

# **Whatcom County Drainage Improvement District #30 Drainage Management Plan**



**Drainage Improvement District #30**

**Whatcom Conservation District**

**Whatcom County Public Works**

**with support from the  
Centennial Clean Water Fund  
under the authority of the  
Washington State Department of Ecology**

## **SECTION 1: DISTRICT OVERVIEW**

### **Location:**

Whatcom County Drainage Improvement District #30 (DID #30) is located within the Silver Creek sub-basin in western Whatcom County southeast of the City of Ferndale and north of the City of Bellingham (Figure 1). Silver Creek is a lower Nooksack River tributary with its confluence in the Nooksack delta.

### **Boundaries:**

DID #30 jurisdictional boundaries are illustrated in Figure 2. The district has irregular borders with Smith Road at the north end. Aldrich Road provides access to most of the district.

### **Area:**

DID #30 encompasses approximately 171 acres within its jurisdictional boundaries.

### **Significant Features:**

DID #30 is located in an area of generally flat terrain with mostly prior converted wetlands. An upper tributary of Silver Creek, also known as Andreason Ditch in this area, is the primary watercourse. Its headwaters originate in “Larrabee Springs”, a natural spring providing perennial flows. Two additional small tributaries from the east provide additional perennial flow. Silver Creek within DID #30 is used by Coho Salmon and Cutthroat Trout with potential/historic use by Chum Salmon and Steelhead. Water from DID #30 flows to the west and combines with other Silver Creek tributaries and eventually joins a Nooksack delta distributory channel near Marietta.

### **Predominant Land Uses:**

Rural residential and hobby farms are the predominant land use in DID #30. Approximately 40 acres are currently used for commercial crop and pasture production in support of the dairy industry. Most of the district is zoned Rural 1DU/10AC and 1DU/5AC. Residential housing development is expected to expand upstream to the west of the district in the near future with a consequent increase in stormwater discharge to the district’s watercourses. Increased stormwater may overtax the district’s existing drainage system but has not been studied.

### **Predominant Drainage Issues:**

1. Beavers – Beavers dams cause most of the drainage related concerns in DID #30. The district and its landowners frequently need to modify or remove dams and occasionally trap to reduce populations. This is typically the only drainage management issue on stream reaches that have been re-vegetated.

2. Reed canarygrass – The entire length of Silver Creek within DID #30 has been planted with native trees and shrubs over the last 10 years. Grass growing in the channel bottom and on the streambanks is now a rare situation that causes little problems. However due to changes in water levels and changes in narrow riparian buffers grass may become an isolated problem in the next 5 years.

3. Accumulated sediments – The change in land use from agriculture to rural residential has resulted in decreased sediment input into channels. In addition streambank re-vegetation projects have stabilized many unstable banks that have been a source of sediment in the past. However, planted riparian buffers in some areas are too small to fully filter livestock generated sediments and sediment laden stormwater from current and future development will likely buildup over time and may still become enough of a problem to require maintenance dredging.

## SECTION 2: MAPS AND WATERCOURSE CLASSIFICATIONS

### Watercourse Classifications:

The classifications used in this drainage management plan are defined in the Drainage Management Guide for Whatcom County and *Informational Factsheet #18 Watercourse Classifications*. Figure 3 illustrates the watercourse classifications in DID #30. WDNR watercourse GIS layers, aerial photos and local residents were used to determine the extent of modified natural and constructed watercourses.

**Natural Watercourses (Red):** No natural watercourses exist in DID #30. Some channels retain natural features such as meanders but have been either cleared or dredged in the past. 0 feet

**Modified Natural Watercourses (Yellow):** Silver Creek (Andreason Ditch) is a maintained district channel. 6,250 feet. In addition, 680 feet of Andreason Ditch is maintained downstream from the DID #30 boundary.

**Constructed Watercourses (Green):** Numerous unmapped constructed field ditches exist in farmed areas. These ditches are typically short and terminate in either other constructed ditches or Andreason Ditch. DID #30 does not maintain any constructed ditches.



Hedgerow along a Modified Natural Watercourse in DID#30

### SECTION 3: OTHER DRAINAGE INFRASTRUCTURE

**Road Crossings** - 11 known crossings (culverts or bridges) (Figure 3) (Table 1) are known to exist in DID #30. None of these crossings are owned or maintained by DID#30 however DID #30 is responsible for keeping crossings clear of debris and beaver dams. One road culvert is owned and maintained by Whatcom County, the remaining crossings are owned and maintained by private landowners.

**Fish Passage** - Fish passage may be restricted by features of the drainage infrastructure, primarily culverts. Whatcom County’s Fish Passage Barrier Inventory lists three culverts in DID #30 as being barriers to fish passage. At least two other crossings exist but have not been assessed.

**Floodgates and Tidegates** – None exist in DID #30.

**Sediment Traps** - None exist in DID #30.

**Other Infrastructure** – A rock diversion exists near the northwest district boundary. Water from Larrabee springs is divided into the headwaters of both Silver Creek and the south fork of Deer Creek.

#### DID #30 DRAINAGE INFRASTRUCTURE INVENTORY

Type of Structure	Number	Culvert Shape	Culvert Material	Culvert Span/Dia	Culvert Rise	Culvert Length	Ownership	Stream Name	Priority Index #
Culvert	1285101	RND	PCC	1.23	1.23	7.5	Private	Andreason Ditch	24.55
Culvert	1285102	RND	SST	1.55	1.55	6	Private	Andreason Ditch	none
Culvert	1285103	RND	PCC	1.38	1.38	7	Private	Andreason Ditch	none
Culvert	1285104	RND	CAL	1.25	1.25	7.1	Private	Andreason Ditch	none
Culvert	1285105	RND	CAL	1.22	1.22	7.15	Private	Andreason Ditch	18.40
Culvert	1285106	RND	CAL	1.22	1.22	7.3	Private	Andreason Ditch	none
Culvert	1285107	RND	CAL	1.22	1.22	5.95	Private	Andreason Ditch	none
Culvert	1285108	RND	CST	0.6	0.6	9.25	Private	Andreason Ditch	none
Culvert	370115	RND	PCC	0.91	0.91	10.06	WCPW	Andreason Ditch	20.73
Unknown	UNK30-01						Private	Andreason Ditch	none
Unknown	UNK30-02						Private	Andreason Ditch	none



Silver Creek (left) & Deer Creek (right) rock diversion

## SECTION 4: SIGNIFICANT NATURAL FEATURES

### FISH:

**General Fish Information** - For the purpose of this Drainage Maintenance Plan, the term “fish” includes all species of native cold-water fishes with the primary focus being Salmonids. Watercourses in DID #30 have elevated water temperatures and have been colonized by exotic species of fish that prefer warm water habitats. Pumpkinseed, Crappie, Smallmouth Bass, and others, are year around residents and are voracious predators to native fish species.

Modified Watercourses (Yellow) in DID #30 support reproducing populations of Coho Salmon and Cutthroat Trout. The reproducing populations of Cutthroat Trout can be either anadromous or resident. Anadromous adult Coho and Cutthroat typically enter the lower reaches of the watercourse to begin their upstream migration to the spawning habitats in late fall. Spawning occurs in the upper reaches of the watercourse where suitable spawning substrate is present. Coho spawn in the late fall and Cutthroat spawn in early spring. Coho adults die after spawning whereas Cutthroat can survive to spawn in successive years. Anadromous adult Cutthroat that survive spawning out migrate through the watercourse from mid to late spring. After hatching from gravel nests (redds), emerging juvenile Coho and Cutthroat will distribute themselves to suitable rearing habitats in the watercourse. Anadromous juvenile Coho and Cutthroat generally spend 22 to 18 months rearing in freshwater before migrating to the marine environment. Generally, juvenile anadromous Coho and Cutthroat are present in the accessible reaches of the watercourse throughout the year. Resident adult and juvenile Cutthroat are typically present in the upper reaches of the watercourses throughout the year.

### **General Fish Habitat Information –**

Modified Watercourses (yellow) typically include suitable spawning, rearing and habitats for Coho salmon and Cutthroat trout.

- Spawning habitats typically occur in those reaches that have gradients between 1-3% and are fed by flowing water and a steady supply of suitable sediments. These reaches tend to be found at the junction between low gradient reaches and the steeper gradient headwater reaches of the system.
- Rearing habitats can be distributed throughout these watercourses but are primarily located where there is sufficient channel complexity, riparian canopy, water quality and invertebrate productivity (fish prey/forage).

Constructed Watercourses (green) are wholly manmade systems constructed to convey water from a local surface or subsurface area for the purpose of improving the soil conditions for agriculture. Typically these watercourses are seasonal and do not have the habitat characteristics or natural processes necessary to support the rearing and spawning requirements of native cold water fishes. However, under some circumstances fish may be present in Constructed Watercourses.

**General Fish Distribution** – Fish distribution information is from Northwest Indian Fisheries Commission limited factors analysis (LFA). Very limited fish survey data is available for the lowland reaches in DIDs. When available, local anecdotal fish presence information is included.

**Fish Habitat in DID #30** – Riparian areas have been planted along all of Andreason Ditch in DID #30. Tree and shrub buffers are generally too narrow (10' to 25') to be properly functioning

but do have very positive habitat functions. Large woody debris is virtually non-existent. The reach analysis in Section 5 provides more detailed habitat information and photos.

**Fish Distribution in DID #30 –**

Silver Creek (Andreason Ditch) has known presence of Coho Salmon and Cutthroat Trout, presumed presence of Bull Trout and potential/historic presence of Chum Salmon and Steelhead. Figure 2 details fish presence in DID #30. Sampling of fish presence may be done prior to drainage maintenance work and will be documented and reported. Systematic evaluation of fish presence would be useful but is beyond the scope of this plan.

**WETLANDS:**

Figure 5 shows Whatcom County CAO wetlands in DID #30. Wetland rating and delineations are beyond the scope of this plan. However most of these wetlands would probably be rated as III or IV with some possibly rated as II where native trees have grown or have been planted. Many of the wetlands are isolated and would not likely be impacted by drainage maintenance work. Some farmland adjacent to maintained watercourses have Prior Converted Wetland status and will be impacted by continued drainage maintenance work.

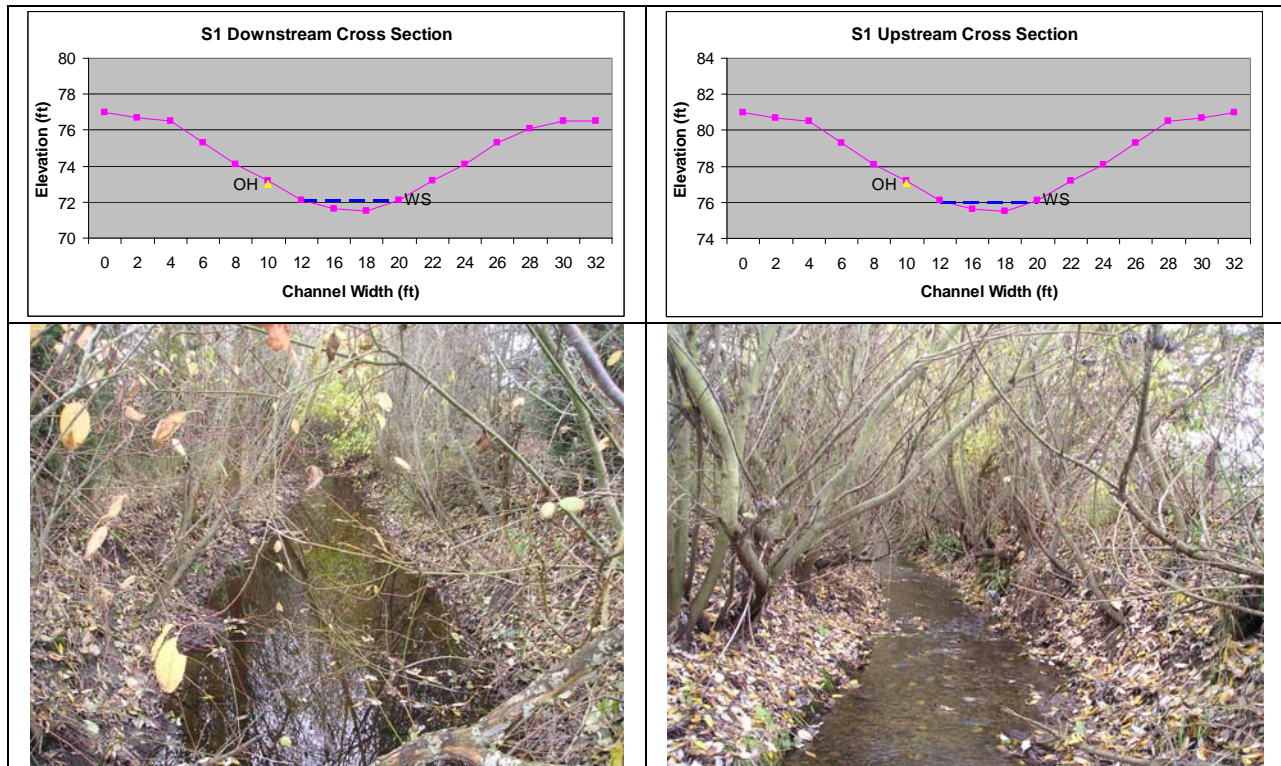


Typical farmed wetland in DID #30

## SECTION 5: MAINTAINED WATERCOURSE REACH ANALYSIS

Figure 3 indicates watercourse reaches historically maintained by DID #30. Legal Easements allow continued drainage maintenance on the watercourse labeled as DID #30 maintained watercourse on Figure 3. Maintained watercourses have been divided into relatively homogeneous reaches. In depth analysis of reach habitat conditions would be useful but is beyond the scope of this plan. Drainage maintenance information for each reach can be found in Section 6. General information about each reach follows:

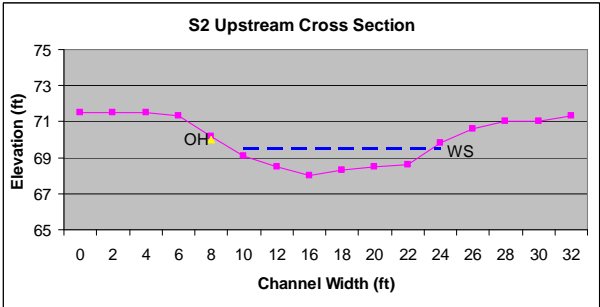
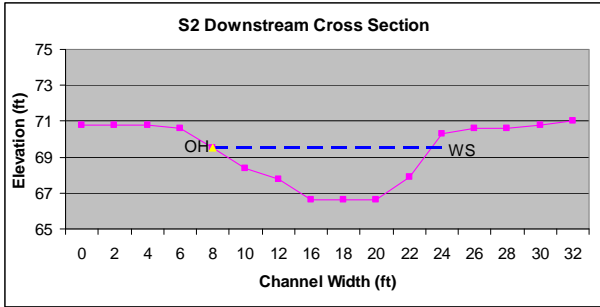
	<b>Reach S1 Silver Creek</b>
	<b>Existing Conditions</b>
<b>Reach Description</b>	Begins at the northwest district boundary just south of Smith Rd and ends near the district mid point just east of Aldrich Rd.
<b>Length</b>	4,050 feet
<b>Current Habitat Conditions</b>	The channel has been modified and simplified via historic maintenance dredging activities. Significant piles of old dredge spoils parallel the channel in places. The channel width ranges from 8 feet to 12 feet. Large woody debris in the channel consists of a few pieces installed with riparian plantings and a few planted deciduous species that have fallen in the water. Although the channel is mostly shaded, water temperatures are high in the summer due to low gradient, lack of deep pools and lack of ground water interface.
<b>Riparian Characteristics</b>	The right and left banks have been planted with native trees and shrubs over the last 10 years. Buffers are typically 10' to 25' with three properties also having larger (CREP) buffers. Native trees and shrubs have generally replaced Reed canarygrass as the dominant feature. Approximately 2,100 feet was planted with only a narrow buffer of Willow species in the late 1990's. This area has the most consistent and effective shade in the reach but lacks the diversity needed for a proper functioning buffer.
<b>Fish Passage Barriers &amp; Obstacles</b>	<ol style="list-style-type: none"> <li>1. One private culvert (1285105) located in Silver Creek (Andreason Ditch) is a fish passage barrier. Replacing the culvert would open 1,753 feet of habitat.</li> <li>2. Six additional culverts were assessed and are not barriers (1285102, 1285103, 1285104, 1285106, 1285107, 1285108).</li> </ol>
<b>Spawning Habitat</b>	Silts and fines dominate the channel substrate in Reach S1. Several small areas of gravel exist near the northwest district boundary and may provide limited spawning habitat for salmonid species.
<b>Reach Fish Utilization</b>	Salmonids have been observed upstream from Reach S1 near Larrabee Springs. These fish may have originated from Deer Creek, a Ten Mile Creek tributary to the north. Reach S1 is primarily a migration corridor and rearing habitat for Coho and Cutthroat.



	<b>Reach S2 Silver Creek</b>
	<b>Existing Conditions</b>
<b>Reach Description</b>	Begins at near the midpoint of DID #30 and ends at Lange Rd. This reach includes some area outside of district boundaries but maintained by the district.
<b>Length</b>	2,750 feet
<b>Current Habitat Conditions</b>	The channel has been modified and simplified via historic maintenance dredging activities. Significant piles of old dredge spoils parallel the channel in places. The channel width ranges from 8 feet to 15 feet. Large woody debris in the channel is absent. Although the channel is mostly shaded, water temperatures are high in the summer due to low gradient, lack of deep pools and lack of ground water interface.
<b>Riparian Characteristics</b>	The right and left banks have been planted with native trees and shrubs over the last 10 years. Buffers are typically 10' to 25'. Native trees and shrubs have generally replaced Reed canarygrass as the dominant feature however land use and occasional high water levels from Beaver dams have created some open areas midway in the reach.
<b>Fish Passage Barriers &amp; Obstacles</b>	<ol style="list-style-type: none"> <li>1. One private culvert (1285101) is a fish passage barrier. Replacing the culvert would open 3,987 feet of habitat.</li> <li>2. One WCPW culvert under Aldrich Rd (370115) is also a partial barrier.</li> </ol>



	<p>3. One other private culvert was assessed and is not a barrier.</p> <p>4. Two additional crossings are known to exist but have not been assessed.</p>
<b>Spawning Habitat</b>	Silts and fines dominate the channel substrate. Spawning habitat for salmonid species is not present.
<b>Reach Fish Utilization</b>	Primarily a migration corridor and rearing habitat for Coho and Cutthroat. Salmonids have been observed upstream from Reach S2 and in a small unnamed tributary to the east. Elevated water temperatures and low dissolved oxygen levels during the summer limit salmonid rearing opportunity.



## **SECTION 6: DRAINAGE MAINTENANCE SCHEDULE BY REACH**

Prior to implementation of drainage maintenance activities the following conditions and notifications will apply:

### **Maintenance Dredging:**

- 30 days notice to WDFW Habitat Biologist.
- Survey or other information provided to WDFW Habitat Biologist with notification.
- Source of sediment identified and corrected to prevent or reduce future dredging.
- Signed landowner agreements for a minimum of 15' native shrub hedgerows on both sides of the area being dredged delivered to WDFW Habitat Biologist prior to any dredging.
- Site visit with WDFW Habitat Biologist prior to project implementation.

### **Watercourse Vegetation Management:**

- 14 day notice to WDFW Habitat Biologist

### **Culvert Maintenance and Replacement:**

- Maintenance requires 14 day notice to WDFW Habitat Biologist.
- Replacement requires 30 day notice to WDFW Habitat Biologist with design drawings and specifications.

### **Aquatic Herbicides:**

- WSDA permit required.

### **Bridge Maintenance and Replacement:**

- Maintenance requires 14 day notice to WDFW Habitat Biologist.
- Replacement requires 30 day notice to WDFW Habitat Biologist with design drawings and specifications.

### **Beaver Dam Management:**

- Removal or modification of new beaver dams, less than 1 month, old requires 3 day notice to WDFW Habitat Biologist.
- Removal or modification of older beaver dams, more than 1 month old, requires 14 day notice to WDFW Habitat Biologist and a site visit.

### **Hand Maintenance:**

- 14 day notice to WDFW Habitat Biologist

The following tables catalog anticipated drainage maintenance actions. Drainage needs do however change due to unanticipated variables. Drainage maintenance practices such as dredging may be needed even when it's not currently planned.

<b>Reach S1 Drainage Maintenance</b>	
<b>Drainage Infrastructure</b>	<ol style="list-style-type: none"> <li>1. DID #30 is responsible for maintaining Silver Creek (Andreason Ditch) within this reach.</li> <li>2. DID #30 keeps culverts and crossings free of debris but private landowners own and are otherwise responsible for their crossings.</li> </ol>
<b>Reach S1 Drainage Maintenance Activities:</b>	
<b>Maintenance Dredging</b>	DID #30 does not currently plan to dredge this reach in the next five years but may need to if it becomes a problem.
<b>Watercourse Vegetation Management</b>	DID #30 does not currently plan to mow this reach in the next 5 years but may need to if it becomes a problem.
<b>Culvert Maintenance and Replacement</b>	Culverts will be kept clear of debris by DID #30. DID #30 does not currently plan to replace any culverts in the next five years but may if they become a problem.
<b>Aquatic Herbicides</b>	DID #30 does not currently plan on using herbicides in this reach but may need to if Reed canarygrass becomes a problem.
<b>Bridge Maintenance and Replacement</b>	Bridges will be kept clear of debris by DID #30. DID #30 does not currently plan to replace any bridges in the next five years but may if they become a problem.
<b>Beaver Dam Management</b>	Beaver dams are a problem in this reach. Dams will be lowered or removed as needed.
<b>Hand Maintenance</b>	Small amounts of debris will be removed using hand tools when needed. Woody vegetation impeding flow will be pruned when needed.

<b>Reach S2 Drainage Maintenance</b>	
<b>Drainage Infrastructure</b>	<ol style="list-style-type: none"> <li>1. DID #30 is responsible for maintaining Silver Creek (Andreason Ditch) within this reach.</li> <li>2. DID #30 keeps culverts and crossings free of debris but private landowners own and are otherwise responsible for their crossings</li> </ol>
<b>Reach S2 Drainage Maintenance Activities:</b>	
<b>Maintenance Dredging</b>	DID #30 does not currently plan to dredge this reach in the next five years but may need to if it becomes a problem.
<b>Watercourse Vegetation Management</b>	DID #30 does not currently plan to mow this reach in the next 5 years but may need to if it becomes a problem.
<b>Culvert Maintenance and Replacement</b>	Culverts will be kept clear of debris by DID #30. DID #30 does not currently plan to replace any culverts in the next five years but may if

	they become a problem.
<b>Aquatic Herbicides</b>	DID #30 does not currently plan on using herbicides in this reach but may need to if Reed canarygrass becomes a problem.
<b>Bridge Maintenance and Replacement</b>	Bridges will be kept clear of debris by DID #30. DID #30 does not currently plan to replace any bridges in the next five years but may if they become a problem.
<b>Beaver Dam Management</b>	Beaver dams are a problem in this reach. Dams will be lowered or removed as needed.
<b>Hand Maintenance</b>	Small amounts of debris will be removed using hand tools when needed. Woody vegetation impeding flow will be pruned when needed.

## **SECTION 7: ADOPTED BEST MANAGEMENT PRACTICES (BMPs)**

DID #30 implements the following drainage practices using BMPs detailed in the listed BMP Factsheets:

**Maintenance Dredging** - Dredging is completed, as needed, by utilizing a hydraulically operated boom-type excavator operated from the top of bank. The excavator is typically equipped with a wide, flat-bottomed bucket with a lid that is designed to remove Reed canarygrass and accumulated sediments without allowing sediment laden water to spill back into the watercourse. Alternatively an excavator with a clamshell bucket is sometimes utilized to “pluck” obstructing clumps of Reed canarygrass from the channel also without allowing sediment laden water to spill back into the channel. All dredged material is deposited landward of the ditch so that it will not return to the water and can later be moved back into the adjoining field or be hauled away.

*BMP Factsheet #6 General Drainage Maintenance BMPs*

*BMP Factsheet #7 Maintenance Dredging*

*BMP Factsheet #14 Constructed Watercourse Maintenance*

*BMP Factsheet #15 Fish Protection*

*BMP Factsheet #16 Water Quality Protection Measures*

**Beaver Dam Management** – Beaver dams are the most common impediment to drainage in DID #30. When dams are of a sufficient size to impact property they are typically removed by hand often simultaneously with beaver trapping. If a dam is located in a natural or unnatural constriction point such as a culvert or area where the channel narrows “beaver deceivers” or “flow levelers” may be utilized. Removal of large dams using a tracked excavator may be necessary in rare circumstances.

*BMP Factsheet #6 General Drainage Maintenance BMPs*

*BMP Factsheet #8 Beaver Dam Management*

*BMP Factsheet #15 Fish Protection*

*BMP Factsheet #16 Water Quality Protection Measures*

**Watercourse Vegetation Management** - Mechanical mowers (rotary or flail designs) are used to control vegetative material from the water line to the top of the bank.

*BMP Factsheet #9 Watercourse Vegetation Management*

**Aquatic Herbicides** – Reed canarygrass growing in the channel bottom and on streambanks can be treated with an aquatic formula of glyphosate with less impact than mechanical dredging. Applications are done in late summer or early fall when the practice is most effective.

*BMP Factsheet #10 Aquatic Herbicides and Watercourse Maintenance*

**Culvert Maintenance and Replacement** - Culverts must be maintained to ensure normal flow passes through the culvert consistent with its design specifications. This typically includes dredging of a ditch adjacent to culvert openings and occasional cleaning-out of the culvert interior. Cleaning is usually performed through the use of high-pressure water, mechanical dredging or by hand. Repair or replacement is necessary when damage or normal deterioration occurs to the extent that prevents optimum water flow or an unsafe crossing situation. When replacement is necessary, bridges will be used when possible or new culverts will be designed using WDFW’s no-slope design criteria. Individual permits will be obtained when culverts need replaced.

*BMP Factsheet #6 General Drainage Maintenance BMPs*

*BMP Factsheet #7 Maintenance Dredging*  
*BMP Factsheet #11 Culvert Maintenance and Replacement*  
*BMP Factsheet #14 Constructed Watercourse Maintenance*  
*BMP Factsheet #15 Fish Protection*  
*BMP Factsheet #16 Water Quality Protection Measures*

**Bridge Maintenance and Replacement** - Bridges must be properly maintained in order to ensure normal flow under the bridge while also continuing to provide equipment or foot access across a watercourse. Repair or replacement is necessary when incidental damage occurs to a bridge that prevents optimum water flow or results in an unsafe crossing situation. Repair or replacement activities typically occur above the high water line. Individual permits will be obtained when bridges need replaced.

*BMP Factsheet #12 Bridge Maintenance and Replacement*

**Constructed Watercourse Maintenance** – Landowners or DID #30 can maintain their constructed watercourses voluntarily using the BMPs listed in:

*BMP Factsheet #14 Constructed Watercourse Maintenance.*

**Hand Maintenance** – Minor obstructions often need removed to keep a watercourse open and flowing. Removing obstructions by hand has less negative impacts than other practices such as dredging.

*BMP Factsheet #17 Hand Maintenance.*


## SECTION 8: HABITAT IMPROVEMENT OPPORTUNITIES

List of Potential Habitat Improvement Projects:

1. Assess two unknown crossings.
2. Seek funding and replace two privately owned barrier culverts.
3. Enhance spawning gravels in reach S1.
4. Distribute *Informational Factsheets* to DID #30 landowners to encourage land use practices that will better keep contaminants out of district watercourses.

Habitat Improvement Project 5 Year Goals:

1. Work with Nooksack Salmon Enhancement Association (NSEA) or others to assess unknown crossing in Reach S1.
2. Work with NSEA or others to assess unknown crossing in Reach S2.
3. Contact landowner in Reach S1 and seek participation to replace culvert #1285105.
4. Seek funding to replace culvert #1285105.
5. Assist with permitting and replace culvert #1285105.
6. Contact landowner in Reach S2 and seek participation to replace culvert #1285101.
7. Seek funding to replace culvert #1285101.
8. Assist with permitting and replace culvert #1285101.
9. Following any dredging work on modified natural watercourses, both sides of the stream will be planted with native tree or shrub buffers.
10. Clean or supplement 150' of spawning gravels in reach S2.
11. Mail the following *Informational Factsheets* to DID #30 landowners:  
*Informational Factsheet #18 Drainage Water Quality*  
*Informational Factsheet #21 Farm Practices*

PI TOTAL:	18.40	GENERAL INFORMATION	CULVERT ATTRIBUTES		
	Site ID:	1285105	Shape:	RND	
	Stream:	Unnamed	Material:	CAL	
	Trib To:	Silver Cr	Span (m):	1.22	
	Owner:	Private	Length (m):	7.15	
		BARRIER STATUS	HABITAT GAIN		
		Problem:	Slope	Lineal Gain (m):	1,753
		Ds Barriers:	3	Spawn Area (m2):	1,416
		Us Barriers:	0	Rear Area (m2):	1,337

PI TOTAL:	24.55	GENERAL INFORMATION	CULVERT ATTRIBUTES		
	Site ID:	1285101	Shape:	RND	
	Stream:	Unnamed	Material:	PCC	
	Trib To:	Silver Cr	Span (m):	1.23	
	Owner:	Private	Length (m):	7.50	
		BARRIER STATUS	HABITAT GAIN		
		Problem:	Slope	Lineal Gain (m):	3,987
		Ds Barriers:	2	Spawn Area (m2):	4,523
		Us Barriers:	1	Rear Area (m2):	4,208

Note: Habitat Improvement projects are contingent upon landowner willingness.

## **SECTION 9: MONITORING, REPORTING AND ADAPTIVE MANAGEMENT PLANS**

**Monitoring Plan:** DID #30 adopts the attached tracking form to monitor all of its activities. Detailed records will be maintained for all drainage maintenance projects including BMP's utilized. Records of all habitat improvement projects will also be maintained for at least 5 years.

**Reporting:** DID #30 will review and approve the completed Monitoring Form at their September annual meeting. A copy of the Monitoring Form with a few representative project photos will then be submitted to the WDFW Area Habitat Biologist.

**Adaptive Management:** DID #30 will review this Drainage Management Plan at the annual meeting. Any changes in the plan should be clearly marked and submitted to WDFW for approval. Adaptive management measures may include:

1. Changes in Drainage Maintenance Schedule.
2. New or changed drainage maintenance BMPs
3. Changes to Habitat Improvement Projects 5 year list.





