

Supplement Analysis
for the
Columbia River Basin Tributary Habitat Restoration EA
(DOE/EA – 2126/SA-20)

J.R. Palensky Wildlife Area Aquatic Herbicide Treatment for *Ludwigia*
BPA project number 2011-004-00

Bonneville Power Administration
Department of Energy



Introduction

In December 2020, Bonneville Power Administration (BPA) completed the Columbia River Basin Tributary Habitat Restoration Environmental Assessment (Programmatic EA) (DOE/EA-2126). The Programmatic EA analyzed the potential impacts of implementing tributary fish and wildlife restoration projects across the Columbia River Basin, ranging from fencing and planting, to bridge construction, instream habitat improvements, and invasive plant treatments. These actions could be funded by BPA to mitigate for effects of the development and operation of the Federal Columbia River Power System (FCRPS) on fish and wildlife.

Consistent with the Programmatic EA, this supplement analysis (SA) analyzes the proposed funding of aquatic herbicide application to treat an outbreak of water primrose (*Ludwigia hexapetala/Ludwigia peploides*, hereafter *Ludwigia*) at the J.R. Palensky Wildlife Area (PWA) by the Oregon Department of Fish and Wildlife (ODFW). *Ludwigia* is an aggressive invasive aquatic plant which is difficult to remove with mechanical and manual treatment methods once it has become established in a waterbody, necessitating the use of herbicides to eradicate it.

This SA analyzes the site-specific impacts of this aquatic herbicide treatment within waterbodies at the J.R. Palensky Wildlife Area to determine if the action is within the scope of the analysis considered in the Programmatic EA. It also evaluates whether the proposed action presents significant new circumstances or information relevant to environmental concerns that were not addressed by the Programmatic EA. The findings of this SA determine whether additional National Environmental Policy Act (NEPA) analysis is needed pursuant to 40 Code of Federal Regulations (CFR) § 1502.9(d) and 10 CFR § 1021 *et seq.*

Proposed Activities

BPA, in coordination with ODFW, is proposing to provide funding for the management of invasive and noxious *Ludwigia* in waterbodies at PWA using aquatic herbicides. Funding for this work partially fulfills commitments made by BPA in the 2010 Willamette River Basin Memorandum of Agreement Regarding Wildlife Habitat Protection and Enhancement between the State of Oregon and the Bonneville Power Administration, part of ongoing efforts to mitigate for the impacts to fish and wildlife from the construction and operation of Federal flood control and hydroelectric facilities in the Willamette River Basin.

PWA is located in Multnomah County along the southern bank of the Multnomah Channel roughly two miles downstream from the confluence of the Multnomah Channel and the Willamette River. The

property is owned by BPA, which has contracted management of the wildlife area to ODFW. PWA is not publicly accessible. The total area of PWA is 423 acres, and it contains numerous permanent and ephemeral streams, wetlands, and lakes. The largest lake on the property is Horseshoe Pond, which occupies forty acres in the southeastern portion of the wildlife area. Horseshoe Pond is a permanent lake with depths ranging from two to six feet that is fed by an ephemeral stream from the nearby Tualatin Mountains. The lake is bordered by emergent wetlands, riparian forest, and fields overgrown with reed canary grass (*Phalaris arundinacea*). An unimproved dirt access road runs along the southern bank of the lake.

Ludwigia is an aggressive perennial aquatic weed native to Central and South America that is highly invasive in the Pacific Northwest. *Ludwigia* prefers shallow (typically less than two meters deep), stagnant or extremely low velocity waterways and waterbodies, though it can tolerate wet mudflats and inundated wetlands to a limited extent. Once established in a waterbody, *Ludwigia* can grow rapidly to form dense mats of vegetation. *Ludwigia* will generally outcompete native aquatic plant species in waterbodies in which it is present. The dense vegetative mats it forms lead to vegetative monocultures and can present passage difficulty and decreased dissolved oxygen in the water column below the plants, making waterbodies uninhabitable for native fish and other aquatic organisms if left unchecked. *Ludwigia* is capable of re-growing from stem and root fragments, allowing it to readily re-colonize areas in which the plant is removed unless care is taken to destroy all plant remnants completely. *Ludwigia* is thus extremely difficult to effectively remove once established in a waterbody without the use of chemical herbicides.

Ludwigia was first detected on PWA in Horseshoe Pond in the summer of 2021. The infestation of *Ludwigia* spread to more than nine acres of the lake by the end of 2021. To eradicate this infestation and restore traditional native vegetation to the areas in which *Ludwigia* now dominates, ODFW would apply aquatic herbicide directly to the areas of the waterbody in which the plant is present. Herbicide application would solely be applied to inundated areas in which *Ludwigia* is present within the waterbody – no terrestrial herbicide would be used. The following herbicide would be applied:

| Herbicide | Application Rate | Application Window | Target Species |
|--------------------|---|--|---|
| Aquatic Glyphosate | 4.0-5.0 lbs. ai/ac Not to exceed maximum label rate across multiple applications | June – October Up to twice per application window as needed | <i>Ludwigia hexapetala/Ludwigia peploides</i> |

Application of the herbicide would be conducted using backpack sprayers or ATV-mounted boom sprayers close to the shoreline. In areas farther from shore, herbicide would be applied using backpack sprayers while wearing chest waders (in shallow water) or small watercraft like canoes or kayaks (in deeper water) to access the areas in which the plant is present. Herbicides and equipment would be transported to site locations via the existing access road that runs along the southern shore of the lake. Herbicide and equipment preparation would be conducted away from waterbodies in non-sensitive areas (such as roadways) to mitigate risks of spills and then brought to the project locations.

To penetrate the dense vegetative mats of *Ludwigia*, multiple treatments per calendar year may be required. It is expected that two treatments would be conducted during the application window of

2022. Areas which are treated would be monitored and herbicide application would be repeated if necessary during the application windows of 2023 and 2024 until the plant has been eradicated.

Ludwigia has not yet been detected at PWA outside of Horseshoe Pond. However, due to the plant's ability to reproduce from broken stem fragments, there is potential for inadvertent spread into other waterbodies at PWA (e.g., from waterfowl). All permanent waterbodies at PWA would be monitored for *Ludwigia* presence. In these waterbodies, manual removal of the *Ludwigia* by carefully pulling the plants by hand, ensuring that stem and root systems remain intact, would be attempted to remove the *Ludwigia* before it has fully established itself. Any plants collected this way would be placed in a dry area outside of the floodplain (e.g., roadways) and left to dry until dead, after which they would be collected and taken off-site for disposal at a local landfill. If such manual control measures are unsuccessful, herbicide application following the same procedures as those being used at Horseshoe Pond would be used to eradicate the infestation. Additional environmental review by BPA environmental compliance staff would be undertaken prior to herbicide use in any other waterbodies. Any additional herbicide use would be limited to other permanent waterbodies and herbicides would not be used in terrestrial wetlands and forests.

Environmental Effects

The typical environmental impacts associated with the Columbia River Basin Tributary Habitat Restoration EA are described in Chapter 3 of the Programmatic EA, and are incorporated by reference and summarized in this document. Below is a description of the potential site-specific impacts of the aquatic herbicide application at PWA and an assessment of whether these impacts are consistent with those described in the Programmatic EA.

1. Fish

The effects of applying aquatic herbicide to treat *Ludwigia* at PWA are consistent with the analysis in the Programmatic EA, Section 3.3.1, which concludes that the impacts to fish species would be low. Section 3.3.1.2.2.3 describes the effects of vegetation management programs, including herbicide applications, on fish. The herbicide chosen for use, aquatic glyphosate, was selected due to its low-to-moderate aquatic toxicity to fish, including Endangered Species Act (ESA)-listed salmonids – such as salmon, steelhead, and bull trout – and the procedures for use of glyphosate to control noxious weeds would be followed to minimize the risk of adverse toxic effects. In general, when herbicides contaminate the aquatic ecosystem, they can cause deleterious effects on the organisms in that environment. Organisms that live in regions impacted by these substances, and whose breeding period coincides with the application period of the herbicides, can suffer serious risks of development and survival of their offspring (Marin-Morales et al. 2013). Herbicide applications would be conducted according to the mitigation measures and conservation measures prescribed in BPA's Habitat Improvement Program Programmatic Biological Opinion (HIP4 BiOp), and all applications would be timed and conducted to minimize the impacts to ESA-listed fish, and thereby, most other fish species.

No ESA-listed fish are present in Horseshoe Pond (StreamNet). The dominant resident fish species in the lake, as documented by ODFW fish surveys, are oriental weatherfish (*Misgurnus anguillicaudatus*) and common carp (*Cyprinus carpio*), with a limited remnant population of three-spined stickleback (*Gasterosteus aculeatus*) also observed. The nearby Multnomah Channel is potential rearing and migration habitat for ESA-listed coho salmon (*Oncorhynchus kisutch*), Chinook salmon (*Oncorhynchus tshawytscha*), steelhead trout (*Oncorhynchus mykiss*), and green sturgeon (*Acipenser medirostris*). Horseshoe Pond does not regularly discharge into the Multnomah Channel and no project activities would occur in or around the Multnomah Channel. However, due to its close proximity to the project

site and the presence of ESA-listed fish species, effects to fish species in the Multnomah Channel from project activities were analyzed.

It is highly unlikely that herbicide applied to Horseshoe Pond would affect nearby ESA-listed fish species. There is no permanent outflow from Horseshoe Pond into the Multnomah Channel. During the proposed application window, the lake tends to be at its lowest water level, further reducing any potential risk of discharge into the Multnomah Channel. Additionally, BPA conducted background research into the effects of aquatic glyphosate on salmonid species as part of its 2019 HIP4 Addendum to Biological Assessment and Essential Fish Habitat Assessment. BPA determined, based on the available literature, that glyphosate presents a low toxicity risk to adult salmonids and a low-to-moderate toxicity risk to juvenile salmonids. In the extremely unlikely event of a discharge from Horseshoe Pond into the Multnomah Channel during project activities, the effects on any ESA-listed fish would therefore be low.

Informal consultation as part of the HIP4 Biological Opinion (BiOp) procedures for high-risk aquatic herbicide applications was conducted with the National Marine Fisheries Service (NMFS) to determine if the proposed activities are consistent with the HIP4 BiOp and would not adversely affect ESA-listed fish species. NMFS reviewed the proposed project activities and locations and determined that the proposed activities are consistent with the HIP4 BiOp. NMFS concurred that the proposed activities would be unlikely to adversely affect ESA-listed fish in the nearby Multnomah Channel for the aforementioned reasons.

Similar effects would be expected for any present non-ESA-listed fish species in the project area during project activities.

2. Wildlife

The effects of applying aquatic herbicides at PWA are consistent with the analysis in the Programmatic EA, Section 3.3.5, which concludes that effects to wildlife would be moderate in the short-term but with overall low long-term effects. Although wildlife may be exposed to herbicides as a result of these activities, they are unlikely to experience lethal effects because the herbicides and application rates proposed are structured to be less than known levels of toxicity. Likewise, chronic exposure over a long period of time is unlikely given the short, singular, annual seasons of application.

Columbian white-tailed deer (*Odocoileus virginianus leucurus*) is the only ESA-listed mammalian species which may be found at PWA (U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) (USFWS 2022)). As part of the HIP4 BiOp procedures for high-risk aquatic herbicide applications, informal consultation was conducted with USFWS to determine whether project activities would affect this species. USFWS reviewed the proposed project activities and locations and determined that the activities may affect but were unlikely to adversely affect any Columbian white-tailed deer present at PWA. Although the application window coincides with foaling season for Columbian white-tailed deer, the lifecycle period in which they are most sensitive to herbicides like glyphosate, the deer and any foals are unlikely to be present during herbicide application due to their general avoidance of human noise and presence. Moreover, Columbian white-tailed deer generally do not forage on aquatic vegetation like *Ludwigia*, and no herbicides would be used on the terrestrial trees and shrubs upon which the deer typically feed. It is therefore unlikely that deer would directly ingest herbicide. Deer may be temporarily disturbed by human presence during project activities, but the effects would be consistent with effects caused by the typical operations and maintenance actions ODFW routinely carries out on the property.

No Oregon state-listed mammalian species are present at PWA (ODFW 2022a). However, four species of Oregon Conservation Strategy bats are present at PWA: California myotis (*Myotis californicus*), silver-haired bat (*Lasiurus noctivagans*), long-legged myotis (*Myotis volans*), and hoary bat (*Lasiurus*

cinereus)(ODFW 2022b). These species of bats are all insectivorous and do not eat aquatic vegetation like *Ludwigia*. As a result, these species would be very unlikely to directly ingest herbicide. No activities would occur in the forested areas in which these bats roost, and therefore project activities would have little impact on these bat species.

No ESA-listed or Oregon state-listed amphibians are present at PWA (USFWS 2022, ODFW 2022a). However, one Oregon Conservation Strategy amphibian species is present during portions of the year at PWA (ODFW 2022b). Northern red-legged frog (*Rana aurora*) uses wetlands and shallow waterbodies at PWA as annual breeding grounds. Adult northern red-legged frogs do not reside at PWA year-round. The frogs migrate to the area during breeding season, typically January and February, from their habitat in the upland forests of the nearby Tualatin Mountains. Breeding typically lasts 1-2 weeks, after which the adults return to their normal habitat. Northern red-legged frog eggs usually hatch within 30-45 days and the tadpoles undergo metamorphosis roughly 90 days after hatching. Following metamorphosis, the frogs migrate to their typical upland forest habitats until they reach sexual maturity (2-3 years). As a result, it is expected that most northern red-legged frogs will have departed from PWA by the time of the herbicide application window. Additionally, northern red-legged frogs typically seek shallow wetlands in which to lay their eggs and will generally avoid open, deeper water like that found at Horseshoe Pond. As a result, project activities would have little impact on northern red-legged frogs.

No ESA-listed or Oregon state-listed reptiles are present at PWA (USFWS 2022, ODFW 2022a). However, there are resident populations of two Oregon Conservation Strategy reptilian species at PWA, western pond turtle (*Actinemys marmorata*) and western painted turtle (*Chrysemys picta bellii*)(ODFW 2022b). Both turtle species are primarily aquatic and live in mud-bottomed permanent lakes at PWA like Horseshoe Pond. It is unlikely that turtles would be present in the project area during project activities due to their general avoidance of human noise and presence. However, both species of turtle are omnivorous and subsist on a variety of invertebrates, insects, small fish, and aquatic vegetation. As a result, there is potential that turtles would ingest vegetation which has been treated with glyphosate. Based on a review of the available literature, the effects of glyphosate exposure on these species has not been studied in detail. However, despite the potential for short-term effects, the long-term effects of removing invasive *Ludwigia* from PWA would have a major positive effect on resident turtles. Dense mats of *Ludwigia* can present a passage barrier for aquatic animals like turtles, making it difficult for them to occupy areas of the lake which have been aggressively colonized. Additionally, *Ludwigia* will outcompete native vegetation and develop into a monoculture that has profound effects on the water column below its mats (see “Vegetation” section below) as well as adversely affect water quality (i.e. dissolved oxygen). Removal of the *Ludwigia* would restore the condition of the lake to its historical quality. Therefore, while there may be short-term effects on resident turtles at PWA, the long-term effects would be beneficial.

Similar effects would be expected for any present non-ESA-listed and non-Oregon state-listed mammalian, amphibious, and reptilian species at PWA during project activities.

For avian species, ESA-listed yellow-billed cuckoo (*Coccyzus americanus*) has the potential to be present at PWA (USFWS 2022), although it has not been regularly observed on the property. Yellow-billed cuckoo do not forage on aquatic plants, instead subsisting mainly on insects like caterpillars and crickets during the months in which activities are planned, and would be very unlikely to directly ingest herbicide applied to *Ludwigia* at PWA as a result. Yellow-billed cuckoo nest in thick riparian forests, and no herbicide application would be conducted in those habitats. The HIP4 BiOp contains mitigation measures to be used when applying herbicides in potential yellow-billed cuckoo habitat, including applying a one-half mile buffer between any observed yellow-billed cuckoo nests and herbicide application sites. ODFW would monitor the forests surrounding waterbodies at PWA for evidence of

yellow-billed cuckoo presence and apply this buffer to project activities in the event of detection. As a result, project activities would have low impact on any yellow-billed cuckoo that may be present.

ESA-listed northern spotted owl (*Strix occidentalis caurina*) also has the potential to be present at PWA (USFWS 2022). Northern spotted owl is typically found in old growth forests – especially ones dominated by conifers – though it will sometimes be found in younger riparian forests such as those found at PWA. Northern spotted owl are nocturnal carnivores, hunting small ground mammals like squirrels, mice, gophers, and voles. They would not forage on *Ludwigia* which has been treated with herbicide, and would therefore be very unlikely to directly ingest herbicide. Moreover, the small mammals upon which northern spotted owl feed are also unlikely to forage on aquatic *Ludwigia*, making attenuated ingestion also unlikely. Northern spotted owl typically nest in March and April. The HIP4 BiOp contains mitigation measures to be used when applying herbicides in potential northern spotted owl habitat, including proscription of project activities in tree stands during nesting periods. These mitigation measures would be applied during project activities. No project activities would take place outside of waterbodies at PWA, and no impacts to the forested sections of the property are expected. As a result, project activities would have a low impact on any northern spotted owl that may be present.

ESA-listed streaked horned lark (*Eremophila alpestris strigata*) has the potential to be present at PWA (USFWS 2022), although it has not been observed on the property. Streaked horned lark is not typically found in riparian wetlands and forest like PWA, instead preferring bare or thinly vegetated fields, plains, and dune systems. Streaked horned lark forage on terrestrial grasses and seeds, and will also eat small insects during nesting seasons. Aquatic plants like *Ludwigia* are not a typical forage for streaked horned lark, and would therefore be very unlikely to directly ingest herbicide. Streaked horned lark typically nest in dry soil between April and August. The HIP4 BiOp contains mitigation measures to be used when applying herbicides in potential streaked horned lark habitat, including conducting pre-activity surveys during nesting season to determine if any streaked horned lark nests are present in the project area and only applying certain herbicides in streaked horned lark habitat. Glyphosate is one of the approved herbicides. These mitigation measures would be followed during project activities. As a result, project activities would have a low impact on any streaked horned lark that may be present.

No Oregon state-listed avian species are present at PWA (ODFW 2022a). However, there are numerous Oregon Conservation Strategy avian species which have been observed in the area: dusky Canada goose (*Branta Canadensis occidentalis*), American white pelican (*Pelecanus erythrorhynchos*), greater sandhill crane (*Antigone canadensis*), purple martin (*Progne subis arboricola*), western bluebird (*Sialia mexicana*), and willow flycatcher (*Empidonax traillii*)(ODFW 2022b). None of these species have a diet that includes aquatic vegetation. Purple martin, western bluebird, and willow flycatcher are all opportunistic terrestrial omnivores and insectivores, while dusky Canada geese subsist mainly on terrestrial grains and grasses. Sandhill crane and white pelican are the only species that will forage in water, hunting fish and other aquatic species. It is therefore very unlikely that any of these species would directly ingest herbicide applied to aquatic plants. Sandhill crane and white pelican may consume fish that have come into contact with glyphosate applied during project activities. However, any short-term effects to these species as a result would be greatly outweighed by removing the *Ludwigia* present at PWA and re-opening areas of waterbodies which are currently uninhabitable by fish due to the *Ludwigia* infestation, restoring the historical hunting areas which the birds used. None of these species are expected to be present during project activities due to their general avoidance of human presence and no herbicide would be applied to terrestrial habitat for the birds. As a result, the effects on dusky Canada geese, purple martin, western bluebird, and willow flycatcher are expected to be low, and while there may be some short-term effects on greater sandhill crane and American white pelican, the long-term effects would be largely beneficial.

Similar effects would be expected for any present non-ESA-listed and non-Oregon state-listed avian species at PWA during project activities.

3. Water Resources

The effects of using aquatic herbicides at PWA are consistent with the analysis in the Programmatic EA, Section 3.3.2, which concludes that the impacts to water resources would be low.

Section 3.3.2.2.1 of the Programmatic EA examines effects on water quantity. There would be no effect to water quantity as a result of these activities, as there would be no water withdrawals or changes to existing hydrology as a result of these activities.

Section 3.3.2.2.2 of the Programmatic EA examines effects on water quality. Excessive growth of aquatic plants, particularly non-native invasive aquatic plants like *Ludwigia*, often leads to degraded water quality. Studies have found that water columns below *Ludwigia* mats generally have lower dissolved oxygen levels when compared to healthy waterbodies (Dandelot et al. 2005; Bunch et al. 2010). These studies identify three possible mechanisms behind the low observed dissolved oxygen levels below established growths of *Ludwigia*. The first is that oxygen produced by *Ludwigia* during primary production is released from emergent leaves into the air rather than into the water as would occur with submerged aquatic plant species. Second, the dense *Ludwigia* canopy prevents light from reaching the underlying water, inhibiting production of oxygen in the water by photosynthesizing aquatic microbes. Finally, respiration of organic matter in the water, on plants, and in the sediment below *Ludwigia* beds consumes oxygen. Permitting unchecked growth of *Ludwigia* would therefore be likely to cause sizable adverse effects to the water quality within waterbodies at PWA. Project activities will help restore natural conditions, providing long-term beneficial effects to water quality.

4. Vegetation

The effects of using aquatic herbicides at PWA are consistent with the analysis in the Programmatic EA, Section 3.2.3.2, which concludes that impacts to vegetation (both “target” and “non-target”) directly sprayed would likely be high, since the killing of vegetation is the purpose for the action. However, application of the prescribed mitigation measures would minimize exposure of non-target species outside of the treatment area such that effects there would be low.

Glyphosate is a broad spectrum, nonselective herbicide that operates by preventing production of essential amino acids in plants to inhibit growth. Glyphosate will affect any plant in the project area, including both target *Ludwigia* and non-target plants. The short-term effects will be high on non-target plants in the project area, likely resulting in killing non-target vegetation. However, *Ludwigia* often outcompetes native aquatic and semi-aquatic species of plants and, if left unchecked, will result in a dense monoculture in which no other vegetation can survive. The plant will grow rapidly to fully colonize waterbodies in which it is present. The dense vegetative mats of *Ludwigia* will prevent light from reaching the water underneath, further choking out other species of aquatic vegetation. The sections of Horseshoe Pond which *Ludwigia* has colonized already exhibit such a monoculture, with limited to no remaining native vegetation among the *Ludwigia* mats. Failure to treat *Ludwigia* outbreaks would therefore have large negative effects on native vegetation. By treating the *Ludwigia* at PWA and eventually eradicating it, there would be long-term positive effects for native vegetation. The overall long-term effects of project activities on vegetation within the project area would therefore be moderate.

There are no ESA-listed aquatic or semi-aquatic vegetative species present at PWA in the project area (USFWS 2022). The only Oregon state-listed aquatic or semi-aquatic plant species which has the potential to be present at PWA is howellia (*Howellia aquatilis*)(ODFW 2022a). However, according to

USFWS documentation, howellia is believed to be completely extirpated from Oregon. Project actions would therefore have no effect on ESA-listed or state-listed vegetative species in the project area.

Effects on non-target vegetation outside of the project area are expected to be low. The HIP4 BiOp contains mitigation measures to be used when applying herbicides to emergent aquatic vegetation which would be employed during project activities. These mitigation measures include limitations on the application rate of herbicide in the water body and prohibiting application during moderate to high winds to decrease the risk of herbicides drifting outside of the project area. All equipment and herbicide preparation would be conducted outside of the project area in non-sensitive areas (such as a roadway) with spill mitigation measures in place to reduce the chances of inadvertent entry of herbicides into areas outside the project area. Additionally, glyphosate is highly soluble in water and readily absorbed into most soil types, giving it a low potential for runoff outside of applied areas. As a result, it is expected that minimal herbicide would enter into non-project areas and the effects on non-target vegetation in those areas would be low.

5. Wetlands

The effects of using aquatic herbicides at PWA are consistent with the analysis in the Programmatic EA, Section 3.3.4, which concludes that the overall impacts to wetlands would be low. Large portions of PWA are composed of wetlands and riparian forests, including the northern and northwestern banks of Horseshoe Pond. These wetlands would suffer no direct effects from herbicide applications. No herbicide would be applied in these areas and inadvertent entry of herbicides in these areas would be minimized as much as possible (see above). All project equipment and machinery would access project sites via an existing access road that does not cross any wetlands.

Ludwigia can tolerate inundated wetlands to a limited degree. Wetlands at PWA would be monitored by ODFW staff for any *Ludwigia* growth. In the event that *Ludwigia* is detected in any wetlands at PWA, the plant would be removed by hand pulling the entire plant, including the intact stem and root system to prevent re-colonization. All efforts would be made to remove *Ludwigia* alone and to avoid pulling other native wetland vegetation. No herbicides would be used to treat *Ludwigia* in wetlands or outside of waterbodies at PWA.

6. Geology and Soils

The effects of applying aquatic herbicides at PWA are consistent with the analysis in the Programmatic EA, Section 3.3.6, which concludes that the long-term impacts to geology and soils would be low to moderate depending on the actions undertaken. Section 3.3.6.2 of the Programmatic EA examines the effects that herbicide application may have on geology and soils. Studies generally indicate that the impacts of herbicide application on soil function are only minor and temporary, but there are some that suggest effects that could substantially alter soil function. These include disruptions to earthworm ecology in soils exposed to glyphosate and site-specific increases in disease resulting from the application of a variety of herbicides (Rose et al 2016). All herbicide use at PWA would be applied to waterbodies, with minimal application directly to soils. Glyphosate is highly soluble in water and would be unlikely to leech into soils outside of the project area as a result. The impact of this herbicide use to soils at PWA would therefore be low.

No other activities are proposed that would have the potential to impact geology and soils.

7. Transportation

The effects of applying aquatic herbicides at PWA are consistent with the analysis in the Programmatic EA, Section 3.3.7, which concludes that the impacts to transportation would be low. The project activities would not affect any roads. No roads would be closed or blocked and no changes to existing

routes would occur. Additionally, PWA is not publicly accessible and contains no public roads. Project activities would therefore have no effect on transportation.

8. Land Use and Recreation

The effects of applying aquatic herbicides at PWA are consistent with the analysis in the Programmatic EA, Section 3.3.8, which states that land use practices underlying project sites would not be changed for most projects. There would be no change to land use at PWA as a result of these activities. The property is currently a non-publicly accessible wildlife area, a condition which would remain following herbicide application. Additionally, as PWA is not publicly accessible or open for public recreation, no effects to public recreational activities would occur.

9. Visual Resources

The effects of applying aquatic herbicides at PWA are consistent with the analysis in the Programmatic EA, Section 3.3.9, which concludes that the impacts to visual resources would be low but evaluated on a site-specific basis for each project. The proposed aquatic herbicide treatments at PWA would occur solely in waterbodies which are inaccessible to the public and therefore have no effect on the public appreciation of the visual quality of the property. The long-term impacts of the herbicide treatments would be to remove the vegetative mats of *Ludwigia* which dominate portions of the waterbody and reopen the waterbody for native vegetation, restoring the traditional visual quality of Horseshoe Pond. This level of impact would be low.

10. Air Quality, Noise, and Public Health and Safety

The effects of applying aquatic herbicides at PWA are consistent with the analysis in the Programmatic EA, Section 3.3.10, which concludes that the impacts to air quality, noise, and public health and safety would be low. As noted in Section 3.2.3.2.3 of the Programmatic EA, workers that handle and apply the herbicides would likely be exposed but would be protected by appropriate personal protective equipment. Careful application of mitigation measures would prevent or minimize exposures, and if exposure did occur, the concentration and toxicities would be low such that effects on humans would be low. Additionally, PWA is not publicly accessible, so there would be low effects on public health and safety.

Air quality and noise would be temporarily affected by project activities. Small vehicles like ATVs and trucks used for transport and project activities would generate noise and exhaust emissions. These effects would be temporary and minor. Moreover, since PWA is inaccessible to the public, this noise and exhaust would be unlikely to impact the public. This noise and exhaust would also be consistent with routine operations and maintenance activities undertaken by ODFW on the property, for which they use similar machinery.

11. Cultural Resources

The effects of applying aquatic herbicides at PWA are consistent with the analysis in the Programmatic EA, Section 3.3.11, which concludes that the impacts to cultural resources would be resolved through the National Historic Preservation Act Section 106 (Section 106) process.

BPA conducted initial Section 106 cultural resources consultations for vegetation management activities, including herbicide use, at PWA in 2015 (BPA CR. No. OR 2015 032). BPA consulted with the Oregon State Historic Preservation Office, the Cowlitz Indian Tribe, and the Confederated Tribes of the Grand

Ronde and made a determination that cultural resources would not be adversely affected by vegetation management programs at PWA.

In 2022, a BPA archaeologist reviewed the proposed aquatic herbicide application at PWA (BPA CR. No. OR 2022 097). The archaeologist determined that because the activities were limited to herbicide application within waterbodies with no ground disturbance, the project activities had no potential to affect cultural resources. Additionally, *Ludwigia*, an invasive species not native to the Pacific Northwest, has no historical cultural value which would be impacted by its removal. The archaeologist determined that further consultation would not be required for these project activities.

12. Socioeconomics and Environmental Justice

The effects of applying aquatic herbicides at PWA are consistent with the analysis in the Programmatic EA, Section 3.3.13, which concludes that impacts to socioeconomics and environmental justice would be low to moderate, subject to site-specific analysis. All herbicide application would be within a BPA-owned wildlife area which is closed to public access and residency. The herbicide treatment would not require additional permanent employees; it would not require individuals to relocate or leave the local area or subject individuals to adverse environmental conditions. There would be no effect on housing and the activities would not eliminate, or affect residential suitability of, any lands in the project area. There are no environmental justice groups present that could be affected, as the project area is limited to a closed wildlife area with no residents. No offsite effects would occur as a result of these actions. As a result, the degree of effect to socioeconomics and environmental justice would be low.

13. Climate Change

The effects of applying aquatic herbicides at PWA are consistent with the analysis in the Programmatic EA, Section 3.3.14, which concludes that impacts to climate change would be low. Any effects to air quality would be caused by short-term exhaust emissions from machinery and equipment (ATVs, trucks) used for the project activities. These effects would be minor, temporary, and consistent with routine operations and maintenance activities which ODFW conducts on the property. Given the short duration of project activities, the small number of vehicles and equipment used, and estimated emissions well below the EPA's reporting threshold under the Clean Air Act, the impact from greenhouse gas emissions from exhaust would be low and therefore the potential for the activities to accelerate climate change would be extremely low.

Findings

BPA finds that the types of actions and the potential impacts related to the proposed aquatic herbicide treatment of *Ludwigia* at the J.R. Palensky Wildlife Area have been examined, reviewed, and consulted upon and are similar to those analyzed in the Columbia River Basin Tributary Habitat Restoration EA (DOE/EA-2126) and Finding of No Significant Impact. There are no substantial changes in the Programmatic EA's Proposed Action and no significant new circumstances or information relevant to environmental concerns bearing on the Programmatic EA's Proposed Action or its impacts within the meaning of 10 CFR § 1021.314 *et seq.* and 40 CFR §1502.9(d). Therefore, no further NEPA analysis or documentation is required.

/s/ Thomas DeLorenzo
Thomas DeLorenzo
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Concur:

/s/ Katey C. Grange for
Sarah T. Biegel
NEPA Compliance Officer

Date: June 22, 2022

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