

## **X. Chuckanut Creek SMA**

**Summary:** The Chuckanut Creek SMA is 91.8 acres in size and has very low density development, but has the potential for significant infill. Infrastructure is limited within the SMA and a lack of sanitary sewer service to most the area currently limits growth. This SMA currently is functioning at high levels for most ecological parameters. Fecal coliform and dissolved oxygen levels have exceeded Washington State water quality parameters and their management should be a high priority for this SMA. Habitat quality is excellent throughout most this drainage and conservation is recommended.

### **X.1 Watershed Analysis**

#### **X.1.1 Landscape Setting**

The drainage is located at the northern toe of Chuckanut Mountain and approximately half the drainage occurs within the City limits. The Chuckanut Watershed is heavily forested and part of a large forested corridor that extends south to Blanchard Mountain. It is also of the only remaining forested corridor in Washington State that extends from the Cascade Mountains to the marine system.

Chuckanut Creek flows within an incised ravine cut into continental sedimentary material and bedrock. The channel is naturally confined within the narrow ravine. The narrow nature of the ravine bottom is not conducive to channel migration to any significant extent. Squalicum-Chuckanut-Nati soils are the dominant soils types in this drainage. The soils can be generally described as moderately deep to very deep, moderately well drained, gently sloping to very steep soils, on foothills, plateaus and landslides. The side slopes of the ravine along most this SMA area range between 20% to 100%. Soils within this reach have a slight to moderate risk of erosion. The ravine widens and slopes decrease in Reach 1.

#### **X.1.2 Land Use**

**Land Use:** The upper reaches and headwaters of Chuckanut Creek are within unincorporated Whatcom County and it flows through low density single family zoned parcels on acreage. The drainage has sustained low to moderate impact outside the City limits, mostly associated with past timber harvest on Chuckanut Mountain and the construction of Interstate 5. Zoning within the greater watershed, outside the City limits, includes rural and commercial forestry and recreational open space with small areas of rural residential with a density of one unit per 5 acres.

Land use within the Chuckanut Creek SMA includes single family residential and public area designations. Existing platted lots and overlaying zoning indicate residentially zone property east and west of Arroyo Park are currently under-developed. Development of these areas is currently limited by the lack of sanitary sewer service. If the area is provided with sanitary sewer service an increase in density would be expected. The central portion of the drainage is dominated by Arroyo Park, a City of Bellingham Park.

The existing Shoreline Management Plan for the City of Bellingham lists Chuckanut Creek shoreline designations as Rural, Natural and Conservancy II.

**Transportation and Utilities:** Major roads within the Chuckanut Creek SMA include Chuckanut Drive (State Road 11) and Old Samish Road. Chuckanut Drive crosses the SMA near the intersection of Chuckanut Drive and Old Samish Road. Old Samish Road parallels and intermittently touches the northern edge of the SMA along its length from Chuckanut Drive east to the City limits. Smaller residential roads access the Chuckanut Village community, west of Chuckanut Drive.

**Public Access:** Public access is provided in two locations within Chuckanut Creek SMA: Chuckanut Bay; and Arroyo Park. Public access is provided via Arroyo Park which dominates Reaches Segment B. Arroyo Park is a City of Bellingham Park and includes foot trails and limited parking. Arroyo Park is maintained in a natural condition, but includes user trails and a foot bridge crossing Chuckanut Creek. The Arroyo Park trail system connects a City and County Interurban trail system that extends from Fairhaven Parkway to Larrabee State Park near the Whatcom/Skagit county line. Connecting trails to the Interurban system provide access to a well developed trail system that connects many areas on the Chuckanut/Blanchard Mountain complex.

**Shoreline Modifications:** Very few modifications were identified along Chuckanut Creek within the City limits. No data was located that provided information on shoreline modifications outside the City limits, but modifications appear minimal. No bulkheads or shoreline armoring were identified by NES in field review within the SMA area. Road crossings and supporting infrastructure are present at Okanogan Street in Chuckanut Village and at the Chuckanut Drive crossing. Chuckanut Creek passes under Old Samish Road via a culver near the southern City Limits. Wooden foot bridges are located within Arroyo Park, two within Chuckanut Village and one near the City limits. The average pervious surface break down for the Chuckanut Creek SMA are 9% pervious surfaces, 16% semi-pervious surface, 75% pervious surface and 7% water. Reach 1 had the greatest percent impervious and semi-pervious area of the reaches. Reaches 2-4 were nearly identical in their break down of surface condition.

### **X.1.3 Critical Areas**

**Wetlands/ Regulated Streams:** Wetlands are present, but most are small and located on slopes adjacent to Chuckanut Creek or at the mouth of the creek. Scattered small (0.1 to 1.0 acre) palustrine forested and scrub-shrub wetlands are located along the length of Chuckanut Creek. Wetlands increase in size and frequency near the mouth. A variety of palustrine emergent, scrub-shrub and forested wetlands are interspersed within the SMA in Reach 1. A saltwater marsh is located at the mouth of Chuckanut Creek as it enters Chuckanut Bay.

City of Bellingham code considers Chuckanut Creek as regulated stream as defined in the City of Bellingham Wetland and Stream Regulatory Chapter. A number of tributary streams feed into Chuckanut Creek of which three are considered City of Bellingham regulatory streams (as indicated in Exhibit B of the Wetland and Stream Ordinance): #35, #38, and #39.

**FEMA:** A small area at the mouth of Chuckanut Creek is located within the FEMA floodplain, but not located within the floodway. All other portions of the review portions of the drainage are not indicated on the FEMA floodplain and floodway maps.

**Slopes:** Chuckanut Creek is located in a ravine with steep slopes along most the SMA length. Side slopes within the majority of the ravine range are at 20% to 100% slopes. Slopes along most of the Chuckanut Creek drainage are area mapped on the Whatcom County Geohazard Maps as "Landslide Hazard Areas".

**Potential PHS/TSE Species:** The Chuckanut SMA includes potential habitat for federally listed bull trout and federal candidate species Puget Sound coho salmon. The SMA is adjacent and flows into to hardshell shellfish beds and winter bird concentrations in Chuckanut Bay. A bald eagle nesting territory is indicated to be near, but not include the Chuckanut SMA. State Priority Habitats identified for the Chuckanut Creek include riparian habitat and wetlands.

#### **X.1.4 Ecological Functions**

Overall Chuckanut Creek is providing most ecological functions at a high level. Several limitations to ecological function have been identified for the Chuckanut SMA. Water quality standards are being met for most parameters within Chuckanut Creek, with the exception of Fecal coliform and dissolved oxygen. Chuckanut Creek has been listed by the WA Dept. of Ecology as: a Category 5 "Polluted Water" for Fecal coliform and dissolved oxygen; a Category 4 "Impaired Water" for low flow; and a Category 2 a "Water of Concern" for pH and temperature. Studies in 2002 by Plotnikoff and Wiseman found no biological degradation of aquatic life based on the *River Invertebrate and Prediction Classification System* at sample stations within the SMA (DOE Water Quality Website 2004). Instream structure is complex and provides high quality fish habitat along the entire Chuckanut SMA.

Riparian vegetation with the SMA is dominated by a second growth mixed coniferous/deciduous forest in most segments. Segments 1 and 3 also include residential lawn and ornamental gardens. The vegetation community is dominated by a diverse number of native plant species. Noxious and invasive plant species such as knotweed, teasel, ivy and herb Robert, are present but at low frequencies and are not well established.

The Chuckanut SMA provides high quality habitat to a wide variety of wildlife and fish species. It provides a wide range of habitat features, a complex structure and is well

connected to other large tracts of high quality habitat. Anadromous trout and salmon use Chuckanut Creek for spawning, migration and rearing. Wildlife species associated with mixed coniferous forests are well represented. No priority species have been specifically identified for this SMA, but could be present.

## **X.2 Reach Analysis: Segment A (Reach Chuckanut 1)**

### **X.2.1 Landscape Setting**

This segment extends from Chuckanut Bay upstream approximately 700 feet with a total size of 11.5 acres. This portion of the drainage is located in alluvium deposits. Soils are upland soils in Drainage Class B or C, which have moderate to slow infiltration rates and have a moderate to slow rate of water transmission. The risk of erosion within the reach soils ranges from slight to moderate. Chuckanut Creek flows within an unconfined channel with an average channel gradient of 1% to 2% in this segment.

### **X.2.2 Land Use**

**Land Use:** The overlaying zoning for this segment includes 10.8 acres of residential and 0.8 acres public area. Current land use includes low density single family residential and undeveloped forested property. There are a number of undeveloped "paper plats" of small lot within and around the reach. Most of this area is not served by City sewer and the houses are on private septic systems. Twenty-seven buildings are mapped for this segment. Current zoning and platted lots indicate the potential for greater density in this segment.

**Transportation:** Only small secondary residential roads are located in this segment.

**Public Access:** No public access is provided within this reach.

**Shoreline Modifications:** No shoreline modifications have been identified for this reach. Two foot bridges cross Chuckanut Creek and Okanogan Street crosses the stream with a bridge. Impervious surface is calculated at 18% of the segment, 28% groundcover is semi-pervious, 54% is pervious and 10% is water.

### **X.2.3 Critical Areas**

**Wetlands/ Regulated Streams:** An estuarine wetland is mapped at the mouth of Chuckanut Creek as it enters Chuckanut Bay. A palustrine forested and emergent wetland is mapped in the City Wetland inventory for this reach near the mouth (6.5 acres). Regulated stream #39 is enters the segment from the south.

**FEMA:** A small area (1.2 acres) is mapped within the FEMA Floodplain. This area appears to be located in the salt marsh area.

**Slopes:** Ravine sides along the entire segment have slopes ranging from 20% to 100%. Slopes in this area mapped on the Whatcom County Geohazard Maps as “Landslide Hazard Areas”.

**Potential PHS/TSE Species:** This segment includes potential habitat for federally listed bull trout and federal candidate species Puget Sound coho salmon. Segment A is adjacent, and flows into, hardshell shellfish beds and winter bird concentrations in Chuckanut Bay. A bald eagle nesting territory is indicated to be in the vicinity of this segment. Bald eagle nesting territory is not documented to include the Chuckanut SMA, but use is possible. State Priority Habitats identified for this segment include instream, riparian habitat, estuary and wetlands.

#### **X.2.4 Ecological Functions**

**Water Quality:** This segment has been listed by the WA Dept. of Ecology as a Category 5 “Polluted Water” for Fecal coliform and dissolved oxygen, Category 4 “Impaired Water” for low flows affecting fish passage and Category 2 “Water of Concern” for pH and temperature (limited excursions from water quality standards).

**Vegetation:** An estimated average fifty foot forested buffer exists on both side of the channel through this reach. The remaining pervious surface is lawns and ornamental gardens.

**Wildlife:** Adjacent to important marine wildlife habitat including: hardshell clam and Dungeness crab habitat, dabbling bird concentrations in Chuckanut mud flats. Anadromous fish utilizing Chuckanut Creek include: coho and chum salmon, sea-run cutthroat and steelhead. Bull trout presence is presumed but not documented.

**Habitat:** Forested riparian area is well connected to quality habitats outside the SMA designation. Important connections include: undeveloped forested habitat connecting to the Chuckanut Mountain complex to the southeast; northeast to undeveloped forested habitat and along the shoreline of Chuckanut Bay.

#### **X.2.5 Opportunities**

##### **Preservation**

- Protect existing native forested and shrub vegetation within SMA area.

##### **Enhancement or Restoration Opportunities**

- The repair of septic systems and extension of city sewer to this area may assist in decreasing Fecal coliform levels.
- Retaining native forest and shrub cover will assist in maintaining instream water temperatures, decrease sediment that can transport Fecal coliform and protect the existing hydrological and habitat functions within this segment.

### **X.3 Reach Analysis: Segment B (Reaches Chuckanut 2 and 3)**

#### **X.3.1 Landscape Setting**

This segment extends upstream to just east of Arroyo Park and has a total size of 34.9 acres. This segment is located in continental sedimentary deposits and bedrock. The majority of the soils are upland soils that are in Drainage Class A, B or C. The erosion risk for soils in this reach is moderate with a small area rated as slight. The channel is naturally confined within a ravine throughout these reaches with an average channel gradient of 2% to 4%.

#### **X.3.2 Land Use**

**Land Use:** The current zoning overlaying this reach includes 6.5 acres of residential and 28.4 acres public. Current land use is predominately forested parkland with single family residential at the east and west ends of the segment. One building is mapped for this reach. Current zoning and platted lots indicate the potential for greater density in the residentially zoned portions of the reach.

**Transportation:** Chuckanut Drive crosses this segment near its western edge. Old Samish Road is the only other road within the SMP designation. Old Samish Road parallels the western side edge of this segment.

**Public access:** Public access is provided via Arroyo Park and associated user trails. New trails are proposed for this area by the City of Bellingham Parks Department.

**Shoreline modification:** A box culvert with baffles for fish passage passes under Chuckanut Drive.

#### **X.3.3 Critical Areas**

**Wetlands/ Regulated Streams:** Small palustrine forested and scrub-scrub wetlands are located along the length of this segment the average sizes are estimated to be approximately 0.2 acres. City of Bellingham regulated streams #35 and #38 enter Chuckanut Creek in this segment. Stream 35 enters from the north, immediately northeast of the Chuckanut Road crossing. #38 enters from the south immediately southeast of the Chuckanut Road crossing.

**FEMA:** No areas within this segment are identified on FEMA maps.

**Slopes:** Ravine sides along the entire segment have slopes ranging from 20% to 100%. Slopes in this reach are mapped on the Whatcom County Geohazard Maps as "Landslide Hazard Areas".

**Potential PHS/TSE Species:** Bull trout presence is presumed based on suitable habitat and prey. Bull trout are Federally listed as a threatened species. Puget Sound coho may occur within this drainage. Puget Sound coho salmon are a candidate species for Federal listing.

### **X.3.4 Ecological Functions**

**Water Quality:** This segment has been listed by the WA Dept. of Ecology as a Category 5 “Polluted Water” for Fecal coliform and dissolved oxygen, Category 4 “Impaired Water” for low flows affecting fish passage and Category 2 “Water of Concern” for pH and temperature (limited excursions from water quality standards).

**Vegetation:** The existing forested buffer exceeds 200 feet on both side of the channel through this reach and is a second growth mixed coniferous/deciduous forest. Noxious weeds have been identified within this segment: teasel and knotweed are located adjacent to Old Samish Road in Reach 3. Ivy and herb Robert are present within Arroyo Park. Herb Robert is well established, but ivy is infrequent.

**Wildlife:** Anadromous fish utilizing Chuckanut Creek include: coho and chum salmon, sea-run cutthroat and steelhead. Bull trout presence is presumed but not documented. Pacific giant salamander larvae have been recorded inhabiting the segment (Jackson, unpublished data). Historical accounts of tailed-frogs from tributary stream adjacent to Chuckanut Drive. Red-legged frogs and northwestern salamanders have breeding populations in a wetland on northwest portion of Reach 2 (Jackson, unpublished data).

**Habitat:** Forested riparian area is well connected to quality habitats outside the SMA designation. Important connections include: undeveloped forested habitat connecting to the Chuckanut Mountain complex to the south; northeast to undeveloped forested habitat. Habitat is of high quality and includes many important habitat features. A sample analysis of stream substrate and aquatic invertebrates was conducted by DOE in this segment. The substrate is as follows: 6% sand, 17% fine gravel, 33% coarse gravel, 36% cobble, 8% boulder. The aquatic macroinvertebrate inventory indicated high diversity. These data are from one sample plot taken in Chuckanut Creek, but the analysis appears to be representative of most areas in drainage. A more comprehensive study is recommended.

### **X.3.5 Opportunities**

#### **Preservation**

- Maintain canopy cover and forested buffer.
- Place a high priority on best management practices that control erosion and protect native soils.

### **Enhancement or Restoration Opportunities**

- Repair none functioning septic fields in this segment.
- Work on trail design within Arroyo Park to discourage trampling of riparian vegetation.
- Control noxious weeds within reach with a high priority given to knotweed control.

## **X.4 Reach Analysis: Segment B (Reach Chuckanut 4)**

### **X.4.1 Landscape Setting**

This segment extends from just east of Arroyo Park to the City limits and is 45.4 acres in size. This SMA is located in continental sedimentary deposits and bedrock. The soils are upland soils that are in Drainage Class B or C. The erosion risk for soils in this reach is slight to moderate. The channel is naturally confined within a ravine throughout this segment with an average channel gradient of 2% to 4%. No channel migration areas were identified due to nature of the natural topography. Ravine slopes are mapped at 20% or greater. Impervious surface is calculated to be at 5% of reach and 13% of the reach groundcover is semi-pervious and 83% is pervious and 5% is water.

### **X.4.2 Land Use**

**Land Use:** The current zoning overlaying this reach includes 43.0 acres of residential and 2.0 acres public. Current land use is predominately forested tracts with single family residential. Public holdings are limited to an area in the southeast corner of the reach. At total of 12 buildings are mapped for this reach. Current zoning and platted lots indicate the potential for greater density in the residentially zoned portions of the segment, but the majority of the segment is retained as City Park property.

**Transportation:** Old Samish Road is the only road within the SMP designation. Old Samish Road parallels the western side edge of this reach and crosses towards its southern extent.

**Public access:** No public access is provided to properties within this reach. A publicly held parcel is owned Whatcom County and no access has been developed.

**Shoreline modification:** No shoreline modifications have been identified for this reach, but should be field confirmed. Impervious surface is calculated to be at 7% of reach and 12% of the reach groundcover is semi-pervious and 82% is pervious and 6% is water (channel).

### **X.4.3 Critical Areas**

**Wetlands/ Regulated Streams:** Small palustrine forested and scrub-scrub wetlands are located along the length of this reach. Wetlands range from 0.1 to 1.0 acres in size, with a mean of 0.4 acres. No other City of Bellingham regulated streams occur in this segment.

**FEMA:** No areas within this segment are identified on FEMA maps.

**Slopes:** Ravine sides along the entire segment have slopes ranging from 20% to 100%. Slopes in this reach are mapped on the Whatcom County Geohazard Maps as "Landslide Hazard Areas".

**Potential PHS/TSE Species:** Bull trout presence is presumed based on suitable habitat and prey. Bull trout are Federally listed as a threatened species. Puget Sound coho may occur within this drainage. Puget Sound coho salmon are a candidate species for Federal listing.

### **X.4.4 Ecological Functions**

**Water Quality:** This segment has been listed by the WA Dept. of Ecology as a Category 5 "Polluted Water" for Fecal coliform.

**Vegetation:** An estimated average 200 foot forested buffer exists on both side of the channel through the majority of this reach. The buffer has been decreased to less than 50 feet at the southern extent of the reach as it passes through residential yards.

**Wildlife:** Anadromous fish utilizing Chuckanut Creek include: coho and chum salmon, sea-run cutthroat and steelhead. Bull trout presence is presumed but not documented.

**Habitat:** Forested riparian area is well connected to quality habitats outside the SMP designation. Important connections include: undeveloped forested habitat connecting to the Chuckanut Mountain complex to the south. Interstate 5 presents a barrier to many wildlife species movement and isolates this site from habitats to the east.

### **X.4.5 Opportunities**

#### **Preservation**

- Maintain canopy cover and forested buffer.
- Place a high priority on best management practices that control erosion and protect native soils.

#### **Enhancement or Restoration Opportunities**

- Repair none functioning septic fields in this segment.
- Control noxious weeds within reach with a high priority given to knotweed control.