

Supplement Analysis
for the
Columbia Estuary Ecosystem Restoration Program EA
(DOE/EA-2006/SA-04)

Sturgeon Lake Restoration Project
BPA project number 2010-004-00
BPA contract number 76317

Bonneville Power Administration
Department of Energy



Introduction

Bonneville Power Administration (BPA) and the U.S. Army Corps of Engineers (Corps) are partners in the Columbia Estuary Ecosystem Restoration Program (Program), which is a collaboration intended to evaluate, protect, monitor, and restore fish and wildlife habitat in the Columbia River estuary.

In July 2016, BPA and the Corps completed the Columbia Estuary Ecosystem Restoration Program Environmental Assessment (DOE/EA-2006) (Programmatic Estuary EA). The Programmatic Estuary EA streamlines the environmental review of routine actions with well understood and predictable environmental impacts common to restoration projects in the Columbia River estuary. The purpose of this supplement analysis (SA) is to provide site-specific information about an individual restoration project proposed under the Program.

Consistent with the Programmatic Estuary EA, this SA analyzes the proposed Sturgeon Lake Restoration Project, which would restore habitat and improve fish passage to Sturgeon Lake and Dairy Creek in Multnomah County, Oregon. The SA analyzes the site-specific impacts of the project to determine if the project is within the scope of the analysis considered in the Programmatic Estuary EA. It also evaluates whether the proposed project presents significant new circumstances or information relevant to environmental concerns that were not addressed by the EA. The findings of this supplement analysis determine whether additional NEPA analysis is needed pursuant to 40 Code of Federal Regulations (CFR) § 1502.9(c).

NEPA History

While BPA is currently the lead Federal agency for the action, the Corps originally proposed this project in 2013 under the name “Dairy Creek/Sturgeon Lake Water Resources Development Act Section 1135 Ecosystem Restoration Project.” At that time, the Corps released the “Dairy Creek Restoration Feasibility Study and Draft EA” for public comment. Due to funding issues, the Corps abandoned the project without responding to comments or releasing a final EA. BPA assumed lead of the project in 2017.

Proposed Action

Sturgeon Lake is the largest body of water on Sauvie Island and serves as an important rearing area for juvenile salmon and steelhead. A historical connection at Dairy Creek currently provides passage to the lake sporadically - only during storm and freshet events. The only year-round connection from the #

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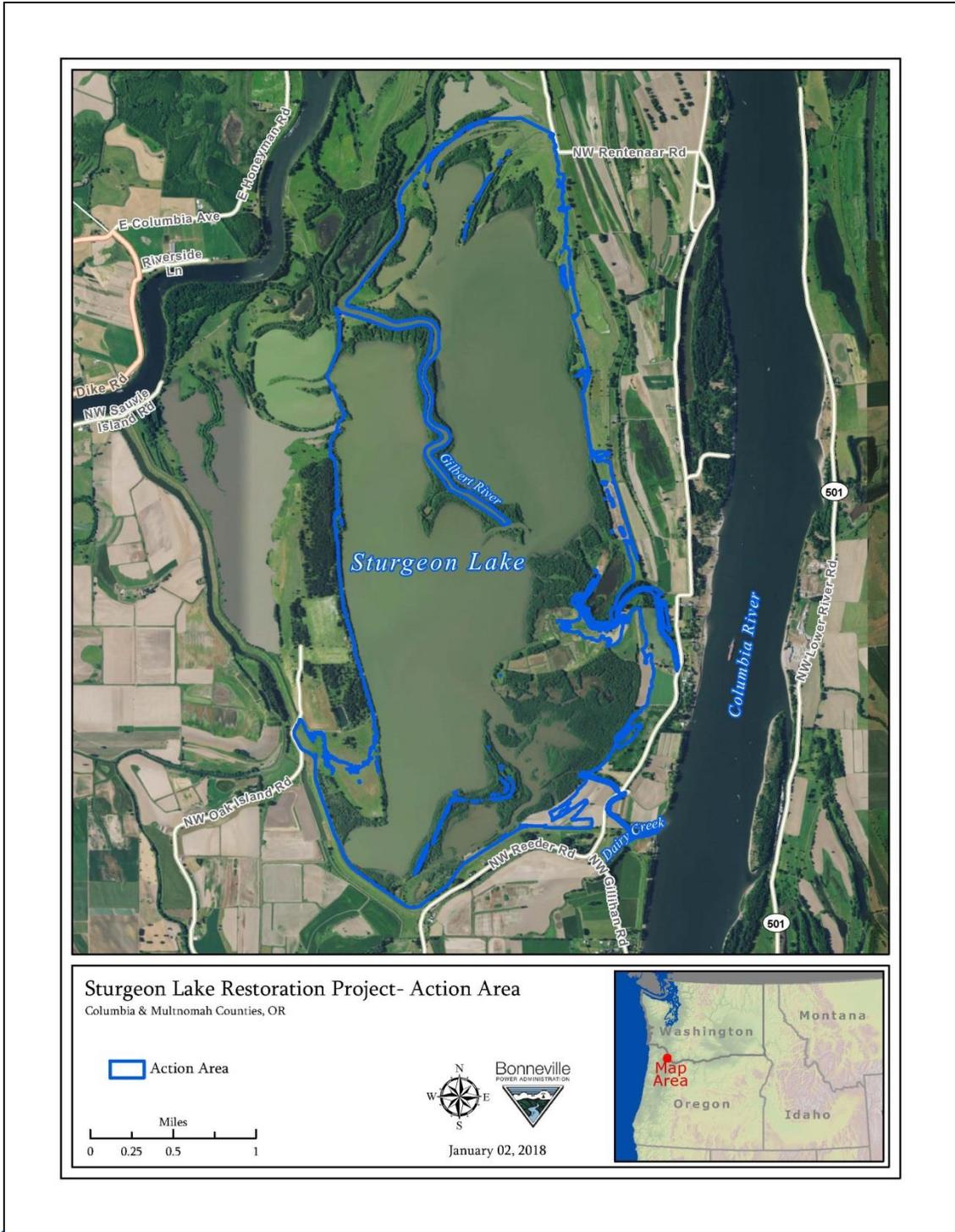


Figure 1. Sturgeon Lake Restoration Project

Under the proposal, BPA would fund the non-profit environmental group Columbia River Estuary Study Taskforce (CREST) to restore year-round connection between the Columbia River and Sturgeon Lake via Dairy Creek. Proposed restoration actions include: replacing two failing culverts with a bridge over Dairy Creek, removing accumulated sediment and debris from Dairy Creek to provide year-round fish passage, planting riparian vegetation in the Dairy Creek channel and on side slopes, removing invasive plants, and

installing a storm-water treatment swale. Post project, fish would only need to travel less than 1 mile to reach Sturgeon Lake via Dairy Creek.

Additional actions, not funded by BPA, would be performed by other parties as part of this action, including: (1) the installation of a debris boom at the mouth of Dairy Creek and (2) expansion of existing bank armor on the south bank of Dairy Creek with the inclusion of large wood and live willow plantings to improve fish habitat, and (3) long-term monitoring and maintenance.

The proposed action would improve habitat for 13 species of salmon and steelhead listed under the Endangered Species Act (ESA), as well as other fish and wildlife. The action is consistent with those considered in the Programmatic Estuary EA, including the following categories of action:

- Placement and maintenance of habitat features to provide structural complexity via the addition of large wood, rock, or other natural materials.
- Removal of invasive emergent and upland plants and weeds by chemical or mechanical means (chemical treatment for control of floating-leaved or submerged invasive plants is not included).
- Plant and protect native vegetation.
- Channel excavation and grading with localized effects on hydrology. Channel work would usually include excavation in floodplains to restore historical tidal channels previously modified through grading, drainage tiles, and linear drainage ditch networks.
- Long-term maintenance of completed estuary restoration projects.
- Tide gate and culvert removal/replacement.
- Construction-related fish salvage and in-water work.

The proposed action is also consistent with the following Columbia River estuary (CRE) module-management actions, developed by National Marine Fisheries Service to aid in the recovery of salmon and steelhead throughout the region:

- CRE-1: Protect intact riparian areas in the estuary and restore riparian areas that are degraded
- CRE-9: Protect remaining high-quality off-channel habitat from degradation, and restore degraded areas with high intrinsic potential for high-quality habitat
- CRE-10: Re-establish or improve access to off-channel habitats
- CRE-15: Reduce the introduction and spread of invasive plants

Public Scoping, Comments, and Responses

When the Corps originally proposed the project in 2013, they conducted scoping, held public meetings, and collected public comments on their draft EA/Feasibility Study. CREST, together with partners at West Multnomah Soil and Water Conservation District (WMSWCD), performed additional outreach, including a project website, community meetings, and a strong signage campaign.

BPA's public scoping began on March 9, 2018, when BPA sent a letter to potentially interested parties. Recipients included adjacent landowners; Native American Tribes; environmental interest groups; and State, local, and Federal agencies. The letter explained the Sturgeon Lake proposal, outlined the environmental review process, requested public comments, and referred the recipients to BPA's website and individual contacts for further information. The public comment period closed on April 9, 2018.

BPA received the following written comments, and has provided responses in italics below:

Comment 1. I have seen the creek and grew up here for 70 years. Please see my comments. We all want this to work.

- Think about #1 when Dairy Creek was flowing – over the past 70 years – it would rise and lower with the Columbia tides. So the creek runs west for a few hours and then runs east for a few

hours. If your dredging and bridge building is successful, the Creek will go back and forth 24 hours a day. You might think about putting a wood wall across the creek to (A) stop boats, canoes, etc. from getting into the lake (B) act like a valve to keep the creek always going west to keep the flow into the lake and out the Gilbert River. The wall would have large doors that can open for the flow west and shut for the flow east.

- *Response: One goal of the project is to allow unobstructed tidal flow into Dairy Creek and Sturgeon Lake. We did not consider any hard barriers across Dairy Creek because we intended for juvenile salmon to access the project area, rest, and rear there, and then readily exit the project to continue downstream migration unobstructed. A hard barrier would block that outward migration from Dairy Creek to the Columbia River. Canoes and boats currently access Sturgeon Lake through the Gilbert River. By opening up Dairy Creek, small boats would be able to access the new channel. At the request of adjacent landowners, the debris boom at the mouth of Dairy Creek has an opening of no more than 10 feet to allow only small watercraft to pass through. Large wood used as in-stream habitat features would dissuade a large amount of new boating in the creek. Water levels during the spring freshet are very high, but summertime water levels would typically be too low to allow boat passage during low tide.*
- [think about] #2. The access road for your equipment is on my, and three other families' property. You will have to upgrade it to get in your equipment. We would like to have some input in how you will leave the road when the project is done. Best of luck on the project.
 - *Response: CREST and project partner WMSWCD are committed to making sure that the private landowner needs are fully met for this project. WMSWCD is securing easements with the private landowners to ensure that the access roads and staging areas would be graded, seeded, and returned to acceptable condition for the landowners after project completion.*

Comment 2. I support the Sturgeon Lake Restoration project and encourage the creation of additional habitat. I own the property just North of the project at [address redacted]. I hope in this process Dairy Creek as it flows North and South parallel with Reeder Road (on the East side) will be unplugged from material. This material particularly near the culvert at 24512 Reeder Rd seems to be inhibiting the flow North of there, creating stagnant water during much of the year. If the creek is allowed to flow, it will increase habitat and decrease the mosquito population. The area I am most concerned with is the creek between: 24512 and 25602 Reeder.

- *Response: The proposed action would have little effect on hydrology in this portion of the historical alignment of Dairy Creek. Several undersized and/or plugged culverts occur in this area, located in the channel beneath driveway crossings. While the proposed action may allow for more water in that channel, these culverts would restrict flow, such that water levels would differ little from the current condition. Further, the proposed action is not likely to drain the stagnant water from the channel, because there would be no change to the elevation of the channel bed where the historical channel branches north. Project partners did evaluate the channel during the original alternatives analysis. They determined that replacing the culverts and removing the debris plugs was cost prohibitive to be a viable alternative, especially given the small amount and low-quality of the habitat that would have been created.*

Comment 3. The Confederated Tribes of the Grand Ronde Community of Oregon (Grand Ronde Tribe) would like to actively engage with BPA on this project in our ceded lands, starting with a staff-to-staff meeting.

On May 15, 2018, BPA attended an in-person meeting with the Confederated Tribes of the Grand Ronde at their request. Input received at the meeting included: (1) the Tribes are very supportive of the project; (2) the Tribes requested archaeological monitoring and offered to provide language for project's long-term monitoring plan to address archaeological monitoring, including an "airtight" inadvertent discovery plan; (3) consider planting oak, cedar, wapato, sedges, rushes, cattail, and other plants of cultural interest; (4) consider adaptive management of plantings on the site to address long-term changes in climate, salinity, and water table level; (5) consider sharing information with archaeologists at PSU who are developing a research strategy for Sauvie Island; and (6) sediment is accreting on the east side of the island. Consider adaptively managing sediments at the Dairy Creek confluence with the Columbia River.

Responses to these comments are addressed in the next section.

Environmental Effects

The typical environmental impacts associated with the Columbia Estuary Ecosystem Restoration Program are described in Chapter 3 of the Programmatic Estuary EA, and are incorporated by reference and summarized in this document. Below is a description of the potential site-specific impacts of the Sturgeon Lake Restoration Project and an assessment of whether these impacts are consistent with those described in the Programmatic Estuary EA.

Much of the site-specific analysis cited in the environmental impacts section below comes from several sources: the Corps' *Dairy Creek Restoration Feasibility Study and Draft EA*, BPA's "Sturgeon Lake Restoration Project Biological Assessment," and CREST's Basis of Design Report.

1. Fish

Overall, the action is expected to have moderate, beneficial effects on fish. ESA-listed fish in the project area include chum, coho, Chinook, steelhead, eulachon, and green sturgeon. Because the channel work would be completed in the dry and in isolation from fish-bearing waters, direct effects during construction are not anticipated. However, after construction is completed, when rainfall or surface flow first enters onto newly disturbed soil in the channel, turbidity in the Dairy Creek and the Columbia River could be elevated temporarily. However, injury or mortality is unlikely to occur due to the limited duration and spatial extent of the impact, the erosion control measures used to limit sedimentation in Dairy Creek, and the high dilution levels that would be provided by the Columbia River and Dairy Creek.

Beneficial effects would far outweigh the temporary negative impacts. These include: increased access to food, resting, growth areas in Sturgeon Lake (270 acres) and Dairy Creek (7.7 acres); improved fish passage through replacement of the failing culverts with a bridge; and sediment flushing in Sturgeon Lake. Additionally, out-migrating juvenile salmonids would travel a more direct route from the Columbia River through Dairy Creek to Sturgeon Lake, rather than making a 14 to 22-mile detour via Gilbert Creek.

In a letter dated March 2, 2018, National Marine Fisheries Service concurred that the action would not jeopardize listed fish and would result in a beneficial effect.

These impacts are consistent with the analysis in the Programmatic Estuary EA, Section 3.2.4, which concludes that impacts to fish would be moderate and beneficial because of the increased food web support, conversion of vegetation to more natural conditions, restored and improved hydrology, and enhanced water quality.

2. Hydrology and Hydraulics

Hydrology and hydraulic modeling was completed for the project to determine flow paths, water depths, and the inundation duration. The purpose of the modeling was to ensure that the project would

achieve the habitat goals while protecting adjacent property and infrastructure. In addition to being designed by a professional engineer, this project has been reviewed by a BPA hydrologic engineer to ensure that the design would achieve the restoration goal. The modeling showed the following effects to Sturgeon Lake, Dairy Creek, and the Columbia River. These impacts are consistent with the analysis in the Programmatic Estuary EA, Section 3.3.3, which concludes that impacts to hydrology and hydraulics would be moderate. These impacts discussed in the Programmatic Estuary EA, Section 3.3.3 include: erosion, scour, and in-channel deposition; increased frequency and duration of inundation; localized changes in velocity, flow, and circulatory patterns; reconnection of channel habitats; and increased instream flows.

Sturgeon Lake: During the spring freshet, water would enter Sturgeon Lake via Dairy Creek in much higher volumes than the current condition. High tides are expected to drive water in to the lake until water-surface elevations are in equilibrium with the Columbia River and Multnomah Channel. Currently, during summer low-flow (August through October), a large plug of wood and accumulated sediment in Dairy Creek prevents exchange of water between the Columbia River and Sturgeon Lake. Post-project, after removal of the plug, water would flow into the lake during high tide and exit the lake at low tide. The biggest changes are expected in winter (November through March). During this time period, hydrologic connection between the lake and the Columbia River would be nearly continuous (USACE 2015).

Dairy Creek: Replacing two undersized culverts with a full-channel-spanning bridge would restore hydraulic control to a normative, unmanaged state. The bridge and channel were designed using the stream simulation approach; that is, matching the slope of the existing channel upstream and downstream of the crossing. The greatly expanded new bridge opening would reduce the probability of catastrophic damage to aquatic habitats associated with undersized culverts during extreme high flows and movement of large debris. The scour countermeasures (large rock) placed under the bridge would provide further stability.

Removing the sediment plug and reconfiguring the channel would improve hydrologic function in Dairy Creek. This design would provide 7.7 acres of channel habitat with tidal flow on a near daily basis, with both a high-flow and a low-flow channel. Installing the bank treatment along the south bank would also stabilize the streambank. Additionally, the large wood elements embedded in the bank would promote the formation of important fish-habitat elements, such as channel complexity, pool formation, and retention of gravel and organic material. The structure is expected to dissipate stream energy, thus reducing the erosive force of the stream on vulnerable banks.

During the spring freshet, accumulation of sand and woody debris is expected at the mouth of Dairy Creek. Likewise, when the Willamette River is flooding, sediment and debris could mobilize into Dairy Creek. The debris boom and bank treatments would limit this effect, as would periodic future maintenance cleaning of the channel. During the summer, a net loss of sediment from Sturgeon Lake through Dairy Creek is anticipated. Shoaling is not expected at the mouth of Dairy Creek in summer, because the low-flow channel would concentrate flow, keeping sediment suspended and preventing deposition at the mouth.

Columbia River: During summer through early fall, Sturgeon Lake is expected to contribute sediments to the Columbia River through Dairy Creek. The amount of sediment would be negligible relative to the vast area and existing sediment loading of the Columbia River.

3. Water Quality

Over the long term, water quality in Sturgeon Lake is expected to improve as the lake would have two full tidal openings (Dairy Creek and the existing connection through the Gilbert River). This increased

flow and flushing effect should also slow down sediment accumulation in Sturgeon Lake, particularly at the south end. Additionally, the improved circulation is expected to reduce algal blooms in Sturgeon Lake. This, in turn, would improve dissolved oxygen and pH conditions, although this has not been quantified. Post-project, water temperatures would still be high in Sturgeon Lake. However, flow models predict that tidal inputs in the summer would lower water temperatures from 19.8°C to 18.6°C, extending the juvenile salmonid rearing period by a few weeks (USACE 2013).

In the short term, during first re-watering after construction, slight, localized increases in suspended sediment could occur in Dairy Creek and the Columbia River, but these impacts would be short in duration, diluted by high flows, and mitigated by following sediment and erosion control practices.

The impacts associated with the project are consistent with those described in the Programmatic Estuary EA, Section 3.4.3, which concludes that effects to water quality would be low to moderate and mitigated by sediment and erosion control practices. The impacts discussed in the Programmatic Estuary EA, Section 3.4.3 include: increased riparian buffer width; increased vegetation cover; localized decrease in non-point source pollution; changes in land use practices minimizing sediment and contaminant inputs; increased flows, tidal exchange, and flushing; increased channel complexity and alignment; and decreased composition, distribution, and quantity of invasive species.

4. Geomorphology, Soils, and Topography

Direct impacts to soils would result from temporary construction activities, including vegetation clearing, grading, and compaction of soils by heavy equipment during construction. Clearing and grading would remove both vegetation and topsoil. Compaction from heavy equipment degrades soil structure, reducing pore space needed to retain moisture and promote gas exchange.

Short-term construction-related impacts would include a temporary increase in soil erosion or temporarily elevated suspended sediments in Dairy Creek or the Columbia River. These impacts would be mitigated by the use of erosion and sediment control devices, designed and installed by a certified erosion control specialist.

Over the long term, impacts would be beneficial due to the restoration of the natural soil-forming process, sediment flushing, and floodplain function.

Sediment may be accreting on the east side of Sauvie Island, including the project area; thus, sediments would be adaptively managed over the long term to keep the channel open. First, the Corps has agreed to stop placing dredge material near the mouth of Dairy Creek. Second, the Oregon Department of Fish and Wildlife (ODFW) would perform future channel maintenance and if needed, remove any material blocking the channel.

The project would not result in any changes to the operation of the existing Reeder Road, but would instead reduce the risk of failure of the undersized culvert. Over the long term, the Dairy Creek streambank would be stable due to the addition of bank armor under the bridge and on the south bank of Dairy Creek, and due to the installation of native plantings.

Project impacts are consistent with those described in the Programmatic Estuary EA, Section 3.5.3, which predicted that construction would have moderate temporary effects, and that long-term impacts would be beneficial. The impacts discussed in the Programmatic Estuary EA, Section 3.5.3 include: temporary erosion and sedimentation; altered channel form, structure, and density; localized changes in velocity, flow, and circulatory patterns; restored sediment transport; and restored spatial and temporal connectivity of streams and wetlands.

5. Sediment Quality

The project would remove about 22,000 cubic yards of material from the Dairy Creek channel and place it in the designated upland disposal areas. This action would loosen sediments in Dairy Creek, which would later be suspended in the water column and redistributed within the estuary upon rewatering.

The Corps commissioned a Phase 1 Environmental Site Assessment, which indicated that contaminated sites are not located in or near the project area. A site visit, conducted on May 30, 2013, did not find any indications of contaminated media in the project area. Field sampling determined that all sediments were suitable for exposure to water after excavation (USACE 2013). Thus, the project poses little risk of exposing or mobilizing contaminated sediments. Over the long term, effects could be beneficial, as the export of sediment would increase organic matter in the Columbia River, with potential benefits to the aquatic food web.

These impacts are less than those described in the Programmatic Estuary EA, Section 3.6.3, which concluded that effects to sediment quality would be moderate. The impacts discussed in the Programmatic Estuary EA, Section 3.6.3 include: changing hydrologic flow patterns; floodplain and tidal reconnection; increasing organic materials in sediments; and introduction of pollutants.

6. Air Quality

Vehicle emissions during the transportation and operation of construction equipment could cause a minor temporary decrease in air quality for the duration of on-the-ground work. Impacts would be low and would not result in violations of state air-quality standards. As described in the Programmatic Estuary EA, Section 3.7.3, impacts on air quality would be low both in concentration and duration. The impacts discussed in the Programmatic Estuary EA, Section 3.7.3 include: temporary and localized increase in dust and pollutants, such as carbon monoxide, nitrogen dioxide, particulates, sulfur dioxide, ozone, or lead.

7. Wildlife

In the short term, noise and visual disturbance during construction would likely cause wildlife to avoid the project area during the construction period. If present during construction, nesting birds, smaller ground-dwelling mammals, reptiles, and amphibians could be harmed or killed incidentally during construction. In the longer term, effects to wildlife are expected to be beneficial. The action would improve breeding and feeding habitat for semi-terrestrial animals such as beaver, amphibians, waterfowl, shorebirds, and insect-eating birds. Likewise, wildlife that use riparian areas would benefit from the planting of native trees and shrubs in the Dairy Creek channel.

ESA-listed Columbian white-tailed deer adults likely use the project area, but suitable fawning habitat is not present. The action would avoid impacts by observing herbicide-buffer zones and timing restrictions developed by BPA and U.S. Fish and Wildlife Service (USFWS) to avoid adverse effects to the deer. BPA consulted with USFWS about impacts to listed wildlife, and concurrence was obtained on April 11, 2018.

These impacts are consistent with the Programmatic Estuary EA, Section 3.8.3, which concluded that effects to wildlife would be moderate and beneficial. The impacts discussed in the Programmatic Estuary EA, Section 3.8.3 include: noise or visual disturbance to wildlife, displacement of individual animals, and habitat conversion.

8. Wetlands, Floodplains, and Vegetation

In the short term, construction would directly affect regulated waters in the project area. Excavation would occur within the Dairy Creek channel, but these areas would be restored following construction. The project would ultimately increase the acreage of wetlands by introducing Columbia River flow to

areas of Dairy Creek that are now inundated only rarely. Additionally, wetland quality would improve due to the restoration of natural flow patterns and the replacement of invasive species with native trees, shrubs, wapato, grasses, and sedges. Some oak and cedar trees would be planted at the highest portions of the site. Although requested by the Grand Ronde, cattail would not be planted, due to its tendency to become invasive.

The action may reduce the rate of sedimentation and aggradation in the lake, but only slightly. Modeling predicts that water level in the Lake would remain the same. The actions would restore natural ecological function to the Dairy Creek floodplain, improving floodwater conveyance and storage capacity.

These impacts are consistent with the Programmatic Estuary EA, Section 3.9.3, which predicted beneficial effects. The impacts discussed in the Programmatic Estuary EA, Section 3.8.3 include: alteration of wetland hydrology; restoration of wetland-forming processes; increased wetland area, habitat complexity, composition of native vegetation, riparian buffer area, vegetation cover, and quantity of tidal marsh habitat flows, tidal exchange, and flushing; and decreased composition, distribution, and quantity of invasive species.

This Floodplain Statement of Findings was prepared in accordance with the Department of Energy's NEPA implementing regulations and in compliance with Floodplain and Wetland Environmental Review Requirements (10 Code of Federal Regulations 1021 and 1022). Chapters 3, 4, and 5 of the Programmatic Estuary EA provide an assessment of impacts to floodplains and wetlands. Consistent with the Programmatic Estuary EA (including Section 3.9.9), the Sturgeon Lake project would restore floodplain connectivity and function and improve wetland function and value, as described above. Additionally, the project would not result in floodplain development. While the project may impact wetlands in the short term, the overall long-term impacts would be beneficial, because the goal of the project is to create more wetland acreage and improve wetland quality, compared to the current condition.

9. Land Use and Recreation

Project construction would temporarily affect small areas of agricultural and recreational uses. To allow for construction access, some of the lands currently used for crop production and managed wildlife habitat would be temporarily transformed into construction roads and staging areas. Permanent access, consisting of an earthen road cut into the bank of Dairy Creek, would be built to allow construction vehicles to maintain the Dairy Creek channel.

Disposal sites would encompass 6 acres of land. ODFW currently leases this land for hay farming and would continue to do so post-project; thus, a low impact. The Project would not encourage or influence land-use changes in the area.

Project operations would have no effect on the current use of Sturgeon Lake and the Columbia River. However, the improvements to Dairy Creek may have long-term beneficial effects to recreation. Since the action would benefit fish, waterfowl, and other recreationally-managed species, hunting and fishing opportunities on Sauvie Island could improve. In addition, removal of debris would allow recreational small craft access to Dairy Creek during higher water events. The debris boom at the mouth of Dairy Creek would have a gap of no more than 10 feet wide to prevent larger craft from entering, at the request of adjacent landowners.

These impacts are consistent with the Programmatic Estuary EA, Section 3.10, which described low to moderate impacts to land use and recreation. The impacts discussed in the Programmatic Estuary EA,

Section 3.10.3 include: changes in land ownership, removal of drainage structures, and changes in access to recreational opportunities.

10. Cultural Resources

The Corps performed site-specific Section 106 cultural resources consultation in 2013, and again in 2016 when a new disposal area was added to the project. The Corps consulted with Oregon State Historic Preservation Office, Confederated Tribes of the Grand Ronde, Confederated Tribe of Siletz Indians, and Confederated Tribes of the Warm Springs Reservation of Oregon. In both instances, the SHPO concurred with the determination of no historic properties affected.

BPA later adopted the project, added a new disposal site, and initiated consultation with the same parties on November 7, 2017. Archaeological consulting firm Willamette CRA conducted a field survey and prepared a cultural resources report with the determination of no historic properties affected. While two isolated artifacts were identified in the project area, both were deemed ineligible for inclusion in the National Register of Historic Places. SHPO concurred with the determination on February 27, 2018.

At the request of Grande Ronde, CREST and a BPA archaeologist would work directly with the Grand Ronde Tribal Historic Preservation Officer to develop a long-term management plan and inadvertent discovery protocol (IDP). CREST would present the IDP at the pre-construction meeting to ensure that the construction contractor follows the protocol. If any discoveries are made, CREST would immediately halt construction and notify BPA, who would then notify all of the consulting parties. Additionally, WMSWCD proposes to share information with PSU archaeologists who are developing a research strategy for Sauvie Island. This would be a beneficial effect, as it could contribute to the body of knowledge regarding the rich cultural history of Sauvie Island.

Cultural resources impacts are consistent with the analysis in the Programmatic Estuary EA, Section 3.11.3. That is, the action would not impact historic sites, and impacts to cultural resources uncovered during construction would be mitigated by the use of IDPs. Therefore, impacts would be low. The impacts discussed in the Programmatic Estuary EA, Section 3.11.3 include: reestablishment of tidal channels, reestablishment of wetland and riparian plant communities, and removal of structures.

11. Socioeconomics

The project would result in small, temporary, beneficial impacts to socioeconomics by providing jobs for construction workers. Long-term benefits could result from the improvement of fish runs and natural scenery. The action would not displace residents or degrade residential suitability; nor would it cause changes to the tax base. CREST has worked with adjacent landowners to come up with a plan that is beneficial to all parties' needs. WMSWCD is securing permanent easements along the riparian corridor; however, these areas will not be open to the public, since they are accessed through private lands. The new stream channel would be considered a water of the State, and thus would be open to the public.

The expected socioeconomic impacts would be low, consistent with those described in the Programmatic Estuary EA, Section 3.12.3. The impacts discussed in the Programmatic Estuary EA, Section 3.12.3 include: short-term employment opportunities, local short-term traffic or lifestyle disruptions due to construction, land use conversion, and improvements to fisheries.

12. Visual Resources

The project area can be seen from Reeder Road and the Columbia River. In the short term, construction and disposal would temporarily leave areas of bare soil visible from these two places. However, this

effect would be mitigated by the installation of erosion and sediment control devices, removal of weeds, and replanting of all areas of bare soil.

In the long term, removal of accumulated sediment and replacement of an undersized culvert with a bridge in Dairy Creek would increase hydrologic connectivity, resulting in an increase in the quality and size of the wetland within the project site. The improved channel would be seeded and planted with native woody riparian vegetation, resulting in a more natural looking environment.

This impact is consistent with the visual resources analysis in the Programmatic Estuary EA, Section 3.13.3, which characterized these effects as low to moderate. The impacts discussed in the Programmatic Estuary EA, Section 3.13.3 include: short-term visual impacts related to construction, and long-term impacts associated with changing the visual condition from a managed state to a more natural landscape.

13. Noise, Hazardous Waste, Public Health, and Safety

Noise level is expected to increase intermittently above ambient conditions during the construction period. The project would not result in any long-term effects to ambient noise levels during operation. Requirements to minimize these effects would be considered during the development of construction specifications.

The Corps commissioned a Phase 1 Environmental Site Assessment, which indicated that contaminated sites are not located in or near the project area. A site visit conducted on May 30, 2013 did not find any indications of contaminated media in the project area. Field sampling determined that all sediments were suitable for exposure to water after excavation (USACE 2013).

Potential safety risks could be associated with increased area, elevation, and duration of flowing water in Dairy Creek. The public could access this water either by small water craft during high flows, or on foot via a permanent earthen maintenance road that would be constructed as part of the project. However, because water levels are expected to rise and fall slowly with the natural tides, safety risks are anticipated to be low. Likewise, the installation of a storm-water treatment swale would further moderate flow in Dairy Creek.

This is consistent with the analysis in the Programmatic Estuary EA, Section 3.14.3, which described low effects to noise, hazardous waste, public health, and safety. The impacts discussed in the Programmatic Estuary EA, Section 3.14.3 include: short-term noise during construction and maintenance, potential encounters with contaminated media during construction, and risks to safety due to change in hydrologic regime after construction.

14. Transportation and Infrastructure

The project would have temporary, short-term impacts on transportation and infrastructure during construction. Traffic would be routed around a temporary bridge from the time that the culverts are demolished until the time that the new bridge is built and operational (approximately 10 weeks, from July through August). During that time, traffic delays are expected, especially during summer weekends when traffic is often heavy through the project area *en route* to Columbia River beaches. This would be mitigated by using traffic control and staging heavy equipment off of public roadways. In the long term, the project would benefit transportation, as the larger bridge opening would pass larger flows and larger debris, thus reducing the probability for catastrophic damage or failure of the crossing during high-water events. This is consistent with or less than the effects in the Programmatic Estuary EA, Section 3.15.3, which described moderate effects to transportation.

The project would not have any impacts on navigation on the Columbia River; however, Dairy Creek would be navigable by small craft more frequently. This is consistent with or less than the effects in the Programmatic Estuary EA, Section 3.15.3, which described low effects to navigation.

The impacts discussed in the Programmatic Estuary EA, Section 3.15.3 include: temporary increase in traffic, changes in navigation, and potential damage to infrastructure due to changes in flow patterns.

15. Climate Change

Vehicles and equipment operating during construction and maintenance of the project could have negative impacts to climate change. However, over the long term, effects are expected to be positive, as the restoration would create a carbon sink that would store carbon dioxide and help mitigate for the release of greenhouse gases.

Plantings would be adaptively managed to address long-term changes in climate (and resulting effects to salinity, surface-water elevation, and groundwater elevation). The riparian area would be replanted first, immediately after construction is completed. The emergent marsh would be planted the following fall, allowing time for natural recruitment of emergent marsh species. Both areas would be planted with a variety of native species at a range of elevations to allow plants to adapt to a range of water levels, salinities, and other fluctuating environmental conditions. WMSWCD would monitor and maintain the plantings over the long term, replanting if necessary. Although climate change may increase temperatures, change precipitation patterns, cause more extreme weather events, and raise sea levels, these impacts would likely occur regardless of the Sturgeon Lake project. Replacement of undersized culverts with a bridge would create a larger opening that would pass larger flows. Likewise, improving access to Sturgeon Lake would provide refuge areas to juvenile fish during more extreme flows in the Columbia River.

Overall, the long-term impacts on climate change from the project are expected to be low and beneficial, consistent with the impacts described in the Programmatic Estuary EA, Section 3.16.3. The impacts discussed in the Programmatic Estuary EA, Section 3.16.3 include: both the release and sequestration of greenhouse gases, and the buffering of sea-level rise, particularly during extreme flows.

Findings

This SA finds that the types of actions and the potential impacts related to the proposed Sturgeon Lake Restoration Project have been examined, reviewed, and consulted upon and are similar to those analyzed in the Columbia Estuary Ecosystem Restoration Program Environmental Assessment (DOE/EA-2006) and Finding of No Significant Impact. There are no substantial changes in the proposed action and no significant new circumstances or information relevant to environmental concerns bearing on the proposed action or its impacts within the meaning of 10 CFR § 1021.314(c)(1) and 40 CFR §1502.9(c). Therefore, no further NEPA analysis or documentation is required.

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Reviewed by:

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Concur:

/s/ Sarah T. Biegel

Sarah T. Biegel

NEPA Compliance Officer

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