Spring Creek
Habitat Restoration Project and Stream Relocation

Mid-Columbia Fisheries Enhancement Group

Biological Assessment

Submitted by
United States Fish and Wildlife Service

March 26, 2009

In accordance with the requirements of Section 7 of the Endangered Species Act of 1973, as amended, the United States Fish and Wildlife Service (FWS) is requesting informal consultation on the effects of the proposed Spring Creek habitat restoration and channel relocation project on bull trout and Ute Ladies'-tresses.

1.0 INTRODUCTION

FWS provided funding to relocate Spring Creek, enhancing the instream and riparian habitat conditions in this highly degraded reach. The Mid Columbia Fisheries Enhancement Group (MCFEG) is the project applicant and sponsor. The proposed project includes relocating the current channel from the existing location to the south; allowing the channel more room for natural stream processes and placing the creek further from influences of nearby development. The goal of this project is to increase and enhance juvenile salmonid rearing habitat. Spring Creek provides potential rearing habitat for spring Chinook and coho salmon, Mid-Columbia River Steelhead and bull trout; rearing habitat has been consistently identified as a limiting factor to salmonid abundance and recovery in the Yakima River Basin. The riparian buffer will be protected from grazing and development and will be replanted and maintained to ensure survival of newly planted native vegetation. Weed abatement is included in the restoration design to help control the spread of invasive, exotic vegetation.

2.0 PROJECT LOCATION

This project is located within the city limits of Union Gap, Yakima County, Washington (Figure 1). Spring Creek is a left bank tributary to Wide Hollow Creek at river mile 0.3, and Wide Hollow Creek enters the Yakima River at river mile 107.4. The proposed project will occur at river mile 0.8 on Spring Creek, near Interstate 82 (I-82). The project is located in Section 5, Township 12 North, Range 19 East. The latitude is 46º 33' 11.985" and the Longitude is 120º 28' 16.995" at the northern end of the project boundary.

To access the site from Yakima, travel south on Main Street into Union Gap, turn west on E. Court Street until it turns into Tacoma Street and heads north. The middle of the proposed project reach on Spring Creek is due west, across an undeveloped lot and goat pasture. The project is located on private property. The landowner should be contacted prior to any site visits.

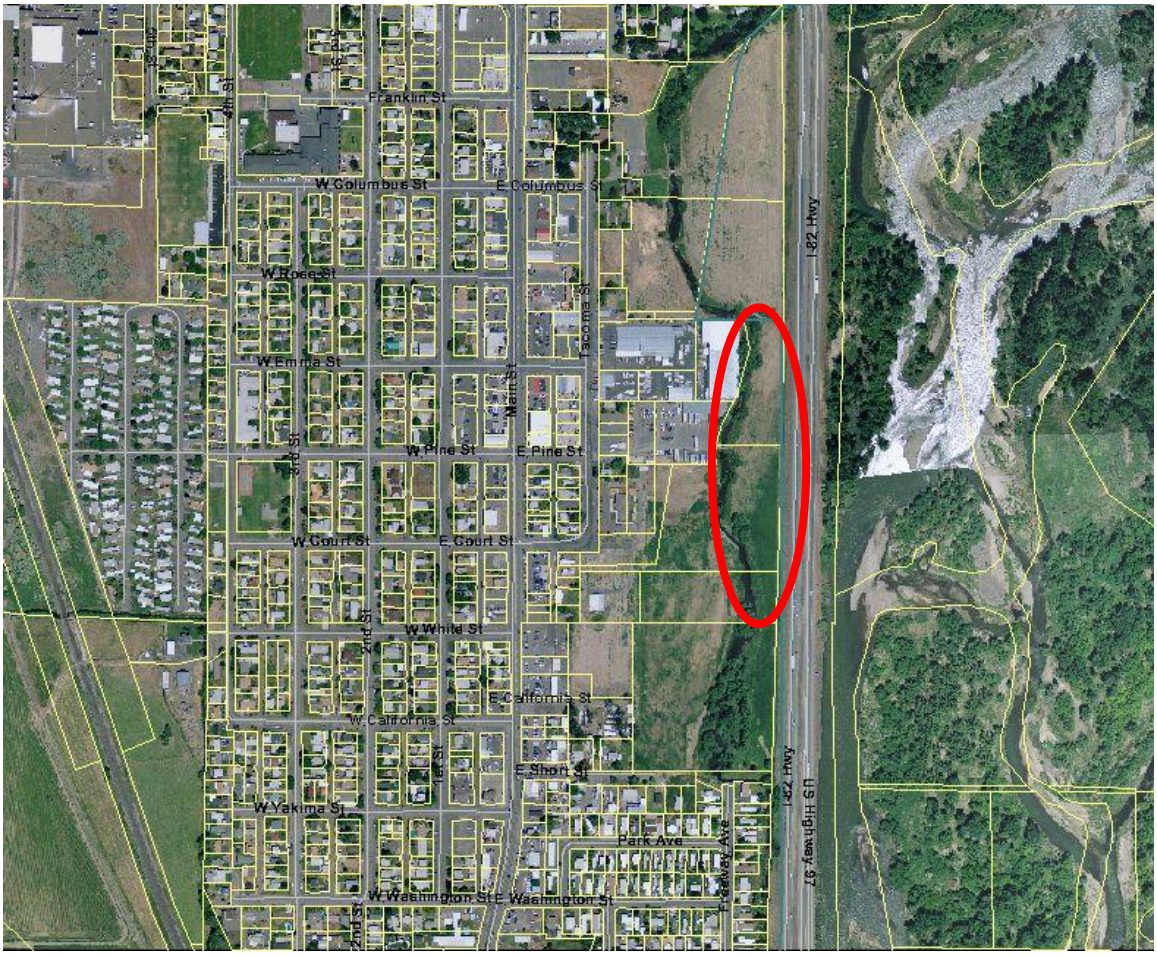

Figure 1. This shows the project location in relation to the city of Union Gap and Interstate 82. The red circle indicates the proposed project location.

3.0 BASELINE CONDITIONS

3.1 WATERSHED CONDITIONS

The project is adjacent to Interstate-82 within the historical migration zone of the Yakima River. Construction of I-82, grazing, and other development in the area has left Spring Creek in an extremely degraded condition. The creek is shallow and wide at the project site, and has been used as farm and pasture land for many years. Native, woody riparian vegetation has largely been removed.

Aptly named, Spring Creek is spring fed from waters that emerge from the aquifer beneath the City of Union Gap. The creek has excellent water temperature and quality, despite its urban environment and lack of riparian cover. Throughout the project area, Spring Creek flows through a sub-irrigated silt-loam meadow that has the potential to support an extremely robust riparian plant community and commensurately complex and productive stream channel. The entire area was once a part of the active Yakima River floodplain, and a part of a large wetland/creek complex. Urban growth, hydrological modification of natural water courses and the construction of Interstate 82 changed these circumstances.

Spring Creek is a tributary to Wide Hollow Creek, which is a right bank tributary to the Yakima River at River Mile 107.4; this confluence is in the City of Union Gap, but Wide Hollow Creek also runs through the City of Yakima. The Wide Hollow Creek watershed is approximately 22 miles in length and suffers from many issues resulting from its proximity to urban development and agricultural practices (Haring 2001). The lower watershed has been altered to facilitate development of transportation systems and provide irrigation delivery to agricultural lands. Cottonwood Creek is the major tributary to Wide Hollow; it is an intermittent stream heavily influenced by irrigation deliveries. While the hydrograph of Wide Hollow Creek is heavily influenced by irrigation practices, Spring Creek appears to maintain a more constant year-round flow.

3.2 Fish Distribution

Spring Creek has high potential to provide quality rearing habitat for native fishes, including resident and anadromous salmonids. Juvenile Spring Chinook salmon, coho salmon, and rainbow trout have been documented in lower Spring Creek, along with native minnows, suckers, and stickleback (WDFW unpublished data 2006). Restoration of Spring Creek will provide higher quality rearing habitat with improved width to depth ratio, deeper meander bends, and increased riparian cover; likely resulting in increased salmonid use over time.

Wide Hollow Creek supports populations of *Oncorhynchus mykiss*, and coho salmon (*O. kisutch*) have been documented spawning and rearing in the creek (WDFW SalmonScape). Mountain whitefish (*Prosopium williamsoni*) have been documented in Wide Hollow Creek as well. Brown trout (*Salmo trutta*) have historically been planted for recreational fishing opportunities throughout lower Wide Hollow Creek (WDFW unpublished data), but this practice no longer occurs. YTAHP surveys in 2007 documented natural reproduction of brown trout within the project area.

Bull trout (*Salvelinus confluentus*) have not been documented in the Wide Hollow Watershed; however there are small, resident populations of bull trout in the upper Ahtanum watershed, adjacent to the Wide Hollow watershed. The Wide Hollow watershed is much lower elevation than the nearby Ahtanum, and water temperatures in much of the Wide Hollow watershed (including Spring Creek) exceed those necessary to support bull trout, and the habitat is not conducive to bull trout spawning or rearing; therefore their occurrence within Spring Creek is extremely unlikely.

3.3 Fish Passage Barriers

An old concrete diversion box and an agricultural culvert on Spring Creek just upstream from its confluence with Wide Hollow Creek are partial barriers, especially to juvenile fish. The project partners anticipate that these barriers will be eliminated as part of a future Washington Dept. of Transportation project to construct a freeway off ramp at this location.

3.4 Water Quality

Spring Creek has not been listed on the Washington Department of Ecology's 303(d) list of impaired water bodies. It is spring fed with a steady flow and water temperature, suitable for salmonid rearing habitat. Increasing the riparian buffer and moving the creek away from

stormwater influences of the existing buildings and parking lots as proposed will further enhance the water quality in Spring Creek, and downstream in Wide Hollow Creek, which has been listed on Ecology's 303(d) list for multiple parameters.

3.5 Land Use

Much of the 1 ¼ miles of Spring Creek are located on prime development property within the city limits of Union Gap. It is inevitable that at some point in the future these properties will be developed, which would likely prohibit any future restoration efforts. Given Spring Creek's current location on the landscape, inevitable future development will have a significant, negative impact on the stream. If restored and protected while there are several large landowners, rather than many small commercial or residential owners, Spring Creek can provide valuable, high-quality rearing habitat for native salmonids.

Currently, the land surrounding the proposed project area is grazed with no livestock exclusion from the stream and very little riparian vegetation. A corn maze is located directly upstream of the project area, with industrial buildings and parking lots encroaching on the creek at the upstream reach of the project area.

3.6 Stream Channel

Currently, the stream channel through the project area is wide and shallow with very little native riparian vegetation. Livestock currently have free access to the creek, further increasing the width to depth ratio and degrading salmonid habitat. Spring Creek flows through fine sandy loam soil in this project area that has the potential to support an extremely robust riparian plant community and commensurately complex and productive stream channel.

4.0 PROJECT DESCRIPTION

4.1 Action Area

The proposed instream project site is located on Spring Creek 0.8 miles upstream from the confluence with Wide Hollow Creek; within the City of Union Gap. The aquatic action area is defined as the portion of the active stream channel (Spring Creek) starting at the northern property boundary and extending 2000 feet downstream; this includes the 1250 feet of the existing creek that will be relocated as well as an additional 750 feet downstream that will be fenced to exclude livestock access and a 50-foot wide buffer on either side of the stream to account for equipment access. The newly constructed channel will be included in the aquatic action area for an equivalent linear distance; although there will be more meanders in the new channel. Equipment and material staging will take place in the field adjacent to the creek. The terrestrial action area will extend a half mile in all directions to account for increased noise disturbance during implementation.

4.2 Project Activities and Conservation Measures

The goal of the project is to improve in-channel aquatic habitat and to protect the stream from future development on the property. The project will re-route 1,250 feet of Spring Creek away from existing and future development areas. In this re-channeled reach, the creek will

meander through a 90-foot wide, protected riparian buffer. The 90 ft. wide buffer will be re-planted for the 1,250 foot long re-channeled reach (Figure 2). The remaining 750 feet (south end of the project area) of existing channel within the project area will have a 25 foot buffer on the west side of the creek. The east buffer width averages 120 feet between the stream and the freeway fence, with the widest area being 160 foot in width for this stream side. All of the riparian buffers (~5.5 acres) will be re-planted with native shrubs. A re-vegetation plan is being developed by Mid-Columbia Fisheries with input from the landowner and WDFW. The re-vegetation plan will include details on site prep, species ratios and density, irrigation, weed abatement, and maintenance.

The 1,250 re-channeled reach will be designed to optimize rearing habitat and improve water quality. Woody debris and brush bundles will be installed in the channel to create complexity and hiding and foraging areas for juvenile salmonids. The new channel will provide increased aquatic habitat complexity by including meanders, woody debris, and an improved width to depth ratio.

Late Spring – Early Summer, 2009: Begin excavation of 40 foot wide valley bottom.

1. Excavate and scrape with bull dozer (tracked) and mid-sized, tracked excavator to create a 40 foot wide valley bottom. The valley bottom will be an average of 4.3 ft below the existing ground elevation; where a layer of cobbles currently exists. Two pieces of equipment will need to cross the wetted, existing channel of Spring Creek one time in order to begin excavation of the new channel and valley bottom.

July, 2009

2. Excavate the new channel. This new channel will initially NOT be connected at either end to the existing channel. Excavation of the new channel will be done using a large or mid-sized tracked excavator. The new channel width will be 4-5 feet wide and 1-2 feet deep, with velocities of 0.5 - 1 foot per second. The sinuosity of the new channel will be 1.6.
3. Pile (stage) the excavated soils 15-20 feet back from the east bank of the existing channel for use later.
4. Construct brush bundles on-site (outside of the channel), by-hand using loosely packed branches and small wood. The bundles will be held together with biodegradable rope (with a life expectancy of 5 years).
5. Install small rootwads and brush bundles in the new, dry channel. The bundles will be installed by hand and secured with willow stakes along the banks and may extend partially (two feet or less) into the channel. The rootwads or any woody debris (not part of a brush bundle) will be secured in place through a combination of partial burial in the channel bed and wedging the material against the stream banks.
6. Place blocknets in the new channel just downstream from the connection point to eliminate fish from entering the new channel for the first two days.
7. Install temporary sediment capture filters, including weed free straw bales and silt fence, at the bottom end of the existing channel, just downstream from the connection point.
8. Connect the new channel at the bottom end first, and then at the top end.

9. Immediately downstream of the inlet of the new channel, partially plug the old channel with biodegradable, gravel-filled sandbags until an adequate flow (approximately 1 cfs) is diverted into the new channel to gradually wet it up. This flow level will be maintained overnight, after which the block nets will be removed, allowing fish access into the new channel. More sandbags will then be gradually added to the plug in the existing channel until approximately 1 cfs of flow still remains in the existing channel.
10. Allow water to flow through both channels for two days to introduce flows to the new channel slowly to reduce turbidity.
11. Salvage fish from any isolated ponds or pools in the old channel. Place any fish stranded in the old channel upstream of the construction site. Remove block nets and enable fish passage through the newly constructed channel.
12. A compacted mixture of sand, gravel, and cobble will be used to fill the channel to the top of the bank at the upstream end of the project area for a distance of at least ten feet to create an impermeable plug that will divert all flow into the new channel. Willow and dogwood cuttings will be planted between and behind the sandbags above the waterline.
13. Allow the old channel to dry out completely.
14. Fill approximately 925 feet of the old channel with the stock piled, excavated material. The soil surface will be graded over the area of the old channel to conform with the current contours. Equipment to be used will likely be a mid-sized excavator and bull dozer. Seed this area with non-invasive, drought tolerant grass.
15. Approximately 325 linear feet of the existing channel, directly behind the window factory, will remain open to function as a temporary "catch basin" for stormwater runoff from developed areas of the property until the landowner provides a different mechanism for collection and discharge of stormwater in accordance with standard of the Eastern Washington Stormwater Design Manual as published by the Washington Department of Ecology.

Fall, 2009

16. Plant the 2,000 foot long riparian zone with native shrubs and grasses.
17. Construct a livestock exclusion fence on the west side of the riparian buffer for the entire 2,000 foot project area. The fence will protect the existing and newly planted vegetation. At least two gates will be installed to provide access.

Spring, 2010

18. Install drip irrigation system for riparian plants.

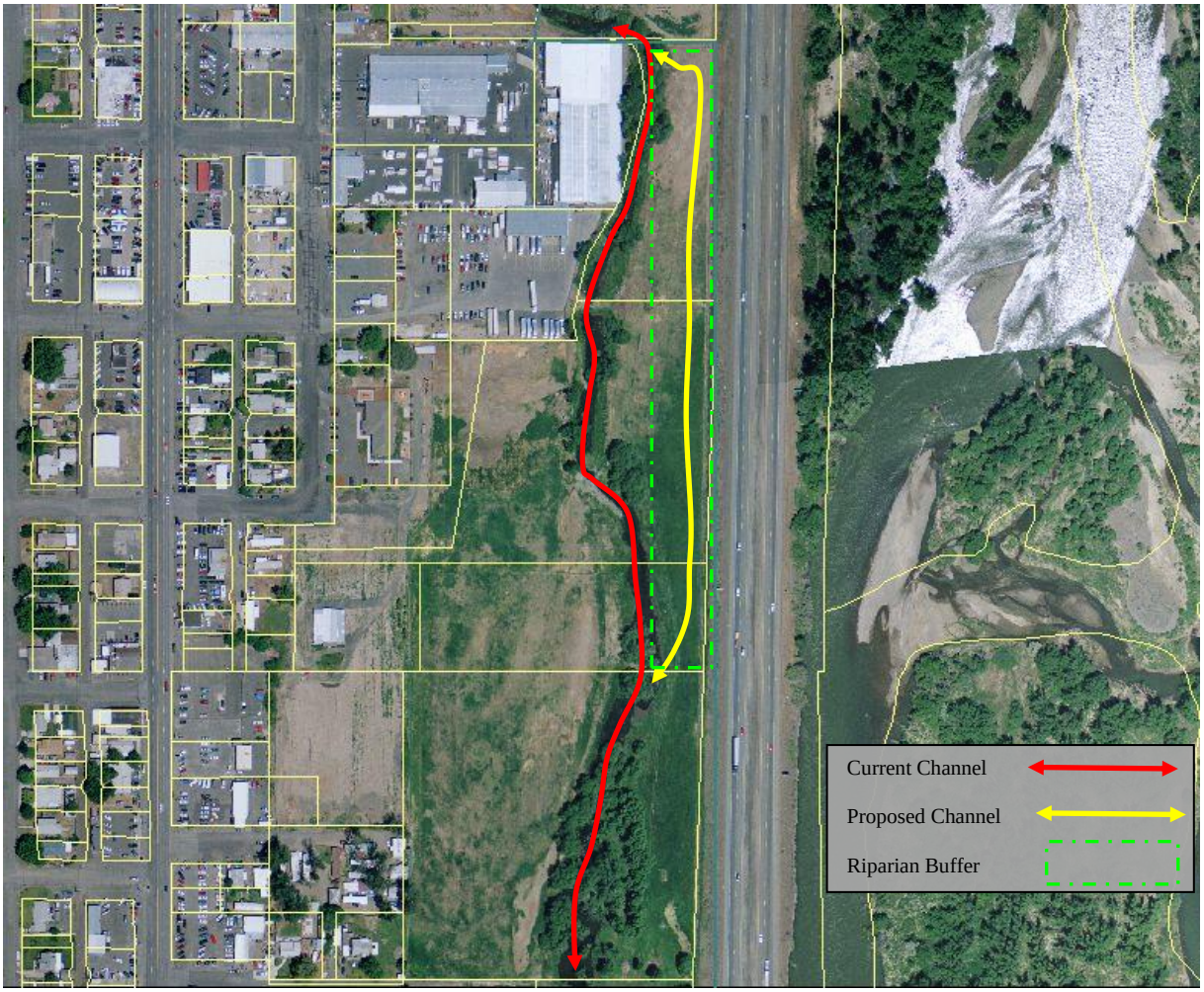

Figure 2. This photo shows the current channel and the proposed alignment of the new channel center with the protected riparian buffer.

Other Conservation Measures

- Any equipment working within the ordinary high water marks shall be maintained in good working conditions such that petroleum products or other harmful chemicals are not leaked into the creek, its banks, or its bed and all equipment will be washed and clean of earth and petroleum products prior to entering the project area.
- The contractor will have a spill containment kit onsite at all times.
- Refueling and maintenance of equipment or vehicles will take place at a designated area outside of the stream channel, at least 150 feet from the ordinary high water mark.
- All applicable best management practices in the Habitat Restoration Program BiOp (NMFS 2007).

5.0 ANALYSIS OF EFFECTS TO LISTED SPECIES

During the course of environmental scoping for this proposed project, several databases were queried for the presence of federally listed threatened and endangered species and critical

habitats. Listed species and critical habitats potentially present within the action area are identified in Table 1. Further research on these species was conducted using databases from the Washington Department of Natural Resources Natural Heritage Database for plants, the Washington Department of Fish and Wildlife Priority Habitat and Species Database, and fish survey archives from WDFW and the Yakama Nation.

Table 1. Federally listed USFWS species possibly present within the project area.

Common Name	**Latin Name**	**Federal Status**	**Critical Habitat**	**ESA Determination**
Columbia River Bull Trout	*Salvelinus confluentus*	Threatened		NLAA
Ute Ladies'-tresses	*Spiranthes diluvialis*	Threatened		NLAA

5.1 Columbia River DPS Bull Trout

Bull trout are not known to occur within the Spring Creek or Wide Hollow Watershed (WDFW unpublished data, Yakama Nation unpublished data), and habitat conditions in Spring Creek are not suitable for reproducing populations of bull trout. There are bull trout present in the upper branches of the Ahtanum Watershed, adjacent to Wide Hollow Creek; although it is thought that most of those fish are resident and are not likely to migrate to the mainstem Yakima River and/or into Spring Creek (Eric Anderson personal communication 2009).

Effects of the proposed actions on relevant environmental indicators for bull trout are summarized in Table 2; none will be degraded as a result of the proposed actions as described.

Table 2. Matrix of Pathways and Indicators for Bull Trout. A checklist for documenting the environmental baseline and effects of the proposed action(s) on relevant environmental indicators.

DIAGNOSTIC OR PATHWAY	INDICATORS	**Functionality (F/FR/FU)****	**EFFECTS OF THE ACTION**		
			Improve	**Maintain**	**Degrade**
Water Quality	Temperature	F	X		
	Turbidity	F		X	
	Chemical Contamination/ Nutrients	F	X		

Life History	Diversity and Isolation	NA			
	Persistence and Genetic Integrity	NA			
Habitat Access:	Physical Barriers	FU		X	
Habitat Elements:	Embeddedness	FR	X		
	Large Wood	FU	X		
	Pool Frequency and Quality	FU	X		
	Off-channel Habitat	FR		X	
	Refugia	FR	X		
Channel Condition & Dynamics:	Average Wetted Width/ Maximum Depth Ratio	FU	X		
	Streambank Condition	FR	X		
	Floodplain Connectivity	FR	X		
Flow/Hydrology:	Change in Peak/ Base Flows	F		X	
	Increase in Drainage Network	FR		X	
Watershed Conditions:	Road Density & Location	FU	X		
	Disturbance History	FU	X		
	Riparian Conservation Areas	FU	X		
Species and Habitats:	Integration of Species and Habitat Conditions	FR	X		

** F = Functioning appropriately, FR = Functioning at risk, FU = Functioning at unacceptable risk
NA = No information Available

While their migratory, rearing, and foraging presence cannot be ruled out from Spring Creek, there is little evidence to suggest that bull trout would be present in Spring Creek or Wide Hollow Creek. Both Spring Creek and Wide Hollow Creek are heavily influenced by

agriculture and urbanization with very little habitat suitable for bull trout. The project will occur mostly in the dry summer months, when adult bull trout should be on their spawning grounds and not likely to be present in Spring Creek, therefore this project **not likely to adversely affect** bull trout.

5.2 Ute Ladies'-tresses

Ute ladies'-tresses (*Spiranthes diluvialis*) were first discovered in Washington State in 1997, but a limited amount of information is available on their distribution. The elevation range for this species is from approximately 700 ft to 7000 ft above sea level. Currently, the only two known populations are located in Okanogan and Chelan counties, and none are known in Yakima County. Ute ladies'-tresses are endemic to moist soils and wetland/riparian habitats near springs, lakes or streams (USFWS 1992). The riparian habitat throughout the project area is severely degraded due to livestock grazing practices and urbanization. Ute ladies'-tresses can occur along stream banks, and therefore its presence cannot be entirely ruled out. However, there are no known populations at the site and the arid climate makes it highly unlikely they would be encountered; therefore, the proposed project is **not likely to adversely affect** Ute ladies'-tresses.

6.0 CUMULATIVE EFFECTS

Cumulative effects are the impacts of future non-federal, state and local government and private actions that are reasonably certain to occur in the action area. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Endangered Species Act.

6.1 Population and Development

Washington's human population is forecast to grow by an additional 1.2 to 2.5 million people in the next 15 years. This population growth will occur predominantly in the Puget Sound region, although the Yakima River Valley of Eastern Washington is also expected to experience population density increases. The Cities of Union Gap and Yakima are also experiencing these increases in development and industrial use as agricultural properties are quickly being converted to other uses. The property surrounding this project area is no exception and is currently up for sale as freeway frontage commercial property.

The increases in population will result in further residential, commercial and infrastructure development. There will continue to be an increase in the conversion of agricultural and forested lands adjacent to streams into housing developments and industrial uses. These types of conversions will likely have adverse impacts to riparian areas and floodplain function through habitat conversion and the construction of flood control structures for the protection of new developments. Frequently, these types of flood control measures result in further confinement of stream channels, which can result in increased water velocities and the simplification of habitat. Changes to nearby infrastructure to facilitate population growth might include the replacement of bridges over Spring and Wide Hollow Creeks, the addition of power lines, sewer and water system infrastructure, and expansion of roads near the creek.

As growth continues in the Yakima Valley, the Washington Department of Transportation is considering updating an interchange on Interstate 82, near the mouth of Wide Hollow Creek. There have been discussions about the possibility of rerouting Wide Hollow Creek so it becomes a tributary to Ahtanum Creek. At this time, these are only conceptual discussions and any action of this sort would require further review. It is likely that the proposed project area is upstream of the reach that might be rerouted in the future.

6.2 Timber Harvest and Agriculture

Only the uppermost watershed of Wide Hollow Creek is on the fringe of forested lands, and therefore there is minimal impact from timber harvest practices. Increases in timber harvest are not anticipated and if they were to occur, current harvest regulations are in place to help protect water quality in the upper watershed.

There is a long history of agricultural use in the Yakima River Valley. The fertile soils in depositional zones have been converted into agricultural production decades ago and since have been grazed or used to cultivate crops. At that time, many creeks, including Spring Creek, were channelized and rerouted to increase the farmland surrounding the creeks. Increasingly, these agricultural areas are being converted to housing and urban development, further decreasing floodplain function. Land use planning and flood control planning are critical to protecting stream health as well as new infrastructure near waterways.

6.3 Pollutants

Water pollution can degrade habitat and have lethal and sub-lethal effects on fish and wildlife. Spring Creek is located near the industrial center of Union Gap and suffers from little riparian buffering and increased stormwater runoff. The lower Yakima Valley is currently experiencing a high rate of suburban and rural development. Water quality could further degrade, depending on the extent to which existing instream flows and habitat elements are maintained and pollutants are managed. Healthy, functional riparian buffers will help minimize impacts to water quality caused by pollutants and stormwater runoff.

7.0 DETERMINATIONS

It is USFWS's determination that the proposed project **may affect, but is not likely to adversely affect** Bull Trout or Ute Ladies'-tresses based on:

- None have been documented in Spring Creek or Wide Hollow Creek
- A juvenile barrier downstream of the project area precludes juveniles from entering the project area
- The project area does not have suitable bull trout spawning habitat
- Grazing practices and construction of I-82 have reduced habitat available for Ute Ladies'-tresses
- No components of the bull trout matrix of pathways and indicator will be degraded
- Conservation measures shall be followed to reduce stream bank and staging area ground disturbance
- The project is proposed and will be implemented to restore habitat.

8.0 REFERENCES

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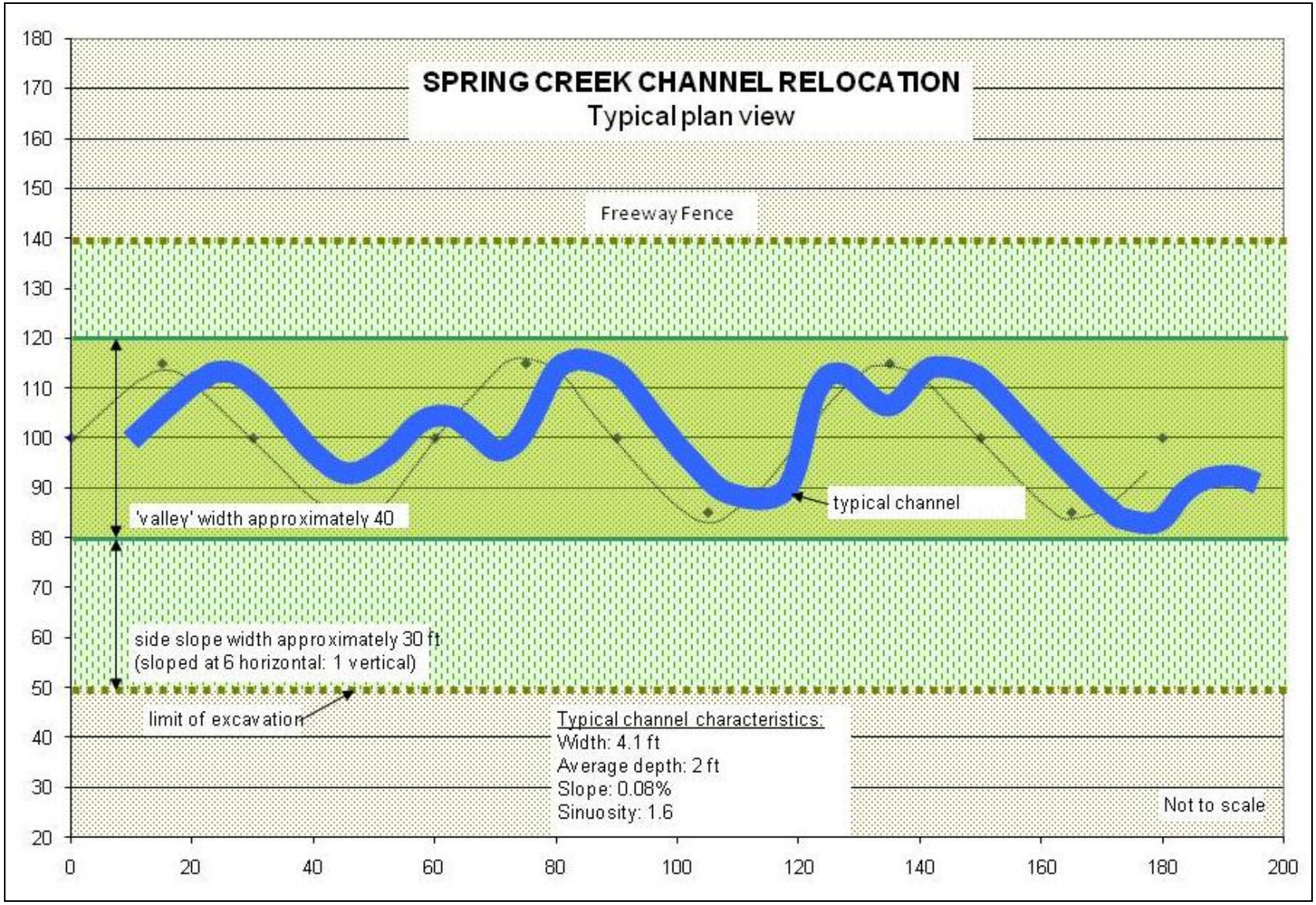
Attachment A: Typical Design Drawings

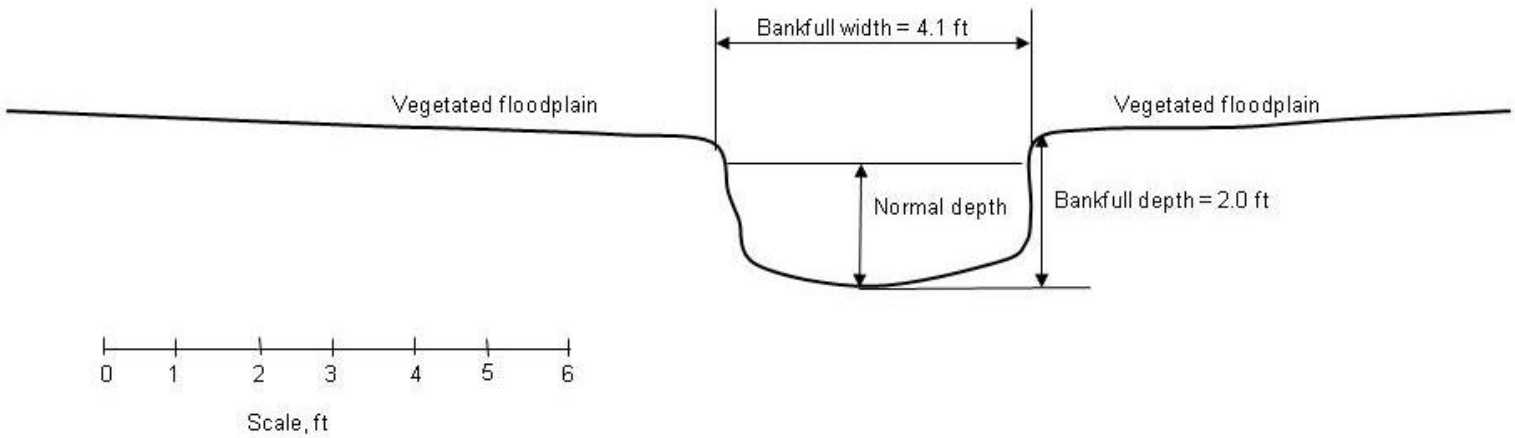
Plan View


SPRING CREEK CHANNEL RELOCATION
Typical plan view
Freeway Fence
'valley' width approximately 40
typical channel
side slope width approximately 30 ft
(sloped at 6 horizontal: 1 vertical)
limit of excavation
Typical channel characteristics:
Width: 4.1 ft
Average depth: 2 ft
Slope: 0.08%
Sinuosity: 1.6
Not to scale
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
0
20
40
60
80
100
120
140
160
180
200

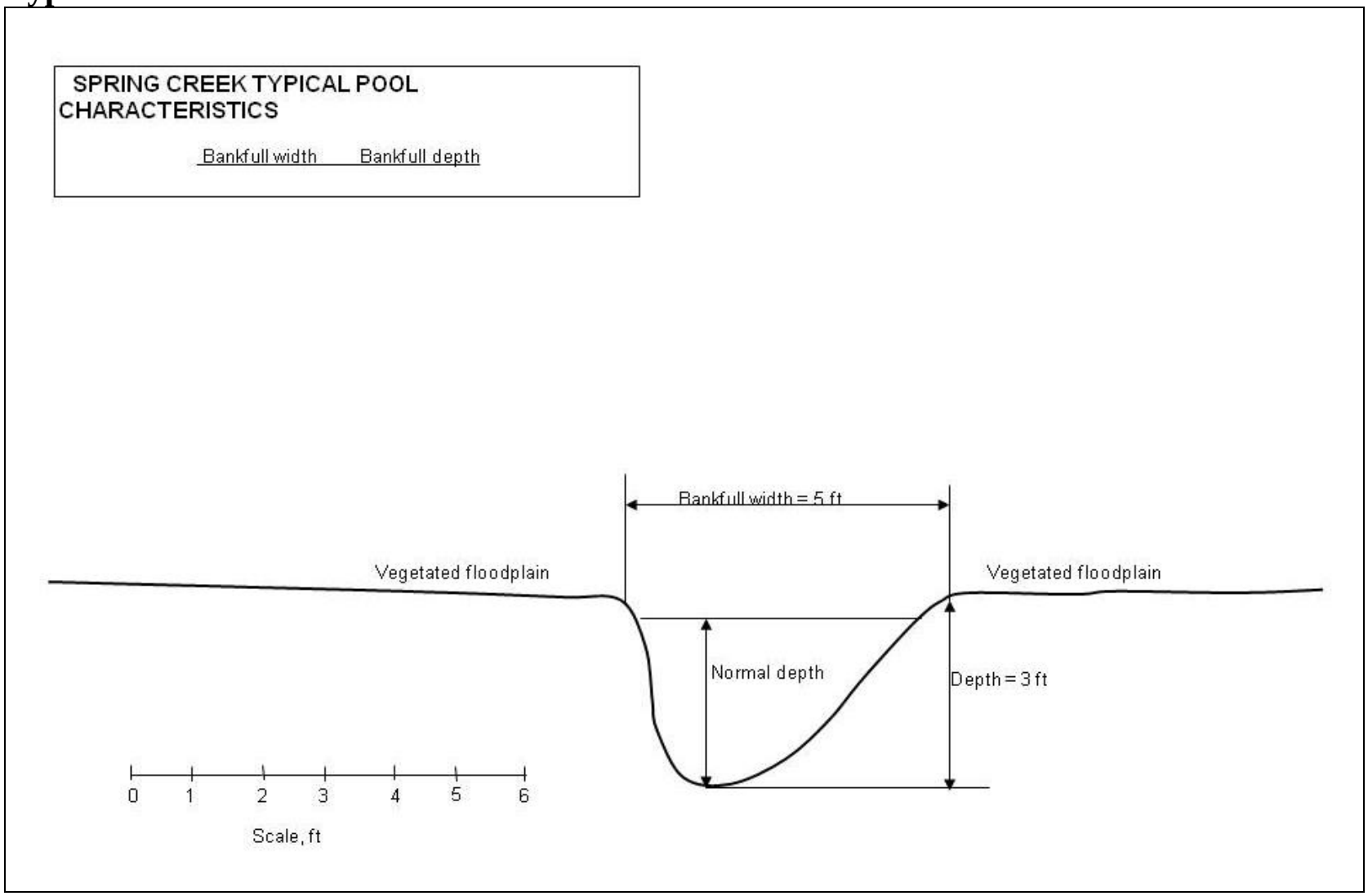
Typical Channel Cross Section

SPRING CREEK TYPICAL CHANNEL CHARACTERISTICS

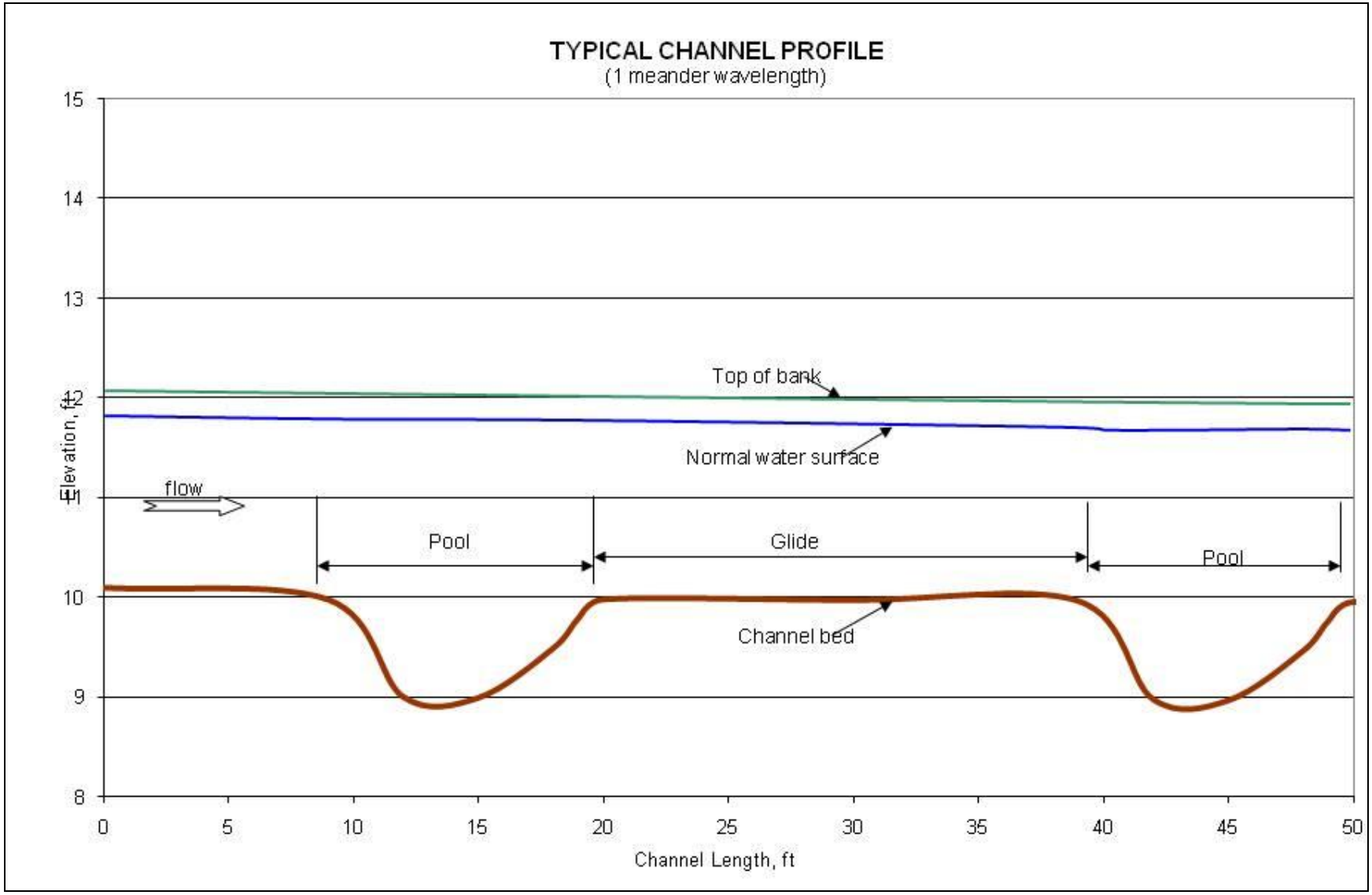
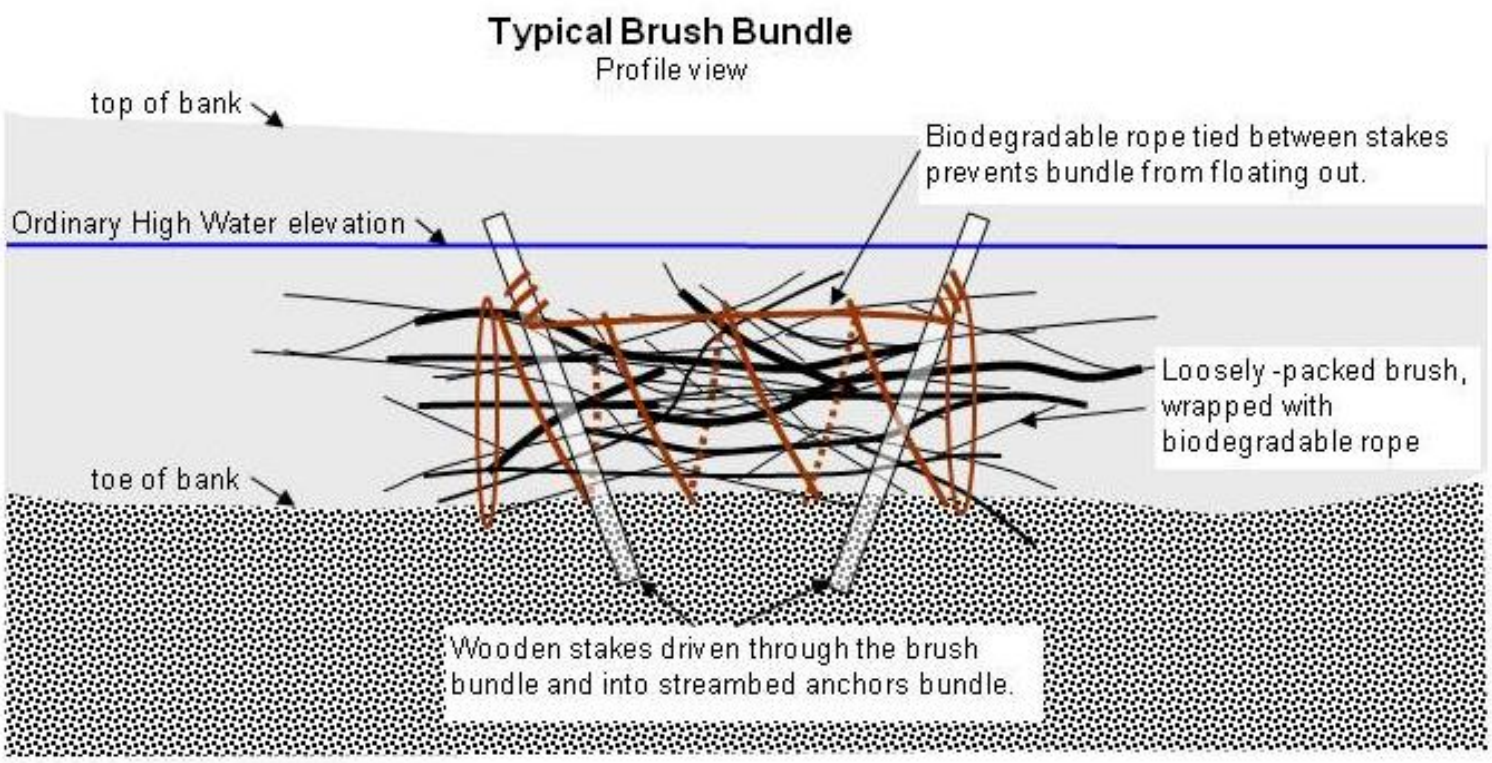
Bankfull width	Bankfull depth	Pool depth	Slope	Sinuosity
4.1 ft	2.0 ft	3.0 ft	0.085%	1.6



Typical Pool Cross Section



Profile


TYPICAL CHANNEL PROFILE
(1 meander wavelength)
Elevation, ft
15
14
13
12
11
10
9
8
Top of bank
Normal water surface
flow
Pool
Glide
Pool
Channel bed
0
5
10
15
20
25
30
35
40
45
50
Channel Length, ft

Typical Brush Bundle Construction