

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



**Drainage Improvement District #30A**

**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 #30A (DID #30A) is located within the Tenmile Creek sub-basin in Whatcom County north of the City of Bellingham and east of the City of Ferndale (Figure 1). DID #30A includes the south fork of Deer Creek, a significant Tenmile Creek tributary. Tenmile Creek is a Nooksack River tributary.

### **Boundaries:**

DID #30A jurisdictional boundaries are illustrated in Figure 2. The district is bordered by DID #30 just south of Smith Rd and ends west of Aldrich Rd and South of Axton Rd with other borders generally following parcel boundaries. Although DID #30A boundaries extend west of Aldrich Rd the district does not hold easements allowing drainage maintenance work west of Aldrich Rd.

### **Area:**

DID #30A encompasses approximately 305 acres within its jurisdictional boundaries.

### **Significant Features:**

DID #30A is located in an area of generally flat terrain comprised of mostly prior converted wetlands. Watercourses have been routed around one large hill located near the center of the district. The south fork of Deer Creek is the primary watercourse. Its headwaters originate in "Larrabee Springs", a natural spring located just south of Smith Rd that provides perennial flows. Two additional small constructed ditches from the east provide additional seasonal flow. Deer Creek within DID #30A is used by Coho Salmon, Chum Salmon and Cutthroat Trout. Water from DID #30A flows to the west and combines with the north fork of Deer Creek, then Tenmile Creek and eventually joins the Nooksack River near Ferndale.

### **Predominant Land Uses:**

Most of the district is used for commercial crop and pasture production in support of the dairy industry. Rural residences, hobby farms and small berry fields are also common in the district. Much of the district is zoned Agricultural with also some Rural 1DU/10AC and 1DU/5AC.

### **Predominant Drainage Issues:**

1. Beavers – Beaver dams cause most of the drainage related concerns in DID #30A. 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 – Grass growing in the channel bottom and on the streambanks impedes drainage and prevents natural sediment transport. Reaches of stream that have not been re-vegetated need periodic grass treatment including herbicide applications, mowing and dredging.

3. Accumulated sediments – Improved agricultural practices have 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, because of narrow buffers some sediment still probably enters the watercourse and may need removed in the future.

## SECTION 2: MAPS AND WATERCOURSE CLASSIFICATIONS

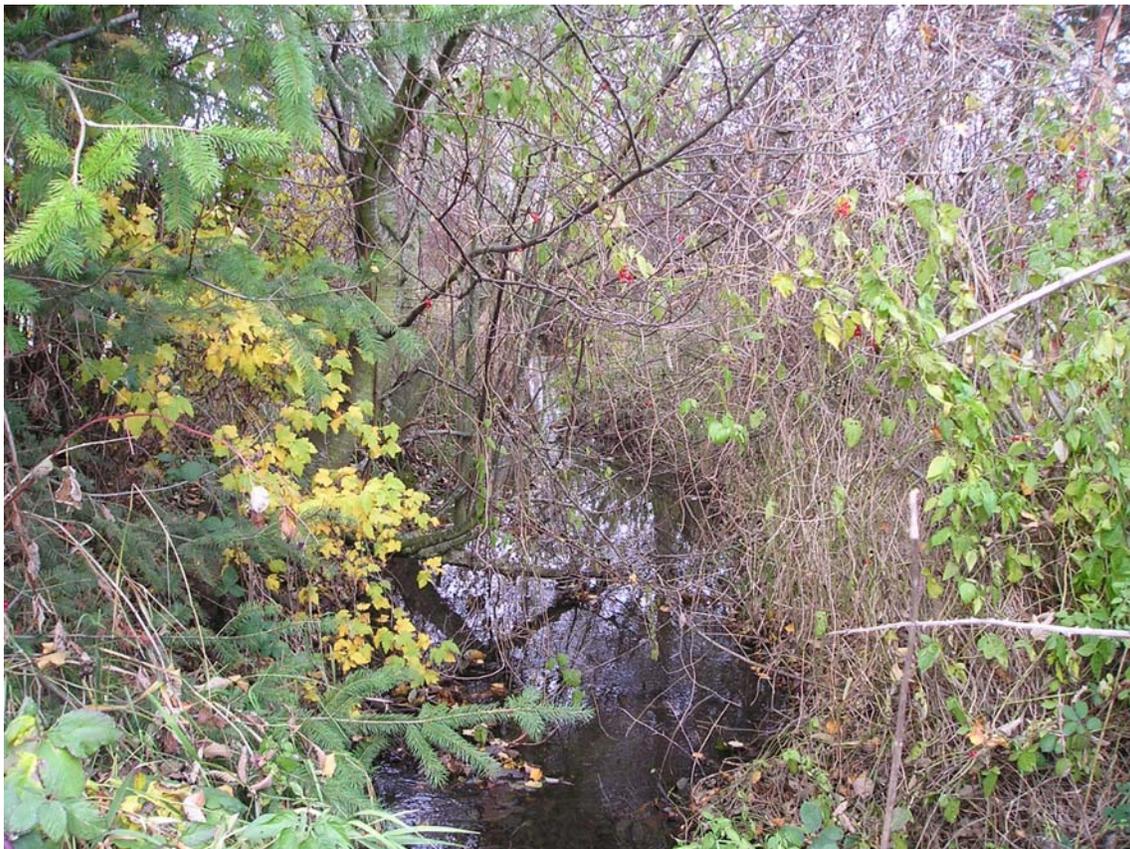
### **Watercourse Classifications:**

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 #30A. 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 #30A. Some channels retain natural features such as meanders but have been either cleared or dredged in the past. 0 feet

**Modified Natural Watercourses (Yellow):** The south fork of Deer Creek is a modified watercourse totaling 7,750 feet. DID #30A maintains 4,850 feet of modified watercourse.

**Constructed Watercourses (Green):** Several constructed field ditches exist in farmed areas. These ditches are typically short and terminate in either other constructed ditches or in the south fork of Deer Creek and total 5,265 feet. DID #30A maintains 0 feet of constructed watercourse.



DID # 30A Modified Natural Watercourse

### SECTION 3: OTHER DRAINAGE INFRASTRUCTURE

**Road Crossings** - 10 known culverts and bridges (Figure 3) (Table 1) are known to exist in DID #30A. None of these crossings are owned or maintained by DID#17 however DID #30A is responsible for keeping crossings clear of debris and beaver dams. Two road culverts are 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 does not list any culverts in DID #30A as being barriers to fish passage however several known culverts have not been assessed.

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

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

**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 #30A DRAINAGE INFRASTRUCTURE INVENTORY

Type of Structure	Number	Culvert Shape	Culvert Material	Culvert Span/Dia	Culvert Length	Ownership	Stream Name	Priority Index #
Culvert	370116	RND	PCC	1.22	14.94	WCPW	S.F. Deer Creek	0.00
Culvert	370595	RND	PCC	0.91	22.56	WCPW	S.F. Deer Creek	0.00
Culvert	1285109	RND	SST	0.78	6.05	Private	Andreason Ditch	0.00
Unknown	UNK30a-01					Private	S.F. Deer Creek	
Culvert	UNK30a-02					Private	S.F. Deer Creek	
Unknown	UNK30a-03					Private	S.F. Deer Creek	
Unknown	UNK30a-04					Private	S.F. Deer Creek	
Culvert	UNK30a-05					Private	S.F. Deer Creek	
Unknown	UNK30a-06					Private	S.F. Deer Creek	
Unknown	UNK30a-07					Private	S.F. Deer Creek	

## 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 #30A 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 #30A support reproducing populations of Coho salmon and Cutthroat trout. 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 or suitable fish habitat 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 #30A** - Functioning riparian areas are lacking along much of the watercourse and large woody debris is limited to one small area. The result is little high quality

Salmonid habitat and elevated water temperatures from the lack of shade. The reach analysis in Section 5 provides more detailed habitat information and photos.

**Fish Distribution in DID #30A –**

The south fork of Deer Creek within DID #30A has use by Coho Salmon, Chum Salmon and Cutthroat Trout; presumed use by Bulltrout and potential/historic use by Steelhead. Coho have been observed spawning in the upper reaches of the south fork of Deer Creek near its origin at Larrabee Springs. Figure 2 details fish presence in DID #30A. 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 #30A. 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 been planted. Some 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 drainage maintenance work.

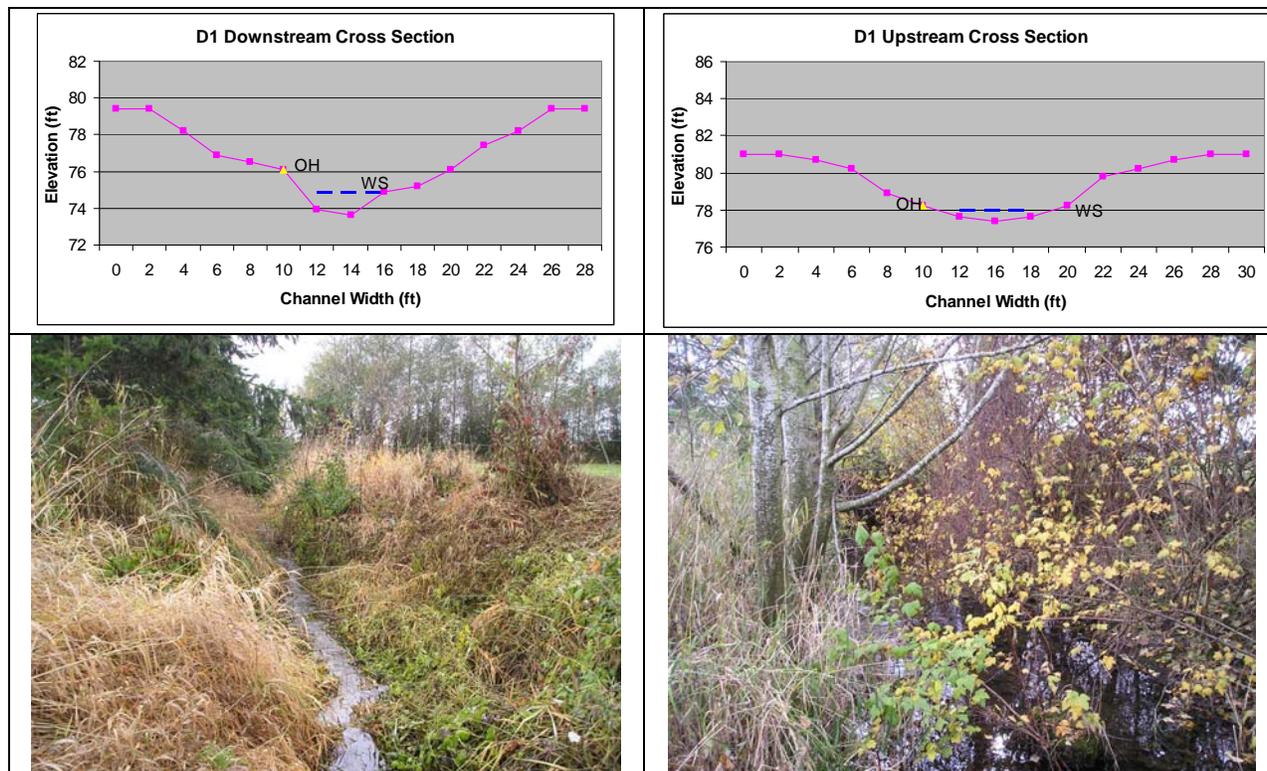


Typical farmed wetland in DID #30A

## SECTION 5: MAINTAINED WATERCOURSE REACH ANALYSIS

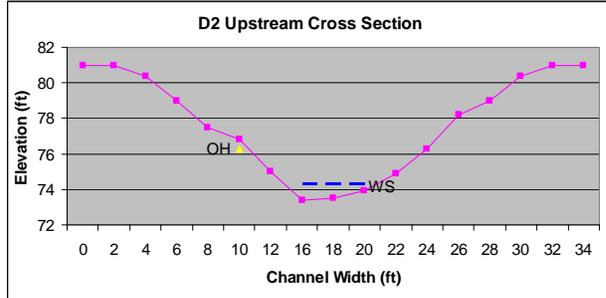
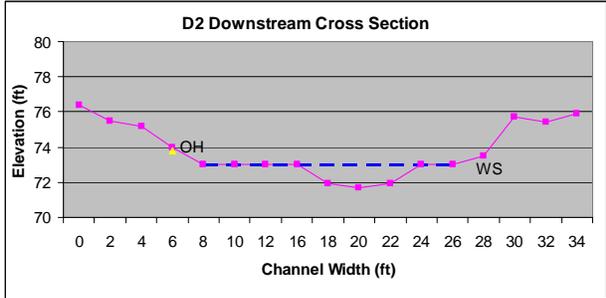
Figure 3 indicates watercourse reaches historically maintained by DID #30A. Legal Easements allow continued drainage maintenance on all watercourses labeled as DID #30A Maintained Watercourses on Figure 3. Maintained watercourses have been divided into relatively homogeneous reaches. In depth analysis 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 D1 South Fork Deer Creek</b>
	<b>Existing Conditions</b>
<b>Reach Description</b>	Begins at Smith Rd and extends to the approximate center of the DID #30A maintained area where the watercourse turns northwest.
<b>Length</b>	2,350 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 6 feet to 12 feet. Large woody debris in the channel is absent. Elevated water temperatures would be expected during the summer due to the absence of adequate riparian cover. Land use practices in the south portion of this reach has resulted in shallow water on top of deep mucky field deposits.
<b>Riparian Characteristics</b>	Narrow buffers of native trees and shrubs have been planted along much of this reach in the past 10 years. Some areas have good canopy cover and little Reed canarygrass remaining on the streambanks or in the stream. Other areas are still primarily covered with Reed canarygrass and Nightshade. Approximately 600 feet of Reach D1 just downstream of Smith Rd was planted with native trees or shrubs by the landowner in the late summer of 2009.
<b>Fish Passage Barriers &amp; Obstacles</b>	<ol style="list-style-type: none"> <li>1. The Smith Rd culvert (370595) was assessed and is not a fish passage barrier.</li> <li>2. Two other known crossings have not been assessed.</li> </ol>
<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 D1. Habitat is limited by the absence of large woody debris in the channel and inadequate riparian vegetation. Elevated water temperatures and low dissolved oxygen levels during the summer may limit salmonid rearing opportunity.



<b>Reach D2 South Fork Deer Creek</b>	
<b>Existing Conditions</b>	
<b>Reach Description</b>	Begins at the end of Reach D1 near the center of the district and ends at Aldrich Rd.
<b>Length</b>	2,450 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 6 feet to 20 feet. Large woody debris was placed in the downstream most 1,000 feet in 2007 but is absent in the rest of the reach. Elevated water temperatures would be expected during the summer due to the inadequate riparian cover.
<b>Riparian Characteristics</b>	This entire reach has been successfully planted with native trees and shrubs. The upstream 1,500 feet was planted in the late 1990s with a narrow buffer that now shades over 90% of the channel. The downstream 1,000 feet was planted with large buffers in the spring of 2007. Early succession plants are beginning to shade the channel and there should be good shade in the next few years.
<b>Fish Passage Barriers &amp; Obstacles</b>	<ol style="list-style-type: none"> <li>1. The Aldrich Rd culvert (Site ID #370116) was assessed and is not a barrier.</li> <li>2. Two other known crossings (UNK30a-04, UNK30a-05) have not been assessed.</li> </ol>

<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 D2. Habitat is limited but improving with the addition of large woody debris and additional riparian planting. Elevated water temperatures and low dissolved oxygen levels from degraded upstream areas limit salmonid rearing opportunities.



## **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 D1 Drainage Maintenance</b>
<b>Drainage Infrastructure</b>	<ol style="list-style-type: none"> <li>1. DID #30A is responsible for maintaining the south fork of Deer Creek within this reach.</li> <li>2. WCPW maintains the Smith Rd culvert.</li> <li>3. DID #30A keeps culverts and crossings free of debris but private landowners own and are otherwise responsible for their crossings.</li> </ol>
	<b>Reach D1 Drainage Maintenance Activities:</b>
<b>Maintenance Dredging</b>	DID #30A 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 #30A may mow limited areas (approximately 900') during the next 5 years to manage Reed canarygrass and Nightshade.
<b>Culvert Maintenance and Replacement</b>	Culverts will be kept clear of debris by DID #30A. DID #30A 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 #30A 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 #30A. DID #30A 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 have not been a problem in this reach. If Beavers colonize the 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 D2 Drainage Maintenance</b>
<b>Drainage Infrastructure</b>	<ol style="list-style-type: none"> <li>1. DID #30A is responsible for maintaining the south fork of Deer Creek within this reach.</li> <li>2. WCPW maintains the Aldrich Rd culvert.</li> <li>3. DID #30A keeps culverts and crossings free of debris but private landowners own and are otherwise responsible for their crossings.</li> </ol>
	<b>Reach D2 Drainage Maintenance Activities:</b>
<b>Maintenance Dredging</b>	DID #30A 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 #30A 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 #30A. DID #30A 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 #30A will continue to use herbicides in this reach to control Reed canarygrass until native trees and shrubs are large enough to provide adequate shade.
<b>Bridge Maintenance and Replacement</b>	Bridges will be kept clear of debris by DID #30A. DID #30A 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 have not been a problem in this reach. If Beavers colonize the 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 #30A 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 #30A. 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 #30A 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 fish passage through four unknown crossings.
2. Seek funding and replace crossings if they are assessed as fish passage barriers.
3. Enhance wetlands associated with Reach D2.
4. Enhance riparian zones by planting native tree and shrub buffers.
5. Maintain riparian plantings until native trees and shrubs become established.
6. Distribute *Informational Factsheets* to DID #30A 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 crossings.
2. Enhance Reach D1 by planting native tree and shrub buffers where they do not already exist (approximately 900').
3. Contact and work with landowner north of Smith Rd to ensure that riparian buffer plants are maintained.
4. Following any dredging work on modified natural watercourses, both sides of the stream will be planted with native tree or shrub buffers.
5. Contact and work with landowners east of Aldrich Rd regarding enhancement of farmed wetlands that have been frequently impacted by beaver dam activity downstream of Aldrich Rd.
6. Mail the following *Informational Factsheets* to DID #30A landowners:  
*Informational Factsheet #19 Drainage Water Quality*  
*Informational Factsheet #22 Farm Practices*

Note: Habitat Improvement projects are contingent upon landowner willingness and funding.

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

**Monitoring Plan:** DID #30A 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 #30A 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 #30A 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.



