Asotin Creek – Reach 1	**Asotin County**

Reach Description: Reach 1 of Asotin Creek runs from the NE ¼ of T9N_R43E_S35 to the mouth on the Snake River

Shoreline Jurisdiction: 802 acres, 14.7 miles

Source: Google maps

Subreaches (SR); see Maps A-1 and A-2

SR 1a: Begins at the northeast corner of the Asotin Wildlife Area and ends at the SW ¼ T10N_R44E_S35; 108 acres, 2.0 miles

SR 1b: Begins at the SW ¼ T10N_R44E_S35 and ends at Headgate County Park; 218 acres, 4.2 miles

SR 1c: Begins at Headgate County Park and ends at the SE ¼ of T10N_R45E_S22; 157 acres, 3.1 miles

SR 1d: Begins at the SE ¼ of T10N_R45E_S22 and ends at the NW ¼ of T10N_R46E_S20; 250 acres, 4.3 miles

SR 1e: Begins at the NW ¼ of T10N_R46E_S20 and ends at the mouth of the Snake River; 68 acres, 1.1 miles

CHARACTERISTICS

Ownership:

Reach 1 is predominantly privately owned, with the exception of the Washington Department of Fish & Wildlife (WDFW)-owned Asotin Wildlife Area (SR 1a) and the County-owned Headgate County Park (SR 1b and 1c).

Asotin Creek – Reach 1 Asotin County
Land Use/Current Shoreline Master Program (SMP): Current land use designation: • Specific land uses have not been designated. The reach land uses include agricultural, residential, parks, and wildlife area. Current zoning designation: • SR 1a and 1b are zoned Agricultural. • SR 1c and 1d are zoned Rural Residential Recreation. • SR 1e is zoned Rural Residential. Current SMP environmental designation: • SR 1a – 1d are designated Rural. • SR 1e is designated Urban.
Existing Land Cover/Development: The first half of Reach 1 of Asotin Creek (SR 1a and 1b) has a small number of residences and the remainder is open space. A paved road runs along the shoreline through the entirety of Reach 1. The second half of Reach 1 (SR 1c – 1e) is more densely populated with residences and small agriculture. Reach 1 ends at the Town of Asotin, which is densely populated.
Geomorphic Character: **Description:** Asotin Creek flows within a bedrock valley that consists mostly of Grande Ronde and Wanapum Basalts and channel and valley bottom that consists mostly of alluvium. The overall valley width narrows upstream where the stream flows within a confined, bedrock valley at its upstream extent. Outburst flood deposits also occur at the valley margins along the lower reaches of the stream. Infrastructure features are present (i.e., roads and bridges) that may limit the overall channel migration potential throughout the lower reaches. **Channel Migration Zone Characterization:** Throughout lower subreaches of Asotin Creek, the potential for channel migration exists. The stream occupies a wide valley and floodplain mostly comprising alluvium throughout the channel and floodplain. Infrastructure (i.e., roadways and structures) are present throughout the lower valley that may hinder the rate and occurrence of migration. **Hardened Banks:** Artificial hardened banks may be present in the lower reaches of the stream upstream of the City of Asotin.
Flooding and Geological Hazards: **Flooding:** Federal Emergency Management Agency (FEMA) floodplains are established in the entire reach, and floodways are delineated in SR 1d and SR 1e. The floodway is relatively narrow compared to the width of the floodplain. Floodplains are relatively wide in SR 1d and 1e and much narrower in SR 1c. **Geological Hazards:** Severely erodible soils can be found in Reach 1. The majority of Reach 1 has moderate

Asotin Creek – Reach 1	Asotin County

to high liquefaction susceptibility, excluding SR 1c where only a few areas are susceptible to liquefaction. Landslide hazards exist throughout the reach where slopes are steeper than 15% over underlying alluvial deposits and Columbia River Basalts.

Existing Public Access:

SR 1a:

- Asotin Road runs the length of this subreach.
- The area is rugged, with limited access other than the road.
- Lick Fork Road intersects with Asotin Road in this subreach. There is a parking area and water access at this intersection.

SR 1b:

- Asotin Road runs the length of this subreach.
- South Fork Road enters the drainage area and intersects with Asotin Road.
- WDFW manages the Blankenship unit along this subreach. The site is a parking area for access to the river. There are no improvements other than parking at this site.

SR 1c:

- Headgate County Park is located within this subreach. There are public parking, restrooms, and water access at this site.
- Asotin Road runs the length of this subreach.
- There are several informal river access points along Asotin Road.

SR 1d:

- Asotin Road runs the length of this subreach.
- Most of the land along this subreach is private, with limited public access.

- George Creek Road crosses Asotin Creek and intersects with Asotin Road.

Reach 1 of Asotin Creek is mostly privately owned, limiting public access. There is stream-side access within the boundaries of the Asotin Creek Wildlife Area (SR 1a), at Headgate County Park, and Blankenship Access (SR 1b and 1c).

Identified Public Access Improvements: None identified.

Public Access Opportunities: Public access opportunities are limited due to high banks and private ownership. WDFW is developing a wildlife management plan for Asotin Creek, which is under development at the time of this draft. The public visioning process may provide information on any additional access opportunities.

Asotin Creek – Reach 1	Asotin County
ECOLOGICAL CONDITIONS	

Water Quantity and Sediment:

A Washington State Department of Ecology (Ecology) gage (Gage No. 35D100) is located in SR 1d upstream of George Creek and has been active since 2005. An Ecology gage (Gage No. 35D080) was located in SR 1d downstream of George Creek, and was active in 2005 and 2006. Several U.S. Geological Service gages are located within this reach, including active Gage No. 13334450 in SR 1a, which has been active since 2001, Gage No. 13334500 in SR 1b, which was active from 1928 to 1959, and Gage No. 13334700 in SR 1d, which was active from 1959 to 1996. An additional active gage (Gage No. 13335050) is located downstream of the reach within the City of Asotin, which has been active since 1991.

At Gage No. 13334450, the average discharge for the period of record is 58 cubic feet per second (cfs), and its peak flow is 936 cfs.

Tributaries that increase water quantity within this reach include Charley Creek in SR 1a and George Creek in SR 1d.

Sediment runoff is likely high during extreme events due to little riparian cover in upland areas and relatively steep slopes. When entering the reach, sediment may accumulate due to riparian cover within the reach and a relatively low gradient.

Water Quality:

A total maximum daily load (TMDL) is required for temperature in SR 1a, 1c, and 1d. Water quality throughout the reach is likely impacted by a lack of riparian shade and agricultural use. In SR 1e, water quality may be impacted by residential and agricultural use.

Habitat Characteristics and Priority Habitat Species (PHS) Presence:

Asotin Creek in this reach has been identified to support elk, chukar, bighorn sheep, and mule deer. The creek may also support the species as identified in Table 28 of the Inventory, Analysis, and Characterization (IAC) Report. Asotin Creek supports Endangered Species Act (ESA)-listed steelhead, Chinook, and bull trout. WDFW has hypothesized that bull trout historically occurred in Asotin Creek in the winter and spring, before habitat was significantly modified (SRSRB 2011). The abundance and productivity of ESA-listed steelhead and spring/summer Chinook in the Asotin Creek mainstem is limited by the following habitat factors, including sediment load, channel stability, key habitat quantity, habitat diversity, and water flow. Temperature is believed to be a significant secondary factor in the upper reaches of the Asotin Creek mainstem (SRSRB 2011).

Riparian vegetation along Asotin Creek was impacted by high flows of the 1996 and 1997 flooding events, particularly in the upper reaches (SR 1a and 1b), with canopy cover reduced by half compared to pre-flood surveys (SRSRB 2011).

SR 1a: This subreach begins at the juncture of North Fork Asotin Creek and South Fork Asotin Creek, at the South Fork Road bridge. The creek in this subreach exhibits a meandering somewhat braided channel, which flows in the floodplain valley, confined on the west by Asotin Creek Road. The floodplain widens near

Asotin Creek – Reach 1	Asotin County

the confluence with Charley Creek, and there is land in agricultural development between the creek and Asotin Creek road along the remainder of the subreach. The riparian vegetation consists of taller deciduous trees along both banks. Vegetation on the slopes of the adjacent bluffs is consistent with shrubs and grasses of the Southeast (SE) Washington shrub-steppe community. The area around the mouth of Charley Creek forms a wetland habitat that is approximately 800 feet wide, and there are several other wetland areas alongside the creek within the shoreline boundary in the rest of this subreach.

SR 1b: The riparian vegetation and wetland areas described for SR 1a are consistent with the habitat in SR 1b. There is little development; it consists of two farms with agricultural lands adjacent to the creek. This subreach ends above the Headgate Dam.

SR 1c: This subreach includes the waters below the Headgate dam. The riparian vegetation described for SR 1a are consistent with the habitat in SR 1c, but this subreach lacks the wider floodplain and wetland habitat, as the creek in SR 1c follows tightly against the foot of the slope of the adjacent bluffs to the south, and is then constrained by Asotin Creek road on the opposite (north) shoreline. There is sparse agricultural development present within the floodplain of the creek on the northern banks, but not all of it is within the 200-foot shoreline boundary. In general, while Asotin Creek road does not appear to constrain development of riparian vegetation, the road separates the shrub-steppe uplands from the riparian corridor along the creek.

SR 1d: This subreach is characterized by more consistent development within the floodplain for residential and agricultural use. All of this development occurs on the north bank of the creek, between the creek and Asotin Creek road. There are several private crossings of the creek in this subreach. In the remaining undeveloped areas of the floodplain, where the creek channel meanders, the habitat includes wetland areas between the creek and the road, similar to those in SR 1a. Below George Creek, the Asotin Creek channel moves away from the side of the bluffs, and the riparian habitat is constrained to a narrow band on either bank due to adjacent agricultural practices or the footprint of Asotin Creek road before the creek shifts back against the bluff slope to the south.

SR 1e: This subreach begins just outside the city limits of Asotin. The creek channel moves to the middle of the floodplain. On sides, the riparian habitat and wetlands are impacted or constrained by agricultural and residential development, which become denser approaching Asotin city limits. Riparian vegetation is generally mid-sized deciduous trees, shrubs, and grasses, with agricultural lands or maintained landscaping outside of this narrow riparian zone.

Asotin Creek – Reach 1	**Asotin County**
ECOLOGICAL FUNCTIONS ANALYSIS	

Riparian areas of Reach 1 were determined to be partially functioning (SRSRB 2011).

Encroachment on the floodplain caused by the construction of dikes (historically), roads, single-family dwellings, and the infrastructure associated with the encroachment continues to threaten aquatic and riparian habitat along Asotin Creek. Fine sediments originating on steep valley slopes remain a concern and have potential to have continued impacts on salmon habitat. Much of the land within the Asotin Creek drainage has high potential for increasing fine sediment loads, so protection of existing aquatic and habitat conditions is an important aspect of controlling sedimentation.

Riparian restoration projects have been and are being completed in this reach; however, until floodplain and riparian cover matures and additional restoration actions are completed, the damaged stream banks, low habitat diversity, and disturbed habitat structures will continue to generate fine sediment and elevate stream temperatures.

Restoration Actions:

- Improve irrigation efficiencies, including conveyance and application methods, particularly SR 1a and 1b.
- Implement restoration projects that may include passive (e.g., Conservation Reserve Expanded Program riparian buffers, protected area conservation easements) or active (e.g., riparian plantings) efforts to reduce erosion and increase filtration.
- Implement aquatic habitat protection plans, including list of prioritized projects from the Asotin Creek Implementation Area of the Water Resource Inventory Area (WRIA) 35 Watershed Plan (Asotin PUD 2007), e.g., large woody debris (LWD) replenishment and riparian buffer replacement/enhancement.
- Aim to reduce riparian and water quality impacts from livestock through expanded use of best management practices (BMPs) (e.g., exclusionary fencing and rotational grazing) for livestock operations within shoreline jurisdiction, particularly in SR 1a and 1b.
- Aim to reduce water quality impacts through expanded or reconfigured connections to sewer systems near urban areas, particularly in SR 1d and 1e.
- Improve irrigation efficiencies, including conveyance and application methods, particularly in SR 1a and 1b.

SR 1a:

Level of Existing Function: Partially Functioning

Stressors:

- Asotin Creek road predominately outside of shoreline jurisdiction
- Upland grazing trails but very limited water access points
- Two rural residences and graze animal outbuildings

Upland development primarily affects aquatic habitat functions of forage and rearing through impacts to water quality via runoff. Upland development may also impact continuity of riparian habitats and riparian

Asotin Creek – Reach 1 Asotin County
functions such as migratory corridors. Livestock activity may cause reduced or disturbed shoreline vegetation or allow establishment of invasive species, impacting riparian functions such as erosion control, wildlife habitat, and migratory corridors. **Potential Restoration Opportunities:** In addition to the items identified above, implement shrub-steppe restoration projects consistent with WDFW manual, in areas adjacent to riparian zone. **Potential Protection Opportunities:** Protect remaining intact riparian buffers through implementation of agricultural BMPs and placing limits on development activities.
SR 1b: **Level of Existing Function:** Partially Functioning **Stressors:** • Asotin Creek road predominately outside of shoreline jurisdiction • Off-road vehicle route, including water crossing • One rural residences with fairly large graze animal infrastructure Runoff from upland roadway development degrades water quality, and this impacts forage and rearing aquatic habitat functions. Upland development may also impact continuity of riparian habitats and riparian functions, such as migratory corridors for terrestrial and water-dependent wildlife. Off-road vehicle and livestock activity may cause reduced or disturbed shoreline vegetation or allow establishment of invasive species, impacting riparian functions such as erosion control, wildlife habitat, and migratory corridors for aquatic species that use nearshore areas, as well as upland species. **Potential Restoration Opportunities:** In addition to the items identified above, implement shrub-steppe restoration projects, consistent with WDFW manual, in areas adjacent to riparian zone. **Potential Protection Opportunities:** Protect remaining intact riparian buffers through implementation of agricultural BMPs and placing limits on development activities.
SR 1c: **Level of Existing Function:** Partially Functioning **Stressors:** • Asotin Creek and Headgate Park Roads are located mostly inside shoreline jurisdiction; Asotin Creek Road constrains the creek to a greater degree than in earlier subreaches • Livestock grazing • Three rural residences mostly outside of jurisdiction with grazing animal infrastructure (inside jurisdiction) Runoff from upland development degrades water quality, and this impacts forage and rearing aquatic habitat functions. Upland development may also impact continuity of riparian habitats and functions, including interrupting migratory corridors. Livestock activity may cause reduced or disturbed shoreline vegetation or allow establishment of invasive species, impacting riparian functions such as erosion control,

Asotin Creek – Reach 1 Asotin County
wildlife habitat, and migratory corridors for aquatic species that use nearshore areas, as well as upland species. **Potential Restoration Opportunities:** Implement projects identified above. **Potential Protection Opportunities:** Protect remaining intact riparian buffers through implementation of agricultural BMPs and placing limits on development activities.
SR 1d: **Level of Existing Function:** Impaired **Stressors:** • Residential development • Asotin Creek Road inside shoreline jurisdiction • Expansive livestock operations with some pens located adjacent to shoreline • Grazing Runoff from upland development degrades water quality, this impacts forage and rearing aquatic habitat functions. Upland development may also impact continuity of riparian habitats and functions, including interrupting migratory corridors. Livestock activity may cause reduced or disturbed shoreline vegetation or allow establishment of invasive species, impacting riparian functions such as erosion control, wildlife habitat, and migratory corridors for nearshore aquatic and terrestrial species. A practice of locating livestock pens adjacent to the shoreline likely impacts water quality. **Potential Restoration Opportunities:** Implement actions identified above. Grass or woody planting strips between feed lot areas and river banks. Consider incorporating aquatic habitat complexity (substrate, organic material, structural elements [e.g., LWD], and aquatic and riparian vegetation). **Potential Protection Opportunities:** Protect remaining intact riparian buffers through implementation of agricultural BMPs and placing limits on development activities. Make stormwater controls for new development consistent with the Eastern Washington Stormwater Manual.
SR 1e: **Level of Existing Function:** Impaired **Stressors:** • Residential, commercial, and recreation development with irrigated landscaping • Asotin Creek Road inside shoreline jurisdiction Runoff from upland development degrades water quality, this impacts forage and rearing aquatic habitat functions. Upland development may also impact continuity of riparian habitats and functions, including interrupting migratory corridors for terrestrial species. **Potential Restoration Opportunities:** In addition to the restoration actions identified above, implement homeowner education and incentives to plant riparian buffer species and other native upland plants to

Asotin Creek – Reach 1	Asotin County
replace irrigated turf. **Potential Protection Opportunities:** Protect remaining intact riparian buffers through implementation of agricultural BMPs and placing limits on development activities. Make stormwater controls for new development consistent with the Eastern Washington Stormwater Manual.	

South Fork Asotin Creek	**Asotin County**

Reach Description: The South Fork Asotin Creek begins at SE ¼ of T9N_R44E_S27 and ends near the northeast corner of the Asotin Creek Wildlife Area.

Shoreline Jurisdiction: 188 acres, 3.7 miles

Source: Google maps

Subreaches (SR); see Map A-3

There are no subreaches in the South Fork Asotin Creek Reach.

CHARACTERISTICS

Ownership:

Asotin Wildlife Area is 100% WDFW-owned.

Land Use/Current SMP:

Current land use designation:

- Specific land uses have not been designated. Land use for the entire reach is a state wildlife area.

Current zoning designation:

- The entire reach is zoned Agricultural.

Current SMP environment designation:

- The entire reach is designated Rural.

South Fork Asotin Creek Asotin County
Existing Land Cover/Development: The South Fork Reach of Asotin Creek shoreline area entirely comprises the Asotin Wildlife Area; therefore, there is minimal development, and the reach consists almost entirely of open space. A gravel road runs along the shoreline the length of the reach.
Geomorphic Character: **Description:** The South Fork Asotin Creek is a single-thread channel that flows within a mostly confined bedrock valley that consists of Grande Ronde Basalt and channel and valley bottom that consists mostly of alluvium. The overall valley width narrows and steepens in the upstream direction. **Channel Migration Zone Characterization:** Channel migration is limited by the presence of bedrock throughout the channel and valley. **Hardened Banks:** No artificially hardened banks appear to exist along South Fork Asotin Creek.
Flooding and Geological Hazards: **Flooding:** FEMA floodplains are not delineated for South Fork Asotin Creek. **Geological Hazards:** Severely erodible soils can be found along the majority of South Fork Asotin Creek. The majority of the creek has moderate to high liquefaction susceptibility. Landslide hazards exist throughout South Fork Asotin Creek where slopes are steeper than 15% over underlying alluvial deposits and Columbia River Basalts.
Existing Public Access: • South Fork Road runs almost the entire length of this reach. • WDFW manages the Asotin Wildlife Area, which has informal steam-side access with parking areas. **Identified Public Access Improvements:** None identified. **Public Access Opportunities:** The rugged terrain minimizes public access opportunities. Asotin Creek is a critical watershed for steelhead, bull trout, and spring Chinook and is considered at high risk for habitat degradation due to stream modifications. WDFW is developing wildlife management plan for Asotin Creek, including the South Fork. There may be some opportunities to provide visual access along the roadway.
ECOLOGICAL CONDITIONS
Water Quantity and Sediment: South Fork Asotin Creek has a water level gage installed by the Snake River Salmon Recovery Board. Mean annual flows were estimated to be 22 cfs at the downstream end of this reach. Sediment most likely moves efficiently through South Fork Asotin Creek during extreme flow events due to relatively steep slopes. The South Fork Asotin Creek has a relatively low percentage of fine sediment.

South Fork Asotin Creek	Asotin County

Water Quality:

The South Fork Asotin Creek is listed by Ecology as requiring a TMDL for temperature at the lower end of the reach. Agricultural activities and lack of riparian cover may impact water quality in South Fork Asotin Creek.

Habitat Characteristics and PHS Presence:

South Fork Asotin Creek may support elk, mountain quail, and mule deer, as well as fish and wildlife species as identified in Table 28 of the IAC Report.

South Fork Asotin Creek supports ESA-listed steelhead, Chinook, and bull trout. WDFW has hypothesized that bull trout historically occurred in South Fork Asotin Creek in the winter and spring, before habitat was significantly modified (SRSRB 2011). The Asotin Creek spring/summer Chinook salmon and steelhead populations are similar in life history and habitat requirements. However, historically upper reaches of South Fork Asotin Creek or upper North Fork Asotin Creek did not likely produce spring Chinook salmon (SRSRB 2011).

The lower section of Asotin Creek South Fork was historically impacted by sediment load and key habitat quantity and secondarily by habitat diversity, channel stability, low flow, and excessive temperature. The upper South Fork Asotin Creek experienced similar impacts; however, temperature and sedimentation are no longer limiting factors.

This reach begins approximately at the Alder Gulch confluence and ends at the juncture of North Fork Asotin Creek, and the entire reach is constrained in a narrow valley. South Fork Road runs through this valley alongside the east bank of the creek for all but the first mile of the reach. Reduced stream channel complexity and floodplain function caused by channel straightening related to the development of South Fork Road, incision, and loss of historical riparian forests and associated LWD source, has reduced habitat diversity and key habitats for salmonids such as rearing and over-wintering habitat. There is minimal, visible development within this reach. The riparian vegetation consists primarily of taller deciduous trees, shrubs, and grasses, and the trees form a closed canopy over the creek for much of the reach.

ECOLOGICAL FUNCTIONS ANALYSIS

Riparian areas of South Fork Asotin Creek have been determined to be properly functioning but at risk (SRSRB 2011). The ability of the North and South Forks of Asotin Creek to support salmon and steelhead populations continues to be suppressed by reduced habitat diversity and elevated sediment load, which impacts availability of pool habitat. Fine sediments originating on steep valley slopes remain a concern and have potential to have continued impacts on salmon habitat.

Restoration Actions:

- Implement restoration projects that may include passive (e.g., Conservation Reserve Expanded Program riparian buffers or conservation easements) or active efforts to reduce erosion and increase filtration.
- Implement aquatic habitat protection plans, including list of prioritized projects from the Asotin Creek Implementation Area of the WRIA 35 Watershed Plan (Asotin PUD 2007), e.g., LWD

South Fork Asotin Creek	Asotin County

replenishment and riparian buffer replacement/enhancement.

- Reduce riparian and water quality impacts from livestock through expanded use of BMPs (e.g., exclusionary fencing and rotational grazing) for livestock operations within shoreline jurisdiction.

Level of Existing Function: Partially Functioning

Stressors:

- South Fork Road constrains the creek through much of this reach.

Runoff from upland development degrades water quality, which impacts forage and rearing aquatic habitat functions. Upland development may also impact continuity of riparian habitats and functions, including interrupting migratory corridors for nearshore aquatic and terrestrial species.

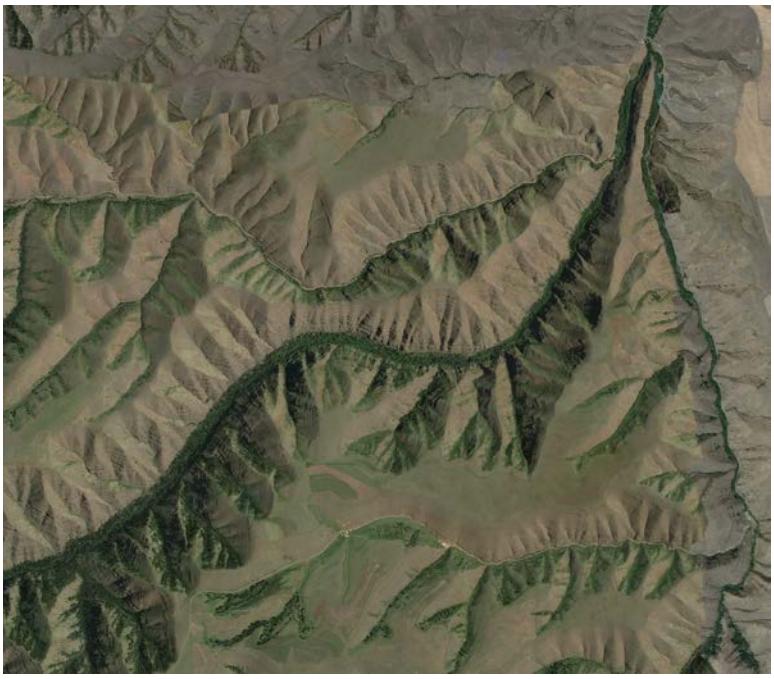
Potential Restoration Opportunities: Implement items listed above.

Potential Protection Opportunities: Protect existing intact riparian buffers from development; and implement or retrofit stormwater controls for existing road development consistent with the Eastern Washington Stormwater Manual.

North Fork Asotin Creek	Asotin County

Reach Description: The North Fork Asotin Creek begins at the NE ¼ of T9N_R43E_S35 and ends near the northeast corner of the Asotin Creek Wildlife Area.

Shoreline Jurisdiction: 360 acres, 7.1 miles



Source: Google maps

Subreaches (SR); see Map A-4

There are no subreaches in the North Fork Asotin Creak Reach.

CHARACTERISTICS

Ownership:

Ownership is 20% WDFW, Asotin Wildlife Area; 35% Washington State Department of Natural Resources (DNR); 30% U.S. Forest Service (USFS); and 15% private.

Land Use/Current SMP:

Current land use designation:

- The entire reach is designated a state and federal reserve, with a minimal amount of residential/agricultural use.

Current zoning designation:

- The entire reach is zoned Agricultural.

Current SMP environment designation:

- The entire reach is designated a Conservancy.

North Fork Asotin Creek	Asotin County

Existing Land Cover/Development:

The North Fork Asotin Creek Reach is almost entirely public land with little development, consisting of mostly open spaces. A gravel road runs the length of the reach.

Geomorphic Character:

Description: The North Fork Asotin Creek is a single-thread channel that flows within a mostly confined bedrock valley that consists of Grande Ronde Basalt and channel and valley bottom that consists mostly of alluvium. The overall valley width narrows and steepens in the upstream direction.

Channel Migration Zone Characterization: Channel migration is limited by the presence of bedrock throughout the channel and valley.

Hardened Banks: No artificial hardened banks appear to exist along the North Fork Asotin Creek.

Flooding and Geological Hazards:

Flooding: FEMA floodplains are delineated for the lower portion of North Fork Asotin Creek. The floodplains are relatively narrow.

Geological Hazards: Severely erodible soils can be found along the most length of North Fork Asotin Creek. Most of the creek has moderate to high liquefaction susceptibility. Landslide hazards exist throughout the creek where slopes are steeper than 15% over underlying alluvial deposits and Columbia River Basalts.

Existing Public Access:

- Shoreline and public access is managed by USFS or WDFW in the Asotin Creek Wildlife Area.
- There is a gravel road that runs the length of this reach.
- There are informal public access points in the wildlife area.
- Because most of the reach is public land with little development, public access is limited.

Identified Public Access Improvements: None identified.

Public Access Opportunities:

Asotin Creek is a critical watershed for steelhead, bull trout, and spring Chinook and is considered at high risk for habitat degradation due to stream modifications. WDFW is developing a wildlife management plan for Asotin Creek, including the North Fork.

ECOLOGICAL CONDITIONS

Water Quantity and Sediment:

No known gages are located on North Fork Asotin Creek, so water quantity is estimated based on nearby gages on Asotin Creek and South Fork Asotin Creek. Lick Creek is a tributary that flows into North Fork Asotin Creek within this reach. The estimated mean annual flow for this reach is 36 cfs.

North Fork Asotin Creek Asotin County
Sediment is likely to efficiently move through North Fork Asotin Creek during extreme flow events due to relatively steep slopes. North Fork Asotin Creek has a relatively low percentage of fines.
Water Quality: North Fork Asotin Creek is listed as requiring a TMDL for temperature.
Habitat Characteristics and PHS Presence: North Fork Asotin Creek may support elk, mountain quail, and mule deer. The creek also supports fish and other species as identified in Table 28 of the IAC Report. North Fork Asotin Creek supports ESA-listed steelhead, Chinook, and bull trout. WDFW has hypothesized that bull trout historically occurred in Asotin Creek in the winter and spring, before habitat was significantly modified (SRSRB 2011). The Asotin Creek spring/summer Chinook salmon and steelhead populations are similar in life history and habitat requirements. However, historically upper reaches of upper North Fork Asotin Creek did not likely produce spring Chinook salmon (SRSRB 2011). This creek begins approximately at the boundary of USFS lands and ends at the juncture of South Fork Asotin Creek. The entire reach is constrained in a narrow valley until approaching the juncture with South Fork Asotin Creek. The first mile of North Fork Asotin Creek is undisturbed. There is an informal gravel access road (an extension of Asotin Creek Road) that follows along the north bank, until approximately 1 mile before the juncture with the South Fork Asotin Creek. At this point it transitions to a more formal gravel road running along the toe of the slope of the cliffs to the west. There is no other development within this reach. The riparian area is densely forested, and vegetation consists primarily of taller deciduous trees, shrubs, and grasses; the trees form a closed canopy over the creek for most of the creek. Approaching the juncture with South Fork Asotin creek, several acres of floodplain adjacent to North Fork Asotin Creek have been converted to agricultural use, which has displaced a combination of riparian and native shrub-steppe habitats within the shoreline boundary. Many locations along the North Fork Asotin Creek mainstem were moderately limited by a lack of key habitat quantity and channel stability (upper North Fork only) or experienced low impacts from flow, habitat diversity, and sedimentation (lower North Fork only) (SRSRB 2011). Steelhead production in the upper North Fork Asotin Creek tributaries is strongly limited by channel stability and a lack of key habitat quantity. It is secondarily limited by low habitat diversity, altered flow, and sedimentation.
ECOLOGICAL FUNCTIONS ANALYSIS
Riparian areas of North Fork Asotin Creek have been determined to be properly functioning but at risk (SRSRB 2011). Reduced stream channel complexity and floodplain function caused by channel straightening, incision, and loss of historical riparian forests/LWD source has reduced habitat diversity and key wintering habitats and rearing functions. Fine sediments originating on steep valley slopes have potential for continued impacts on salmon habitat.

North Fork Asotin Creek	Asotin County

Restoration Actions:

- Implement restoration projects that may include passive (e.g., Conservation Reserve Expanded Program riparian buffers or conservation easements) or active efforts to reduce erosion and increase filtration.
- Implement aquatic habitat protection plans, including list of prioritized projects from the Asotin Creek Implementation Area of the WRIA 35 Watershed Plan (Asotin PUD 2007), e.g., LWD replenishment and riparian buffer replacement/enhancement.
- Aim to reduce riparian and water quality impacts from livestock through expanded use of BMPs (e.g., exclusionary fencing and rotational grazing) for livestock operations within shoreline jurisdiction.

Level of Existing Function: Partially Functioning

Stressors:

- Asotin Road constrains the shoreline through most of the reach.

Runoff from upland roadway development degrades water quality, which impacts forage and rearing aquatic habitat functions. Upland development may also impact continuity of riparian habitats and riparian functions such as migratory corridors for aquatic and terrestrial species.

Potential Restoration Opportunities: Implement items listed above.

Potential Protection Opportunities: Implement or retrofit stormwater controls for existing road development consistent with the Eastern Washington Stormwater Manual and protection of intact riparian buffers.

George Creek	Asotin County

Reach Description: George Creek Reach begins at the SW ¼ of T10N_R45E_S25 and ends at the SE ¼ T10N_R45E_S24.

Shoreline Jurisdiction: 72 acres, 1.4 miles

Source: Google maps

Subreaches (SR); see Map A-5

There are no subreaches in the George Creek Reach.

CHARACTERISTICS

Ownership:

Ownership of George Creek is 100% private.

Land Use/Current SMP:

Current land use designation:

- Specific land uses have not been designated. Current land use is a mixture of agriculture and open space.

Current zoning designation:

- The entire reach is zoned Rural Residential.

Current SMP environment designation:

- The southern half of the George Creek Reach is not designated under the original SMP; the northern half is designated as Rural.

George Creek	Asotin County

Existing Land Cover/Development:

George Creek has several residences at the mouth of the creek. Downstream there are several farms, and the remaining area is open space. A gravel road runs through portions of the reach.

Geomorphic Character:

Description: George Creek is a single-thread channel that flows within a bedrock valley that consists of Grande Ronde Basalt walls and channel and valley bottom that consists mostly of alluvium. The stream flows within a wide valley (relative to its size) and has a mostly sinuous, meandering planform.

Channel Migration Zone Characterization: The potential for channel migration exists throughout the channel and floodplain due to the presence of alluvium within these boundaries.

Hardened Banks: No artificial hardened banks appear to exist along George Creek.

Flooding and Geological Hazards:

Flooding: FEMA floodplains are delineated for George Creek. Floodplains are relatively moderate in width.

Geological Hazards: Severely erodible soils can be found along the majority of George Creek. The majority of George Creek has moderate to high liquefaction susceptibility. Landslide hazards exist throughout the creek where slopes are steeper than 15% over underlying alluvial deposits and Columbia River Basalts.

Existing Public Access:

There is no known existing public access.

Identified Public Access Improvements: None identified.

Public Access Opportunities:

Because much of George Creek has no surface flow, and because the entire reach is privately owned, there are no known public access opportunities.

ECOLOGICAL CONDITIONS

Water Quantity and Sediment:

George Creek had an Ecology gage (Gage No. 35P050) that was active from 2006 to 2013. No known tributaries enter this reach. A portion of this reach, approximately 1 mile upstream from Asotin Creek, may go dry or have minimal surface flow under certain conditions. The estimated mean annual flow for this reach is approximately 20 cfs.

Sediment input is expected to occur during high-runoff events due to little upland vegetation. Sediment input may be impacted by upland agricultural use.

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Water Quality:

George Creek requires a TMDL for temperature. Water quality is likely impacted from agricultural use and a lack of riparian cover in upland areas.

Habitat Characteristics and PHS Presence:

George Creek may support chukar, mountain quail, and mule deer, as well as fish and other species as identified in Table 28 of the IAC Report. George Creek supports ESA-listed steelhead, Chinook, and bull trout. WDFW has hypothesized that bull trout historically occurred in George Creek in the winter and spring, before habitat was significantly modified (SRSRB 2011). The Asotin Creek spring/summer Chinook salmon and steelhead populations are similar in life history and habitat requirements. However, historically George Creek did not likely produce spring Chinook salmon (SRSRB 2011).

The creek in this reach forms a narrow braided channel that is characterized by alternating segments featuring a wider riparian zone with closed canopy and areas where there is minimal vegetation aside from a very narrow strip of vegetation along each bank. Gravel or informal access roads exist along the west bank of the creek.

There is minimal development within this reach, but there is significant use by livestock for grazing. Grazing disturbs the riparian zone and native shrub-steppe habitat. The densest riparian area is forested, and vegetation consists primarily of taller deciduous trees, shrubs, and grasses. A portion of this reach, approximately 1 mile upstream from Asotin Creek, may go dry or have minimal surface flow under certain conditions. Approaching the juncture with Asotin Creek, the floodplain adjacent to George Creek has been converted to agricultural use, which has displaced a combination of riparian and native shrub-steppe habitats within the shoreline boundary.

Sediment load, channel stability, key habitat quantity, and habitat diversity have been identified as the primary factors limiting the abundance and productivity of steelhead and spring/summer Chinook in George Creek (SRSRB 2011). Flow and temperature were identified as secondary factors, with temperature a significant issue in the George Creek mainstem.

ECOLOGICAL FUNCTIONS ANALYSIS

Riparian areas of the George Creek Reach have been determined to have areas that are properly functioning, partially functioning, and impaired (SRSRB 2011). Parts of George Creek are dewatered during portions of the year, which presents a barrier to fish passage, particularly steelhead.

Restoration Actions:

- Implement restoration projects that may include passive (e.g., Conservation Reserve Expanded Program riparian buffers or conservation easements) or active efforts to reduce erosion and increase filtration.
- Reduce riparian and water quality impacts from livestock through expanded use of BMPs (e.g., exclusionary fencing and rotational grazing) for livestock operations within shoreline jurisdiction.

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- Implement aquatic habitat protection plans, including list of prioritized projects from the Asotin Creek Implementation Area of the WRIA 35 Watershed Plan (Asotin PUD 2007).
- Implement LWD replenishment and riparian buffer replacement/enhancement projects to support increased habitat complexity and reduce water temperatures.

Level of Existing Function: Partially Functioning to Impaired

Stressors:

- Residential development
- George Creek Road inside shoreline jurisdiction

Runoff from upland residential and roadway development degrades water quality, which impacts forage and rearing aquatic habitat functions. Upland development may also impact continuity of riparian habitats and riparian functions such as migratory corridors for nearshore aquatic and terrestrial species.

Potential Restoration Opportunities: Implement items listed above.

Potential Protection Opportunities: Implement or retrofit stormwater controls to be consistent with the Eastern Washington Stormwater Manual and protect remaining intact riparian buffers.