

**FINAL LICENSE APPLICATION
EXHIBIT E**

APPENDIX S

INVASIVE PLANTS MANAGEMENT PLAN

**INVASIVE PLANTS MANAGEMENT PLAN
DRAFT**

**SKAGIT RIVER HYDROELECTRIC PROJECT
FERC NO. 553**

Seattle City Light

April 2023

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List of Acronyms and Abbreviations

BC	biological control
BMP	Best Management Practices
CC	chemical control
City Light.....	Seattle City Light
EDRR.....	early detection and rapid response
ESA	Endangered Species Act
FERC.....	Federal Energy Regulatory Commission
GIS	Geographic Information System
IVM.....	integrated vegetation management
IWM.....	integrated weed management
MM	manual and mechanical
NPS	National Park Service
O&M.....	Operations and Maintenance
PC.....	preventative control
Project	Skagit River Hydroelectric Project
SOP	Standard Operating Procedure
SRCC	Skagit Resource Coordinating Committee
USDA.....	U.S. Department of Agriculture
USFWS	U. S. Fish and Wildlife Service
USFS	U.S. Forest Service
WDNR	Wisconsin Department of Natural Resources
WSNWCB.....	Washington State Noxious Weed Control Board

1.0 INTRODUCTION

This document describes Seattle City Light’s (City Light) proposed Invasive Plants Management Plan (Invasive Plants Plan) for the Skagit River Hydroelectric Project (Project or Skagit River Project), Federal Energy Regulatory Commission (FERC) No. 553. This Invasive Plants Plan will provide guidance for the management of invasive terrestrial plant species within the Project Boundary. The goal of this Invasive Plants Plan is to minimize and prevent, to the extent possible, the establishment and spread of invasive non-native plant species and to enhance native plant communities. It is intended to be implemented in conjunction with City Light’s comprehensive Draft Terrestrial Invasive Plant Species Prevention Best Management Practices that addresses operations in its service territory and generation and transmission systems, as applicable and amended (City Light 2020). Information obtained through the implementation of the plan will be used to inform decision-making regarding invasive plants in an adaptive management context.

City Light will coordinate the efforts required under this Invasive Plants Plan with other license obligations, including other Project resource management plans included in the new license.

2.0 PURPOSE AND SCOPE OF THE PLAN

This Invasive Plants Plan is being proposed by City Light to provide best management practices (BMP) and resource management goals that guide City Light's actions related to minimizing the spread of terrestrial invasive plants within the Project Boundary under the new license. This plan will be effective for the term of the new license and is subject to periodic five (5) year review and updates in consultation with the Skagit Resource Coordinating Committee (SRCC).¹

2.1 Goals and Objectives

The goal of this Invasive Plants Plan is to identify, control, contain, eradicate, minimize, and prevent, to the extent possible, the establishment and spread of invasive plant species or diseases on, near, or downstream of the Project Boundary. These goals support City Light's corresponding management plans which aim to enhance native habitat for terrestrial wildlife.²

The implementation actions included in this plan are designed to meet the stated goals and are designed to:

- Apply integrated weed management (IWM) methods and strategies to reduce or eradicate existing or new populations of invasive plants;
- Establish, restore, preserve, propagate, and enhance native plant communities to prevent and reduce the risk of future invasive plant infestation; and
- Implement adaptive management to accomplish goals through the life of the license.

2.2 Geographic Area

The geographic scope includes Project facilities, lands, and shorelines within the Project Boundary, including City Light's fish and wildlife mitigation lands, and geographic locations adjacent to the Project Boundary where there is a clear pathway and vector for invasive species origin from within the Project Boundary.

¹ The Skagit Resource Coordinating Committee includes agency representatives that will collaborate regarding implementation and monitoring of this Invasive Plants Plan and contribute to adaptive management decisions.

² City Light's management plans with goals to enhance wildlife habitat include Avian Species Protection Plan (City Light 2023a), Wildlife Protection and Enhancement Plan (City Light 2023b), and Fish and Wildlife Mitigation Lands Plan (City Light 2023c).

3.0 PLAN IMPLEMENTATION

Upon approval by FERC, the Invasive Plants Plan will be implemented in consultation with the SRCC. City Light will use the following elements to minimize the spread of invasive plants within the Project Boundary:

- **Prevention:** City Light will aim to prevent the introduction and spread of invasive plant species within the Project Boundary using BMPs and early detection and rapid response (EDRR).
- **EDRR:** City Light will use EDRR for identifying and treating new populations of invasive plants to prevent their spread. This will incorporate invasive plant identification, mapping, reporting, assessing, managing, and monitoring of new invasive species or a new location of a known invasive species.
- **Effective Control:** City Light will employ IWM and other strategies to control invasive plant species within the Project Boundary through eradication, containment, and/or reduction of invasive plant population densities and abundance. In addition, City light will follow IWM guidelines to help determine management prescriptions, such as when to direct seed, install plants, mulch, or apply other methods.
- **Monitoring and Data Management:** City Light will monitor treatment efficacy and use results of monitoring to inform and adapt management.
- **Outreach and Education:** City Light will educate and inform City Light employees and contractors about best practices for preventing introduction and spread of invasive plants.
- **Coordination:** City Light will communicate regularly with the SRCC and collaborate on invasive vegetation management, control, and monitoring efforts.

3.1 Integrated Weed Management

IWM refers to managing invasive plant species using multiple control tactics. By integrating several approaches into a weed management plan, the control of invasive species can be optimized based on the timing and capabilities of each method employed. Strategizing the use of multiple methods over a period of time can ensure that different biological considerations of targeted species are addressed to eradicate invasive populations. The four general categories of IWM, and specific techniques used to manage invasive species, are summarized below.

- **Preventative Control (PC):** PC implements education and outreach to change human behavior that increases the prevalence of invasive species within a specific community. This method facilitates the accurate identification of invasive plant populations, emphasizes BMPs such as cleaning equipment and clothing to stop the spread of invasive species seeds or rhizomatous plant material, and the close monitoring of specific areas to detect early infestations. Cultural practices often use the manipulation of a plant community and structure to control invasive species and give native plants a competitive advantage over weeds. Creating canopy openings to increase sun exposure in an area infested with a shade-loving invasive species and replanting with sun-tolerant native species is an example of cultural control.

- **Manual and Mechanical (MM) Control:** MM control methods focus on physical practices that disrupt plant life cycles. MM control methods can be as simple as hand-pulling targeted invasive species or as complex as using agricultural equipment to reduce seedbank prevalence. This method works best for small, newly introduced populations in areas where chemicals cannot be utilized. MM control efforts must be persistent and continue throughout the growing season to be successful.
- **Biological Control (BC):** BC refers to the use of disease, fungi, insects, or animals to control invasive populations. This method generally takes several years to show results depending on the specific biological tool used. For example, grazing animals need to be used for multiple, consecutive years, generally during early growth periods, to eliminate a population. Another example of a species utilized for this method is the *Galerucella* beetle used to control purple loosestrife (WDNR 2023). This is the least researched control method and is generally broken up into two categories—classical and inundative biocontrol.
 - **Classical Biocontrol:** This method uses natural predators of the invasive plant to establish a long-term balance between the biocontrol organism and the plant. Because the biocontrol organism population declines as the invasive plant population is reduced, full eradication cannot occur with this method.
 - **Inundative Biocontrol:** Pathogens such as nematodes are applied to the target weed population at high rates, similar to an herbicide application. The intent is to use large quantities of the biocontrol to attack the invasive population and eliminate it at once. This method does not address residual seed bank or re-establishment issues (Government of British Columbia 2023).
- **Chemical Control (CC):** CC utilizes herbicides, either synthetic or naturally derived. They can be applied either in a broad application such as spraying large populations, or specifically to individuals using a method such as stem injection or spot-treatment. Use of this method is limited in riparian areas or areas with coarse soils where herbicides may enter the watershed. Selection of the appropriate herbicide is important for this method to be effective. When selecting the appropriate herbicide, the weather (e.g., rain, temperature, wind), which species the herbicide targets (general or selective), and if the herbicide relies on soil or foliar activity to be effective must be considered (USDA 2023).

3.1.1 Target Species

Target species describes invasive plants that will be targeted for treatment by City Light. Priorities for treatment of IWM target species on U.S. Forest Service (USFS) land will be determined by the USFS and priorities on land managed by the National Park Service (NPS) will be determined by the NPS. Priorities for treatment of IWM target species on non-federal lands will be determined through collaboration with the SRCC and based on proximity to sensitive plant species or habitats. City Light may additionally apply protocols from *Prioritizing Weeds: the Alien Ranking System* (Hiebert 2001) or similar system to refine the target species list on non-USFS lands.

The initial target list includes plant species that fall into one of the following categories:

- All species listed as Class A or Class B weeds by the County Noxious Weed Boards of Skagit County, Whatcom County, and Snohomish County. The classifications of noxious weeds are defined as follows (Washington State Noxious Weed Control Board [WSNWCB] 2021; Revised Code of Washington 17.10.010):
 - Class A Weeds — Non-native species with a limited distribution in the state. Eradication is required by state law.
 - Class B Weeds — Non-native species established in some regions of Washington but of limited distribution or not present in other regions of the state. Because of differences in distribution, treatment of Class B weeds varies between regions of the state. In regions where a Class B weed is unrecorded or of limited distribution, prevention of seed production is required. In these areas, the weed is a “Class B designate,” meaning it is designated for control by state law. In regions where a Class B species is already abundant or widespread, control is a local option. In these areas, the weed is “Class B-selected,” with containment, gradual reduction, and prevention of further spread being the chief goals. County noxious weed control boards may also designate Class B weeds for required control.
- Species identified by the NPS as ornamental species that have escaped from historical cultivation in Newhalem, also known as “First Priority Species” (NPS 2011).
- Species identified as target species during the 2019 Study Plan Development Process (i.e., reed canarygrass [*Phalaris arundinacea*], Japanese knotweed [*Fallopia japonica*], traveler's-joy [*Clematis vitalba*], petty spurge [*Euphorbia peplus*], and sycamore maple [*Acer pseudoplatanus*]).
- Other non-native species recommended, assessed, and agreed to by City Light and/or the SRCC.

The initial target list of invasive plant species will be updated prior to monitoring surveys and will be reviewed every five (5) years or sooner if additional species are identified to occur within the Project Boundary.

3.1.2 Integrated Weed Management Methods

IWM methods that may be used independently, consecutively, or in tandem with other methods are listed below. Examples of how they may be used to control invasive plant species known to occur in the Project Boundary (Table 3.1-1).

Preventative Control Techniques:

- PC-1: Education regarding proper identification and BMPs in the form of signage, outreach, and workshops.
- PC-2: Monitoring specific areas to detect infestations early on.
- PC-3: Revegetating areas with robust native species after other treatment methods have been employed to reduce invasive reestablishment.
- PC-4: Manipulating vegetation communities and structures to create suboptimal growing conditions for invasive plant species.

Manual and Mechanical Control Techniques:

- MM-1: Hand-pulling.
- MM-2: Mowing or cutting.
- MM-3: Use of large-scale agricultural equipment.
- MM-4: Flooding using easily manipulated water levels.
- MM-5: Smothering using materials such as black plastic or mulch.
- MM-6: Prescribed burning.
- MM-7: Hand tilling.

Biological Control Techniques:

- BC-1: Livestock grazing (e.g., goats or sheep).
- BC-2: Release of specific insect predators.
- BC-3: Applications of pathogens such as bacteria or nematodes.

Chemical Control Techniques:³

- CC-2: 2,4-D – Selective, some broadleaf, woody, and aquatic plants are susceptible.
- CC-3: Chlorsulfuron – Selective, some broadleaf plants and grasses are susceptible.
- CC-4: Imazapic – Selective, some broadleaf plants and grasses are susceptible.
- CC-5: Sulfometuron methyl – General, most plants are susceptible.
- CC-6: Triclopyr – Selective, some woody and broadleaf plants are susceptible.

³ The herbicides listed only as recommendation for CC to treat specific invasive plant species; City Light will review all herbicides prior to use for compliance with City of Seattle pesticide policies.

Table 3.1-1. Potential IWM methods by invasive plant species.

Scientific Name	Common Name	IWM/Control Methods
<i>Acer platanoides</i>	Norway maple	PC-1, PC-2 MM-1, MM2 Notes: Early detection can be difficult due to this species' similarity to native maples. Girdling or cutting down mature trees and then treating with glyphosate using cut and paint or filling drilled holes can be effective (NYIS 2023).
<i>Acer pseudoplatanus</i>	Sycamore maple	PC-1, PC-2 MM-1 MM-2 Notes: Early detection can be difficult due to this species' similarity to native maples. Girdling or cutting down mature trees and then treating with glyphosate using cut and paint or filling drilled holes can be effective (NYIS 2023).
<i>Aegopodium podagraria</i>	Bishop's goutweed	PC-1, PC-2, PC-3, PC-4 MM-1, MM-2, MM-5 CC-2, CC-6 Notes: Bishop's goutweed has a rhizomatous growth strategy, so care must be used to remove all plant material when using manual control methods.
<i>Arctium lappa</i>	Greater burdock	PC-1, PC-2, PC-3, PC-4 MM-1, MM-2, MM-5, MM-7 BC-1 (specifically sheep, MSU 2023) CC-2, CC-4 Notes: Target manual removal efforts prior to second year growth, where seeds are numerous and difficult to remove from clothing and equipment (MSU 2023).
<i>Bromus tectorum</i>	Cheatgrass	PC-1, PC-2, PC-3, PC-4 MM-1, MM-2, MM-3, MM-4, MM-5, MM-6, MM-7 BC-1 CC-4 Notes: Because this grass germinates in fall, timing of management methods is important; grasses that have overwintered are less susceptible to herbicides. High intensity, low frequency grazing has also been shown to reduce seed production (Shoderbeck 2015).
<i>Buddleja davidii</i>	Butterfly bush	PC-1, PC-2 MM-1, MM-2, MM-6 BC-1 Notes: Goats can be used to damage plants but will not fully eradicate populations; follow up with manual and chemical control methods is recommended (King County 2021).
<i>Carduus pycnocephalus</i>	Italian thistle	PC-1, PC-2 MM-1, MM-2, MM-5, MM-7 BC-2, CC-5 Notes: Thistle crown weevil (<i>Trichosirocalus horridus</i>) can be an effective insect predator to reduce populations (USDA 2023).
<i>Campanula rapunculoides</i>	Creeping bellflower	PC-1, PC-2, PC-3, PC-4 MM-1, MM-2, MM-5, MM-7

Scientific Name	Common Name	IWM/Control Methods
<i>Centaurea diffusa</i>	Diffuse knapweed	PC-1, PC-2, PC-3, PC-4
<i>Centaurea gerstlaueri</i>	Meadow knapweed	MM-1, MM-2, MM-7 BC-2 CC-2, CC-6
<i>Centaurea stoebe</i>	Spotted knapweed	Notes: Root weevil (<i>Cyphocleonus achates</i>), knapweed root moth (<i>Agapeta zoegana</i>), knapweed flower weevils (<i>Larinus minutus</i> and <i>Larinus obtusus</i>), have been used as a biological control species to control knapweed infestations (USDA 2023).
<i>Cirsium arvense</i>	Canadian thistle	PC-1, PC-2
<i>Cirsium vulgare</i>	Bull thistle	MM-1, MM-2, MM-5, MM-7 BC-2 Notes: Thistle stem weevil (<i>Ceutorynchus litura</i>) and thistle stem gall fly (<i>Urophora cardui</i>) can be an effective insect predator to reduce populations (USDA 2023).
<i>Clematis vitalba</i>	Traveler's-joy	PC-1, PC-2 MM-1, MM-5 BC-1 CC-2, CC-4 Notes: Sheep will feed on seedlings and young vines at ground level (DiTomaso 2013a).
<i>Convolvulus arvensis</i>	Field bindweed	PC-1, PC-2, PC-3 MM-1, MM-7 CC-2 Notes: Roots left in the soil can regenerate in about two weeks so repetitive removal is necessary (Pokorny 2022).
<i>Conium maculatum</i>	Poison hemlock	PC-1, PC-2, PC-3 MM-1, MM-5 BC-3 CC-2, CC-5, CC-6 Notes: Care must be taken to avoid contact with skin or inhaling toxic vapors if cutting when removing this plant. Viruses that infect <i>Apiaceae</i> species can be used as a biological control (Chandran 2022).
<i>Crataegus monogyna</i>	English hawthorn	PC-1, PC-2 MM-1, MM-2 H-1, H-6
<i>Cytisus scoparius</i>	Scot's broom	PC-1, PC-2, PC-3, PC-4 MM-1, MM-2, MM-3, MM-4, MM-5, MM-6, MM-7 BC-2 CC-2, CC-4, CC-6 Notes: Scot's broom seed beetle (<i>Bruchidius villosus</i>) and scot's broom twig miner moth (<i>Leucoptera spartifoliella</i>) are potential insect biological control agents (DiTomaso 2013b).
<i>Daphne laureola</i>	Spurge-laurel	PC-1, PC-2, PC-3 MM-1, MM-2, MM-7 CC-6
<i>Echium vulgare</i>	Common viper's bugloss	PC-1, PC-2, PC-3 MM-1, MM-2, MM-5 H-1, H-2, H-3, H-6

Scientific Name	Common Name	IWM/Control Methods
<i>Euphorbia oblongata</i>	Egg-leaf spurge	PC-1, PC-2, PC-3, PC-4 MM-1, MM-2, MM-5, MM-7 BC-1, BC-2 H-1, H-2, H-4, H-5 Notes: Flea beetles (<i>Apthona nigriscutis</i> , <i>A. lacertosa</i> , <i>A. czwalinae</i> , <i>A. adominalis</i> , <i>A. cyparissiae</i> , <i>A. flava</i>) long-horned beetle (<i>Oberea erythrocephala</i>), gall midge (<i>Spurgia esulae</i>), leafy spurge hawkmoth (<i>Hyles euphorbiae</i>) are all documented as effective biological control agents (USDA 2023).
<i>Fallopia japonica</i>	Japanese knotweed	PC-1, PC-2, PC-3 MM-1, MM-2
<i>Geranium robertianum</i>	Herb-Robert	PC-1, PC-2, PC-3 MM-1, MM-2, MM-5, MM-7 CC-6
<i>Hedera helix</i>	English ivy	PC-1, PC-2 MM-1, MM-2, MM-7 CC-6
<i>Hieracium aurantiacum</i>	Hawkweed, orange	PC-1, PC-2, PC-3, PC-4 MM-1, MM-5, MM-7 CC-2
<i>Hieracium pilosella</i>	Hawkweed, mouse-eared	
<i>Hieracium piloselloides</i>	Hawkweed, tall	
<i>Hypericum perforatum</i>	St. John's-wort	PC-1, PC-2, PC-3 MM-1, MM-5, MM-7 BC-2 Notes: Klamath weed beetle (<i>Chrysolina quadrigemina</i> and <i>Chrysolina hypericin</i>) adults and larvae feed on the leaves of common St. John's-wort. St. John's-wort moth (<i>Aplocera plagiata</i>) larvae feed on the leaves. St. John's-wort root borer (<i>Agrilus hypericin</i>) larvae feed on plant roots (WNWCB 2023).
<i>Ilex aquifolium</i>	English holly	PC-1, PC-2, PC-3 MM-1, MM-2, MM-7 CC-4, CC-6 Notes: Because the exterior of leaves are waxy and thick, herbicide treatments must be injected into cuts made on trunk or painted onto cut stumps (King County 2020).
<i>Jacobaea vulgaris</i>	Tansy ragwort	PC-1, PC-2, PC-3 MM-1 and 2, MM-5, MM-7 BC-2 CC-2, CC-3, CC-4, CC-5, CC-6 Notes: The ragwort flea beetle, (<i>Longitarsus jacobaeae</i>) is a natural predator of tansy that is active in the spring (Fery 2018).
<i>Juglans nigra</i>	Black walnut	PC-1, PC-2, PC-3, PC-4 MM-1, MM-2
<i>Lamium galeobdolon</i>	Yellow archangel	PC-1, PC-2, PC-3 MM-1, MM-5, MM-7 CC-2, CC-3, CC-4, CC-5, CC-6

Scientific Name	Common Name	IWM/Control Methods
<i>Leucanthemum vulgare</i>	Oxeye daisy	CCP-1, CCP-2, CCP-3 MM-1, MM-2, MM-3, MM-5, MM-7 H-1, H-2, H-6
<i>Linaria dalmatica</i>	Dalmatian toadflax	PC-1, PC-2, PC-3 MM-1, MM-2, MM-3, MM-5, MM-7 BC-1, BC-2 CC-2, CC-6
<i>Linaria purpurea</i>	Purple toadflax	Notes: Sheep are known to reduce populations if grazing before seeds emerge. A beetle (<i>Brachypterolus pulicarius</i>), feeds on the ovary. <i>Mecinus janthiniiformis</i> is a stem-boring weevil that suppresses flower and seed production. Two other weevils, (<i>Gymnaetron antirrhini</i> and <i>G. netum</i>), feed on the seed capsule. Toadflax moth (<i>Calophasia lunula</i>) defoliates up to 20 percent of the leaves on a single plant (Stone 2018).
<i>Lunaria annua</i>	Honesty	PC-1, PC-2, PC-3 MM-1, MM-2, MM-5, MM-7
<i>Phalaris arundinacea</i>	Reed canarygrass	PC-1, PC-2, PC-3 MM-1 through 5, MM-7 BC-1 Notes: Treatment methods vary widely depending on the size and density of population.
<i>Potentilla recta</i>	Sulphur cinquefoil	PC-1, PC-2, PC-3, PC-4 MM-1, MM-7 CC-6
<i>Prunus cerasifera</i>	Cherry plum	PC-1, PC-2, PC-3 MM-1, MM-2
<i>Prunus laurocerasus</i>	Cherry-laurel	PC-1, PC-2, PC-3 MM-1, MM-2
<i>Robinia hispida</i>	Bristly locust	Notes: Herbicide treatment needs to be applied to cut stumps or notches on trunk to be effective.
<i>Rubus bifrons</i>	Himalayan blackberry	PC-1, PC-2, PC-3 MM-1 through 7 BC-1 CC-3, CC-5, CC-6 Notes: In some cases, grazing goats can reduce populations (DiTomaso 2013c).
<i>Sorbus aucuparia</i>	European mountain-ash	PC-1, PC-2 MM-1, MM-2
<i>Tanacetum vulgare</i>	Common tansy	PC-1, PC-2, PC-3 MM-1, MM-2, MM-7
<i>Verbascum thapsus</i>	Flannel mullein	CC-3, CC-5
<i>Vinca minor</i>	Lesser periwinkle	PC-1, PC-2, PC-3, PC-4 MM-1 CC-4, CC-6

1 All herbicide information associated with CC techniques are from USDA factsheet (USDA 2023) unless otherwise noted.

3.1.2.1 U.S. Forest Service Lands

This section will describe the specific USFS-approved IWM treatments for application on USFS lands.

3.1.2.2 Lands Administered by the National Park Service

Lands administered by the NPS will follow practices in the Invasive Non-Native Plant Management Environmental Assessment (NPS 2011) which recommends an integrated pest management approach that includes select use of certain herbicides in order to implement a well-balanced invasive plant management program.

3.2 Best Management Practices

City Light will implement BMPs and standard operating procedures (SOP) to minimize the introduction and spread of invasive plants, reduce erosion, and protect wildlife habitats and sensitive species during all Project activities. These BMPs will be applied to routine operations and maintenance (O&M), new construction projects, and all other Project activities. For invasive plant populations that extend beyond the Project Boundary, where pathways and vectors analysis point to clear origin from Project operations and adjacent land ownership allows (e.g., Ross Lake National Recreation Area), City Light will collaborate with adjacent landowners to manage populations.

- Use Integrated Vegetation Management (IVM) and modified wire-border zone approach to replace invasive plants and non-compatible native plants with native plant species compatible with required clearances, to the extent possible, given underlying property ownership. As part of this effort and in conjunction with other license implementation efforts, City Light will:
 - Monitor non-native invasive and non-compatible native species.
 - Use a two-part approach to encourage compatible native species: (1) targeting non-native invasive species and non-compatible native species, and (2) using integrated management to create conditions which allow compatible native species to flourish and reduce dominance of non-native invasives and non-compatible natives.
 - Develop a toolbox, as part of BMPs, that promote IVM and follow City of Seattle pesticide policies.
 - Consider impacts of climate change and use of models (e.g., USFS Seedlot Selection Tool) to select plant material of appropriate provenance.
- Implement City Light's existing Pesticide Reduction Program (City Light undated) for the selection and minimization of herbicide application.
- Use of native or non-invasive non-native species for landscaping.

- BMPs for cleaning and inspection⁴ of vehicles or personal clothing (e.g., shoelaces) will be implemented when:
 - Moving vehicles out of a local area of operation.
 - Moving machinery between properties or sites within the same property where invasive species may be present in one area, and not in another.
 - Using machinery along roadsides, in ditches, and along watercourses.
 - Using vehicles on unformed dirt roads, trails, or off-road conditions.
 - Using machinery to transport soil and quarry materials.
 - Visiting remote areas where access by vehicles is limited.

3.2.1.1 Routine Operations and Maintenance

City Light will implement BMPs specific to normal Project O&M activities including woody debris management on reservoirs, vegetation management throughout the Project Boundary, road and culvert maintenance, and basic maintenance of infrastructure. City Light will comply with SOPs for individual job categories, such as materials management, vegetation management, landscape maintenance, and road maintenance.

3.2.1.2 New Construction

New construction involves substantial work (e.g., relocating a Project tower or section of road, significant construction of shoreline habitat treatments, bridges, or major culvert replacements) that would involve substantial ground disturbance. All new construction projects will be assessed for regulatory compliance and will follow conditions of permits to avoid or minimize effects. City Light will comply with SOPs for individual job planning or habitat restoration. For each project, the procedures and BMPs that may be included are:

- Minimize vegetation modification and revegetate areas disturbed by operations using native plant species beneficial to wildlife.
- Incorporate IWM into project planning, budgeting, and implementation.
- Clean tools and equipment.
- Cover and manage stockpiles of gravel or soil.
- Proper disposal or recycling of green waste.
- Use of certified weed-free materials (e.g., straw) for erosion reduction and for revegetation of disturbed areas.
- Locate staging areas as close to construction sites as practicable to minimize driving distances between staging areas and construction sites.
- Locate staging areas in previously disturbed or graveled areas to minimize soil and vegetation disturbance where practicable.

⁴ Refer to Seattle City Light's Draft Terrestrial Invasive Plant Species Prevention Best Management Practices for details and illustrations of vehicle cleaning and inspection techniques.

- Stabilize disturbance areas by applying a weed-free gravel (if available) top layer to the roadways.

3.3 Vectors and Pathways

City Light's SOPs and BMPs are designed to minimize the introduction and spread of invasive plant species by vectors and pathways. Multiple pathways and vectors may influence the establishment and spread of invasive species in the study area (pathways are the means that species are introduced to new environments, and vectors are the transfer mechanisms). These are both natural, such as seed dispersal via wind or animals, and human-induced, such as spread by humans as they move through areas on foot, by boat, or via other vehicles.

City Light will identify locations within the Project Boundary where there are Project-related disturbances and associated invasive plant species dispersal, map invasive plant species locations, and monitor changes in these populations. This information will be used to prevent the spread of known sources and provide for EDRR and effective control.

3.4 Sensitive Plants and Habitats

Sensitive plants include special-status plants as well as those that are culturally important to Indian Tribes and Canadian First Nations. Sensitive habitats include healthy native communities that support richness of native species and meet functional ecological conditions in areas such as wetland and riparian habitats. City Light will seek to protect sensitive plants and habitats from effects of invasive species and will develop IWM strategies to minimize impacts.

3.4.1 Special-Status Plants

Special-status plants include those that are defined by each entity below and are known or have the potential to occur in the Project Boundary.

Special-status plant species include:

- **Listed or Proposed Under the Federal Endangered Species Act (ESA)** – Species that are listed as Endangered, Threatened, or Proposed for Listing and protected under ESA.
- **ESA Federal Candidates** – Species for which the U. S. Fish and Wildlife Service (USFWS) has sufficient information about biological vulnerability and threats to support a proposal to list as Endangered or Threatened under ESA, but the development of listing regulations has not occurred because of other higher priority listing activities.
- **ESA Federal Species of Concern** – Species usually thought to be in decline, and which may be considered for federal candidate status in the future.
- **State-Listed Species** – Species listed by the Washington Natural Heritage Program on an advisory basis as Endangered, Threatened, or Sensitive.
- **USFS Sensitive Species** – Species on the Regional Forester's List of Sensitive Species for the Mount Baker – Snoqualmie National Forest (USFS 2004).

3.4.2 Culturally Important Plants

City Light will continue respectful and private communication with Indian Tribes and Canadian First Nations for the purposes of protecting traditional knowledge. Communication regarding culturally important plants will be fully coordinated coordinates with the protocols and management measures in the Historic Properties and Management Plan (City Light 2023d).

3.5 Revegetation

Revegetation is the process of reestablishing vegetation cover in disturbed areas and is a standard component of construction, erosion control, and site restoration. The main functions of revegetation are to conserve native plant resources, reduce loss of soil to erosion, combat invasive species, mitigate impacts of climate change, and maintain healthy forests and wildlife habitat. City Light will revegetate areas with Project-related ground disturbance or areas 0.25 acre or greater, with minimal vegetative cover (less than 30 percent cover). Revegetation will be focused on establishing native species to prevent available habitat for invasive species, to reduce erosion and sedimentation, and to increase diversity of native plants in the Project Boundary. City Light may prioritize specific species to accomplish these goals. Revegetation efforts in the vicinity of Newhalem and Diablo may be prioritized using guidance from the Seattle City Light Newhalem and Diablo Landscape Tree Inventory (Bartlett Consulting 2022), which provides recommendations for historic preservation and diversity.

For revegetation at locations on USFS land, land managed by NPS, areas larger than 3 acres, or on steep slopes or areas within erosional areas, planning will include a site assessment and the development of a revegetation plan, with the following:

- General site conditions, including slope, terrain, soils, land use, and access proximity to water;
- Proximity to invasive plant occurrences;
- Vegetation community specifics, including native species composition, richness and density, percent cover;
- Site complexity, including the variety of landforms; and
- Other constraints.

At sites where compaction may be a problem, topsoil may be broken up, removed, and salvaged in such a manner as to keep it usable for replanting. If it is to remain in place for longer than one month, topsoil will be stored in a manner that keeps the soil biota alive, maintains soil microbe health, prevents erosion, and prevents the establishment of invasive plant species. In sites that are being seeded, seeding will take place within a few days after topsoil is replaced. At some sites, amendments, such as compost or fertilizer, may need to be added to the soil. City Light will use seed mixes that contain only locally native plant species.

A mixture of seeding techniques may be used and will be detailed in the revegetation plans. Seeding rates will be determined based on pure live seed methods and mixture to improve seeding success. Seeds should be covered not more than three times the thickness of the seed. Sites will be covered with certified weed-free mulch after seeding, and mulch will cover the surface through germination. If certified weed-free material is not available, the USFS will be consulted.

Larger sites will typically be replanted with a mixture of native trees, shrubs, and forbs. Species and planting decisions will be determined in collaboration with the SRCC. Plantings within the transmission line ROW will include species compatible with clearance requirements and habitat enhancement targets.

Revegetation will occur as soon as possible after ground disturbing activities during the appropriate season for seed establishment or planting viability. Restoration and seeding of disturbed areas, including topsoil piles and berms, will be completed within 60 days following completion of construction or ground-disturbing activities, if in the appropriate season or as soon as feasibly possible the next appropriate season.

Revegetation sites will be periodically monitored to evaluate success. When all site criteria are met, revegetation work will be deemed successful. A revegetation site will be monitored annually, for up to five years, or until criteria from revegetation plans are met and attained for one year (with a minimum of two years of monitoring). If, after five years, success criteria are not met, remedial measures will be implemented. An additional two years of monitoring will follow the implementation of remedial measures. If, at the end of an additional two years of monitoring, success criteria are still not met, the site will be declared problematic and strategies to deal with the site will be developed in consultation with the USFS.

3.6 Management Units

Management units will be used to identify areas of specific treatments of invasive plant species in alignment with related management priorities. Units will be delineated by geographic location, which may coincide with ownership (e.g., Ross Lake as a geographic location, managed by NPS). Units may be additionally determined by management goals and treatment methods proposed to meet those goals.

Methods for treatment within each management unit will include the consideration and relative value of sensitive areas (e.g., wetlands), value of enhancement opportunities (e.g., creating habitat for elk), the threat of the invasive species to the ecology of the unit, resource protections (e.g., cultural resources), or other priorities determined by the SRCC. Initial management units and treatment methods will additionally consider existing landscape limitations, non-invasive vegetation, and compatibility within the “wire-border zone” approach.

3.7 Data Collection and Management

City Light will follow specific protocols for data management and Geographic Information System (GIS) mapping with the intent to track changes of treated invasive plants, seeded, or planted native plants, plants or plant communities of traditional importance, and sensitive habitats. A database will be maintained, in tandem with GIS maps, showing specific metrics (e.g., percent cover or species richness) measured at intervals (Table 4.0-1), and the details of the planting or treatments, if any. All changes in populations will be compared against target goals for each area to measure success, or to inform adaptive management.

3.8 Education and Training

City Light will provide outreach and education with information on how to limit the introduction or spread of target species in the Project Boundary and to reduce impacts to sensitive species and

habitats. Training will be provided to City Light employees annually. Training will include the review of BMPs and SOPs, as well as provide basic weed identification references. Outreach and education regarding common vectors and preventative actions will be made available to recreationists at high-use sites within the Project Boundary.

3.9 Emergency Situations

Emergency situations include instances where there is imminent risk to human life, including a threat of fire hazard, mechanical failure, or power outage. In the event of an emergency, City Light will make efforts to avoid direct effects and will communicate with appropriate agencies if these situations arise.

4.0 MONITORING, REPORTING, AND COMMUNICATIONS

Monitoring efforts will be performed to document the progress of meeting the Invasive Plants Plan goals and objectives. Monitoring will be an extension of protection and enhancement implementation, using baseline information determined through City Light study efforts. The goals of monitoring are to inform the effectiveness of protective measures, followed by enhancements to increase areas and diversity of habitats and richness of native plants. Protection measures will be measured by the reduction of Project-related disturbance of native habitats/plant communities and sensitive plants, and the spread of invasives. Enhancement measures will include the preservation or increase of native plant communities. The monitoring goals are to determine the effectiveness of protection measures and native plant community enhancement, and to inform adaptive management updates to this Invasive Plants Plan. Specific monitoring activities are listed with the timeline in Table 4.0-1.

Table 4.0-1. Timeline for protection and enhancement monitoring activities.

Timeline	Protection and Enhancement Monitoring Activity
Every two (2) years following license issuance	Monitor revegetated areas for establishment and effectiveness.
Every five (5) years following license issuance	Survey prioritized areas for target species and update invasive plant database and update associated GIS maps.
	Describe the status, distribution, likely vectors, and limiting factors for target invasive plant species and update maps accordingly.
	Survey for sensitive plants in prioritized areas. Update sensitive species database and GIS maps and provide the culturally important plant data to Indian Tribes and Canadian First Nations.
Every fifteen (15) years following license issuance	Management units will be surveyed every fifteen (15) years, with a focus on specific treatment areas and identified pathways and vectors.

4.1 Adaptive Management

Adaptive management which is the iterative process by which City Light will gather information, synthesize new and existing information, and assess the need to update management decisions outlined in this Invasive Plants Plan. Adaptive management will be applied to each implementation activity through monitoring using information gathered during City Light’s relicensing study data as baseline. At five (5) year intervals, City Light will collaborate with the SRCC to evaluate monitoring information to determine if new Best Available Science, BMPs, IWM techniques, or changes in other management decisions would increase the success of the protection and enhancement measures included in this Invasive Plants Plan.

4.2 Reporting Schedule

City Light will report annually on the status of known invasive plant populations, native plant propagation, and other pertinent issues. Every five (5) years, City Light will file a report with FERC, describing implementation and any proposed modifications to the Invasive Plants Plan based upon the results of monitoring and consultation with the SRCC.

4.3 Communications

City Light will coordinate and communicate Invasive Plants Plan implementation actions with the SRCC. Because of simultaneous implementation of multiple resource management plans (e.g., cultural, wildlife, fish and aquatics), cross-resource communication will be necessary. An important goal of this communication will be to achieve a balanced integration of resource goals in the Project Boundary. Coordination processes may include:

- Clarifying resource goals, objectives, and priorities;
- Ongoing consultation with relevant resource groups and other entities;
- Sharing information used to make resource decisions; and
- Solving problems and resolving issues.

Although communication regarding the Invasive Plants Plan may include communications on several topics, City Light has identified specific areas of interest that will require collaboration, including:

- Coordination with adjacent property owners or land managers to prevent the spread of invasive species.
- Coordination with NPS, British Columbia Parks, Skagit Environmental Endowment Commission, and other land managers on reed canarygrass and other invasive plant management issues.
- Continue to coordinate with the Skagit Cooperative Weed Management Area with management of knotweed and other invasives along the Skagit and Sauk rivers.
- Identify and analyze constraints and opportunities for invasive species management that could be addressed at a larger (e.g., watershed) scale.

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