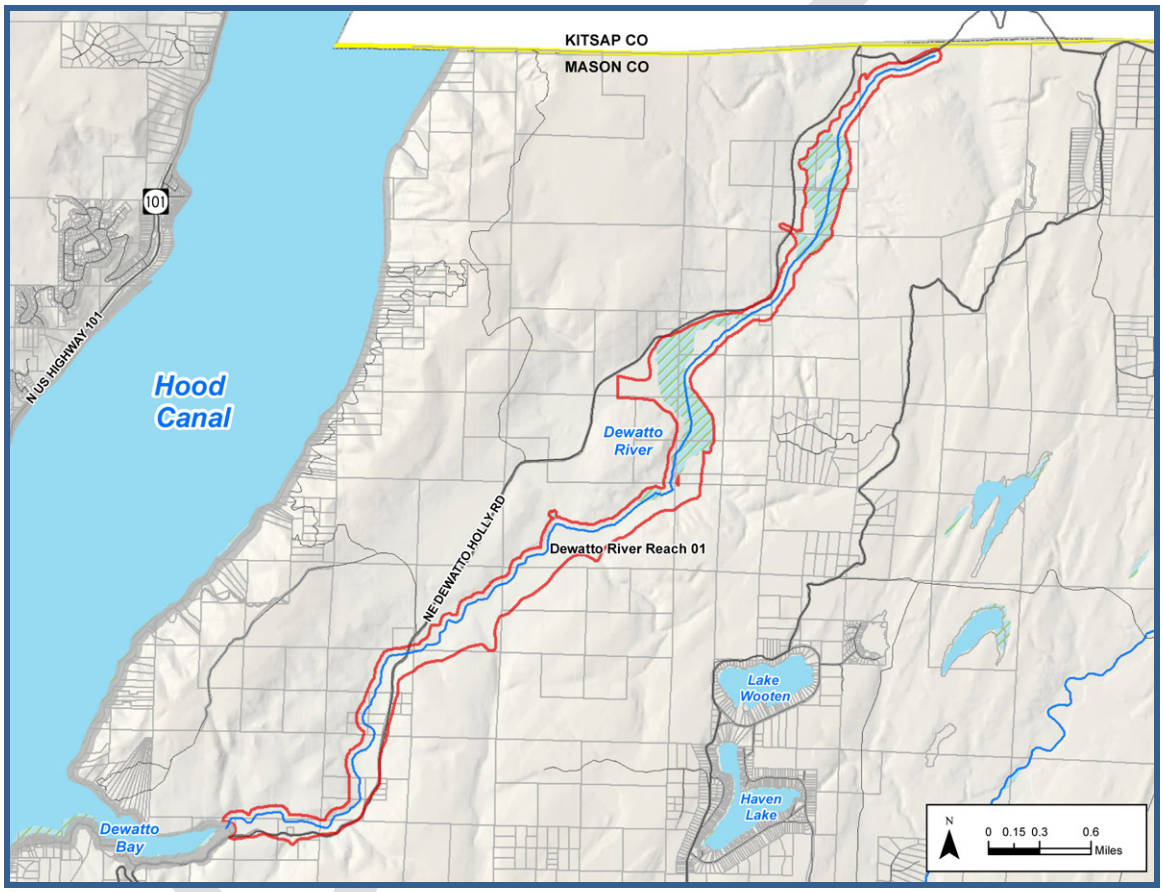
CHAPTER 7.
WRIA 15: KITSAP

7.1 Dewatto River



7.1.1 Process and Channel Modifications

Dewatto Creek discharges to Dewatto Bay on the eastern shore of Hood Canal. The mouth of the Dewatto River is located approximately 5.5 miles north of The Great Bend of Hood Canal (Kuttel, 2003). The river flows to the southwest, roughly parallel to the marine shore. The stream is considered a shoreline for approximately 7.4 miles in length, which is fed by roughly 30 miles of tributaries that drain approximately 23 square miles of land (Ames et al., 2000).

Limited development has occurred in the Dewatto River watershed, and the drainage basin is in relatively good condition compared to other watersheds in western WRIA 15. The Dewatto River watershed has been modified by historic and current timber production (Kuttel, 2003). Several culverts located on tributaries to the river are partial fish barriers (WDFW, 2009). Floodplain connectivity along the river and all tributaries has been rated as good (May and Peterson, 2002).

The Dewatto River drainage basin has been modified by logging and limited development. Some of the process modifications include:

- Logging adjacent to the stream;
- Residential development along the lower portion of the stream; and
- Culverts and other structures that change the flow patterns and disrupt fish passage.

7.1.2 Water Quality

The Dewatto River is listed on the 303(d) list of impaired waters (Category 5 water) for the fecal coliform bacteria parameter; however, this listing is for a reach just outside of Mason County, within Kitsap County (Ecology, 2008). Category 5 listings require the preparation of a Total Maximum Daily Load (TMDL) to address water quality concerns for the waterbody.

7.1.3 Critical or Priority Habitat and Species

The Dewatto River is mapped as supporting many priority salmonids species (WDFW, 2010; Table 7-1).

Table 7-1. Priority fish species documented for the Dewatto River

Common Name	Scientific Name	Habitat Use	Federal Listing	State Listing
Coastal cutthroat trout	*Oncorhynchus clarki clarki*	Migration/Spawning/Rearing	~	~
fall Chinook salmon	*Oncorhynchus tshawytscha*	Migration/Spawning/Rearing	Threatened	Candidate
fall Chum salmon	*Oncorhynchus keta*	Migration/Spawning	~	~
summer Chum salmon	*Oncorhynchus keta*	Migration/Spawning	Threatened	Candidate
Pink salmon	*Oncorhynchus gorbuscha*	Migration/Spawning	~	~
Coho salmon	*Oncorhynchus kisutch*	Migration/Spawning/Rearing	Concern	~
winter Steelhead	*Oncorhynchus mykiss*	Migration/Spawning/Rearing	Threatened	~

Summer chum are documented in the Dewatto River, but the stock was considered extinct by the 2002 SaSI update. The update declared the fall chum stock as healthy and the winter steelhead stock as depressed (Washington Department of Fish and Wildlife, 2003). In addition, the Hood Canal Salmon Enhancement Group has conducted instream habitat and steelhead surveys to assist in overall salmon recovery in the Dewatto River. Steelhead smolts have been introduced annually to the Dewatto River as part of the Hood Canal Steelhead Supplementation Project (http://www.hcseg.org/index.xml).

Critical habitat has been designated for the Hood Canal Evolutionarily Significant Unit (ESU) summer-run chum salmon within the lower reach of Dewatto River extending downstream to the confluence with Hood Canal (USFWS, 2005; Table 7-2).

Table 7-2. Critical Habitat documented for Dewatto River

Stream	Reach	Species Common Name	Scientific Name
Dewatto River	01	chum salmon	*Oncorhynchus keta*

Approximately 210.0 acres of wetland, representing 27.6 percent of the reach, are mapped within the Mason County shoreline jurisdiction of the stream (NWI, 1989).

Priority wildlife species occurrences are mapped for mountain quail and osprey in area adjacent to the river (WDFDW, 2010).

The Washington Department of Natural Resources (WDNR) Natural Heritage Program (NHP) has not identified priority plant species or vegetation communities within the Dewatto River shoreline planning area (WDNR, 2009).

7.1.4 Land Use

Land uses in the Dewatto River shoreline are primarily timber and forest resource. Large tracts of land are owned by Manke Timber Company and Pope Resources. Other land uses include the,single family residential and parks. The Port of Dewatto, one of the smallest ports in Washington, was formed in 1927 and manages park land near Dewatto Bay.

See reach sheet for land use information.

7.1.5 Land Cover

Land cover within the reach is described on the reach sheet.

7.1.6 Summary of Key Management Issues

See reach sheet for key management issues.

7.1.7 Reach Analysis

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DEWATTO RIVER

SHORELINE LENGTH
7.4 MI

REACH AREA
760.2 AC

PHYSICAL AND ECOLOGICAL FEATURES

HYDROLOGY (MAPS 4 AND 10)
Floodplain - 64% (484 acres) of the reach, excluding open water, is mapped as FEMA 1% annual chance floodplain

HAZARD AREAS (MAP 12)
29.6% erosion, 17.9% landslide

LAND COVER (MAP 15)
39% forest, 4% wetland, 56% floodplain/riparian (GAP, 2009).

Riparian vegetation: 64% forest cover, 6% non-forest, 28% other natural vegetation, 2% water (PNPTC, 2011).

HABITATS AND SPECIES (MAP 8)
Coastal cutthroat trout, fall Chinook salmon, fall chum salmon, summer chum salmon, pink salmon, coho salmon, winter steelhead. Critical habitat for summer-run chum salmon. Mountain quail and osprey.

Wetlands – 210.0 acres (27.6% of reach); wetland habitat types include palustrine emergent, palustrine forested, and palustrine scrub-shrub

WATER QUALITY (MAP 13)
No 303(d) listings within Mason County. One 303(d) listing for fecal coliform bacteria; however, this is within Kitsap County.

BUILT ENVIRONMENT AND LAND USE

EXISTING LAND USES AND OWNERSHIP (MAP 18)

Land Use – Forestry (98%) with remaining 2% a mix of Residential and Vacant. Ownership – 100% Private.

SHORELINE MODIFICATIONS (MAP 16)

One road crossing in the southwestern portion of the reach: Holly Dewatto Rd.

ZONING AND COMPREHENSIVE PLAN DESIGNATIONS (MAP 21)

Zoning districts - Rural Residential 20 Acres (95%) and Rural Residential 10 Acres (5%). Comprehensive Plan Designation -100% Rural.

Existing Shoreline Environmental Designations (SED) – 100% Conservancy.

PUBLIC ACCESS (MAP 14)

Dewatto River Campground, managed by the Port of Dewatto, has 60 campsites, a picnic area, access to the water for fishing, and trails (Mason County Department of Parks and Trails, 2006).

IMPERVIOUS SURFACES (MAP 16)

Less than 1% of the reach contains mapped impervious surfaces (NOAA CCAP 2006). Aerial photos from 2009 show a very low level of rural residential development in this reach.

AREAS OF SPECIAL INTEREST

No Ecology listed facilities or contaminated sites.

CULTURAL AND ARCHAEOLOGICAL RESOURCES

There are no listed cultural resources or state or federally listed historic properties. Resource mapping suggests there is a very low probability of finding unknown artifacts within this reach, with smaller portions of the reach in low and moderate-low zones.

OPPORTUNITY AREAS (MAP 23)

Improve public access at existing Dewatto River Campground

Restore fish passage through culvert removal or replacement

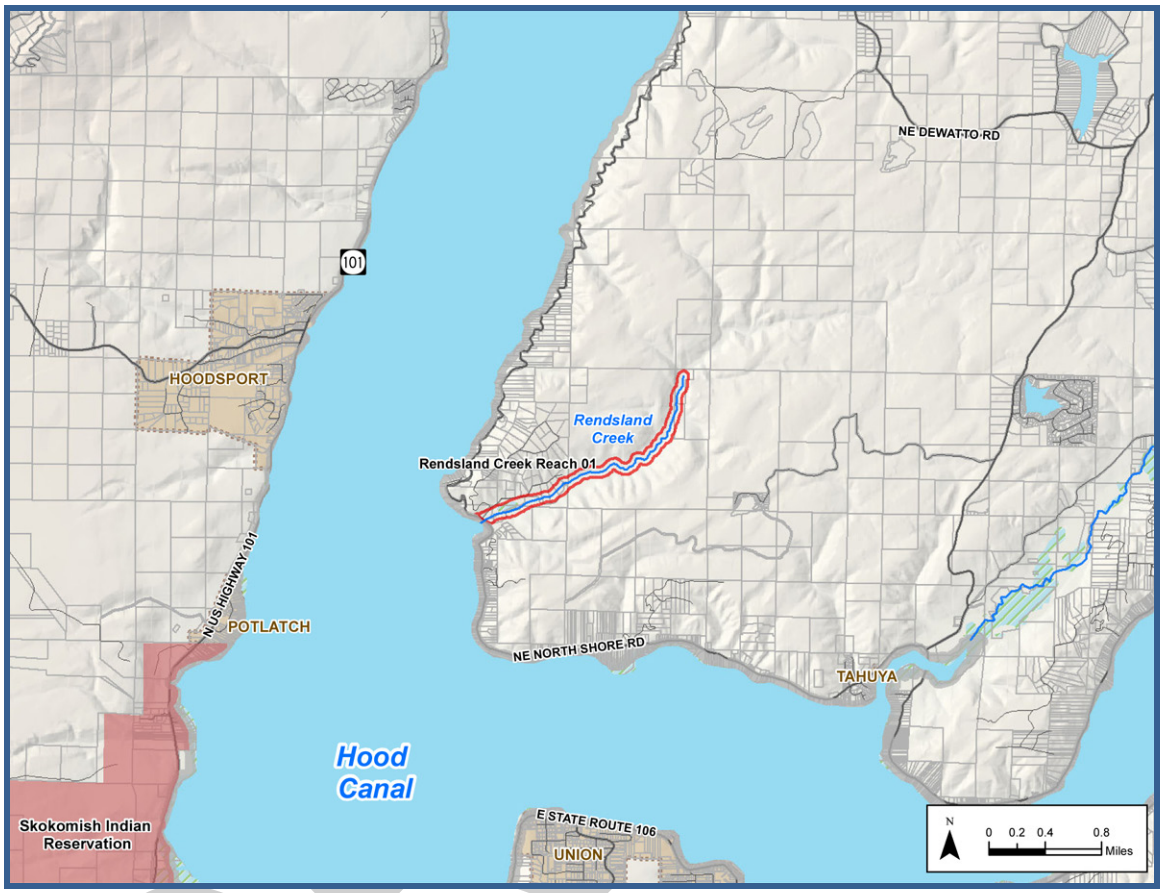
Restore riparian habitat through forest rehabilitation and invasive plant control

KEY MANAGEMENT ISSUES

Control of invasive plants in the riparian zone (i.e., knotweed)

Culverts blocking salmonid fish passage in the drainage basin

7.2 Rendsland Creek



7.2.1 Process and Channel Modifications

The headwaters of Rendsland Creek are at Tee Lake, which drains approximately 5.3 miles to The Great Bend of Hood Canal via a well developed delta. In addition to Tee Lake, which has a seasonal outlet, roughly 4.4 miles of tributaries contribute to the stream flow including a dozen small lakes and ponds. Upstream reaches receive perennial flow, while flow becomes intermittent downstream (Kuttel, 2003).

Limited development is present along the stream, with the exception of residences at the mouth of Rendsland Creek (Kuttel, 2003). A culvert near the headwaters of the stream has been repaired to allow fish passage (WDFW, 2011) and several of the tributaries to Rendsland Creek contain culverts. In addition, the residents of Tee Lake manipulate lake levels, which may limit fish movement. The floodplain connectivity of the stream has been rated as fair (May and Peterson, 2002).

The Rendsland Creek drainage basin has been modified by logging and limited development. Some of the process modifications include:

- Land conversion from pervious to impervious surfaces, primarily at the mouth of the stream;
- Logging adjacent to the stream at the upstream extent;
- Road crossings; and
- Culverts and other structures that change the flow patterns.

7.2.2 Water Quality

Rendsland Creek is not included on the 303(d) list of impaired waters (Category 5) (Ecology, 2008).

7.2.3 Critical or Priority Habitat and Species

Rendsland Creek supports several priority fish species (WDFW, 2010; Table 7-3).

Table 7-3. Priority fish species documented for Rendsland Creek

Common Name	Scientific Name	Habitat Use	Federal Listing	State Listing
Coastal cutthroat trout	*Oncorhynchus clarki clarki*	Migration/Spawning/Rearing	~	~
fall Chum salmon	*Oncorhynchus keta*	Migration/Spawning	~	~
Coho salmon	*Oncorhynchus kisutch*	Migration/Spawning/Rearing	Concern	~

Approximately 4.9 acres of wetland (representing 4.7 percent of the reach) are mapped within the Mason County shoreline jurisdiction of the stream (NWI, 1989). No priority species occurrences have been mapped in the vicinity of the stream, and the WDNR NHP has not identified priority plant species or vegetation communities within the Rendsland Creek shoreline planning area (WDFW, 2010; WDNR, 2009).

7.2.4 Land Use

The State of Washington owns major land area within the Rendsland Creek shoreline. See reach sheet for land use information.

7.2.5 Land Cover

Land cover is mainly forested and forest resource lands, with single family residential uses at the mouth. See reach sheet for land cover areas.

7.2.6 Summary of Key Management Issues

See reach sheet for key management issues.

7.2.7 Reach Analysis

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RENDSLAND CREEK

SHORELINE LENGTH:
2.0 MI

REACH AREA:
105.3 AC

PHYSICAL AND ECOLOGICAL FEATURES

HYDROLOGY (MAPS 4 AND 10)

Floodplain - 27% (28 acres) of the reach, excluding open water, is mapped as FEMA 1% annual chance floodplain

HAZARD AREAS (MAP 12)

20.8% erosion, 28.1% landslide

LAND COVER (MAP 15)

71% forest, 3% wetland, 26% floodplain/riparian (GAP, 2009).

Riparian vegetation: 85% forest cover, 1% non-forest, 13% other natural vegetation (PNPTC, 2011)

HABITATS AND SPECIES (MAP 8)

Coastal cutthroat trout, fall chum salmon, coho salmon.

4.9 acres of palustrine emergent wetland (4.7% of reach).

WATER QUALITY (MAP 13)

Not listed as a 303(d) impaired waterbody.

BUILT ENVIRONMENT AND LAND USE

EXISTING LAND USES AND OWNERSHIP (MAP 18)

Land Use – Forestry (63%); Vacant (25%); and remaining 12% is a mix of Parks, Open Space, Recreation Areas and Residential. Ownership – Public (70%) and Private (30%).

SHORELINE MODIFICATIONS (MAP 16)

No shoreline modifications are mapped in the reach.

ZONING AND COMPREHENSIVE PLAN DESIGNATIONS (MAP 21)

Zoning districts – Rural Residential 20 Acres (63%) and Rural Residential 5 Acres (37%). Comprehensive Plan Designations: 100% Rural.

Existing SED: 100% Conservancy.

PUBLIC ACCESS (MAP 14)

There are no mapped parks or public access facilities for Rendsland Creek. However, Menard's Landing Park, operated by the Port of Tahuya, adjoins Rendsland Creek and has picnic tables, a gazebo and a small hand-carry boat/kayak launch site.

Public clam and oyster recreational harvest areas at the mouth of Rendsland Creek.

IMPERVIOUS SURFACES (MAP 16)

Less than 1% of the reach is mapped as containing impervious surfaces (NOAA CCAP 2006). Aerial photos from 2009 show one road crossing the lower part of the reach.

AREAS OF SPECIAL INTEREST

No Ecology listed facilities or contaminated sites.

CULTURAL AND ARCHAEOLOGICAL RESOURCES

There are no listed cultural resources or state or federally listed historic properties. Resource mapping suggests there is a low to moderate probability of finding unknown artifacts within this reach.

OPPORTUNITY AREAS (MAP 23)

Opportunity for new public access to majority of waterbody. State of Washington is major land owner.

Protect forested riparian areas where trees are intact.

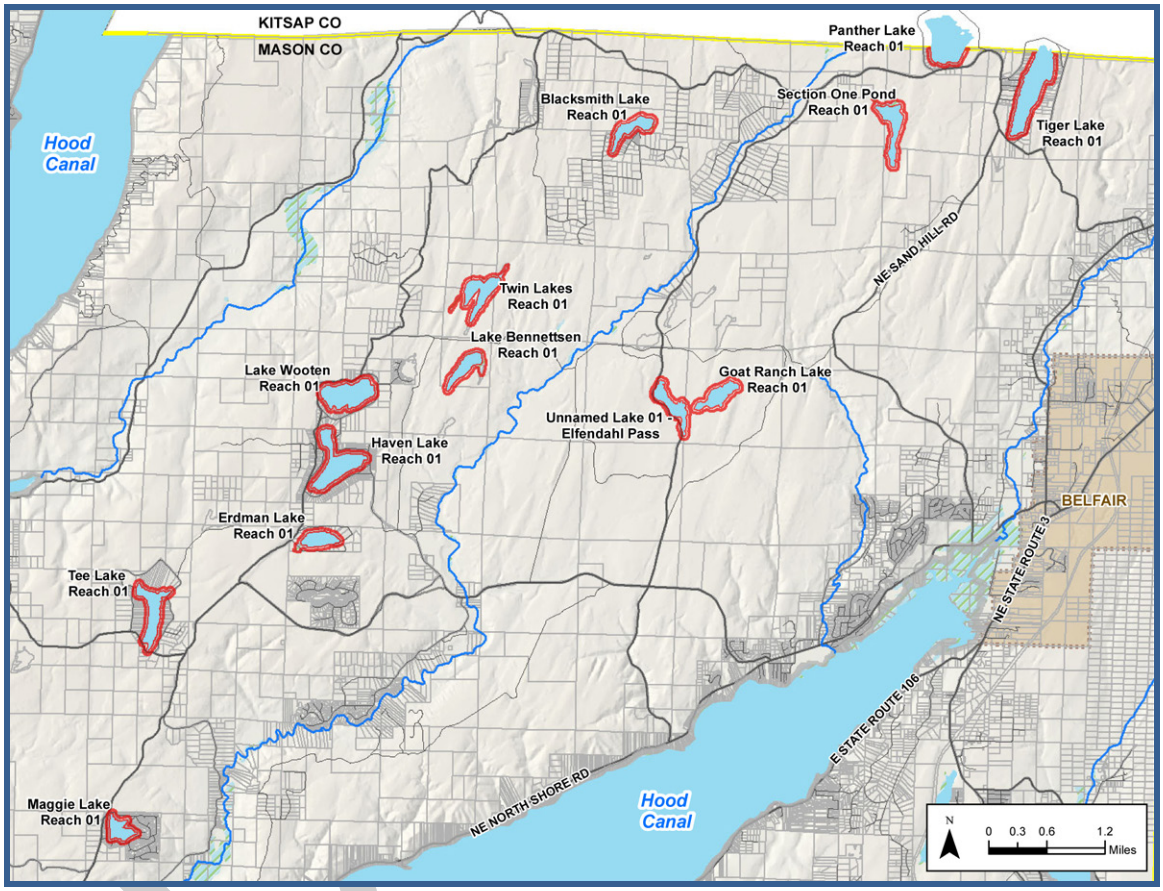
Protect existing water quality in Rendlsand Creek.

KEY MANAGEMENT ISSUES

Timber harvest in the watershed resulting in increased surface water runoff.

Alterations at the mouth of Rendsland Creek in the nearshore areas (see Chapter 5).

7.3 Lakes on Kitsap Peninsula (Blacksmith, Twin, Bennettsen, Wooten, Haven, Goat Ranch, Erdman, Tee, Maggie, Tiger, Panther, Unnamed, Section 1 Pond)



7.3.1 Physical Characterization and Modifications

Thirteen lakes occur on the Kitsap Peninsula and are included in this inventory and characterization report in WRIA 15. Lakes located west of the Tahuya River are: Maggie Lake, Tee Lake, Erdman Lake, Haven Lake, Lake Wooten, Lake Benettsen, Twin Lakes, and Blacksmith Lake. Lakes to the east of the Tahuya River include: Goat Ranch Lake, Unnamed Lake, Scarification Lake, Section 1 Lake, Panther Lake, and Tiger Lake. Numerous other lakes occur on the Kitsap Peninsula within Mason County; however, these are less than 20 acres in size and are not considered shorelines of the state.

In addition to residential development along the shorelines of many of these lakes, logging practices are common on the lands adjacent to the lakes and the upper watershed in general.

Lakes West of the Tahuya River

Lakes located west of the Tahuya River are surrounded by residential development with piers and floats typically associated with lake-side residences. Notable exceptions to this include: Erdman Lake, Lake Bennettsen, and Twin Lake that have limited to no development along their shorelines. Tee Lake is the headwaters for Rendsland Creek and Lake Wooten drains to Haven Lake. Erdman Lake, Haven Lake, Bennettsen Lake, and Blacksmith Lake all drain to the Tahuya River. Culverts are common along the inlet and/or outlet streams to many of these lakes (Kuttel, 2003).

Lakes East of the Tahuya River

Residential development is generally more limited or not present on lakes located east of the Tahuya. Exceptions include Panther Lake and Tiger Lake, which are located near the Mason-Kitsap County border; these lakes are developed. Goat Ranch Lake, Unnamed Lake, and Panther Lake all drain to the Tahuya River, while Section 1 Pond drain to Mission Creek. Scarification Pond was evaluated in the field by Ecology staff and determined to be less than 20 acres in size and therefore not a shoreline of the state. Culverts are less common on the inlet and/or outlets of these lakes (Kuttel, 2003).

Lakes in the Mason County portion of WRIA 15 have been altered by development and timber harvest. Some of the process modifications include:

- Logging practices;
- Water diversion/storage use;

- Adjacent residential development;
- Pier, ramps, and floats;
- Culverts and other structures that alter flow regime;
- Bank armoring; and
- Conversion of pervious to impervious surfaces.

7.3.2 Water Quality

No water quality assessment information was identified for Blacksmith, Twin, Bennettsen, Wooten, Goat Ranch, Erdman, Tee, Maggie, Tiger, Unnamed and Panther Lakes. They are not included on Ecology's 303 (d) list of impaired waters.

Haven Lake is included on the 303 (d) list due to elevated PCB and Hexachlorobenzene levels. Fish tissue samples collected from Haven Lake in 2005 had concentrations of PCBs (as total PCB congeners) and hexachlorobenzene higher than the National Toxics Rule Criteria (Washington State Department of Ecology, 2008c). The source of PCBs and Hexachlorobenzene in Haven Lake is uncertain. Because the source(s) of pollutants in Haven Lake is uncertain, additional monitoring of water quality, and assessment to identify and subsequently reduce pollutant sources, are potential restoration opportunities for Haven Lake.

Haven Lake was assessed as oligo-mesotrophic (Washington Department of Ecology, 1997) in the 1990s and would have been considered at that time to have good water quality. This assessment was based on several conditions including abundant macrophyte growth and elevated chlorophyll concentrations. An IAVMP for plant management is currently under development for Haven Lake.

In the 1990s, Tiger Lake was assessed as oligo-mesotrophic, while Wooten Lake was assessed as oligotrophic (Washington Department of Ecology, 1997), which would have related to good and excellent water quality, respectively. No recent water quality data were identified.

7.3.3 Critical or Priority Habitat and Species

Nine of the fourteen lakes are mapped as supporting priority fish species (WDFW, 2010; Table 7-4). Cutthroat trout and coho salmon are the more commonly occurring salmonids in these lakes.

Table 7-4. Priority fish species documented for Blacksmith Lake, Lake Wooten, Haven Lake, Goat Ranch Lake, Erdman Lake, Tee Lake, Panther Lake, Unnamed Lake, and Section 1 Pond

Lake	Reach	Coastal Cutthroat Trout	Fall Chum Salmon	Coho Salmon (federal species of concern)	Rainbow Trout	Winter Steelhead (federally listed as threatened)
Blacksmith Lake	01	P/M	~	~	P/M	~
Lake Wooten	01	P/M	~	P/M	~	~
Haven Lake	01	P/M	P/M	J, S, P/M	~	J, P/M
Goat Ranch Lake	01	P/M	~	J, P/M	~	~
Erdman Lake	01	P/M	P/M	J, S, P/M	~	~
Tee Lake	01	P/M	~	J, P/M	~	~
Panther Lake	01	P/M	~	J, P/M	~	~
Unnamed Lake	01	P/M	~	J, P/M	~	~
Section 1 Pond	01	P/M	~	P/M	~	~

*J=Known juvenile rearing; S=Known spawning; P/M=Presences/Migration

In addition to the priority fish species listed above, many of the lakes contain warmwater game fish and other sport fishes that support recreational fisheries. Species include largemouth bass (*Micropterus salmoides*), yellow perch (*Perca flavescens*), pumpkinseed sunfish (*Lepomis gibbosus*), and brown bullhead (*Ameiurus nebulosus*).

The following approximate wetland areas have been mapped within the Mason County shoreline jurisdiction for the lakes discussed in this section. The corresponding percentage of lake reach occupied by wetland habitat is also listed (NWI, 1989; Table 7-5).

Table 7-5. Approximate wetland area in the vicinity of lakes on Kitsap Peninsula

Lake	Reach	Approximate Area of Mapped Wetlands (acres	Percent of Reach
Blacksmith Lake	01	8.8	24.3
Twin Lake	01	11.9	22.9
Lake Benettsen	01	12.6	36.5
Lake Wooten	01	2.8	7.1
Haven Lake	01	5.4	9.8
Goat Ranch Lake	01	2.0	6.1
Erdman Lake	01	6.0	21.2
Tee Lake	01	2.3	4.6
Maggie Lake	01	2.6	9.2
Tiger Lake	01	2.7	5.3
Panther Lake	01	0.4	3.0
Unnamed Lake	01	5.7	13.8
Section 1 Pond	01	8.7	18.9

Goat Ranch Lake has other priority wildlife species occurrences for pacific pond turtle and western toad. Maggie Lake has a purple martin priority species occurrence and Unnamed Lake has a priority species occurrence for western toad (WDFW, 2010). The WDNR NHP has identified the following priority plant species and vegetation communities within the Twin Lakes shoreline planning area (WDNR, 2009):

- Few-flowered Sedge;
- Beakrush - (Bog Cranberry) / Sphagnum Spp.;
- Bog Labrador-tea - Bog-laurel / Sphagnum Spp.; and
- Low Elevation Sphagnum Bog PTN.

7.3.4 Land Use

Twins Lake, Lake Bennettsen, Section 1 Pond, Goat Ranch Lake and Unnamed Lake are entirely within forestry use. Public access is available at three lakes: a WDFW boat launch and a DNR boat launch provide access to Twins Lake; WDNR trail provides access to Lake Bennettsen and Unnamed Lake; and Elfendahl Pass Staging Area provides access to Unnamed Lake (Mason County Parks and Recreation Department, 2008; WDNR, 2010). Elfendahl Pass Staging Area is a 5 acre RV campground managed by WDNR (Mason County Department of Parks and Trails, 2006). Twin Lakes, Section 1 Pond, Goat Ranch Lake and Unnamed Lake are part of the DNR Tahuya State Forest lands.

Tahuya State Forest is a 23,000-acre working forest located generally between Dewatto River and Belfair. WDNR manages this forest for timber production, wildlife habitat and recreation. Recreation and public access opportunities must be compatible with overall forest and trust management objectives to be allowed within the state forest lands. More than 200,000 recreational users visit the forest each year. Tahuya offers numerous recreation opportunities, such as off-road vehicle (ORV) riding, horseback riding, mountain biking, fishing, hunting, camping, hiking and recreational mushroom harvesting. There are approximately 170 miles of trails in the Tahuya State Forest (Washington State Department of Natural Resources (WDNR), 2008 and 2011). All shoreline lakes are located outside the Tahuya State Forest except for Twins Lake, Section One Pond, Goat Ranch Lake, and Unnamed Lake (WDNR Engineering Division Resource Mapping Cartography, 2005).

Lake Wooten, Haven Lake, Tee Lake, Maggie Lake, and Tiger Lake are predominately in residential use. Remaining lands surrounding the lakes in Mason County section of WRAI 15 are mapped as vacant. A WDFW boat launch provides access to each of these lakes. There is a proliferation of individual docks/piers at each of these five lakes except for Haven Lake.

Erdman Lake has an almost even mix of residential and vacant land uses. There is a WDNR trail that runs adjacent to the western portion of Erdman Lake for about 1,000 feet. The trail is part of the WDNR Tahuya State forest lands. There are several individual docks/piers associated with existing residences.

Blacksmith Lake and Panther Lake have a mix of forestry, residential and vacant land uses. A WDFW boat launch provides access to Panther Lake. There is no public access to Blacksmith Lake. There are numerous individual docks/piers associated with existing residences in Panther Lake while Blacksmith Lake only has 6 docks/piers.

7.3.5 Land Cover

Much of the land cover surrounding these lakes is related to forest resource lands; therefore, most of the lakes have land cover dominated by forest. Of the thirteen lakes in WRIA 15 (Kitsap), nine of these have forested land cover that occupies 60 percent or more of the shoreline area (USGS, 2009). Only Twin Lake, Wooten Lake, Haven Lake, Tiger Lake and Panther Lake have forested land cover less than 50 percent. Goat Lake, Twin and Unnamed have substantial wetland area as land cover (over 20%).

7.3.6 Summary of Key Management Issues

PLACEHOLDER

7.3.7 Reach Analysis

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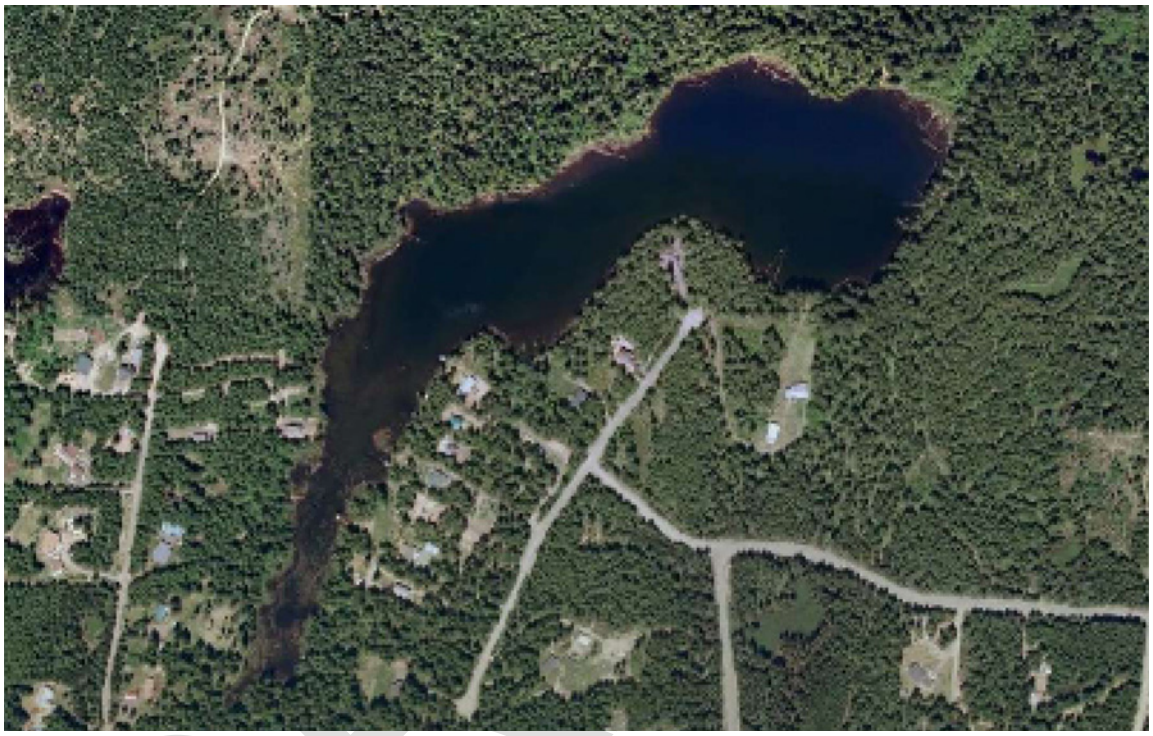
BLACKSMITH LAKE

SHORELINE PERIMETER	WATERBODY AREA	REACH AREA
1.4 MI	27.2 AC	63.2 AC



PHYSICAL AND ECOLOGICAL FEATURES

HYDROLOGY (MAPS 4 AND 10)

Floodplain - 32% (11 acres) of the reach, excluding open water, is mapped as FEMA 1% annual chance floodplain

HAZARD AREAS (MAP 12)

No mapped hazard areas.

LAND COVER (MAP 15)

26% open water, 5% playa, 70% forest (GAP, 2009).

Riparian vegetation: 45% forest cover, 7% non-forest, 4% other natural vegetation, 43% water (PNPTC, 2011).

HABITATS AND SPECIES (MAP 8)

Coastal cutthroat trout and rainbow trout.

No wetlands are mapped in this reach.

WATER QUALITY (MAP 13)

Not included on Ecology's 303 (d) list of impaired waters

BUILT ENVIRONMENT AND LAND USE

EXISTING LAND USES AND OWNERSHIP (MAP 18)

Land Use – Forestry (53%), Residential (29%), and Vacant (18%). Ownership – 100% Private.

SHORELINE MODIFICATIONS (MAP 16)

According to aerial imagery (2009), there are six docks/piers present. No other shoreline modifications are mapped in the reach.

ZONING AND COMPREHENSIVE PLAN DESIGNATIONS (MAP 21)

Zoning districts – 100% Rural Residential 5 Acres. Comprehensive Plan Designations: 100% Rural.

Existing Shoreline Environment Designation (SED) – not designated.

PUBLIC ACCESS (MAP 14)

There are no mapped parks or public access facilities in the Blacksmith Lake shoreline.

IMPERVIOUS SURFACES (MAP 16)

1.0% of the reach is mapped as containing impervious surfaces (NOAA CCAP 2006). Aerial photos from 2009 show scattered residential development along the southern part of the lake.

AREAS OF SPECIAL INTEREST

No Ecology listed facilities or contaminated sites.

CULTURAL AND ARCHAEOLOGICAL RESOURCES

There are no listed cultural resources or state or federally listed historic properties. Resource mapping suggests there is a low to moderate probability of finding unknown artifacts within this reach.

OPPORTUNITY AREAS (MAP 23)

Protect existing forested riparian zone.

Identify public access points where none currently exist.

KEY MANAGEMENT ISSUES

Protection of existing forested riparian zone.

Provide public access or identify goals for public access in County's park planning documents.

TWIN LAKES

SHORELINE PERIMETER	WATERBODY AREA	REACH AREA
1.8 MI	40.5 AC	92.4 AC

PHYSICAL AND ECOLOGICAL FEATURES

HYDROLOGY (MAPS 4 AND 10)

Floodplain - 23% (12 acres) of the reach, excluding open water, is mapped as FEMA 1% annual chance floodplain

HAZARD AREAS (MAP 12)

No mapped hazard areas.

LAND COVER (MAP 15)

16% open water, 41% forest, 44% wetland (GAP, 2009).

Riparian vegetation: 46% forest cover, 1% non-forest, 28% other natural vegetation, 25% water (PNPTC, 2011).

HABITATS AND SPECIES (MAP 8)

See Section 7.3.3 for list of priority plant species and vegetation communities.

Wetlands – 10.6 acres (20.5% of reach); wetland habitat types include lacustrine littoral aquatic bed and palustrine emergent.

WATER QUALITY (MAP 13)

Not included on Ecology's 303 (d) list of impaired waters

BUILT ENVIRONMENT AND LAND USE

EXISTING LAND USES AND OWNERSHIP (MAP 18)

Land Use – 100% Forestry. Ownership – Private (95%) and Public (5%).

Four acres are within the DNR Tahuya State Forest lands.

SHORELINE MODIFICATIONS (MAP 16)

There are two public boat launches. No other shoreline modifications are mapped in the reach.

ZONING AND COMPREHENSIVE PLAN DESIGNATIONS (MAP 21)

Zoning districts - Rural Residential 20 Acres (86%) and Rural Tourist (14%). Comprehensive Plan Designations – 100% Rural.

Existing SED – not designated.

PUBLIC ACCESS (MAP 14)

There is a WDFW gravel boat launch that provides access to Twin Lakes. The total park size is about 4 acres and includes a small parking lot (Washington Department of Fish and Wildlife WDFW Lands, 2011; Mason County Department of Parks and Trails, 2006). As part of the Tahuya State Forest, Washington State DNR has camping facilities and a hand boat launch at Twin Lakes (Mason County Department of Parks and Trails, 2006).

IMPERVIOUS SURFACES (MAP 16)

No impervious surfaces are mapped in this reach (NOAA CCAP 2006). Aerial photos from 2009 show forestry roads on the NW shore of the lake and no other development.

AREAS OF SPECIAL INTEREST

No Ecology listed facilities or contaminated sites.

CULTURAL AND ARCHAEOLOGICAL RESOURCES

There are no listed cultural resources or state or federally listed historic properties. Resource mapping suggests there is a low to moderate probability of finding unknown artifacts within this reach.

OPPORTUNITY AREAS (MAP 23)

Protect existing forested riparian zone.

Consider interpretative signage at boat launches related to lake water quality and habitat protection.

KEY MANAGEMENT ISSUES

Limit proliferation of single family residential docks.

Protection of existing forested riparian zone.

LAKE BENNETTSEN

SHORELINE PERIMETER	WATERBODY AREA	REACH AREA
1.1 MI	26.9 AC	61.4 AC

PHYSICAL AND ECOLOGICAL FEATURES

HYDROLOGY (MAPS 4 AND 10)

Floodplain - 35% (12 acres) of the reach, excluding open water, is mapped as FEMA 1% annual chance floodplain

HAZARD AREAS (MAP 12)

No mapped hazard areas.

LAND COVER (MAP 15)

33% open water, 1% beach, 2% playa, 64% forest (GAP, 2009).

Riparian vegetation: 43% forest cover, 1% non-forest, 56% water (PNPTC, 2011)

HABITATS AND SPECIES (MAP 8)

6.6 acres of lacustrine littoral emergent wetland (19.2% of reach).

WATER QUALITY (MAP 13)

Not included on Ecology's 303 (d) list of impaired waters

BUILT ENVIRONMENT AND LAND USE

EXISTING LAND USES AND OWNERSHIP (MAP 18)

Land Use – 100% Forestry. Ownership – Private (93%) and Public (7%).

SHORELINE MODIFICATIONS (MAP 16)

According to aerial imagery (2009), there are several overwater structures that appear to be a docks. No other shoreline modifications are mapped in the reach.

ZONING AND COMPREHENSIVE PLAN DESIGNATIONS (MAP 21)

Zoning districts – Rural Tourist (85%) and Long Term Commercial Forest (15%). Comprehensive Plan Designations - Rural (85%) and Long Term Commercial Forest (15%).

Existing SED – 100% Conservancy.

PUBLIC ACCESS (MAP 14)

There is a WDNR trail that runs adjacent to the southwestern and eastern portions of Lake Bennettsen for about 600 feet.

IMPERVIOUS SURFACES (MAP 16)

No impervious surfaces are mapped in this reach (NOAA CCAP, 2006). Aerial photos from 2009 show a few single-family residences on large lots on the northern shore of the lake.

AREAS OF SPECIAL INTEREST

No listed facilities or contaminated sites.

CULTURAL AND ARCHAEOLOGICAL RESOURCES

There are no listed cultural resources or state or federally listed historic properties. Resource mapping suggests there is a low to moderate probability of finding unknown artifacts within this reach.

OPPORTUNITY AREAS (MAP 23)

Protect existing forested riparian zone.

KEY MANAGEMENT ISSUES

Limit proliferation of single family residential docks.

Protection of existing forested riparian zone.

LAKE WOOTEN

SHORELINE PERIMETER	WATERBODY AREA	REACH AREA
1.6 MI	68.0 AC	107.8 AC

PHYSICAL AND ECOLOGICAL FEATURES

HYDROLOGY (MAPS 4 AND 10)

Floodplain - 29% (12 acres) of the reach, excluding open water, is mapped as FEMA 1% annual chance floodplain

HAZARD AREAS (MAP 12)

2.3% erosion, 2.3% landslide

LAND COVER (MAP 15)

1% developed, 55% open water, 1% beach, 2% playa, 39% forest, 2% wetland (GAP, 2009).

Riparian vegetation: 15% closed canopy, 20% non-forest, 65% water (PNPTC, 2011)

HABITATS AND SPECIES (MAP 8)

Coastal cutthroat trout and coho salmon.

No wetlands are mapped in this reach.

WATER QUALITY (MAP 13)

Excellent water quality; not included on Ecology's 303 (d) list of impaired waters

BUILT ENVIRONMENT AND LAND USE

EXISTING LAND USES AND OWNERSHIP (MAP 18)

Land Use – Residential (87%) and Vacant (13%).
Ownership – 100% Private.

SHORELINE MODIFICATIONS (MAP 16)

According to 2009 aerial imagery, there are individual docks/piers associated with most residences. An unnamed road crossing is located in the southern portion of the reach. There is one public boat launch.

ZONING AND COMPREHENSIVE PLAN DESIGNATIONS (MAP 21)

Zoning districts –100% Rural Residential 20 Acres.
Comprehensive Plan Designations – 100% Rural.
Existing SED – 100% Urban Residential.

PUBLIC ACCESS (MAP 14)

There is a WDFW boat launch with associated parking that provides access to Wooten Lake. The boat launch is a 12-foot wide concrete launch. The total park is 1 acre in size (Washington Department of Fish and Wildlife WDFW Lands, 2011; Mason County Department of Parks and Trails, 2006).

IMPERVIOUS SURFACES (MAP 16)

3.5% of the reach is mapped as containing impervious surfaces (NOAA CCAP, 2006). Aerial photos from 2009 show single-family residences and roads surrounding much of the lake.

AREAS OF SPECIAL INTEREST

No listed facilities or contaminated sites.

CULTURAL AND ARCHAEOLOGICAL RESOURCES

There are no listed cultural resources or state or federally listed historic properties. Resource mapping suggests there is a low to moderate probability of finding unknown artifacts within this reach.

OPPORTUNITY AREAS (MAP 23)

Protect existing forested riparian zone.
Consider interpretative signage at boat launches related to lake water quality and habitat protection.

KEY MANAGEMENT ISSUES

Limit proliferation of single family residential docks.
Protection of existing forested riparian zone.

HAVEN LAKE

SHORELINE PERIMETER	WATERBODY AREA	REACH AREA
2.2 MI	69.5 AC	124.6 AC

PHYSICAL AND ECOLOGICAL FEATURES

HYDROLOGY (MAPS 4 AND 10)

Floodplain - 42% (23 acres) of the reach, excluding open water, is mapped as FEMA 1% annual chance floodplain

HAZARD AREAS (MAP 12)

0.3% erosion, 0.3% landslide

LAND COVER (MAP 15)

1% developed, 46% open water, 3% beach, 3% playa, 47% forest (GAP, 2009).

Riparian vegetation: 21% forest cover, 19% non-forest, 60% water (PNPTC, 2011)

HABITATS AND SPECIES (MAP 8)

Coastal cutthroat trout, fall chum salmon, coho salmon, and winter steelhead.

No wetlands are mapped in this reach.

WATER QUALITY (MAP 13)

Listed on Ecology's 303 (d) list of impaired waters for PCBs and hexachlorobenzene; integrated aquatic vegetation management plan under development

BUILT ENVIRONMENT AND LAND USE

EXISTING LAND USES AND OWNERSHIP (MAP 18)

Land Use – Residential (77%) and Vacant (23%).
Ownership – 100% Private.

SHORELINE MODIFICATIONS (MAP 16)

According to 2009 aerial imagery, there are individual docks/piers associated with most residences. An unnamed road crossing is located southwestern portion of the reach. There is one public boat launch.

ZONING AND COMPREHENSIVE PLAN DESIGNATIONS (MAP 21)

Zoning districts – Rural Residential 5 Acres (93%) and Rural Residential 20 Acres (7%).
Comprehensive Plan Designations – 100% Rural.

Existing SED – 100% Urban Residential.

PUBLIC ACCESS (MAP 14)

There is a WDFW gravel boat launch with associated parking that provides access to Haven Lake. The total park size is about 4 acres (Washington Department of Fish and Wildlife WDFW Lands, 2011; Mason County Department of Parks and Trails, 2006).

IMPERVIOUS SURFACES (MAP 16)

2.7% of the reach is mapped as containing impervious surfaces (NOAA CCAP 2006). Aerial photos from 2009 show single-family residences surrounding most of the lake.

AREAS OF SPECIAL INTEREST

No listed facilities or contaminated sites.

CULTURAL AND ARCHAEOLOGICAL RESOURCES

There are no listed cultural resources or state or federally listed historic properties. Resource mapping suggests there is a low to moderate probability of finding unknown artifacts within this reach, with a small portion of the reach in moderate to moderate-high probability zones.

OPPORTUNITY AREAS (MAP 23)

Protect existing forested riparian zone.

KEY MANAGEMENT ISSUES

Limit proliferation of single family residential docks.

Protection of existing forested riparian zone.

ERDMAN LAKE

SHORELINE PERIMETER	WATERBODY AREA	REACH AREA
0.9 MI	26.8 AC	54.9 AC

PHYSICAL AND ECOLOGICAL FEATURES

HYDROLOGY (MAPS 4 AND 10)

Floodplain - 19% (5 acres) of the reach, excluding open water, is mapped as FEMA 1% annual chance floodplain

HAZARD AREAS (MAP 12)

7.1% erosion, 7.1% landslide

LAND COVER (MAP 15)

32% open water, 2% beach, 3% playa, 59% forest, 5% floodplain/riparian (GAP, 2009).

Riparian vegetation: 38% forest cover, 7% non-forest, 10% other natural vegetation, 45% water (PNPTC, 2011)

HABITATS AND SPECIES (MAP 8)

Coastal cutthroat trout, fall chum salmon, and coho salmon.

Wetlands – 5.6 acres (20.0% of reach); wetland habitat types include palustrine forested and palustrine scrub-shrub.

WATER QUALITY (MAP 13)

Not included on Ecology's 303 (d) list of impaired waters

BUILT ENVIRONMENT AND LAND USE

EXISTING LAND USES AND OWNERSHIP (MAP 18)

Land Use – Vacant (50%), Residential (45%), and remaining 5% is a mix of Parks, Open Space, Recreation Areas and Forestry. Ownership – 100% Public.

SHORELINE MODIFICATIONS (MAP 16)

According to 2009 aerial imagery, there are several docks/piers associated with residences. No other shoreline modifications are mapped in the reach.

ZONING AND COMPREHENSIVE PLAN DESIGNATIONS (MAP 21)

Zoning districts – 100% Rural Residential 5 Acres. Comprehensive Plan Designations – 100% Rural.

Existing SED – not designated.

PUBLIC ACCESS (MAP 14)

There is a WDNR trail that runs adjacent to the western portion of Erdman Lake for about 1,000 feet (Washington State Department of Natural Resources, 2010).

IMPERVIOUS SURFACES (MAP 16)

No impervious surfaces are mapped in this reach (NOAA CCAP 2006). Aerial photos from 2009 show scattered single-family residences surrounding the lake.

AREAS OF SPECIAL INTEREST

According to the Ecology facilities/sites database, there are no listed facilities or contaminated sites.

CULTURAL AND ARCHAEOLOGICAL RESOURCES

There are no listed cultural resources or state or federally listed historic properties. Resource mapping suggests there is a low to moderate probability of finding unknown artifacts within this reach.

OPPORTUNITY AREAS (MAP 23)

Protect wetlands associated with Erdman Lake.

Protect existing forested riparian zone.

KEY MANAGEMENT ISSUES

Protection of associated wetlands.

Limit proliferation of single family residential docks.

Protection of existing forested riparian zone.

TEE LAKE

SHORELINE PERIMETER	WATERBODY AREA	REACH AREA
2.0 MI	47.5 AC	97.4 AC

PHYSICAL AND ECOLOGICAL FEATURES

HYDROLOGY (MAPS 4 AND 10)

Floodplain - 43% (21 acres) of the reach, excluding open water, is mapped as FEMA 1% annual chance floodplain

HAZARD AREAS (MAP 12)

1.4% erosion, 1.4% landslide

LAND COVER (MAP 15)

2% developed, 36% open water, 1% beach, 2% playa, 60% forest (GAP, 2009).

Riparian vegetation: 29% forest cover, 21% non-forest, 2% other natural vegetation, 49% water (PNPTC, 2011)

HABITATS AND SPECIES (MAP 8)

Coastal cutthroat trout and coho salmon.

0.2 acres of palustrine scrub-shrub wetland (0.4% of reach).

WATER QUALITY (MAP 13)

Not included on Ecology's 303 (d) list of impaired waters

BUILT ENVIRONMENT AND LAND USE

EXISTING LAND USES AND OWNERSHIP (MAP 18)

Land Use – Residential (69%), Vacant (22%), and remaining 9% is a mix of Forestry, Parks, Open Space, and Recreation Areas. Ownership – 100% Private.

SHORELINE MODIFICATIONS (MAP 16)

According to 2009 aerial imagery, there are individual docks/piers associated with most residences. There is one public boat launch. No other shoreline modifications are mapped in the reach.

ZONING AND COMPREHENSIVE PLAN DESIGNATIONS (MAP 21)

Zoning districts – Rural Residential 5 Acres (97%) and Rural Residential 20 Acres (3%). Comprehensive Plan Designations – 100% Rural.

Existing SED – 100% Urban Residential.

PUBLIC ACCESS (MAP 14)

There is a WDFW gravel boat launch with associated parking that provides access to Tee Lake. The total park size is about 4 acres (Washington Department of Fish and Wildlife WDFW Lands, 2011; Mason County Department of Parks and Trails, 2006).

IMPERVIOUS SURFACES (MAP 16)

5.0% of the reach is mapped as containing impervious surfaces (NOAA CCAP 2006). Aerial photos from 2009 show scattered single-family residences and roads around most of the lake.

AREAS OF SPECIAL INTEREST

No listed facilities or contaminated sites.

CULTURAL AND ARCHAEOLOGICAL RESOURCES

There are no listed cultural resources or state or federally listed historic properties. Resource mapping suggests there is a low to moderate probability of finding unknown artifacts within this reach.

OPPORTUNITY AREAS (MAP 23)

Protect existing forested riparian zone.

KEY MANAGEMENT ISSUES

Limit proliferation of single family residential docks.

Protection of existing forested riparian zone.

MAGGIE LAKE

SHORELINE PERIMETER	WATERBODY AREA	REACH AREA
1.1 MI	22.5 AC	50.6 AC

PHYSICAL AND ECOLOGICAL FEATURES

HYDROLOGY (MAPS 4 AND 10)

Floodplain - 44% (12 acres) of the reach, excluding open water, is mapped as FEMA 1% annual chance floodplain

HAZARD AREAS (MAP 12)

No mapped hazard areas.

LAND COVER (MAP 15)

6% developed, 32% open water, 1% beach, 3% playa, 57% forest (GAP, 2009).

Riparian vegetation: 29% forest cover, 24% non-forest, 4% other natural vegetation, 43% water (PNPTC, 2011)

HABITATS AND SPECIES (MAP 8)

Purple martin.

No wetlands are mapped in this reach.

WATER QUALITY (MAP 13)

Not included on Ecology's 303 (d) list of impaired waters

BUILT ENVIRONMENT AND LAND USE

EXISTING LAND USES AND OWNERSHIP (MAP 18)

Land Use – Residential (66%), Vacant (20%), remaining 14% is a mix of Parks, Open Space, Recreation Areas, and Forestry. Ownership – 100% Private.

SHORELINE MODIFICATIONS (MAP 16)

According to 2009 aerial imagery, there are individual docks/piers and floats associated with most residences. There is one public boat launch. No other shoreline modifications are mapped in the reach.

ZONING AND COMPREHENSIVE PLAN DESIGNATIONS (MAP 21)

Zoning districts – Rural Residential 5 Acres (98%) and Rural Residential 20 Acres (2%). Comprehensive Plan Designations – 100% Rural. Existing SED – 100% Urban Residential.

PUBLIC ACCESS (MAP 14)

There is a WDFW gravel boat launch with associated parking that provides access to the north end of Phillips Lake. The park is 1 acre in size (Washington Department of Fish and Wildlife WDFW Lands, 2011; Mason County Department of Parks and Trails, 2006).

IMPERVIOUS SURFACES (MAP 16)

15.0% of the reach is mapped as containing impervious surfaces (NOAA CCAP, 2006). Aerial photos from 2009 show scattered single-family residences and roads surrounding most of the lake.

AREAS OF SPECIAL INTEREST

No state listed facilities or contaminated sites.

CULTURAL AND ARCHAEOLOGICAL RESOURCES

There are no listed cultural resources or state or federally listed historic properties. Resource mapping suggests there is a low to moderate probability of finding unknown artifacts within this reach.

OPPORTUNITY AREAS (MAP 23)

Protect existing forested riparian zone.

Protect floodplain from alteration or fill.

KEY MANAGEMENT ISSUES

Limit proliferation of single family residential docks.

Protection of existing forested riparian zone.

PANTHER LAKE

SHORELINE PERIMETER	WATERBODY AREA	REACH AREA
0.9 MI	26.9 AC	41.7 AC

PHYSICAL AND ECOLOGICAL FEATURES

HYDROLOGY (MAPS 4 AND 10)

Floodplain - 31% (5 acres) of the reach, excluding open water, is mapped as FEMA 1% annual chance floodplain

HAZARD AREAS (MAP 12)

No mapped hazard areas.

LAND COVER (MAP 15)

65% open water, 1% playa, 34% forest (GAP, 2009).

Riparian vegetation: 20% forest cover, 9% non-forest, 72% water (PNPTC, 2011)

HABITATS AND SPECIES (MAP 8)

Coastal cutthroat trout and coho salmon.

No wetlands are mapped in this reach.

WATER QUALITY (MAP 13)

Not included on Ecology's 303 (d) list of impaired waters

BUILT ENVIRONMENT AND LAND USE

EXISTING LAND USES AND OWNERSHIP (MAP 18)

Land Use – Residential (47%), Forestry (36%), and Vacant (17%). Ownership – 100% Private.

SHORELINE MODIFICATIONS (MAP 16)

According to 2009 aerial imagery, there are individual docks/piers associated with most residences. There is one public boat launch. No other shoreline modifications are mapped in the reach.

ZONING AND COMPREHENSIVE PLAN DESIGNATIONS (MAP 21)

Zoning districts – 100% Rural Residential 5 Acres.

Comprehensive Plan Designations – 100% Rural.

Existing SED – 100% Urban Residential.

PUBLIC ACCESS (MAP 14)

There is a WDFW gravel boat launch with associated parking at the southern part of the lake . The total park size is about 4 acres (Washington Department of Fish and Wildlife WDFW Lands, 2011; Mason County Department of Parks and Trails, 2006).

IMPERVIOUS SURFACES (MAP 16)

No impervious surfaces are mapped in this reach (NOAA CCAP, 2006). Aerial photos from 2009 show approximately half of the reach developed with single-family residences.

AREAS OF SPECIAL INTEREST

No listed facilities or contaminated sites.

CULTURAL AND ARCHAEOLOGICAL RESOURCES

There are no listed cultural resources or state or federally listed historic properties. Resource mapping suggests there is a moderate-high to very high probability of finding unknown artifacts within this reach.

OPPORTUNITY AREAS (MAP 23)

Protect existing forested riparian zone.

KEY MANAGEMENT ISSUES

Limit proliferation of single family residential docks.

Protection of existing forested riparian zone.

TIGER LAKE

SHORELINE PERIMETER	WATERBODY AREA	REACH AREA
2.2 MI	98.0 AC	148.3 AC

PHYSICAL AND ECOLOGICAL FEATURES

HYDROLOGY (MAPS 4 AND 10)

Floodplain - 68% (34 acres) of the reach, excluding open water, is mapped as FEMA 1% annual chance floodplain

HAZARD AREAS (MAP 12)

1.3% erosion, 1.3% landslide

LAND COVER (MAP 15)

2% developed, 58% open water, 2% beach, 3% playa, 34% forest, 1% wetland (GAP, 2009).

Riparian vegetation: 14% forest cover, 16% non-forest, 70% water (PNPTC, 2011)

HABITATS AND SPECIES (MAP 8)

No wetlands are mapped in this reach.

WATER QUALITY (MAP 13)

Good water quality; not included on Ecology's 303 (d) list of impaired waters

BUILT ENVIRONMENT AND LAND USE

EXISTING LAND USES AND OWNERSHIP (MAP 18)

Land Use – Residential (88%), remaining 12% is a mix of Vacant, Forestry, Transportation, Parks, Open Space and Recreation Areas. Ownership – 100% Private.

SHORELINE MODIFICATIONS (MAP 16)

According to 2009 aerial imagery, there are individual docks/piers associated with most residences. No other shoreline modifications are mapped in the reach.

ZONING AND COMPREHENSIVE PLAN DESIGNATIONS (MAP 21)

Zoning districts – 100% Rural Residential 5 Acres.

Comprehensive Plan Designations – 100% Rural.

Existing SED – 100% Urban Residential.

PUBLIC ACCESS (MAP 14)

There is a WDFW gravel boat launch that provides access to the north end of Tiger Lake in Kitsap County (Washington Department of Fish and Wildlife WDFW Lands, 2011).

IMPERVIOUS SURFACES (MAP 16)

5.5% of the reach is mapped as containing impervious surfaces (NOAA CCAP, 2006). Aerial photos from 2009 show single-family residences and roads surrounding the lake.

AREAS OF SPECIAL INTEREST

No Ecology listed facilities or contaminated sites.

CULTURAL AND ARCHAEOLOGICAL RESOURCES

There are no listed cultural resources or state or federally listed historic properties. Resource mapping suggests there is a very low probability of finding unknown artifacts within this reach.

OPPORTUNITY AREAS (MAP 23)

Protect floodplain from alteration or fill.

Protect existing forested riparian zone.

KEY MANAGEMENT ISSUES

Limit proliferation of single family residential docks.

Protection of existing forested riparian zone.

SECTION 1 POND

SHORELINE PERIMETER	WATERBODY AREA	REACH AREA
1.7 MI	38.7 AC	84.8 AC

PHYSICAL AND ECOLOGICAL FEATURES

HYDROLOGY (MAPS 4 AND 10)

Floodplain - 33% (15 acres) of the reach, excluding open water, is mapped as FEMA 1% annual chance floodplain

HAZARD AREAS (MAP 12)

No mapped hazard areas.

LAND COVER (MAP 15)

95% forest, 5% wetland (GAP, 2009).

Riparian vegetation: 58% forest cover, 2% other natural vegetation, 40% water (PNPTC, 2011)

HABITATS AND SPECIES (MAP 8)

Coastal cutthroat trout and coho salmon.

Wetlands – 6.7 acres of wetland (14.6% of reach) mapped; wetland habitat types include palustrine emergent and palustrine forested.

WATER QUALITY (MAP 13)

No water quality data available

BUILT ENVIRONMENT AND LAND USE

EXISTING LAND USES AND OWNERSHIP (MAP 18)

Land Use – 100% Forestry. Ownership – Public (84%) and Private (16%).

Thirty-seven acres are mapped within the Tahuya State Forest.

SHORELINE MODIFICATIONS (MAP 16)

No shoreline modifications are mapped in the reach.

ZONING AND COMPREHENSIVE PLAN DESIGNATIONS (MAP 21)

Zoning districts – Long Term Commercial Forest (85%) and Rural Residential 20 Acres (15%). Comprehensive Plan Designations - Long Term Commercial Forest (85%) and Rural (15%). Existing SED – not designated.

PUBLIC ACCESS (MAP 14)

There is no mapped public access to Section 1 Pond.

IMPERVIOUS SURFACES (MAP 16)

No impervious surfaces are mapped in this reach (NOAA CCAP, 2006). Aerial photos from 2009 show forestry roads in the NW part of the reach.

AREAS OF SPECIAL INTEREST

No listed facilities or contaminated sites.

CULTURAL AND ARCHAEOLOGICAL RESOURCES

There are no listed cultural resources or state or federally listed historic properties. Resource mapping suggests there is a low to moderate probability of finding unknown artifacts within this reach.

OPPORTUNITY AREAS (MAP 23)

Protect floodplain from alteration or fill.

Protect existing forested riparian zone.

KEY MANAGEMENT ISSUES

Protection of existing forested riparian zone.

GOAT RANCH LAKE

SHORELINE PERIMETER	WATERBODY AREA	REACH AREA
1.3 MI	32.1 AC	65.4 AC

PHYSICAL AND ECOLOGICAL FEATURES

HYDROLOGY (MAPS 4 AND 10)

Floodplain - 19% (6 acres) of the reach, excluding open water, is mapped as FEMA 1% annual chance floodplain

HAZARD AREAS (MAP 12)

No mapped hazard areas.

LAND COVER (MAP 15)

6% open water, 63% forest, 30% wetland (GAP, 2009).

Riparian vegetation: 42% forest cover, 12% other natural vegetation, 46% water (PNPTC, 2011)

HABITATS AND SPECIES (MAP 8)

Coastal cutthroat trout and coho salmon. Pacific pond turtle and western toad.

Wetlands - 2.0 acres (6.1% of reach); wetland habitat types include lacustrine littoral aquatic bed and palustrine scrub-shrub.

WATER QUALITY (MAP 13)

Not included on Ecology's 303 (d) list of impaired waters

BUILT ENVIRONMENT AND LAND USE

EXISTING LAND USES AND OWNERSHIP (MAP 18)

Land Use – 100% Forestry. Ownership – 100% Public.

Thirty-three acres are mapped within the Tahuya State Forest.

SHORELINE MODIFICATIONS (MAP 16)

No shoreline modifications are mapped in the reach.

ZONING AND COMPREHENSIVE PLAN DESIGNATIONS (MAP 21)

Zoning districts – 100% Long Term Commercial Forest. Comprehensive Plan Designations - 100% Long Term Commercial Forest.

Existing SED – not designated.

PUBLIC ACCESS (MAP 14)

There are no mapped public access facilities at Goat Ranch Lake.

IMPERVIOUS SURFACES (MAP 16)

No impervious surfaces are mapped in this reach (NOAA CCAP 2006). Aerial photos from 2009 show the reach to be undeveloped except for forestry roads.

AREAS OF SPECIAL INTEREST

No Ecology listed facilities or contaminated sites.

CULTURAL AND ARCHAEOLOGICAL RESOURCES

There are no listed cultural resources or state or federally listed historic properties. Resource mapping suggests there is a low to moderate probability of finding unknown artifacts within this reach.

OPPORTUNITY AREAS (MAP 23)

Protect existing forested riparian zone.

Public access facilities could be developed.

KEY MANAGEMENT ISSUES

Protection of existing forested riparian zone

UNNAMED LAKE

SHORELINE PERIMETER	WATERBODY AREA	REACH AREA
1.6 MI	32.7 AC	73.8 AC

PHYSICAL AND ECOLOGICAL FEATURES

HYDROLOGY (MAPS 4 AND 10)

Floodplain - 28% (11 acres) of the reach, excluding open water, is mapped as FEMA 1% annual chance floodplain

HAZARD AREAS (MAP 12)

No mapped hazard areas.

LAND COVER (MAP 15)

82% forest, 17% wetland (GAP, 2009).

Riparian vegetation: 49% forest cover, 6% non-forest, 8% other natural vegetation, 37% water (PNPTC, 2011)

HABITATS AND SPECIES (MAP 8)

Coastal cutthroat trout and coho salmon. Western toad.

Wetlands – 3.6 acres (8.8% of reach); wetland habitat types include lacustrine littoral aquatic bed, palustrine emergent, and palustrine scrub-shrub.

WATER QUALITY (MAP 13)

Not included on Ecology's 303 (d) list of impaired waters

BUILT ENVIRONMENT AND LAND USE

EXISTING LAND USES AND OWNERSHIP (MAP 18)

Land Use – 100% Forestry. Ownership – 100% Public.

Forty-one acres are mapped within the Tahuya State Forest.

SHORELINE MODIFICATIONS (MAP 16)

No shoreline modifications are mapped in the reach.

ZONING AND COMPREHENSIVE PLAN DESIGNATIONS (MAP 21)

Zoning districts – 100% Long Term Commercial Forest. Comprehensive Plan Designations - 100% Long Term Commercial Forest.

Existing SED – not designated.

PUBLIC ACCESS (MAP 14)

Washington State DNR maintains Elfendahl Pass Staging Area at the north end of Unnamed Lake, a 5 acre RV campground with a picnic area (Mason County Department of Parks and Trails, 2006). A WDNR trail is mapped in the southern portion of the reach for about 200 feet extending towards Unnamed Lake.

IMPERVIOUS SURFACES (MAP 16)

1.5% of the reach is mapped as containing impervious surfaces (NOAA CCAP, 2006). Aerial photos from 2009 show one road following the western shore of the lake.

AREAS OF SPECIAL INTEREST

No listed facilities or contaminated sites.

CULTURAL AND ARCHAEOLOGICAL RESOURCES

There are no listed cultural resources or state or federally listed historic properties. Resource mapping suggests there is a low to moderate probability of finding unknown artifacts within this reach.

OPPORTUNITY AREAS (MAP 23)

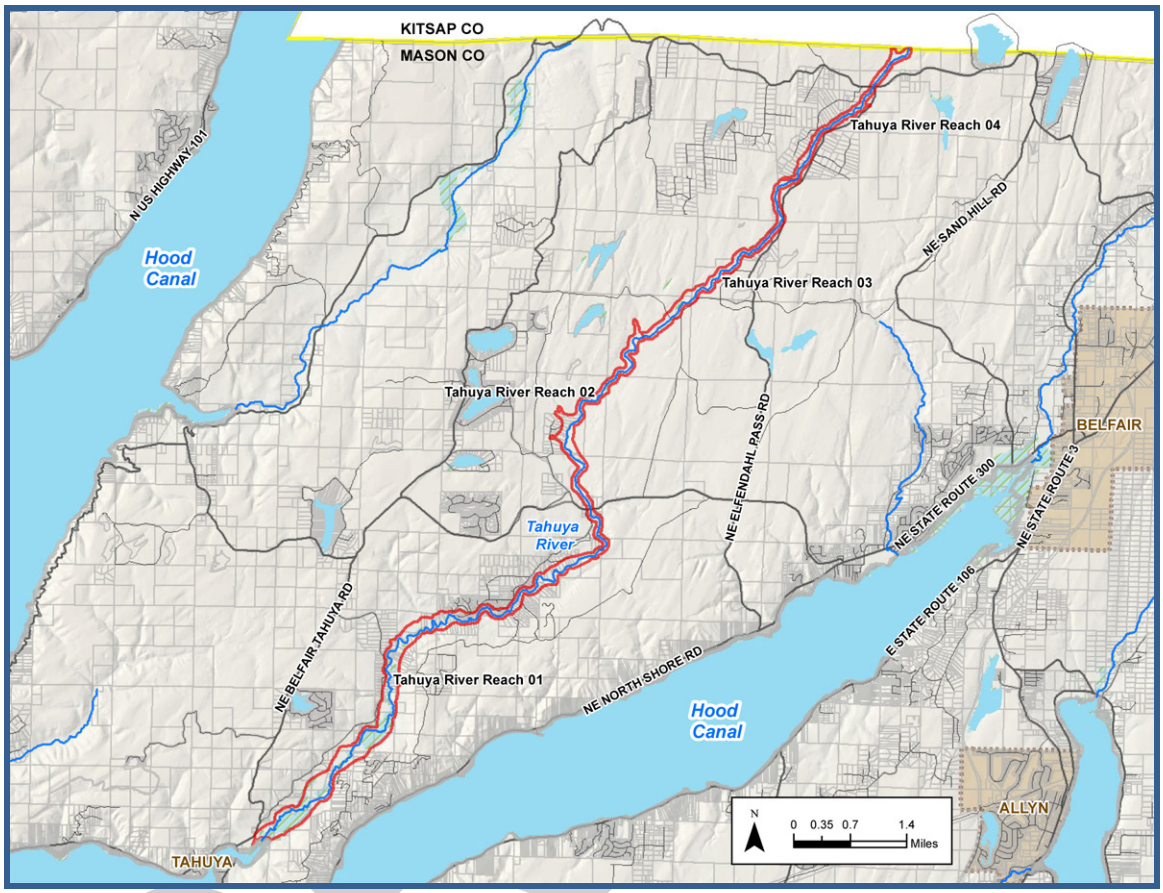
Protect floodplain from alteration or fill.

Protect existing forested riparian zone.

KEY MANAGEMENT ISSUES

Protection of existing forested riparian zone.

7.4 Tahuya River



7.4.1 Physical Characterization and Modifications

The Tahuya River is the largest river on the Kitsap Peninsula and drains approximately 45 square miles of land (Kuttel, 2003). Many of the shoreline lakes described above in Section 7.3 drain to the Tahuya. The mainstem measures approximately 32 miles long and tributaries account for an additional 65 miles (Ames et al., 2000). The headwaters of the river are at Tin Mine Creek, Gold Creek, and wetlands. The river drains to The Bend of Hood Canal. The Tahuya River has been described in this section as four reaches with a total of 17.1 linear miles designated as shorelines of the state within Mason County.

Development is intense along the shorelines of some waterbodies within the drainage basin (Ames et al., 2000). In addition, logging has historically been and currently is a dominant land use in the drainage basin (Kuttel, 2003). Several complete and partial barriers located on tributaries along the lower reaches of the river have been repaired to allow fish passage; however, a complete barrier still exists on one of these tributaries near the mouth of the river (WDFW, 2011). In addition, development has resulted in diking and bank armoring along numerous portions of the river. Floodplain connectivity was rated as fair for the lower reaches of the river (May and Peterson, 2002).

The Tahuya River drainage basin has been extensively modified in the past. Some of the process modifications include:

- Logging practices;
- Adjacent residential development;
- Culverts and other structures that alter flow regime; and
- Channelization and bank armoring.

7.4.2 Water Quality

Tahuya River is included on the 303(d) list of impaired waters (Category 5 water) for the dissolved oxygen parameter (Ecology, 2008). Water quality was sampled in the Tahuya near the Mason-Kitsap County line in Reach 4. A Category 5 listing requires the preparation of a TMDL to address water quality concerns for that parameter. The Tahuya River also has three Category 2 listings for fecal coliform bacteria, pH, and bioassessment.

The Tahuya drains into a portion of Hood Canal that is experiencing severe hypoxia (low dissolved oxygen) resulting in fish kills and harm to marine organisms in the late summer. Eutrophication in the lower reaches of the canal such as Lynch Cove has been linked to phytoplankton growth and nutrients (primarily nitrogen) that

enter the canal from various sources. The US Geological Services (USGS) and others have been studying the sources of nutrients, specifically nitrogen, in Hood Canal, investigating both surface and groundwater sources.

As part of a study by the US Geological Service (USGS), sampling for nutrient levels was undertaken in the Tahuya River. Water quality testing for nutrients in the surface water drainages discharging into lower Hood Canal was conducted in 2004 (Franz et al., 2006). This testing included Tahuya River, Mission Creek and Union River among other surface water drainages. Base-flow samples were also collected. Concentrations of nutrients at all sites were low.

7.4.3 Critical or Priority Habitat and Species

As the largest river on the Kitsap Peninsula, Tahuya River is mapped as supporting many priority salmonid species (WDFW, 2010; Table 7-6). Fish use and presence are described below by shoreline reach.

Table 7-6. Priority fish species documented for Tahuya River (Reaches 1, 2, 3, 4)

Common Name	Scientific Name	Habitat Use	Federal Listing	State Listing
Coastal cutthroat trout	*Oncorhynchus clarki clarki*	Migration/Spawning/rearing	~	~
fall Chinook salmon (Reaches 1 and 2 only)	*Oncorhynchus tshawytscha*	Migration/Spawning/Rearing	Threatened	Candidate
fall Chum salmon	*Oncorhynchus keta*	Migration/Spawning (Reach 1 only)	~	~
summer Chum salmon (Reaches 1 and 2 only)	*Oncorhynchus keta*	Migration/Spawning	Threatened	Candidate
Coho salmon	*Oncorhynchus kisutch*	Migration/Spawning/Rearing	Concern	~
Rainbow trout	*Oncorhynchus mykiss*	Migration/Spawning/Rearing	~	~
winter Steelhead	*Oncorhynchus mykiss*	Migration/Spawning/Rearing	Threatened	~

Summer chum were documented in Tahuya River, but the stock is now considered extinct by Washington Department of Fish and Wildlife (2003). The Tahuya River is one of the main production areas for fall chum and the stock is considered healthy (Washington Department of Fish and Wildlife 2003. The river supports a small number of spawning fall Chinook salmon, but the number was below the escapement goal for the stream in 2003. The stock status of winter steelhead was considered depressed in 2002 (Washington Department of Fish and Wildlife, 2003).

Critical habitat has been designated for the Hood Canal ESU summer-run chum salmon within the lower reach of the Tahuya River downstream to the confluence with Hood Canal (USFWS, 2005; Table 7-7).

Table 7-7. Critical Habitat documented for Tahuya River

Stream	Reach	Species Common Name	Scientific Name
Tahuya River	01	chum salmon	*Oncorhynchus keta*
Tahuya River	02	chum salmon	*Oncorhynchus keta*

The total area of wetland within the four reaches of the Tahuya River, located in the Mason County shoreline jurisdiction of the stream, is 217.1 acres (NWI, 1989). This represents 17.5 percent of the total reach area.

No priority wildlife species occurrences have been mapped in the vicinity of the river (WDFW, 2010). The WDNR NHP has identified shore pine-Douglas fir/salal as a priority vegetation community within the Tahuya River, Reach 4, shoreline planning area (WDNR, 2009).

7.4.4 Land Use

Land uses along Tahuya River are a mix of forestry, vacant and residential lands. There is limited agriculture in Reach 1. The Tahuya River meanders in and out of the Tahuya State Forest, with Reaches 02 and 03 mainly located within the DNR Tahuya State Forest.

There are three sites that provide public access to Tahuya River: 1) fishing access on WDFW land, 2) Tahuya River Horse Camp, and 3) Camp Spillman. Tahuya River Horse Camp and Camp Spillman are part of the Tahuya State Forest and managed by DNR.

Tahuya River Horse Camp has 10 campsites and 1,200 feet of water access. The total size of the campsite is 12 acres. Each year, two or three horseback riding and mountain bike riding events are organized out of this facility. The campsite has a horse ramp, hitching post, and large corral that can hold multiple horses. The Hood Canal Salmon Enhancement Group assisted WDNR with bank stabilization to diminish the effects of river migration at this site (Mason County Department of Parks and Trails, 2006; WDNR, 2008).

Camp Spillman has 10 campsites and provides 800 feet of water access. The total size of the campsite is 10 acres. The campground has an amphitheater and a covered picnic area. The site is used mostly by people with recreational vehicles (RVs) who ride the trails with their ORVs (Mason County Department of Parks and Trails, 2006; WDNR, 2008).

7.4.5 Land Cover

Land cover is mainly forested and forest resource lands, including forested floodplain. See reach sheet for land cover areas.

7.4.6 Summary of Key Management Issues

PLACEHOLDER

7.4.7 Reach Analysis

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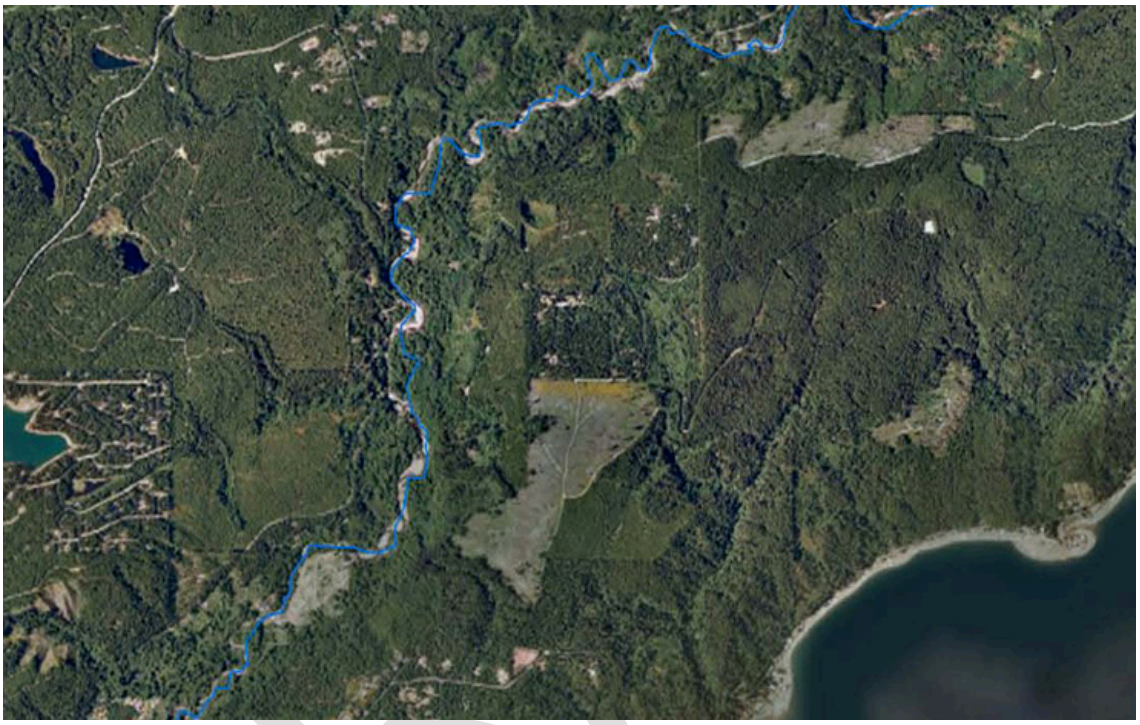
TAHUYA RIVER - REACH 01

SHORELINE LENGTH
7.8 MI

REACH AREA
677.3 AC



PHYSICAL AND ECOLOGICAL FEATURES

HYDROLOGY (MAPS 4 AND 10)
Floodplain - 75% (510 acres) of the reach, excluding open water, is mapped as FEMA 1% annual chance floodplain

HAZARD AREAS (MAP 12)
4.9% erosion, 5.3% landslide

LAND COVER (MAP 15)
2% developed, 2% agriculture, 26% forest, 12% wetland, 58% floodplain/forest (GAP, 2009).

Riparian vegetation: 52% forest cover, 14% non-forest, 28% other natural vegetation, 7% water (PNPTC, 2011)

HABITATS AND SPECIES (MAP 8)
Coastal cutthroat trout, fall Chinook salmon, fall chum salmon, summer chum salmon, coho salmon, rainbow trout, winter steelhead. Critical habitat for summer-run chum salmon.

Wetlands – 179.7 acres (26.5% of reach); wetland habitat types include palustrine emergent, palustrine forested, palustrine scrub-shrub.

WATER QUALITY (MAP 13)
One Category 2 listing for pH, which indicates some evidence of water quality problems. No 303(d) listings for water quality impairment within Reach 1.

BUILT ENVIRONMENT AND LAND USE

EXISTING LAND USES AND OWNERSHIP (MAP 18)

Land Use – Vacant (39%), Forestry (33%), Residential (15%), and Agriculture (13%). Ownership - Private (99%) and Public (1%).

WDNR Tahuya State Forest Lands – 5 acres.

SHORELINE MODIFICATIONS (MAP 16)

No shoreline modifications are mapped in the reach.

ZONING AND COMPREHENSIVE PLAN DESIGNATIONS (MAP 21)

Zoning districts – Rural Residential 5 Acres (69%), Rural Residential 20 Acres (19%), and Agriculture Resource Lands (12%). Comprehensive Plan Designations - Rural (88%) and Agriculture Resource Lands (12%).

Existing SED – 100% Urban Residential.

PUBLIC ACCESS (MAP 14)

There is WDFW fishing access along 4,400 feet of undeveloped waterfront. Limited parking available. Total park size is 3 acres (Washington Department of Fish and Wildlife WDFW Lands, 2011; Mason County Department of Parks and Trails, 2006).

IMPERVIOUS SURFACES (MAP 16)

3.0% of the reach is mapped as containing impervious surfaces (NOAA CCAP 2006). Aerial photos from 2009 show rural residential development and a horse farm in this reach.

AREAS OF SPECIAL INTEREST

No Ecology listed facilities or contaminated sites.

CULTURAL AND ARCHAEOLOGICAL RESOURCES

There are no listed cultural resources or state or federally listed historic properties. Resource mapping suggests there is a low to moderate to very high probability of finding unknown artifacts within this reach.

OPPORTUNITY AREAS (MAP 23)

Protect existing forested riparian zone.

Restore degraded riparian zones.

KEY MANAGEMENT ISSUES

Culverts on tributaries blocking fish passage.

Protection of existing forested riparian zones.

Prevent further degradation of water quality.

TAHUYA RIVER - REACH 02

SHORELINE LENGTH:
3.8 MI

REACH AREA:
246.8 AC

PHYSICAL AND ECOLOGICAL FEATURES

HYDROLOGY (MAPS 4 AND 10)
Floodplain - 47% (115 acres) of the reach, excluding open water, is mapped as FEMA 1% annual chance floodplain

HAZARD AREAS (MAP 12)
8.1% erosion, 15.5% landslide

LAND COVER (MAP 15)
1% developed, 61% forest, 4% wetland, 34% floodplain/forest (GAP, 2009).

Riparian vegetation: 68% forest cover, 4% non-forest, 21% other natural vegetation, 7% water (PNPTC, 2011)

HABITATS AND SPECIES (MAP 8)
Coastal cutthroat trout, fall Chinook salmon, fall chum salmon, summer chum salmon, coho salmon, rainbow trout, winter steelhead. Critical habitat for summer-run chum salmon.

10.6 acres of palustrine scrub-shrub wetland (4.3% of reach).

WATER QUALITY (MAP 13)
No 303(d) listings for water quality impairment within Reach 2.

BUILT ENVIRONMENT AND LAND USE

EXISTING LAND USES AND OWNERSHIP (MAP 18):

Land Use –Forestry (66%), Vacant (18%), and Residential (16%). Ownership - Public (63%) and Private (37%).

WDNR Tahuya State Forest Lands – 156 acres.

SHORELINE MODIFICATIONS (MAP 16)

A road crossing exists in the southern portion of the reach at NE Belfair Tahuya Rd.

ZONING AND COMPREHENSIVE PLAN DESIGNATIONS (MAP 21):

Zoning districts – Long Term Commercial Forest (63%), Inholding Lands (34%), and Rural Residential 5 Acres (3%). Comprehensive Plan Designations - Long Term Commercial Forest (63%), Inholding Lands (34%), and Rural (3%).

Existing SED – Conservancy (95%) and Urban Residential (5%).

PUBLIC ACCESS (MAP 14)

Washington State DNR manages Tahuya River Horse Camp. Tahuya River Horse Camp has 10 campsites available. It also provides 1,200 feet of water access on 12 acre site (Mason County Department of Parks and Trails, 2006; WDNR, 2008). About 30 feet of WDNR trails are mapped in the northeast portion of the reach.

IMPERVIOUS SURFACES (MAP 16

1.6% of the reach is mapped as containing impervious surfaces (NOAA CCAP 2006). Aerial photos from 2009 show scattered rural residential development throughout the reach.

AREAS OF SPECIAL INTEREST

No Ecology listed facilities or contaminated sites.

CULTURAL AND ARCHAEOLOGICAL RESOURCES

There are no listed cultural resources or state or federally listed historic properties. Resource mapping suggests there is a low to moderate probability of finding unknown artifacts within this reach.

OPPORTUNITY AREAS (MAP 23)

Protect existing forested riparian zone.

Restore degraded riparian zones.

KEY MANAGEMENT ISSUES

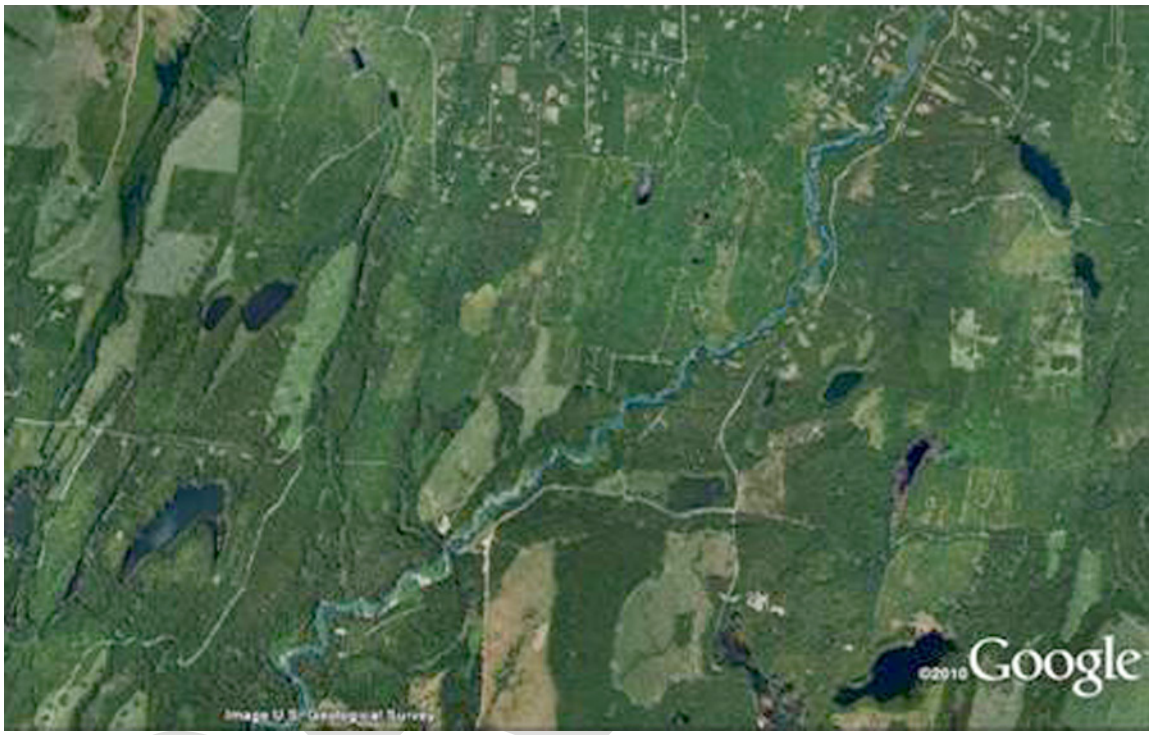
Protection of existing forested riparian area.

Protection of current good water quality.

TAHUYA RIVER - REACH 03

SHORELINE LENGTH
3.2 MI

REACH AREA
185.7 AC



PHYSICAL AND ECOLOGICAL FEATURES

HYDROLOGY (MAPS 4 AND 10)
Floodplain - 55% (102 acres) of the reach, excluding open water, is mapped as FEMA 1% annual chance floodplain

HAZARD AREAS (MAP 12)
1.2% erosion, 2.8% landslide

LAND COVER (MAP 15)
78% forest, 2% wetland, 21% floodplain/forest (GAP, 2009).

Riparian vegetation: 66% forest cover, 3% non-forest, 30% other natural vegetation (PNPTC, 2011)

HABITATS AND SPECIES (MAP 8)
Coastal cutthroat trout, fall chum salmon, coho salmon, rainbow trout, winter steelhead.

Wetlands –12.4 acres (6.7% of reach); wetland habitat types include palustrine emergent and palustrine scrub-shrub.

WATER QUALITY (MAP 13)
No 303(d) listings for water quality impairment within Reach 3.

BUILT ENVIRONMENT AND LAND USE

EXISTING LAND USES AND OWNERSHIP (MAP 18)

Land Use – Forestry (88%) and Residential (12%). Ownership - Public (72%) and Private (28%).

WDNR Tahuya State Forest Lands – 133 acres.

SHORELINE MODIFICATIONS (MAP 16)

No shoreline modifications are mapped in the reach.

ZONING AND COMPREHENSIVE PLAN DESIGNATIONS (MAP 21)

Zoning districts - Long Term Commercial Forest (57%), Rural Residential 20 Acres (23%), and Rural Residential 5 Acres (20%). Comprehensive Plan Designations – Long Term Commercial Forest (57%) and Rural (43%).

Existing SED – 100% Urban Residential.

PUBLIC ACCESS (MAP 14)

Washington State DNR manages Camp Spillman, a 10 acre campsite. The campsite provides 800 feet of water access,10 campsites, an amphitheater, and a covered picnic area (Mason County Department of Parks and Trails, 2006; WDNR, 2008). Over 1,200 feet of WDNR trails are mapped in the central portion of the reach, crossing Tahuya River twice.

IMPERVIOUS SURFACES (MAP 16)

Less than 1% of the reach is mapped as containing impervious surfaces (NOAA CCAP, 2006). Aerial photos from 2009 show very limited rural residential development in this reach.

AREAS OF SPECIAL INTEREST

No Ecology listed facilities or contaminated sites.

CULTURAL AND ARCHAEOLOGICAL RESOURCES

There are no listed cultural resources or state or federally listed historic properties. Resource mapping suggests there is a low to moderate probability of finding unknown artifacts within this reach.

OPPORTUNITY AREAS (MAP 23)

Protect intact forested riparian areas.

Restore degraded riparian areas.

KEY MANAGEMENT ISSUES

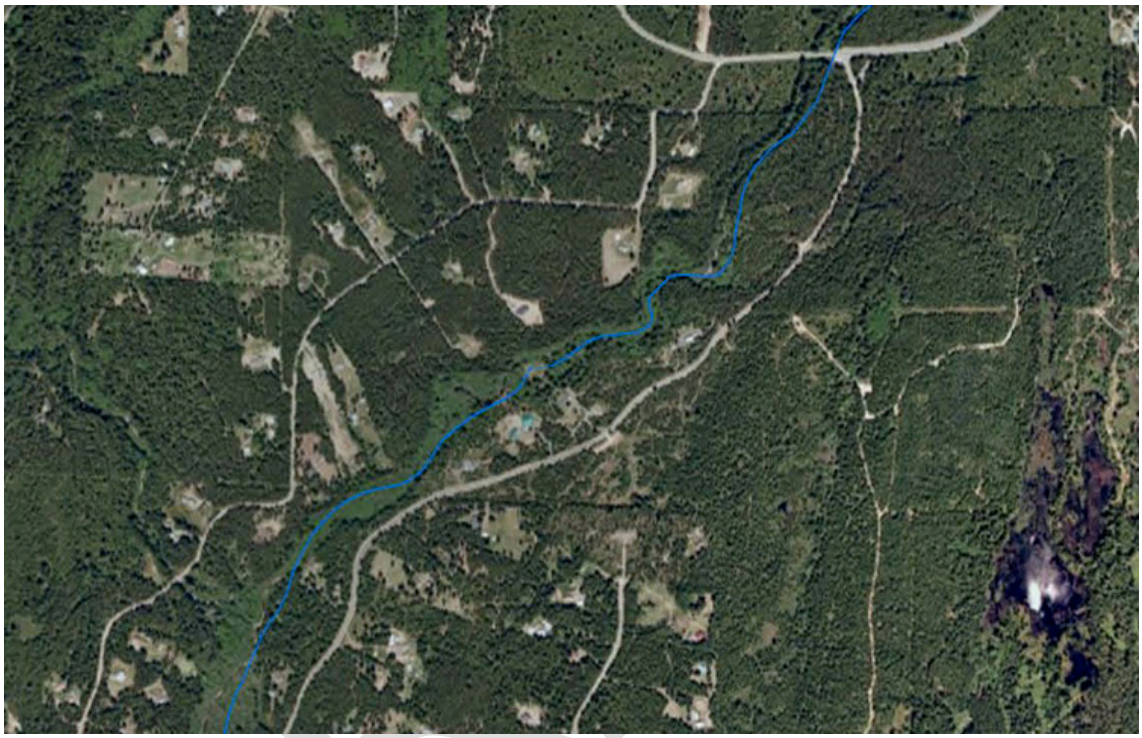
Protection of forested riparian areas.

Protection of current good water quality.

TAHUYA RIVER - REACH 04

SHORELINE LENGTH
2.3 MI

REACH AREA
129.2 AC



PHYSICAL AND ECOLOGICAL FEATURES

HYDROLOGY (MAPS 4 AND 10)
Floodplain - 50% (64 acres) of the reach, excluding open water, is mapped as FEMA 1% annual chance floodplain

HAZARD AREAS (MAP 12)
No mapped hazard areas.

LAND COVER (MAP 15)
71% forest ,1% wetland, 28% floodplain/forest (GAP, 2009)

Riparian vegetation: 61% forest cover, 8% non-forest, 31% other natural vegetation (PNPTC, 2011)

HABITATS AND SPECIES (MAP 8)
Coastal cutthroat trout, fall chum salmon, coho salmon, rainbow trout, winter steelhead. Shore pine-Douglas fir/salal.

14.4 acres of palustrine scrub-shrub wetland (11.1% of reach).

WATER QUALITY (MAP 13)
One 303(d) Category 5 listing for dissolved oxygen impairment and two Category 2 listings for fecal coliform bacteria and bioassessment, which indicates some evidence of water quality problems.

BUILT ENVIRONMENT AND LAND USE

EXISTING LAND USES AND OWNERSHIP (MAP 18)

Land Use –Residential (44%); Vacant (33%); Forestry (21%); and Parks, Open Space, and Recreation Areas (2%). Ownership – Private (77%) and Public (23%).

WDNR Tahuya State Forest Lands – 30 acres.

SHORELINE MODIFICATIONS (MAP 16)

According to aerial imagery (2009), NE Bear Creek Dewatto Road crosses the river in the northern part of the reach. No other shoreline modifications are mapped in the reach.

ZONING AND COMPREHENSIVE PLAN DESIGNATIONS (MAP 21)

Zoning districts – Rural Residential 5 Acres (56%), Rural Residential 20 Acres (44%). Comprehensive Plan Designations – 100% Rural.

Existing SED – 100% Urban Residential.

PUBLIC ACCESS (MAP 14)

There are no mapped public access facilities in the reach.

IMPERVIOUS SURFACES (MAP 16)

Less than 1% of the reach is mapped as containing impervious surfaces. Aerial photos from 2009 show limited rural residential development and roads in this reach.

AREAS OF SPECIAL INTEREST

No listed facilities or contaminated sites.

CULTURAL AND ARCHAEOLOGICAL RESOURCES

There are no listed cultural resources or state or federally listed historic properties. Resource mapping suggests there is a low to moderate to very high probability of finding unknown artifacts within this reach.

OPPORTUNITY AREAS (MAP 23)

Protect intact forested riparian areas.

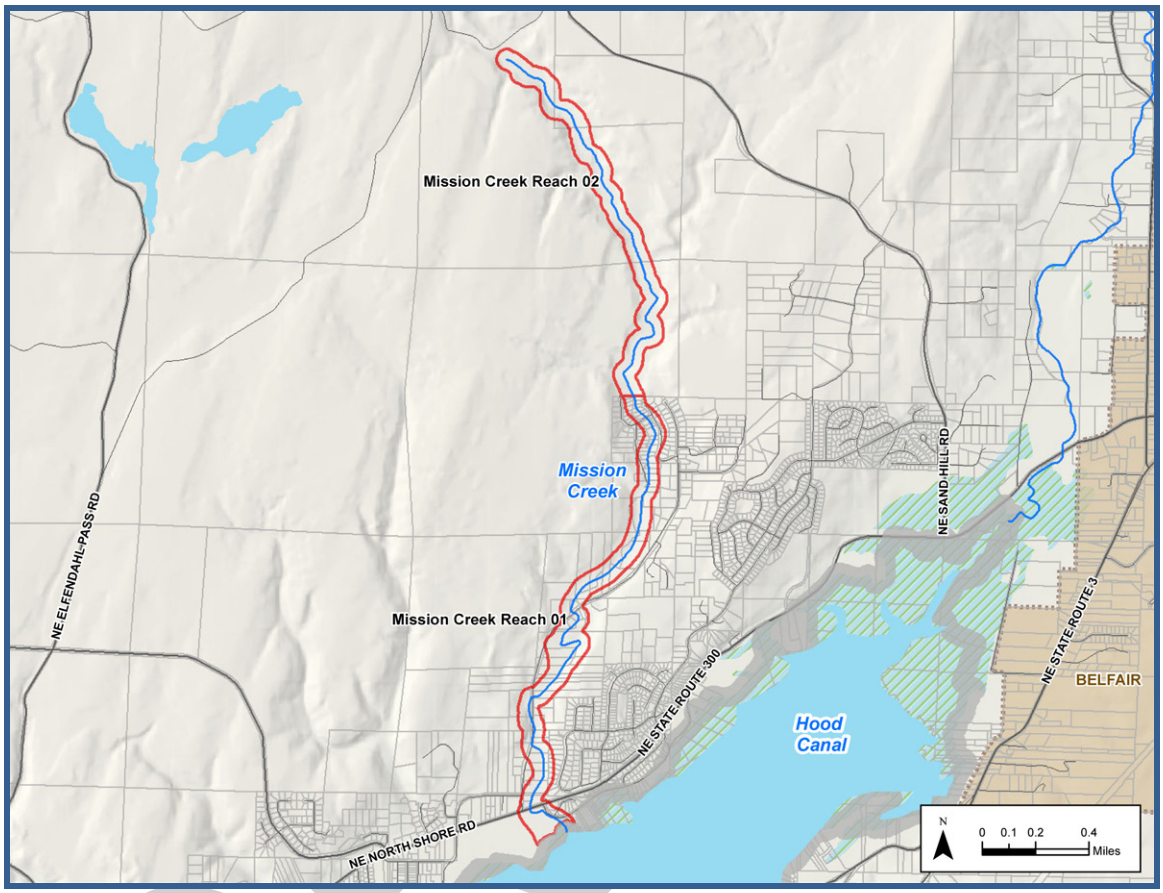
Restore degraded riparian areas.

KEY MANAGEMENT ISSUES

Protection of forested riparian areas.

Protection of current good water quality.

7.5 Mission Creek



7.5.1 Process and Channel Modifications

The mouth of Mission Creek is located approximately two miles west of the mouth of Union River and three miles west of the City of Belfair. The stream drains about 13.7 square miles of land and includes approximately 10 miles of mainstem and 10 miles of tributaries (Hood Canal Coordinating Council, 2005). The headwaters of the stream are located above Mission Lake and at a wetland located northwest of the lake; the channels join downstream of Mission Lake (Kuttel, 2003).

The upper portions of the drainage basin, including Mission Creek Reach 2, are dominated by industrial forests, while residential development and park land are located near the mouth. Several culverts located on Mission Creek and its tributaries have been repaired to allow fish passage (WDFW, 2011). Floodplain connectivity was rated as fair for the lower 0.5 mile of stream and good upstream of this location (May and Peterson, 2002).

The Mission Creek drainage basin has been extensively modified by humans. Some of the process modifications include:

- Logging adjacent to the stream;
- Land conversion from pervious to impervious surfaces;
- Culverts and other structures that change the flow patterns;
- Channelization and bank armoring; and
- Adjacent residential development.

7.5.2 Water Quality

Mission Creek is not included on the 303(d) list of impaired waters (Category 5) (Ecology, 2008). However, Mason County Public Works and the Hood Canal Salmon Enhancement Group have also been monitoring water quality since 2006. Mission Creek exceeded state water quality standards for fecal coliform during low flow months in the summer and fall (HCSEG and Mason County Public Works, 2009). Washington State Department of Health (WDOH) collects fecal coliform data in the marine waters of Hood Canal near the mouth of Big Mission Creek (station number 268). This potential shellfish growing area is classified as prohibited to shellfish harvest due to a history of poor water quality. While a direct link to failing septic systems has not been established, the fecal coliform issue in Mission Creek is directly related to the developed areas along the stream and may be related to domestic animals (HCSEG and Mason County Public Works, 2009).
Mission Creek drains directly into Lynch Cove, a waterbody that has experienced significant drops in dissolved oxygen, resulting in fish kills on several occasions.

Low dissolved oxygen levels are linked to high nutrient levels and high water temperatures.

7.5.3 Critical or Priority Habitat and Species

Mission Creek is divided into two reaches that are mapped as supporting many priority salmonid species (WDFW, 2010; Table 7-5).

Table 7-5. Priority fish species documented for Mission Creek (Reaches 1 and 2)

Common Name	Scientific Name	Habitat Use	Federal Listing	State Listing
Coastal cutthroat trout	*Oncorhynchus clarki clarki*	Migration/Spawning/Rearing	~	~
fall Chinook salmon (Reach 1 only)	*Oncorhynchus tshawytscha*	Migration/Spawning/Rearing	Threatened	Candidate
fall Chum salmon	*Oncorhynchus keta*	Rearing (Reach 2 only) and Migration/Spawning	~	~
Coho salmon	*Oncorhynchus kisutch*	Migration/Spawning/Rearing	Concern	~
Rainbow trout	*Oncorhynchus mykiss*	Migration/Spawning/Rearing	~	~
winter Steelhead	*Oncorhynchus mykiss*	Migration/Spawning/Rearing	Threatened	~

Less than 1 percent of the reach within the Mason County shoreline jurisdiction of the stream is mapped as wetland; it is located at the mouth of the stream (NWI, 1989). Priority waterfowl concentrations are mapped in the vicinity of the stream (WDFW, 2010). The WDNR NHP has not identified priority plant species or vegetation communities within the Mission Creek shoreline planning area (WDNR, 2009).

7.5.4 Land Use

See reach sheet for land use information.

7.5.5 Land Cover

See reach sheet for land cover information.

7.5.6 Summary of Key Management Issues

PLACEHOLDER

7.5.7 Reach Analysis

MISSION CREEK - REACH 01

SHORELINE LENGTH
2.1 MI

REACH AREA
105.4 AC

PHYSICAL AND ECOLOGICAL FEATURES

HYDROLOGY (MAPS 4 AND 10)
Floodplain - 31% (33 acres) of the reach, excluding open water, is mapped as FEMA 1% annual chance floodplain

HAZARD AREAS (MAP 12)
19.9% landslide

LAND COVER (MAP 15)
8% developed, 57% forest, 2% wetland, 28% floodplain/riparian (GAP, 2009).

Riparian vegetation: 51% forest cover, 30% non-forest, 1% off-shore, 18% other natural vegetation (PNPTC, 2011)

HABITATS AND SPECIES (MAP 8)
Coastal cutthroat trout, fall Chinook salmon, fall chum salmon, coho salmon, winter steelhead. Waterfowl concentrations.

0.6 acres of estuarine intertidal aquatic bed wetland (0.6% of reach).

WATER QUALITY (MAP 13)
No 303(d) listings for water quality impairment within Reach 1. However, there are documented issues with fecal coliform especially during summer low flow and in the fall of each year.

BUILT ENVIRONMENT AND LAND USE

EXISTING LAND USES AND OWNERSHIP (MAP 18)

Land Use - Residential (66%); Vacant (22%); remaining 12% is a mix of Parks Open Space, and Recreation Areas; Commercial; and Transportation. Ownership - Private (89%) and Public (11%).

SHORELINE MODIFICATIONS (MAP 16)

A road crossing exists in the southwestern portion of the reach at SR 300.

ZONING AND COMPREHENSIVE PLAN DESIGNATIONS (MAP 21)

Zoning districts – Rural Residential 5 Acres (77%), Rural Residential 10 Acres (20%), and Industrial (3%). Comprehensive Plan Designations – 100% Rural.

Existing SED – 100% Urban Conservancy.

PUBLIC ACCESS (MAP 14)

Washington State Parks manages Belfair State Park, providing trail access and about 3,800 feet of nearby tidelands access. The total park size is over 63 acres (Mason County Department of Parks and Trails, 2006).

IMPERVIOUS SURFACES (MAP 16)

16.3% of the reach is mapped as containing impervious surfaces, mostly low intensity development (NOAA CCAP, 2006). Aerial photos from 2009 show single-family residences and roads scattered throughout most of the reach.

AREAS OF SPECIAL INTEREST

No Ecology listed facilities or contaminated sites.

CULTURAL AND ARCHAEOLOGICAL RESOURCES

There are no listed cultural resources or state or federally listed historic properties. Resource mapping suggests there is a moderate to high probability of finding unknown artifacts within this reach.

OPPORTUNITY AREAS (MAP 23)

Protect existing forested riparian zones.

Restore riparian vegetation where degraded.

KEY MANAGEMENT ISSUES

Protection of forested riparian zones.

Prevent further degradation of water quality.

MISSION CREEK - REACH 02

SHORELINE LENGTH	REACH AREA
1.6 MI	79.6 AC

PHYSICAL AND ECOLOGICAL FEATURES

HYDROLOGY (MAPS 4 AND 10)

Floodplain - There is no mapped FEMA 1% annual chance floodplain for the reach

HAZARD AREAS (MAP 12)

36.4% landslide

LAND COVER (MAP 15)

77% forest, 11% wetland, 11% floodplain/riparian (GAP, 2009).

Riparian vegetation: 82% forest cover, 18% other natural vegetation (PNPTC, 2011)

HABITATS AND SPECIES (MAP 8)

Coastal cutthroat trout, fall chum salmon, coho salmon, rainbow trout, winter steelhead. Waterfowl concentrations.

No mapped wetlands.

WATER QUALITY (MAP 13):

No 303(d) listings for water quality impairment within Reach 2.

BUILT ENVIRONMENT AND LAND USE

EXISTING LAND USES AND OWNERSHIP (MAP 18)

Land Use – 100% Forestry. Ownership – 100% Public.

SHORELINE MODIFICATIONS (MAP 16)

No shoreline modifications are mapped in the reach.

ZONING AND COMPREHENSIVE PLAN DESIGNATIONS (MAP 21)

Zoning districts – 100% Long Term Commercial Forest. Comprehensive Plan Designations - 100% Long Term Commercial Forest.

Existing SED – 100% Conservancy.

PUBLIC ACCESS (MAP 14)

Washington State DNR manages Mission Creek Trailhead which has a 1 acre staging area for trail access (Mason County Department of Parks and Trails, 2006).

IMPERVIOUS SURFACES (MAP 16)

No impervious surfaces are mapped in this reach (NOAA CCAP, 2006). Aerial photos from 2009 show the reach to be undeveloped.

AREAS OF SPECIAL INTEREST

No listed facilities or contaminated sites.

CULTURAL AND ARCHAEOLOGICAL RESOURCES

There are no listed cultural resources or state or federally listed historic properties. Resource mapping suggests there is a low to moderate probability of finding unknown artifacts within this reach.

OPPORTUNITY AREAS (MAP 23)

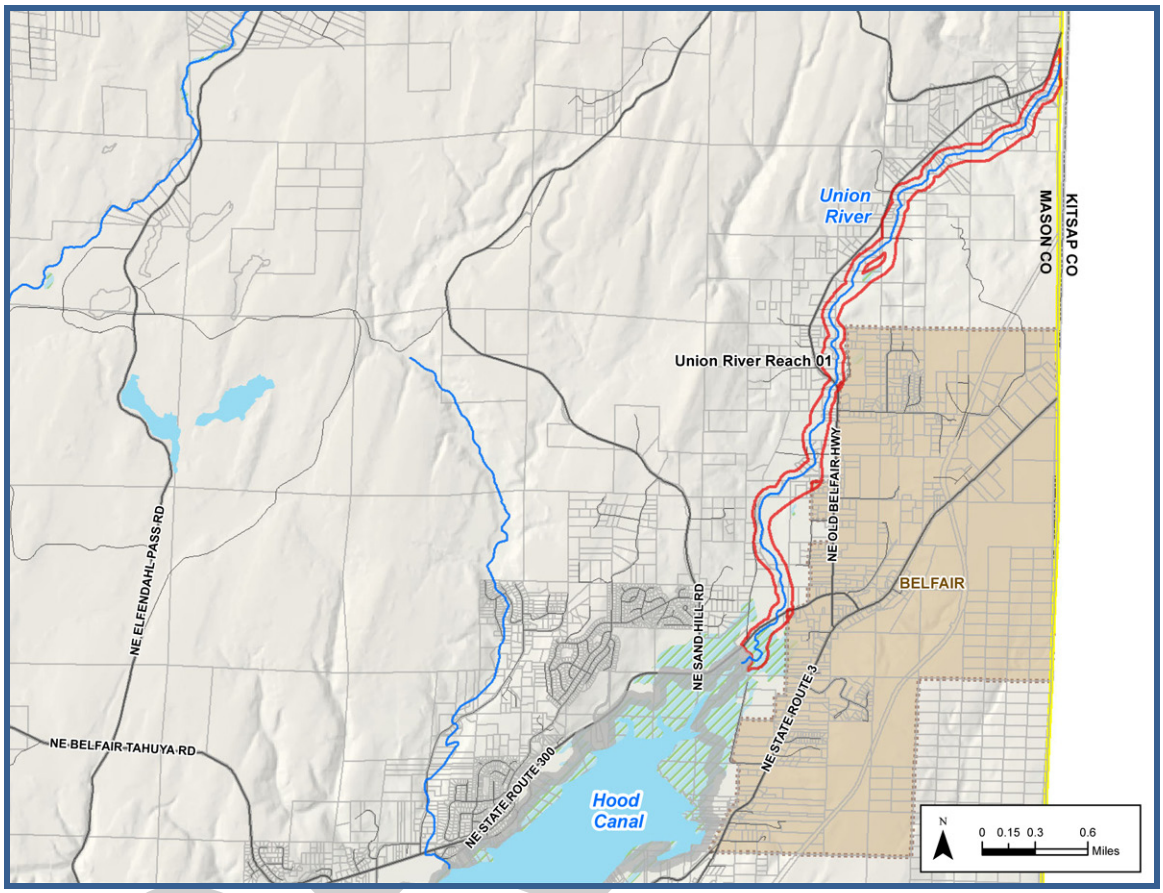
Protect existing forested riparian zones.

KEY MANAGEMENT ISSUES

Protection of forested riparian zones.

Prevent further degradation of water quality.

7.6 Union River



7.6.1 Process and Channel Modifications

The Union River drains approximately 24 square miles of land via 10 miles of mainstem and 30 miles of tributaries (Ames et al., 2000). The mouth of the stream drains to Hood Canal at Lynch Cove, which is located about 0.5 miles west of the City of Belfair. The river originates upstream of Union River Reservoir, which was completed in 1957 and supplies water to the City of Bremerton and the Puget Sound Shipyard (Kuttel, 2003). The stream flows through Kitsap and Mason Counties.

The upper drainage basin is modified by industrial forestry and water diversion/storage, while the lower basin is used for residential development, small farms, and some forestry (Kuttel, 2003). Several tributaries have culverts that act as complete fish barriers (WDFW, 2009). Floodplain connectivity was rated as fair on the lower mile of Union River and good upstream of this location (May and Peterson, 2002).

The Union River drainage basin has been historically modified. Some of the process modifications include:

- Logging practices;
- Water diversion/storage use;
- Adjacent residential development;
- Adjacent agriculture;
- Culverts;
- Channelization and bank armoring; and
- Conversion of forest lands to impervious surfaces.

7.6.2 Water Quality

Two monitoring stations on Union River have recorded low dissolved oxygen concentrations that do not meet Washington State water quality standards. The stream is listed on the 303(d) list of impaired waters (Category 5 water) for dissolved oxygen (Ecology, 2008). Category 5 waters require the preparation of a TMDL to address water quality concerns for that parameter.

A TMDL is already in place for the Union River, which addresses water quality impairment due to fecal coliform bacteria. Ecology has conducted a water quality implementation plan and water quality effectiveness monitoring study for the fecal coliform bacteria TMDL in Union River and its tributaries. Fecal coliform bacteria concentrations have not shown significant improvement at target locations since the

TMDL study (Ecology, 2010). Union River drains directly into Lynch Cove, a waterbody that has had significant issues with low dissolved oxygen. Low dissolved oxygen levels are linked to high nutrient levels and high water temperatures.

The Union River also contains several Category 2 listings for pH; however, these reaches lie outside of Mason County and within Kitsap County (Ecology, 2008).

7.6.3 Critical or Priority Habitat and Species

Union River is mapped as supporting many priority salmonid species (WDFW, 2010; Table 7-8).

Table 7-8. Priority fish species documented for Union River

Common Name	Scientific Name	Habitat Use	Federal Listing	State Listing
Coastal cutthroat trout	*Oncorhynchus clarki clarki*	Migration/Spawning/Rearing	~	~
fall Chinook salmon	*Oncorhynchus tshawytscha*	Migration/Spawning/Rearing	Threatened	Candidate
fall Chum salmon	*Oncorhynchus keta*	Migration/Spawning	~	~
summer Chum salmon	*Oncorhynchus keta*	Migration/Spawning	Threatened	Candidate
Pink salmon	*Oncorhynchus gorbuscha*	Migration/Spawning	~	~
Coho salmon	*Oncorhynchus kisutch*	Migration/Spawning/Rearing	Concern	~
Rainbow trout	*Oncorhynchus mykiss*	Migration/Spawning/Rearing	~	~
winter Steelhead	*Oncorhynchus mykiss*	Migration/Spawning/Rearing	Threatened	~

Union River supports the only healthy summer chum stock in west WRIA 15 and north WRIA 14 (Washington Department of Wildlife, 2003); however, fall Chinook escapement has not met the goal for the stream (Washington Department of Fish and Wildlife and Western Washington Treaty Indian Tribes, 1994). In addition, Union River is one of the main production streams of winter steelhead in the area

(Kuttel, 2003), but the stock status was characterized as depressed in 2002 (Washington Department of Wildlife, 2003).

Critical habitat has been designated for the Hood Canal ESU summer-run chum salmon on the Union River, within the lower reach of Union River downstream to the confluence with Hood Canal (USFWS, 2005; Table 7-9).

Table 7-9. Critical Habitat documented for Union River

Stream	Reach	Species Common Name	Scientific Name
Union River	01	chum salmon	*Oncorhynchus keta*

Wetland habitat covers 18.5 acres, or 6.5 percent of the reach, within the Mason County shoreline jurisdiction of the stream (NWI, 1989). Priority species occurrences and habitats have been mapped along the stream, including: bald eagle, bald eagle buffer, waterfowl concentrations, and Estuarine Zone (WDFW, 2010).

The WDNR NHP has not identified priority plant species or vegetation communities within the Union River shoreline planning area (WDNR, 2009).

7.6.4 Land Use

See reach sheet for land use information.

7.6.5 Land Cover

See reach sheet for land cover information.

7.6.6 Summary of Key Management Issues

See reach sheet for key management issues.

7.6.7 Reach Analysis

UNION RIVER

SHORELINE LENGTH
4.6 MI

REACH AREA
285.7 AC

PHYSICAL AND ECOLOGICAL FEATURES

HYDROLOGY (MAPS 4 AND 10)
Floodplain - 44% (126 acres) of the reach, excluding open water, is mapped as FEMA 1% annual chance floodplain

HAZARD AREAS (MAP 12)
3.8% erosion, 4.9% landslide

LAND COVER (MAP 15)
11% developed, 10% agriculture, 26% forest, 12% wetland, 41% floodplain/riparian (GAP, 2009).

Riparian vegetation: 49% forest cover, 34% non-forest, 16% other natural vegetation, 1% water (PNPTC, 2011)

HABITATS AND SPECIES (MAP 8)
Coastal cutthroat trout, fall Chinook salmon, fall chum salmon, summer chum salmon, pink salmon, coho salmon, rainbow trout, winter steelhead. Critical habitat for summer-run chum salmon. Bald eagle, bald eagle buffer, waterfowl concentrations, and estuarine zone.

Wetlands – 18.5 acres (6.5% of reach); wetland habitat types include palustrine emergent, palustrine forested, palustrine scrub-shrub.

WATER QUALITY (MAP 13)
303(d) listed for the dissolved oxygen parameter and a TMDL is in place to address fecal coliform bacteria.

BUILT ENVIRONMENT AND LAND USE

EXISTING LAND USES AND OWNERSHIP (MAP 18)

Land Use – Residential (45%), Forestry (18%), Vacant (17%), Agriculture (17%), and remaining 3% a mix of Industrial, Parks, Open Space, and Recreational Areas. Ownership – Private (98%) and Public (2%).

SHORELINE MODIFICATIONS (MAP 16)

There is one mapped road crossing located in the southern portion of the reach at SR 300. According to aerial imagery (2009) there appear to be multiple road crossings associated with residential development throughout the reach.

ZONING AND COMPREHENSIVE PLAN DESIGNATIONS (MAP 21)

Zoning districts – Rural Residential 5 Acres (55%), Rural Residential 20 Acres (26%), Agricultural Resource Lands (11%), and Rural Residential 10 Acres (10%). Comprehensive Plan Designations – Rural (89%) and Agricultural Resource Lands (11%).

Existing SED – 100% Rural.

PUBLIC ACCESS (MAP 14)

WDFW manages over 8,000 feet of riverfront fishing access along Union River. There is limited parking available (Mason County Department of Parks and Trails, 2006; WDFW Lands, 2011).

IMPERVIOUS SURFACES (MAP 16)

21.4% of the reach is mapped as containing impervious surfaces, most of which is low intensity development or developed open space (NOAA CCAP, 2006). Aerial photos from 2009 show single-family residences, roads, agricultural, and commercial uses throughout the reach.

AREAS OF SPECIAL INTEREST

The Ecology-listed facilities and sites include a Leaking Underground Storage Tank.

CULTURAL AND ARCHAEOLOGICAL RESOURCES

The DAHP database lists two inventoried early historic sites and one inventoried pre-contact village within this reach. Resource mapping suggests there is a moderate-low probability of finding unknown artifacts within this reach, with a smaller portion of the reach in moderate to moderate-high zones.

OPPORTUNITY AREAS (MAP 23)

Protect existing forested riparian areas.

KEY MANAGEMENT ISSUES

Protection of forested riparian zones.

Prevent further degradation of water quality.

7.7 Data Gaps

The following data gaps have been identified for the WRIA 15 Freshwater Shorelines:

- Current information regarding in-stream habitats is lacking;
- Wetland data is lacking; there is no countywide wetland inventory;
- Modifications have not been consistently quantified including numbers of docks, bulkheads, dams, etc;
- Current condition of riparian zone is lacking.