Appendix G. Protecting *Core Remaining Habitat* for At-risk Species on State-owned Aquatic Lands

Table of Contents

Appendix G. Protecting Core Remaining Habitat for At-risk Species on State-owned Aquatic Lands G-1

1.0 Washington DNR's intent G-3

2.0 State aquatic lands ownership and Washington DNR management G-3

3.0 Process used to delineate remaining habitat G-4

4.0 Species and associated habitat G-5

4.1 Western pond turtle G-5

4.2 Oregon spotted frog G-14

References G-20

List of Figures and Tables

Figures

Figure 1. Process used to delineate and recommend potential remaining habitat protections for vulnerable species identified in Table 1. ..... G-4

Figure 2. Aerial photo of Columbia River looking east: Franz Lake National Wildlife Refuge is in the foreground; Beacon Rock State Park lies beyond G-7

Figure 3. Aerial view of Columbia River shorelands and bedlands adjacent to Beacon Rock State Park. Map of Beacon Rock turtle habitat complex G-8

Figure 4. Aerial view of Columbia River shorelands and bedlands adjacent to Beacon Rock State Park G-9

Figure 5. Aerial view of Columbia River shorelands and bedlands adjacent to Pierce National Wildlife Refuge G-9

Figure 6. Area of proposed protection of state-owned aquatic lands adjacent to the Beacon Rock turtle habitat complex G-12

Figure 7. Shoreline master program environmental designations for Black Lake and the upper section of Black River, Thurston County, WA G-17

Figure 8. Shoreline master program environmental designations for the lower section of Black River, Thurston County, WA G-18

Tables

Table 1. Species covered under the Aquatic Lands Habitat Conservation Plan with protections for core remaining habitat G-1

Table 2. Species considered that did not meet the definition of core remaining habitat G-2

Appendix G. Protecting *Core Remaining Habitat* for At-risk Species on State-owned Aquatic Lands

Under the Aquatic Lands Habitat Conservation Plan, the Washington State Department of Natural Resources (Washington DNR) proposes to protect the last core remaining habitat on state-owned aquatic lands for at-risk species covered under the habitat conservation plan (Table 1). These species have limited breeding habitat statewide, their current populations are small and vulnerable to extirpation, or their state populations are rapidly declining.

Table 1. Species covered under the Aquatic Lands Habitat Conservation Plan with protections for core remaining habitat.

Species	Habitat on or Immediately Adjacent to State-owned Aquatic Lands?	Federal Listing Status	State Listing Status	Natural Heritage Rank	Discrete Habitat Locations for Protection?
Western pond turtle (*Actinemys marmorata*)	Yes	Species of concern	Endangered	G3G4,S1	Yes
Oregon spotted frog (*Rana pretiosa*)	Yes	Candidate	Endangered	G2,S1	Yes

Washington DNR defines core remaining habitat as locations of known habitat for species covered under the habitat conservation plan that meet all of the criteria below:

1. Washington DNR management authority can be confirmed either on, or immediately adjacent to, known habitat.
2. Species warrant protection by virtue of their listing status or rank as one (or more) of the following:
    a. Species is federally listed as endangered or threatened.
    b. Species is state-listed as endangered or threatened.
    c. Species has a state rank of S1 or S2, as defined by the Washington Natural Heritage program.
3. Species have relatively small geographic ranges, discrete documented habitat locations, or are known to fulfill critical life history requirements for the species.

A species must meet all three components in order to be considered.
While Washington DNR initially identified nine species for potential protection under this program (Tables 1 and 2), only two meet the criteria above and are currently on this list (Table 1). Washington DNR envisions that species may be added or removed from this list in the future if additional information is revealed that warrants a change based on these three criteria.

Table 2. Species considered that did not meet the definition of core remaining habitat.

Species	Habitat on or Immediately Adjacent to State-owned Aquatic Lands?	Federal Listing Status	State Listing Status	Natural Heritage Rank	Discrete Habitat Locations for Protection?
Western snowy plover (*Charadrius alexandrinus nivosus*)	No	Threatened	Endangered	G4, S1	Yes
Northern leopard frog (*Rana pipiens*)	No	Species of concern	Endangered	G5, S1	Yes
Pacific lamprey (*Entosphenus tridentata*)	Yes	Species of concern	Monitored	G4, S3-S4	No
Columbia spotted frog (*Rana luteiventris*)	Yes	Not listed	Candidate	G4,S4	Yes
Marbled murrelet (*Brachyramphus marmoratus*)	Yes[1]	Threatened	Threatened	G3G4, S3	No[2]
Harlequin duck (Histrionicus histrionicus)	Yes[3]	Not listed	Not listed	S4, S2B	No[4]
Common loon (*Gavia immer*)	No	Not listed	Sensitive	G5, S2B, S4N	Yes

Species that met the criteria in every way except for occurring on state-owned aquatic lands included:

- Western snowy plover
- Northern leopard frog
- Common loon

Species that didn't meet the listing or ranking requirement of the definition included:

[1] Documented *at sea* foraging habitat on state-owned aquatic lands during breeding season.

[2] Foraging habitat in nearshore and offshore marine areas has been identified at a coarse scale (at sea survey sampling segments); discrete locations at a finer scale, or foraging *hot spots*, have not been identified to date.

[3] Harlequin ducks breed in fast-moving mountain streams and thus are not known to nest on state-owned aquatic lands. It is likely that in some areas, adult and juvenile birds may forage on state-owned aquatic lands during the breeding season; however, specific locations are unknown.

- Pacific lamprey
- Columbia spotted frog

Species without discrete habitat locations identified included:

- Harlequin duck
- Marbled murrelet
- Pacific lamprey

While many salmonid species are federally or state listed, Washington DNR excluded these in the definition of core remaining habitat for the following reasons:

1. Salmonids use extremely large ranges, for which stringent protections would not allow Washington DNR to carry out its aquatic management authority (described in Chapter 1 of the habitat conservation plan).
2. Many of the standards and programmatic measures included in Chapter 5 of the habitat conservation plan are aimed at protecting critical life history requirements of species that rely on nearshore environments, particularly salmonids. This includes in-water work timing restrictions, protection of native aquatic vegetation, ambient light requirements, protection of forage fish spawning substrate, and other measures described in Chapter 5 of this habitat conservation plan.

1.0 Washington DNR's intent

Where these species use state-owned aquatic lands, Washington DNR will contribute to the recovery and protection of core remaining habitat by implementing specific habitat protection strategies.

Washington DNR will prohibit use authorizations on state-owned aquatic lands that will negatively affect core remaining habitat as defined in this plan. Washington DNR will also prohibit use authorizations that result in impacts to natural habitat value and function. Such impacts include physical disturbance or disruption of potential breeding, foraging, and basking habitat, or disruption of natural, effective juvenile dispersal in these areas. In addition, Washington DNR will prohibit use authorizations on state-owned aquatic lands shown to negatively affect core remaining habitat value and function on lands that are adjacent to state-owned aquatic lands.

Over the course of the incidental take permit, Washington DNR will use the adaptive management component of this HCP to develop additional, specific management actions for any new areas identified as core remaining habitat for species covered under the habitat conservation plan.

2.0 State aquatic land ownership and Washington DNR management

To define Washington DNR's management authority and apply the long-term habitat protection goals for remaining habitat species, Washington DNR first determines aquatic ownership for parcels of tidelands, shorelands, and bedlands where remaining habitat may be located. To

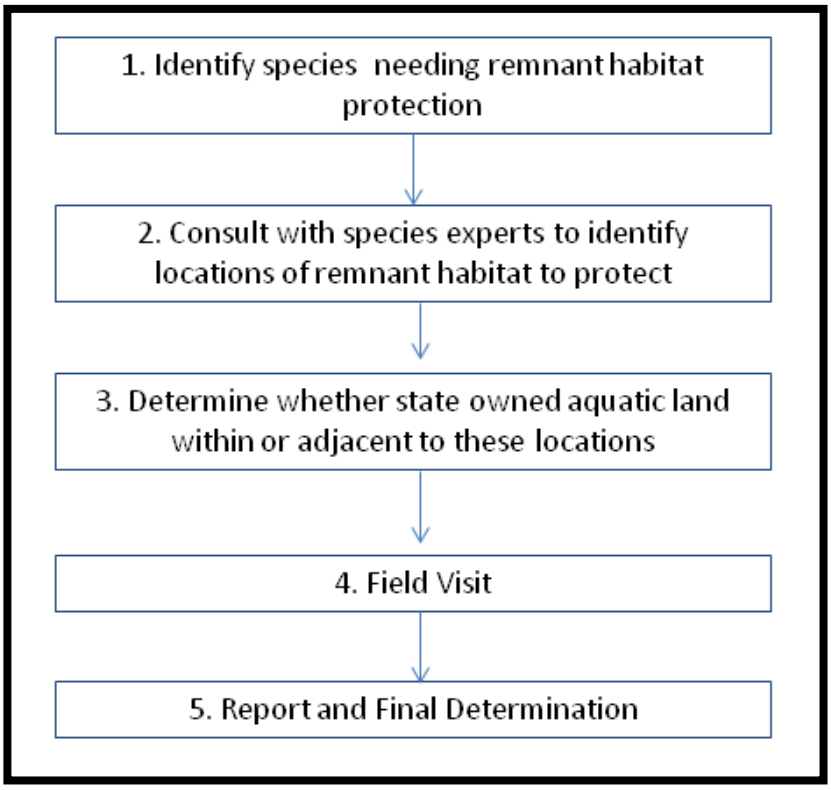
determine ownership, Washington DNR reviews existing ownership records, or conducts a navigability-for-title assessment for water bodies.[4] Washington DNR staff review records of aquatic land parcel sales, exchanges, or other agreements since statehood. The navigability-for-title assessment and ownership transactions assist Washington DNR in defining the boundaries of state-owned aquatic lands, where necessary.

Washington DNR will manage all navigable bedlands, shorelands, and tidelands not recorded as transferred or sold until, or unless, additional evidence is brought forward indicating that they are not state-owned aquatic lands.

3.0 Process Used to Delineate Remaining Habitat

Washington DNR follows a process outlined in Figure 1 to identify potential remaining (remnant)habitat for protection under the habitat conservation plan. A brief description of remaining habitat is provided for each species.

Figure 1. Process used to delineate and recommend potential remaining(remnant) habitat protections for vulnerable species identified in Table 1.



[4] *Navigability for title*: A determination of navigability for property title purposes.

4.0 Species and Associated Habitat

4.1 Western pond turtle *(Actinemys marmorata)*

Introduction and background

The Western pond turtle (also known as the Pacific pond turtle) has a state listing of endangered, and a federal listing of species of concern. Threats include destruction of native habitat; bioaccumulation of pollutants; increased water temperatures; concentrations of heavy metals, salts and petroleum products in sediments and water column; fill; bank armoring; sediment disturbance; predation by bullfrogs and warm water fishes; and taking and harassing animals in the wild.

Western pond turtle. Photo: CaliforniaHerps.com

Within Washington State, western pond turtles historically occurred in the Puget Trough ecoregion and in the Columbia River Gorge from sea level up to elevations near 300 meters (984 feet) (Hays et al., 1999; Hallock & McAllister, 2005). There are four populations in the Columbia River Gorge, two naturally occurring and two that have been established through reintroductions. There are two populations in Puget Sound that have been established through reintroductions.

A recovery plan for this species suggests the importance of captive breeding and re-introduction, as well as protection of current habitat and protection of adjacent and potential future habitat (Hays et al., 1999). The recovery plan lists the Columbia River population as distinct from the Willamette/Puget Trough population. The Columbia Gorge population evolved under free-flowing river conditions with natural ponds, wetlands, and riparian habitat in Washington that would have been well-connected to upland ponds. Dam impoundment has permanently changed these conditions by altering the frequency and magnitude of flood events that contribute to habitat, and by reducing remaining habitat to isolated upland ponds. Railroad grading and fill have cut off access to the river in many places, compromising traditional migration and dispersal routes to other potential areas.

General Habitat Description

The western pond turtle occupies ponds, wetlands, and backwater portions of lakes and rivers containing warm water. Turtles use logs and vegetation mats as haul out basking habitat. Nesting occurs in unconsolidated, well-drained substrate (such as gravel, sand, and dirt) adjacent to breeding ponds. South-facing aspects, such as riparian areas along the river, may provide greater warmth for incubation. Western pond turtles use rivers for migration and dispersal, typically during flood stage. River water temperatures are generally too cold for turtles (Hays et al., 1999).

Western Pond Turtle Habitat

Columbia River sites

In the fall of 2010, Washington DNR staff consulted with herpetologists Marc Hayes and Lisa Hallock of the Washington Department of Fish and Wildlife to identify current locations of key habitat for the turtle. Initially, they identified sites at which turtle reintroductions have previously occurred, including three sites in Skamania County and a fourth in Klickitat County:

1. Beacon Rock State Park.
2. Pierce National Wildlife Refuge.
3. Bergen Road, which is a mosaic of public and private lands near Carson, Washington.
4. Sondino Ponds (including Balch Lake, which is owned by WDFW). Sondino Ponds, the one site in Klickitat County, has the largest naturally occurring population of western pond turtles.

Of these four sites, only one location had the potential for state-owned aquatic land managed by Washington DNR: Beacon Rock State Park and the adjacent Pierce National Wildlife Refuge.

State aquatic land ownership and DNR management

Washington DNR staff, aquatic land surveys, and aquatic parcel data support the conclusion that although extensive shoreline alteration has occurred at Beacon Rock State Park and Pierce National Wildlife Refuge, Washington DNR can assert state ownership over some portion of upland riparian habitat, shorelands, and all the bedlands. The source of shoreline alteration is unknown (whether natural or human caused) and is ongoing. The Franz Lake National Wildlife Refuge is located west of Beacon Rock State Park and is also adjacent to state-owned aquatic lands.

Habitat assessment and land use

Washington DNR staff conducted a field visit on October 13, 2011, visiting four sites (Beacon Rock State Park, Pierce National Wildlife Refuge, Bergen Road, and Sondino Ponds). David Anderson, Washington Department of Fish and Wildlife district wildlife biologist (Region Five), was present for the site visits at Beacon Rock State Park, Pierce National Wildlife Refuge, and Bergen Road.

Figure 2 shows the Beacon Rock/Pierce National Wildlife Refuge turtle habitat complex. This is the primary wetland complex providing potential and current turtle habitat on the Washington side of the Columbia River.

Figure 2. Aerial photo of Columbia River looking east: Franz Lake National Wildlife Refuge is in the foreground; Beacon Rock State Park lies beyond.

Photo: Washington State Department of Ecology Coastal Atlas.

Figure 3. Aerial view of Columbia River shorelands and bedlands adjacent to Beacon Rock State Park. Map of Beacon Rock turtle habitat complex.

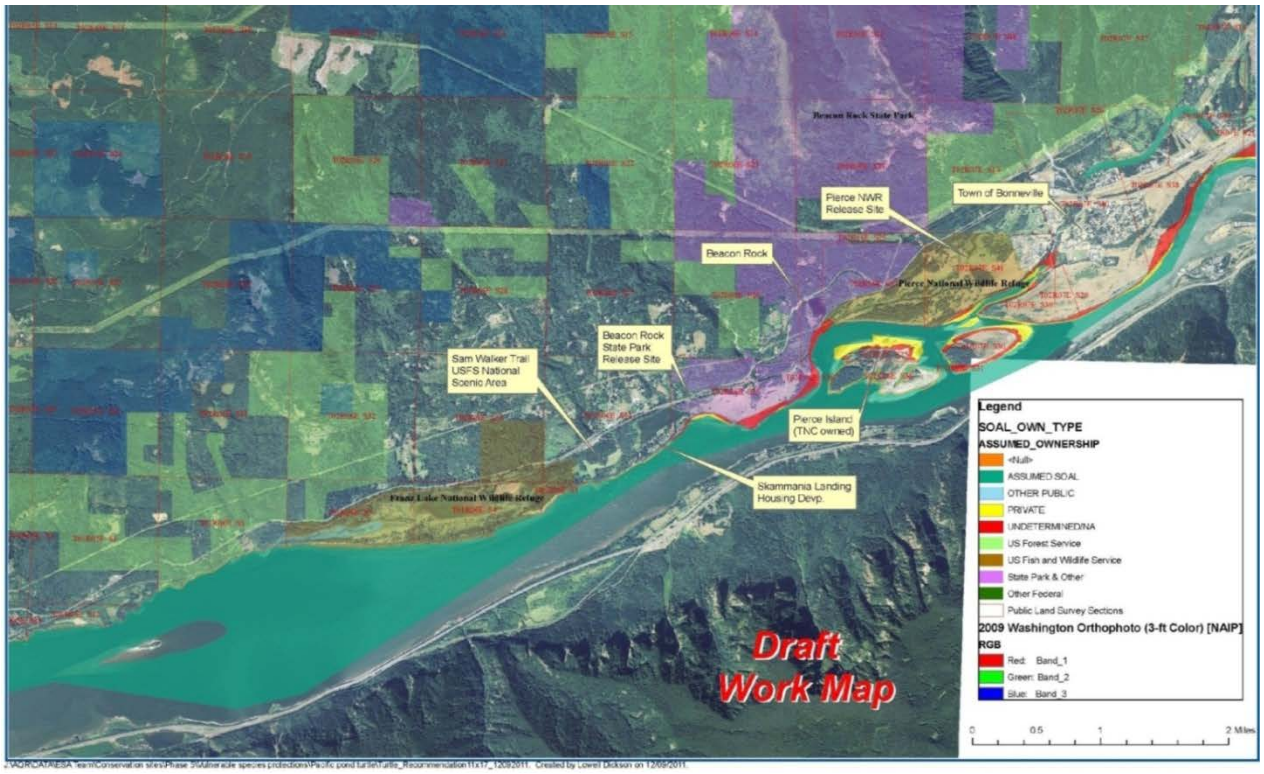


Figure 4. Aerial view of Columbia River shorelands and bedlands adjacent to Beacon Rock State Park.

Figure 5. Aerial view of Columbia River shorelands and bedlands adjacent to Pierce National Wildlife Refuge.

Photo: Washington State Department of Ecology Coastal Atlas.

Washington Department of Fish and Wildlife staff identified Beacon Rock State Park and adjacent Pierce National Wildlife Refuge as being the primary location for, and providing the highest quality of, protected turtle habitat for the Columbia Gorge turtle population in Skamania County (Figures 3, 4 and 5). This relatively large complex of low-lying wetland areas with ample upland and riparian nesting areas on publicly owned land (State Parks, National Wildlife Refuges, and the Columbia Gorge Scenic Area) provides irreplaceable breeding, foraging, basking, and rearing habitat for this reintroduced population. The Washington State Recovery Plan for the Pacific Pond Turtle (Hays et al. 1999) requires wetland areas such as this as a key habitat component for recovery in the Gorge.[5] Two of the four sub-populations in the Columbia River Gorge are currently located here, including a population at Beacon Rock initially reintroduced in 2007.

Turtles occupy both Beacon Rock State Park and Pierce National Wildlife Refuge where water temperatures are warmer than the river (an important feature), and logs and floating vegetation are present for basking.

Washington Department of Fish and Wildlife Biologist David Anderson suggests that riparian areas along the Columbia River shorelands within a few hundred meters of the breeding ponds provide potential nesting habitat, particularly on the warmer, south-facing aspects that support warmer soil conditions for egg development.

Submerged shorelands and bedlands of state-owned aquatic lands would provide habitat function during a brief period of migration and dispersal, typically during spring flood events. Pierce National Wildlife Refuge often floods significantly in spring, allowing dispersal corridors from reintroduction ponds out into the river, presumably dispersing down river to slower water (wetland) areas, such as Franz Lake National Wildlife Refuge. Little information exists on the topic of needs of dispersing turtles during flood migration events.

The Franz Lake National Wildlife Refuge—located west of Beacon Rock State Park—is managed for waterfowl, primarily swans, and supports potential future habitat for turtles as populations increase and turtles migrate down river. This location may one day provide a western anchor point in this extensive wetland complex.

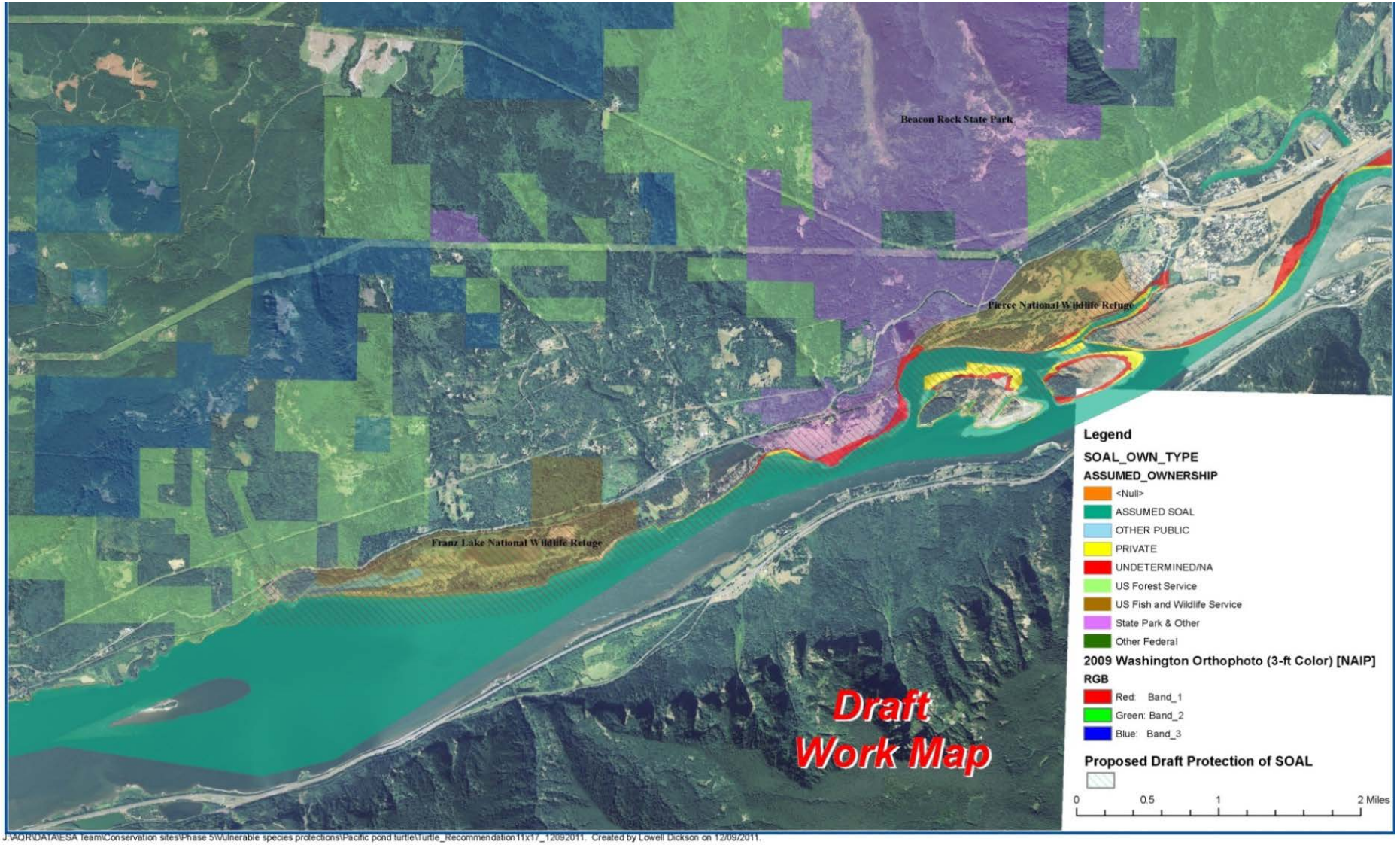
Adjacent to Franz Lake National Wildlife Refuge and fronting the Columbia River, the Sam Walker Trail Access (U.S. Forest Service, National Scenic Area) provides a potentially important stretch of federally owned riparian and wetland area suitable for future turtle habitat.

All four of the sites are located within the Columbia River Gorge National Scenic Area. The majority of this area along the Columbia River is designated under Skamania County's Shoreline Management Act as open space with three small sections zoned as residential (Figure 3). A few small areas are zoned for small woodland or forest (Columbia Gorge National Scenic Area, 2007).

[5] Recovery Objectives:
The western pond turtle will be considered for downlisting to state threatened status when:
1. The Puget Sound/Puget Trough recovery zone supports at least two subpopulations of more than 200 western pond turtles, comprises no more than 70 percent adults (>120 millimeter carapace length) that are sustained through natural recruitment. One of the two subpopulations must inhabit a wetland complex that includes more than two wetlands.
2. The Columbia River Gorge recovery zone supports at least three subpopulations of more than 200 western pond turtles, comprised of no more than 70 percent adults (>120 millimeter carapace length) that are sustained through natural recruitment. Two of the three subpopulations must inhabit wetland complexes of more than two wetlands.
3. The wetland and surrounding upland nesting habitat is secure from development and excessive human disturbance

One of the residential areas includes a shoreline housing development—Skamania Landing—that contains roughly 30 to 40 riverfront lots directly west of the turtle release site at Beacon Rock State Park. The development maintains a levee, creating an adjacent pond with water supplied by a creek. David Anderson, Washington Department of Fish and Wildlife biologist, recalled anecdotal stories of residents seeing turtles on their lawns. It is unknown to what extent turtles currently use the lake during the summer.

Figure 6. Area of proposed protection of state-owned aquatic lands adjacent to the Beacon Rock turtle habitat complex. (proposed area seen in diagonal cross-hatching).



Management recommendations

Protection should include all bedlands and shorelands managed by Washington DNR, from the eastern boundary of the Pierce National Wildlife Refuge (town of North Bonneville) to the western boundary of the Franz National Wildlife Refuge (see Figure 5). The goal of limiting uses of this remaining habitat located on state-owned aquatic lands is to reduce human disturbance to western pond turtles during breeding and migration and to further protect any riparian habitat on state-owned aquatic lands.

Western pond turtle remaining habitat characterization

The following habitats will be quantified for their occurrence on state-owned aquatic lands of Beacon Rock State Park and adjacent lands of the Pierce National Wildlife Refuge (Figure 7) on an annual basis, with changes documented:

1. Basking habitat: Banks and adjacent backwater habitats with relatively slow current and emergent basking habitats—including solid rock, boulders, cobbles, gravel, sand, mud flats, downed logs, submerged branches, nearshore vegetation, emergent floating vegetation, submerged aquatic vegetation, and other introduced structures.
2. Nesting habitat: Riparian areas along shorelands, particularly on south-facing aspects within a few hundred meters of the breeding ponds.
3. Underwater refugia: Rocks of various sizes, submerged logs or branches, submerged vegetation, and holes and undercut areas along banks.
4. Other aquatic habitat: Riverine, permanent, and ephemeral wetlands.
5. Overwintering habitat: Muddy substrate in lakes or ponds.
6. Dispersal corridors: Connectivity between terrestrial and submerged habitats.

Identification of habitat enhancement opportunities will be included.

Washington DNR management strategies on state-owned aquatic lands

Washington DNR will contribute to the recovery of remaining western pond turtle populations along the Columbia River in Washington by prohibiting new use authorizations on state-owned aquatic lands at the Beacon Rock habitat complex (Figure 5) that negatively affect turtle habitat (habitat elements 1 through 6, above). Negative effects include physical disturbance or disruption of potential breeding, foraging and basking habitat, or disruption of natural effective juvenile dispersal in these areas (for example, non-essential flood control measures). In addition, Washington DNR will not authorize the following activities on state-owned aquatic lands shown to impact habitat function:

1. Outfalls and discharges that may cause localized reductions in water and sediment quality, resulting in increased turbidity, reduced foraging efficiency, diminished habitat quality, and increased potential for bioaccumulation of pollutants.

2. Habitat loss from construction of roadways, bridges, and docks.
3. Stormwater runoff.
4. Nearshore activities, such as fill and bank armoring, sediment disturbance, and utility line construction that might alter shallow-water lake and stream tributary habitats.

4.2 Oregon Spotted Frog *(Rana pretiosa)*

Introduction and background

The Oregon spotted frog has a state listing of endangered and a federal listing as a candidate species under the Endangered Species Act. Threats to the Oregon spotted frog include destruction and modification of habitat, predation by non-native fish and bullfrogs, disease, and successional habitat loss of wetlands (Hallock 2013).

Oregon spotted frog.
Photo: Washington DNR, 2007

Hallock (2013) states that the historic range of the frog extends from British Columbia through the Puget Trough and Willamette Valley into Northern California. Washington's remaining populations of Oregon spotted frogs occupy wetlands connected to riverine systems.

The perennial creeks and associated network of intermittent tributaries provide aquatic connectivity between breeding sites, active season habitat and overwintering habitat. In Washington they are known to persist in the following drainages:

- Sumas River
- Black Slough
- Samish River
- Black River
- Outlet Creek
- Trout Lake Creek

Of the six populations currently known to occur in Washington, two are in the Black River watershed in Thurston County and two are in Klickitat County

General habitat description

Oregon spotted frogs are highly aquatic. They typically occupy marshes; marshy edges of ponds and lakes; shallow, slow-moving waters of streams with emergent vegetation; and bottom substrate with dead and decaying vegetation (Nordstrom & Riener, 1997).

Habitat at Black Lake and Black River: State aquatic

land ownership and Washington DNR management

The shorelands and bedlands in the southern area of Black Lake proposed for protection have a status of definitely navigable and are state-owned. The Black River has a status of *definitely navigable* and the bedlands and shorelands to within four miles of the shores of Black Lake are state-owned (Figures 8 and 9). The remaining four miles of the Black River up to the shores of Black Lake have a status of *probably navigable* and are probably owned by the state. The northern half of the Black River flows through the Black River unit managed by the U.S. Fish and Wildlife Service as part of the Nisqually National Wildlife Refuge. The U.S. Fish and Wildlife Service owns 526 hectares (1,300 acres) within the approved boundary of the 1,603-hectare (3,960-acre) Black River unit. This unit includes wetlands and riparian habitats, as well as a portion of the uplands along the Black River. The U.S. Fish and Wildlife Service manages the area to protect biological diversity and support fish, birds, and species that depend on wetlands; the Black River unit includes three of the known Oregon spotted frog locations in Washington (U.S. Fish and Wildlife Service, 2012).

Habitat and land use description

The area proposed for management by Washington DNR in this plan includes the very southern portion of Black Lake and northern portion of Black River, located in Water Resource Inventory Areas 13 (Deschutes) and 23 (Upper Chehalis) respectively. The area with identified remaining habitat includes the very southern portion of Black Lake, which forms the headwaters of the Black River, and the Black River extending to the border of the Chehalis Indian Reservation (Figure 8).

Black Lake is located in central Thurston County. The river drains southwest from the south end of Black Lake into the Chehalis River near Oakville in Grays Harbor County. The Black River drainage is approximately 378 square kilometers (144 square miles), with 272 square kilometers (105 square miles) in Thurston County; the remainder of the Black River basin is located in Grays Harbor County. In general, the Black River is a slow-flowing river with a broad floodplain that supports one of the largest remaining intact riparian wetland systems in western Washington (Figures 8 and 9). Most flooding along the main stem of the river is inundation flooding with low velocity of the flood water (Thurston County, 2012; Washington State Department of Ecology, 2012). Much of the area adjacent to the river is wetland or subject to periodic flooding that prohibits or restricts development near the river.

Black River is part of a larger water quality improvement project for the watershed.[6] Water quality concerns include high temperatures and low dissolved oxygen, both of which are associated with low summer flows and non-point pollution from adjacent rural land uses (Ecology, 2004; Thurston County, 2009). Thurston County considers water quality in Black Lake to be fair, citing moderate to high nutrient concentrations, which often result in nuisance blue-green algae growth in late summer and fall (Thurston County, 2005).

Thurston County designated the majority of the Black River shoreline as natural under its Shoreline Master Program, with small portions designated as *rural conservancy*. Natural designations protect areas of intact shoreline function with minimal degradation and restrict land use to low-intensity uses that maintain ecological function and processes. Rural conservancy

[6] Also called a total maximum daily load, which identifies limits on specific pollutants that can be discharged to a water body.

designations apply to areas outside incorporated municipalities and urban growth areas and provide for sustained resource use, public access, and recreation, while protecting ecologic function (Thurston County, 2009) (Figures 7 and 8). Land owned by the U.S. Fish and Wildlife Service within the Black River unit are currently closed to public access; the river is open and accessible to the public by boat only.

Figure 7. Shoreline master program environmental designations for Black Lake and the upper section of Black River, Thurston County, WA.

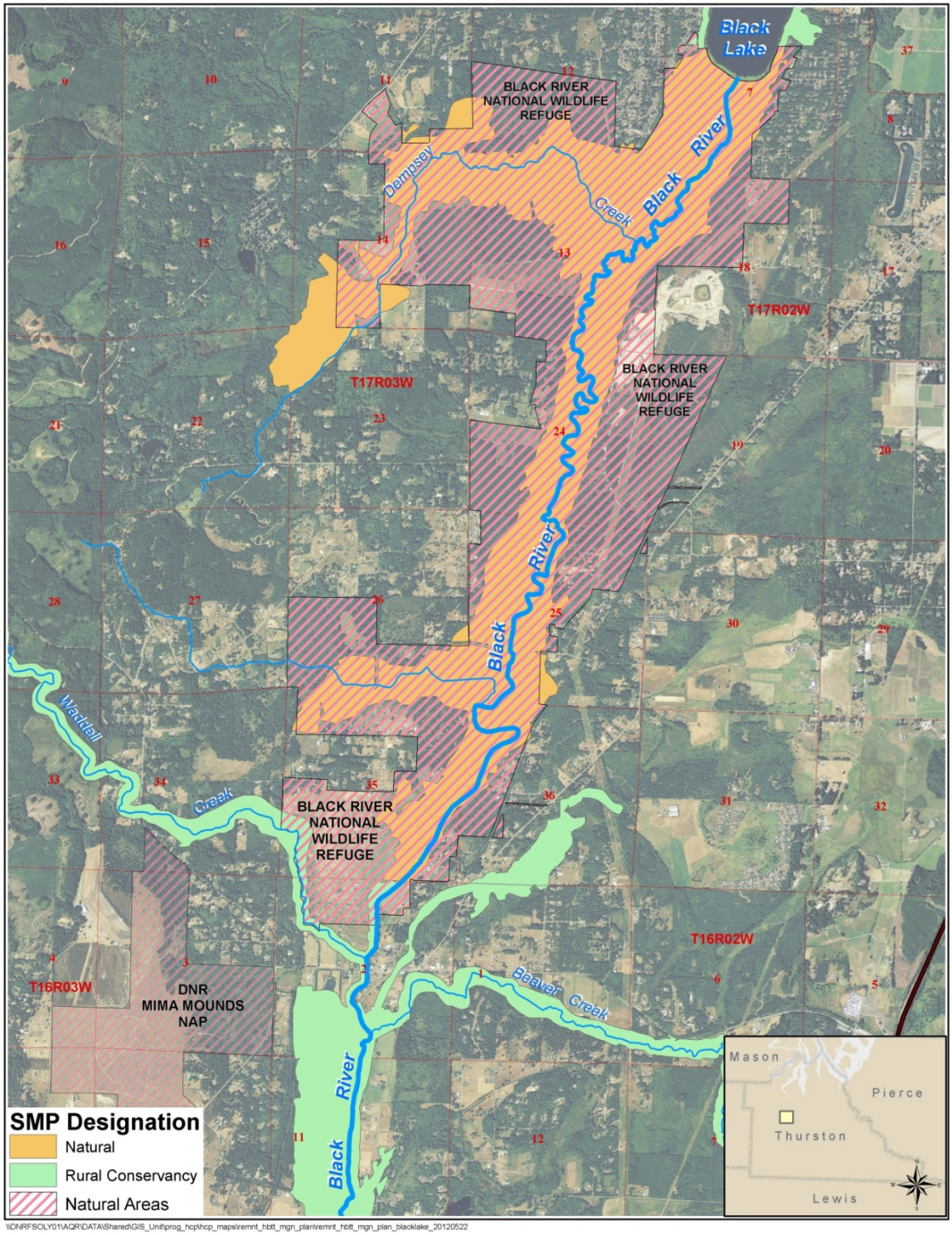
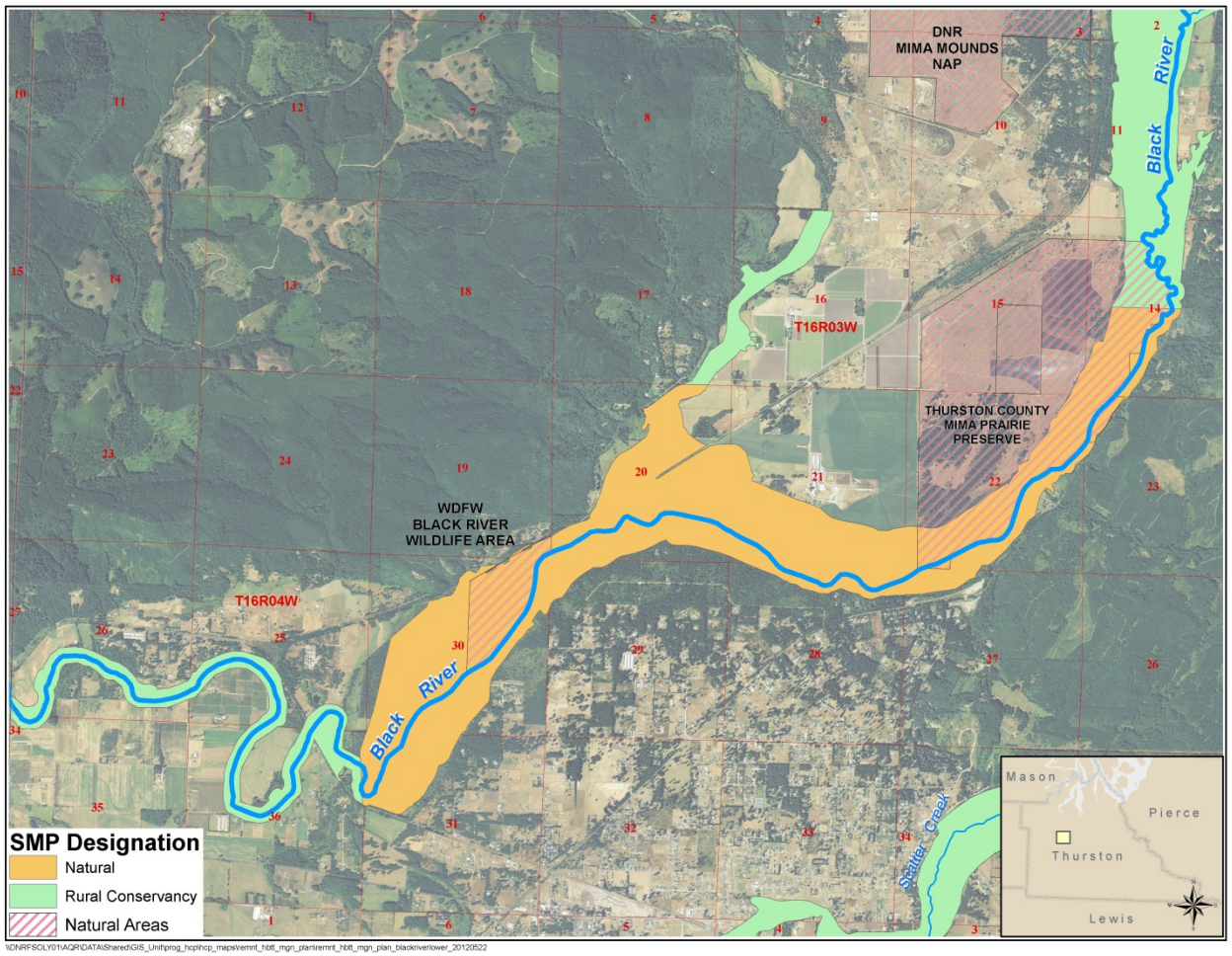


Figure 8. Shoreline master program environmental designations for the lower section of Black River, Thurston County, WA.



Management Recommendations

Washington DNR's management strategies for the Oregon spotted frog habitat in the southern portion of Black Lake and the Black River will follow Thurston County's Shoreline Master Program (Thurston County, 2009). Specifically, habitat protection strategies will align with the county's recommended restoration plans, shoreline inventory and characterizations, and land use designations from the county's updated shoreline master program. The county's land use designations and the U.S. Fish and Wildlife Service's management objectives are consistent with the goals of protecting remaining habitat for the Oregon spotted frog in these areas. This will provide Washington DNR with the greatest opportunity for successful, long-term protection of remaining habitat where ecological function has been determined to be relatively intact for the Oregon spotted frog in these water bodies.

Oregon spotted frog remaining habitat characterization of southern Black Lake and Black River

1. Basking: Logs and sunny vegetated banks.
2. Breeding: Depths less than 30 centimeters (12 inches); short vegetation; and still water—not likely to occur on state lands, though may perhaps occur on lands immediately adjacent to state lands.
3. Overwintering habitat: Aerobic mud in at least 1 foot of water; dense, rooted vegetation. Surface exposure: 50 percent to 75 percent exposed sediment (25 to 50 percent vegetative cover).
4. Connectivity: Marshes and deep pools.
5. Refugia: Sedges, rushes, grasses (including sedge- and hardhack (Spiraea douglasii)), shallow water organic debris, and deeper pools.

Washington DNR management strategies for State-owned Aquatic Lands

Implementation of management strategies will contribute to the protection and recovery of remaining Oregon spotted frog habitat by prohibiting any new use authorization shown to have negative effects on spotted frog habitat on state-owned aquatic lands in the Black River basin. Negative effects include physical disturbance or disruption of potential breeding, foraging, and basking habitat, or disruption of natural, effective juvenile dispersal in these areas. Washington DNR will not authorize the following activities shown to impact habitat function (Nordstrom & Riener, 1997):

1. Draining, dredging, or altering riparian areas and wetlands.
2. Activities that will result in impacts to local hydrology from adjacent managed uplands.
3. Alteration of muddy substrate used for hibernation.
4. Stormwater runoff.
5. Removal of basking habitat.
6. Herbicide and pesticide use in areas inhabited by the Oregon spotted frog.

References

Columbia River Gorge National Scenic Area. 2007. Quadrangle Map Locator. Available at: http://www.gorgevitalsigns.org/QuadLoc/.

Hallock, L.A., and K.R. McAllister. 2005. Western Pond Turtle. Washington Herp Atlas. Accessed June 11, 2005. Available at: http://www1.dnr.wa.gov/nhp/refdesk/herp/

Hallock L.A. Biologist, Washington Department of Fish and Wildlife. Personal communication. 2011.

Hallock, L.A. 2013. Draft State of Washington Oregon Spotted Frog Recovery Plan. Washington Department of Fish and Wildlife, Olympia, WA . Available at http://wdfw.wa.gov/publications/01505/wdfw01505.pdf

Hays, D. W., McAllister, K. R., Richardson, S.A. and D. W. Stinson. 1999. Washington State Recovery Plan for the Western Pond Turtle. Washington Department of Fish and Wildlife, Olympia, WA. 66 pp.

Nordstrom, N., and K. Riener. 1997. Oregon Spotted Frog (Pages 6-1 to 6-12) in E. M. Larsen, ed.. Management recommendations for Washington's priority species, Volume III: Amphibians and Reptiles. Washington Department of Fish and Wildlife, Olympia, WA. 122 pp

Thurston County. 2005. Department of Health. Water Resources Monitoring Report 2004 - 2005: WRIA 13 – Budd/Deschutes. Accessed June 2012. Available at: http://www.co.thurston.wa.us/health/ehrp/pdf/AR03-05/AR03-05_BuddWS.pdf

Thurston County. 2009. Shoreline Master Program Update Shoreline Analysis and Characterization. July 14, 2009. Available at: http://www.co.thurston.wa.us/planning/shoreline/shoreline-inventory.html

Thurston County. 2012. Thurston County Emergency Management, Flood Stage Monitoring data on Black River, accessed June 2012. Available at: http://www.co.thurston.wa.us/em/Rivers/BlackRiver.htm

United States Fish and Wildlife Services. 2012. Nisqually National Wildlife Refuge – Black River Unit. Website. Accessed 2012. Available at: http://www.fws.gov/nisqually/management/bru_general.html

Washington State Department of Natural Resources. Aquatic Resources Program Habitat Conservation Plan Covered Species Technical Paper. August 2007. Available on file, Olympia, Washington.

Washington State Department of Ecology. 2004. The Chehalis/Grays Harbor Watershed Dissolved Oxygen (DO), Temperature, and Fecal Coliform Bacteria TMDL: Detailed Implementation (Cleanup) Plan. Rountry, D. Water Quality Program, Olympia, WA. Available at: http://www.ecy.wa.gov/programs/wq/tmdl/ChehalisRvrTMDLSummary.html

Washington State Department of Ecology. 2012. River and Stream Flow Monitoring Data page. Accessed June 2012. Available at https://fortress.wa.gov/ecy/wrx/wrx/flows/station.asp?sta=23E060#block3