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ODFW also wishes to acknowledge the following project partners who have contributed to the development of this plan and the conservation of the Gail Achterman Wildlife Area:

- AgriCare and Agriculture Capital, Inc.
- Gail Achterman Legacy Group
- Bonneville Environmental Foundation
- Bonneville Power Administration
- City of Salem
- Columbia Land Trust
- Equilibrium Capital Group
- Glen-Gibson Watershed Council
- Institute for Applied Ecology
- Meyer Memorial Trust
- Oldcastle Materials
- Oregon Community Foundation
- Oregon Department of Geology and Mineral Industries
- Oregon Department of Transportation
- Oregon Parks and Recreation Department
- Oregon Watershed Enhancement Board
- Oregon Wildlife Heritage Foundation
- PGE Foundation
- River Design Group
- Rose E. Tucker Charitable Trust
- Salem Audubon
- Salem Yacht and Boat Club
- Samuel S. Johnson Foundation
- Straub Environmental Center
- The Nature Conservancy
- Trout Mountain Forestry
- Trust for Public Lands
- Wetlands Conservancy
- Willamette Riverkeeper
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The vision for preservation of this site is credited to the late Gail Achterman and her friends and family. An Oregon conservation leader committed to an economically and ecologically sustainable future for the Willamette Basin, her passion for the natural world inspired the coming together of citizens, land trusts, charitable foundations, non-governmental organizations, and state and federal agencies, to secure the funding and partnerships necessary to support the purchase of the Gail Achterman Wildlife Area and ensure permanent conservation of the site’s natural values.

Photo credits: Ann Kreager unless otherwise indicated.
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Executive Summary

In May 2016, the Oregon Department of Fish and Wildlife (ODFW) took ownership of the Gail Achterman Wildlife Area (GAWA), a 290.8 acre site located on the Willamette River mainstem just outside of Salem, Oregon. Formerly recognized as Hayden Island, it is one of the largest and most intact riparian forests remaining between the Willamette River’s confluence with the Santiam River and Willamette Mission State Park. Consisting entirely of priority habitats identified by the Oregon Conservation Strategy (OCS) (ODFW 2016), this forest was slated to be logged and mined for gravel before significant efforts were undertaken to secure the site in perpetuity for conservation purposes.

In 2010, the Bonneville Power Administration (BPA) and the State of Oregon signed an agreement to settle BPA wildlife habitat mitigation obligations in the Willamette Valley, guaranteeing more than $117 million for fish and wildlife habitat conservation and restoration, protecting a minimum of 16,880 acres of important native habitats by the end of 2025. To accomplish this mitigation objective the parties established the Willamette Wildlife Mitigation Program (WWMP), managed by the ODFW.

ODFW granted BPA and the Oregon Watershed Enhancement Board (OWEB) a permanent conservation easement on the property in exchange for the program funds. The Conservation Values identified under the conservation easement for the property (Appendix 1) include riparian and wetland habitats, two miles of Willamette River mainstem bank, and approximately 1.5 miles of a back channel. The property may serve as a “habitat stepping stone” and provide cold water refuge and critical life history functions for listed species and species of conservation concern including Chinook salmon (*Oncorhynchus tshawytscha*), winter steelhead (*Oncorhynchus mykiss*), cutthroat trout (*Oncorhynchus clarki*), Oregon chub (*Oregonichthys crameri*), Pacific lamprey (*Entosphenus tridentata*), western pond turtle (*Actinemys marmorata*), and red-legged frog (*Rana aurora*).

This Management Plan (Plan) describes the overall goals and objectives of ODFW’s management of GAWA for the next 10 years (2018-2028), and serves to guide restoration and management actions as well as public access and use. The Plan builds on the conservation easement and the OCS, provides context for the site’s local and regional conservation importance, documents site features and history, and designates the habitat types and species that will be the focus of management and restoration actions. It describes the present and desired future conditions for the site and then outlines a suite of actions to move the site towards those conditions, including a schedule of implementation. The Plan is based on an adaptive management framework, recognizing the importance of monitoring and evaluation, and the value of integrating improved understanding of the site into ongoing restoration and management regimes.
The long-term management goals for the Gail Achterman Wildlife Area include:

- Maintain the structure and function of wetlands and riparian habitats.
- Enhance habitat features for wetland and riparian-dependent wildlife species.
- Support natural hydrologic processes.
- Protect significant cultural resources.
- Provide compatible public use and access to the site.
- Conduct monitoring for program compliance to ensure implementation of the management plan, and effectiveness.

Under this Plan, the existing habitats will be protected and restored where needed. The anticipated increase in native plant and wildlife diversity at GAWA will also provide visitors with increased wildlife viewing, hunting, and other recreational activities.
1 Introduction and Background

Located in the central portion of the Willamette Valley, Polk County, Oregon, GAWA borders the Willamette River west of the city limits of Salem and south of Highway 22 (Figure 1).

Funding for acquisition was provided by BPA, OWEB, the Trust for Public Land (TPL), and the Oregon Department of Transportation (ODOT). In May 2016, the Trust for Public Lands conveyed the site to the ODFW for permanent ownership and conservation protection. ODFW granted BPA and OWEB a permanent conservation easement on the property in exchange for program funds. The property is the fourth site purchased by ODFW under the WWMP. Property information details are provided in Table 1.

The island hosts OCS habitats, including black cottonwood (*Populus trichocarpa*) and Oregon ash (*Fraxinus latifolia*) dominated riparian forests, off-channel habitats, and a floodplain slough, and holds potential for improving habitat conditions for numerous native fish, wildlife and plant species, including several species that are in decline in the Willamette Valley.

The WWMP aims for projects that meet the following goals:

- Protect wildlife habitat with significant cultural value;
- Use cost-sharing measures to ensure the WWMP meets or exceeds its protected acreage goal;
- Draw on partnerships to enhance the likelihood of successful project completion;
- Provide public access to WWMP properties in a manner consistent with each site’s Conservation Values; and
- Encourage the use of ecosystem services markets.

1.1 Purpose of the Management Plan

This Plan provides the guidance for site management and restoration for the next ten years (2018-2028). It summarizes existing site conditions, past uses, and site history, envisions future habitat conditions, outlines public access and use opportunities, communicates management and restoration goals and objectives, provides a timeline for undertaking maintenance and restoration actions, and suggests a monitoring strategy. Management and restoration goals and desired future conditions (DFC) identified in this Plan will serve as the foundation for the development of more specific operational prescriptions and budgets for individual projects, as well as for grant applications to secure restoration funding.

The OCS, an overarching plan to conserve Oregon’s fish and wildlife, and their habitats, guides project selection in the WWMP, and provides the foundation for management of GAWA. It is predicated on using the best available science to create a broad vision for long-term conservation of Oregon’s native fish and wildlife, as well as various invertebrates and native plants. Goals and objectives set by this Plan will assist with conserving, restoring, and
reconnecting key habitats in the area to help achieve habitat and wildlife goals in the Willamette Valley consistent with the vision set by the OCS.

The Willamette Valley ecoregion has one of the fastest growing human populations in Oregon and supports the state’s three largest urban centers. Goals and objectives set by this Plan will assist with conserving, restoring, and reconnecting key habitats in the area to help achieve wildlife and habitat goals in the Willamette Valley consistent with the vision set by the OCS.

**Figure 1.** GAWA Site Location and Surrounding Vicinity
**Table 1** Acquisition and Property Information

<table>
<thead>
<tr>
<th>Acquisition:</th>
<th>Gail Achterman Wildlife Area (also known as Hayden Island)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Acreage:</td>
<td>290.8</td>
</tr>
<tr>
<td>Acquisition Cost:</td>
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<tr>
<td>Funding Sources:</td>
<td>Willamette Wildlife Mitigation Program, Oregon Watershed Enhancement Board, Trust for Public Land (private donations), Oregon Department of Transportation</td>
</tr>
<tr>
<td>Acquisition Date:</td>
<td>5/26/2016</td>
</tr>
<tr>
<td>Conservation Easement:</td>
<td>Held by Bonneville Power Administration and Oregon Water Enhancement Board</td>
</tr>
<tr>
<td>Location:</td>
<td>Polk County, nearest city: Salem</td>
</tr>
<tr>
<td>Stewardship Fund(s):</td>
<td>$ 170,000</td>
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<tr>
<td>T-R-S / Tax Lots</td>
<td>7S 4W Section 36 and 31 / Tax Lots 600, 601, and 602</td>
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<tr>
<td>Lat/Long:</td>
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<tr>
<td>River Mile:</td>
<td>89-88</td>
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<td>Zoning:</td>
<td>Exclusive Farm Use</td>
</tr>
<tr>
<td>Water Rights:</td>
<td>There are no surface water rights</td>
</tr>
<tr>
<td>Focal Species:</td>
<td>Chinook salmon, winter steelhead, willow flycatcher, western pond turtle, Oregon chub, and others (see Table 8 for comprehensive list)</td>
</tr>
<tr>
<td>Non-Native Species:</td>
<td>Water primrose, reed canarygrass, Armenian blackberry, English ivy, and others (see Table 3 for comprehensive list)</td>
</tr>
</tbody>
</table>
The Plan contents and structure meet OWEB and BPA requirements as described in the Conservation Easement (2016), the WWMP’s Management Plan Template (2017), and OWEB’s Management Plan Guidance (2015). As with any restoration and management plan, the goals and objectives outlined in the Plan drive actions by ODFW on the ground; timing and/or sequencing outlined in the Plan are projections and actual timing will be contingent on evaluation of effectiveness of the treatments to ensure project success, and also in response to available funding. Targets and success criteria for GAWA will be based on achieving habitat restoration and management goals and objectives identified in this Plan within the prescribed timeline.

1.2 Conservation Values and Ecological Significance

The purchase of the site by ODFW preserves the property in perpetuity, and the conservation easement on the property held by BPA and OWEB designates that the site be managed for preservation of the site’s documented Conservation Values.

The permanent conservation easement lists the Conservation Values associated with the property at the time of purchase. As stated therein (Appendix 1), the property’s Conservation Values include, but are not limited to:

- Location within a priority conservation area for riparian and wetland habitats identified in the OCS; and
- Approximately two miles of Willamette River mainstem bank, one and one-half miles of a back channel, and active floodplain connections within the 100-year Willamette River floodplain; and
- Large, relatively intact riparian forest between the Willamette River’s confluence with the Santiam River and Willamette Mission State Park; and
- Wetland and riparian habitats, and bottomland hardwood forests comprised of native species including black cottonwood, Oregon ash, and red-osier dogwood; and
- Location within a conserved habitat network on the mainstem Willamette River that may serve as a “habitat stepping stone” and provide cold water refuge and critical life history functions for listed species and species of conservation concern including Chinook salmon, cutthroat trout, Oregon chub, Pacific lamprey, western pond turtle, and red-legged frog.

BPA and ODFW agree the Conservation Values may periodically fluctuate or trend toward long-term change, due to natural events such as wildfire, floods, interdecadal climate events, and long-term climate change, as well as human-initiated enhancement or restoration actions.
1.3 ODFW Mission and Authority

ODFW’s mission is, “To protect and enhance Oregon’s fish and wildlife and their habitats for use and enjoyment by present and future generations.” ODFW is the only state agency charged exclusively with protecting Oregon’s fish and wildlife resources, and the state wildlife policy (ORS 496.012) and food fish management policy (ORS 506.109) govern management of fish and wildlife resources. ODFW’s authorities are further defined in Oregon Administrative Rule.

1.4 Property and Administrative Oversight

ODFW acquisition of properties through the WWMP follow the general priorities of acquiring lands adjacent to existing wildlife areas to add connectivity, and additional habitat or acquisition of lands that, while not adjacent to existing wildlife areas, provide valuable or unique habitats and they contribute significantly to other agency priorities such as public access. In other cases, other partners may not be available to pursue acquisition, and it is determined that the property would be best managed by ODFW.

GAWA is independent from existing Wildlife Areas and subsequently, the primary management responsibility will fall to WWMP staff with oversight from the South Willamette Watershed District. Maintenance and restoration assistance may also be provided by watershed staff, including the Watershed District Manager, Habitat Program Manager, and other staff.

2 Site Description, History, and Use

2.1 Landscape and Conservation Setting

Since European settlement, the Willamette River has experienced major alterations including the loss of riparian forests, channel simplification and flow moderation, and the degradation and loss of much of its historic floodplains and associated species and habitats. Beginning in the 1820’s, the U.S. Army Corps of Engineers (USACE) was mandated by Congress to improve navigable rivers by clearing and modifying channels. Contributing to these impacts was the construction of Federal dams in the middle and upper Willamette Basin beginning in the late 1940’s. With the onset of dam construction, including the construction of Detroit and Big Cliff dams on the North Santiam River in 1953, large floods on the Willamette River became less common. Prior to the dams being built, the Willamette Valley experienced periodic large scale flooding, inundating the floodplain and allowing channels to meander and sediment to redeposit on an annual basis. In turn, vegetation would colonize and expand. After construction, large floods became less common and farms and development extended further into riparian boundaries.

In response to the degradation of much of the Willamette River’s floodplain, conservation priorities for the Willamette Basin include the protection and restoration of existing floodplain
habitats such as described in the OCS (2016), Willamette Subbasin Plan (Primozich et al., 2004) and Willamette Basin Biological Opinion (NMFS 2008).

**Figure 2.** GAWA Property Boundary

GAWA is located less than one river mile south of the upstream end of Minto-Brown Island’s conservation area and is situated along the west bank of the Willamette River immediately upstream from the Rickreall Creek confluence and approximately four miles upstream from Salem. A floodplain slough at the northwest section of the property separates it from the adjacent floodplain. The property boundaries follow the high water mark of the main stem and back channel, which are waters of the State (Figure 2).
The site has long been identified as a significant forested floodplain property on the main stem of the Willamette River. Situated between the historic (1850) channel and the current channel, it consists entirely of priority habitats identified by the OCS, including flowing water and riparian, wetland, and forest opening habitats. GAWA is the largest contiguous block of riparian forest along the mainstem downstream of Harrisburg and one of the only significant riparian forests remaining in the 34-mile stretch between the Santiam confluence and Willamette Mission State Park. Throughout this river reach, riparian habitats are generally limited to narrow, fragmented fringes of treed habitats immediately adjacent to the channel. GAWA, in contrast, is approximately 1.5 miles long and up to approximately one-half mile wide at its widest point, containing scour channels, wetlands, and alcoves. The upstream end is adjacent to an island owned by the Department of State Lands (DSL), which is a site of forest recruitment. The confluence of Rickreall Creek and the Willamette River forms the downstream boundary of GAWA. Rickreall Creek forms a habitat connection with conserved areas in Polk County such as the Eola Hills and the Baskett Butte and Slough complex, which is partially protected as a National Wildlife Refuge (Figure 3).

GAWA is located within the region that is designated Critical Habitat for spring Chinook Salmon and winter Steelhead as well as in the Upper Willamette River Conservation and Recovery Plan for Chinook Salmon and Steelhead (ODFW and NMFS 2011) and within an Anchor Habitat designated by the Willamette River Habitat Protection and Restoration Program 2010-2015 (OWEB 2010). The Northwest Power Planning Council’s Willamette Subbasin Plan, Appendix R (WRI 2004) identifies the island as within a Priority Area.

### 2.2 Site History

#### 2.2.1 Historic Vegetation

The 1852 General Land Office (GLO) survey (Christy et al. 2011) documented river corridor conditions early in the European American settlement of the Willamette Valley. Vegetation communities identified on the GLO maps characterized the floodplain adjacent to GAWA as “bottom land” and included both Rickreall Creek (noted as “La Creole River”) and a prominent floodplain slough (noted as “bayou”) to the west of the GAWA site. The property was labeled as “island” between the Willamette River and the floodplain slough, which remains prominent today. Riparian hardwoods and river wash dominated the site (Figure 4).

As described by the GLO surveyors, vegetation was dominated by Oregon ash with combinations of red alder (*Alnus rubra*), big leaf maple (*Acer macrophyllum*), black cottonwood, white oak (*Quercus garryana*), and red osier dogwood (*Cornus sericea*). Evidence of past channel movement and scouring is visible with LiDAR (Figure 5).
Figure 3. Landscape and Conservation Setting
Figure 4. Historic Vegetation

1852 General Land Office Survey, Christy et al. 2011

- Oak savanna
- Open water
- River wash
- Roemer fescue
- Riparian hardwoods
- Tufted hairgrass
- Gail Achterman Wildlife Area
2.2.2 Historic Land Use

GAWA is located in an area likely to have been used by the Native American Kalapuya tribe for hunting, plant harvesting, and seasonal encampments that have been documented along the Willamette River between Mill and Pringle Creeks (CH2M 2016). Regular burning in the area by Native Americans was used to encourage the growth of wild food plants and to provide habitat for game species (Boyd 1986) and is just one of the early impacts that arose from land management. A mix of agricultural and residential uses of the area continued from the time of early EuroAmerican settlement through much of the 1900s until the 1960s, when urbanization continued with land conversion to farmland and subdivisions of single-family dwellings (Hemesath and Nunez 2002).

Figure 5. LiDAR imagery of Gail Achtermann WA

Poor accessibility likely limited early land uses on the island (RDG 2015). The town of Cincinnati, established in 1849, was formerly located on the north bank of Rickreall Creek at the confluence with the Willamette River. Figure 6 reflects a subset of six historical air photos that illustrate the primary changes in GAWA from 1936 to 2014. For the complete set of historical photos, refer to Appendix 5. The 1936 air photo captured the area after nearly 100 years of settlement. At this time, none of the Willamette Project dams had been built and the Willamette Valley was periodically impacted by high magnitude flood events. Surface patterns on the island interior suggest the unforest part of the island was used for haying.
Figure 6. GAWA Historical Photos

Photos rectified by IAE (2015)
at that time. Although the access road is apparent on the western edge of the island in the 1936 air photo, there is no clear crossing at the floodplain channel. Farmers may have built a low water ford to cross the floodplain channel to manage the hay field. Conditions remained similar in the 1948 air photo. The floodplain channel crossing was more pronounced in the 1955 air photo and agricultural production looked to be more intensive than in 1936 photo. Similar to the island interior, floodplain agriculture became more pronounced with the proliferation of orchards to the west of GAWA (RDG 2015).

An extensive floodplain road network in the 1963 air photo traversed the central and northern portions of the island. Expanding disturbance areas may signify early aggregate exploration efforts in the middle of the island. Other roads or trails trending to the north may have been for logging, recreation, or created by livestock grazing on the island. A floating boat dock appears upstream of the Rickreall Creek confluence in the 1963 photo. The 1979 air photo shows the island in recovery. Other than the primary entrance road into the island, the lateral road network visible in the 1963 photo is no longer apparent. A small pond to the south of the primary entrance road is likely filled with groundwater suggesting preliminary gravel exploration was completed. Island conditions remained relatively unchanged until aggregate development extraction had reinitiated by the 1987 air photo. Gravel Extraction activities centered on the interior of the island. From approximately 1994 to present, the former extraction area was on a trend towards vegetation recolonization.

2.2.3 Interim Management

Interim management activities that have occurred on the site since acquisition and during development of the management plan include maintenance operations and continued collection of baseline vegetation and wildlife data/documentation. A Land Use Agreement (LUA; Appendix 2) with BPA was executed on June 20, 2017, which approved interim management activities such as access road repair, maintenance, and access trail construction, subject to specific conditions. Habitat mapping and surveys of plant and animal species were conducted in 2016 and 2017, although surveys were limited in 2017 because of floodwaters prohibiting access to the island. Salem Audubon and ODFW conducted breeding bird surveys in 2016 and in limited areas in 2017. Fish seining and trapping was conducted in August 2016 and in July 2017 within off-channel habitats (Figure 7). Only Pool 1 was sampled in 2016. See Appendix 3 for a list of the complete inventory of species detected.

Aerial drone flights over portions of the island were conducted on January 30, May 1, and September 14, 2017. Orthomosaic imagery and digital elevation models were generated and uploaded to ArcGIS to assist in vegetation mapping, establishing baseline habitat conditions, and assessing hydrological conditions of the island. Figure 8 illustrates composite ortho-imagery overlain in ArcGIS and details a central portion of the site, which includes the forest opening, wetlands, and portions of the back channel. Additional imagery exists for the north portion of the island as well.
Figure 7. Fish sampling locations 2016-17
A volunteer work party was conducted in June 2017 that involved hand removal of scotch broom (*Cytisus scoparius*) and oxeye daisy (*Leucanthemum vulgare*). In August 2017, the Northwest Youth Corps was contracted for one week to hand-clear invasive species and vegetation to provide administrative access to interior portions of the island. Additional pathways have been mechanically mowed to provide access into the site and to reduce blackberry encroachment.

Prior to ODFW acquiring the property in 2016, the Institute for Applied Ecology (IAE) collected baseline data, established photopoints in August 2014, and conducted a follow-up visit in October 2015 (IAE 2015). Additional photopoint stations were established in summer 2017. These data are mapped using ArcGIS.

The site is frequently checked to ensure no trespassing, vandalism, or other illegal activity, is occurring. Boundary signs and wildlife area rules and regulations will be posted at the administrative entrance to the site.

Funding for floodplain forest enhancement and aquatic invasive species removal has been secured through the Willamette Mainstem Anchor Habitat Investment Program with funding from BPA, Meyer Memorial...
Trust, and OWEB (Focused Investment Partnership (FIP)). Restoration efforts using these funds will begin in spring 2018.

2.3 Physical Description

2.3.1 Site Features and Topography

GAWA is a 290.8- acre property located southwest of Salem, Oregon, in eastern Polk County at river mile 88-89, immediately south of Highway 22 and bounded by the Willamette River to the east. Rickreall Creek forms a confluence with the Willamette River at the north end of the island. The site supports intact and extensive floodplain gallery riparian forest and shrubland, wetlands, and active floodplain connections. A forest opening occurs in the central portion of the site where approximately twelve acres were disturbed in the 1960s by gravel mining activities.

Several other excavated depressions occur that appear to be the result of mining activities as well. Based on air photo analysis, there had been some limited gravel mining on GAWA prior to the earliest permits issued between 1974 to 1991 by Oregon Department of Geology and Mineral Industries (DOGAMI). The 1992 DOGAMI inspection report noted the northern portion of the disturbed interior area had been previously used as a gravel processing and stockpiling area (now the forest opening). Prior gravel excavation had lowered approximately six acres along the southern portion of the disturbed area to elevations approximately 15 to 20 feet below the original topography.

The property consists of three tax lots: 600, 601, and 602 in Township 7 South, Range 4 West, Section 36 and 31, Willamette Meridian. An approximate centroid is 44.917823 North, -123.117195 West. The full legal description is included as Appendix 4. The site is zoned as Exclusive Farm Use.

Lands to the west and southwest of the site are engaged in irrigated agriculture, growing hops, hazelnuts, blueberries, and other crops. Immediately to the north of the property is the small community of Eola. Across the Willamette River to the east, land uses include a gravel operation, golf course, agriculture, and a natural area owned by the City of Salem (Minto Brown Island). A USACE revetment is located on the eastern bank of the Willamette River across from GAWA. A second USACE revetment is located on the west bank of the Willamette River at and upstream of the Rickreall Creek confluence.

The property can be accessed for administrative purposes through a private easement gravel road (Ingress/Egress Easement Agreement May 23, 2014 and September 2, 2015, Polk County). A two-track dirt road accesses the property and extends onto the site a short distance. The only other access to the site is by waterway. There are no wells, irrigation, buildings, or fences on the property, but there is a single gate located on the property near the administrative
entrance. There is one approximately eight-foot diameter span steel multi-plate pipe arch (culvert), forty-three feet long with beveled ends under the short, two track dirt entrance road (Figure 9). A small, dilapidated hunting blind is located in the forest opening, and was dismantled shortly after purchase of the site and will be removed for safety purposes in 2019.

GAWA is situated on a floodplain terrace and as such, is relatively flat across its entire acreage at 130 feet in elevation, with the exception of the back channel, linear scour channels, and isolated depressions caused by past flood events and prior gravel mining operations. At this elevation, much of the site is inundated during winter wet periods.

**Figure 9.** Site features and topography
2.3.2 Existing Vegetation

In 2016 and 2017, habitat and floral surveys were conducted to document vegetation characteristics on the property. The majority of the island consists of riparian forest and wetlands (including off-channel habitat) (Figure 10), both OCS Strategy Habitats. A small forest

**Figure 10.** Existing Vegetation and Habitats
opening is located centrally. The mapping presented in this management Plan reflects current vegetative cover and improved understanding of site conditions following initial site surveys.

Riparian forest is the dominant habitat feature and makes up the greatest proportion of the site (252.1 acres or 87%). Vegetation in general is largely dominated by mature black cottonwood, with some Oregon ash and occasional big-leaf maple. As the mid-canopy trees transition to forest and scrub-shrub wetlands, dominant species include Oregon ash, Pacific willow (*Salix lasiandra*), red-osier dogwood, snowberry (*Symphoricarpos albus*), and stinging nettle (*Urtica dioica*), plants characteristic of floodplain communities. Reed canarygrass (*Phalaris arundinacea*) and Armenian and trailing blackberry (*Rubus armeniacus* and *R. ursinus*) are ubiquitous throughout the island. Patches of native sedges and rushes are scattered throughout and the shrub and herbaceous layers contain significant native components. Most conspicuous is the vegetation dominating the slough. Here, the native wapato (*Sagittaria latifolia*) and the non-native water primrose (*Ludwigia hexapetala*) are densely concentrated, impeding water flow. Where the property borders on the Willamette River, the substrate becomes cobble river rock and gravel to the water’s edge. Young black cottonwood, willow, ash, and patches of blackberry dominate the vegetation in this area. Table 2 summarizes the OCS habitats and their corresponding sub-categories, and further characterizes the attributes of the vegetation found on the property.

**Table 2. Habitat Types, Acreages, and Age Classes**

<table>
<thead>
<tr>
<th>OCS Strategy Habitat</th>
<th>Habitat Sub-Categories</th>
<th>Age Class (yrs)</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off-Channel</td>
<td><em>Back Channel, Side Channels</em></td>
<td></td>
<td>17.7</td>
</tr>
<tr>
<td></td>
<td><em>Slough</em></td>
<td></td>
<td>6.1</td>
</tr>
<tr>
<td></td>
<td><strong>Total Acreage (Off-channel)</strong></td>
<td></td>
<td><strong>23.8</strong></td>
</tr>
<tr>
<td>Riparian and Flowing Water</td>
<td><em>Cottonwood/Ash</em></td>
<td>40 to 100</td>
<td>161.1</td>
</tr>
<tr>
<td></td>
<td><em>Cottonwood/Ash/Willow</em></td>
<td>25 to 80</td>
<td>68.9</td>
</tr>
<tr>
<td></td>
<td><em>Maple/Cottonwood/Ash</em></td>
<td>100+</td>
<td>15.6</td>
</tr>
<tr>
<td></td>
<td><em>Blackberry Dominant</em></td>
<td>30</td>
<td>6.5</td>
</tr>
<tr>
<td></td>
<td><strong>Total Acreage (Riparian)</strong></td>
<td></td>
<td><strong>252.1</strong></td>
</tr>
<tr>
<td>Forest Opening</td>
<td><em>Forest Opening</em></td>
<td></td>
<td>4.6</td>
</tr>
<tr>
<td></td>
<td><em>Forest Opening/Scotch broom</em></td>
<td></td>
<td>3.6</td>
</tr>
<tr>
<td></td>
<td><strong>Total Acreage (Forest Opening)</strong></td>
<td></td>
<td><strong>8.2</strong></td>
</tr>
<tr>
<td>Wetland</td>
<td><em>Cottonwood/Ash/Marsh</em></td>
<td>40</td>
<td>6.5</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL ACREAGE</strong></td>
<td></td>
<td><strong>290.6</strong></td>
</tr>
</tbody>
</table>
Off-channel habitat includes the back and side channels (17.7 acres) and the slough (6.1 acres), which cumulatively comprise a total of 23.8 acres (8%). Wetlands delineated on the property were calculated to total roughly eighteen acres, although the entire island was not completely surveyed. Detailed topography of the wetland delineation mapping are contained in the wetland delineation report, Appendix 6 (PHS 2009). These wetlands share similar vegetation, soil, and hydrological characteristics, and can be described as areas consisting largely of shallow linear troughs (scour channels) and random, isolated ponded areas that in context, differentiate little from the forest habitats. The exception is a large wetland area that was created as a result of surface mining activities that can contain standing water for several months of the year. This wetland is approximately 6.5 acres (0.02%), and is vegetated with herbaceous plants in the northern portion, such as dense patches of spikerush (*Eleocharis* sp.), starwort (*Callitriche* sp.), and cudweed (*Gnaphalium palustre*). The southern portion of the wetland is densely vegetated with cottonwood and willow saplings.

A large, open area occurs in the central portion of the property, which is described as a Forest Opening. Forest Openings are a specialized and local habitat type characterized in the OCS as resulting from disturbances such as wildfire and disease, but may include man-made activities such as salvage logging or timber harvest. While sounding sterile, these openings provide structural complexity and plant diversity that otherwise may not be present. At GAWA, past gravel stockpiling and processing activities in this area resulted in densely compacted, shallow cobbly soils that are vegetated predominantly with a mix of native and non-native grasses and forbs, including camas (*Camassia quamash*), elegant harvest lily (*Brodiaea elegans*), and tarweed (*Madia sativa*). This area comprises 8.4 acres or 0.03% of the site.

Throughout a majority of the understory, invasive plants species such as reed canarygrass and Armenian blackberry are interspersed throughout the site, often dominating areas to the exclusion of other plant species. In other areas, invasives form a matrix with native shrubs and forbs. Scattered populations of scotch broom, common tansy (*Tanacetum vulgare*), and oxeye daisy occur in the more disturbed or open areas in the forest opening or along the access road. Meadow knapweed (*Centaurea pratensis*) and common toadflax (*Linaria vulgaris*) were observed on the river’s edge and the forest opening, and a small population of purple loosestrife (*Lythrum salicaria*) occurs immediately adjacent to the north end of the property. Water primrose is prolific in the slough at the north end of the island. Several spurge laurel plants (*Daphne laureola*) were located largely on the southern half of the island.

Invasive plant locations have been mapped in GIS and data on general characteristics such as relative densities or population size were noted. Any new discoveries will be added to the database and any subsequent treatments will be reflected. Targeted invasive plant species are identified in Table 3 and in Figure 11. A topographical overlay illustrates the location of the plants in relation to elevation (and subsequent inundation). Other invasives, such as Armenian blackberry or reed canarygrass, are ubiquitous throughout the understory and are not illustrated.
Table 3. Invasive Plant Species Receiving Targeted Treatments

<table>
<thead>
<tr>
<th>T- Designated Weed¹</th>
<th>B- Listed Weed²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Primrose</td>
<td>Water Primrose</td>
</tr>
<tr>
<td>Yellow Floating Heart</td>
<td>Yellow Floating Heart</td>
</tr>
<tr>
<td><em>Ludwigia hexapetala</em></td>
<td><em>Nymphoides peltata</em></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B- Listed Weed²</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Ivy</td>
</tr>
<tr>
<td>Orange Jewelweed</td>
</tr>
<tr>
<td>Japanese Knotweed</td>
</tr>
<tr>
<td>Meadow Knapweed</td>
</tr>
<tr>
<td>Old Man’s Beard</td>
</tr>
<tr>
<td>Parrot-feather</td>
</tr>
<tr>
<td>Purple Loosestrife</td>
</tr>
<tr>
<td>Scotch Broom</td>
</tr>
<tr>
<td>Spurge Laurel</td>
</tr>
<tr>
<td>Yellow Flag Iris</td>
</tr>
<tr>
<td>Yellow Toadflax</td>
</tr>
<tr>
<td>Purple Loosestrife</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other (non-regulated)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armenian Blackberry</td>
</tr>
<tr>
<td>Cherry trees</td>
</tr>
<tr>
<td>Common Tansy</td>
</tr>
<tr>
<td>Cutleaf Blackberry</td>
</tr>
<tr>
<td>English Holly</td>
</tr>
<tr>
<td>Oxeye Daisy</td>
</tr>
<tr>
<td>Reed Canarygrass</td>
</tr>
<tr>
<td>Vinca</td>
</tr>
</tbody>
</table>

¹ ODA T-Designated Weed is a focus for prevention and control by the Noxious Weed Control Program
² ODA B-Listed Weed Limited to intensive control as determined on a site specific, case-by-case basis.
Figure 11. Distribution of Target Invasive Plants
2.3.3 Waterbodies and Hydrology

Once an active gravel point bar, GAWA is now a relatively inactive feature dominated by a mature riparian forest (Figure 12). The island's change in character is attributed to reduced flood frequency and magnitude due to the construction of flood control dams and reservoirs in the upper watershed (NHC 2010). The increased level of summer time base flows to meet water quality and recreation goals impact the hydrology at the site.

**Figure 12.** Aerial (UAV) Photo of GAWA.

GAWA is at a generally lower elevation than the floodplain around it and portions of the island are annually inundated at relatively frequent flows. During high water flows, the downstream end of the island floods from backwater, while the upper end has water entering from the main Willamette River channel, flowing through secondary channels and across the island at higher but still moderate velocities (NHC 2010).

The U.S. Geological Survey (USGS) has operated a stream gaging station at Salem (Gage 14191000) since the mid-1860’s. Additional studies were conducted on the island including a hydrologic and hydraulic analysis (NHC 2010), a site reconnaissance (RDG 2015), and wetland delineation (PHS 2009) which further informed hydrological dynamics and conditions of the site. The largest flood reported for the site was reported on December 4, 1861 by the USGS. The maximum discharge for this event was estimated at 500,000 cubic feet per second (cfs) (USGS 2009). From 1970 to 2014, historical average monthly flows for January, the highest flow month, were approximately 49,000.
A hydrologic analysis conducted by NHC (2010) illustrated flows and flood behavior on the site, characterizing the various hydrological conditions at GAWA (Table 4). Seventy-thousand cfs appears to be the threshold flow where secondary channels are activated and inundation is increased throughout the island. As measured at the Salem gage, a 10-year flood event at 190,000 cfs fully inundates the island (RDG 2015). Figure 13 illustrates hydrological flows at the 2-year flood levels.

**Figure 13.** Two-year flood inundation
Table 4. Flows and Key Flood Behavior

<table>
<thead>
<tr>
<th>Flow at USGS Salem Gage (cfs)</th>
<th>Flow Event</th>
<th>Key Flood Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>50,000</td>
<td>11% Exceedance (41 days/year)&lt;sup&gt;3&lt;/sup&gt;</td>
<td>Flow confined to floodplain channel with some flooding of adjacent floodplain depressions.</td>
</tr>
<tr>
<td>70,000</td>
<td>5.7% Exceedance (21 days/year)&lt;sup&gt;4&lt;/sup&gt;</td>
<td>Secondary channels through the island are inundated. Steepest water surface gradient.</td>
</tr>
<tr>
<td>90,000</td>
<td>2.4% Exceedance (8.6 days/year)&lt;sup&gt;4&lt;/sup&gt;</td>
<td>More extensive overbank flows and more than half of the island is inundated.</td>
</tr>
<tr>
<td>110,000</td>
<td>0.8% Exceedance (2.8 days/year) Mean Annual Flood&lt;sup&gt;4&lt;/sup&gt;</td>
<td>Island almost fully inundated and flow paths still primarily follow the main river channel.</td>
</tr>
<tr>
<td>190,000</td>
<td>10-year Flood</td>
<td>Floodplain almost fully inundated and flow vectors follow valley alignment more so than the channel alignment.</td>
</tr>
<tr>
<td>250,000</td>
<td>50-year Flood</td>
<td>Rare event – floodplain is deeply flooded – some portions of the island are flooded by more than 20 feet of water.</td>
</tr>
<tr>
<td>280,000</td>
<td>100-year Flood</td>
<td>---------</td>
</tr>
</tbody>
</table>

<br>

<sup>3</sup> Percent of time flows exceed this value (based on the daily mean flows from 1970 to 2007 for the USGS Willamette River at the Salem gage).

<sup>4</sup> Mean instantaneous annual peak flow, USGS Willamette River at Salem gage from 1970 to 2007.
Adapted from NHC (2010). Flow values are relative to the USGS Willamette River at Salem, OR (#14191000) gage.

The primary channel parallels the western boundary of GAWA and connects to the Willamette River during winter and spring flow levels. The channel crossing is located on the main access road to the site. At high flow, administrative access to the site is impeded, becoming impassable when the height at the USGS Salem Gage measures approximately 10.5 feet (Figure 14).

**Figure 14.** Culvert Crossing

Flow conditions when the Salem Gage measures 9.2 feet

The same location at 17.4 feet

Top photo: January 30, 2017. Bottom photo: March 15, 2017
A eight-foot diameter culvert is located here, which over time has become exposed but does not affect fish passage as water easily flows around it and does not impound. The condition of the culvert will be assessed for structural integrity and/or necessity to determine whether the channel would benefit from removal or replacement of the culvert, or if improvements can be made to augment crossing.

Figure 15 illustrates the average discharge and gage heights at the Willamette River Salem gage for the period from September 1, 2016 through June 2017. The orange line on the hydrograph, at roughly 24 kcfs, is the rate at which the back channel is flooded to an extent that access is impeded. Under these conditions, the back channel was flooded for nearly seven months.

**Figure 15** Willamette River Salem Gauge Hydrograph 2016-17

Side, or secondary channels, are located on the perimeter of the island and are activated at various flood stages. The lower velocity in these channels allows sediment deposition, providing complexity and habitat features that encourage habitat use of fish, waterfowl, and wildlife throughout the year (Figure 16).
The former gravel pit and processing area is located in the central portion of the island. The pit was excavated thirteen to fourteen feet below the historical floodplain elevation and is approximately seventeen feet below the predicted two-year water surface elevation modeled for the island (RDG 2015), allowing for substantial inundation in this area. A large portion of this area has been recolonized by cottonwoods and ash (Figure 17).

Figure 17. Former gravel pit

High water marks create a dark shadow on the trees as water recedes. January 30, 2017
2.3.4 **Soils and Geology**

A map showing the geology in the vicinity of GAWA consists entirely of “Recent River Alluvium”, which is described as:

“Unconsolidated cobbles, coarse gravel, sand and some silt and clay within the active channels of the Willamette River. The deposits are generally 15–45 feet thick, and consist of stratified sands and well-rounded pebbles, gravels, and cobbles, often overlain by 3 to 15 feet of sand.”

**Figure 18.** Soils types
and silt overburden... [These areas are] subject to major flooding, critical stream-bank erosion, and lateral channel migration; includes many areas located between 1852 meander line and present channel that illustrate possible extent of future changes.” (DOGAMI 1981)

The soils on the site are largely loamy (Figure 18, Table 5) and erodible only if exposed to high velocities during floods. Approximately fifteen percent of the soils on the site are considered prime farmland (Map units 13, 14, and 17).

The entire site consists of well-drained and excessively drained soils. Roughly one-half of the site is underlain by xerofluvents (79), an alluvium component of floodplains. The remaining soil types at the site are also well drained hydric soils described as having high permeability, effective rooting depths greater than sixty inches, and with the exception of the Chehalis, Newberg, and Cloquato units, are subject to frequent periods of long flooding. There is very little organic matter in the surface horizon (NRCS 2017).

Located just downstream below the Rickreall Creek confluence along the left bank is the only erosion resistant material in the area. An Eocene-Oligocene sedimentary rock outcrop impinges here and therefore causes the river to turn nearly ninety degrees to the right (NHC 2010). The remainder of the material on GAWA is relatively young and susceptible to lateral erosion, although anthropogenic changes within the watershed have substantially reduced the potential for and frequency of erosion, and there is little evidence of significant river migration.

Table 5. Soils of Gail Achterman Wildlife Area, Polk County, Oregon

<table>
<thead>
<tr>
<th>Map Unit Symbol</th>
<th>Map Unit Name</th>
<th>Acres</th>
<th>Percent of Site</th>
<th>Hydric</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Camas gravelly sandy loam</td>
<td>36.5</td>
<td>13</td>
<td>No</td>
</tr>
<tr>
<td>14</td>
<td>Chehalis silty clay loam, occasionally flooded</td>
<td>1</td>
<td>~0</td>
<td>Yes</td>
</tr>
<tr>
<td>17</td>
<td>Cloquato silt loam</td>
<td>5.5</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>53</td>
<td>Newberg fine sandy loam</td>
<td>42.6</td>
<td>15</td>
<td>No</td>
</tr>
<tr>
<td>79</td>
<td>Xerofluvents, loamy</td>
<td>170.6</td>
<td>59</td>
<td>Yes</td>
</tr>
<tr>
<td>21000A</td>
<td>Riverwash</td>
<td>1</td>
<td>~0</td>
<td>Yes</td>
</tr>
<tr>
<td>W</td>
<td>Water</td>
<td>33.4</td>
<td>11</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>290.6</strong></td>
<td><strong>100%</strong></td>
<td></td>
</tr>
</tbody>
</table>

2.3.5 **Infrastructure, Roads, and Maintenance Access**

Most of the GAWA site is undeveloped except for a short, two-track dirt road accessing the site via a shared private road easement (State Farm Road). Unmanaged, this road quickly becomes overgrown with reed canary-grass and blackberry. A 10-inch PVC pipe directs occasional discharges from the adjacent agricultural fields into a side channel at the property boundary before the gated entrance (Figure 19). A boundary sign identifies the Wildlife Area at this administrative entrance. No other fencing or gates occur on the property.

An eight-foot diameter corrugated culvert (Figure 20), forty-three feet long with beveled ends, was once embedded under the dirt road but now lies exposed - the low water crossing it supported is no longer functional as a result of the underlying fill having been eroded by the overtopping flows. Vehicle access to the site is limited to all-terrain vehicles and farm equipment for administrative purposes as a result.

![Administrative access road](Figure 19)

![Steel culvert](Figure 20)

2.4 **Environmental Setting**

2.4.1 **Climate**

Average monthly precipitation (January 1950 through May 2017) ranges from a low of 0.39 inches in July to a high of 6.93 inches in December. The average annual rainfall for this period is 40.3 inches. Average high temperatures for this period range from 52.6°F (11.4 °C) (December) to 79.8°F (26.5 °C) (August). Low temperatures range from 27.4°F (-2.5 °C) (December) to 62.2°F (16.8 °C) (July). The highest historical temperature was recorded at 107°F (41.7 °C) in 2009.
Average monthly precipitation (January 1950 through May 2017) ranges from a low of 0.39 inches in July to a high of 6.93 inches in December. The average annual rainfall for this period is 40.3 inches. Average high temperatures for this period range from 52.6°F (11.4 °C) (December) to 79.8 °F (26.5 °C) (August). Low temperatures range from 27.4°F (-2.5 °C) (December) to 62.2 °F (16.8 °C) (July). The highest historical temperature was recorded at 107 °F (41.7 °C) in 2009 and the lowest recorded temperature was -5 °F (-20.6 °C) in 1972. Over a two-year period (2015/2016), monthly mean surface water temperatures ranged from a low of 45 °F (7.2 °C) (January) to a high of 71 °F (21.6 °C) (August).

Current climate change models illustrate potential scenarios as the Earth’s global average temperatures increase because of increased carbon dioxide in the atmosphere. While there are limitations with climate models, they generally successfully reproduce known historical variables and formulate predictions with various levels of assurance. Even with the lowest possible emissions scenario, significant changes to the Earth’s climate and subsequently, local environments, are predicted. Ecosystem changes, extreme weather events, disease, drought, and increased wildfires are likely to have adverse effects on the Willamette Valley region.

A climate assessment report led by the Oregon Climate Change Research Institute (Dalton et al., 2017) indicates Oregon’s climate continues to warm and is projected to increase an average of 3-7 °F by the 2050’s, impacting the state’s physical, biological, and human-managed systems. In the Willamette Valley, heat waves are expected to become longer, more common and more intense. A three-fold to nine-fold increase in the amount of area burned in the basin by the year 2100 is anticipated.

For GAWA, changes to hydrology appear to be the most significant threat as summer low flows will decrease and peak-flow timing will shift earlier. Precipitation patterns could decline year-round but may include monsoon patterns in the spring coupled with increased seasonal drought in the summer. Storm events could increase in intensity, resulting in more flooding in all rivers in the basin (Doppelt et al., 2009). Flood risk and summer water supply may influence operating rules for reservoirs, dictating the amount and timing of release of flows, which in turn may affect food, water, and shelter resources on the island as well as influence access to the site for management. Wildlife and habitat may be negatively impacted as favorable conditions for disease, insect pests, and invasive species develop. Increased water temperatures and

5 NOAA Regional Climate Centers data, Marion County, station SALEM McNary Field, Oregon.
6 USGS Surface-Water Monthly Statistics, Marion County, station KEIZER Willamette River, Oregon.
storm intensities are likely to be detrimental to the reproduction and survival of many native fish and amphibians.

Future goals may need to shift as monitoring and evaluation detect climate change impacts. Management activities at GAWA should be adapted to consider the following factors likely to be influenced by climate changes:

- Hydrological changes on the island evidenced in changes in flow (depth, velocity), water temperatures, and the timing and duration of inundation.
- Shifts in precipitation resulting in increased evapotranspiration (the evaporative loss of water from the ground surface and through vegetation.)

2.4.2 Hazardous Waste

There are no known solid, liquid, or contained gas hazardous wastes on the property.

2.5 Legal Restrictions and Public Access

2.5.1 BPA/OWEB Conservation Easement

GAWA was originally purchased by TPL and then conveyed to ODFW on May 26, 2016, at which time ODFW became the fee-title owner of the property and assumed all legal responsibilities stated in the conservation easement. The conservation easement was deeded by ODFW to BPA and OWEB in perpetuity, for protection of the Conservation Values (Section 1.2) associated with the site. Permitted and prohibited uses that have relevance for short- and long-term actions recommended under this Plan are summarized in Tables 6 and 7.
### Table 6. Permitted Uses and Management Action Compliance

<table>
<thead>
<tr>
<th>Permitted Uses</th>
<th>Management Action Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preserve and protect the Conservation Values of the Property, including</td>
<td>Goals and objectives in the Plan provide for long-term protection/restoration of habitats, see Chapters 4 and 5. Goal 7, Objective 7a and b were developed to monitor and evaluate</td>
</tr>
<tr>
<td>restoring and enhancing the site for fish and wildlife habitat as approved in</td>
<td>effects of public use on site. Adaptive management (Section 5.3) includes monitoring and evaluating management actions, important for long-term success and protection of Conservation Values.</td>
</tr>
<tr>
<td>the management plan or by BPA.</td>
<td></td>
</tr>
<tr>
<td>Develop a Management Plan that will fully protect the Conservation Values in</td>
<td>The Management Plan has been developed with goals and objectives that provide long-term protection/restoration of Conservation Values and meets BPA’s obligations under the NEPA and ESA; see Section 5.1. Public use will be managed to protect wildlife and habitats; see Section 2.5.2, Goal 7, Objectives a and b were developed to monitor and evaluate effects of public use on site.</td>
</tr>
<tr>
<td>perpetuity and meet BPA’s obligations under the Northwest Power Act and</td>
<td></td>
</tr>
<tr>
<td>Endangered Species Act. This includes plans for restoring, enhancing, and</td>
<td></td>
</tr>
<tr>
<td>maintaining the property, expected activities and uses of the property, and</td>
<td></td>
</tr>
<tr>
<td>allowable public access and use.</td>
<td></td>
</tr>
<tr>
<td>Provide reasonable public access to the site, including hunting of game</td>
<td>Public access will be allowed, compatible with habitat and species management goals as described in Section 2.5.2. Public use will be managed to protect wildlife and habitats; see Section 2.5.2, Goal 7, Objectives a and b were developed to monitor and evaluate effects of public use on site.</td>
</tr>
<tr>
<td>animals (as described in ORS 498) and fishing to be accessed on foot only,</td>
<td></td>
</tr>
<tr>
<td>unless any of these public uses are determined to impair one of the site’s</td>
<td></td>
</tr>
<tr>
<td>Conservation Values.</td>
<td></td>
</tr>
</tbody>
</table>
Table 7. Easement Restrictions and Management Action Compliance

<table>
<thead>
<tr>
<th>Easement Restrictions</th>
<th>Management Plan Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential, Commercial or Industrial Uses. Any residential, commercial, or industrial uses of the Protected Property are prohibited, including timber harvesting, grazing of livestock, and agricultural production.</td>
<td>None contemplated as part of Plan.</td>
</tr>
<tr>
<td>Construction of Buildings, Facilities, Fences or Other Structures. Construction of new buildings, facilities, fences or other structures is prohibited. Repair, maintenance, or replacement of existing buildings, facilities, fences or other structures identified in the Baseline Documentation Report are permitted at the same location and within the existing footprint of such structures.</td>
<td>The culvert located along the back-channel that crosses the main access road will be assessed to determine if repair, replacement, or removal is recommended. See Goal 1, Objective 1b and Goal 9, Objective 9a.</td>
</tr>
<tr>
<td>Utilities. Except as provided for in Section J.2, the installation or relocation of new public or private utilities, including electric, telephone, or other communications services is prohibited. Existing utilities on, over, or under the Protected Property may be maintained, repaired, removed or replaced at their current location as that location is documented in the Baseline Documentation Report.</td>
<td>None contemplated as part of Plan.</td>
</tr>
<tr>
<td>Signs. Except for no trespassing signs, for sale signs, signs identifying the owner of the Protected Property, and signs that may be erected by the Grantee identifying the Purpose of the Protected Property, all other signs, advertisements, and billboards of any nature are prohibited. The permitted signs may not exceed 15 square feet in size.</td>
<td>Boundary markers and wildlife area rules and regulations erected as part of Plan. See Public Access/Use Objective 7b.</td>
</tr>
</tbody>
</table>
### Table 7. (cont.)

<table>
<thead>
<tr>
<th>Easement Restrictions</th>
<th>Management Plan Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mining. The exploration, development, mining or extraction of soil, sand, loam, gravel, mineral, oil, gas, or other substance from the surface or subsurface of the Protected Property is prohibited.</td>
<td>None contemplated as part of Plan.</td>
</tr>
<tr>
<td>Waste. Dumping, collecting, recycling, accumulating, or storing of trash, refuse, waste, sewage, bio-solids, or other debris is prohibited.</td>
<td>None contemplated as part of Plan. Trash and/or dumping that occur will be regularly removed as part of the operations and maintenance of the property. See Goal 9, Objective 9b.</td>
</tr>
<tr>
<td>Topography. Altering the existing topography of the Protected Property by digging, plowing, diskng, or otherwise disturbing the surface or subsurface is prohibited.</td>
<td>None contemplated as part of Plan except as part of potential restoration activities.</td>
</tr>
<tr>
<td>Watercourses/Wetlands. Draining, dredging, channeling, filling, leveling, pumping, diking, impounding or any other alteration of any watercourses, ponds, seeps, bogs, springs, wetlands, or any seasonally wet area is prohibited, as is altering or tampering with existing water control structures or devices.</td>
<td>None contemplated as part of Plan. The slough will be evaluated to determine if removing the sediment plug would be advantageous to improving the hydrologic connection with the river. See Goal 1. Objective 1b.</td>
</tr>
<tr>
<td>Vegetation. The cutting, trimming, shaping, killing, or removal of any vegetation from the Property, except for control of invasive, non-native, or noxious weeds, is prohibited.</td>
<td>Restoration actions include invasive weed control and native plant restoration to restore/enhance native habitats. See Goal 2, Objective 2b-d; Goal 4, Objective 4a-c; and Goal 5, Objective 5d.</td>
</tr>
<tr>
<td>Exotic Species. The introduction, cultivation, or use of exotic plant or animal species on the Protected Property is prohibited. Exotic plants include non-native invasive plant species.</td>
<td>None contemplated as part of Plan.</td>
</tr>
</tbody>
</table>
Table 7. (continued)

| Roads and Impervious Surfaces. Construction of new roads and paving of any existing road not paved or otherwise covered in an impervious material as of the Effective Date is prohibited. Existing roads identified in the Baseline Documentation Report may be maintained and repaired in their current condition and within their existing footprint as identified in the Report. | No new roads contemplated as part of Plan. The existing dirt access road will be mowed and maintained as needed to provide administrative access to staff and equipment. See Goal 9, Objective 9a. |
| Grant of Rights. The granting of any property interest or rights in the Property, including liens, easements, permits, licenses, and leases, without the prior written consent of Grantees is prohibited. | None contemplated as part of Plan. |

2.5.2 Public Access, Use and Recreation

ODFW strives to balance public use with resource protection on wildlife areas. Currently the site is open to non-motorized public use, although there is no parking, trail, or wayfinding facilities and access is limited to river access only. A private road easement provides access for administrative purposes. Foot travel within the site is allowed during daylight hours. Allowed and anticipated public uses of GAWA are the same as for other ODFW Wildlife Areas: nature access, wildlife viewing, education and interpretation, hunting, and angling. Campsites, kiosks, or other similar infrastructure will not be constructed.

GAWA provides a unique educational opportunity to offer school groups from elementary to college-age student’s exposure to and participation in maintenance, restoration, and monitoring. With prior coordination with ODFW, school groups can take field trips to the site, and internship programs can be developed with local area colleges and universities to provide field experience at the college and university levels. Partnerships with Straub Environmental Center, Willamette Riverkeeper, the Northwest Youth Corps, and other groups, enable ODFW to develop outreach programs and opportunities that serve the community-at-large.

Hunting and angling are allowed at GAWA. Annual hunting and fishing season dates, hours, allowable species to harvest, and other information is provided in ODFW’s regulation booklets. ODFW may adjust hunting regulations annually based on flyway regulations, wildlife population assessments, and other social and habitat considerations.
In addition to these allowed uses, some uses of the property by the public are expressly prohibited under Oregon Administrative rules OAR 635-008-0050 and 635-008-0200, including:

- Entry into an area posted “closed to entry”;
- Leaving garbage and litter on the area;
- No person shall display behavior which unreasonably deters, distracts or hinders others in the peaceable enjoyment of the area;
- Drones/UAV’s may not be flown within the boundary except for administrative use or by permit issued by ODFW;
- Camping and open fires;
- Off-leash dogs (except during authorized game bird seasons);
- Discharge of rifles and pistols;
- Motorized vehicle use beyond parking areas;
- Removal of firewood, minerals, artifacts or other products found on the land;

2.5.3 Cultural Resources and SHPO Consultation

Cultural significance is one of the considerations given when choosing properties to enroll in the WWMP. Projects that provide significant cultural benefits for tribal partners will get priority over projects with equal rankings that do not provide significant cultural benefits. Tribal involvement in the management of the habitats at GAWA is encouraged. The assessment of cultural significance may vary from tribe to tribe, but some of the base attributes that constitute “cultural significance” include target plant and animal species such as camas, wapato, tarweed, deer, salmon, and raptors, all of which occur at GAWA.

A BPA contract archaeologist visited the site on May 22, 2017 and determined there are no features or evidence of occupation in any archaeological records that suggest that the site was occupied by indigenous people for long periods. Other than the presence of plant species valued by the Kalapuya, the site appears to lack significant cultural resources.

ODFW will comply with necessary state and federal permit requirements, including necessary cultural resource reviews and consultation. In the event that any cultural material is encountered during project activities, state and federal regulations will apply. Generally, a project would be put on hold and a qualified archeologist would be contacted to evaluate the discovery.

2.5.4 Zoning and Overlays

The property is zoned Exclusive Farm Use (EFU) with a Mineral and Aggregate Overlay (MAO) and is included in Polk County’s Goal 5 inventory of significant aggregate resources. While the DOGAMI permit to mine a small portion of the site has been closed (DOGAMI 2016), the MAO remains in place. In addition, the Willamette Greenway overlay, which provides a continuous
natural area adjacent to the river for the protection of fish and wildlife habitat, supports some recreational use along the shore.

The Goal 5 administrative rule (OAR 660-023) for local natural resource protection requires an Economic, Social, Environmental, and Energy analysis (ESEE) of land uses and activities to aide in the resolution of conflicting uses. The ESEE analysis identifies the Greenway as a conflicting use, but recognizes it is compatible with Greenway-related uses under the Plan. The zoning code associated with the MAO overlay prohibits any infrastructure development such as parking and campgrounds, which are also prohibited uses in the CE. ODFW’s planned conservation, restoration, and management actions are not in conflict with this zoning overlay. Additional actions could be contemplated in the future if the zoning overlay is removed.

3 Conservation Priorities and Threats to Conservation Values

Conservation priorities at GAWA draw on the recommendations of several conservation plans and planning efforts that have been developed by federal, state, and non-governmental organizations for the Willamette Valley or the Willamette Subbasin. These plans and efforts identify priority conservation habitats and ecosystem types, as well as focal species whose habitat needs represent groups of at-risk species or who are imperiled enough that the species themselves are a high conservation priority. These plans and efforts include the federal Endangered Species Act (ESA) (US Fish and Wildlife Service and National Marine Fisheries Service), Oregon Endangered Species Act and the OCS (ODFW/Oregon Department of Agriculture (ODA) listed and OCS habitat types and species), and other efforts documenting declining species, wildlife-habitat relationships, and locally rare or uncommon species (Willamette Restoration Initiative, Oregon Watershed Enhancement Board (OWEB), Oregon Biodiversity Information Center (ORBIC), and Partners in Flight (PIF)).

Vegetation communities at GAWA are characterized by three primary OCS Strategy Habitat types: Flowing Water and Riparian, Wetland, and Forest Opening. Project specific surveys, baseline documentation (Appendix 5), and botanical surveys have been conducted since 2014 (IAE 2015). Additional studies including Reclamation Plans and Inspections (DOGAMI 1981, 1992, 2016), wetland delineation (PHS 2009), and a river engineering evaluation (NHC 2010), contribute to the understanding of habitat characteristics and ecological values of the island.

With the identification of the priority habitat types, additional reviews were conducted to determine which species the site has the greatest opportunity to benefit (Table 8) from habitat restoration or enhancement. Factors considered in the selection of the focal species included whether there were existing or restorable features of on-site habitats, whether the species has been documented on-site or within a two-meander reach of the project site on the Willamette River, and the rarity of these species in the Willamette Valley.

Because so much of the habitat on GAWA is in good condition structurally, with mature trees and diverse shrub structure, management will emphasize enhancement and preservation of
values. The island’s relative geomorphic stability is evidence of floodplain integrity, thus the primary focus of management will be on limiting the spread and/or reducing onsite infestations of noxious weeds, replacing them with native constituents and encouraging natural succession. The primary threat to conservation values is the abundance of invasive plant species. Unauthorized vehicular access, camping, and trash also pose potential threats. ATV tracks have been documented on several occasions, knocking down vegetation and depending on soil condition, leaving tracks. Shotgun shells and abandoned duck decoys are often found littering portions of the property. The site can be accessed by the public from the river, creating the potential for illegal camping or dumping. During high flow events, debris and refuse are carried onto the site, and include such items as duck blinds, patio furniture, sheet metal, and tires.
## Table 8. Priority Conservation Habitats and Species at GAWA

(Bold font = documented on Gail Achterman WA)

<table>
<thead>
<tr>
<th>OCS Ecological System</th>
<th>Priority Focal Species</th>
<th>Additional Priority Species Benefitting from Management</th>
<th>Current Habitat Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flowing Water and Riparian</strong></td>
<td>Bird species:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Willow Flycatcher (SOC, S, PIF)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>White-breasted Nuthatch (S, O, PIF)</td>
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<tr>
<td></td>
<td>Great Blue Heron (O)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Amphibians &amp; Reptiles:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Northern Red-legged Frog (SOC, S, O)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Western Pond Turtle (S, O)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Fish:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Upper Willamette Chinook Salmon (T, S, O)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Upper Willamette Steelhead (T, S, O)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Plants:</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Wapato</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Includes the river and shoreline and various age groups of Cottonwood/ash gallery forests and shrublands which dominate the site.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fat: for prevalence of non-native shrub components including Armenian blackberry and reed canarygrass.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Good: for herbaceous layer composition and presence of native plant species.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Very Good: for extent of system on site as compared to pre-settlement mapping; multi-story gallery forest, mature cottonwoods, anchor habitat for fish, wildlife travel corridor and flyway, and diverse vegetation understory and age classes.</td>
</tr>
<tr>
<td><strong>Wetlands and Off-Channel</strong></td>
<td>Bird species:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>White-breasted Nuthatch (S, O, PIF)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Willow Flycatcher (SOC, S, PIF)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Great Blue Heron (O)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Amphibians &amp; Reptiles:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Northern Red-legged Frog (SOC, S, O)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Western Pond Turtle (S, O)</td>
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<tr>
<td></td>
<td>Fish:</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Upper Willamette Chinook Salmon (T, S, O)</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Upper Willamette Steelhead (T, S, O)</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Oregon Chub (S, O)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Plants:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wapato</td>
<td></td>
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<td></td>
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<td></td>
<td>Includes the back-channel, scour channels, and slough, and scattered emergent wetlands across the properties, which are incorporated into the riparian forest and shrubland habitats.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Poor: for prevalence of aquatic invasive species including water primrose, parrot-feather, and reed canarygrass.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Good: for hydrologic connections and restorable desired habitat structure.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Very Good: for the wapato population, diverse species composition and vegetative structure, a significant degree of woody debris to support aquatic wildlife, and complex channelization which provides for an array of different hydrological conditions and variation.</td>
</tr>
<tr>
<td><strong>Forest Opening</strong></td>
<td>Bird species:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Willow Flycatcher (SOC, S, PIF)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>White-breasted Nuthatch (S, O, PIF)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Western Pond Turtle (S, O) (nesting)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Amphibians &amp; Reptiles:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Predominant open area within the central portion of the island, primarily occupied by native and non-native forbs, grasses, and shrubs. Shallow, compacted, gravelly soils inhibit growth.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Poor: for past mining disturbances resulting in compacted soils, spoils material, and prevalence of non-native grasses, forbs, and shrubs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Good: for providing edge habitat and native species diversity.</td>
</tr>
</tbody>
</table>

### Codes and Definitions Used for Conservation Habitats and Species List

- **USFWS**
  - **T**: Listed Threatened
  - **D**: Delisted
- **SOC**: Species of Concern
- **STATE**: Sensitive Species
- **PWEB**: (O) Priority Species (Willamette Basin Ecological Priorities)
- **PIF**: Bird species identified as “focal species” by Partners in Flight (PIF) in the “Conservation Strategy for Landbirds in Lowlands and Valleys of Western Oregon and Washington” (March 2003).
3.1 Priority Habitats and Species and Threats to Conservation Values

3.1.1 Flowing Water and Riparian

Status and Description

The OCS describes Flowing Water and Riparian habitats to include naturally occurring flowing freshwater streams and rivers and their adjacent habitat. freshwater aquatic systems provide essential habitat to many at-risk species, including spawning and rearing habitat for salmonids, breeding habitat for amphibians, and habitat for freshwater mussels and other invertebrates. The property contains approximately one and one-half miles of Willamette River bank and roughly 250- acres of riparian habitat.

ESA-listed fish species utilize the site’s Willamette River shoreline and include Upper Willamette spring Chinook and Upper Willamette winter steelhead. Other priority species likely use the island’s riverine habitat such as Pacific lamprey and Willamette floater mussel (Anodonta wahlamatensis).

The high species diversity typically associated with riparian habitats are evident at GAWA, providing wintering habitat and travel corridors for birds, amphibians, reptiles, mammals, and other wildlife. Riparian habitats provide shade and essential nutrients, filter runoff, and minimize flood impacts. Maintaining the mature trees along back channel and shoreline will help reduce water temperatures, benefitting fish, while providing perching and nesting sites for bald eagles and great blue herons. Large diameter trees provide downed logs along the banks of the site, which benefit fish and other species including turtles, which use the logs for basking. Downed logs and brush piles also provide denning, cover and foraging sites for both large and small mammals, including moles, voles, coyote and deer. American beavers (Castor canadensis) contribute to habitat complexity, species diversity, and improved water quality and play an active role at GAWA.

Riparian habitat supports the greatest number of Neotropical migratory landbirds in Oregon. Species with significant declining trends that will benefit by riparian habitat protection and restoration at GAWA include rufous hummingbird (Selasphorus rufus), orange-crowned warbler
(Vermivora celata), and Wilson’s warbler (Wilsonia pusilla) (Rosenberg et al., 2016). Over fifty species of birds have been observed on GAWA, including neo-tropical migrants such as the red-eyed vireo (Vireo olivaceus) (Appendix 3). Remnants of an abandoned great blue heron rookery can be seen on the northern portion of the island where nesting has been historically documented. While herons are commonly observed at GAWA, they do not currently breed there.

GAWA’s riparian forests and their associated aquatic habitats provide crucial habitat for amphibians and reptiles, including red-legged frogs and long-toed salamanders (Ambystoma macrodactylum), both of which have been documented onsite. Amphibians require riparian forests for much of their life requirements including feeding, overwintering, and cover, with downed logs and brush piles offering foraging, hiding and overwintering habitat. Reptiles, including turtles and snakes, utilize the riparian forest habitat for cover during the active season and for overwintering, as well as for migration corridors. A painted turtle (Chrysemys picta) was observed on the mainstem and western pond turtles are known to occupy the nearby Rickreall Creek. For a complete list of species observed at GAWA, see Appendix 3.

Threats to Flowing Water and Riparian Habitat at GAWA

Riparian forests in the Willamette Valley were historically quite extensive and diverse, acting as migration corridors across the landscape. It is estimated that approximately seventy to eighty percent of riparian forest habitat has been reduced from pre-European settlement levels (Primozich and Bastasch 2004) because of conversion to farmland and urban development. Water quality, invasive aquatic species, channel complexity, water temperature, and loss of floodplain function, are all identified as limiting factors in flowing water and riparian habitats. Identified as a key habitat in the OCS for the Conservation Opportunity Area “Middle Willamette River Floodplain” (COA ID 60), restoring and maintaining riparian habitat is one of the stated Recommended Conservation Actions in the OCS (ODFW 2016).

At GAWA, the riparian forest is largely intact and stable, however native vegetation is compromised in some areas by invasive reed canarygrass, scotch broom, and blackberry, among others (Table 3). English ivy (Helix hedera), while not well established in the understory, is found in a few locations where the ivy has grown vertically up the trees. Non-native cherry trees (Prunus sp.), believed to be a graft stock from an orchard cherry, is aggressive and is found in areas along the west boundary. Common toadflax (Linaria vulgaris) and meadow knapweed (Centaurea pratensis) (B-List Noxious weeds for Oregon) occur on the shore of the Willamette River.

The ability for cottonwood trees to regenerate on the island has been compromised by flood control on the Willamette River, which has resulted in a lack of disturbance and gravel recruitment on-site. Despite regular seasonal inundation on portions of the island, scouring action is somewhat limited, and in those areas where scouring occurs, reed canarygrass colonizes before cottonwoods can establish.
3.1.2 Wetlands

Status and Description

The OCS describes wetlands as areas either permanently inundated with water, such as occurs in marshes or oxbow lakes, or exhibiting seasonal inundation, such as wet prairies and vernal pools. Wetlands are important for migrating waterfowl, shorebirds, waterbirds, songbirds, mammals, amphibians, and reptiles, all of which occur on the island (Appendix 3). Wetland habitat at GAWA is characterized by off- and side-channel habitat, which includes backwater sloughs, and deciduous swamps and shrublands. The off-channel habitat at GAWA was formerly the main channel of the Willamette River, which through time changed course and separated the site from the floodplain proper. Approximately 1.5 miles in length, the channel holds cold water most of the year. In the winter and early spring, the slough conveys surface flow, providing refuge for juvenile native fish including spring Chinook salmon and winter steelhead. It becomes disconnected from surface flows during the summer months when the Willamette River water surface elevations decline below the elevations of the back- and secondary-channels that connect the slough with the river. Groundwater upwelling continues to maintain aquatic habitat in this area during these base flow periods.

The slough, together with the back channel, occupies approximately 34 acres. These habitats provide value for a variety of species, including perhaps the largest naturally-occurring population of wapato, a culturally-significant plant species, on the Willamette mainstem. Waterfowl, mammals such as beaver and river otter, utilize the vegetation and near-constant source of water. Red-legged frogs and other pond-breeding amphibians utilize these habitats for shelter, forage, and ovipositing on available aquatic plant species. Native turtles require
emergent wetlands for many of their life requirements, including for feeding, reproduction, resting, and basking. While the channel and slough account for the greatest area of wetland on the island, smaller wetlands are scattered across the site as well, characterized by linear scour channels or depressions. Slough sedge (Carex obnupta) and rushes (Juncus effusus, J. tenuis) are scattered throughout the wetlands, the largest of these wetlands encompasses nearly eight acres and remains seasonally flooded.

**Threats to Wetlands at GAWA**

The extent of aquatic invasive species in the channel and slough areas poses the greatest threat to these habitats. Water primrose and parrot-feather (Myriophyllum aquaticum), T-and B-List Noxious Weeds for Oregon, impact wapato populations and degrade fish habitat. Other B-List invasives include purple loosestrife, which was observed immediately adjacent to the north end of the property near the mouth of Rickreall Creek. Meadow knapweed (Centaurea pretensis) and common toadflax (Linaria vulgaris) occur in small populations along the shoreline.

Warm water (non-native) fish occupy the waters of the backwater slough and possibly the channel. Yellow perch (Perca flavescens), bluegill (Lepomis macrochirus), pumpkinseed (Lepomis gibbosus), yellow bullhead (Ameiurus natalis), and western mosquitofish (Gambusia affinis) were discovered during sampling of the slough in the summer of 2016. Water temperatures and dense concentrations of aquatic vegetation affect water quality and temperatures, and as a result, no native fish were found in this area.

Connectivity may present an issue to side channel flows and may impact the function of hydrological processes. Further evaluation will be necessary to determine if reconnecting the southern portion of the slough to the river is feasible or necessary to improve habitat conditions (i.e., make habitat conditions unsuitable for water primrose). Inability to obtain access to the site during high-water flows may influence site management timing.
3.1.3 Forest Opening

Status and Description

The OCS identifies Forest Opening as a specialized and local habitat, meaning it isn’t adequately represented through Strategy Habitat types. Patchy in distribution, these specialized habitats fill ecological niches specific to the local environment (OCS 2016). Described as providing essential structural complexity and plant diversity, forest opening habitat at GAWA was artificially induced as a product of past mining disturbances. Conservation actions described in the OCS for forest openings include maintaining openings of 5 acres or greater to provide the most benefit to songbirds and other wildlife. Snag creation, downed logs, and minimal ground disturbance contribute to overall benefit to this specialized habitat type.

This area has been referred to as a “grassy opening”, being predominantly vegetated with non-native grasses and forbs. Despite the prevalence of non-native plants, this area yields an unusual diversity of native forbs, including common camas, elegant harvest lily, river lupine, and ookow (Dichleostemma congestum), as well as sapling California black oak and madrone (Arbutus menziesii) – unusual in this reach of the Willamette. In addition to an abundance of native plant species in this area, the soil conditions, sparse vegetation, and availability of sunlight in the forest opening converge to create potentially suitable nesting conditions for native turtles.

The prior disturbance and compacted soils of the forest opening creates a strong edge effect, an abrupt transition from forest habitat to open habitat. Species richness and abundance of forest plants and animals, avifauna in particular, can be associated with this transition as changes in canopy, vegetation density, and hydrology influence resources. Edge habitat may positively influence nest site selection, food availability, floristic composition, competition, and predation. In general, forest edges are considered to have high conservation value, especially for bird communities (Terraube et al., 2016).
**Threats to Forest Opening at GAWA**

Soil compaction related to the historical gravel extraction and processing operation in the central portion of the island has led to diminished riparian habitat recruitment, which has resulted in the creation of a forest opening habitat. The widespread re-establishment of native riparian vegetation in this area is unlikely given the prior disturbance, and is highly susceptible to encroachment of weedy woody species such as scotch broom and blackberry. Three primary overburden piles comprised of approximately 10,000 cubic yards of material (RDG 2015) are distributed throughout the area and are colonized by invasive species such as scotch broom and blackberry. These piles act as source areas and may even influence surface flows. Non-native annual and perennial grasses and forbs dominate the non-woody vegetation in the forest opening. Soft brome (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), and orchardgrass (*Dactylis glomerata*) are examples of the types of grasses in this area, while scotch broom and blackberry are dominant woody invasives. Unauthorized ATV use and littering have been observed in this area.

The compacted soils may also impede western pond turtle nesting. While this area provides some of the best sun exposure on the island, the turtles may be deterred from nesting if the soils are too difficult to dig in.

### 3.1.4 Other Significant On-Site Values

Native Americans have been present in North America for centuries. Through their stewardship, the character and biological richness of the landscape could be attributed in large part to their land management practices (Moore et al., 2017). The Kalapuya shaped the landscape through their utilization of native plants species for food, medicine, weaving, and ceremonies. Loss of habitat, fire suppression, and invasive species contribute to the decline of plant species once abundant in the Willamette Valley.
GAWA hosts a diverse plant assemblage that enhances conservation values (e.g., pollinator habitat, species diversity and richness) and hold cultural significance to Willamette Valley tribes today (Table 9). The majority of the forbs are observed in the forest opening with the exception of wapato, which is found in the northern slough. Tree and shrub species are found throughout the remainder of the island.

Table 9. Culturally Significant Plants of Gail Achterman Wildlife Area

<table>
<thead>
<tr>
<th>FORBS</th>
<th>Scientific Name</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crown brodiaea</td>
<td>Brodiaea coronaria</td>
<td>Food</td>
</tr>
<tr>
<td>Common camas</td>
<td>Camassia quamash</td>
<td>Food</td>
</tr>
<tr>
<td>Cow parsnip</td>
<td>Heracleum lanatum</td>
<td>Food, medicine, dye</td>
</tr>
<tr>
<td>Mountain tarweed</td>
<td>Madia glomerata</td>
<td>Food</td>
</tr>
<tr>
<td>Coast tarweed</td>
<td>Madia sativa</td>
<td>Food</td>
</tr>
<tr>
<td>Wapato</td>
<td>Sagittaria latifolia</td>
<td>Food</td>
</tr>
<tr>
<td>White brodiaea</td>
<td>Triteleia hyacinthina</td>
<td>Food</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SEDGES AND RUSHES</th>
<th>Scientific Name</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slough sedge</td>
<td>Carex obnupta</td>
<td>Weaving</td>
</tr>
<tr>
<td>Soft rush</td>
<td>Juncus effusus</td>
<td>Food, weaving, thatching, tying</td>
</tr>
<tr>
<td>Path rush</td>
<td>Juncus tenuis</td>
<td>Weaving</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SHRUBS</th>
<th>Scientific Name</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serviceberry</td>
<td>Amelanchier alnifolia</td>
<td>Food</td>
</tr>
<tr>
<td>California hazelnut</td>
<td>Corylus cornuta</td>
<td>Food, weaving, medicine</td>
</tr>
<tr>
<td>Ocean spray</td>
<td>Holodiscus discolor</td>
<td>Medicine, tools, weapons</td>
</tr>
<tr>
<td>Oregon grape</td>
<td>Mahonia aquifolium</td>
<td>Food, medicine</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TREES</th>
<th>Scientific Name</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>California black oak</td>
<td>Quercus kelloggii</td>
<td>Food</td>
</tr>
<tr>
<td>Cascara</td>
<td>Rhamnus purshiana</td>
<td>Medicine</td>
</tr>
<tr>
<td>Pacific willow</td>
<td>Salix lucida</td>
<td>Medicine, fiber, tools</td>
</tr>
<tr>
<td>Red alder</td>
<td>Alnus rubra</td>
<td>Dye, medicine</td>
</tr>
<tr>
<td>Oregon ash</td>
<td>Fraxinus latifolia</td>
<td>Tools, basketry</td>
</tr>
<tr>
<td>Black cottonwood</td>
<td>Populus trichocarpa</td>
<td>Medicine, rope, basketry</td>
</tr>
</tbody>
</table>
Chapter: Desired Future Conditions

Management of GAWA in the first 10 years of ODFW ownership will focus primarily on conservation and enhancement of native habitats for the benefit of native wildlife and plant species, and on providing key features that support a suite of at-risk and declining Willamette Valley species. The Desired Future Conditions (DFC) and related goals and objectives reflect the property’s Conservation Values and regional conservation priorities.

DFC’s describe characteristics of the site following management and restoration activities. They are referenced when developing projects and prescriptions, and can be used to measure progress toward achieving objectives and meeting the needs of focal species. DFCs are intended to be guidelines and should be applied with flexibility in consideration of project context, short- and long-term objectives, current and future vegetation potential, soils and topography, habitat patch size and landscape context.

Dramatic changes to habitat types are not anticipated as a result of management activities at GAWA. Because the site is already dominated by mature gallery forest species with high diversity and complex structure, the primary focus of management on GAWA will be to maintain existing resources and enhance biological features through natural regeneration, native plantings, and invasive species control. The existing habitats will continue to function without major modifications to the overall landscape, with the exception of focused invasive plant removal efforts and subsequent replanting of native flora.

Invasive Plants

The largest threat to the integrity of the habitats on the property is invasive species. Regular flooding at the site frequently disrupts the soil surface, and input of weedy propagules is likely to be a long-term problem. Flood control and the prevalence of invasive species, particularly water primrose, reed canarygrass, and blackberry, limit the ability of native species to colonize or regenerate. Consequently, the focus for DFC’s will be on limiting the spread, and where possible, eradicating or reducing the degree of invasive species in the areas most likely to benefit from targeted efforts and replacing them with native shrubs, forbs, sedges, and rushes.

The largest and most obvious impact from invasives is in the northern slough, where the native wapato colony is severely compromised by dense concentrations of the highly invasive aquatic species, water primrose. The Western Aquatic Invasives Network (WAIN) was formed to address the threat and impact of aquatic invasive species in the Willamette River Basin with the primary purpose to foster collaboration to share information, expertise, data, and best management practices to develop strategies to protect and restore riparian habitat. ODFW has partnered with the Willamette Riverkeeper to implement aquatic invasive plant treatments at GAWA in order to achieve Willamette Basin-wide goals on this issue.

Targeted efforts to eradicate water primrose as completely as possible will be a foremost priority management action and is scheduled to begin in the summer of 2018. Continued site
reconnaissance provides for ongoing refinement of treatment options for the other invasive targets, recognizing that restoration of these systems is problematic because of the persistence of reed canarygrass and blackberry and the continued influx of weeds. Treatment of emerging invasive plant populations, especially where they are observed to be encroaching upon high quality habitat, will remain a goal. By improving the condition of the habitats through mechanical and manual eradication, selective use of herbicides to suppress targets in select areas, and the re-establishment of native plant communities, an overall reduction in invasive species is anticipated.

**Improved Water Quality and Habitat Diversity**

Native plant and animal communities will benefit significantly from control of water primrose and other invasive plant species by improving water quality and habitat access. Aquatic plants are known to affect water quality by altering diurnal fluctuations of dissolved oxygen and large-scale die-offs can create anoxic conditions detrimental to aquatic life. Decreased temperatures and increased dissolved oxygen will shift plant communities to more native species dominance. Sediment accumulation can be reduced with removal of invasive aquatic plants, which in turn will help retain water in the slough and off-channel habitats for longer periods.

**Fish, Wildlife, and Cultural Plants**

Control of aquatic invasive plant species is likely to improve access to off-channel habitat for aquatic and semi-aquatic species (fish, waterfowl, amphibians, reptiles, etc.). Likewise, a reduction in the concentration of blackberry patches, and where possible, reed canarygrass, will dramatically improve the ability of animals to move across the landscape in search of forage, cover, and nesting habitat. By increasing the availability of open water habitat and stabilizing native plant populations, we can anticipate an increased use by wildlife such as amphibians, reptiles, beaver, juvenile anadromous fish, Oregon chub and other native resident fish species. Enhancement of the forested areas will provide multiple layers of vegetation for birds, bats, mammals, and herpetofauna, increasing the diversity of food sources and roosting/nesting sites. Removing dense invasive cover, such as blackberries, has been shown to release native forbs. Keeping the forest opening free of woody overgrowth will expand existing culturally-significant plant populations. It may be possible that portions of the overburden piles in the forest opening could be spread judiciously to improve nesting turtle habitat and soil compaction in this area, taking into consideration the impacts associated with releasing weed seeds contained in the piles.

**Public Access and Use/Infrastructure**

There are no anticipated changes in general to public use of GAWA. Recreational use is welcomed and encouraged, but access to the island will remain limited to waterway or by permission from ODFW to utilize the private road easement. Significant effort will be made to engage the community and will include activities intended to connect the public with the site while also providing education about the ecology and natural history of the Willamette River for
diverse audiences and community members of all ages. Partnerships with organizations such as Straub Environmental Center, Willamette Riverkeeper, Audubon Society, and academic institutions will be encouraged. Hunting will remain open during the designated seasons. There will be no changes to current infrastructure, which is limited to a single gate at the land access point. Trails will be developed for administrative purposes only and only those signs that identify boundaries, wildlife area rules, or the purpose of the protected site may be posted.

5 Management Plan Implementation

5.1 Management Goals, Objectives, Strategies, and Timelines

The goals, objectives, and strategies (Table 10) are designed to protect the site’s Conservation Values, native habitats, and unique and important ecological features, while also providing a framework to guide management and restoration actions. Goals are broad statements describing the transition from the site’s current condition to its desired future condition. Each goal has one or more objectives; these objectives direct implementation of site activities. Each objective is assigned one or more strategies, which are also used to evaluate whether the objective has been met.

The maintenance and restoration actions recommended in this Plan provide a framework of short-term treatments to long-term multi-year efforts. Prioritization is needed to focus management actions where they have the most immediate effect, and to build in needed time to plan and secure funds for larger-scale efforts. The prioritization recommended here (established timelines) accounts for these needs as well as the degree of threat to existing plants, wildlife, and habitats, especially listed species; baseline information needed; potential to achieve moderate to high quality habitat conditions; feasibility of projects within the 10-year timeframe of this Plan; availability of funding, and anticipated sequencing of actions.

A step-down process is used to outline components of the overall site management:

- Goals state *generally* what is trying to be achieved;
  - Objectives state *specifically* what is trying to be achieved;
    - Strategies state how, *generally*, objectives will be achieved;
      - Actions state how, *specifically*, the strategy will be implemented.
Table 10. Management Goals, Objectives, Strategies, Actions, and Timelines

<table>
<thead>
<tr>
<th>Goal 1: Support natural hydrologic processes including flooding, channel migration, groundwater interaction, and formation of backwater areas to the extent practical.</th>
<th>Timeframe</th>
<th>Priority</th>
<th>Season</th>
</tr>
</thead>
</table>

**Objective 1a. Study the relationship between flows and surface water elevations in the river, side channel, and alcoves, for a minimum of five years and utilize results to inform future habitat management.**

- Combine onsite hydrologic monitoring data with historic aerials, LiDAR imagery to analyze high-resolution topography, and known habitat requirements of target species to guide management of the site.
  - Install field equipment such as a permanent staff gauge, peizometer, and temperature loggers, to monitor hydrological variables at locations along the channel and in the slough.
  - Document water stages in the side channel/off-channel areas and relate them to the Willamette River Salem gauge to determine correlation with the channel gauge.
  - Utilize temperature monitoring to assess hyporheic flow benefits to side channel temperatures at variable flows and surface water elevations.
  
<table>
<thead>
<tr>
<th>Timeframe</th>
<th>Priority</th>
<th>Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-2023</td>
<td>H</td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>H</td>
<td>Summer</td>
</tr>
<tr>
<td>Ongoing</td>
<td>H</td>
<td>Winter/Spring</td>
</tr>
<tr>
<td>Ongoing</td>
<td>H</td>
<td>Winter/Spring/Summer</td>
</tr>
</tbody>
</table>

**Objective 1b. By 2022, determine benefits of side-channel flow restoration and enhancement and implement actions to improve habitat conditions.**

- Assess the condition of the back-channel culvert.
  - Make necessary repairs, modifications, upgrades, and/or removal during dry season.

<table>
<thead>
<tr>
<th>Timeframe</th>
<th>Priority</th>
<th>Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017-2019</td>
<td>L</td>
<td>Summer</td>
</tr>
</tbody>
</table>

- Assess processes and/or limitations that may affect site dynamics.
  - Conduct surveys to improve understanding of hydrological and geomorphological functions.
  - Develop and implement management strategies according to findings.

<table>
<thead>
<tr>
<th>Timeframe</th>
<th>Priority</th>
<th>Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017-2028</td>
<td>M</td>
<td>Winter/Summer</td>
</tr>
</tbody>
</table>
Goal 2: Limit and reduce the occurrence and spread of target invasive species to protect structure and function of habitats.

| Objective 2a. Establish management strategies and protocols for treatment of invasive plants. |
|---|---|---|---|
| **Employ an Early-Detection-Rapid-Response (EDRR) approach to highly invasive species.** |
| - Use aerial photography, ground reconnaissance, and existing reports and data to delineate and prioritize management units. |
| - Conduct surveys to determine locations of targeted invasive species and map extent where containment is a priority. |
| - Update weed maps to indicate treatment locations. |
| **Implement control measures for decreasing targeted invasive species.** |
| - Conduct hand, mechanical, or herbicide treatments. |
| **Implement actions (such as side channel flow enhancement) to help prevent colonization or reestablishment of non-natives.** |
| **Revegetate with native plants in areas where extensive invasive removal has occurred to limit encroachment and reestablishment of non-natives.** |
| **Objective 2b. Control highly invasive aquatic plant species.** |
| **Develop a target species list and strategies for control of invasives with the Willamette Aquatic Invasives Network and project partners.** |
| **Control water primrose, parrot-feather, and other priority aquatic invasives.** |
| - Conduct in-channel herbicide and mechanical treatments aimed at achieving and maintaining ≤10% cover of water primrose, parrot-feather, and other invasive aquatics. |
| **Objective 2c. Remove invading trees and invasive shrubs threatening forest habitats.** |
| **Inhibit new colonization of non-native cherry trees.** |
| - Cut saplings in the fall and treat with systemic herbicide to kill the roots. |
| - Apply foliar herbicide applications to tree saplings and regrowth during the summer. |
| **Treat highly invasive woody species, such as scotch broom and Armenian blackberry, where feasible.** |
| - Maintain scotch broom levels at ≤1% cover, through mechanical and chemical treatments. |
| - Maintain blackberry levels at ≤40% cover, through mechanical and chemical treatments. |
**Objective 2d. Control target invasive weeds threatening forest habitats.**

- Contain common toadflax and meadow knapweed within its current footprint and if possible, eradicate the populations through chemical control.  
  2018-2028  
  Spring/Summer

- Restrict purple loosestrife from expanding into the north slough, and work with the adjacent landowner to eradicate the offsite population.  
  Annual  
  Spring/Summer

- Manage English ivy.  
  - Identify and map areas where English ivy has established and vertically covers trees.  
  - Cut stems from tree trunks and apply chemical treatment to 100% of impacted trees.  
  - Mechanically- and/or chemically- treat plants to achieve ≤15% ground cover.  
  2018  
  Spring-Fall

<table>
<thead>
<tr>
<th>Goal 3: Maintain and expand populations of culturally-significant plant species.</th>
<th>Timeframe</th>
<th>Priority</th>
<th>Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 3a. Protect, monitor, and expand populations of wapato, camas, tarweed, cow parsnip, and other plants recognized as having cultural significance.</td>
<td>Yearly</td>
<td>L</td>
<td>Spring/Summer</td>
</tr>
<tr>
<td>- Conduct population assessments for target plants to determine numbers, extent, and threats.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Manage areas within and around targeted populations to reduce non-native woody plant cover to ≤5% and to create suitable areas for seed germination.</td>
<td>Yearly</td>
<td>M</td>
<td>Spring/Summer</td>
</tr>
<tr>
<td>- Introduce or augment populations of culturally-sensitive plant species.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Maintain the forest opening by mowing to allow natural expansion.</td>
<td>2018-2028</td>
<td>L</td>
<td>Summer/Fall</td>
</tr>
<tr>
<td>- Incorporate native forbs into seed and bulb mixes.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Objective 3b. Incorporate traditional ecological knowledge into management practices.**

- Engage with the tribal community to obtain cultural information to help inform management practices.  
  2019-2021  
  M

- Conduct at least three educational and outreach activities that inform the public about traditional practices.  
  2019-2028  
  Summer
Objective 4a. Incorporate established Best Management Practices (BMPs) when conducting management activities.

- Conduct management activities during periods of least disruption to fauna.
- Minimize disturbance of management actions on nesting birds or hibernating/nesting turtles.
  - Conduct visual searches before undergoing site preparation and maintenance to avoid impacts.
  - When operating machinery, maintain lower speed to allow animals to move out of the way.
  - Set tractor mowing decks sufficiently high (~10 inches) to avoid soil gouging and reduce the potential for direct impacts to animals.
  - Use hand-cutting methods when possible.
- Minimize herbicide applications when possible by using mechanical treatments instead.
- When possible, apply herbicides during periods that have the least impact to pollinators.
- Minimize large-scale alterations to habitat by staggering size of area and location of treatments across the site.

<table>
<thead>
<tr>
<th>Timeframe</th>
<th>Priority</th>
<th>Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ongoing</td>
<td>H</td>
<td>Year-round</td>
</tr>
</tbody>
</table>

Objective 4b. Manage key habitat structure for wildlife.

- Maintain structural diversity within canopy, shrub, and ground vegetation to support foraging and nesting opportunities at variable strata.
  - Retain existing snags, unless they are deemed hazardous.
  - Create additional snags if opportunities or management activities support development.
  - Target minimum snag height creation at 10-30 feet and minimum diameter at breast height at 12 inches (15-20 inches optimal).
  - Leave existing woody debris in place or utilize in off-channel habitat, unless it prevents critical maintenance access or creates hazards.
  - Place large wood and root wads to provide cover for native fish and basking areas for native turtles.
  - Create small, localized brush piles as refuge for amphibians and reptiles, small mammals, and birds by generating materials from woody vegetation removal activities.
  - Maintain or create areas of sunny, sparse, and low-growing vegetation and gravelly surfaces to support potential turtle nesting habitat.
  - Protect nesting and breeding locations of western pond turtles and red-legged frogs using enclosures if discovered.

<table>
<thead>
<tr>
<th>Timeframe</th>
<th>Priority</th>
<th>Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ongoing</td>
<td>H</td>
<td>Variable</td>
</tr>
</tbody>
</table>
- Support great-blue heron nesting colonies.
  - Assess site characteristics of historical great-blue heron breeding locations on Gail Achterman Wildlife Area.
  - Monitor annually and establish BMPs if herons are documented as nesting on site.
- Manage habitat quality, quantity, and access for native fishes by assessing habitat conditions.
  - Conduct periodic fish sampling surveys to assess species diversity.
  - Conduct UAV flights to monitor back channel and slough invasive plant populations.
  - Use data obtained from monitoring (see Objective 1a) to develop management strategies.

**Objective 4c. Manage plant composition for wildlife.**

- Maintain or increase native species diversity within canopy, shrub, and ground vegetation to support foraging and nesting opportunities at variable strata.
  - Remove competitive invasive plant species using strategies outlined in this document.
  - Replant areas where invasive species have been removed with native plantings.
  - Maximize pollinator habitat by incorporating native species into planting mixes.
- Plant native emergent vegetation in aquatic areas after invasive treatments to support waterfowl, native fish, pond-breeding reptiles, and amphibians.

**Goal 5: Facilitate natural succession of the riparian forest and forest opening habitat.**

<table>
<thead>
<tr>
<th>Objective 5a. Assess forest health to determine existing habitat quality and inform management decisions.</th>
<th>Timeframe</th>
<th>Priority</th>
<th>Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete baseline assessments of riparian vegetation, including plant diversity, distribution, tree age-class, and health.</td>
<td>2017</td>
<td>H</td>
<td>Year-round</td>
</tr>
<tr>
<td>Develop a forestry plan, forest management prescription, and corresponding BMPs.</td>
<td>2017-2023</td>
<td>M</td>
<td></td>
</tr>
</tbody>
</table>
### Objective 5b. Establish and maintain a regenerative and diverse riparian forest system.

- Manage for structural, species, and age-class diversity by implementing the forest plan and BMPs.  
  
- Allow for a naturally recruiting mixed-deciduous riparian forest with a diverse component of native trees/shrubs.  
  - Follow BMPs to ensure natural colonization is not impacted by management activities.  
  - Remove invasive shrubs and trees to minimize competition to natives.

- Promote regeneration of black cottonwoods.  
  - Evaluate if natural recruitment is occurring.  
  - Augment population in areas of low recruitment by planting cottonwoods.

- Identify and map locations of oak and madrone trees.  
  - Reduce competing vegetation to encourage growth of oaks and madrones.  
  - Flag and protect at-risk trees to avoid impact from management activities.

### Objective 5c. Actively manage gravel processing area as a forest opening to allow natural regeneration of native grasses, shrubs, and forbs.

- Restrict establishment of unwanted invasive woody vegetation.  
  - Maintain a periodic disturbance (mowing, spray) every 2-3 years to promote ground surface infiltration and eliminate woody regrowth of non-native plants.  
  - Maintain ≤5% woody invasive species encroachment.

### Goal 6. Develop and implement an effective and efficient monitoring program.

<table>
<thead>
<tr>
<th>Timeframe</th>
<th>Priority</th>
<th>Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>Summer</td>
<td></td>
</tr>
<tr>
<td>2018, 2021, 2024, 2027</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Objective 6a. Conduct regular photo monitoring at established photopoints to document changes in landscape.

- Initiate photo monitoring in the first year of management.

- Complete photo monitoring at established baseline photo points at three-year intervals for locations not subject to major restoration projects.

- Conduct photo monitoring prior to and following major restoration actions annually for five years.
Objective 6b. Monitor plant communities to evaluate effectiveness of restoration and enhancement activities.

- Develop a comprehensive baseline habitat map. 2015-2018 H
  - Develop project-specific restoration goals and establish monitoring strategies. Per project H
  - Conduct surveys (post-restoration) to document response of the resources and inform adaptive management (e.g., percent plant survival; percent cover of invasive species).
- Update habitat map every 5 years. 2022, 2027
- Update and map invasive plant locations and treatments yearly. 2017-2028

Objective 6c. Establish a wildlife monitoring program to determine whether priority focal species are present at the site.

- Develop specific monitoring goals and protocols for priority focal wildlife species. 2018-2020 H
- Conduct surveys of these resources following established protocols. Per protocols H Year-round
- Enlist volunteer help where practicable to support monitoring goals. As needed Year-round

Goal 7. Provide public access compatible with habitat and species management goals for Gail Achterman WA

<table>
<thead>
<tr>
<th>Objective 7a. Allow access to the site for wildlife viewing, hunting, and angling consistent with habitat and species management goals.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Public access will be consistent with existing easements and the Oregon Administrative Rules for use of wildlife areas.</td>
</tr>
<tr>
<td>- Public access is available from the Willamette River. The existing road easement supports administrative access only.</td>
</tr>
<tr>
<td>• Public use will be monitored for potential conflicts between users and habitat/species conservation goals.</td>
</tr>
<tr>
<td>- Implement seasonal or site specific restrictions to minimize conflicts if necessary.</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>--------------------</td>
</tr>
<tr>
<td>Ongoing</td>
</tr>
<tr>
<td>Ongoing</td>
</tr>
</tbody>
</table>
Objective 7b. Minimize trespass and/or vandalism.

- Monitor for unauthorized use/access.
  - Establish trail cameras at discrete locations to assess public use.
  - Document and mitigate public impacts such as dumping, unauthorized trail development, vandalism, poaching, and theft.

- Post boundary signs and wildlife area rules and regulations along western boundary and shoreline.

- Address unauthorized/illicit use as needed.
  - Install appropriate barriers on the access road to prevent unauthorized vehicular use.
  - Inform Oregon State Police of ODFW ownership and coordinate response if needed.

Goal 8. Support outreach and education opportunities.

| Objective 8a. Coordinate with organizations such as the Straub Environmental Center, Willamette Riverkeeper, City of Salem, and academic facilities, to support management objectives and/or facilitate education and outreach. |
|---|---|---|
| Provide opportunities for internships, citizen scientist projects, academic research, and youth groups. | Ongoing | H | Year-round |
| Offer field tours for agency staff and conservation partners as part of management activities. | Yearly | H | S |
**Goal 9. Improve wildlife values by removing, repairing, or maintaining infrastructure.**

<table>
<thead>
<tr>
<th>Objective 9a. Maintain access road to provide/ensure administrative access to the property.</th>
<th>Timeframe</th>
<th>Priority</th>
<th>Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keep access road clear of vegetation overgrowth.</td>
<td>As needed</td>
<td>H</td>
<td>Spring-Fall</td>
</tr>
<tr>
<td>Assess, improve, and maintain access at the low water crossing.</td>
<td>2018-2019</td>
<td>H</td>
<td></td>
</tr>
<tr>
<td>- Work with ODFW engineers to determine if changes or repairs to the channel and culvert are needed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Implement the most cost-effective solution if repairs or replacement are needed.</td>
<td>2019</td>
<td>H</td>
<td></td>
</tr>
<tr>
<td>Maintain good relationship with adjacent landowner by communicating activities via the shared right-of-way easement and by informing them of planned restoration activities or public events.</td>
<td>Ongoing</td>
<td>H</td>
<td></td>
</tr>
</tbody>
</table>

**Objective 9b. Remove obstacles and trash.**

<table>
<thead>
<tr>
<th></th>
<th>Timeframe</th>
<th>Priority</th>
<th>Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dismantle and remove duck blind from the site.</td>
<td>2019</td>
<td>M</td>
<td>Summer</td>
</tr>
<tr>
<td>Remove and properly dispose of unwanted trash and debris found on the property.</td>
<td>Ongoing</td>
<td>H</td>
<td></td>
</tr>
</tbody>
</table>
5.2 Adaptive Management

All management and restoration work undertaken by ODFW when implementing this Plan will occur under an adaptive management framework. Adaptive management is based on the principles of monitoring priority site features, conditions, and management action effectiveness, benchmarking their progress and status against the stated goals and objectives for the site, and adjusting next steps accordingly.

The adaptive management cycle of planning, implementing, evaluating, and as needed, modifying management actions continually improves practitioners’ understanding of treatment effectiveness, encourages innovation in methods, and results in timely adjustments to planned actions rather than reaching the end of a project before altering the techniques or approach. Adaptive management helps address uncertainties in ecosystem management, allows for addressing unique conditions found at a specific site, provides opportunities to assess progress, and aids in achieving stated goals.

The monitoring efforts outlined in this chapter are designed to track the status of the site’s Conservation Values and progress toward achieving the DFCs for the site. Monitoring of restoration treatment effectiveness will be part of any grant received for the project. Work completed by contractors will be evaluated and provide real-time feedback on treatment condition and success. After 5 years of implementation, the Technical Advisory Group of partner staff comprised of funders and technical experts will function as a communications structure to provide feedback on how the restored features are developing and functioning; and, recommendations for changes to design, methods, sequencing or monitoring. ODFW’s partners in the Willamette Wildlife Mitigation Program will perform the same role, as will ODFW biologists whose work is focused on habitats or species found on Gail Achterman Wildlife Area. At the end of a 10-year period, changes in habitat conditions will be evaluated to compare to baseline conditions, determine progress to date, and inform the plan amendment process. Ultimately, all management and restoration decisions are determined by ODFW staff.
5.3 Monitoring

All monitoring will occur under the broader framework of ODFW’s Monitoring Program for Willamette Wildlife Mitigation Program Project sites. The goals for this program include:

- Document baseline habitat types consistent with OCS;
- Determine OCS habitat conditions within WWMP properties;
- Determine if land management has impacted habitat conditions;
- Determine whether DFC’s have been achieved or are trending towards achievement.

5.3.1 Effectiveness Monitoring

Effectiveness monitoring for GAWA will focus on baseline documentation described in Chapters 2 and 3, status of the site’s Conservation Values, and restoration effectiveness. Effectiveness monitoring is designed to provide important biological and ecological information about the site, while minimizing duplication of other monitoring efforts. ODFW will share the monitoring data collected at GAWA with other conservation-oriented groups and the public, with the exception of sensitive species data, which will be limited to appropriate government agencies (i.e., USFWS, ODA, ORBIC, etc.), WWMP partners, and the WAIN who are managing populations of the same species on nearby lands.

Any monitoring will employ scientific principles and professionally accepted techniques. Much of the monitoring is designed to be collected at a rapid assessment level of detail and will be qualitative in nature, however some data (e.g. wildlife monitoring) may be quantitative in nature. All monitoring data generated will be stored electronically and maintained by ODFW.

Four monitoring efforts will occur under this Plan:

1. **Photopoints.**

   Twenty-two photopoints have been established on the property for the purpose of documenting site condition and visual changes in the landscape over time. Photos have been taken in each of the cardinal directions at these locations and will serve as the baseline for future comparisons. Photo monitoring will be repeated at five-year intervals unless the location has been subject to a major restoration project, in which case the photos will be taken annually for a minimum of five years. Photos will be taken at approximately the same time each year to document changes over time.

2. **Wildlife surveys.**

   Monitoring protocols will be established for birds, herpetofauna, and fish species, and will utilize accepted methods for surveying. Baseline surveys will be conducted within the first 3 years of site ownership to establish presence. Monitoring of targeted species will be
conducted as staffing allows, between every 1 to 3 years. Species presence and population trends are examples of information that could be obtained that ma.

3. **Major restoration and enhancement actions.** Major enhancement and restoration activities will be monitored in order to document significant changes to plant communities and where possible, response of wildlife species to those changes. Pre- and post-project monitoring will occur in areas that are subjected to restoration activities where changes to hydrologic modification, invasive plant removal, or native planting occurs. Monitoring may be conducted by ODFW biologists or monitoring staff, by contractors undertaking the restoration work, or by researchers or volunteers. Monitoring protocols will be designed to inform whether management prescriptions are effective and trending toward intended goals. Specific monitoring goals and protocols will be utilized for different types of projects. Monitoring should capture changes in species composition and structure following major invasive species removal. Native vegetation establishment, hydrological changes, and use of the site by breeding wildlife are all monitoring targets.

4. **Public Access.**

Public access will be monitored for type of use, unauthorized activities, vandalism, or dumping of trash. Frequent visits to the site in addition to the use of trail cameras will help identify conflicts between users and conservation goals.

5.3.2 **Compliance Monitoring**

Compliance monitoring for GAWA will be conducted consistent with the WWMP monitoring plan currently in development, at least once every five years and potentially more frequently, to determine if the terms established in the conservation easement and Plan are being followed and if enforcement action is necessary. Compliance monitoring is a requirement of BPA and intends to identify consistent implementation of conservation easement and management plan restrictions and actions.

5.4 **Planning Process and Public Participation**

The development of this Plan involved several steps. A core team of ODFW biologists, field staff, and program managers met initially to discuss management plan content and ODFW goals and needs for the project. ODFW conducted several site visits with staff and field biologists in order to further refine habitat goals and objectives. Following initial site visits, ODFW hosted site tours and meetings for partner organizations and requested input on best uses of the site. Attendees and contributors to this process are referenced at the beginning of this document and included representatives from various organizations and ODFW, including species’ specialists, wildlife area managers, and Willamette Wildlife Mitigation Program staff. Meetings to discuss site goals and recommended management actions were conducted between key and
core partner groups. Comments from these groups were reviewed and incorporated as appropriate.

Field surveys were completed by consultants and ODFW from 2014 through 2018. This core team reviewed the draft Plan and all subsequent revisions. After internal comments were incorporated, the draft Plan was sent out for review by outside groups and agencies for comments. Comments from these groups were reviewed and incorporated as appropriate.

The draft Plan was made available to the public via the ODFW website. A new release for the draft plan and public meeting was distributed by ODFW in addition to sending emails to interest groups and project partners.

The draft Plan was presented to the public at a public meeting on January 22, 2017 via a presentation and discussion with ODFW WWMP staff. Comments were received and questions were answered at the meeting. Three members from the public attended. Following is a summary of the questions and statements received:

- What type of public access and usage will be available (e.g., trails, access points, and hunting)?
- What is the timing of the restoration planned for the slough and how long will it take?
- How will trash and debris be managed?
- Access to the slough is allowable via kayak but permission from Salem Yacht Club is needed to land craft on their property.
- The Ludwigia population has increased over the last five years and inhibits access to the slough.
- Appreciation was expressed of our management of tribal cultural plants and coordination with the Tribes. Confederated Tribes of Grand Ronde would like to visit the wapato area.

5.5 Regulatory Requirements

ODFW will comply with all applicable laws, regulations, and other requirements that apply to properties acquired through the WWMP. Federal, State, and local jurisdictional regulations that may require consultation or permitting as a result of management activities at the Gail Achterman Wildlife Area include:

- Cultural Resource Review - Federal and State agencies must factor historic preservation into project requirements
  o National Historic Preservation Act (Section 106)
  o State Historic Preservation (ORS 358.635)
- Joint Permit
  o Clean Water Act (Section 404) (U.S. Army Corps of Engineers)
  o Removal-Fill Law (ORS 196.765-990) (Oregon Department of State Lands)
State
  o Pesticide General Permit 2300-A (Department of Environmental Quality)
Federal-and State-listed Endangered Species
  o Endangered Species Act (Section 7) (U.S. Fish and Wildlife Service)
  o Listed Plant Permits (Oregon Department of Agriculture)
Land Use Compatibility – (Polk County)
Airport/FAA Restrictions – GAWA is located in Class D airspace. This may apply to UAV use on site and will need to be reviewed
BPA’s Habitat Improvement Programmatic (HIP III) for Operations and Maintenance
State of Oregon pesticide reporting guidelines

5.6 Operations & Management

Funds have been provided by BPA to enhance, operate, maintain, and protect the property to preserve or enhance the conservation values described in Section 1.2. These funds will be expended towards the following kinds of activities:
  • Regular maintenance of boundaries and signs;
  • Monitoring surrounding land uses that could adversely affect the conservation values;
  • Maintaining current photos, maps, and tax information;
  • Creating and maintaining management plans;
  • Maintaining gates, fences, and locks;
  • Facilitating and managing public access;
  • Preventing and limiting encroachment of invasive species;
  • Habitat mapping and evaluation;
  • Outreach to neighbors, stakeholders, and local governments;
  • Equipment specific to stewardship needs;
  • Invasive species management at a maintenance level.

Restoration activities associated with the property will be funded with sources other than the O&M funds provided under the stewardship agreement.

5.7 Management Plan Development and Reporting

This Plan is a working document that will be actively used by ODFW biologists and field staff to direct on-the-ground restoration and management actions, according to the stated goals, objectives, and strategies. The strategies are written as actions with assigned timelines, and will be used to design a sequence of work over the coming years. In this regard, the Plan will be actively implemented and frequently updated, by design.

The information contained in this Plan meets ODFW’s needs and interests, as well as BPA and OWEB requirements described in the Conservation Easement. A review of this Plan by ODFW
and BPA will be conducted at the 5-year point (2023) to determine if an updated set of goals and actions are warranted, and if understanding of the site changes significantly. In accordance with the OWEB Grant Agreement, ODFW will submit a brief report every 5 years summarizing the use and management of the property and relating how ODFW’s actions are enhancing the Conservation Values described in the Conservation Easement. Otherwise, in 2028 ODFW and BPA will determine whether a revision to this Plan is needed, or that the site can transition from a restoration and enhancement mode to an operations and maintenance mode.

Stewardship reports will be completed on an annual basis and will include updates on habitat conditions, surrounding land use, development or changes in the Plan, observed or reported trespass, relationships with surrounding landowners, and the potential or observed effect of each of these changes to the property. Any herbicide use will be listed following standards of BPA’s Habitat Improvement Programmatic (HIP) Herbicide and State of Oregon reporting guidelines.

5.8 Management Staff Contact Information

**Willamette Fish and Wildlife Policy and Program Manager, WWMP Program Manager.**
3150 E. Main St., Springfield, OR 97478
541-726-3515, ext. 29

**Willamette Wildlife Mitigation Program Coordinator, Primary contact for WWMP.**
4034 Fairview Industrial Drive, Salem, OR 97302
503-947-6086

**Willamette Wildlife Mitigation Project Biologist,** Develop management plan and assist with implementation in coordination with District staff; primary day-to-day oversight of the property; O&M responsibilities; monitoring per WWMP monitoring plan.
7118 NE Vandenberg Ave., Corvallis, OR 97330
541-757-4186

**Willamette Wildlife Mitigation Restoration and Monitoring Biologist,** Assist wildlife area staff with restoration design and implementation, monitoring, property operations and maintenance, and grant development as needed.
26969 Cantrell Road, Eugene 97402
541-935-2591

**South Willamette Watershed District Manager,** Coordination of watershed district priorities.
7118 NE Vandenberg Avenue, Corvallis, OR 97330
541-757-5242
Habitat Program Manager, Implementation of watershed district priorities; supervision of seasonal staff.

7118 NE Vandenberg Avenue, Corvallis, OR 97330
541-757-5237
6 References Cited

Adams, J., C. Pearl, and R. Bury. 2004. Wetland Management for Amphibians in the Willamette Valley. USGS Forest and Rangeland Ecosystem Science Center, Corvallis, OR.


Oregon Department of Environmental Quality. 2006. Willamette Basin TMDL: Upper Willamette Subbasin, Portland, OR.


USGS. 2009. USGS stream Gage 14191000 Willamette River at Salem, OR – Station Notes.

