = Upland Obligate (always occurs in non-wetlands)
NI = No indicator (no wetland indicator for this plant species)

Plant Form = Plant Type based on type classification by USDA NRCS Plants Database (2020).

TR = Tree
TR/SH = Tree/Shrub
SH = Shrub
FB = Forb (Herb)
FE = Fern
GR = Gramminoid (Grasses, Sedges, Rushes)

Appendix C. Incidental Wildlife Observations

Rubber boa (*Charina bottae*) observed in the sunny roadbed of an upland forest powerline corridor, Chelan County, WA.

Pacific tree frog (*Pseudacris regilla*) observed in wetland forested channel of northern Project Area on skunk cabbage and pond edge, Chelan County, WA.

American Beaver (*Castor canadensis*) sign observed in the northern wetland forest pond area (left), and black cottonwood tree chewed by beaver just outside of the project area in the northern wetland (right), Chelan County, WA.

Final Botanical Report for the Nason Creek Floodplain Enhancement Project

Overview of Nason Creek and surrounding conifer forest (Left) and Spotted knapweed (*Centaurea stoebe*) the most abundant noxious weed of the Nason Creek Project Area (Right).

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1. Introduction

Yakama Nation Fisheries, Upper Columbia Habitat Restoration Project, (UCHRP) is performing habitat restoration projects in the Upper Columbia Basin of Washington to restore aquatic and riparian habitats to support the recovery of Endangered Species Act (ESA) listed fish species. Preliminary plans for the Nason Creek Floodplain Enhancement Project (Project) includes placement of artificial log structures, development of side channels, promoting pool development, and increasing floodplain connectivity along Nason Creek.

A botanical inventory was conducted for the project in 2020 to identify and document any state or federal listed vascular plants (rare plants), state or county listed noxious weeds and document and describe the existing plant communities within the Project Area. The purpose of this document is to support review by the Yakama Nation and follows methods consistent with the Washington State Natural Heritage Program (WNHP). Botanical inventory surveys and associated wetland assessment and delineation were performed at the Nason Creek Project by Hamer Environmental for Yakama Nation Fisheries Program.

The Nason Creek Project is located in Chelan County, Washington on Nason Creek between River Mile 3.4 and 4.6. The proposed Project is 12.0 miles north of Leavenworth, Washington and accessed from State Highway 207 (T 26N, R 17E, S 9). The Project Area of Potential Effect, (APE) is less than 50 acres in size. The Project Area also includes APE for equipment staging and access routes to perform work located above the OHW.

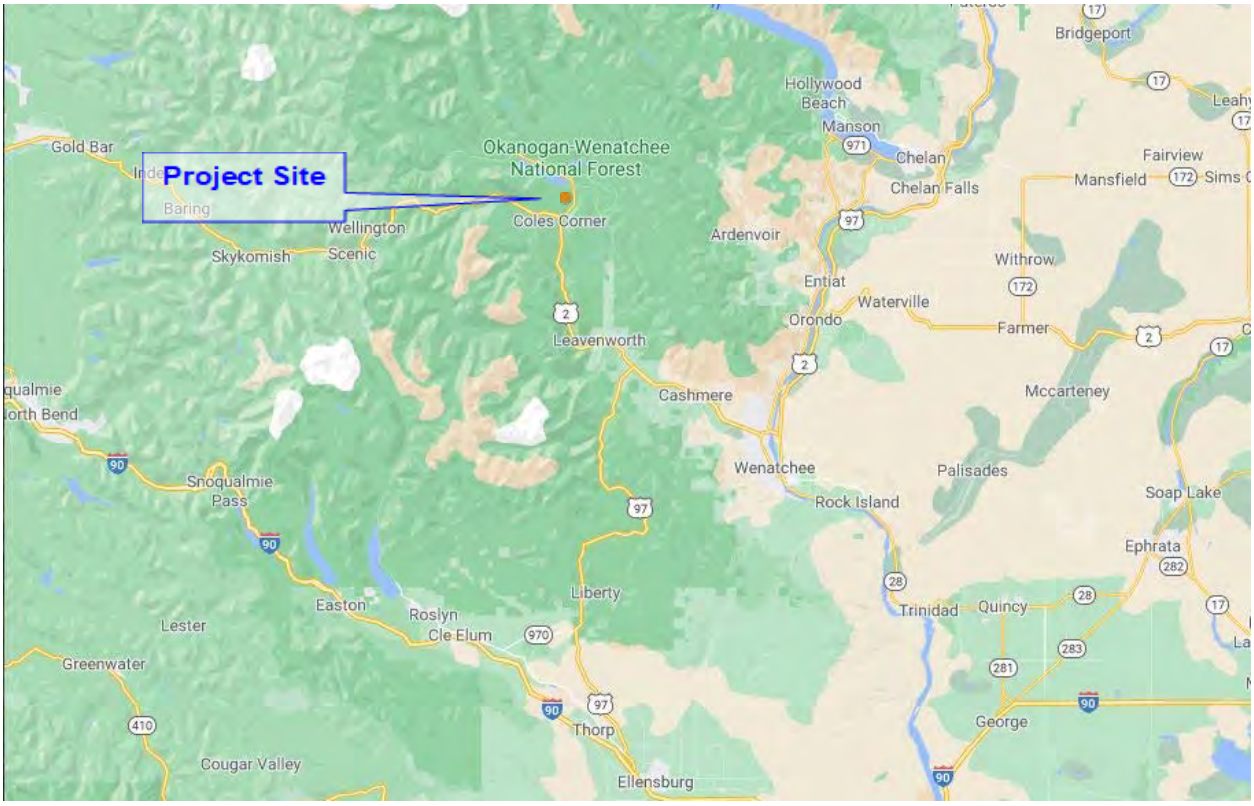


Figure 1. Nason Creek Project Vicinity Map, Chelan County, Washington.

2. Methods

2.1 Pre-field Review of Rare Plants with Potential to Occur in the Project Area

A pre-field desktop review was conducted to create a priority list of rare vascular plant species with potential to occur in the Nason Creek Project vicinity. This refined rare plant list was also used to determine best timing for field botanical surveys based on flowering times of those plant species. The WNHP of the Washington Department of Natural Resources, maintains records of all rare plants and the rare plant list for Chelan County, WA served as the baseline (WNHP 2020a). The WNHP rare plant list was refined to exclude those rare plants found only at high elevations or other habitats not found at the Nason Creek Project (Appendix A). Secondly, a GIS dataset of rare plants maintained by the WNHP was used to identify rare plants and high-quality ecosystems located within a 10-mile radius of the Project Area (WNHP 2020b). These plants and plant communities have a higher likelihood of occurrence due to their proximity to the Project but were similarly excluded if range or habitats had no potential for occurrence at Nason Creek (Table 1).

Table 1. Rare Plants and Plant Communities within 10-miles of the Nason Creek Project[1] (WNHP 2020b).

Common Name	Scientific Name	Approximate Distance from Site	State Status	NatureServe Status
Smoky Mountain sedge	Carex proposita	8.2 mi WSW	S	-
Thompson's chaenactis	Chaenactis thompsonii	9.5 mi S	S	-
bulb-bearing water-hemlock	Cicuta bulbifera	4.4 mi N	S	-
Wenatchee larkspur	Delphinium viridescens	3.2 mi SE	T	-
Salish fleabane	Erigeron salishii	9 mi SSW	S	-
Salish fleabane	Erigeron salishii	8 mi WSW	S	-
Taylor's stickseed	Hackelia taylorii	9 mi SSW	T	-
Rone's biscuitroot	Lomatium roneorum	8 mi NNE	E	-
Rone's biscuitroot	Lomatium roneorum	10 mi SSE	E	-
Rone's biscuitroot	Lomatium roneorum	4.2 mi ESE	E	-
false mountain willow	Salix pseudomonticola	9 mi SSW	S	-
strawberry saxifrage	Saxifragopsis fragarioides	7 mi S	T	-
strawberry saxifrage	Saxifragopsis fragarioides	7 mi SW	T	-
Seely's catchfly	Silene seelyi	8 mi S	S	-
Seely's catchfly	Silene seelyi	7 mi NNW	S	-

Common Name	Scientific Name	Approximate Distance from Site	State Status	NatureServe Status
Bog Willow / Beakrush / Sphagnum Shrub Fen	Salix pedicellaris / Rhynchospora alba / Sphagnum Shrub Fen	4.4 mi N	-	Vulnerable
Buxbaum's Sedge Fen	Carex buxbaumii Fen	4.4 mi N	-	Vulnerable
Lesser Panicled Sedge / Hamatocaulis Moss Fen	Carex diandra / Hamatocaulis vernicosus Fen	4.4 mi N	-	Not Ranked
Mud Sedge / Sphagnum spp. Fen	Carex limosa / Sphagnum spp. Fen	4.4 mi N	-	Not Ranked

[1]Rare Plants – Several high-elevation WNHP rare plant detections were excluded from table due to lack of habitat at Nason Creek.

To determine best timing to conduct field botanical surveys, further research was required to identify the flowering period (or best time of year) for field identification of each rare plant species. Three sources in order of preference were consulted for flowering period of rare plants: WNHP Rare Plant Field Guide, Burke Herbarium Image Collection and the Consortium of Pacific Northwest Herbaria Specimen Database (WNHP 2011, Burke Museum Herbarium 2020, Consortium of PNW Herbaria 2020).

The 35 plant species on this rare plant list were the focus of the botanical inventory surveys, and timing of surveys was determined based on the flowering period of these rare plants (Appendix A).

2.2 Field Botanical Surveys

The field botanical inventory surveys included two visits conducted in the early and late-summer of 2020, and included:

1. A full walk-through of all potential project APEs and access routes, including a 100-foot buffer surrounding all project APEs and access routes. Since the Nason Creek Project is still in preliminary phase, a larger buffer was applied to proposed APE corridors than a standard project site to ensure maximal coverage in case final site plans require adjustment.
2. A botanical inventory of the project was performed by conducting meandering transects throughout the site and associated buffers following an intuitive controlled approach accepted by WNHP. All vascular plant species observed were recorded, and extra time was spent in areas with habitats suitable for rare plants.
3. Plant communities comprising the site were documented and described, noting general conditions. Existing plant communities were identified in the field, using plant community associations from *Classification and Management of Aquatic, Riparian, and Wetland Sites on the National Forests of Eastern Washington* when possible (Kovalchik and Clausnitzer 2004).
4. When a rare plant or rare plant community was observed, a WNHP rare plant/plant community data form was completed, the location documented by GPS, and photos collected.
5. Any Washington state noxious weeds encountered during the surveys were documented, and all large Class A and B weed infestations were mapped (Washington State Noxious Weed Control Board 2020).

Any plants that could not be positively identified in the field were collected for later identification with a dissecting microscope and additional botanical references.

3. Results

Botanical inventories of the Nason Creek Project and associated buffers were conducted, by Hamer Environmental botanist, Erin Colclazier, on 13-14 July and 19-20 August 2020. A total of 250 plant species were identified at the site (Appendix B). Incidental wildlife observed during the botanical inventories were also documented (Appendix C).

3.1 Existing Plant Communities

The Project Area consists of a section of Nason Creek located immediately adjacent to State Highway 207, with gravel bar and large cobble banks, seasonal side channels and natural log structures surrounded by mixed conifer-deciduous and mature conifer riparian forest, dense riparian shrublands and some wetland areas. Most of the Project APE's (Areas of potential effect), are located within the Ordinary High Water (OHW) of Nason Creek channel and side-channels, with cobble-gravel dominated banks that contain sparse vegetative cover, but become dense with shrubs along the forest (inland) and water edges. The influence of State Highway 207, results in non-native plants, noxious weed infestations and trash along the highway shoulder and forest edge. An area surveyed east of State Highway 207, just north of a large powerline right-of-way (ROW) contains riverine forest and pond wetland habitat with hydrologic connection to Nason Creek through culverts. In the central portion of the Project Area, a cattail slough (emergent riverine wetland) was documented, with hydrologic connection to Nason Creek. Another unique habitat encountered, is a meadow surrounded by mid-succession conifer forest adjacent to (east of) an area recently logged and located in the north-central portion of the Project Area. Lastly, the northern extent of the Project Area, contains mature Ponderosa Pine forest with some areas of saturated soils. Existing plant communities can be generally subdivided into the following categories: meadow, emergent wetland, wetland forest pond, riparian shrub, floodplain forest, and sparsely vegetated bank.

Meadow

Native grasses and forbs were dominant in the forest meadow with patches of shrubs at meadow edges and located in the north-central portion of the Project Area. Dominant grasses included California brome (*Bromus carinatus*) and meadow fescue (*Schedonorus pratensis*), with Idaho fescue (*Festuca idahoensis*). Forbs were more varied, but included yarrow (*Achillea millefolium*), grand collomia (*Collomia grandiflora*), showy fleabane (*Erigeron speciosus*), western pearly-everlasting (*Anaphalis margaritacea*), arrowleaf balsamroot (*Balsamorhiza sagitata*), lupine (*Lupinus* sp.), Lyall's mariposa (*Calochortus lyalli*), field chickweed (*Cerastium arvense*), grand collomia (*Collomia grandiflora*), and others. Shrubs, Cascade barberry (*Mahonia nervosa*), common snowberry (*Symphoricarpos albus*) and white spirea (*Spirea betulifolia*) were at forest margins, with kinnikinnick (*Arctostaphylos uva-ursi*) common near the cleared forest-meadow margin. Although the plant community described below is based on existing, dominant plant species in the meadow, it could be classified based on the surrounding forested plant association if assuming the climax (or mature) vegetation condition if left undisturbed.

> Plant Community: California brome-Idaho fescue-yarrow meadow (*Bromus carinatus-Festuca idahoensis-Achillea millefolium* meadow)

Gravel bar areas at the Nason Creek waterline, or narrow bands of depositional banks with willows, frequently included an emergent vegetation component of lakeshore sedge (*Carex lenticularis*), water horsetail (*Equisetum fluviatile*), Coville's rush (*Juncus covillei*) and reed canarygrass (*Phalaris arundinacea*) with patches of purple monkeyflower (*Mimulus lewisii*), Canadian mint (*Mentha arvense*) and noxious weed common tansy (*Tanacetum vulgare*).

Plant Association: Lenticular Sedge meadow (Carex laeviculmis meadow)

Emergent Wetland Slough

A small emergent riverine wetland is located along a seasonal side channel north of the primary Nason Creek channel. Saturated soils and some standing water present during both survey visits (July and August 2020). Native broadleaf cattail (*Typha latifolia*) is dominant, with sparse shrub twinberry honeysuckle (*Lonicera involucrata*), and other emergents, water horsetail, panicled bulrush (*Scirpus microcarpus*) and stinging nettle (*Urtica dioica*). A small patch of noxious reed canarygrass (*Phalaris arundinacea*) was also identified.

Plant Association: Broadleaf cattail Association (*Typha latifolia* Association)

Riverine Forest-Pond Wetland

A forested wetland with a ponded area is located southeast of State Highway 207 and immediately north of a transmission corridor. The wetland forest area contains sparse black cottonwood trees, dense gray alders (*Alnus incana*), patches of shrubs, red osier dogwood (*Cornus sericeus* ssp. *stonolifera*) and vine maple. Understory was dominated by skunk cabbage (*Lysitchiton americanus*) with lady fern (*Athyrium filix-femina*). Standing water was present throughout the forest wetland when surveyed in mid-July, but half of the forest contained only saturated soils by mid-August 2020. The eastern extent of the area became an open pond with water depth of two or more feet, and ringed by Scouler's willow (*Salix scouleriana*) and red-osier dogwood. Several patches of noxious weed, reed canarygrass were at the highway edge and pond margin.

Plant Association: Black cottonwood/Mountain alder (*Populus balsamifera* ssp. *trichocarpa/ Alnus incana*

Riparian Shrub

Bands of willow-dominated shrub vegetation were located along the waterline edge and interior forest margin of many gravel bars and lower streambanks. Dominant willow species include Pacific willow (*S. lucida* ssp. *lasiandra*), MacKenzie's willow (*S. prolixa*) and sandbar willow (*Salix exigua*). Young black cottonwood (*Populus balsamifera* ssp. *trichocarpa*), arroyo willow (*S. lasiolepis*), and understory plants were present and commonly included lakeshore sedge, horsetail, and creeping bentgrass (*Agrostis stolonifera*). Noxious weeds were particularly common in more sparsely vegetated gravel bars and remnant channels, and included tansy (*Tanacetum vulgare*), reed canarygrass, spotted knapweed (*Centaurea stoebe*), bouncing bet (*Saponaria officinalis*), oxeye daisy (*Leucanthemum vulgare*), and common St. Johnswort (*Hypericum perforatum*).

Plant Association: Willow/Alluvial bar (*Salix*/Alluvial bar)
Plant Association: Willow/Mesic forb (*Salix*/Mesic forb)

Floodplain Forests

Riparian forests along the mainstem of Nason Creek include a mix of mid-succession and mature conifers with patches of deciduous trees and a variable understory of shrubs and forbs, with drier understory species generally eight to ten feet from the forest and creek edge. Common conifers include grand fir (*Abies grandis*), Douglas fir (*Pseudotsuga menziesii*), and ponderosa pine (*Pinus ponderosa*) with western red cedar (*Thuja plicata*) and small patches of deciduous trees black cottonwood or bigleaf maple (*Acer*

macrophyllum). Understory species in wetter areas adjacent to Nason Creek included vine maple (A*cer circinatum*) or red-osier dogwood (*Cornus stolonifera*) with sparse Douglas spirea (*Spirea douglasii*), Saskatoon serviceberry (*Amelanchier alnifolia*), Oregon boxwood (*Paxistima myrsinites*) or Wood's rose (*Rosa woodsii*). Understory species were frequently sparse or absent but include drier areas with forbs: bride's bonnet (syn. queen's cup *Clintonia uniflora*), star-flowered Solomon's seal (Maianthemum stellatum), bunchberry dogwood (*Cornus canadensis*), and trillium (*Trillium ovatum*). The northeastern corridor, where Project plan will reconnect and deepen a seasonal side channel (some areas with saturated soils July 2020) contains mature conifer trees with patches of black cottonwood trees at the creek edge and dense vine maple throughout.

> Plant Association: Grand fir/vine maple-WEN (Abies grandis/Acer circinatum-WEN)
> Plant Community Type[1]: Grand fir/vine maple-bride's bonnet (Abies grandis/Acer circinatum-Clintonia unifoliata)
> [1]Lillybridge et al. 1995

A few forest patches, on the north-side of the Nason Creek mainstem, contained the same mix of overstory conifer species with sparse bigleaf maple in the deciduous overstory, but the understory varied with dominant shrubs common snowberry and hollyleaved barberry (*Mahonia aquifolium*) with vine maple and sparse understory of white hawkweed (*Hieracium albiflorum*), star-flowered Solomon's seal (Maianthemum stellatum) and noxious weed common St. Johnswort.

> Plant Association: Grand fir/common snowberry-floodplain (Abies grandis/Symphoricarpos albus-floodplain

Sparsely Vegetated Bank

Most Nason Creek lower banks are dominated by small cobbles and gravels and contain ten percent or less cover of vegetation. Therefor the habitat is categorized as unvegetated alluvium, despite sparsely present patches of forbs, grasses, and willow seedlings. Common plants include a variety of introduced forbs, graminoids and noxious weeds, including: yarrow, Canadian horseweed, bouncing bet, common sheep sorrel (*Rumex acetosella*) and noxious weeds common tansy, spotted knapweed (*Centaurea stoebe*), reed canarygrass, oxeye daisy, diffuse knapweed, and common St. Johnswort.

> Plant Community: Unvegetated Alluvium

3.2 Rare Plants and Noxious Weeds

No rare plants were documented during this study. Suitable habitat was not observed for any of the ten state listed plant species documented within 10 miles of the Project Area (Table 1).

No rare WNHP Ecological Communities were found, but one high quality WNHP community, Grand fir/Vine maple Forest (*Abies grandis/Acer circinatum* Forest) was documented within the Project Area. This riparian forest type has a conservation status rank by WNHP as S3/G4, Vulnerable (S3) in the State of Washington, but Apparently Secure (G4) globally (Rocchio and Crawford 2015).

Washington state noxious weed species documented in the Project Area included 11 state listed noxious weeds: 5 Class B, 6 Class C weeds and 2 Monitor weeds (Table 2, Figure 2). Eradication of noxious weeds is required for all Class A weeds and some Class B weeds by Washington State, but is recommended for

all noxious weed infestations (Washington State Noxious Weed Control Board 2020). In Chelan County, eight of the state listed weeds are designated for control. Spotted knapweed (*Centaurea stoebe*), diffuse knapweed (*C. diffusa*), Dalmatian toadflax (*Linaria dalmatica* ssp. *dalmatica*), Scotch thistle (*Onopordum acanthium*) and Scotchbroom (*Cytisus scoparius*) are Class B noxious weeds designated for control/eradication in Chelan County (Chelan County Weed Control Board 2020). Canada thistle (*Cirsium arvense*), common St. Johnswort (*Hypericum perforatum*), and oxeye daisy (*Leucanthemum vulgare*) are Class C noxious weeds also designated for control in Chelan County.

Table 2. Noxious Weed Species documented at Nason Creek Project, Chelan County, WA.

Scientific Name	Common Name	Plant Type	USDA Plants Code	State Weed Class[w]
Centaurea diffusa	diffuse knapweed	Forb	CEDI	B[w]
Centaurea stoebe	spotted knapweed	Forb	CEST8	B[w]
Cirsium arvense	Canada thistle	Forb	CIAR4	C[w]
Hypericum perforatum	common St. Johnswort	Forb	HYPE	C[w]
Leucanthemum vulgare	oxeye daisy	Forb	LEVU	C[w]
Linaria dalmatica ssp. dalmatica	Dalmatian toadflax	Forb	LIDAD	B[w]
Onopordum acanthium	Scotch thistle	Forb	ONAC	B[w]
Cytisus scoparius	Scotchbroom	Shrub	CYSC4	B[w]
Mycelis muralis	wall-lettuce	Forb	MYMU	Monitor
Phalaris arundinacea	reed canarygrass	Grass	PHAR3	C
Saponaria officinalis	bouncing bet	Forb	SAOF4	Monitor
Silene latifolia ssp. alba	white cockle	Forb	SILA21	C
Tanacetum vulgare	common tansy	Forb	TAVU	C

State Weed Class[w]: [w] indicates plant species designated for control in Chelan County.

Class A weeds = species with limited distribution and establishment in WA.

Class B weeds = species with distribution limited to some portions of WA.

Class C weeds = species with widespread distribution in WA or of special interest to the agricultural industry.

Monitor weeds = species where more information is needed of suspect weeds, but no regulatory requirement to control.

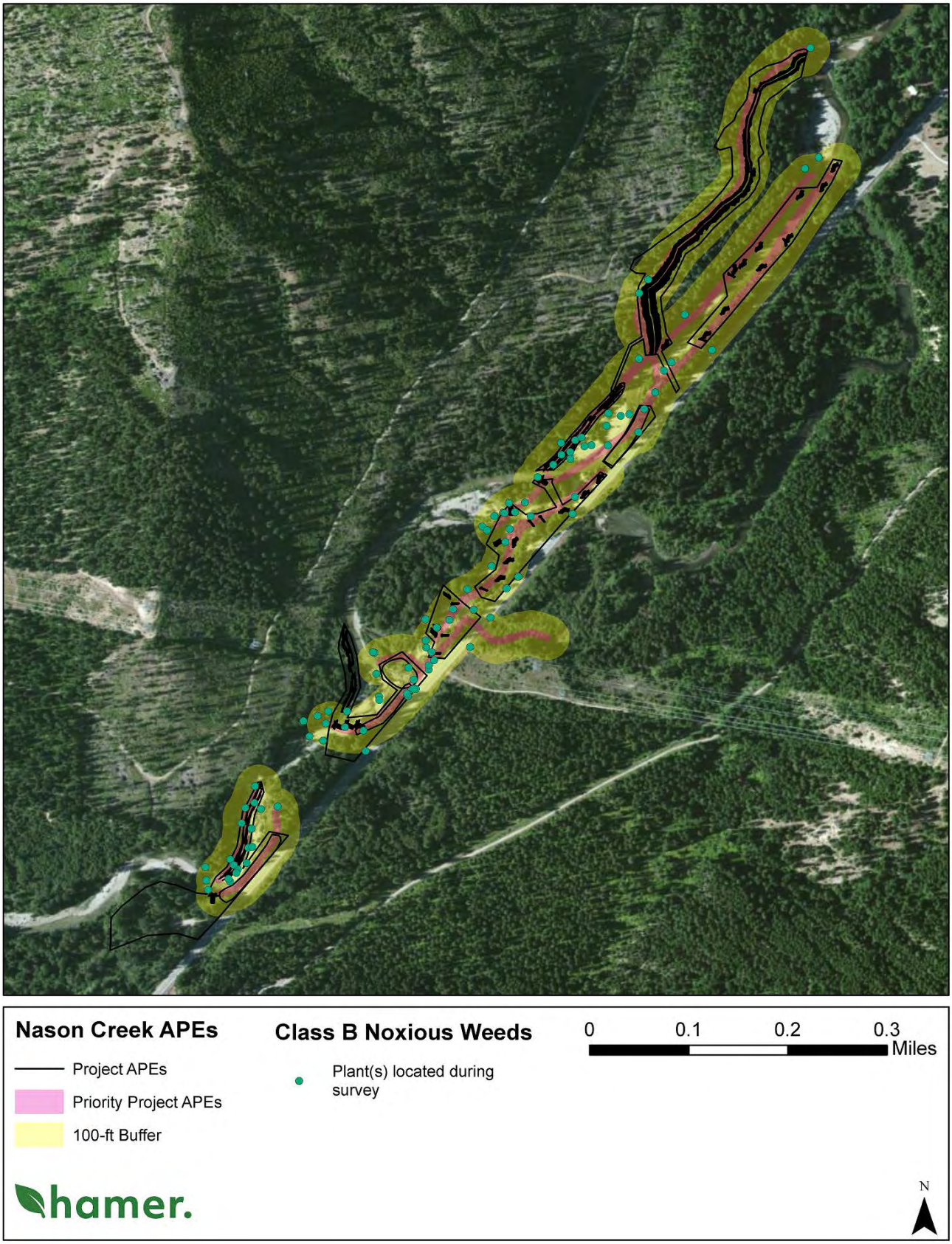


Figure 2. Overview of Class B Noxious Weeds documented at Nason Creek, Chelan County, WA.

Noxious weeds were found throughout the Project Area on gravel bars, overflow channels and disturbed areas along the Highway 207 road shoulder but were largely absent from forested areas (Figure 2; Appendix D). Spotted knapweed, a Class B weed, was the most abundant noxious weed in the Project Area, regularly observed along gravel bars and in dense patches along remnant and overflow channels with gravel substrate. Noxious weeds with infestations found along gravel bars co-occurring with spotted knapweed include, most commonly, Class C designates oxeye daisy and common St. Johnswort, and Class C non-designates common tansy and white cockle (Appendix D). Class B designates, Dalmatian toadflax and diffuse knapweed infestations were also found in gravel bar areas, but to a lesser extent. Class B designates, Scotch thistle and Scotchbroom minimally occurred, with Scotch thistle consisting of two plants found along Highway 207 west pull-out near a powerline right-of-way, and two Scotchbroom shrubs located just outside of the central Project Area along a northern streambank (Appendix C). Canada thistle, also a Class C designated weed, was found sparsely in streambank patches adjacent to mature forest, in small numbers and frequently in the same areas as Class C non-designate reed canarygrass. Monitor weed, bouncing bet was minimally present in some lower gravel bars of the southern Project Area. Monitor weed, wall-lettuce, was minimally present in the Project Area, found in the shady interface between disturbed overflow channels and forest as individual to several plants.

4. Discussion

4.1 Botanical Survey Coverage

Although most of the subject property is on Western Rivers Conservancy lands, US Forest Service and Washington Department of Transportation (WDOT) have ownership and interest in supporting the restoration project. A portion of the Project Area, which includes project APEs, was excluded from this botanical survey effort. US Forest Service will conduct rare plant surveys on the remaining portion of the Project Area in 2021, prior to the initiation of construction. Unfortunately, these botanical surveys were not conducted in coordination with US Forest Service botanical personnel.

4.2 Rare Plants and Plant Communities

No rare plants were documented during this survey effort. Although surveys were scheduled to coincide with the flowering period of rare plants with potential to occur in the Project Area; three State-listed species may have completed flowering before the initial survey visit on 13 July 2020: Palouse milkvetch (*Astragalus arrectus*), Suksdorf's monkeyflower (*Erythranthe suksdorfii*), and fuzzy-tongue penstemon (*Penstemon eriantherus* var. *whitedii*; Appendix A, WANHP 2020a). In addition, of the ten species of rare plants documented within 10-miles of the Project, only false mountain willow (*Salix pseudomonticola*), contained potentially suitable habitat within the Project Area (Table 1). Potentially suitable habitats for these four species were carefully surveyed for evidence of plants belonging to the same genus of the listed plants. All plants of the same genus as one of the four rare species were subsequently identified to verify that they were not the rare species.

A WNHP high quality plant community, Grand fir/Vine maple Forest (*Abies grandis/Acer circinatum*) was documented within the Project Area, with a conservation rating as S3/G4 (Rocchio and Crawford 2015). This ranking of S3/G4, means that in the State of Washington the ecological community is at moderate risk for extirpation, though it's considered secure globally. This forest area contains mature trees over 100 years in age, based on tree species composition and tree diameters observed. In Washington, numerous

potential threats to these forested plant communities include stand replacing fires due to fire suppression, timber harvest, introduced diseases, and land conversion, resulting in reduction and fragmentation of existing forest stands (Rocchio and Crawford 2015). Within the Nason Creek Project Area, this plant community roughly represents thirteen percent of the area surveyed.

4.3 Noxious Weeds

Eleven noxious weed species were documented during the 2020 botanical inventory, including zero Class A, five Class B, and six Class C designated species (Table 2). Of the eleven weed species, eight are Chelan County designates that require control to manage: spotted knapweed, diffuse knapweed, Canada thistle, common St. Johnswort, oxeye daisy, Dalmatian toadflax, Scotch thistle, and Scotch broom (Chelan County NWCB 2020). The NWCB recommends treatment of all listed noxious weeds (WNWCB 2020).

When prioritizing control and management of weeds, an assessment of surrounding areas for additional noxious weed infestations and vectors for spread and reintroduction of noxious weeds like roads, waterways and construction equipment is important. Targeted treatment of weeds in small-isolated patches may also be a more effective use of limited resources over that of widespread treatment of weeds based solely on species. Lastly, prioritization of noxious weeds with only one or a very limited distribution, may dramatically reduce cost and effort of managing for these weeds in future years. In the Project Area, reintroduction of weed infestations from upstream areas of Nason Creek and along Highway 207 road shoulders are highly likely, particularly for spotted knapweed and other weeds found along gravel bars. Coordination of weed control efforts with neighboring landowners and Chelan County Noxious Weed Control Board will have a more impactful result.

Noxious Weed Infestations & Control Methods

Consult Chelan County Noxious Weed Control Board for further information regarding Best Management Practices for treating noxious weed infestations, and the Pacific Northwest Pest Management Handbook for herbicide use (Chelan NWCB 2020). The following recommendations are based on site-specific knowledge of weed infestation size and accessibility for treatment but are not intended to supersede Yakama or Chelan County guidelines for treatment.

Class B Designated Weeds:

- **Spotted knotweed** (*Centaurea stoebe*) was the most common noxious weed encountered during field surveys, with infestations widespread throughout the Project Area, particularly along gravel streambanks and overflow channels. Since spotted knapweed is common throughout the Project Area and frequently near Nason Creek, both mechanical and chemical treatments may not be practical or safe to apply near waterways, and reintroduction of spotted knapweed from upstream areas would be likely. Biocontrol agents are a better approach for widespread noxious weeds to contain infestations from further expansion, and with enough diffuse knapweeds in the vicinity to provide a continuing food supply to biocontrol agents. There are numerous biocontrol agents for spotted knapweed, with further information and biocontrol requests handled through the Washington State University Integrated Weed Control Project (IWCP; WSU Extension 2020).

- **Diffuse knapweed** (*Centaurea diffusa*) infestations were limited to small patches in the southern portion of the Project Area, along gravel bars and roadside edges (Appendix C). Since diffuse knapweed is closely related to spotted knapweed, some of the biocontrol agents used to control spotted knapweed would also effectively control diffuse knapweed. Spot chemical treatments of

individual infestations may also be practical only if treatments use chemicals safe to apply near waterways.

- **Dalmatian toadflax** (*Linaria dalmatica* ssp. *dalmatica*) infestations are small and patchy, and limited to the southern Project Area, mostly along the Highway 207 road edge and a gravel bar along Nason Creek. Mechanical removal of individual plants by hand pulling is possible, due to the small infestation sizes. However, hand pulling will need to be repeated annually. Chemical treatment is also possible, but proximity to water and reintroduction of the plants along the river corridor should be considered. A biological control agent is successfully used for infestations of this plant in Oregon but has not yet been successful at sites in Washington (WNWCB 2020).
- **Scotch thistle** (*Onopordum acanthium*) infestations are limited to two individual plants. Due to the small number of plants, manual control is feasible by digging out the vegetative rosette and cutting the taproot of the plant (WNWCB 2020). There are no insect biocontrol agents for Scotch thistle, but herbicide control is possible, especially if treating multiple weed species and larger infestations.
- **Scotchbroom** (*Cytisus scoparius*) infestation was limited to two individual shrubs documented just outside of the Project Area (within 20 feet of the survey buffer). While control of this infestation is not required since it lands outside of the Project Area, its recommended. Mechanical control of an infestation this size is the recommended method of treatment but will require multi-year management to eradicate resprouting shrubs and germination of weed seeds. Chemical control is possible using foliar and/or basal bark treatments. Biological control agent, Scotchbroom bruchid (*Bruchidius villosus*) has been shown to impact plant reproduction by feeding on the seeds of Scotch broom (WNWCB 2020).

Class C Designated Weeds:

- **Canada thistle** (*Cirsium arvense*) infestations were minimal, found sparsely in streambank patches adjacent to mature conifer and near reed canarygrass. Control of Canada thistle infestations are difficult, with mechanical treatments requiring repeated efforts and biological control agents having limited impacts. Chemical controls will also require multiple treatments for efficacy and any herbicides selected will need to be safe for use along waterways. Mechanical treatment is recommended based on the overall small size of infestations.
- **Common St. Johnswort** (*Hypericum perforatum*) infestations are common along gravel bars and other regularly disturbed areas within the Project Area including Highway 207 road pullouts. Infestations are sparse and widespread, making mechanical removal impractical. Several biocontrol agents may be effective at controlling the infestations and chemical controls can be effective using herbicides deemed safe for use along waterways.
- **Oxeye daisy** (*Leucanthemum vulgare*) infestations are common along gravel bars in the Project Area, frequently co-occurring with spotted knapweed and common St. Johnswort. Mechanical methods of treatment can be effective but are impractical for this site due to the abundant and widespread nature of the infestations. No biocontrol agents exist for this weed. Chemical control using herbicide deemed safe for use along waterways is recommended.

4.4 Recommendation

1. Review final site design plans against botanical survey coverage to ensure no additional areas require survey before construction. Also, ensure project manager is in coordination with US Forest Service botanical personnel regarding remaining botanical surveys to be conducted.

4.5 Next Steps

The following will be completed by UCHRP contractors at the Nason Creek Project:

1. Develop and implement a Weed Management Plan to control and prevent the spread of existing noxious weed infestations during and after project construction and prioritize treatment of Class B and C designated noxious weeds. Continued annual monitoring is strongly recommended to reduce risk of new weeds from establishing. Refer to previous section 4.2 for species-specific recommendations for best methods of control.

2. Develop and implement a Revegetation and Plant Survival Plan to restore areas of temporary project impacts, including staging areas and equipment access paths. The plant community descriptions and botanical species list should be referenced for revegetation planning. The Revegetation Plan should determine site specific revegetation goals, maintenance, adaptive management, and annual progress monitoring to ensure successful vegetation establishment and plant survival requirement rates are met.

3. If a federal or state-listed plant is found during project activities, immediately cease activity in vicinity of plant and contact the project manager, as required under UCHRP permits. To verify identification of the rare plant and determine best mitigation measures, consult with a qualified botanist.

Literature Cited

Burke Museum Herbarium. 2020. Burke Herbarium Image Collection - Species descriptions accessed online 2020 by Erin Colclazier of Hamer Environmental. Available online: http://biology.burke.washington.edu/herbarium/imagecollectionnew/browse.php?Classification=Vascular%20Plants

Camp, P., J.G. Gamon, WNHP and WDNR. 2011. *Field Guide to the Rare Plants of Washington*. University of Washington Press, Seattle, WA.

Chelan County Noxious Weed Control Board. 2020. Noxious Weed List and County Designations. Chelan County, WA. Available online: https://www.co.chelan.wa.us/files/noxious-weed/documents/2020%20Chelan%20County%20Weed%20List.pdf

Consortium of Pacific Northwest Herbaria. 2020. Specimen Records accessed online April-September 2020 by Erin Colclazier of Hamer Environmental. Available online: http://www.pnwherbaria.org/data/search.php

Kovalchik, Bernard L.; Clausnitzer, Rodrick R. 2004. Classification and management of aquatic, riparian, and wetland sites on the national forests of eastern Washington: series description. Gen. Tech. Rep. PNW-GTR-593. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 354 p. In cooperation with: Pacific Northwest Region, Colville, Okanogan, and Wenatchee National Forests. Available online: https://www.fs.fed.us/pnw/pubs/pnw_gtr593.pdf

Lillybridge, T.R.; Kovalchik, B.L.; Williams C.K.; Smith, B.G. 1995. Field guide for forested plant associations of the Wenatchee National Forest. Gen. Tech. Rep. PNW-GTR359. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 335 p. In cooperation with: Pacific Northwest Region, Wenatchee National Forest. Available online: https://www.fs.fed.us/pnw/pubs/pnw_gtr359.pdf

Rocchio, F.J. and R.C. Crawford. In Progress. Ecological Systems of Washington State. A Guide to Identification. Natural Heritage Report 2015-04. Washington Dept. of Natural Resources, Natural Heritage Program. Olympia, WA. Available online: https://www.dnr.wa.gov/publications/amp_nh_ecosystems_guide.pdf?tzbuji

Washington Natural Heritage Program (WNHP). 2020a. Washington Vascular Plant Species of Special Concern by County. Washington Natural Heritage Program, Washington Department of Natural Resources. Olympia, WA. Available online: https://www.dnr.wa.gov/publications/amp_nh_county_plants.pdf?gn8v6t

WNHP. 2020b. GIS Dataset of Rare Plants and High-Quality Ecosystems. Washington Natural Heritage Program, Washington Department of Natural Resources. Olympia, WA. Available online: https://data-wadnr.opendata.arcgis.com/search?groupIds=266f0b3bdc014f5ab2a96ad4ea358a28

Washington State Noxious Weed Control Board (WNWCB). 2020. (http://www.nwcb.wa.gov/). 2020 Washington State Noxious Weed List and Monitor List accessed online June 10, 2020 by Erin Colclazier, Hamer Environmental.

Washington State University (WSU) Extension. 2020. Biological Control Agents by Weed. Integrated Weed Control Project, WSU Extension, Puyallup, WA, accessed online 6 October 2020 by Erin Colclazier of Hamer Environmental. Available online: http://invasives.wsu.edu/biological/weed.htm

Appendix A. Rare Plants with Potential to Occur in the Project Area.

Scientific Name	Common Name	State Status	Federal Status	Habitat Description	Flowering Period	Plant Family
Agoseris elata	Tall agoseris	S		Meadow, open woods, rocky ridges, 500-7800 ft; Assoc spp. herbaceous but vary	June-Aug	Asteraceae
Anemone patens var. multifida	Pasqueflower	T	BS, FS	Prairies and grasslands, open alpine slopes and ridges in loose, sandy well-drained soil and open woods; 2300-6600 ft	late May-Aug	Ranunculaceae
Astragalus arrectus	Palouse milkvetch	T	BS, FS	Grassy hillsides, sagebrush flats, river bluffs and grassy or shrub-dominated openings; 1000-4000 ft	late Apr-early July	Fabaceae
Botrychium hesperium	Western moonwort	S	BS, FS	Sage shrubland, moist and dry meadows, forest edges; dry, gravelly or sandy loams; 2500-6300 ft	May-August	Ophioglossaceae
Botrychium paradoxum	Paradoxical moonwort	T	BS, FS	Forests, moist meadows, riparian areas, compacted old roadbeds	year round	Ophioglossaceae
Carex capillaris	Hair sedge	T	BS, FS	wet meadows, streambanks, wetlands; 2800-6500 ft	June-Aug	Cyperaceae
Carex rostrata	Northern beaked sedge	S	BS, FS	Fens, bogs, quaking or floating peat, lake and stream shores, wet meadows, often in shallow water/floating mats; 3200-5120 ft	July-Aug	Cyperaceae
Carex tenera	Slender broom sedge	S	BS, FS	Dry to moist meadows, open forests, shrub wetlands and lake shores; assoc. spp. paper birch, black cottonwood, willow, field horsetail	May-Sept	Cyperaceae
Cicuta bulbifera	Bulb-bearing water-hemlock	S	BS, FS	Obligate wetland species found at edges of marshes, slow moving streams, lake margins, bogs, wet meadows and shallow standing water; 240-3700 ft	Aug-Sept	Apiaceae
Cryptantha spiculifera	Bristly cryptantha	S	BS	Dry, open, flat or sloping areas in stable or stony soils, with low vegetative cover; 450-3500 ft	May-July	Boraginaceae

Scientific Name	Common Name	State Status	Federal Status	Habitat Description	Flowering Period	Plant Family
Delphinium viridescens	Wenatchee larkspur	T	BS, FS	Moist meadows, seasonally wet openings in aspen groves, hardwood thickets, with seasonal inundation; 1240-5700 ft	July	Ranunculaceae
Eleocharis atropurpurea	Purple spike-rush	X		Wetland species of pond and lake margins, canal banks, irrigation ditches, and maritime shores; 0-5900 ft, once found on lake Chelan	June-Sept	Cyperaceae
Erythranthe pulsiferae	Candelabrum monkeyflower	S	BS, FS	Seasonally wet or moist open areas; often in exposed mineral soil or in grass/forb openings in ponderosa pine, Douglas fir and oak forests; 1580-4000 ft	June-July	Scrophulariaceae
Erythranthe suksdorfii	Suksdorf's monkeyflower	S	BS, FS	Open, moist or dry places, from valleys and foothills to mod. or high elevations in the mountains; in seasonally moist swales, drainages or vernal pools within sage steppe habitat, with disturbed microhabitats; 430-7100 ft;	Apr-June	Scrophulariaceae
Hackelia cinerea	Gray stickseed	T	BS, FS	Open or sparsely forested areas, esp. on cliffs, talus or other exposed rock, often mossy cracks; 1040-2520 ft	May-July	Boraginaceae
Hackelia venusta	Showy stickseed	E	E	Dry, loose granitic sand and crevices in granite or talus; 1500-7400 ft	May-July	Boraginaceae
Juncus howellii	Howell's rush	T	BS, FS	Moist meadows and riparian zones at various montane elev; 2840-3500 ft	July-Aug	Juncaceae
Lathyrus torreyi	Torrey's peavine	T		Open areas, trail edges and open woods, usually at low-elev sites dominated by Doug fir; 320-2025 ft	May-July	Fabaceae
Lomatium roneorum	Leavenworth desert-parsley	E		Open, rocky slopes in ponderosa pine forest openings	Apr-June	Apiaceae

Scientific Name	Common Name	State Status	Federal Status	Habitat Description	Flowering Period	Plant Family
Nicotiana attenuata	Coyote tobacco	S	BS, FS	Dry sandy bottomlands, rocky washes and other dry open places; 320-2640 ft	June-Sept	Solanaceae
Ophioglossum pusillum	Adder's-tongue	S	BS, FS	Seasonally wet areas in pastures, old fields, roadside ditches, bogs, fens, wet meadows, flood plains, moist woods; assoc. spp. Lodgepole pine, spirea, sedges, grasses, strawberry, yarrow; 40-3200 ft	June-Sept	Ophioglossaceae
Parnassia cirrata var. intermedia	Cascade grass-of-Parnassus	T		Marshes, seeps, bogs, wet meadows and along streams from 6000 ft+	Aug-Sept	Parnassiaceae
Pediocactus nigrispinus	Dark-spine ball cactus	S	BS	Lowland to montane sage desert, grasslands and coniferous forests	May-July	Cactaceae
Pellaea brachyptera	Sierra cliffbrake	S	BS, FS	Arid sites with little vegetation, including open south & west-facing slopes in rocky soils; 1100-3500 ft	year round	Pteridaceae
Penstemon eriantherus var. whitedii	Fuzzy-tongue penstemon	T	BS, FS	West-facing slopes of small canyons, ridgetops, dry, rocky places in the Cascade foothills; 500-4000 ft elev	May-June	Scrophulariaceae
Rotala ramosior	Lowland toothcup	S	BS, FS	Damp areas in fine sand and silt, wet swampy mudflats, lake and pond margins and along free-flowing river reaches; 200-2260 ft	June-Aug	Lythraceae
Salix pseudomonticola	False mountain willow	S	BS, FS	Wet meadows, streambanks, lake edges, hummocks in fens, and floodplains; 2950-5500 ft	May-Sept	Salicaceae
Schizachyrium scoparium var. scoparium	Little bluestem	T	BS	Open places, in sand, silt, cobble and gravel, above and below highwater line; in high qual riparian habitat; 610-1320 ft	July-Sept	Poaceae

Scientific Name	Common Name	State Status	Federal Status	Habitat Description	Flowering Period	Plant Family
Sidalcea oregana var. calva	Wenatchee checkermallow	E	E	Moist meadows with surface water or saturated soil into early summer; in somewhat open coniferous stands with Doug fir, ponderosa pine; 1900-3200 ft	June-July	Malvaceae
Silene scouleri ssp. scouleri	Scouler's catchfly	S	BS, FS	Valley and foothill grassland; prairies and open timberland; low to moderate elev;	June-early Sept	Caryophyllaceae
Silene seelyi	Seely's catchfly	S	BS, FS	Shaded crevices in ultramafic, granitic, or basaltic cliffs and rock outcrops, and occ. Among boulders in talus; 1120-6300 ft	May-Aug	Caryophyllaceae
Spiranthes diluvialis	Ute ladies-tresses	E	T	Low elev wetland complexes and moist meadows; Assoc. spp. Ponderosa pine, sagebrush, bitterbrush, willows, and sedges; 720-1830 ft	mid July-Aug	Orchidaceae
Spiranthes porrifolia	Western ladies-tresses	S	BS, FS	Wet meadows, bogs, streams and seepage slopes; 10-6800 ft; sedges, white brodiaea and seep monkeyflower.	Jul-Sept	Orchidaceae
Sporobolus compositus var. compositus	Composite dropseed	S	BS	Riverbanks and lake sides	Aug-Sept	Poaceae
Trifolium thompsonii	Thompson's clover	T	BS, FS	Lower mountain slopes and ridges in grasslands dominated by bunchgrasses and herbs; 1140-3760 ft	May-July	Fabaceae

State Status of plant species is determined by the Washington Natural Heritage Program. Factors considered include abundance, occurrence patterns, vulnerability, threats, existing protection, and taxonomic distinctness. Values include:

E = Endangered. In danger of becoming extinct or extirpated from Washington.
S = Sensitive. Vulnerable or declining and could become Endangered or Threatened in the state.
T = Threatened. Likely to become Endangered in Washington.
X = Likely extirpated from Washington State.

Federal Status under the US Endangered Species Act (ESA):

LE = Listed Endangered. In danger of extinction.
LT = Listed Threatened. Likely to become endangered.
C = Candidate species. Sufficient information exists to support listing as Endangered or Threatened.
BS = Bureau of Land Management Agency Sensitive species.
FS = US Forest Service Agency Sensitive species.

Appendix B. Comprehensive Plant Species List

Scientific name	Common Name	Wetland Status	Native/ Introduced	Plant Form
Abies grandis	grand fir	FACU	N	TR
Acer circinatum	vine maple	FAC	N	SH
Acer macrophyllum	bigleaf maple	FACU	N	TR
Achillea millefolium	common yarrow	FACU	N	FB
Achnatherum nelsonii ssp. dorei	Dore's needlegrass	FACU	N	GR
Actaea rubra	red baneberry	FAC	N	FB
Adenocaulon bicolor	American trailplant	NI	N	FB
Agoseris retorsa	spearleaf agoseris	NI	N	FB
Agrostis gigantea	redtop, black bent	FACW	N	GR
Agrostis scabra	rough bentgrass	FAC	N	GR
Agrostis stolonifera	creeping bentgrass	FACW	I	GR
Aira caryophyllea	common silver-hair grass	FACU	I	GR
Alnus incana tenuifolia	mountain (thinleaf) alder	FACW	N	TR
Alnus rhombifolia	white alder	FACW	N	TR
Alnus viridis ssp. sinuata	Sitka alder	FACW	N	TR/SH
Alopecurus pratensis	meadow foxtail	FAC	I	GR
Ambrossia chammisonis	silver bur ragweed	FAC	N	FB
Amelanchier alnifolia	Saskatoon serviceberry	FACU	N	SH
Amsinckia menziesii	Menzies' fiddleneck	FACU	N	FB
Anaphalis margaritacea	western pearlyeverlasting	FACU	N	FB
Angelica arguta	Lyall's angelica	FACW	N	FB
Antennaria anaphaloides	pearly pussytoes, tall pussytoes	NI	N	FB
Antennaria microphylla	littleleaf pussytoes	NI	N	FB
Aquilegia formosa	western columbine	FAC	N	FB
Arctostaphylos uva-ursi	bearberry/kinnikinnick	FACU	N	SH
Arnica cordifolia	heartleaf arnica	NI	N	FB
Arnica lanceolata	lanceleaf arnica	FACW	N	FB
Artemisia ludoviciana	western mugwort	FACU	N, I	FB
Asarum caudatum	British Columbia wild ginger	FAC	N	FB
Athyrium filix-femina	common ladyfern	FAC	N	FE
Atriplex patula	spear saltbush	FACW	N	FB
Balsamorhiza sagittata	arrowleaf balsamroot	NI	N	FB
Berula erecta	cutleaf water parsnip	OBL	N	FB
Bromus arvensis	field brome	FACU	I	GR
Bromus briziformis	rattlesnake brome	UPL	I	GR
Bromus carinatus	California brome	NI	N	GR
Bromus inermis	smooth brome	FACU	N, I	GR
Bromus tectorum	cheat grass	UPL	I	GR
Calamagrostis canadensis	bluejoint reedgrass	FACW	N	GR
Calamagrostis rubescens	pinegrass	NI	N	GR

Scientific name	Common Name	Wetland Status	Native/ Introduced	Plant Form
Calamagrostis stricta	slimstem reedgrass	FACW	N	GR
Calochortus lyalli	Lyall's mariposa lily	NI	N	FB
Carex aquatilis	water sedge	OBL	N	GR
Carex bebbii	Bebb's sedge	OBL	N	GR
Carex bolanderi	Bolander's sedge	FAC	N	GR
Carex deweyana	Dewey sedge	FAC	N	GR
Carex geyeri	Geyer's sedge	NI	N	GR
Carex laeviculmis	smoothstem sedge	FACW	N	GR
Carex lenticularis	lakeshore sedge	FACW	N	GR
Carex pachystachya	chamisso sedge	FAC	N	GR
Carex praegracilis	clustered field sedge	FACW	N	GR
Carex utriculata	Northwest Territory sedge	OBL	N	GR
Carex vesicaria	blister sedge	OBL	N	GR
Castilleja hispidula	harsh Indian paintbrush	NI	N	FB
Centaurea diffusa^{w}	diffuse knapweed^{w}	UPL	I	FB
Centaurea stoebe^{w}	spotted knapweed^{w}	UPL	I	FB
Cephalanthera austiniae	phantom orchid	NI	N	FB
Cerastium arvense	field chickweed	FACU	N, I	FB
Cerastium nutans	nodding chickweed	FACU	N	FB
Chamaerion angustifolium ssp. circumvagum	fireweed	FACU	N	FB
Chimaphila umbellata	pipsissewa	NI	N	SH
Cicuta douglasii	western water-hemlock	OBL	N	FB
Cinna latifolia	drooping woodreed	FACW	N	GR
Circaea alpina	small enchanter's nightshade	FAC	N	FB
Cirsium arvense^{w}	Canada thistle^{w}	FACU	I	FB
Cirsium edule	edible thistle	FAC	N	FB
Claytonia parviflora	streambank springbeauty	FACU	N	FB
Claytonia sibirica var. sibirica	Siberian springbeauty	FAC	N	FB
Clematis columbiana	rock clematis	NI	N	VI
Clematis ligusticifolia	western white clematis	FAC	N	VI
Clintonia uniflora	bride's bonnet	NI	N	FB
Collomia grandiflora	grand collomia	NI	N	FB
Conyza canadensis	Canadian horseweed	FACU	N	FB
Corallorhiza striata	hooded coralroot	FACU	N	FB
Cornus canadensis	bunchberry dogwood	FAC	N	SH
Cornus sericea ssp. stolonifera	redosier dogwood	FACW	N	SH
Crataegus douglasii	Douglas' hawthorn	FAC	N	TR/SH
Crataegus suksdorfii	Suksdorf's hawthorn	FAC	N	TR/SH
Crepis atribarba	slender hawksbeard	NI	N	FB
Cytisus scoparius^{w}	Scotchbroom^{w}	NI	I	SH

Scientific name	Common Name	Wetland Status	Native/ Introduced	Plant Form
Dactylis glomerata	orchardgrass	FACU	I	GR
Descurainia longepedicellata	western tansymustard	UPL	N	FB
Dianthus barbatus	sweet william	NI	I	FB
Dicentra formosa	bleeding-heart	FACU	N	FB
Dodecatheon dentatum	white shooting star	FACW	N	FB
Eleocharis palustris	common spikerush	OBL	N	GR
Eleocharis palustris	common spikerush	OBL	N	GR
Elymus lanceolatus	thickspike wheatgrass	UPL	N	GR
Elymus repens	quackgrass	FAC	I	GR
Epilobium ciliatum ssp. watsonii	fringed willowherb	FACW	N	FB
Epilobium lactiflorum	milk-flower willowherb	FACW	N	FB
Equisetum arvense	field horsetail	FAC	N	FB
Equisetum fluviatile	water horsetail	OBL	N	FB
Equisetum hyemale	scouringrush horsetail	FACW	N	FB
Equisetum laevigatum	smooth horsetail	FACW	N	FB
Erigeron linearis	desert yellow fleabane	FACU	N	FB
Erigeron peregrinus	subalpine fleabane	FACU	N	FB
Erigeron speciosus	showy fleabane	FACU	N	FB
Euthamia occidentalis	western goldentop	FACW	N	FB
Festuca idahoensis	Idaho fescue, blue bunchgrass	FACU	N	GR
Festuca rubra	red fescue	FAC	N, I	GR
Fragaria virginiana	Virginia strawberry	FACU	N	FB
Galium aparine	stickywilly	FACU	N	FB
Galium trifidum	threepetal bedstraw	FACW	N	FB
Glyceria grandis	American mannagrass	OBL	N	FB
Glyceria striata	fowl mannagrass	OBL	N	GR
Goodyera oblongifolia	western rattlesnake plantain	FACU	N	FB
Gymnocarpium disjunctum	Pacific oakfern	FAC	N	FE
Heracleum maximum	common cowparsnip	FAC	N	FB
Hieracium albiflorum	white hawkweed	NI	N	FB
Hieracium scouleri	Scouler's woollyweed	NI	N	FB
Holodiscus discolor	oceanspray	FACU	N	SH
Hordeum brachycantherum	meadow barley	FACW	N	GR
Hypericum perforatum^{wc}	common St. Johnswort^{wc}	FACU	I	FB
Ipomopsis aggregata	scarlet gilia	NI	N	FB
Juncus arcticus ssp. littoralis	mountain rush	FACW	N	GR
Juncus bufonis	toad rush	FACW	N	GR
Juncus covillei	Coville's rush	FACW	N	GR
Juncus effusus	common rush	FACW	N	GR
Juncus ensifolius	iris-leaf rush	FACW	N	GR

Scientific name	Common Name	Wetland Status	Native/ Introduced	Plant Form
Juncus filiformis	thread rush	FACW	N	GR
Juncus nodosus	knotted rush	OBL	N	GR
Juncus regelii	Regel rush, Regel's rush	FACW	N	GR
Juncus tenuis	poverty rush	FACW	N	GR
Juncus torreyi	Torrey's rush	FACW	N	GR
Koeleria macrantha	prairie Junegrass	NI	N	GR
Lactuca serriola	prickly lettuce	FACU	I	FB
Lapsana communis	common nipplewort	FACU	I	FB
Lathyrus bijugatus	drypark pea	NI	N	FB
Leucanthemum vulgare[w‹]	oxeye daisy[w‹]	FACU	I	FB
Lilium columbianum	Columbian lily	NI	N	FB
Limosella aquatica	water mudwort	OBL	N	FB
Linaria dalmatica ssp. dalmatica[w‹]	Dalmatian toadflax[w‹]	UPL	I	FB
Linnaea borealis	twinflower	FACU	N	SH
Lonicera ciliosa	orange honeysuckle	UPL	N	SH/VI
Lonicera involucrata	twinberry honeysuckle	FAC	N	SH
Lotus micranthus	desert deervetch	NI	N	FB
Lupinus sp.	lupine	NI	N, I	FB
Lycopus uniflorus	northern bugleweed	OBL	N	FB
Lysichiton americanus	American skunkcabbage	OBL	N	FB
Madia gracilis	grassy tarweed, slender tarweed	FACU	N	FB
Mahonia aquifolium	Hollyleaved barberry	FACU	N	SH
Mahonia nervosa	Cascade barberry	FACU	N	SH
Maianthemum dilatatum	false lily of the valley	FAC	N	FB
Maianthemum racemosum	starry false lily of the valley	FAC	N	FB
Maianthemum stellatum	star-flowered Solomon's seal	FACU	N	FB
Matricaria discoidea	disc mayweed	FACU	I	FB
Medicago lupulina	black medic	FACU	I	FB
Melilotus albus	white sweet clover	FACU	I	FB
Mentha arvensis	Canadian mint	FACW	I	FB
Mertensia platyphylla	broadleaf bluebells	NI	N	FB
Milmulus moschatus	muskflower	FACW	N	FB
Mimitanthe pilosa	false monkeyflower	FACW	N	FB
Mimulus guttatus	seep monkeyflower	OBL	N	FB
Mimulus lewisii	purple monkeyflower	FACW	N	FB
Mimulus moschatus	musk-flower, sticky monkey-flower	FACW	N	FB
Mycelis muralis	wall-lettuce	FACU	I	FB
Nasturtium officinale	watercress	OBL	I	FB
Onopordum acanthium[w‹]	Scotch thistle[w‹]	NI	I	FB
Oenathera villosa	hairy evening primrose	FAC	N	FB

Scientific name	Common Name	Wetland Status	Native/ Introduced	Plant Form
Osmorhiza berteroi	sweetcicely	FACU	N	FB
Panicum capillare	witchgrass	FACU	N	GR
Paxistima myrsinites	Oregon boxwood	FACU	N	SH
Penstemon attenuatus	sulphur penstemon	FACU	N	FB
Penstemon fruiticosus	bush penstemon	NI	N	FB
Phacelia hastata	silverleaf phacelia	UPL	N	FB
Phacelia leptosepala	narrowsepal phacelia	NI	N	FB
Phalaris arundinacea[w]	reed canarygrass[w]	FACW	I	GR
Philadelphus lewisii	Lewis' mockorange	UPL	N	SH
Pinus ponderosa	ponderosa pine	FACU	N	TR
Plantago lancoelata	narrowleaf plantain	FACU	I	FB
Plantago major	common plantain	FAC	I	FB
Poa bulbosa	bulbous bluegrass	FACU	I	GR
Poa compressa	Canada bluegrass	FACU	I	GR
Poa pratensis	Kentucky bluegrass	FAC	I	GR
Poa sp.	bluegrass	NI	N, I	GR
Polygonum amphibium v. emersum	longroot smartweed	OBL	N	FB
Polygonum aviculare	prostrate knotweed	FAC	N, I	FB
Polygonum douglasii	Douglas' knotweed	FACU	N	FB
Polystichum munitum	swordfern	FACU	N	FB
Populus balsamifera ssp. trichocarpa	black cottonwood	FACW	N	TR
Populus tremuloides	quaking aspen	FAC	N	TR
Prosartes hookeri	Hooker fairy-bell, Hooker's fairy bells	NI	N	FB
Prunella vulgaris	common selfheal	FACU	N	FB
Prunus emarginata	bitter cherry, Oregon cherry	FACU	N	TR/SH
Pseudognaphalium canescens	Wright's cudweed	FACU	N	FB
Pseudotsuga menziesii	Douglas-fir	FACU	N	TR
Pteridium aquilinum	western brackenfern	FACU	N	FE
Pterospora andromedea	woodland pinedrops	NI	N	FB
Pyrola picta	whiteveined wintergreen	NI	N	SH
Ranunculus acris	tall buttercup	FACW	N, I	FB
Ranunculus flammula	greater creeping spearwort	OBL	N	FB
Ranunculus macounii	Macoun's buttercup	OBL	N	FB
Ribes lacustre	prickly currant	FACW	N	SH
Rosa gymnocarpa	dwarf rose	FACU	N	SH
Rosa nutkana	Nootka rose	FAC	N	SH
Rosa woodsii	Woods' rose	FACU	N	SH
Rubus parviflorus v. parviflorus	western thimbleberry	FAC	N	SH
Rubus ursinus	dewberry	FACU	N	SH

Scientific name	Common Name	Wetland Status	Native/ Introduced	Plant Form
Rumex acetosella	common sheep sorrel	FACU	I	FB
Rumex crispus	curly dock	FAC	I	FB
Rumex occidentalis	western dock	FACW	N	FB
Salix exigua	narrowleaf willow	FACW	N	TR/SH
Salix lasiolepis	arroyo willow	FACW	N	TR/SH
Salix lucida ssp. lasiandra	Pacific willow	FACW	N	TR/SH
Salix prolixa	MacKenzie's willow	OBL	N	TR/SH
Salix scouleriana	Scouler's willow	FAC	N	TR/SH
Sambucus nigra ssp. cerulea	blue elderberry	FACU	N	SH
Saponaria officinalis	bouncing bet	FACU	I	FB
Schedonorus pratensis	meadow fescue	FACU	I	GR
Schoenoplectus subterminalis	swaying bulrush	OBL	N	GR
Scirpus microcarpus	panicled bulrush, red-tinge bulrush	OBL	N	GR
Scuttelaria galericulata	marsh skullcap	OBL	N	FB
Silene latifolia[w]	white campion, bladder campion[w]	UPL	I	FB
Solidago canadensis	Canada goldenrod	FACU	N	FB
Solidago gigantea	late goldenrod	FACW	N	FB
Sorbus sitchensis	western mountain ash	FAC	N	SH
Sparganium emersum	European bur-reed	OBL	N	FB
Spergularia rubra	red sandspurry	FAC	I	FB
Spiraea betulifolia	white spirea	FAC	N	SH
Spiraea douglasii	rose spirea	FACW	N	SH
Stachys chamissonis var. cooleyae	Coastal hedgenettle	FACW	N	FB
Stellaria calycantha	northern starwort	FACW	N	FB
Streptopus amplexifolius	claspleaf twistedstalk	FAC	N	FB
Symphoricarpos albus	common snowberry	FACU	N	SH
Symphoricarpos oreophilus	mountain snowberry	NI	N	SH
Symphyotrichum eatonii	Eaton's aster	FAC	N	FB
Symphyotrichum laeve	smooth blue aster	FACU	N	FB
Symphyotrichum spathulatum	western mountain aster	FAC	N	FB
Tanacetum vulgare[w]	common tansy, tansy[w]	FACU	I	FB
Thalictrum occidentale	western meadowrue	FACU	N	FB
Thinopyrum intermedium	intermediate wheatgrass	NI	I	GR
Thuja plicata	western redcedar	FAC	N	TR
Tiarella trifoliata v. unifoliata	oneleaf foamflower	FAC	N	FB
Tragopogon dubius	western salsify	UPL	I	FB
Tragopogon pratensis	meadow salsify	NI	I	FB
Trautvetteria carolinensis	Carolina bugbane	FACW	N	FB
Trientalis borealis ssp. latifolia	broadleaf starflower	FAC	N	FB

Scientific name	Common Name	Wetland Status	Native/ Introduced	Plant Form
Trifolium hybridum	alsike clover	FAC	I	FB
Trifolium pratense	red clover	FACU	I	FB
Trifolium wormskioldii	cows clover, coast clover	FACW	N	FB
Trillium ovatum	Pacific trillium	FACU	N	FB
Typha latifolia	broadleaf cattail	OBL	N	FB
Urtica dioica	stinging nettle	FAC	N	FB
Vaccaria hispanica	cow soapwort	FACU	I	FB
Verbascum thapsus	common mullein	FACU	I	FB
Verbena bracteata	bigbract verbena	FAC	N	FB
Veronica americana	American speedwell	OBL	N	FB
Vicia americana	American vetch	FAC	N	FB
Vicia sativa	garden vetch	FACU	I	FB
Viola glabella	pioneer violet	FACW	N	FB

ʷ = Washington State Noxious Weed species

ᶜ = Chelan County Noxious Weed designated for control

Wetland Status: US Army Corps of Engineers (USACE) status for Arid West Region

OBL = Obligate (always occurs in wetlands)
FAC = Facultative (equally likely in wetlands or non-wetlands)
FACW = Facultative Wetland (usually occurs in wetlands)
FACU = Facultative Upland (usually occurs in non-wetlands)
UPL = Upland Obligate (always occurs in non-wetlands)
NI = No indicator (no wetland indicator for this plant species)

Plant Form = Plant Type based on type classification by USDA NRCS Plants Database (2020).

TR = Tree
TR/SH = Tree/Shrub
SH = Shrub
FB = Forb (Herb)
FE = Fern
GR = Gramminoid (Grasses, Sedges, Rushes)

Appendix C. Incidental Wildlife Observations

Beaver Use:
Fresh beaver sign and a lodge were observed throughout the southern third of the Project Area, with the beaver lodge located between two of the large log structures. Older beaver sign was observed on willows and tree saplings along Nason Creek intermittently throughout the remaining portion of the Project Area.

Photo 1 – Beaver chewed tree in southern project area.

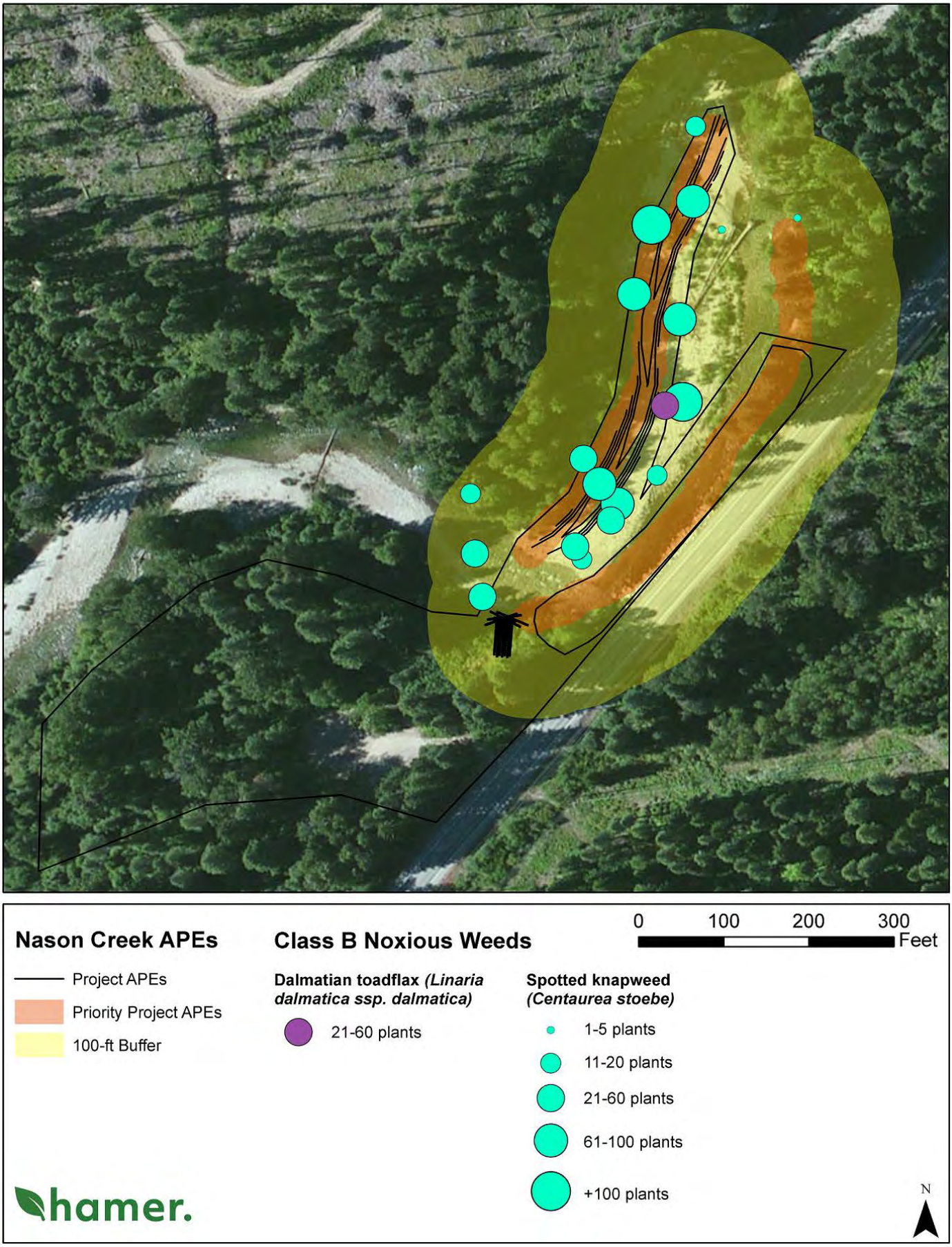
Elk:
Sign of elk was observed, both with scat and a deciduous tree stripped of bark with large tooth marks and vertical stripping.

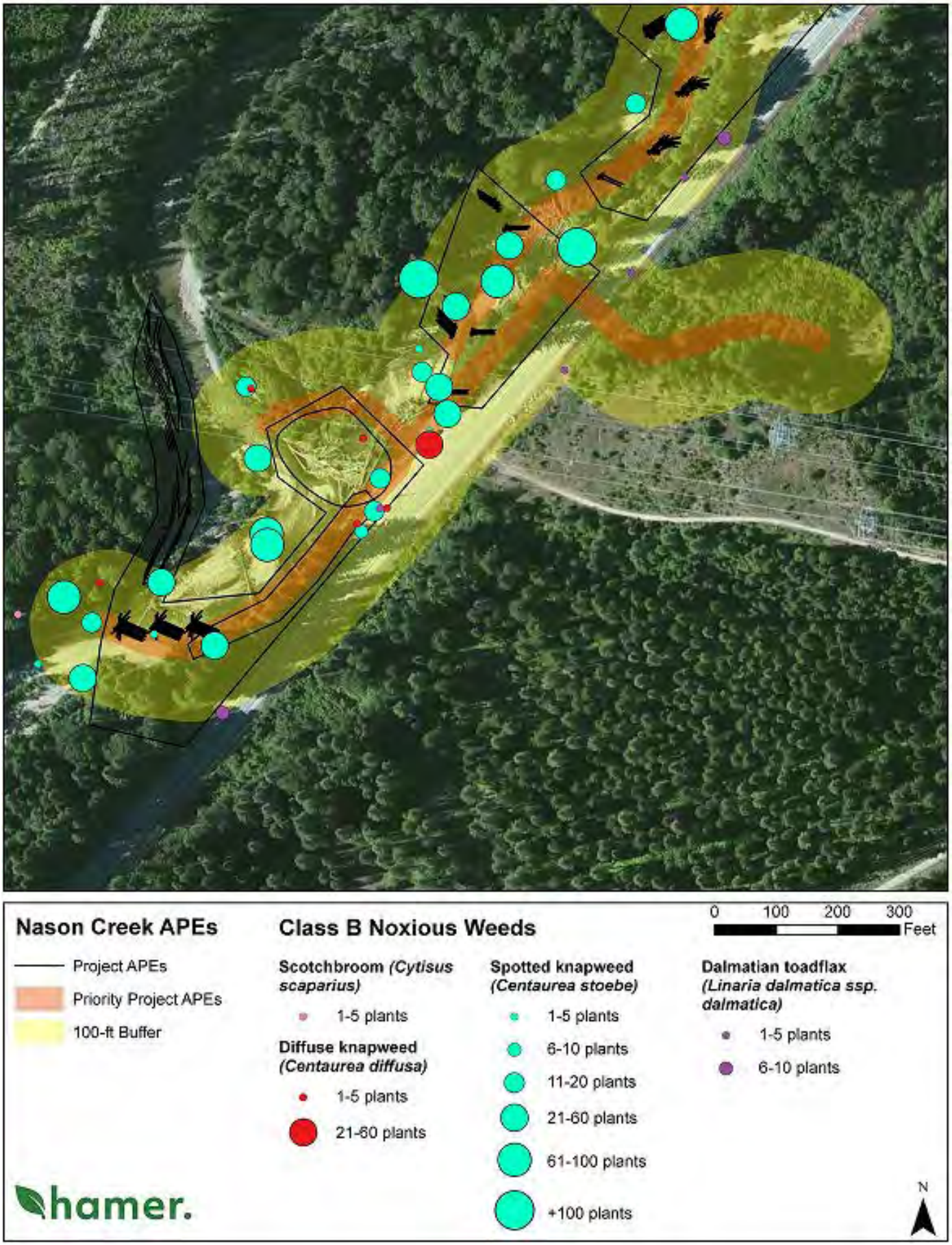
Photo 2 – Alder tree with bark stripped by elk.

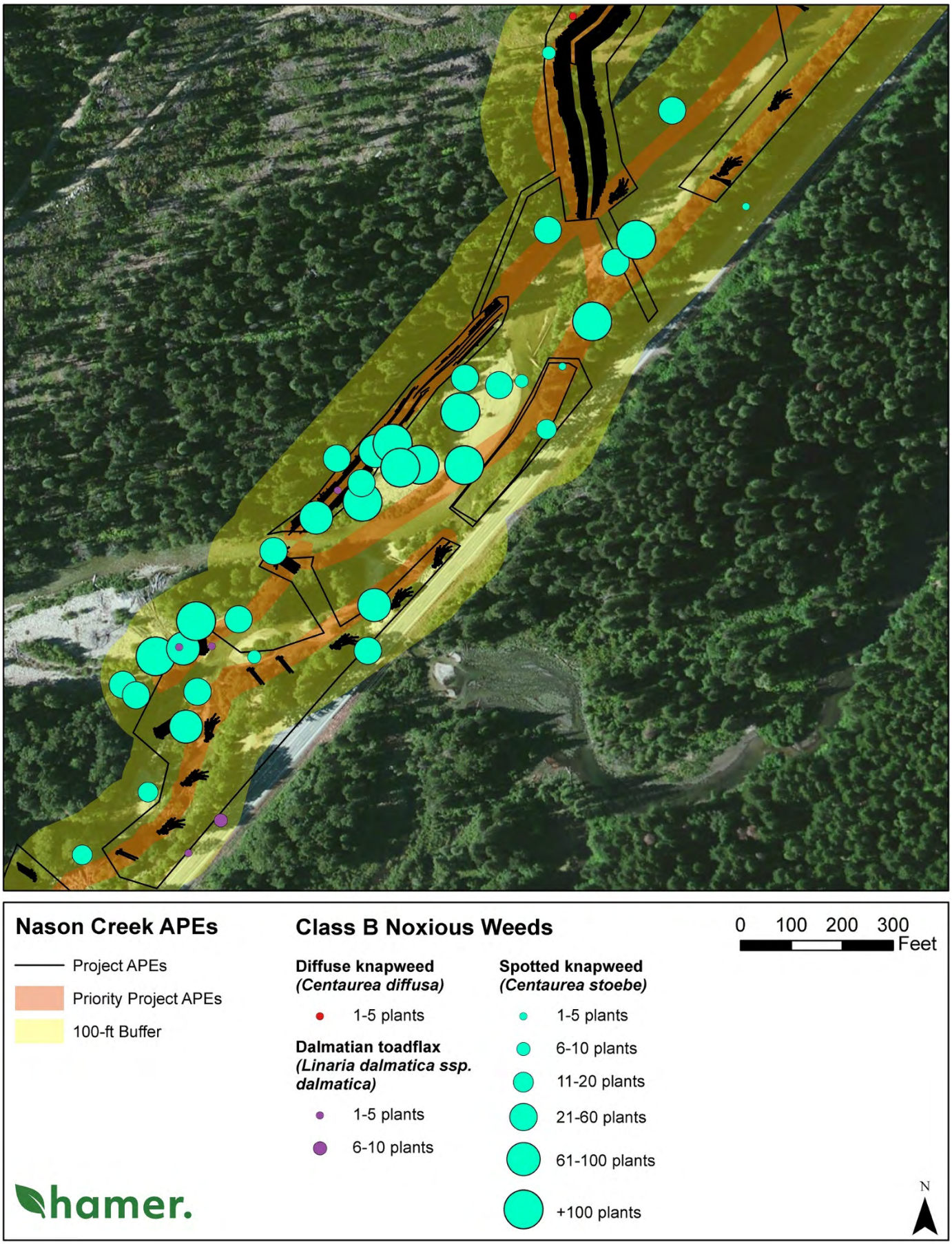
Amphibians:
Cascades frog (*Rana cascadae*) were observed multiple times along the shoreline.

Photo 3 – Cascades frog in Nason Creek.

Appendix D. Nason Creek Noxious Weeds


Nason Creek APEs
Project APEs
Priority Project APEs
100-ft Buffer
Class B Noxious Weeds
Dalmatian toadflax (Linaria dalmatica ssp. dalmatica)
21-60 plants
Spotted knapweed (Centaurea stoebe)
1-5 plants
11-20 plants
21-60 plants
61-100 plants
+100 plants
0 100 200 300 Feet
hamer.
N


Nason Creek APEs
Project APEs
Priority Project APEs
100-ft Buffer
Class B Noxious Weeds
Scotchbroom (Cytisus scaparius)
1-5 plants
Diffuse knapweed (Centaurea diffusa)
1-5 plants
21-60 plants
Spotted knapweed (Centaurea stoebe)
1-5 plants
6-10 plants
11-20 plants
21-60 plants
61-100 plants
+100 plants
Dalmatian toadflax (Linaria dalmatica ssp. dalmatica)
1-5 plants
6-10 plants
0 100 200 300
Feet
hamer.
N


Nason Creek APEs
Project APEs
Priority Project APEs
100-ft Buffer
Class B Noxious Weeds
Diffuse knapweed
(Centaurea diffusa)
1-5 plants
Dalmatian toadflax
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1-5 plants
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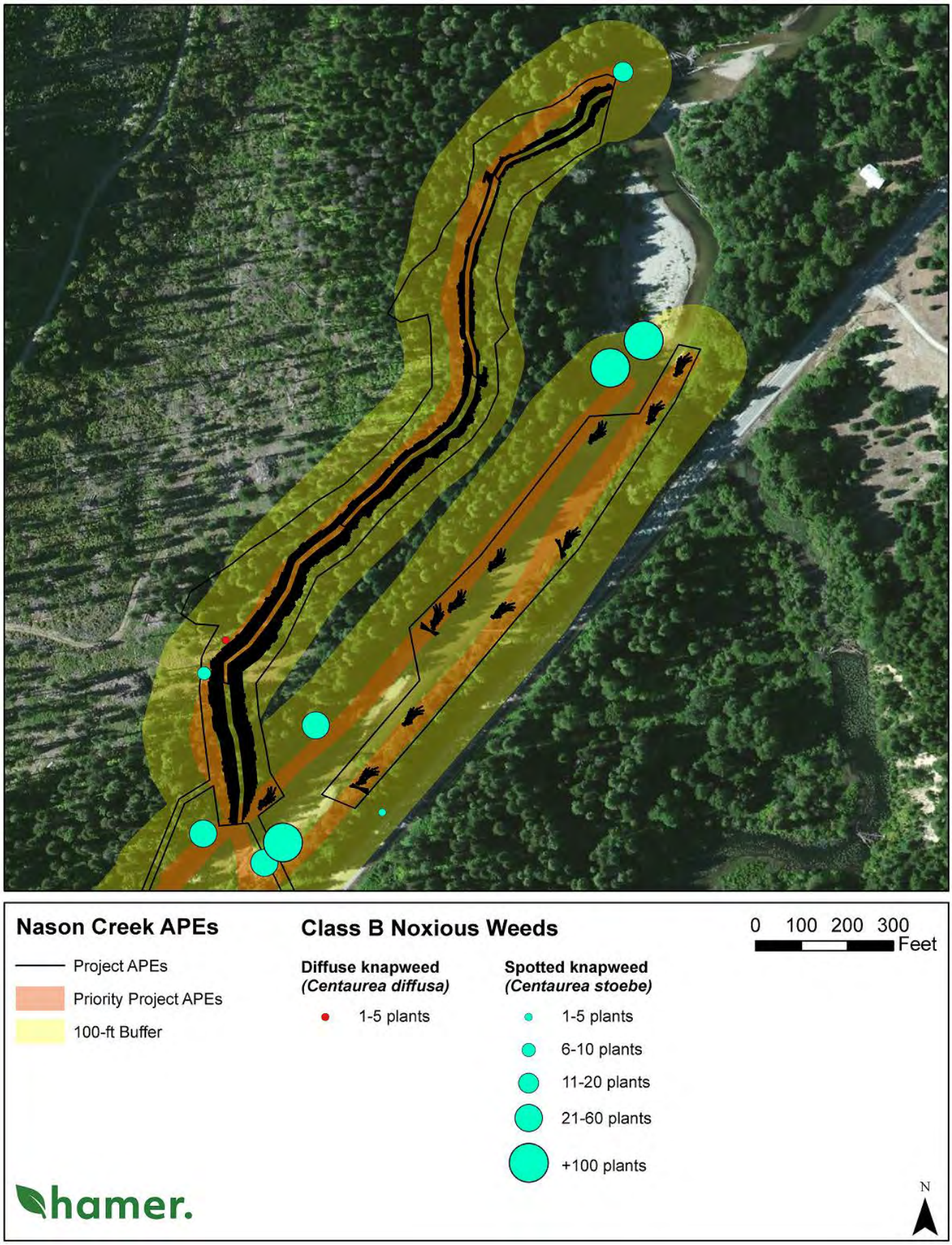
(Centaurea stoebe)
1-5 plants
6-10 plants
11-20 plants
21-60 plants
61-100 plants
+100 plants
0 100 200 300
Feet
N
hamer.


Nason Creek APEs
Project APEs
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1-5 plants
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Feet
hamer.
N