

**Whatcom County  
Bertrand Watershed Improvement District  
Agricultural and Watershed Enhancement Plan**



**Bertrand Watershed Improvement District**

**assisted by**

**Whatcom Conservation District**

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## 1.0 SUMMARY

The Bertrand Watershed Improvement District (BWID) will sponsor and participate in a series of actions to enhance their farmlands and to enhance the function of watersheds within the district. The purpose of this plan is to identify the practices, such as drainage maintenance, needed to preserve viable agriculture and to identify practices to both offset unavoidable negative impacts and to generally improve ecological functions. The intention is to also demonstrate that work undertaken by the BWID is consistent with the Whatcom County Critical Areas Ordinance, Shorelines Management Plan and the Washington State Hydraulic Code. The goal is to generally identify the practices and projects, document best management practices designed to minimize impacts, and to secure long term permits from the Washington State Department of Fish & Wildlife (WDFW) and from Whatcom County Planning and Development Services (PDS). The result will be an expedited process that will benefit all three agencies.

The Bertrand Watershed Improvement District Agriculture-Watershed Characterization and Mapping Report was completed in August 2016. That report is a comprehensive look at agricultural and watershed processes in the BWID that provides important background information. The report can be found at [www.bertrandwid.com](http://www.bertrandwid.com). This BWID Agricultural and Watershed Enhancement Plan addresses specific permitting requirements and describes practices the BWID would like to permit and implement in the next few years.

## 2.0 DISTRICT OVERVIEW

### General:

The BWID was founded in 2004 under WA State law (RCW 87.03). Local farmers and landowners organized to represent the needs of the agriculture community. The BWID along with five other established WIDs envisions:

- Healthy and sustainable water systems
- A vibrant and productive agricultural economy
- A sense of community by developing positive and trusting relationships
- A unified presence and educated representation of all agricultural industries

The priorities of the BWID include:

1. Water Quantity
2. Water Quality
3. Agricultural Drainage
4. Flood Management
5. Communication, Outreach, and Education
6. Water Flow Processes; Habitats and Species
7. Agricultural Protection

**Location:**

The Bertrand Watershed Improvement District is located in the north central lowland area of Whatcom County, adjacent to the mainstem Nooksack River within WRIA 1. Some of the District is in the floodplain of the Nooksack River. Land use is mixed, including agriculture and rural residential areas. Agriculture includes a mix of dairy crops, berries, and seed potatoes. Several large agricultural production facilities supporting the regional agricultural community are located with the BWID.

The closest city is Lynden (Pop. 12,900) to the east. The City of Ferndale (pop. 12,700) is located to the south. A significant proportion of the soils in the BWID have been classified by the USDA Natural Resources Conservation Service as Prime or Prime if managed. The BWID area encompasses 14,393 acres in total.

Major waterbodies include Bertrand Creek, lower Fishtrap Creek, and Schneider Ditch. Bertrand, Fishtrap and Double Ditch (a Fishtrap tributary) originate in Canada. These primary streams and numerous smaller streams and tributaries contribute significant water flows to the Nooksack River.

The BWID contains three other special purpose districts within its boundaries: Consolidated Drainage Improvement District #1 generally encompasses the Duffner Ditch (a Bertrand Creek tributary) area within the Nooksack River floodplain. Drainage Improvement District #2 generally encompasses the Schneider Ditch area mostly within the Nooksack River floodplain. Diking District #4 maintains a system of levees along the Nooksack River, Fishtrap Creek, and Bertrand Creek. Other right bank Nooksack River levees are maintained by the Whatcom County Flood Control Zone District Lynden/Everson Subzone.

**Fish Presence:**

Modified natural streams shown in Appendix 1 typically have fish presence as mapped by WDFW's "Salmonscape". Fish use includes:

Fishtrap Creek - Fall Chinook, Coho, Chum, Steelhead and Cutthroat trout.

Bertrand Creek - Fall Chinook, Coho, Chum, Steelhead and Cutthroat trout.

Double Ditch (Fishtrap trib.) - Fall Chinook, Coho, Chum, Steelhead and Cutthroat trout.

Schneider - Coho, Steelhead and Cutthroat trout.

Whiskey - Fall Chinook, Coho, Steelhead and Cutthroat trout

Duffner – Coho, and Cutthroat trout.

McClellan (Bertrand Trib.) - Fall Chinook, Coho, Chum, Steelhead and Cutthroat trout.

Current fish use is limited by floodgates in Duffner Ditch and Whiskey Creek. Smaller tributary streams and ditches may also have fish use. Watercourses in the Nooksack River floodplain will likely have juvenile fish seeking refuge during flood events.

**Fish Habitat:** Factors contributing to functioning fish habitat includes good water quality (cool, clean), instream structure such as large wood (refuge out of flows, cover from predators), and riparian cover (shade, food source, cover from predators). In the BWID, functioning riparian areas are not continuous along many of the watercourses

and large woody debris is not common. The result is limited high quality Salmonid habitat and elevated water temperatures.

### **Watercourse Classifications:**

The classifications used in this plan are defined in the Drainage Management Guide for Whatcom County and are based upon those utilized by the Washington Department of Fish & Wildlife (WDFW). WDFW jurisdictional watercourses are mapped as Modified Natural for the purposes of this plan. Appendix 1 illustrates the watercourse classifications in the BWID. WDFW watercourse GIS layers, aerial photos and local residents were used to determine the extent of modified natural and constructed watercourses.

**Natural Watercourses (Red):** Are defined as having not been significantly altered from their natural flow path, floodplain, and riparian cover. No natural watercourses exist in the BWID. Some channels retain natural features such as meanders but have been either cleared or dredged in the past.

**Modified Natural Watercourses (Yellow):** Are defined as being historically altered natural systems. They typically have headwaters and may have been previously diverted, dredged, straightened, dyked, or cleared. Bertrand Creek, Fishtrap Creek, Double Ditch, Schneider Ditch, Wiskey Creek and numerous tributaries are all modified watercourses as well as several other smaller independent Nooksack River tributary streams.

**Constructed Watercourses (Green):** Are typically short ditches that start in fields, lack headwaters and eventually flow into modified watercourses. Numerous constructed field ditches exist in farmed areas

**Stream Crossings and Fish Passage:** Numerous stream crossings exist in the BWID including State highways, County roads, private driveways and farm roads. Typical structures are bridges and culverts. Culverts may be barriers to fish passage and are commonly undersized contributing to poor drainage and flooding. Floodgates are structures used to prevent Nooksack River floodwaters from surging into smaller watercourses. The floodgates found in the BWID are also barriers to fish passage.

**Past Drainage Maintenance Mitigation Work:** Some habitat restoration has been completed in the past as mitigation for drainage maintenance, mostly along Schneider Ditch. Extensive Hedgerow plantings have been installed to prevent Reed canarygrass growth in the channel by casting deep shade.

**Past Voluntary Habitat Restoration:** Considerable work has also been completed to restore more natural habitat conditions using the Conservation Reserve Enhancement Program (CREP) or other voluntary programs. Stream and wetland buffers now exist in the BWID where landowners have chosen to participate. Several culverts that were

barriers to fish passage have also been remedied in recent years as has a floodgate in Schneider Ditch.

**Wetlands:**

Farmlands in the BWID are classified by the Natural Resources Conservation Service (NRCS) as either Prior Converted Wetland, Farmed Wetland, or Non Wetland status.

**Other Significant Natural Features:**

Nooksack River – The mainstem Nooksack River borders the BWID and is a migration corridor to several listed fish species including Bull trout, Chinook salmon, and Steelhead.

Nooksack River Floodplain – The Nooksack floodplain contains very high quality farmland, fish habitat and is managed for flood conveyance.

**3.0 AGRICULTURAL ENHANCEMENT PRIORITIES**

Common agricultural practices that may have negative impacts to other natural resources are listed below as well as WDFW and PDS notification requirements. When required, offsetting enhancements (mitigation) will be negotiated prior to implementation.

**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.

30 day notice to WDFW Habitat Biologist

Natural Resource Notification of Activity to PDS 10 days prior

**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.

14 day notice to WDFW Habitat Biologist

Natural Resource Notification of Activity to PDS 10 days prior

**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.

14 day notice to WDFW Habitat Biologist (maintenance)

30 day notice to WDFW Habitat Biologist (replacement)

Natural Resource Notification of Activity to PDS 10 days prior

**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. Treatment is completed in late summer or early fall when the practice is most effective.

Permit from Washington State Department of Ecology.

**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.

14 day notice to WDFW Habitat Biologist (maintenance)

30 day notice to WDFW Habitat Biologist (replacement)

Natural Resource Notification of Activity to PDS 10 days prior

**Beaver Dam Management** - Beaver dams are the most common impediment to drainage. 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.

3 day notice to WDFW Habitat Biologist (dam less than 1 month old)

14 day notice to WDFW Habitat Biologist (dam more than 1 month old)

Natural Resource Notification of Activity to PDS 10 days prior

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

14 day notice to WDFW Habitat Biologist

Natural Resource Notification of Activity to PDS 10 days prior

Many other agricultural practices may be needed during the timeframe of this plan. These include but are not limited to practices such as ditch covering (for water quality improvements), pump stations (for use during the growing season), streambank stabilization and fish screens (on irrigation intakes).

14 day notice to WDFW Habitat Biologist

Natural Resource Notification of Activity to PDS 10 days prior

#### 4.0 WATERSHED ENHANCEMENT PRIORITIES

Actions to enhance watershed functions are well documented in other planning documents including the Whatcom County Shorelines Management Plan and the WRIA 1 Salmon Recovery Plan. In general, plans call for implementing practices that improve fish habitat, enhance riparian areas, and improve water quality. Practices such as these always require voluntary landowner participation and may require additional grant funding. The BWID may implement these projects both as mitigation for agricultural practices and as proactive steps to improve watersheds in agricultural areas. Examples of these practices include:

**Riparian Forest Buffers** – Planting native trees and shrubs (35' minimum width) along waterways to improve fish habitat and water quality. Funding may be available from the Conservation Reserve Enhancement Program (CREP), the Environmental Quality Incentive Program (EQIP), or from the Washington State Department of Ecology.  
14 day notice to WDFW Habitat Biologist  
Natural Resource Notification of Activity to PDS 10 days prior

**Hedgerow Buffers** – Planting predominantly native shrub buffers (15' width) along waterways to improve fish habitat and water quality. Funding may be available from CREP, and EQIP.  
14 day notice to WDFW Habitat Biologist  
Natural Resource Notification of Activity to PDS 10 days prior

**Fish Passage** – Replacing culverts, floodgates, or other structures that act as barriers to fish passage with fish passable structures. Additional benefits often include safer crossings, better drainage and reduced flooding. Funding may be available from CREP, EQIP, or the Family Forest Fish Passage Program (FFFPP).  
30 day notice to WDFW Habitat Biologist  
Natural Resource Notification of Activity to PDS 10 days prior

**Instream Habitat Structures** – Placing large wood in the stream to increase channel complexity and provide cover and shelter for fish. Funding may be available from EQIP.

Other projects that could be considered include spawning gravel supplementation, flow supplementation, wetland enhancement, and floodgate modification.  
30 day notice to WDFW Habitat Biologist  
Natural Resource Notification of Activity to PDS 10 days prior

#### 5.0 GENERAL MITIGATION REQUIREMENTS

When work takes place in critical areas (watercourses and wetlands) or their buffers mitigation is required to offset any unavoidable impacts, (Whatcom County Critical



Areas Ordinance, Shorelines Management Plan and the Washington State Hydraulic Code).

Appropriate mitigation will be proposed as each project is planned. Proposed mitigation will be designed to replace any lost natural resources functions or values.

**Mitigation Sequencing** – As a project is planned, impacts will be mitigated in the following sequence:

1. Avoid. Conducting the work away from critical areas. Many farm practices such as drainage maintenance cannot reasonably avoid undertaking work in critical areas, their buffers or floodplains.
2. Minimize. Practices needed to maintain farmland productivity such as drainage maintenance are expensive and inconvenient to implement. No work will be planned unless it is absolutely necessary.
3. Restore. Disturbed areas will be stabilized and restored. Damaged woody plants will be replaced. In some cases, native trees and shrubs will be planted to replace lost habitat.
4. Compensate. Off-site habitat projects may also compensate for impacts. An example is the removal of a fish passage barrier opening new habitat as compensation for habitat lost from drainage maintenance. Riparian planting can also compensate for stream habitat impacts.

**Mitigation Plan** – Site specific mitigation plans will be submitted to WDFW and PDS staff along with notification of the planned agricultural enhancement or watershed improvement activity. The plan will include detailed descriptions of activities, best management practices, drawings (if needed), maps, and maintenance and monitoring plans.

**Mitigation Monitoring and Maintenance** – The BWID will maintain any mitigation projects for a minimum of five years. Native plant buffers will be maintained using CREP standards. Other practices will be maintained following NRCS Operations and Maintenance procedures.

### **BEST MANAGEMENT PRACTICES (BMPs)**

Appendix 2 to this addendum includes a series of BMP factsheets with detailed information on practices designed to minimize impacts to natural resources.

#### **Maintenance Dredging**

*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**

*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**

*BMP Factsheet #9 Watercourse Vegetation Management*

**Aquatic Herbicides**

*BMP Factsheet #10 Aquatic Herbicides and Watercourse Maintenance*

**Culvert Maintenance and Replacement**

*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**

*BMP Factsheet #12 Bridge Maintenance and Replacement*

**Constructed Watercourse Maintenance**

*BMP Factsheet #14 Constructed Watercourse Maintenance*

**Hand Maintenance**

*BMP Factsheet #17 Hand Maintenance*

## 6.0 SCHEDULING AND REPORTING FORMS

Bertrand Watershed Improvement District Work Schedule			
Agricultural Improvements			
<u>Maintenance Practice</u>	<u>Date(s) Planned</u>	<u>Watercourse feet impacted</u>	<u>Notes</u>
<b>Maintenance Dredging</b>			
As needed	?	?	
<b>Watercourse Vegetation Management</b>			
As needed	?	?	
<b>Culvert Maintenance and Replacement</b>			
As needed	?	?	
<b>Bridge Maintenance and Replacement</b>			
As needed	?	?	
<b>Aquatic Herbicide Applications</b>			
As needed	?	?	
<b>Beaver Dam Management</b>			
As needed	?	?	
<b>District Specific Practices</b>			
As needed	?	?	

**Bertrand Watershed Improvement District Work Schedule**  
**Habitat Improvements**

<b>Project Name or Description</b>	<b><u>Date(s) planned</u></b>	<b><u>Watercourse feet impacted</u></b>	<b>Notes</b>
Duffner Ditch floodgate replacement	2019	200'	Fish passage, install self regulating floodgates
Bertrand Creek at Badger Rd enhancements	2019	200'	Stabilize streambank to reduce fine sediment load, large wood placement for fish habitat
McClellan Creek fish passage	2019	100'	Replace barrier culverts with bridge
Other projects as available			

**Bertrand Watershed Improvement District Reporting and monitoring form**  
**Agricultural Improvements:**

<u>Maintenance Practice</u>	<u>Date(s) Implemented</u>	<u>Watercourse feet impacted</u>	<u>Notes</u>
<b>Maintenance Dredging</b>			
<b>Watercourse Vegetation Management</b>			
<b>Culvert Maintenance and Replacement</b>			
<b>Bridge Maintenance and Replacement</b>			
<b>Aquatic Herbicide Applications</b>			
<b>Beaver Dam Management</b>			
<b>Sediment Trap Maintenance</b>			
<b>District Specific Maintenance Practices</b>			

**Bertrand Watershed Improvement District Reporting and monitoring form**  
**Habitat Improvements**

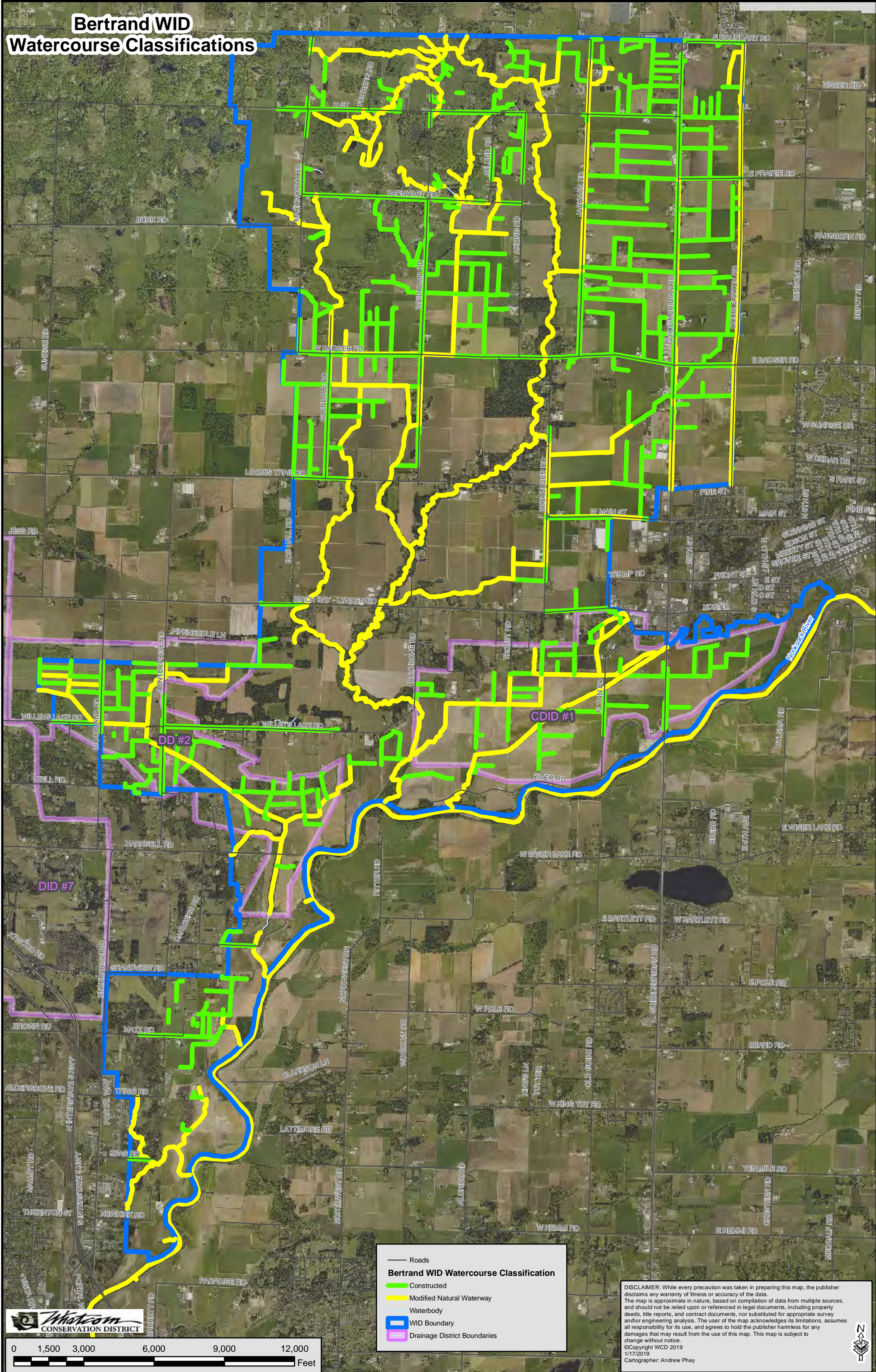
Project Name or Description	Date(s) Implemented	Watercourse feet impacted	Notes

\_\_\_\_\_ Date \_\_\_\_\_  
 BWID Board

\_\_\_\_\_ Date \_\_\_\_\_  
 BWID Board

\_\_\_\_\_ Date \_\_\_\_\_  
 BWID Board

# Bertrand WID Watercourse Classifications



— Roads

**Bertrand WID Watercourse Classification**

- Constructed
- Modified Natural Waterway
- Waterbody
- WID Boundary
- Drainage District Boundaries

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