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# ***Fennel Creek Trail Plan***

## **Draft Environmental Impact Statement**



**January 2007**

**January 16, 2007*****Cover Letter*****Subject: Draft Environmental Impact Statement for Fennel Creek Trail Plan**

To Whom It May Concern:

The City of Bonney Lake is pleased to transmit this Draft Environmental Impact Statement (Draft EIS) for the proposed adoption of the Fennel Creek Trail Plan. A consultant to the City, working in conjunction with a citizens' advisory committee, submitted a draft trail plan in December 2005. That plan is the basis for this Draft EIS. If adopted, the trail plan will become part of the Parks Element of the City's Comprehensive Plan.

The draft Fennel Creek Trail Plan describes the development and operation of a multi-use trail 6.3 miles in length from Allan Yorke Park in Bonney Lake to a connection with the Pierce County Foothills Trail. The proposed trail system includes segments along the Lake Debra Jane Outfall Corridor and east to 214th Avenue East. The City would construct the trail and supporting facilities within the city limits of Bonney Lake. The proposed plan includes a trail surfaced with porous asphalt for bicycle and pedestrian use and a parallel, soft-surface tread for equestrian use.

Key environmental issues identified by the City for analysis in the EIS involve potential impacts to the following elements of the natural environment:

- Vegetation
- Wetlands
- Wildlife
- Fish

The EIS evaluates four alternative configurations for the trail, based on the width of the trail section and the minimum distance from the inner edge of the trail to the creek, as follows:

Alternative A – 14-foot-wide trail section, trail 50 feet from creek

Alternative B – 24-foot-wide trail section, trail 50 feet from creek

Alternative C – 14-foot-wide trail section, trail 100 feet from creek

Alternative D – 24-foot-wide trail section, trail 100 feet from creek

Comments on the Draft EIS should be sent by mail to the City of Bonney Lake, Department of Planning and Community Development, Attention Stephen Ladd, 8720 184th Avenue E, P.O. Box 7380, Bonney Lake, WA 98391 or by email to [ladds@ci.bonney-lake.wa.us](mailto:ladds@ci.bonney-lake.wa.us). All comments must be received on or before 5:30 p.m., February 7, 2007, after which time the Planning Commission will hold a public hearing on the trail plan and on the Draft EIS at Bonney Lake City Hall, 19306 Bonney Lake Blvd.

Comments should be as specific as possible and address the adequacy of the environmental document, the merits of the alternatives discussed, or both. The Final EIS will include responses to the comments. The Final EIS may address additional alternatives to the proposal, may contain additional environmental analysis, if warranted, and will describe any changes to the proposal that have occurred.

Questions about the proposal, or about the EIS process, may be directed to me at the mail or e-mail addresses provided above, or by phone at (235) 447-4350.

Sincerely,  
CITY OF BONNEY LAKE

Stephen Ladd  
Planning Manager, Dept. of Planning and Community Development

# FACT SHEET

## Title

Fennel Creek Trail Plan  
Draft Environmental Impact Statement (DEIS)

## Description of Proposal and Alternatives

The City of Bonney Lake proposes to adopt a plan for the development of the Fennel Creek Trail. To implement the plan, over time the City would construct a multi-use trail within or near the riparian corridor of Fennel Creek, a perennial stream that flows through the City and adjacent unincorporated Pierce County. This trail would be 6.3 miles in length and be constructed of porous asphalt. The completed trail would extend south from Allan Yorke Park in Bonney Lake to the Foothills Trail, a major regional trail under development by Pierce County from Sumner to Orting, South Prairie and several other communities in the eastern part of the County. The Fennel Creek Trail would also connect with Pierce County's proposed Flume Trail from Lake Tapps to Buckley, via an extension to 214th Avenue E.

The Draft Fennel Creek Trail Plan evaluated in this EIS includes four alternative configurations for the proposed trail. Under all four alternatives the City proposes to construct a 6.3-mile trail for pedestrian, bicycle, and equestrian use along the Fennel Creek Corridor. As shown in Figure 1, the four alternatives follow the same general route. The differences among the alternatives are based on the width of the trail section (14 feet or 24 feet) and the distance from the inner edge of the trail to Fennel Creek (50 feet or 100 feet), as follows:

Alternative A – 14-foot trail section width, trail 50 feet from creek

Alternative B – 24-foot trail section width, trail 50 feet from creek

Alternative C – 14-foot trail section width, trail 100 feet from creek

Alternative D – 24-foot trail section width, trail 100 feet from creek

The EIS is based on the preliminary planning and design information provided in the draft trail plan (Bruce Dees and Associates 2005). Future work to implement the trail plan will include additional detail on trail location and design.

## Proponent

City of Bonney Lake  
Department of Planning and Community Development

## Date of Implementation

Action by the City of Bonney Lake on the proposal is expected in mid or late 2007. If adopted, construction on selected trail segments could begin some time in 2007 at the earliest.

**Lead Agency/Responsible Official and Contact Person**

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Department of Planning and Community Development  
Stephen Ladd, SEPA Responsible Official  
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P.O. Box 7380  
Bonney Lake, WA 98391  
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**Licenses & Permits Potentially Required**

City of Bonney Lake

- Clearing and Grading Permits
- Building Permits

Washington Department of Ecology

- National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Permit
- Clean Water Act Section 401 Certification

Washington Department of Fish and Wildlife

- Hydraulic Project Approval

U.S. Army Corps of Engineers

- Clean Water Act Section 404 Permit

**Authors & Principal Contributors**

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## **1. SUMMARY**

### **1.1 PROPOSAL AND OBJECTIVES**

The City of Bonney Lake proposes to adopt a plan for the development of the Fennel Creek Trail. To implement the plan, the City would construct a multi-use trail within or near the riparian corridor of Fennel Creek, a perennial stream located in the City and adjacent unincorporated Pierce County. This trail would be 6.3 miles in length and be constructed of porous asphalt. The completed trail would extend south from Allan Yorke Park in Bonney Lake to the Foothills Trail, a major regional trail under development by Pierce County from Sumner to Orting, South Prairie and several other communities in the eastern part of the County. The Fennel Creek Trail would also connect with Pierce County's proposed Flume Trail from Lake Tapps to Buckley.

The City's objective is to implement a key aspect of the Parks Element of the City's Comprehensive Plan. The proposed trail will open the Fennel Creek corridor to public use for non-motorized transportation and recreation, and allow trail users to experience the sights and sounds of the woodlands and pastoral scenes along the creek corridor. The design criteria for the trail are to:

1. Provide for recreation use with a safe, multi-use trail to accommodate walkers, bikers and horse riders that is compliant with the Americans with Disabilities Act (ADA)
2. Address community needs and issues, especially concerns of abutting property owners
3. Protect and enhance sensitive areas and other habitat along the trail corridor
4. Provide opportunities for public education on the importance of the resources of the Fennel Creek system and its importance to the Puyallup River basin

Since 1997 the City's Comprehensive Plan has addressed the growing demand for public recreation venues, including trails. The Draft Fennel Creek Trail Plan (Bruce Dees & Associates 2005) describes the planning history for this proposal and the recreation needs to which it responds. The Fennel Creek Trail would connect Allan Yorke Park to the Foothills Trail and the future Pierce County Flume Trail. The City of Bonney Lake currently does not provide any recreational trails, while the City's Comprehensive Plan indicates the City will need 7.1 miles of new trail by the year 2022. The Fennel Creek Trail would become an important link in the County's regional trail system and an alternative transportation corridor.

## **1.2 PROJECT HISTORY**

The proposed action began in July, 1997, when the City distributed a questionnaire to gauge demand for various types of recreational facilities to 3,100 Bonney Lake households. The majority of the 150 respondents indicated their first priority was a system of trails for walking, jogging, and biking. The next highest priority was sports fields, followed by children's play areas, and picnic areas. Respondents also assigned high priority to acquisition of new park land. The City's 1997 Parks Plan was based on that survey input.

In 1999, the City contracted with Foster Wheeler Environmental (later acquired by Tetra Tech) to prepare a Fennel Creek Corridor Environmental Analysis. That study inventoried vegetation communities, wetlands and wildlife habitats in the creek corridor, focusing primarily on the portions currently in public ownership.

In April 2005, the City retained Bruce Dees & Associates, a landscape architecture firm, to work with a Citizens Ad Hoc Committee to develop a plan for a trail to connect Allen Yorke Park to the Pierce County Foothills Trail following the Fennel Creek Corridor. Bruce Dees & Associates (2005) prepared a Draft Report on the Fennel Creek Trail Plan. The draft plan includes 1) a trail route within the Fennel Creek watershed, 2) trail construction plans and layouts, and 3) trail cross sections and vegetation clearances.

The City has not yet adopted the Fennel Creek Trail Plan, but expects to act on the plan in 2007. When adopted, the Fennel Creek Trail Plan will become part of the Parks Element of the City's Comprehensive Plan. In March 2006 the City contracted with Tetra Tech to prepare a State Environmental Policy Act (SEPA) EIS for the trail plan, with a specific focus on the segments of the proposed Fennel Creek Trail within the city limits of Bonney Lake. Those segments are from 214th Avenue East to Victor Falls and north from that route along the Lake Debra Jane Outfall Corridor to Allan Yorke Park.

Some of the land within the proposed trail corridor is in existing City or other public ownership. Much of the corridor, however, is within private ownership. As such, access rights for the trail route must be developed over the long term by acquiring private property from willing sellers, or by dedication through the City's subdivision approval process. The City intends to apply for grants to help support right-of-way acquisition and trail development, and will otherwise use City financial resources to fund the proposal.

In the interim, while the longer-term acquisition of trail property for the entire route is under way, the City plans to develop selected segments of the trail through existing public lands.

## **1.3 ENVIRONMENTAL REVIEW PROCESS**

The City plans to implement the Fennel Creek Trail Plan in phases over time and will likewise complete phased review of the proposal under SEPA. The City identified the proposed Fennel Creek Trail in the Parks Plan adopted in 1998; SEPA review for that Comprehensive Plan action was the first step of the environmental review for the trail. This

EIS is a major, second step of the environmental review process. The City issued a Determination of Significance (DS) under SEPA for the trail plan on January 20, 2006. Following public review of the Draft EIS, the City will evaluate the review comments and publish a Final EIS that includes responses to the comments. The City will not consider adoption of the Fennel Creek Trail Plan until after the FEIS has been published.

Following adoption of the plan, the City will implement the plan as funding, other resources, and property acquisition allow. The draft trail plan reflects preliminary planning and design information for the trail; it does not include final design or construction drawings. Those will be developed in the future. Because the EIS is based on preliminary planning and design, and on incomplete information about wetlands and other resources within the private-property sections of the trail corridor, additional site-specific review under SEPA will be needed in the future. The City has not determined at this time the precise form of that future SEPA documentation. The City could issue a supplemental EIS or addendum on the entire trail corridor or SEPA checklists on construction plans for individual segments of the trail.

#### **1.4 SCOPE OF THE EIS**

The DS issued by the City in January 2006 indicated that impacts on riparian flora and fauna (terrestrial and aquatic) and wetlands must be addressed in the EIS. That determination was based on the 1999 Fennel Creek Corridor Environmental Analysis and the extensive stakeholder coordination incorporated in the development of the Fennel Creek Trail Plan. Homeowners' associations from neighborhoods adjacent to the trail corridor and other community organizations were represented on the Citizens Ad Hoc Committee and participated in the public involvement effort for the plan.

The DS requested public input on the scope of the EIS, including what types of impacts should be studied. The City provided a 30-day period for receipt of comments on the scope of the EIS. The City received no comments from agencies, tribes, organizations or members of the public in response to the DS and request for scoping comments. Therefore, the scope defined for the EIS remained as identified in the DS. Based on the scoping process, this EIS addresses direct, indirect and cumulative impacts to vegetation, wetlands, fish and wildlife resources in the Fennel Creek corridor.

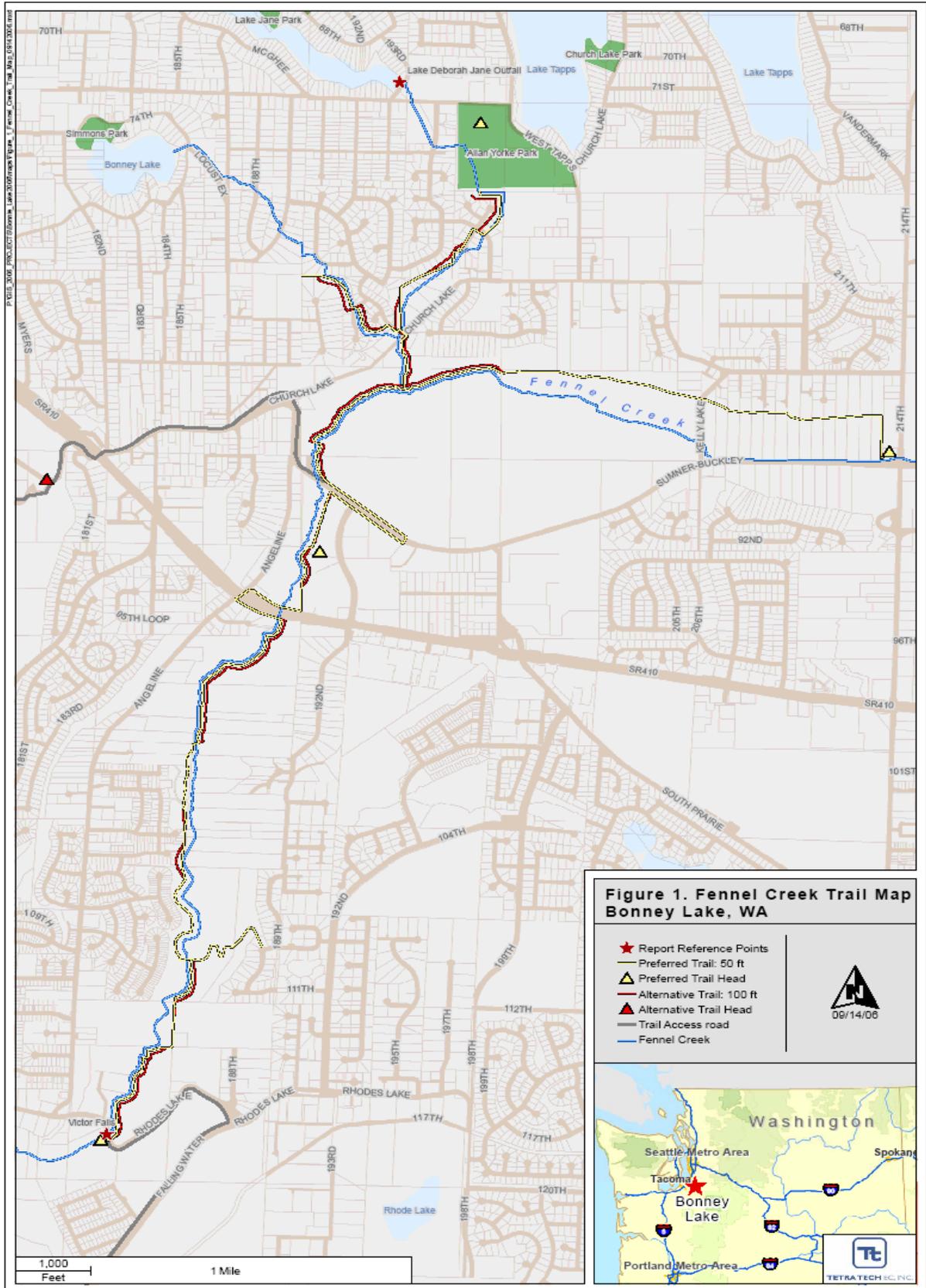
#### **1.5 PROPOSED ACTION AND ALTERNATIVES**

This EIS assesses four alternative configurations for the proposed trail. Under all four alternatives the City proposes to construct a 6.3-mile trail for pedestrian, bicycle, and equestrian use along the Fennel Creek Corridor. As shown in Figure 1, the four alternatives follow the same general route. The differences among the alternatives are based on the

width of the trail section (14 feet or 24 feet) and the distance from the inner edge of the trail to Fennel Creek (50 feet or 100 feet; see Table 1).

**Table 1.** Basic Characteristics of the Fennel Creek Trail Alternatives

<b>Alternative</b>	<b>Length</b>	<b>Width of Trail Section</b>	<b>Minimum Distance from Creek</b>
A	6.3 miles	14 feet	50 feet
B	6.3 miles	24 feet	50 feet
C	6.3 miles	14 feet	100 feet
D	6.3 miles	24 feet	100 feet



## 1.6 COMPARISON OF ALTERNATIVES

This EIS addresses impacts to vegetation, wetlands, wildlife, and fish. Table 2 summarizes the types and levels of impacts to these elements of the environment for each alternative. The impact analysis for each element addresses short-term impacts from construction of the trail facilities and long-term impacts from use, operation and maintenance of the trail.

Key short-term impacts from construction disturbance include potential erosion and sedimentation; their effects can be avoided or mitigated to non-significant levels through the prescribed use of standard best management practices (BMPs). Long-term impacts include loss of native vegetation, wetlands, and wildlife habitat within the trail footprint, all of which can be mitigated to non-significant levels. No impacts to Threatened, Endangered, or State Sensitive species of plants or animals are anticipated.

Wetlands are rather extensive within the trail corridor. Wetland impacts could likewise be extensive. Unless most of these impacts are avoided through final trail location and design, initial wetland impacts from placement of fill to support the trail would be significant. The EIS team estimated the range of potential wetland impacts of the four alternatives based on three wetland data sources: the National Wetland Inventory (NWI) conducted by the U.S. Fish and Wildlife Service, Pierce County wetlands mapping, and habitat mapping updated by Tetra Tech from the original Fennel Creek environmental analysis prepared for the City of Bonney Lake in 1999. Table 2 indicates the range of potential impacts, in acres, for the four alternatives. The City would need to compensate for the actual wetland impacts through creation of new wetland habitat and/or enhancement of existing wetlands.

Regardless of the alternative selected, the City would provide compensatory mitigation for the impacts to wetlands and other resources. Impact mitigation measures include:

- For vegetation, replanting of native species in areas disturbed by construction;
- For wetlands, choosing a final alignment in the field which avoids and minimizes wetland impacts; creating or enhancing wetlands elsewhere; directing drainage from the trail away from wetlands;
- For wildlife, choosing a final alignment that avoids sensitive habitat features such as large trees, snags, and amphibian breeding habitat ; scheduling construction outside of the breeding season (March through July); prohibiting dogs off leash; prohibiting dog access to the creek;
- For fish, complying with permit regulations restricting construction and maintenance activities to in-water work windows; following stormwater management BMPs to prevent impacts; preventing dog access to the creek; and
- For long-term protection of Fennel Creek, designing several trail spurs to the creek bank in areas where impacts would be minimal to prevent the public from creating their own access trails to the creek bank.

**Table 2.** Summary of Potential Impacts of the Fennel Creek Trail Alternatives

Element of the Environment	Alternative A	Alternative B	Alternative C	Alternative D	No Action Alternative
<p><b>Vegetation</b></p> <ul style="list-style-type: none"> <li>• Temporary disturbance (clearing, equipment operation, soil compaction, etc.) within up to 4.1 acres along trail section and 3.6 acres at trailhead facilities.</li> <li>• Restoration of disturbed areas not occupied by permanent facilities.</li> </ul> <p><b>Long-term</b></p> <ul style="list-style-type: none"> <li>• Loss of vegetation on up to 9.6 acres occupied by permanent facilities.</li> <li>• Potential for increased growth or importation of invasive plant species in habitats where construction disturbance occurred.</li> <li>• Limited loss of canopy cover from ongoing maintenance, including removal of live hazard trees and trimming of vegetation to maintain sight lines at road crossings.</li> <li>• Minor trampling of trailside vegetation during trail use.</li> </ul>	<p><b>Short-term</b></p> <ul style="list-style-type: none"> <li>• Temporary disturbance on up to 4.1 acres along trail and 3.6 acres at trailheads</li> <li>• Restoration of temporarily disturbed areas.</li> </ul> <p><b>Long-term</b></p> <ul style="list-style-type: none"> <li>• Loss of vegetation on up to 16.4 acres occupied by permanent facilities.</li> <li>• Potential for invasive plant, maintenance clearing/trimming and trampling similar to Alternative A, but slightly larger.</li> </ul>	<p><b>Short-term</b></p> <ul style="list-style-type: none"> <li>• Temporary disturbance on up to 3.8 acres along trail and 3.6 acres at trailheads</li> <li>• Restoration of temporarily disturbed areas.</li> </ul> <p><b>Long-term</b></p> <ul style="list-style-type: none"> <li>• Loss of vegetation on up to 8.9 acres occupied by permanent facilities.</li> <li>• Potential for invasive plant, maintenance clearing/trimming and trampling same as Alternative A.</li> </ul>	<p><b>Short-term</b></p> <ul style="list-style-type: none"> <li>• Temporary disturbance on up to 3.8 acres along trail and 3.6 acres at trailheads</li> <li>• Restoration of temporarily disturbed areas.</li> </ul> <p><b>Long-term</b></p> <ul style="list-style-type: none"> <li>• Loss of vegetation on up to 15.2 acres occupied by permanent facilities.</li> <li>• Potential for invasive plant, maintenance clearing/trimming and trampling similar to Alternative A, but slightly larger.</li> </ul>	<p><b>Short-term</b></p> <ul style="list-style-type: none"> <li>• Temporary disturbance on up to 3.8 acres along trail and 3.6 acres at trailheads</li> <li>• Restoration of temporarily disturbed areas.</li> </ul> <p><b>Long-term</b></p> <ul style="list-style-type: none"> <li>• Loss of vegetation on up to 15.2 acres occupied by permanent facilities.</li> <li>• Potential for invasive plant, maintenance clearing/trimming and trampling similar to Alternative A, but slightly larger.</li> </ul>	<p><b>No Action Alternative</b></p> <ul style="list-style-type: none"> <li>• No short- or long-term impacts from trail development.</li> <li>• Ongoing influences on native vegetation in trail corridor would continue.</li> </ul>

**Table 2.** Summary of Potential Impacts of the Fennel Creek Trail Alternatives (continued)

Element of the Environment	Alternative A	Alternative B	Alternative C	Alternative D	No Action Alternative
Wetlands	<p><b>Short-term</b></p> <ul style="list-style-type: none"> <li>• Potential for sedimentation or accidental spills into wetlands during construction, to be limited through use of BMPs.</li> </ul> <p><b>Long-term</b></p> <ul style="list-style-type: none"> <li>• Filling of wetland area by trail facilities, ranging from an estimated 0.8 to about 6 acres, depending on specific trail location. Compensatory mitigation to be provided.</li> <li>• Increased potential for human and pet disturbance, including introduction of invasive plant species.</li> <li>• Potential for minor sedimentation during culvert maintenance.</li> </ul>	<p><b>Short-term</b></p> <p>Same as Alternative A, slightly more extensive.</p> <p><b>Long-term</b></p> <ul style="list-style-type: none"> <li>• Wetland fill, estimated to range from 1.4 to about 8 acres; compensatory mitigation to be provided.</li> <li>• Increased potential for disturbance, introduction of invasive plants, similar to Alternative A.</li> <li>• Potential for minor sedimentation during culvert maintenance.</li> </ul>	<p><b>Short-term</b></p> <p>Essentially the same as Alternative A.</p> <p><b>Long-term</b></p> <ul style="list-style-type: none"> <li>• Wetland fill estimated to range from 0.6 to about 5 acres; compensatory mitigation to be provided.</li> <li>• Increased potential for disturbance, introduction of invasive plants, similar to Alternative A.</li> <li>• Potential for minor sedimentation during culvert maintenance.</li> </ul>	<p><b>Short-term</b></p> <p>Same as Alternative A, slightly more extensive.</p> <p><b>Long-term</b></p> <ul style="list-style-type: none"> <li>• Wetland fill estimated to range from 1.1 to about 8 acres; compensatory mitigation to be provided.</li> <li>• Increased potential for disturbance, introduction of invasive plants, similar to Alternative A.</li> <li>• Potential for minor sedimentation during culvert maintenance.</li> </ul>	<p>No short- or long-term wetland impacts from trail development. Possible impacts from current use and/or adjacent future land development.</p>

**Table 2.** Summary of Potential Impacts of the Fennel Creek Trail Alternatives (continued)

Element of the Environment	Alternative A	Alternative B	Alternative C	Alternative D	No Action Alternative
Wildlife	<p><b>Short-term</b></p> <ul style="list-style-type: none"> <li>• Temporary wildlife displacement during construction, localized to area of construction activity.</li> </ul> <p><b>Long-term</b></p> <ul style="list-style-type: none"> <li>• Loss of wildlife habitat occupied by permanent trail facilities.</li> <li>• Long term noise and visual disturbance, restricted access from fencing, and trampling of vegetation. Urban species would remain common.</li> <li>• Minor restriction in access to sensitive habitats for larger mammals from fencing.</li> <li>• Potential loss of snags and larger, older trees with cavities as hazard trees, leading to loss of breeding and year-round habitat for a variety of wildlife species.</li> </ul>	<p><b>Short-term</b></p> <ul style="list-style-type: none"> <li>• Temporary displacement during construction, same as Alternative A.</li> </ul> <p><b>Long-term</b></p> <ul style="list-style-type: none"> <li>• Loss of wildlife habitat slightly more than Alternative A.</li> <li>• Long term disturbance, restricted access effects same as Alternative A.</li> <li>• Minor restriction in access to sensitive habitats for larger mammals.</li> <li>• Potential loss of snags and larger, older trees with cavities, similar to Alternative A.</li> </ul>	<p><b>Short-term</b></p> <ul style="list-style-type: none"> <li>• Temporary displacement during construction, same as Alternative A.</li> </ul> <p><b>Long-term</b></p> <ul style="list-style-type: none"> <li>• Loss of wildlife habitat same as Alternative A.</li> <li>• Long term disturbance, restricted access effects same as Alternative A.</li> <li>• Minor restriction in access to sensitive habitats for larger mammals.</li> <li>• Potential loss of snags and larger, older trees with cavities, same as Alternative A.</li> </ul>	<p><b>Short-term</b></p> <ul style="list-style-type: none"> <li>• Temporary displacement during construction, same as Alternative A.</li> </ul> <p><b>Long-term</b></p> <ul style="list-style-type: none"> <li>• Loss of wildlife habitat slightly more than Alternative A.</li> <li>• Long term disturbance, restricted access effects same as Alternative A.</li> <li>• Minor restriction in access to sensitive habitats for larger mammals.</li> <li>• Potential loss of snags and larger, older trees with cavities, similar to Alternative A.</li> </ul>	<p>No short- or long-term wildlife impacts from trail development. Ongoing impacts from adjacent urban land use and future development.</p>

**Table 2.** Summary of Potential Impacts of the Fennel Creek Trail Alternatives (continued)

Element of the Environment	Alternative A	Alternative B	Alternative C	Alternative D	No Action Alternative
Fish	<p><b>Short-term</b></p> <ul style="list-style-type: none"> <li>• Potential for temporary sedimentation or spills in fish bearing streams during construction, to be limited through use of BMPs.</li> <li>• Temporary fish displacement from construction noise.</li> </ul> <p><b>Long-term</b></p> <ul style="list-style-type: none"> <li>• Potential intermittent, temporary downstream release of sediment, debris from ditch and culvert maintenance.</li> <li>• Potential increase in human disturbance in streams from trail users.</li> </ul>	<p><b>Short-term</b></p> <ul style="list-style-type: none"> <li>• Same as Alternative A.</li> </ul> <p><b>Long-term</b></p> <ul style="list-style-type: none"> <li>• Same as Alternative A.</li> </ul>	<p><b>Short-term</b></p> <ul style="list-style-type: none"> <li>• Potential for temporary sedimentation, spills and fish displacement somewhat less than Alternative A, due to greater distance from stream.</li> </ul> <p><b>Long-term</b></p> <ul style="list-style-type: none"> <li>• Potential for temporary maintenance somewhat less than Alternative A, due to greater distance from stream.</li> <li>• Potential for human disturbance same as Alternative A.</li> </ul>	<p><b>Short-term</b></p> <ul style="list-style-type: none"> <li>• Same as Alternative C.</li> </ul> <p><b>Long-term</b></p> <ul style="list-style-type: none"> <li>• Same as Alternative C.</li> </ul>	<p>No short- or long-term impacts to fish from trail development. Ongoing impacts from adjacent urban land use and future development.</p>

Based on the available information and the application of these mitigation measures, it is likely that all significant adverse impacts can be mitigated. Wetlands represent a possible exception to this general conclusion. Due to lack of access to private land in much of the trail corridor, wetlands have not been formally delineated in those areas. The City and its trail planning consultant have not identified the exact trail location for the four alternative configurations. As a result, wetland impacts have not been identified with precision or certainty. The final alignment of the trail would be selected in the field by a team including the landscape architect and wetland consultant, minimizing impacts to wetlands and wetland buffers to the greatest extent possible. An alternatives analysis demonstrating avoidance and minimization of impacts will be a requirement of the Corps of Engineers Section 404 permit that will be needed to construct the trail. The City's analysis of the wetland restoration that can be accomplished on the 37-acre site owned by the City indicates that it may be possible to develop sufficient wetland mitigation credits on the site to offset the trail development impacts and provide a surplus of mitigation credits.

## **2. ALTERNATIVES**

This section describes the proposed action under consideration by the City and the alternatives to the proposal, including No Action, that are evaluated in the EIS. It also addresses timing considerations.

### **2.1 PROPOSED ACTION**

The City of Bonney Lake proposes to adopt a plan for the development of the Fennel Creek Trail. To implement the plan, the City would construct a multi-use trail within or near the riparian corridor of Fennel Creek, a perennial stream located in the southeastern part of the City and adjacent unincorporated Pierce County. The trail plan describes a trail that would be 6.3 miles in length and be constructed of porous asphalt. The City would construct the 5.2 miles of the proposed trail that are located within the city limits of Bonney Lake. Independent action by Pierce County would be required to complete the remaining 1.1 mile of trail outside the city limits.

The proposed Fennel Creek Trail would extend south from Allan Yorke Park in Bonney Lake to Victor Falls (see Figure 1), an 80-foot waterfall on Fennel Creek near Rhodes Lake Road. This route would provide a connection to the Foothills Trail, a major regional trail under development by Pierce County from Sumner to Orting, South Prairie and several other communities in the eastern part of the County. A branch of the trail would extend eastward from the vicinity of Church Lake Road to 214th Avenue E, providing a connection to Pierce County's proposed Flume Trail from Bonney Lake to Buckley. The trail would be located parallel to the creek along most of the route, but would pass through adjacent agricultural and residential areas where needed to make access connections or avoid constraints. The trail would be available for pedestrian, bicycle and equestrian use. The draft Fennel Creek Trail Plan (Bruce Dees and Associates 2005) includes 1) maps and description for a trail route within the Fennel Creek watershed, 2) trail construction plans and layouts and 3) trail cross sections and vegetation clearances.

The trail's minimum distance from the creek, other than at locations where the route crosses the creek, would be 50 or 100 feet, depending on the alternative. In addition, spur trails giving direct access to the creek bank may be provided at several other locations where impacts could be minimized. This would give the public low-impact access to the creek banks so that they do not create their own trails to do so. The location of these potential spurs would be determined during the field routing of the final trail alignment. The draft plan reflects a preliminary location for the trail, based on the level of information that is currently available. More site-specific analysis in the field is needed to define the exact trail location.

The City proposes to implement the plan in phases as funding and property acquisition allow. Some segments of the trail would follow existing public lands and could be

developed in the relatively near future. Much of the corridor is within private ownership, however. Trail development in those areas would occur take longer due to the need to acquire access rights. The City plans to establish right-of-way for the trail by acquiring private property from willing sellers, either through purchase or by dedication of land or long-term easements under the City's subdivision approval process.

## **2.2 FENNEL CREEK TRAIL CONSTRUCTION, OPERATION AND MAINTENANCE**

### **2.2.1 Construction**

The Draft Fennel Creek Trail Plan (Bruce Dees & Associates 2005) describes construction elements for the proposed trail. They include construction of the trail surface itself, bridges to accommodate stream crossings, multiple trailhead facilities, signage, drainage features, landscaping, and restoration of areas disturbed during construction. Based on the draft plan, the key construction activities are summarized as follows:

- The trail itself would consist of two components, a paved trail for pedestrian, bicycle and in-line skate use and a soft-surface trail for equestrian use.
- The primary, paved trail would be up to 12 feet wide and have 2-foot shoulders on each side. It would be constructed of 2 inches of porous asphalt, over 4 inches of crushed rock, over 12 inches of ballast. This would allow rainwater to percolate through the trail and avoid requirements for stormwater detention facilities. The trail surface would be elevated slightly above the surrounding grade.
- The equestrian part of the trail would consist of a trail tread 2 feet wide with cleared, vegetated buffers 3 feet wide on either side. It would be separated from the paved trail by a minimum of 5 feet where possible (including the 2-foot shoulder for the paved trail), but would be adjacent to the paved trail where constraints limit the width of the trail section. The equestrian trail would be surfaced with native soil, wood chips, or sand, as dictated by site conditions.
- Forest duff excavated for the paved and equestrian trails would be spread adjacent to the trail to reestablish the native vegetation cover.
- Soil exposed by construction would be seeded with native grasses and forbs to promote immediate erosion control and rapid reestablishment of native vegetation the next growing season.
- Cross drainage would be intercepted in a swale or cutoff trench (French drain). The trail would be positioned to low points and cross over any culverts needed for drainage.
- Vegetation would be cleared to the specified width on either side of the trail location to permit construction. Additional clearing would be necessary at street crossings.

Overhead vegetation and tree limbs would be trimmed to a clearance height of 10 feet. Hazard tree removal along the trail would be limited to that specified by a professional arborist.

- Informational, directional/regulatory and interpretive signs of various types would be installed at appropriate locations. Trail use etiquette, traffic advisory (including “No Parking signs”), and property delineation signs would be located adjacent to the trail and at road and driveway crossings. Signs would be placed between 3 and 6 feet from the trail edge. Similar signs at the trailhead facilities would provide map and text information to trail users. Signage indicating the edges of sensitive areas, and the need to avoid them, would be installed where needed. Interpretive signs would be installed in key locations to educate trail users about resources in the Fennel Creek corridor.
- Mile post markers, bollards and traffic signs would be installed to control traffic flow along the trail.
- Vegetation screens with a height of at least 8 feet would be installed to ensure the privacy of properties adjacent to the proposed trail.
- Construction of creek crossings would need Hydraulic Project Approvals from Washington Department of Fish and Wildlife, and would need to be designed so that they do not alter the creek’s hydrology. All crossings would have to be full spans (without any piers in the creek), and may need to be designed to float or pivot away from the creek during flood events. Bridge details are included in the Draft Fennel Creek Trail Plan (Bruce Dees and Associates 2005).
- Public access points are proposed at four locations along the 6.3 mile length of the trail, as shown in Figure 1. These are at the northern terminus of the trail at Allan Yorke Park; eastern terminus at 214th Avenue East; the southern/western terminus at Rhodes Lake Road; and an intermediate location off of 192nd Avenue East, between the Sumner-Buckley Road and State Route (SR) 410. Trailhead facilities currently exist at Allan Yorke Park. New facilities, including small parking lots for 10 to 15 vehicles, toilets, drinking fountains, bicycle racks and hitching posts, benches and signage would be constructed at the other three locations.

### **2.2.2 Operation and Maintenance**

The City of Bonney Lake would operate and maintain the completed Fennel Creek Trail within the City limits. The trail would be open for public use seven days a week during daylight hours. Ongoing maintenance activities are summarized below:

- Drainage Maintenance – Ditches and culverts would be maintained periodically to allow for effective drainage. Nominal work would be done as needed to repair damage, restore drainage paths and water flow, and undertake proactive measures in areas identified to have a clear and present potential for acute drainage incidents.

- Vegetation Management – Ongoing vegetation management, primarily trimming of trees and shrubs and mowing of grass areas, would be conducted along the entire trail route.
- Litter and Dog-waste Control – Litter and dog-waste bag receptacles would be located along the trail at public access points.
- Sign Maintenance – Information and directional signs would be repaired or placed as needed.
- Monitoring – The City would monitor use of the trail and the condition of resources along the trail corridor, and would address any significant indications of user conflicts or resource damage.

## **2.3 DESCRIPTION OF ALTERNATIVES**

This DEIS compares the impacts of five alternatives: four action alternatives (A through D) and a No Action Alternative.

### **2.3.1 Action Alternatives**

The City of Bonney Lake proposes to construct a trail for pedestrian, bicycle, and equestrian use along the Fennel Creek Corridor, adjacent agricultural land, and residential areas. As shown in Figure 1, under each alternative the trail would be approximately 6.3 miles long and would follow the same general route. The structural composition of the paved trail would also be the same in each alternative, with a 12-inch layer of ballast overlain by a 4-inch layer of crushed rock and a 2-inch trail surface of porous asphalt. The composition of the soft-surfaced equestrian trail would likewise be the same in each alternative.

One key variable among the alternatives involves the width of the trail section (the cross-sectional area of the developed trail corridor, effectively the right-of-way for the trail). The trail section would be 14 feet for Alternative A and Alternative C, and 24 feet for Alternative B and Alternative D. As described in the draft trail plan, the corridor for the 24-foot trail section would typically consist of the following:

- 2-foot paved trail shoulder
- 12-foot paved trail surface
- 2-foot paved trail shoulder
- 3-foot vegetated buffer
- 2-foot soft-surfaced equestrian trail tread
- 3-foot vegetated buffer.

Depending on site-specific property circumstances, there could be additional vegetated buffer area on either or both sides of the trail.

The 14-foot section for Alternatives A and C could involve reduced widths for each component (e.g., an 8-foot paved trail with 1-foot shoulders, and 1-foot buffers on the equestrian trail). Alternatively, a 14-foot section could be accomplished by eliminating the equestrian trail and constructing a 10-foot paved trail with 2-foot shoulders. The Draft Fennel Creek Trail Plan (Bruce Dees and Associates 2005) does not specify the dimensions for a 14-foot trail section.

The distance of the trail from the creek bank would also vary among the alternatives. Under Alternatives A and B the innermost edge of the trail would be sited as close as 50 feet from the creek bank. Under Alternatives C and D the trail edge would be sited at least 100 feet from the creek bank.

Based on the difference in trail widths, the four action alternatives would require placement of different quantities of construction materials. These quantities are summarized below in Table 3.

**Table 3.** Quantities of Construction Materials Needed for the Four Fennel Creek Trail Alternatives

Alternative	Trail Width (feet)	Porous Asphalt (cubic yards)	Crushed Rock (cubic yards)	Ballast (cubic yards)
A	14	2,900	5,700	17,200
B	24	4,900	9,900	29,600
C	14	2,900	5,700	17,200
D	24	4,900	9,900	29,600

**2.3.2 No Action Alternative**

Under the No Action Alternative, the City would not adopt or implement the Fennel Creek Trail Plan. The City would not acquire property for a public right-of-way for trail use and would not construct the trail facilities described in the plan. This alternative would result in no public access or public-use trails in the Fennel Creek corridor within the Bonney Lake City limits, at least for the foreseeable future. Conditions within and adjacent to the corridor would continue to be influenced by land use patterns and development actions. Future residential subdivision activity could occur near the corridor. Depending on the development plans of individual applicants, such activity could include dedication of on-site rights-of-way for pedestrian use and even construction of trail systems for internal use.

**2.4 TIMING/PHASING CONSIDERATIONS**

As discussed previously, the City expects to implement the Fennel Creek Trail Plan in phases as funding, other resources and property acquisition allow. Some segments of the trail would make use of existing public rights-of-way and could be developed in the relatively near future. Much of the corridor is within private ownership, however, and trail

development in those areas would occur over the longer term following acquisition of access rights for the trail route.

The Fennel Creek Trail Plan (Bruce Dees and Associates 2005) defines nine specific segments for the entire proposed trails system, as follows:

Section A – Allan Yorke Park to City property at 195th Court E

Section B – City property at 195th Court E to Church Lake Road

Section C – Link from Bonney Lake Elementary to Church Lake Road

Section D – Kelly Lake Road to 214th Avenue E

Section E - Church Lake Road to Sumner-Buckley Highway undercrossing

Section F - Sumner-Buckley Highway undercrossing to Angeline Road

Section G – Angeline Road to Garden Meadows

Section H – Garden Meadows through Willow Brook

Section I – Willow Brook to Victor Falls Overlook

The draft plan suggests six priorities for phased development of the trail segments, and recommends as the first priority the development of Section F as a demonstration trail. Recommended priorities for other trail sections reflect opportunities based on the presence of existing City property and/or facilities (such as sidewalks) that could provide trail links, population clusters that would be served, or opportunities for education and interpretation.

At this time the City has not defined a development schedule or sequence for specific trail segments. Eventual determination of the timing for completion of the trail will likely be dependent primarily upon the City's ability to secure funding for trail development. The City has applied for grants to build certain trail segments.

## **2.5 BENEFITS AND DISADVANTAGES OF FUTURE IMPLEMENTATION**

Reserving implementation of the proposed action until some future time would postpone impacts to various elements of the environment, primarily wetlands. It would also allow the City more time to develop detailed information on existing conditions within the trail corridor, pursue funding sources, and investigate prospects for acquiring public rights-of-way. However, adopting the trail plan and building the trail in the near future would not appear to foreclose future options that would be desirable for the residents of Bonney Lake. The City does not have other plans for public uses in the creek corridor that would be rendered impractical by development of the proposed trail, and is not aware of other actions proposed by public or private entities for the area along the trail route. Conversely, deferred action on the proposal could result in lost opportunities for trail development if continued

land conversion and subdivision activity adjacent to the creek corridor resulted in new constraints to trail development. Based on current information, the City believes the disadvantages of deferred implementation would outweigh the benefits.

### 3. AFFECTED ENVIRONMENT, IMPACTS AND MITIGATION MEASURES

This section describes the existing environment in terms of vegetation types and wetlands, wildlife, and fish, and the likelihood of occurrence of threatened, endangered, and other species of state and federal concern; the anticipated impacts of the proposed alternatives; and measures that are available to mitigate those impacts.

The Fennel Creek Corridor was not completely surveyed in the field due to public access restrictions along much of the proposed trail route. Similarly, the exact locations of the trail alternatives have not been identified at this point; Figure 1 shows their approximate locations, based on currently available information. These alternatives have not been surveyed or marked in the field. Additional field inventory and site-specific planning will be conducted in the future as the City proceeds with phased implementation of the proposal. Once an alternative is chosen, the specific route would be selected in the field, using a team including the landscape architect and biology consultants, with the intent of avoiding sensitive areas and habitat features (such as wetlands, important or sensitive vegetation, and wildlife habitat features such as snags).

The description of the affected environment and the impact analysis in this EIS relies on a number of sources that include limited on-site field surveys in 1998 and 2006, the earlier environmental analysis of the corridor (City of Bonney Lake 1999), interpretation of more recent aerial photos, and updated GIS data obtained from a variety of sources. These GIS sources include field survey data obtained from portions of the corridor which were accessible because they were publicly owned, which were studied in 1998 and 2006, National Wetland Inventory Data, and the Pierce County wetlands GIS data.

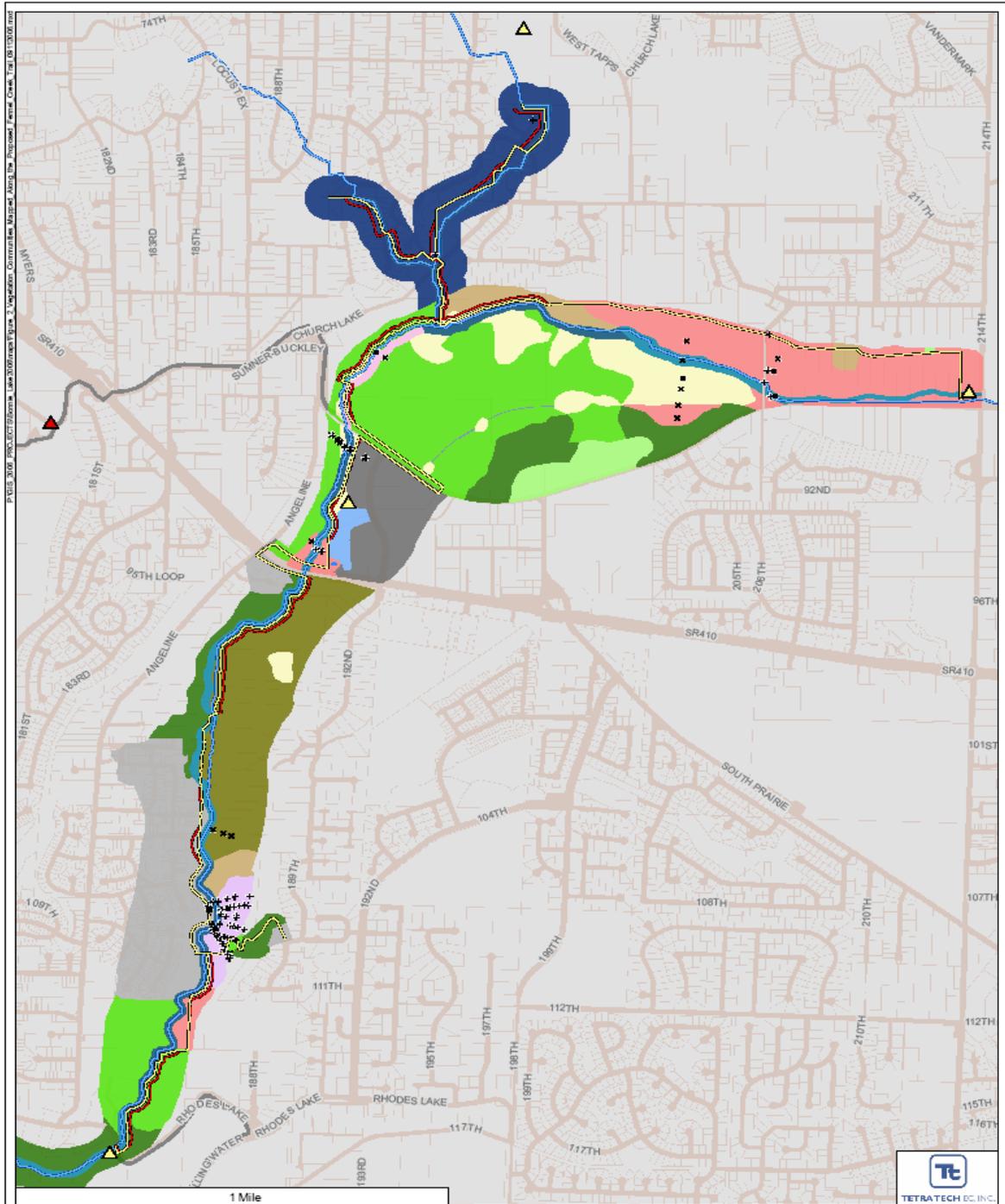
On-site field surveys were conducted in 2006 in portions of the corridor that were accessible because they are publicly owned, to augment data from similar surveys conducted in 1998 for an earlier environmental analysis of the corridor (City of Bonney Lake 1999), which was used to provide data on habitat conditions.

#### 3.1 VEGETATION

##### 3.1.1 Habitat Types and Species Composition

Habitat types in the project area are shown in Figure 2, and the breakdown of habitats within the vicinity of the current trail Alternative alignments is included in Table 4. Table 4 also lists some of the most common species in these habitats. These habitats had been originally defined in the earlier environmental analysis of the corridor (City of Bonney Lake 1999), and were updated with data obtained from the 2006 field surveys. WDFW information on Priority Habitats, which also includes the NWI wetlands, was reviewed for all aspects of the impact analysis. These data were used to aid in generating the Fennel Creek corridor habitat map in Figure 2. These habitats are typical of forested, shrub, and herbaceous habitats elsewhere in Pierce County. The tree species present include western red cedar, Douglas-fir, black cottonwood, western hemlock, red alder, cascara, Oregon ash, willows, and bigleaf

**Figure 2.** Vegetation Communities Mapped Along the Proposed Fennel Creek Trail



**Figure 2. Vegetation Communities Mapped Along the Proposed Fennel Creek Trail Bonney Lake, WA**

<ul style="list-style-type: none"> <li>— Preferred Trail: 60 ft</li> <li>▲ Preferred Trail Head</li> <li>— Alternative Trail: 100 ft</li> <li>▲ Alternative Trail Head</li> <li>— Trail Access road</li> <li>+ 2006 Transect locations</li> <li>■ 1999 Transect locations</li> <li>— Fennel Creek</li> </ul>	<p>Wetlands and Habitats, Surveyed 1998*</p> <ul style="list-style-type: none"> <li>■ Drainage</li> <li>■ Palustrine Emergent</li> <li>■ Palustrine Forested</li> <li>■ Palustrine Open Water</li> <li>■ Palustrine Scrub-Shrub</li> <li>■ Palustrine Mosaic, 52% Wetland / 48% Upland</li> <li>■ Riverine Emergent</li> <li>■ Riverine Forested</li> </ul>	<ul style="list-style-type: none"> <li>■ Riverine Scrub-Shrub</li> <li>■ Upland Forested</li> <li>■ Upland Forested / Palustrine Forested</li> <li>■ Upland Forested / Residential</li> <li>■ Upland Pasture</li> <li>■ Upland Pasture / Residential</li> <li>■ Residential</li> <li>■ Industrial / Commercial / Road</li> <li>■ Retaining Ponds</li> </ul>	 <p>09/11/06</p> <p>*Supplementary aerial photo interpretation conducted in 2006</p>
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**Table 4.** Habitat Types, Characteristic Vegetation, Acres of Habitats Within the Corridors along each Trail Alternative, and Average Frequency of Occurrence of Habitats in the Fennel Creek Trail Alternatives

Habitat Class	Habitat Type	Characteristic Plant Species or Types	Impacted Area (acres) by Alternative <sup>1/</sup>				Average Frequency of Occurrence among the Four Trail Alternatives
			A	B	C	D	
Upland	Industrial/Commercial/Road Mosaic <sup>2/</sup>	unvegetated, ornamental trees and shrubs, turf grasses	0.66	1.14	0.67	1.16	6.1%
	Residential <sup>2/</sup>	ornamental trees and shrubs, turf grasses	1.08	1.90	1.09	1.89	10.0%
	Upland Forested	western red cedar, red alder, black cottonwood, red elderberry, trailing blackberry, cascara	0.78	1.37	0.51	0.87	5.9%
	Upland Forested/Residential Mosaic	western red cedar, red alder, black cottonwood, salmonberry, red elderberry, trailing blackberry, cascara, ornamental trees and shrubs, turf grasses	1.51	2.68	1.71	2.93	14.8%
	Upland Pasture	tall fescue, orchardgrass, dog tail	1.40	2.50	1.66	2.92	14.2%
	Upland Pasture/Residential Mosaic	tall fescue, orchardgrass, dog tail, ornamental trees and shrubs, turf grasses	0.04	0.07	0.04	0.07	0.4%
	Upland Totals	-	5.48	9.66	5.68	9.83	51.3%
Upland/Wetland Mosaic	Wetland/Upland Mosaic <sup>1/</sup> : 52% Emergent wetland/ 48% Upland meadow <sup>1/</sup>	western hemlock, red alder, Oregon ash, bigleaf maple, salmonberry, Douglas spiraea, trailing blackberry, Himalayan blackberry, ocean spray, lady fern, reed canary grass, skunk cabbage, soft rush	0.36	0.63	0.26	0.42	2.8%
	Upland Forested/Palustrine Forested Mosaic	western red cedar, red alder, black cottonwood, Sitka spruce, western hemlock, salmonberry, red elderberry, pacific blackberry, cascara, devil's club, ladyfern, water parsley, skunk cabbage	0.87	1.49	0.90	1.54	8.0%
	Mosaic Totals	-	1.23	2.12	1.16	1.96	10.8%
Wetland	Palustrine Emergent	soft rush, tall fescue, velvetgrass, bentgrass, creeping buttercup	0.50	0.85	0.31	0.48	3.6%
	Palustrine Forested	western red cedar, Sitka spruce, western hemlock, salmonberry, devil's club, lady fern, water parsley, skunk cabbage	2.11	3.65	2.14	3.68	19.4%
	Palustrine Scrub-Shrub	willow, Douglas spiraea	0.60	1.05	0.72	1.22	6.0%
	Retaining Ponds	bare ground, weedy annuals, duckweed, willows, black cottonwood	0.05	0.14	0.13	0.26	1.0%
	Riverine Emergent	soft rush, tall fescue, velvet grass, bentgrass, creeping buttercup	0.17	0.29	0.08	0.12	1.1%
	Riverine Forested	red alder, Oregon ash	0.50	0.79	0.36	0.62	3.8%
	Riverine Scrub-Shrub	willows, Douglas spiraea	0.65	0.90	0.09	0.15	3.0%
Wetland Totals	-	4.59	7.67	3.83	6.54	37.9%	
Total Long-term Acreage Impacted		-	9.56	16.36	8.94	15.25	
Total Short-term Vegetation Acreage Impacted			4.10	4.09	3.83	3.81	

<sup>1/</sup>Based on field transect surveys of the area and 14-foot and 24-foot wide areas of trail habitat loss (depending on alternative).

<sup>2/</sup> Excluded from vegetation impacts totals.

maple. There is no old-growth forest present. Some large trees are present but most of the area was logged at least once. Common shrubs include salmonberry, Douglas spiraea, trailing blackberry, Himalayan blackberry, oceanspray, Pacific ninebark, Oregon grape, devil's club, and red elderberry. Herbaceous species include swordfern, soft rush, tall fescue, velvet grass, bentgrass, creeping buttercup, reed canarygrass, orchardgrass, and dog tail in meadow habitats. In wetland shrub and forest areas, herbaceous species such as skunk cabbage, lady fern, water parsley, rushes, creeping buttercup, and sedges are present.

The most frequently occurring habitat types in the immediate vicinity of the trail corridor alignments are palustrine forested wetlands (19 percent), a mosaic of upland forest and residential (15 percent), upland pasture (15 percent), a mosaic of upland forest and palustrine forested wetlands (14 percent), and residential (10 percent). Forest communities, as well as most of the wetland plant communities, are composed primarily of native species, but some non-native weedy species are present. Reed canarygrass and Himalayan blackberry, respectively, are common species in some of the wetland and riparian plant communities. Individual plant species known and likely to occur in the project corridor are listed in Appendix A: Plant and Wildlife Species, of the earlier environmental analysis of the corridor (City of Bonney Lake 1999).

### 3.1.2 Vegetation Impacts

Direct impacts to vegetation would be limited to the footprint of the trail, and to areas temporarily disturbed during construction. Table 4 presents estimated acreages of long-term impacts to various habitats for 14-foot and 24-foot wide trail alternatives, by habitat types; and also presents (at the bottom of the table) estimated total acreages of short-term impacts.

Constructing the trail facilities would convert existing vegetation along the trail route to trail surfaces. Excluding the Industrial-Commercial-Road and Residential habitats, construction of Alternative A (a 14-foot wide trail) would result in the long-term loss of 9.6 acres of vegetation, Alternative B (a 24-foot wide trail) would result in the loss of 16.4 acres, Alternative C (14-foot) would result in the loss of 8.9 acres, and Alternative D (24-foot) would result in the loss of 15.2 acres of vegetation (Table 4). These acreages are minor in comparison to the size of the Fennel Creek Corridor and in relation to the scale of urban development occurring in the Bonney Lake area, and are not considered to be significant.

The Palustrine Forested habitat type would be most impacted by any of the four alternatives, with Upland Forested/ Residential, Upland Pasture and Residential also comprising relatively high fractions of affected vegetation types. The two forested habitats above consist mainly of native species, and removal of these habitats would result in a non-significant, permanent loss of native vegetation.

The total short-term impact acreages presented in the bottom row of Table 4 are based on the assumption that temporary disturbance during construction would be limited to an area 3 feet in width on either side of the trail section, for all of the alternatives. Therefore, construction for all of the alternatives could temporarily disturb an additional band up to 6

feet wide along the trail routes. The extent of actual disturbance within this temporary impact zone, comprising between 3.8 and 4.1 acres (depending on Alternative, see Table 4) would be variable and intermittent. Outside the area of clearing for the equestrian trail tread and the paved trail and shoulders, much of the disturbance would be limited to trampling or brief operation of equipment. Temporarily disturbed areas outside of the trail surfaces would be revegetated immediately following construction.

Minor adverse impacts to plants in the corridor would result from long-term trail use. Non-significant impacts could result from maintenance of sight lines at crossings, or from trampling by humans or pets.

### **3.1.3 Threatened or Endangered Plant Species**

Threatened, endangered, or sensitive plant species are usually sensitive to disturbance. Because the corridor and the project vicinity are largely urbanized, there is a low probability for the presence of threatened, endangered, or sensitive species. The Washington State Department of Natural Resources (WDNR) Priority Habitats and Species Program (PHS) lists plant species considered to be federally threatened, endangered, a candidate for listing, or sensitive. No federally listed plant species are known to be in the project area or vicinity based on WDNR (2006) data and field observations by Tetra Tech staff.

### **3.1.4 Plant Species with State Status**

The PHS has also developed a list of plant species considered to be threatened, endangered, or sensitive within the State of Washington (WDNR, 2006). Data from the PHS indicate that no state sensitive plant species have been reported growing in the vicinity of the Fennel Creek Corridor adjacent to the proposed trail route, and none were observed during field studies.

### **3.1.5 Impacts to Threatened, Endangered or State Status Plant Species**

No threatened, endangered, or sensitive plant species are located within the trail corridor. No short- or long-term impacts to threatened, endangered, and sensitive plant species are anticipated.

## **3.2 WETLANDS**

### **3.2.1 Wetlands Existing Conditions**

Wetlands are defined as those areas that are inundated or saturated long enough during the growing season to develop anaerobic conditions in the upper portion of the soil, which results in the development of wetland vegetation and hydric soils. Analysis of potential wetland impacts for this EIS was based on three sources of information concerning wetland locations and types within the Fennel Creek corridor. The three sources are field surveys and aerial photo interpretation based on the field survey data; the National Wetlands

Inventory (NWI), a U.S Fish and Wildlife Service program; and wetland mapping developed by Pierce County.

In 1999 the City contracted with the consulting firm Foster Wheeler Environmental (now Tetra Tech EC, Inc.) to perform an environmental analysis of the Fennel Creek corridor. Consultant staff conducted transect surveys to coarsely estimate the extent of wetlands and map locally occurring habitat types within the corridor. Wetland transect survey plot methods were based on the Corps 1987 Wetland Delineation Manual (Environmental Laboratory 1987) and the Washington State Wetlands Identification and Delineation Manual (Washington Department of Ecology 1997). The data sheets from the 1999 surveys are in Appendix B of the published environmental analysis of the Fennel Creek corridor (City of Bonney Lake 1999).

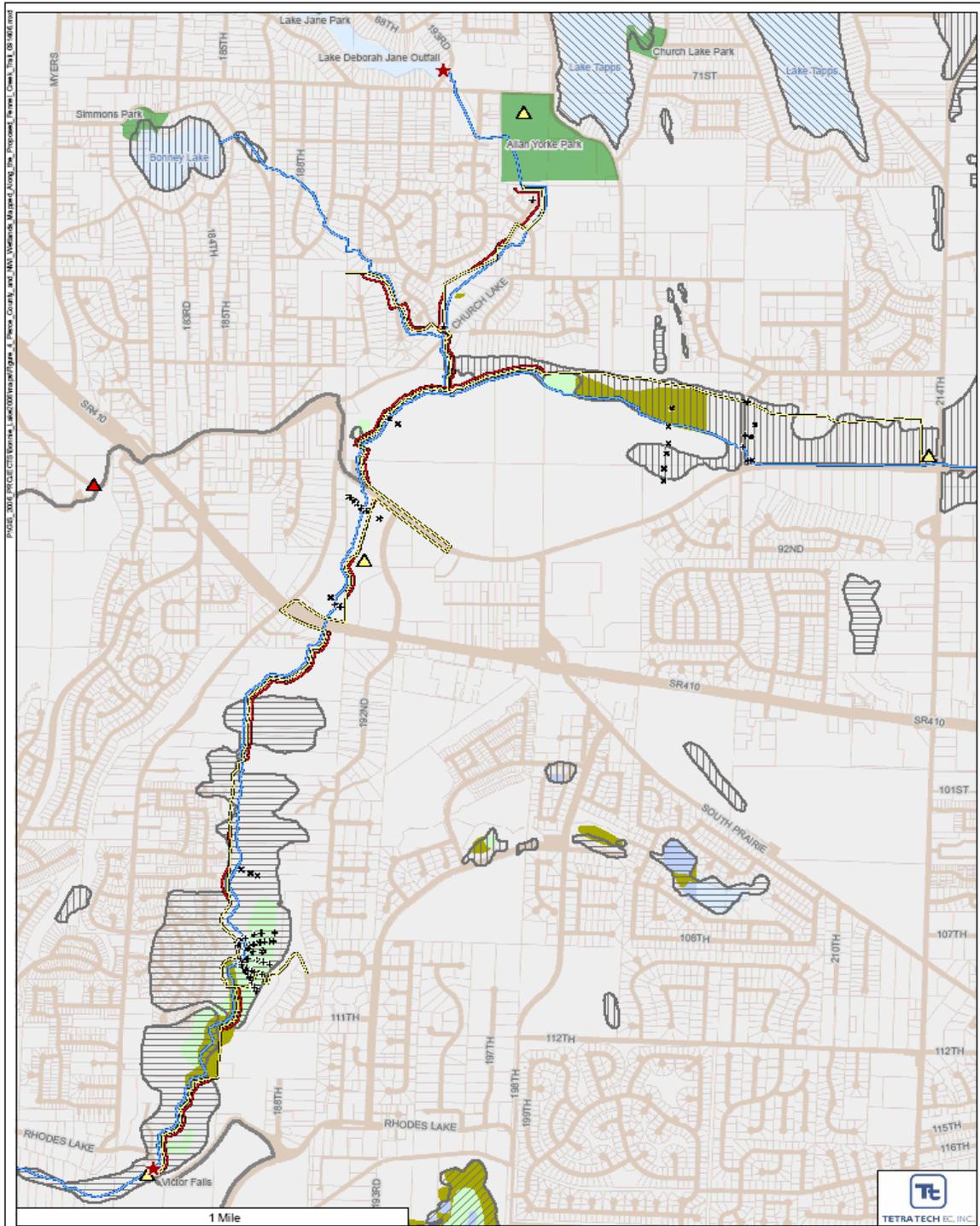
In support of the EIS, Tetra Tech staff conducted additional field surveys in May 2006. Figure 3 generally shows the locations of the transects and survey plots. Wetland areas outside of the survey transects were identified from interpretation of recent aerial photos, in conjunction with the field data. Detailed wetland delineations were not performed during the 1999 or 2006 field surveys, however, and have yet to be conducted for the Fennel Creek corridor. Nevertheless, the data from these on-site surveys (presented in Table 4) are considered likely to be the most accurate information on wetlands among the three sources available.

The other available sources of information on wetlands in the study area are the National Wetlands Inventory (NWI), a U.S. Fish and Wildlife Service program, and wetland mapping developed by Pierce County. Wetland data from the NWI and Pierce County wetland maps are shown in Figure 4. A close comparison of this map with Figure 2 indicates that the field studies commissioned by the City identified more extensive wetland areas that did the NWI or Pierce County mapping. WDFW information on Priority Habitats, which also includes the NWI wetlands, was reviewed for all aspects of the impact analysis; features identified on these maps are shown in Figure 5. These data were used to aid in generating the Fennel Creek corridor habitat map, which was then used to develop preliminary estimates of upland and wetland habitat impacts for each of the four alternatives presented in Table 4.

### **3.2.2 Wetland Impacts**

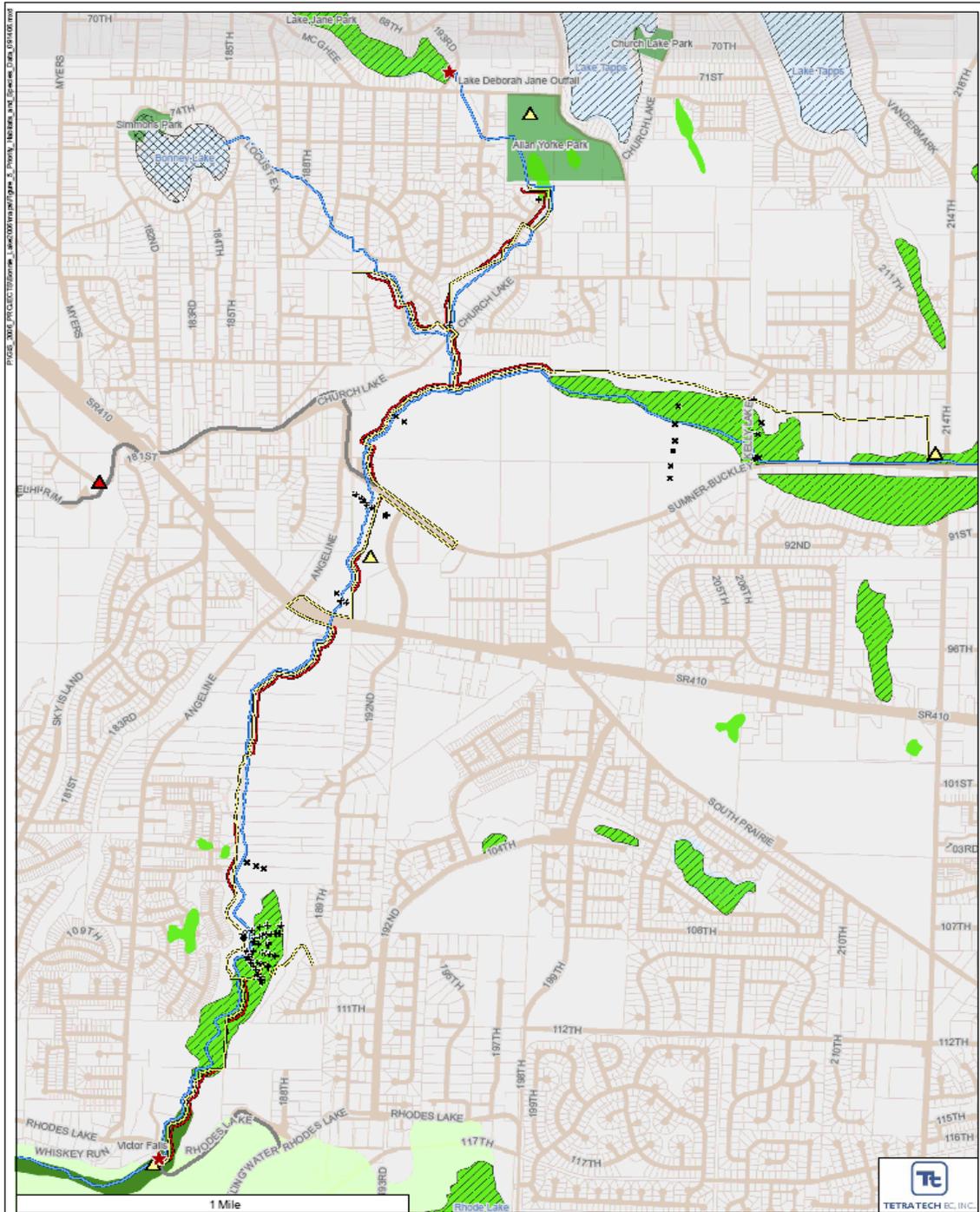
Wetlands along the entire trail corridor have not been delineated. Permanent, direct impacts to wetlands through filling would be limited to areas where the trail was constructed on wetlands. Wherever possible, the final trail alignment will be designed to avoid or minimize those impacts. Other construction impacts could include accidental spills of construction materials, temporary noise disturbance to wetland wildlife, erosion and sedimentation. Portions of wetlands are located within each Alternative trail corridor and could be subject to filling from construction (See Tables 4, 5, and 6, and Figure 4).





**Figure 4. Pierce County and NWI Wetlands Mapped Along the Proposed Fennel Creek Trail Bonney Lake, WA**

<ul style="list-style-type: none"> <li>★ Report Reference Points NWI Wetlands</li> <li>— Preferred Trail: 50 ft</li> <li>▲ Preferred Trail Head</li> <li>— Alternative Trail: 100 ft</li> <li>▲ Alternative Trail Head</li> <li>— Trail Access road</li> <li>+ 2006 Transect locations</li> <li>• 1999 Transect locations</li> <li>— Fennel Creek</li> </ul>	<p><b>Wetland Type</b></p> <ul style="list-style-type: none"> <li>■ Freshwater Pond</li> <li>■ Freshwater Emergent Wetland</li> <li>■ Freshwater Forested / Shrub Wetland</li> </ul>	<p><b>Pierce County Wetlands Wetland Class</b></p> <ul style="list-style-type: none"> <li>■ Unclassified Wetland</li> <li>■ Wetland, Class 1</li> <li>■ Wetland, Class 2</li> <li>■ Wetland, Class 3</li> </ul>	 06/14/08
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**Figure 5. Priority Habitats and Species Data  
Bonney Lake, WA**

- |                             |                          |
|-----------------------------|--------------------------|
| ★ Report Reference Points   | <b>Habitat Type</b>      |
| — Preferred Trail: 60 ft    | Waterfowl Concentration  |
| △ Preferred Trail Head      | Great Blue Heron         |
| — Alternative Trail: 100 ft | Riparian Zone            |
| ▲ Alternative Trail Head    | Wetland                  |
| — Trail Access road         | Urban Natural Open Space |
| + 2008 Transect locations   |                          |
| • 1999 Transect locations   |                          |
| — Fennel Creek              |                          |



In addition to the field survey characterization of the site shown in Table 4, The NWI and Pierce County data were used to independently calculate acreages of potential impacts to wetlands along the trail corridor. This was considered prudent because wetlands have not been delineated along the entire corridor.

The total estimated area of wetland impact according to NWI data ranges from 0.65 acres for Alternative C to 1.42 acres for Alternative B (see Table 5). The total estimated area of impact according to Pierce County data ranges from 3.83 acres for Alternative C to 7.26 acres for Alternative B (see Table 6). Although the estimated acreages of impact using the NWI, Pierce County, and updated habitat data are very different (0.65 acres vs. 3.83 acres for Alternative C, for example), the results are consistent in terms of the rank of each Alternative in terms of acres of impact from highest to lowest. In all three cases, Alternative C has the lowest acreage of wetland impact, Alternative A the next lowest, Alternative D the next lowest, and Alternative B the highest acreage of impact.

**Table 5.** Estimated Wetland Impacts of Alternative Trail Corridors based on NWI Data

Wetland Data Source	Wetland Type <sup>1/</sup>	Description	Impacted Area (acres ) by Alternative			
			B	D	A	C
NWI Wetland Data	PEMC	Palustrine Emergent	0.86	0.01	0.48	0.43
	PEMA	Palustrine Emergent	-	0.74	-	-
	PFOC	Palustrine Forested	0.56	0.33	0.38	0.22
Total Wetland Area of Impact			1.42	1.08	0.85	0.65

<sup>1/</sup>National Wetland Inventory 2006

**Table 6.** Estimated Wetland Impacts of Alternative Trail Corridors Based on Pierce County Data

Wetland Data Source	Wetland Type <sup>1/</sup>	Impacted Area (acres ) by Alternative			
		B	D	A	C
Pierce County GIS	Not Categorized	3.00	2.87	1.75	1.69
	Type II Wetland	4.29	3.62	2.52	2.14
Total Wetland Area of impact		7.26	6.50	4.28	3.83

<sup>1/</sup>Pierce County GIS 2006

Accidental spills of surfacing material (e.g., permeable asphalt, crushed rock, ballast) from the top of the trail during construction could result in burial of wetland vegetation and soils. The use of BMPs and careful material placement during construction would reduce the risk of erosion.

All affected potential wetlands are located in the City of Bonney Lake. The proposed wetland impacts would be regulated by the U.S. Army Corps of Engineers (Corps) and by the Washington State Department of Ecology under the Clean Water Act. The Clean Water Act requires no net loss of wetlands and activities that include filling regulated wetlands require a permit from both agencies. The City of Bonney Lake would also regulate impacts to wetlands under the Bonney Lake Municipal Code.

Listed below are summaries of the estimates of impacts to wetlands for each alternative using each of the three sources of information. Mitigation for impacted wetland acres is discussed in Section 3.5.2. After considering the impacts of the trail construction together with the mitigation that will occur, no significant impacts to wetlands or their buffers are expected with the incorporation of mitigation measures.

**3.2.2.1 Wetland Impacts of Alternative A**

This Alternative has the third highest estimated wetlands impact of the Alternatives. Under Alternative A, the City of Bonney Lake proposes to construct a trail 6.3 miles long and 14 feet wide, which in some areas would be as close as 50 feet from Fennel Creek. Alternative A would impact each of the 15 plant communities listed

in Table 4, with Palustrine Forested (2.11 acres), Upland Forested/Residential mosaic (1.51 acres), Upland Pasture (1.40), and Residential (1.08 acres) being the most affected (Figure 2).

Alternative A would impact 0.48 acres of Palustrine Emergent Wetland (PEMC), and 0.40 acres of Palustrine Forested Wetland (PFOC) for a total of 0.85 acres of impacted wetlands, according to data obtained from National Wetland Inventory (NWI) (Table 6, Figure 4). According to wetland data obtained from Pierce County (Pierce County GIS 2006), Alternative A would impact a total of 4.28 acres of wetland, 2.52 acres of which are categorized as Class II wetlands with the remaining wetlands not classified (Table 6, Figure 4).

According to the revised habitat mapping prepared by Tetra Tech in 2006, Alternative A would impact 0.50 acres of Palustrine Emergent Wetland (PEMC), 2.11 acres of Palustrine Forested Wetland (PFOC), 0.60 acres of Palustrine scrub-shrub, 0.05 acres of retaining ponds, 0.17 acres of Riverine Emergent wetland, 0.50 acres of Riverine Forested, and 0.65 acres of Riverine Scrub-shrub, for a total of 4.59 acres of impacted wetlands (Table 4, Figure 2), plus some proportion of the 1.23 acres of wetland/upland mosaic listed in Table 4.

### 3.2.2.2 Wetland Impacts of Alternative B

This Alternative has the highest estimated wetland impact of the Alternatives. Under Alternative B, the City of Bonney Lake proposes to construct a 24-foot wide, 6.3-mile trail along the Fennel Creek Corridor, which in some areas would be as close as 50 feet from Fennel Creek. Alternative B would impact each of the 15 plant communities in Table 4, with Palustrine Forested (3.65 acres), Upland Forested/Residential (2.68 acres), Upland Pasture (2.50), and Residential (1.90 acres) being the most affected (Figure 2).

Alternative B would impact 0.87 acres of Palustrine Emergent Wetland (PEMC) and 0.56 Palustrine Forested Wetland (PFOC) for a total of 1.43 acres of impacted wetlands according to data obtained from NWI (Table 6, Figure 4). According to wetland data obtained from Pierce County (Pierce County GIS 2006), Alternative A would impact a total of 7.26 acres of wetland, 4.29 acres of which categorized as type II wetlands with the remaining acres of wetlands not categorized (Table 6, Figure 4).

According to the revised habitat mapping prepared by Tetra Tech in 2006, Alternative B would impact 0.85 acres of Palustrine Emergent Wetland (PEMC), 3.65 acres of Palustrine Forested Wetland (PFOC), 1.05 acres of Palustrine scrub-shrub, 0.14 acres of retaining ponds, 0.29 acres of Riverine Emergent wetland, 0.79 acres of Riverine Forested, and 0.90 acres of Riverine Scrub-shrub, for a total of 7.67 acres of impacted wetlands (Table 4, Figure 2), plus some proportion of the 2.12 acres of wetland/upland mosaic listed in Table 4.

### 3.2.2.3 Wetland Impacts of Alternative C

This Alternative has the lowest estimated impact of the Alternatives. Under Alternative C, the City of Bonney Lake proposes to construct a 14-foot wide, 6.3 mile trail along the Fennel Creek Corridor, which in some areas, would be sited as close as 100 feet from Fennel Creek. Alternative C would impact each of the 15 plant communities in Table 4, with Palustrine Forested (2.14 acres), Upland Forested/Residential (1.71 acres), Upland Pasture (1.66), and Residential (1.09 acres) being the most affected (Figure 2).

Alternative C would impact 0.43 acres of Palustrine Emergent Wetland (PEMC) and 0.22 acres of Palustrine Forested Wetland (PFOC) for a total of 0.65 acres of impacted wetlands according to data obtained from NWI (Table 5, Figure 4). According to wetland data obtained from Pierce County (Pierce County GIS 2006), Alternative A would impact a total of 3.83 acres of wetland, 2.14 acres of which are categorized as Class II wetlands with the remaining acres of wetlands not classified (Table 6, Figure 4).

According to the revised habitat mapping prepared by Tetra Tech in 2006, Alternative C would impact 0.31 acres of Palustrine Emergent Wetland (PEMC), 2.14 acres of Palustrine Forested Wetland (PFOC), 0.72 acres of Palustrine scrub-shrub, 0.13 acres of retaining ponds, 0.08 acres of Riverine Emergent wetland, 0.36 acres of Riverine Forested, and 0.09 acres of Riverine Scrub-shrub, for a total of 3.83 acres of impacted wetlands (Table 4, Figure 2), plus some proportion of the 1.16 acres of wetland/upland mosaic listed in Table 4.

### 3.2.2.4 Wetland Impacts of Alternative D

Alternative D has the second-highest wetland impacts of the alternatives. Under Alternative D, the City of Bonney Lake proposes to construct a 24 foot wide, 6.3 mile porous asphalt trail for pedestrian, bicycle, and equestrian use along the Fennel Creek Corridor, which in some areas, would be sited as close as 100 feet from creek bank.

Alternative D would impact each of the 15 plant communities in Table 5, with Palustrine Forested (3.68 acres), Upland Forested/Residential (2.93 acres), Upland Pasture (2.92), and Residential (1.89 acres) being the most affected (Figure 2).

Alternative D would impact 0.74 acres of Palustrine Emergent Wetland (PEMC and PEMA) and 0.33 Palustrine Forested Wetland (PFOC) for a total of 1.07 acres of impacted wetlands according to data obtained from NWI (Table 5, Figure 4). According to wetland data obtained from Pierce County (Pierce County GIS 2006), Alternative D would impact a total of 6.50 acres of wetland, 3.62 of which are categorized as Class II wetlands with the remaining acres of wetlands not classified (Table 6, Figure 4).

According to the revised habitat mapping prepared by Tetra Tech in 2006, Alternative D would impact 0.48 acres of Palustrine Emergent Wetland (PEMC), 3.68 acres of Palustrine Forested Wetland (PFOC), 1.22 acres of Palustrine scrub-shrub, 0.26 acres of retaining ponds, 0.12 acres of Riverine Emergent wetland, 0.62 acres of Riverine Forested, and 0.15 acres of Riverine Scrub-shrub, for a total of 6.54 acres of impacted wetlands (Table 4, Figure 2), plus some proportion of the 1.96 acres of wetland/upland mosaic listed in Table 4.

## 3.3 WILDLIFE

The project area passes through 14 habitat types (Figure 2), which provide habitat for a high diversity of wildlife species. Forested habitats are the most common habitat type throughout the four trail alternative corridors (Table 4), although residential and pasture/meadow habitats are also present and the stream itself provides habitat for a variety of species.

### 3.3.1 Wildlife Species Composition and Affected Environment

The wildlife species inhabiting the Fennel Creek corridor are typical of urbanizing areas supporting the types of habitat mosaics and fragmented habitats found throughout western Washington. Black-tailed deer and coyotes are likely the only common large mammal species present, and would consist of animals accustomed to living with humans and development nearby. Smaller mammal species or groups likely to be common include the raccoon, red and/or gray fox, Virginia opossum, a variety of bats, mice, voles, and shrews; northern flying squirrel, and tree squirrels. Individual wildlife species likely to occur in the project corridor are listed in the Plant and Wildlife Species Appendix A of the environmental analysis of the Fennel Creek corridor (City of Bonney Lake 1999). A great variety of birds occur in the area, including waterfowl and other waterbirds in the local lakes and streams, such as the mallard, wood duck, Canada goose, great blue heron, and green-backed heron. Birds common in urban, suburban, and fragmented habitats in rural areas and likely to be common along Fennel Creek include the American robin, black-capped and chestnut-backed chickadee, spotted towhee, song sparrow, Bewick's wren, European starling, house finch, American goldfinch, scrub jay, Steller's jay, American crow, Vaux' swift, downy woodpecker, red-breasted nuthatch, house sparrow, and rock pigeon. Neotropical migrant species likely to inhabit these fragmented habitats include the Swainson's thrush, yellow warbler, common yellowthroat, yellow-rumped warbler, warbling vireo, tree swallow, barn swallow, and violet-green swallow. Amphibians likely to be present in the area include the Pacific chorus frog, red-legged frog, bullfrog, northwestern salamander, and red-bellied newt.

### 3.3.2 General Wildlife Impacts

Construction of a Fennel Creek Trail could impact wildlife through noise and visual disturbance. Where construction activities (i.e., grading and dumping, spreading, and leveling of gravel) occur, wildlife sensitive to

disturbance could be temporarily displaced to surrounding areas. The time period of construction in any given segment of the trail would be short (up to two weeks), and most wildlife would be expected to return to their original use areas following construction. Wildlife that use portions of the project corridor where human presence and activity is currently less common are expected to show a greater response to trail construction than wildlife in other portions of the project corridor where human disturbance is currently more common.

Long-term trail use could impact wildlife through noise and visual disturbance, harassment from dogs, and habitat degradation through trampling of vegetation and introduction of invasive weeds. The Fennel Creek Corridor passes through a significantly urbanized matrix and is bounded on several sides with residential and agricultural lands. Wildlife that use these areas have a demonstrated tolerance for human activities and domestic animals, and trail use would likely represent a negligible increase in disturbance. Urban generalists, such as raccoons, house sparrows, house finches, song sparrows, and American robins would remain common throughout the project area. Birds that nest adjacent to the proposed trail could be displaced to areas farther from the trail, and some small mammals may also move to areas farther from the trail. Disturbance effects to larger mammals, such as deer, coyotes, and foxes, may be moderated somewhat by the fact that these animals are active mostly in early morning, evening, and nighttime, when trail use is expected to be less intensive. With the incorporation of mitigation measures, impacts are not expected to be significant.

### **3.3.3 Threatened or Endangered Wildlife Species**

The bald eagle is the only species with federal status that may potentially use areas within Fennel Creek corridor. The nearest recorded bald eagle nest site is approximately 2 miles west of Victor Falls on the banks of the Puyallup River (WDNR 2006). Bald eagles are very unlikely to be adversely affected by construction or long-term use of any of the proposed Fennel Creek Trail Alternatives.

### **3.3.4 Impacts to Threatened and Endangered Wildlife Species**

The bald eagle nest near the Puyallup River is 2 miles from the proposed trail (WDNR 2006). Given the distance of the bald eagle nest site from the trail and the type of human activities that are already taking place in the trail vicinity, disturbance associated with trail construction and use is not expected to affect these nest sites and therefore there would be no adverse impacts to these species.

### **3.3.5 State-status Wildlife Species and Priority Habitats**

One wildlife species of state sensitive status is known to occur in the Fennel Creek corridor study area. There is an existing great blue heron rookery near Bonney Lake, 0.5 miles from the Lake Debra Jane Outfall Corridor and the “spur trail” to Allan Yorke Park. Priority habitats present are shown in Figure 5, and include areas of Priority Wetland Habitat, Waterfowl Concentrations, and Riparian Zones.

### **3.3.6 Impacts to State-status Wildlife Species and Priority Habitats**

The existing great blue heron rookery is located near Bonney Lake is 0.5 miles from the Lake Debra Jane Outfall Corridor and the “spur trail” to Allan Yorke Park. Disturbance associated with trail construction and use is therefore not expected to affect these nest sites and therefore there would be no adverse impacts to nesting great blue herons. Only long-term impact acreages are discussed below as areas temporarily disturbed during construction would be restored.

#### **3.3.6.1 Alternative A**

Alternative A would impact 2.49 acres of Priority Habitats (WDNR 2006) (Table 7, Figure 5). Designated Priority Wetland Habitat would be most impacted (1.09 acres), followed by Waterfowl Concentrations (1.02 acres) and Riparian Zones (0.38 acres).

#### **3.3.6.2 Alternative B**

Alternative B would impact 4.26 acres of Priority Habitats (WDNR 2006) (Table 7, Figure 5). Designated Priority Wetland Habitat would be most impacted (1.86 acres), followed by Waterfowl Concentrations (1.74) and Riparian Zones (0.66).

**3.3.6.3 Alternative C**

Alternative C would impact 1.95 acres of Priority Habitats (WDNR 2006) (Table 7, Figure 5). Designated Priority Wetland Habitat would be most impacted (0.82 acres), followed by Waterfowl Concentrations (0.76 acres) and Riparian Zones (0.37 acres).

**3.3.6.4 Alternative D**

Alternative D would impact 3.30 acres of Priority Habitats (WDNR 2006) (Table 7, Figure 5). Designated Priority Wetland Habitat would be most impacted (1.38 acres), followed by Waterfowl Concentrations (1.28 acres) and Riparian Zones (0.64 acres).

**Table 7.** Impacts of Action Alternatives to WDNR Priority Habitats

Data Source	Habitat Type/Species <sup>1/</sup>	Area of Impact (acres ) by Alternative <sup>1/</sup>			
		A	B	C	D
Priority Habitat and Species Database (WDNR)	Riparian Zone	0.38	0.66	0.37	0.64
	Waterfowl Concentration	1.02	1.74	0.76	1.28
	Wetlands	1.09	1.86	0.82	1.38
Total Priority Habitat Area of impact		2.49	4.26	1.95	3.30

<sup>1/</sup>Multiple priority habitat types may be assigned to the same piece of land. Thus, the Total Priority Habitat Area exceeds the physical area for which habitats were assigned.

**3.4 FISH**

**3.4.1 Fish Habitat and Species Composition**

Fennel Creek above Victor Falls may provide habitat for resident fish such as rainbow trout, cutthroat trout, redbside shiners, mountain whitefish, sculpins, sticklebacks, and suckers. Fish habitat is not in high-quality condition due to the effects of stormwater runoff from urban areas, historic channelization (such as the area north of SR 410), pollutants such as fertilizers and pesticides, and lack of shade in some areas due to removal of forest cover.

**3.4.2 General Impacts to Fish**

Impacts to freshwater fish resources from construction of the Fennel Creek Trail would primarily be those associated with the project corridor stream crossings. Potential short- and long-term sedimentation impacts near stream crossings would be limited to sediment that could be generated by: 1) laying of the new porous asphalt/crushed rock trail surface; 2) hole excavation related to fencing, signposts, and bollards; and 3) ditch and culvert sediment removal during ongoing maintenance. Introduction of fine sediments through erosion and runoff to the streams can reduce the suitability of spawning gravels by filling gravel interstices, thereby restricting intragravel water flow and associated dissolved oxygen levels.

The City would need to obtain a National Pollutant Discharge Elimination System (NPDES) construction stormwater permit from the Washington Department of Ecology to construct the proposed trail. As a condition of the permit, the City would be required to prepare and implement a stormwater pollution prevention plan (SWPPP) for the project. The SWPPP would prescribe the use of a variety of best management practices (BMPs) from approved menus of techniques to control erosion and sedimentation from construction sites. These BMPs would include measures for covering and stabilizing areas exposed during construction, controlling stormwater runoff from the site and removing sediment and other pollutants from the runoff. Other conditions of the permit would require spill prevention and control measures. The erosion/sedimentation and spill prevention/control BMPs that would be specified in the SWPPP are standard techniques that have been demonstrated to be effective in limiting stormwater pollution from construction sites to acceptable levels that meet water quality standards (Ecology 2005). Therefore, short-term (construction) impacts to surface waters and aquatic habitat are not expected to be significant.

Long-term (operational) impacts of the Fennel Creek Trail are similar for most fish species, regardless of federal or state status. Impacts to spawning adults of the various fish species may be slightly greater than to juveniles, although impacts are not expected to be significant. Operation impacts on fish resources could result from increased human use of, and access to Fennel Creek. These impacts could include: disturbance to spawning fish by humans and domestic pets at stream crossings; fish poaching, trash and debris thrown from the trail into streams; and untreated human and animal waste entering streams. However, trail design elements (interpretive signs, barriers to creek access) and human behavior controls (regulations) can be placed and enforced to minimize and mitigate the effect of these impacts; therefore, impacts are not expected to be significant.

Other operational impacts to fish resources could result from long-term bridge and culvert maintenance, which typically involves the removal of sediment or vegetation blockage at culvert and bridge crossings. While the net effect of culvert and bridge maintenance typically improves stream flows and fish passage, there is a potential for periodic adverse impacts created by the disturbance and downstream release of sediments and debris. With incorporation of mitigation measures, these impacts are not expected to be significant.

### **3.4.3 Threatened and Endangered Fish Species**

No threatened or endangered fish are known to occur in the portion of Fennel Creek adjacent to the proposed trail (WDNR 2006). According to previous communications with Washington Department of Fish and Wildlife (WDFW), Victor Falls acts as a complete migration barrier to anadromous salmon and trout species (City of Bonney Lake 1999).

### **3.4.4 Fish Species with State Status**

No state sensitive, threatened, or endangered fish species are known to occur within the project area (WDNR 2006).

### **3.4.5 Impacts to Threatened, Endangered or State-status Fish Species**

No adverse impacts to listed or state-status fish species are expected to occur, since none are known to occur in this reach of Fennel Creek.

## **3.5 MITIGATION**

### **3.5.1 Vegetation**

Under the four alternatives, mitigation for construction impacts would first consist of avoiding and minimizing potential impacts wherever possible. Mitigation also includes the use of construction BMPs and a vegetation management plan that would meet the requirements of all resource agencies. This plan would be implemented to specify when plant removal is needed, how areas would be replanted or re-seeded if necessary, and monitoring requirements. Impacts to plants in the corridor from long-term use of the trail by humans or pets would be mitigated by several actions. Primary mitigation for plant impacts would be specified in the vegetation management plan. The goal of the management plan is to maintain and monitor native plant communities in the corridor, provide a safe trail environment, and control invasive species. Also, the plan would identify when plant replacement is needed, specify plant species, numbers, and locations for native plantings, and stipulate monitoring requirements. The plan would follow regulations and incorporate guidelines for native plant management as stipulated by Pierce County. This strategy is designed to minimize potential negative impacts from vegetation management in wetland and riparian buffers, wetlands, water bodies, steep slopes, deciduous forests, and the urban matrix.

Monitoring, documentation, and implementation would be the responsibility of the City of Bonney Lake and would be accomplished by City staff or a contractor.

### 3.5.2 Wetlands

Thorough wetland delineation of the trail corridor has yet to occur. Specific determination of wetland type, category, and total areas of impact will be made in the future. At that time the specifics of mitigation required by the federal, state, and local agencies will be determined. This document uses rough, preliminary estimates of wetland areas of impact to examine the differences between the action alternatives.

In accordance with Bonney Lake Municipal Code 16.22.050, unavoidable alteration of Class I-IV wetlands and wetland buffer would be mitigated by replacement or enhancement using a 1.5:1 ratio in the same sub-basin, with possible exemptions for wetlands in Class III and IV under 1,000 square feet (Bonney Lake Municipal Code 16.20.070). A 37-acre wetland mitigation site has been identified. This site was chosen for mitigation because part of this wetland will be impacted by the proposed trail and it is owned by the City of Bonney Lake. Enhancement and possibly wetland creation in this area could meet the compensation ratio for permanent wetland impacts, especially considering the fact that the trail will be specifically routed in the field to avoid and minimize impacts. Temporary impacts to wetlands during construction would be minimized through the use of BMPs. These would include performing trail maintenance during the driest months, and using hand tools to minimize the risk of disturbed soil or sediments entering the wetland. To avoid accidental spillage of trail construction materials into wetlands, careful placement and grading of trail material and the use of erosion and sediment BMPs are recommended. Ongoing maintenance to keep the corridor clear of nuisance vegetation would be conducted.

#### 3.5.2.1 Wetland Mitigation Site

The proposed mitigation site is a 37-acre parcel, located on the east side of Fennel Creek, owned by the City of Bonney Lake (Figure 3). During the spring 2006 field surveys, Tetra Tech investigated a number of additional wetland plots, laid out in transects, to determine the proportion of the open meadow/former pasture part of the proposed mitigation site that was wetland. Based on the 2006 field data and the data obtained in the earlier investigation (City of Bonney Lake 1999), 52 percent, or 5.30 acres of the upland-wetland mosaic in the 10.19-acre meadow/pasture area appears to be jurisdictional wetland. The wetland data sheets from the 2006 field survey are provided in Appendix A.

#### 3.5.2.2 Wetland Mitigation Concept and Credit Analysis

To estimate potential mitigation credits in 2000, Foster Wheeler Environmental Corporation (now Tetra Tech) prepared a Financial Analysis of Wetland and Riparian Restoration along Fennel Creek (Foster Wheeler Environmental Corporation 2000). That document, a companion piece to the Environmental Analysis of the Fennel Creek Corridor, estimated wetland restoration costs for the 37-acre mitigation parcel, east of Fennel Creek, near the Willow Brook development. The original mitigation concept is provided in the 2000 Financial Analysis (Foster Wheeler Environmental Corporation 2000). The cost to implement that concept was originally estimated at \$322,000 (in 2000 dollars), and would be approximately \$387,000 in 2006 dollars.

This DEIS includes a revised preliminary mitigation design and estimate of the cost of the mitigation options. As indicated in Bonney Lake Municipal Code 16.22.050.E. and F, the unit of measure for wetland mitigation effectiveness was before-and-after wetland functions and values scores based on the Wetland Rating Data Form of the "Revised Washington State Wetlands Rating System for Western Washington." Tetra Tech has estimated how much the aggregate wetland functions and values scoring would increase on the 37-acre parcel. The initial rating score for the mitigation site is estimated to be 30.5, and would increase to an estimated score of 52, for a ratio of 1:1.6, which exceeds the City Code's criterion of a minimum ratio of 1:1.5. The details of this analysis are presented in Appendix B, along with a blank copy of the new wetland rating form.

In this DEIS, Tetra Tech has a) revisited the Financial Analysis of Wetland and Riparian Restoration along Fennel Creek, revising the original 37-acre parcel's proposed restoration plan to include mitigation through wetland creation, and b) updated the costs of the original and new plans to compare their cost-effectiveness. Cost-effectiveness depends on whether the increase in the value of the mitigation over the 2000 plan (Foster Wheeler Environmental Corporation 2000) would justify the added cost of construction. Tetra Tech estimated

the current (2006) costs of the original 2000 plan (Foster Wheeler Environmental Corporation 2000), and the revised 2006 plan, based on current 2006 prices (e.g., plant material, labor, equipment costs, etc.). The estimated costs will help the City choose a trail alternative and mitigation concept. The estimated costs are approximate and may change based on the results of future formal wetland delineations, functional assessments, and additional soils and shallow groundwater and other hydrologic data.

### **Revised Mitigation Description**

The revised mitigation/restoration concept includes excavation to convert 4.0 of the 4.28 acres of upland meadow in the 10-acre upland/wetland pasture mosaic within the 37-acre parcel to create a mosaic of forested and scrub-shrub wetland (Figure 6) with 0.28 acres of upland forest. Table 8 shows estimated costs for the revised 2006 mitigation concept, which is illustrated in Figure 6.

The revised mitigation plan presents an option that would significantly restore the pasture area of the site to its original habitat, which appears (based on the condition of the area to the north of the pasture area and surrounding vegetation) to be a mosaic of scrub-shrub and forested wetlands. In contrast to the previous (2000) plan for this area, this alternative recommends grading of the pasture to allow greater control over features that may affect the success of the project. Grading would allow removal of invasive, non-native and undesirable plant species and thereby provide greater control over the types of vegetation that ultimately colonize various portions of the site. This is in addition to fostering the success of plantings of native species by lowering the elevation. Therefore, although this option would significantly increase the cost of the overall project, it offers a greater chance of success than a plan that does not incorporate grading and which relies solely upon installation of desired plant species.

The 10-acre pasture area east of Fennel Creek, in Study Area 3 of the mitigation site, currently offers low-value wetland and upland habitat. Vegetation in this area consists largely of hummocky non-native grasses such as reed canarygrass, tall fescue, orchardgrass, thistles, dogtail, and bentgrass, with Himalayan blackberry dominating the eastern and northern perimeters. Some native wetland species such as soft rush and sedges are found in the moist areas of the site. There is very little structural diversity, and the majority of the habitat on the site consists only of a ground layer. Some mid-story species are found at the perimeter of the site, but do not form a complete canopy at any point.

Under this alternative, the pasture area would be restored to a mosaic of scrub-shrub and forested wetlands. The resulting habitat would include a diverse ground layer, a shrub and mid-story layer, and a canopy layer, although the structure will take time to develop; canopy closure is expected within 10 years. This alternative is designed to mimic an early successional stage of vegetative development, under the assumption that a fully diversified and mature wetland complex would develop over time.

The 10-acre pasture area would be graded on average 6 inches to eliminate existing undesirable vegetation and to bring the surface closer to the water table. The topsoil would be windrowed and solarized to kill non-native seeds and roots; the 6 inches of soil below the topsoil layer would be removed and disposed of. The topsoils would be respread after having been sterilized. If feasible, the soils removed would be moved to the surrounding upland areas to minimize costs to the degree possible.

The wetland would be revegetated with herbaceous and shrub plugs and/or small, bare root stock and seeding, including various native species of rushes, spikerushes, sedges, red alder, red-osier dogwood, salmonberry, and Oregon ash. Cuttings of riparian tree species including cottonwood and various species of willow, collected locally, would be planted in this area. It is expected that wind-borne seeds will be a significant source of natural revegetation in this area, particularly with cottonwoods, willows, and alder.

Some of the soils (from a 0.28-acre area) would be retained onsite to create hummocks, areas of slightly higher elevation (1-1.5 feet) than the surrounding wetland. These areas would be planted with small, bare-root mid-story species including red elderberry, and overstory species such as vine maple, big-leaf maple, Douglas-fir and/or Sitka spruce. Western hemlock and western red cedar are likely to become established on the mitigation

site once canopy closure (and shaded conditions) is achieved. These hummocks should be connected to the upland area rather than being completely surrounded by wetland.

Habitat diversity would be further enhanced by placement of woody debris near the edges of the wetland to provide cover for small birds and mammals, lizards, and snakes. Several such debris piles are recommended, all of them at the edge of the wetland area so that they are accessible to small animals from the upland area. Woody material can be obtained from offsite sources. Woody debris that could possibly be dislodged during a high-flow event should be secured by a ducks-bill anchor and cable system.



**Table 8. Summary of Costs for Revised 2006 Wetland and Riparian Restoration/Mitigation Concept (in 2006 \$)**

Description of Item	Quantity	Units	Unit Cost (\$)	Total Cost (\$)	Comments
<b>Design/Permits/As-Built Survey</b>					
Restoration Plan/Drawings	1	ea	40,000	40,000	
Permitting	4	ea	10,000	40,000	
As-Built Drawings/Report	1	ea	20,000	20,000	
<i>Additional Technical Studies</i>					
Hydrological model/groundwater testing	1	ea	20,000	20,000	
Soil profile	1	ea	8,000	8,000	
Comprehensive wetland delineation	1	ea	12,000	12,000	
<b>Construction Costs</b>					
Earthwork					
Site grading <sup>1/</sup>	8,065	cy	5	40,325	
Trucking off-haul/return <sup>2/</sup>	750	lds	100	75,000	
Traffic control	20	days	1,500	30,000	
Bubbler irrigation system	1	ea	25,000	25,000	
Plant purchase <sup>3/</sup>	6,000	ea	6	36,000	
Plant installation and maintenance <sup>3/</sup>	6,000	ea	7	42,000	
Soil prep/erosion control	1	ea	50,000	50,000	
<b>Subtotal</b>				<b>438,325</b>	
Contingency				65,748	15% of subtotal
Mob/demob				21,916	5% of subtotal
Engineering during construction				21,916	5% of subtotal
Supervision and administration				43,832	10% of subtotal
<b>Total Grading/Restoration Construction</b>				<b>591,738</b>	
<b>Maintenance and Monitoring Costs</b>					
Biological Monitoring					
Veg transects	2	ea	2,000	4,000	Yearly
Weed control (hand weeding)	2	ea	2,000	4,000	Yearly
Annual monitoring report	1	ea	1,500	1,500	
Erosion Control					
Monitoring				+	as needed after floods or at the end of rainy season
Soil replacement				+	as needed
<b>Annual Sub-Total:</b>				<b>9,500+</b>	
<b>5-Yr M&amp;M Total:</b>				<b>47,500+</b>	no inflation adjustment
<b>TOTAL PROJECT COST:</b>				<b>779,237<sup>4/</sup></b>	

<sup>1/</sup>Assumes grading, on-site sterilization, and regrading of average 0.5 foot of topsoil over 10 acres. Site is accessible to heavy machinery.

<sup>2/</sup>Assumes use of 16-yard capacity dump trucks.

<sup>3/</sup>Assumes 200 plugs or canister stock forbs and shrubs from a nursery and 400 cuttings of willow, cottonwood, and/or alder from local sources, per acre.

<sup>4/</sup>Total cost prepared with the assumption that this project would be performed independently. Costs **per acre** associated with permitting, preparation of a restoration plan, hydrologic modeling, soil studies, mobilization, engineering and supervision during construction, and long-term maintenance and monitoring, would be reduced if this project were performed as part of an overall restoration project. Does not include maintenance costs as these cannot be reliably predicted.

Other Assumptions:

- Existing hydrological features would support wetland vegetation in the long-term but that irrigation would be necessary for short-term plant establishment.
- Soils are adequate to support broad spectrum of forbs, shrubs and trees.
- Irrigation system will tie into existing municipal water lines.

Implementation of the 2006 revised mitigation concept could actually cost much less than estimated, if wetland hydrology can be restored to the onsite pasture area with less site grading than is currently planned. Shallow groundwater monitoring of the mitigation site is proposed to begin during the winter of 2006-2007 and more detailed topographic information on the site will be gathered in conjunction with the monitoring. The mitigation concept and its estimated cost will be refined if so indicated by the groundwater monitoring and topographic data.

### **Comparison of Mitigation Alternatives**

While there are many uncertainties about the specific wetlands and acreages impacted and the details of mitigation, a comparison can be made between the alternative proposals and the cost/benefit of the mitigation concepts.

The number of “credits” generated by the proposed mitigation would vary according to the types and acres of wetlands affected. A summary credit analysis showing the range of potential credits is presented in Table 9, below. The calculations in Table 9 are based on the Washington Department of Ecology et al.’s (2006, Table 1a, p. 73) “Wetland Mitigation in Washington State, Part 1, Agency Policies and Guidance”. This analysis is conservative in that it assumes that all affected wetlands are Category II. Two analyses of potential mitigation credits are included. In one (see part A of Table 9), the impacted and mitigation-site wetlands are not all within the same hydrogeomorphic (HGM) class, because the updated wetland functional assessment indicates that both riverine and depressional wetlands would be affected (see Appendix B). The second analysis (part B of Table 9) assumes that the impacted and mitigation wetlands are within the same HGM class. Table 9 indicates that a range of mitigation credits could be generated at the mitigation site, depending on (a) the match between the HGM classes of the impacted and mitigation wetlands, and (b) the type of mitigation (original 2000 vs. revised 2006) concept employed.

**Table 9.** Estimated Range of Mitigation Credits from the Two Mitigation Alternatives

A. Impact and Mitigation in Different HGM Classes	Mitigation Alternative 1 (2000)			Mitigation Alternative 2 (2006)		
	Acres	Ratio	Credits	Acres	Ratio	Credits
Reestablishment/creation				4	1	4
Rehabilitation	20.7	6	3.5	20.7	4	5.2
Preservation	16	10	1.6	12	10	1.2
Total credits*	Approximately 0**			Approximately 4 - 5		

B. Impact and Mitigation in Same HGM Classes	Mitigation Alternative 1 (2000)			Mitigation Alternative 2 (2006)		
	Acres	Ratio	Credits	Acres	Ratio	Credits
Reestablishment/creation				4	1	4
Rehabilitation	20.7	6	3.5	20.7	3	6.9
Preservation	16	10	1.6	12	10	1.2
Total credits*	Approximately 5			Approximately 12		

\*Credits = acres/ratio

\*\* due to lack of reestablishment/creation acreage

Analyses based on Washington Department of Ecology et al. (2006)

HGM = hydrogeomorphic, meaning combined hydrologic and landform characteristics of a wetland

Table 10 presents a comparison of the estimated costs of the two alternative mitigation plans (in 2006 dollars) and the cost per mitigation credit gained. (Note that the line item costs in each column are stated as a range, to account for uncertainty, which results in slight apparent differences in cost figures between Table 8 and Table 10.) The higher costs for the 2006 revised mitigation concept are due to the much higher construction cost (mostly due to inclusion of site grading) and a higher contingency allowance (due to uncertainties about construction costs) for this mitigation alternative. However, as discussed in the mitigation alternative description, implementation of the 2006 revised mitigation concept could actually cost much less than estimated, if wetland hydrology can be restored to the onsite pasture area with less site grading than is currently planned. A contingency was added to each item to generate the range of costs shown for the three concepts below.

**Table 10.** Comparison of Original and Revised Wetland Mitigation Concepts

Wetland/Riparian Restoration/Mitigation Component	2000 Concept (year 2000 \$, in 000s) <sup>1/</sup>	2000 Concept (year 2006 \$s, in 000s) <sup>2/</sup>	2006 Revised Concept (2006 \$, in 000s)
Additional Technical Studies	20-25	24-30	40-44
Restoration/Mitigation Plan	20-30	24-36	40-44
Permitting	20-30	24-36	40-44
As-built Drawings	10-15	12-18	20-22
Construction, including mobilization/demobilization, engineering, and supervision	170-210	204-252	525-580 <sup>3/</sup>
Long-term Maintenance	25-35	30-42	unknown
Mitigation Monitoring (5 year)	40-45	48-54	47.5
Construction Contingency	17-21	21-25	65.7
Total <sup>4/</sup>	322-381 <sup>1/</sup>	387-493	779-857 <sup>3/4/</sup>
Mitigation Credits Generated	10.7	0-5 <sup>5/</sup>	4-12 <sup>5/</sup>
Estimated Cost per Acre	8-10	11-13 <sup>6/</sup>	21-23 <sup>7/</sup>
Estimated Cost per Credit	30-36 <sup>6/</sup>	77-99 <sup>6/</sup>	65-214 <sup>7/</sup>

<sup>1/</sup>Based on analysis in Foster Wheeler Environmental Corporation (2000)

<sup>2/</sup>Assumes approximate annual inflation rate of 3.4%.

<sup>3/</sup>Includes a 10% range

<sup>4/</sup>Total based on assumption that full restoration and rehabilitation would occur in the 10-acre pasture area and that all other areas would be enhanced-preserved according to the 2000 Conceptual Plan, and a 10% range.

<sup>5/</sup>Based on Washington Department of Ecology et al. (2006) ratios and as shown in Table 9.

<sup>6/</sup>Assumes that 20.7 acres would be enhanced and 16 acres would be preserved, and 5 credits generated for low and high.

<sup>7/</sup>Assumes that 20.7 acres would be enhanced, 4 acres would be restored, and approximately 12 acres would be preserved; 12 credits generated for the low part of the range, and 4 credits generated for the high part of the range.

Table 11 presents a summary analysis of the relationship between the estimated credits generated by the two mitigation alternatives, and the range of estimated wetland impacts of the four trail alternatives. In the case where wetland impact and mitigation sites are in different HGM classes, Mitigation Alternative 1 (the original 2000 mitigation concept) would not provide any mitigation credit, based on the ratios in Washington Department of Ecology et al. (2006). Mitigation Alternative 1 would provide 5 mitigation credits if the trail impact and mitigation sites are in the same HGM class, and could provide surplus credits if the wetland impact of the trail is less than 5 acres. The amount of surplus credit would depend on the extent of wetland impacts from the selected trail alternative.

Mitigation Alternative 2 (the revised 2006 mitigation concept) would provide 4 to 5 acres of mitigation credit if the impact and mitigation sites are in different HGM classes, and 12 credits if impact and mitigation sites are in the same HGM class. Alternative 2 could therefore provide a higher surplus of mitigation credit that could be used to compensate for impacts from other wetland fill projects in the City of Bonney Lake. The additional credits generated by Alternative 2, however, are estimated to cost significantly more (\$73,000 to \$239,000) per acre for construction compared to the credits from Alternative 1 (\$77,000 to \$99,000 per acre), although the cost ranges of the two alternatives overlap.

To illustrate the possible mitigation outcomes, consider a lower-cost example of combined trail impacts and surplus mitigation credit. Such an outcome could occur if the Fennel Creek Trail Alternative C were chosen, it proved to have only 1 acre of wetland impact, the impact and mitigation sites were in the same HGM class, and Mitigation Alternative 1 was used to create 5 credits. In this case, there would be 4 acres of surplus mitigation credit generated, at an estimated cost of \$77,000 to \$99,000 per acre, which could be used to compensate for the impacts of other projects. In the same trail impact case but using Mitigation Alternative 2, a surplus of 11 credits would be generated at a cost of \$73,000 to \$239,000 per acre. Note, however, that the actual cost per credit of Mitigation Alternative 2 could be reduced, depending on possible changes to the plan and its costs based on the results of shallow groundwater monitoring and topographic surveys proposed for the winter of 2006-2007.

**Table 11.** Summary of Mitigation Credits vs. Trail Alternative Impacts

	Estimated Range of Impact of Fennel Creek Trail (acres) by Trail Alternative							
	Alternative A		Alternative B		Alternative C		Alternative D	
	Low	High	Low	High	Low	High	Low	High
Wetland Impact Range (acres)	0.8	6	1.4	8	0.6	5	1.1	8
Impact and Mitigation from Different HGM Class								
Credits from Mitigation Alt 1	0	0	0	0	0	0	0	0
Credit Surplus or Deficit	-0.8	-6	-1.4	-8	-0.8	-0.8	-0.8	-0.8
Credits from Mitigation Alt 2	4	5	4	5	4	5	4	5
Credit Surplus or Deficit	3.2	-1	2.6	-3	3.4	0	2.9	-3
Impact and Mitigation from Same HGM Class								
Credits from Mitigation Alt 1	5	5	5	5	5	5	5	5
Credit Surplus or Deficit	4.2	-1	3.6	-3	4.4	0	3.9	-3
Credits from Mitigation Alt 2	12	12	12	12	12	12	12	12
Credit Surplus or Deficit	11.2	6	10.6	4	11.4	7	10.9	4

It is difficult at this time to provide a specific cost comparison of the mitigation for the four alternatives, because of the current uncertainties about the impacts of the proposed trail. A fully-informed decision on the mitigation approach cannot be made without more precise information on both the wetland impacts for the respective trail alternatives and the extent of grading needed to provide a reasonable assurance of success for the wetland restoration on the mitigation site. In the absence of complete information, however, there are some valid observations about the mitigation alternatives that can be made from the analysis conducted to date. One is that Mitigation Alternative 2 is expected to out-perform Mitigation Alternative 1 under almost all scenarios of trail impacts and mitigation credits. Table 11 indicates there are 16 such scenarios or possible outcomes to consider (low or high impact outcomes from four trail alternatives, and two mitigation credit outcomes based on wetland HGM classes). Mitigation Alternative 2 would provide a mitigation credit surplus in 11 out of those 16 cases, including all possible outcomes if the impact and mitigation wetlands

prove to be from the same HGM class. By contrast, Mitigation Alternative 1 would provide a mitigation credit surplus in only 4 out of those 16 cases, which would be the low-impact outcome for each trail alternative if the impact and mitigation wetlands prove to be from the same HGM class. Moreover, if the impact and mitigation wetlands are from different HGM classes, Mitigation Alternative 1 cannot provide a mitigation credit surplus for any of the trail alternatives (i.e., additional mitigation efforts would be needed to offset the wetland impacts of the proposed trail).

From Tables 10 and 11, it can also be observed that the costs per credit for Mitigation Alternative 2 would be high (\$214,000 per credit) only in the case where the impact and mitigation-site wetlands are from different HGM classes, and the lower amount of mitigation credit is generated. If the impact and mitigation-site wetlands are determined to be from the same HGM classes, the estimated costs per credit for Mitigation Alternative 2 are slightly less than those for Mitigation Alternative 1. That condition highlights the importance of developing better, more complete information about wetland outcomes within the proposed trail corridor and on the mitigation site.

A comparative analysis of the cost of mitigating for the four alternatives, based on a series of assumptions, is provided below in Table 12. The assumptions upon which this comparison is based are as follows:

- The acres of wetland impact of each alternative is estimated to be the midpoint of the collective range of impacts calculated, based on the three sources of available wetland information (Tetra Tech surveys and habitat mapping; Pierce County Wetlands Data; and NWI);
- The HGM classes of the impact areas and the mitigation area are the same; and
- The cost per mitigation credit is at the midpoint of the range reported in Table 10.

**Table 12.** Comparison of Estimated Mitigation Costs for 2006 Revised Plan by Alternative, Based on Assumptions that Impact and Mitigation Are in the Same HGM Class, and that Wetland Impacts Are at the Midpoint of the Range Based on Three Sources of Wetland Data.

2006 Revised Mitigation Plan	Alternatives			
	A	B	C	D
Midpoint of Wetland Impacts by Alternative	3.40	4.70	2.80	4.55
Credits (ac) Needed for Mitigation (same HGM class)	3.40	4.70	2.80	4.55
Midpoint of Estimated Cost Per Credit (\$1,000s) <sup>1/</sup>	140	140	140	140
Estimated Cost of Mitigation (\$1,000s)	474	656	391	635

<sup>1/</sup>Midpoint of mitigation cost per credit based on a range of \$65K to \$214K per credit generated

Based on this analysis, Alternative C would be the least costly choice in terms of mitigation costs, assuming that the revised 2006 mitigation plan was employed. The 2006 plan would

likely generate more mitigation credits, based on the current ratios presented in Washington Department of Ecology et al. (2006) (see Table 11).

### 3.5.3 Wildlife

There are several wildlife mitigation measures that should be implemented in various phases of project design, construction, and operation. During the design phase, the final trail alignment should be sited to avoid important wildlife habitat features found during the field alignment selection process, such as snags and large trees with cavities, wetlands suitable for use by breeding amphibians. In addition, the trail alignment should include several “spurs” that access Fennel Creek in areas where environmental impacts are expected to be minimal, based on consultations with numerous other trail providers throughout Oregon and Washington. These other trail providers strongly advocated that providing these access points will minimize creation of such access points by the public in more sensitive areas.

During construction, the initial clearing for the trail would be scheduled to take place outside of the main animal breeding season (March through July).

During operation, potential harassment of wildlife would be mitigated by requiring that dogs be leashed at all times, and not allowing dogs in Fennel Creek.

Implementation of standard BMPs for erosion control which would be a condition of the 404 and other permits would minimize and mitigate potential adverse impacts to fish, and reduce impacts to a level of non-significance.

### 3.5.4 Fish

Control of hazardous materials is a standard provision in construction contracts and permits, and would prevent spillage of hazardous materials.

If instream work is anticipated, the timing of the “work window” (e.g., during culvert sediment removal) specified in the Hydraulic Project Approval (HPA) would normally eliminate potential impacts to spawning fish since they would not be present.

For the action Alternatives, construction BMPs for erosion and sedimentation control would be implemented to protect fish habitat. Silt fences or other erosion control would be installed at all stream crossings to mitigate potential erosion impacts during construction. Careful placement of porous asphalt and crushed rock near stream crossings using hand tools or light equipment would prevent porous asphalt and crushed rock from entering stream channels. Trail shoulders would be stabilized in areas adjacent to streams to prevent erosion and sloughing. After construction, routine culvert and ditch maintenance should be done during the dry season. The trail would be fenced or screened at stream crossings to protect fish from human disturbance and to maintain riparian vegetation. Access of trail users to stream banks and channels would only be permitted in areas shown to have the least adverse impacts to the creek and surrounding vegetation. Leashes would be required to prevent dogs from entering streams and harassing fish. Appropriate signs would be placed

at stream crossings to explain the reasons for restrictions. Native riparian vegetation would be restored at stream crossings to improve habitat and provide shading.

#### 4. REFERENCES

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## Appendix A Distribution List

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Bruce Dees & Associates	1	1
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WA Department of Ecology, SEPA Register		1
For sale to public	5	6
<b>Total</b>	<b>26</b>	<b>30</b>

# **Appendix B Functional Assessment Results and Wetland Rating Form**

Appendix B. Estimated Wetland Mitigation Site Ratings Before and After Site Restoration Following the Revised 2006 Mitigation Plan, including Grading, using Hruby (2004): Washington State Wetland Rating System for Western Washington, Revised, Washington Department of Ecology

Water Quality	Pre-restoration score	Expected Post-restoration score
D 1.1	2	2
D 1.2	0	0
D 1.3	5	5
D 1.4	0	2
D 1 total	7	9
D 2 Multiplier	2	2
Total Water Quality	14	18
Hydrologic Functions		
D 3.1	1.5	2.5
D 3.2	1	1
D 3.3	0	0
D 3 total	2.5	3.5
D 4 Multiplier	2	2
Total Hydrologic	5	7
Habitat Functions		
H 1.1	0	4
H 1.2	2	3
H 1.3	1	2
H 1.4	0	3
H 1.5	0	4
H 1 total	3	16
H 2.1	3	3
H 2.2	2	2
H 2.3	2	2
H 2.4	3	3
H 2 total	10	10
Total Habitat	13	26
Total	32	51
Site pre- and post-restoration score ratio		1.59

The scores shown are based on application of the Ecology rating form contents for depressional wetlands, which is the appropriate classification of the proposed mitigation area on the City's 37-acre mitigation site. While the proposed site has some elements of riverine wetlands, it predominantly fits the classification guidance for depressional wetlands. These scores were estimated based on the field data sheets from the 1999 and 2006 studies, observations during the 2006 site visit, and examination of aerial photographs taken in 2005.