

Ordinance 3835 Exhibit D



MEMORANDUM

To: Pendleton Planning Commission and City Council
From: Jesse Winterowd
Date: February 19, 2013
Re: Goal 5 and Developed Stream Corridor ESEE Analysis

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1. INTRODUCTION AND BACKGROUND

Pendleton Periodic Review and the Goal 5 Rule

Every 10 years or so, local governments are required to review their comprehensive plans and land use regulations to ensure that they are current and comply with applicable Statewide Planning Goals and rules. In 2010, the City adopted a four-year Periodic Review Work Program. The adopted work program calls for:

- A preliminary inventory of riparian corridors, wetlands and associated wildlife habitat (addressed in Tech Memo 6);
- Identification of land uses and activities that conflict with the conservation of inventoried resources (addressed in Tech Memo 10);
- Consideration of program options for conservation of significant natural resource sites (discussed at the May 30, 2011 Joint Work Session and summarized in Tech Memo 10); and
- Review and adoption of comprehensive plan policies and land use regulations that do *not* require an ESEE (economic, social, environmental and energy) analysis under the new Goal 5 rule (discussed in Tech Memo 10).

Winterbrook has prepared, and Pendleton has adopted, a series of Tech Memos and maps, as well as draft policies and zoning ordinance text, to address the City's commitments under this work program.

In 2012, Winterbrook completed the draft Pendleton Local Wetland Inventory (LWI). This document was reviewed by the City and is now under review by the Oregon Department of State Lands (DSL).

Implications of the New Goal 5 Rule for Pendleton

In 1996, the Land Conservation and Development Commission (LCDC) adopted what is known as the "new Goal 5 rule" (OAR Chapter 660, Division 023).

Safe Harbor versus Standard Goal 5 Process

The new Goal 5 rule applies to cities that are in the Periodic Review process and provides two basic tracks for Goal 5 compliance:

1. **The Standard Goal 5 process** – that requires local governments to identify conflicting uses and prepare an ESEE analysis that considers the consequences of various decision options (which is time-consuming, costly and involves some degree of risk) *before* adopting plan policies and land use

regulations. However, the standard process allows local governments much greater flexibility in designing a resource protection program.

2. **The “Safe Harbor” process** – that allows a local government to by-pass the ESEE analysis process by adopting prescribed protection standards.¹ In the case of “riparian corridors”, the safe harbor prohibits most types of development within 50 feet of the tops-of-bank of fish-bearing streams. Exceptions are provided for public facilities and services, water-related uses, and to avoid a regulatory taking of property.

At the Joint Work Session on May 30, 2011, it was generally agreed that the City should consider applying the “safe harbor” for riparian corridors in undeveloped areas, and apply the standard Goal 5 process to developed areas to provide more local flexibility. The City Council formally adopted this policy choice on September 22, 2011 through Ordinance 3814, which incorporated policy text and direction from Tech Memo 10 into the Pendleton Comprehensive Plan.

Wildlife habitat is protected within flash flood areas, undeveloped riparian corridor reaches, and wetlands within these areas, by RCW protections already adopted in relation to Goal 7. Wildlife habitat within isolated wetlands and developed riparian corridors is addressed in this ESEE analysis.

Most of the wetlands identified in the Pendleton LWI are found within mapped riparian corridors, floodways or flash flood hazard areas. Two wetlands are more than 50 feet from mapped riparian corridors and therefore are considered to be “isolated” from such corridors. Winterbrook recommends conservation of these isolated wetlands while allowing public facilities (roads and utilities) uses on a limited basis.

¹ OAR 660-023-0020(2) includes the following description of a “safe harbor”:
A “safe harbor” consists of an optional course of action that satisfies certain requirements under the standard process. Local governments may follow safe harbor requirements rather than addressing certain requirements in the standard Goal 5 process. For example, a jurisdiction may choose to identify “significant” riparian corridors using the safe harbor criteria under OAR 660-023-0090(5) rather than follow the general requirements for determining “significance” in the standard Goal 5 process under OAR 660-023-0030(4). Similarly, a jurisdiction may adopt a wetlands ordinance that meets the requirements of OAR 660-023-0100(4)(b) in lieu of following the ESEE decision process in OAR 660-023-0040.

2. GOAL 5 PROCEDURAL REQUIREMENTS

The new Goal 5 rule includes a series of provisions that must be addressed in Periodic Review for riparian corridors, wetlands and wildlife habitat areas. The bulleted points below summarize the relationship of the City's existing Goal 5 regulations and proposed RCW Subdistrict to applicable Goal 5 regulations.

660-023-0030 Goal 5 Inventory Process:

This section requires local governments to conduct a natural resource inventory that meets demanding standards related to the location, quality and quantity of the resource. In Pendleton's case, the resource sites are riparian corridors, wetlands and wildlife habitat areas.

- Prior to adopting Tech Memo 6, the comprehensive plan did not have such a detailed and site-specific inventory.
- Tech Memo 6: Preliminary Riparian Corridor, Wetlands and Wildlife Habitat Inventory (Winterbrook Planning, April 2011) and Map C.2 have been acknowledged by LCDC to meet Goal 5 inventory requirements for riparian corridors and wildlife habitat.
- The City completed a draft Local Wetlands Inventory (LWI) in June 2012. The LWI is now under review by the Department of State Lands.

660-023-0040 ESEE Decision Process:

Unless the "safe harbor" approach is chosen, this section requires that conflicting uses be identified and the ESEE consequences of alternative resource protection programs be evaluated *before* adopting a Goal 5 program (policies and land use regulations).

- Pendleton's Umatilla River (U-R) Subdistrict was not based on an ESEE analysis; rather, an ESEE analysis is required for each development application. The U-R Subdistrict is cumbersome to administer and relatively inflexible. The U-R Subdistrict also covers land 75 feet inland from the Umatilla River floodway, and 50 feet inland from its tributaries.
- Tech Memo 10 identified conflicting uses and activities. The Planning Commission and City Council reached tentative agreement on a Goal 5 (and Goal 7 –Natural Hazards) program at their May 30, 2011 Joint Work Session, and formally adopted this program direction on September 22, 2011.
 - The draft Riparian Corridor and Wetlands (RCW) Subdistrict applies "safe harbor" provisions for undeveloped riparian corridors (a 50-foot

setback from the top-of-bank); therefore, an ESEE analysis is not required.

- The City's Umatilla River (U-R) Subdistrict continues to apply to developed riparian corridors until the City can prepare an ESEE analysis that considers local protection alternatives for such developed areas. This is costly and uncertain for property owners and the City.
- **This memorandum provides ESEE analysis required by Goal 5 and allows for greater property owner flexibility. Adopting this ESEE analysis would allow application of the RCW Subdistrict to developed riparian corridors and Locally Significant Wetlands (LSW) and setback reductions from 50 to 25 feet.**

660-023-0060 Buildable Lands Affected by Goal 5 Measures:

If the supply of buildable land is reduced as a result of Goal 5 protection measures, local governments must account for this reduction in the Buildable Lands Inventory (BLI).

- It does not appear that impacts on the BLI were considered prior to adoption of the U-R Subdistrict – which covers land 75 feet inland from the Umatilla River floodway, and 50 feet inland from its tributaries.
- Tech Memos 3 Preliminary Buildable Lands Inventory, 3.1 Revised BLI, and 3.2 Commercial BLI and Maps B1, 3.1, and 5.3a account for the reduction in the buildable land supply within the Pendleton UGB based on Goal 5 Natural Resource and Goal 7 Natural Hazard constraints.

3. APPLICATION OF THE RCW SUBDISTRICT

As a result of this ESEE Analysis, the Riparian Corridor and Wetlands (RCW) Subdistrict will be renamed to the Riparian Corridor and Wetland (RCW) Subdistrict to recognize that wetland located outside of mapped riparian corridors, floodplains and flash flood hazard zones will also be covered. Purpose and Applicability Sections of the proposed RCW Subdistrict are provided below:

- *Purpose. The Riparian Corridor and Wetland (RCW) Subdistrict is intended to conserve and enhance the riparian corridors and wetlands within the Pendleton Urban Growth Boundary as shown on the Pendleton Natural Features and Local Wetland Inventories. The RCW Subdistrict is also intended to minimize erosion and flash flood impacts to these wetlands, riparian corridors and downstream areas, and to maintain aesthetic, recreational and property values along riparian corridors and wetlands. These general purposes are accomplished by:*
 - (1) *Conserving significant riparian corridors, native vegetation and associated wetlands consistent with Statewide Planning Goal 5 (Natural Resources), Goal 7 (Natural Hazards) and as called for by applicable Pendleton Comprehensive Plan policies;*
 - (2) *Protecting and enhancing water quality within the Umatilla River and its tributaries and thereby improving fish habitat;*
 - (3) *Minimizing erosion and property damage from development and flash flood events;*
 - (4) *Limiting native vegetation removal, grading and impervious surface area in designated riparian corridors and adjacent slopes; and*
 - (5) *Encouraging the replanting of native vegetation to provide shade and wildlife habitat.*
 - (6) *Conserving locally significant wetlands outside of mapped riparian corridors.*
- *Relationship to Floodplain Regulations. The provisions of this subdistrict supplement Ordinance #3791 which regulates development within the 100-year floodplain. In cases of conflict, the more restrictive provision applies.*
- *Relationship to Umatilla River (U-R) Subdistrict. The U-R Subdistrict ceased to apply to developed corridors of the Umatilla River and its tributaries upon adoption of amendments to this Section in 2013. The 2013 amendments are based on the ESEE (Economic, Social, Environmental and Energy) consequences analysis required by Statewide Planning Goal 5.*
- *Department of State Lands (DSL) Notification. The Oregon Department of State Lands (DSL) shall be notified in writing of all applications to the City of*

Pendleton for development activities, including applications for land use, grading or building permits, which may affect any wetlands or riparian corridors identified in Pendleton Natural Features Inventory or the Pendleton Local Wetland Inventory (LWI).

- *Applicability. The provisions of the RCS Subdistrict apply to land and water areas shown as the RCW Subdistrict on the Pendleton Zoning Map, and include the following:*
 - (1) *Riparian Corridors and Associated Wetlands in Developed and Undeveloped Areas. The riparian corridor extending upland 50 feet from the tops-of-bank of fish-bearing reaches of the Umatilla River, Wildhorse Creek, Patawa Creek, Tutuilla Creek, and McKay Creek as shown on the Pendleton Natural Features Map. Where a mapped wetland is located fully or partially within the 50-foot riparian corridor, the riparian corridor shall extend 50 feet from the upland edge of the locally significant wetland.*
 - (2) *Floodways. Land within the 100-year floodway as shown on FEMA maps. In several areas, the floodway extends beyond the 50-foot riparian corridor.*
 - a. *Flash Flood Hazard Zones. The flash flood hazard zones for fish-bearing streams, Nelson Creek and Airport Ravine are measured 50 feet horizontally from the centerline of the stream or ravine.*
 - b. *Development within other mapped intermittent stream ravines is subject to review by the City Engineer; however, these streams do not have a defined flash flood hazard zone.*
 - (3) *Associated Steep Slopes. Land with slopes of 25% or greater that is adjacent to – and not more than 150 feet from – the outer boundary of a riparian corridor, floodway or flash flood zone.*
 - (4) *Isolated Wetlands. Locally-significant wetlands shown on the Pendleton LWI that are not within mapped riparian corridors, floodways or flash flood hazard zones.*

As indicated, the RCW Subdistrict represents a “limited protection program” that conserves flash flood hazard areas, floodways, and associated steep slopes (related to Goals 6 and 7). These are shown on Maps P-3 and P-4.

The RCW Subdistrict also includes protection for developed and undeveloped reaches of fish-bearing streams and wetlands, and wildlife habitat (related to Goal 5). Developed and undeveloped reaches are shown on Maps P-2, P-3, and P-4.

The City has applied the riparian corridor safe harbor provisions of the Goal 5 administrative rule² to relatively undeveloped stream reaches as prescribed in OAR 660-023-0090. Basically, this safe harbor requires a 50-foot setback from the top-of-bank of fish-bearing streams, while allowing limited (*e.g.*, public facilities, trails, water-dependent and stream restoration) uses within the setback area.

However, the City Council has chosen to provide greater flexibility for relatively developed stream reaches and LSWs within the UGB. As explained above, when the City Council chooses not to apply the safe harbor to relatively developed stream reaches and wetlands, the Goal 5 rule requires that an analysis of economic, social, environmental and energy (ESEE) consequences be conducted prior to adopting stream corridor and wetland protection standards.

The City's draft Riparian Corridor and Wetlands (RCW) Overlay District allows stream corridor and wetland setback reductions in exchange for stream corridor and wetland restoration. Thus, an "ESEE analysis" is required for the City to allow reduction of the "safe harbor" 50-foot setback to 25 feet in relatively developed stream reaches (as mapped in Map P-2) and LSWs.

As documented below, the ESEE consequences of the City's more flexible "limited protection program" are generally positive, because the condition of the wetlands, and riparian corridors in developed areas will be improved, over time, through the implementation of riparian corridor restoration plans within the remaining 25-foot setback area.

² As defined in OAR 660-02300020(2): A "safe harbor" consists of an optional course of action that satisfies certain requirements under the standard process. Local governments may follow safe harbor requirements rather than addressing certain requirements in the standard Goal 5 process. For example, a jurisdiction may choose to identify "significant" riparian corridors using the safe harbor criteria under OAR 660-023-0090(5) rather than follow the general requirements for determining "significance" in the standard Goal 5 process under OAR 660-023-0030(4).

4. DEVELOPED STREAM CORRIDOR REACHES

This section: (a) summarizes the lineal feet of developed stream corridor reaches in Pendleton; (b) describes land uses allowed by zoning that conflict with stream corridor conservation; and (c) and analyzes the ESEE consequences of three local protection options (full local protection – allow no conflicting development uses, limited local protection – as proposed in the RCW Overlay District, and no local protection – no protection for riparian corridors).

Characteristics of Developed Stream Corridors

Technical Memorandum 6: Preliminary Riparian Corridor, Wetland, and Wildlife Habitat Inventory (Winterbrook Planning, 2011), and *Technical Memorandum 10: Natural Features Policy Alternatives* (Winterbrook Planning, 2011) describe the location, quantity and quality of the five fish-bearing stream corridors within the Pendleton Urban Growth Boundary (UGB):

- Umatilla River
- McKay Creek
- Tutuilla Creek
- Patawa Creek
- Wildhorse Creek

The two memoranda include maps and descriptions for each significant, fish-bearing stream corridor. Map P-2 (Developed and Undeveloped Reaches) distinguishes between relatively developed and relatively undeveloped stream reaches. Map P-3 (Goal 5 and 7 Regulations Existing U-R and Proposed RCW Subdistrict) shows the interaction between recently-mapped riparian areas and proposed regulations. Map P-4 (Comp Plan Overlay Existing U-R and Proposed RCW Subdistrict) shows comprehensive plan designations in relation to riparian areas.

Table 1 lists each significant riparian corridor and provides information regarding the condition of each corridor (developed versus undeveloped) on both sides of the stream. If a stream defines the UGB, the riparian area outside the UGB is not accounted for in Table 1.

Table 1. Stream Corridors within the Pendleton UGB

Stream Corridor	Fish-bearing Stream	Developed Reaches (feet)	Undeveloped Reaches (feet)
Umatilla River	Yes	40,492	10,525
McKay Creek	Yes	17,938	584
Tutuilla Creek	Yes	15,219	7,665
Patawa Creek	Yes	0	4,300

Stream Corridor	Fish-bearing Stream	Developed Reaches (feet)	Undeveloped Reaches (feet)
Wildhorse Creek	Yes	3,000	3,076

Source: Department of Forestry, Winterbrook Planning

Each of these fish-bearing stream corridor reaches is mapped and described in Technical Memoranda 6, 9, and 10 and associated maps C-4 and P-2 (Winterbrook Planning, 2011). Each corridor has protected salmonid species and suffers from an overall lack of streamside vegetation.

LWI Wetlands

The draft Pendleton LWI identified four wetlands within the Pendleton UGB, ranging in size from 0.5 acres to 9 acres, and totaling about 14 acres. Table 2 shows these wetlands and their status (associated with mapped riparian areas, or isolated). All four wetlands are within industrial plan designations as shown on Figure 1.

Table 2: LWI Wetland Characteristics

Wetland ID	Riparian Area	Wetland Status
MC-1	McKay Creek	Associated
UR-1	Umatilla River	Isolated
UR-2	Umatilla River	Isolated
UR-3	Umatilla River	Associated

Source: Winterbrook Planning

Associated wetland UR-3 is already covered by adopted and acknowledged RCW standards, so this ESEE analysis covers the remaining three wetlands. These wetlands are proposed to be protected by the same limited protection program as developed riparian areas (50' setback, reduceable to 25'), and the ESEE analysis addresses them accordingly.

Identification of Conflicting Uses

The Goal 5 rule requires cities to determine conflicting urban uses based on uses allowed by applicable zoning districts. As shown on Table 2 and Figure 1, each of the fish-bearing stream corridors have conflicting residential, commercial and/or industrial uses. Each of these uses have activities that conflict with resource preservation – including riparian vegetation removal, excavation and construction of impervious surfaces. – all of which remove wildlife habitat and increase the potential for erosion, loss of streamside vegetation, and increased sedimentation.

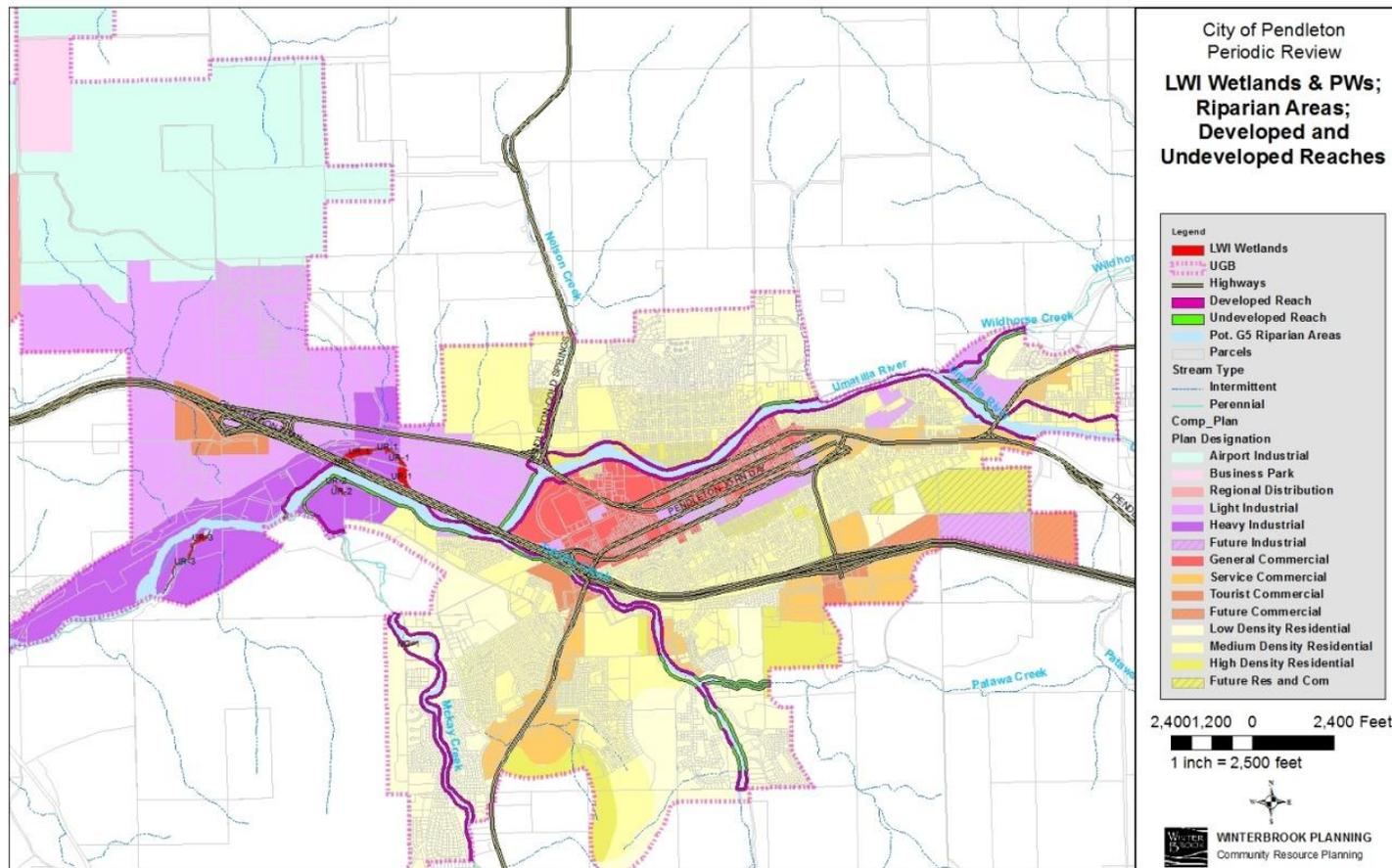
Table 2: Plan designation for developed stream reaches

Stream	Residential	Commercial	Industrial
Umatilla River	MDR, HDR	GC, SC	LI, HI
McKay Creek	LDR		
Tutuilla Creek	LDR, MDR	GC, SC, TC	

Stream	Residential	Commercial	Industrial
Patawa Creek	LDR, HDR		
Wildhorse Creek	LDR		LI

Source: Winterbrook Planning and Pendleton Comprehensive Plan Map.

Figure 1: Fish-bearing streams and wetlands relative to applicable Plan districts within Pendleton UGB



Source: Winterbrook Planning and Pendleton Comprehensive Plan Map.

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5. ESEE CONSEQUENCES ANALYSIS FOR RELATIVELY DEVELOPED STREAM REACHES AND ISOLATED WETLANDS

This section considers the ESEE consequences of three alternatives for protecting relatively developed stream reaches and wetlands:

- (a) Full local protection (allowing no conflicting land uses within 50 feet of a protected stream or wetland);
- (b) No local protection (allowing full development without restriction right up to the stream bank or wetland); and
- (c) Limited local protection. The “limited protection option” relies on the City’s Riparian Corridor and Wetlands (RCW) Subdistrict, which balances economic and environmental values. The RCW is intended to conserve the significant (fish-bearing) stream corridors and wetlands, consistent with the Goal 5 Administrative Rule (OAR Chapter 660, Division 23).
 - This overlay district as applied to **relatively undeveloped stream** reaches and wetlands is consistent with the “safe harbor” provisions of Division 23 in (a) prohibiting most types of residential, commercial, industrial and public development within the prescribed 50-foot setback area, while (b) allowing for streets and public facilities necessary to serve adjacent development (subject to an alternatives analysis), passive recreational and water-dependent uses.
 - The overlay district as applied to **relatively developed stream** reaches and wetlands allows for a 50% setback reduction (to 25 feet) in exchange for riparian corridor restoration (restorative plantings and stream bank stabilization).

Economic Consequences

Fish-bearing streams and wetlands within Pendleton UGB provide a number of economic benefits by:

- Serving as breeding areas for salmon and steelhead and supporting Umatilla River tribal and sports fisheries;
- Supporting Pendleton’s tourist industry which relies in part on the scenic beauty of the Umatilla River and its tributaries;

- Increasing adjacent residential property values that benefit from preserved open space and views; and
- Providing natural drainage channels, rather than artificial conveyance systems, for urban runoff.

Full Local Protection Option (No Conflicting Land Uses Allowed)

The economic consequences of full local protection (protecting the entire 50-foot setback area regardless of existing development) would be mixed. On the one hand, full protection of the 50-foot riparian corridor and wetlands would support the economic benefits identified above by prohibiting additional development within the 50-foot setback area. Moreover, full local protection would help address state and federal requirements related to protection of endangered salmonid habitat – by prohibiting new development that could adversely impact such habitat by removing additional vegetation and creating additional impervious surface areas near streams. Not addressing state and federal requirements would impose economic costs on the City.

On the other hand, from the point of view of individual property owners, the economic consequences of full local protection would be adverse, because developed stream corridors typically have improvements within 50 feet of the stream bank. Under the full protection option, existing development would become “non-conforming” making expansion difficult and expensive.

Restrictions would also be placed on lawns, gardens and accessory structures within the 50-foot setback area that would be burdensome to property owners. In addition to prohibiting residential, commercial, industrial and public uses allowed by the base zone, full stream corridor protection in developed areas would make it impossible to extend streets and utilities necessary to allow for access and full utilization of underdeveloped properties.

Finally, the full protection option provides no incentive for property owners to restore riparian vegetation or to minimize stream bank erosion (when compared with the “limited protection” option described below).

No Local Protection Option

The no local protection option would mean that the economic benefits provided by intact stream corridors and wetlands could be lost. Importantly, providing no local protection is not a realistic option from a state and federal regulatory perspective. No local protection would mean that stream temperatures would likely rise as riparian vegetation continues to be removed to make room for development, in violation of state and federal habitat regulations.

Limited Protection Option (Application of the RCW)

The City's Riparian Corridor and Wetlands (RCW) Subdistrict offers limited protection in developed riparian reaches in exchange for riparian corridor restoration. The RCW prohibits most types of residential, commercial, industrial and public development within a reduced 25 foot setback area (while allowing public facilities, trails, and water dependent uses) – provided that riparian vegetation is restored through planting of native vegetation. In this manner, the economic benefits associated with intact stream corridors and wetlands are enhanced without placing an undue burden on individual property owners.

Social Consequences

Stream corridors and wetlands provide aesthetic and functional benefits for a community. For example, a stream or wetland can add value and enjoyment in a residential setting, or provide places to relax and enjoy scenic views in a work setting. Urban fish and wildlife habitat also provide social values in terms of connecting city dwellers to outdoor recreational opportunities. Streams and wetlands can also provide educational value when they are relatively high quality and accessible to schools and parks.

Full Local Protection Option (No Conflicting Land Uses Allowed)

The social consequences of full local protection are mixed. On the one hand, protecting relatively developed streams and wetlands contributes to urban aesthetics and provide a direct connection to nature for existing residential, commercial and industrial development.

On the other hand, protecting relatively developed streams and wetlands could limit development options for commercial, industrial and residential property owners, with corresponding adverse social impacts (e.g. increasing housing costs or decreasing job opportunities).

No Local Protection Option (Reliance on State Regulations)

The social consequences of the no local protection for relatively developed streams and wetlands are negative: the aesthetic, natural and educational values of existing stream corridors would continue to be diminished for the community as a whole, for individual property owners, and for their neighbors.

Limited Protection Option (Application of the RCW)

The social consequences of a limited protection option (application of the City's RCW to relatively developed streams), would have positive social consequences, because individual property owners would be able to use and expand development on most of their property (minimizing potential impacts to jobs and housing costs), while maintain and restoring critical vegetation along stream corridors and wetlands (thereby maintaining and restoring aesthetic, natural and educational values associated with these water features).

Environmental Consequences

Intact stream corridors and wetlands provide a wide array of environmental benefits³:

- **Microclimate and shade:** Streams and adjacent trees and woody vegetation are associated with localized air cooling, increased humidity, and soil moisture. Shading from riparian vegetation also helps keep stream water cool which is critical to fish (especially salmonids) and other aquatic species. Pendleton's fish-bearing streams are water quality limited for in-stream temperature. The Oregon Department of Environmental Quality (DEQ) has set shade targets for these streams. Existing tree canopy and overhanging shrubs contribute to meeting the shade targets.
- **Bank stabilization and control of sediments, nutrients and pollutants:** Trees, vegetation, rocks and leaf litter intercept precipitation, hold soils, banks and steep slopes in place, slow surface water runoff, take up nutrients, and filter sediments and pollutants found in surface water. In more developed locations, fish-bearing streams are more likely to experience slumping and erosion. Existing riparian and wetland vegetation helps to reduce stormwater runoff. Upland soil may also contain legacy pollutants (*e.g.*, DDT) which can be transported to the stream when vegetation is cleared, the soil is disturbed and stormwater picks up soil particles. Vegetation also filters other urban pollutants (*e.g.*, oils and brake dust from cars) from stormwater.
- **Organic inputs, food web and nutrient cycling:** Streams, wetlands and riparian vegetation provide food and nutrients for aquatic and terrestrial species (*e.g.*, plants, leaves, twigs, seeds, berries, and insects) and are part of an ongoing chemical, physical and biological nutrient cycling system. The streams and riparian areas within Pendleton UGB contribute organic inputs to the Umatilla River and nearby wetlands, and to food and nutrient recycling in the watershed.
- **Wildlife habitat/corridors:** Vegetated stream corridors, wetlands and associated features (*e.g.*, downed trees) provide wildlife habitat functions such as food, cover, breeding and nesting opportunities, and migration corridors. Native and non-native vegetation patches and corridors support local native wildlife and migratory species, which in some cases (as documented in Technical Memorandum 6) are listed by federal and/or state wildlife agencies. Vegetated stream corridors allow wildlife to migrate and disperse among different habitat areas while providing access to water. Vegetation creates a buffer between human activities and wildlife. Noise, light, pollution, people and domestic animals can adversely impact wildlife and riparian vegetation can reduce these impacts.

³ Much of the information regarding environmental benefits provided by stream corridors is adapted from the *Portland Airport Futures Final Report, Appendix C, Economic, Social, Environmental and Energy Analysis* (February 2011).

- **Stream flow moderation and flood storage:** Streams and wetlands provide conveyance and storage of stream flows, floodwaters and groundwater discharge. Trees and vegetation intercept precipitation and promote infiltration which tempers the stream flow fluctuations and short-term flooding events.

Full Local Protection Option (No Conflicting Land Uses Allowed)

The environmental consequences of full protection would be positive, because these relatively developed streams offer fish and wildlife habitat value that would not be further diminished by development. However, prohibiting residential, commercial and industrial development within 50 feet of a stream bank or wetland would do little to encourage *restoration* of native vegetation that cools steam temperatures and stabilizes stream banks.

No Local Protection Option

Under the no local protection option, development would be allowed to the top-of-bank or wetland without restriction, which would have extremely adverse environmental consequences.

Limited Protection Option (Application of the RCW)

The environmental consequences of a limited protection option (the City's proposed RCW) would be positive, since stream and wetland vegetation within the 25 foot setback area would eventually be restored, supporting the environmental benefits described above.

Energy Consequences

In Pendleton, vegetated stream corridors provide shade and windbreaks which can modify high temperatures during the summer months and the effects of cold winds during the winter months. The use of existing stream corridors and wetlands for storm water storage and conveyance reduces energy that would otherwise be used for construction and maintenance of stormwater culverts and storage ponds. At the same time, full protection would limit commercial, industrial and residential infill opportunities, which would have a marginal effect on land use efficiency within Pendleton's UGB.

Full Local Protection Option (No Conflicting Land Uses Allowed)

The energy consequences of full local protection would be positive. Existing riparian vegetation would continue to provide shade during the summer months and a windbreak during the winter months. Fish-bearing streams and wetlands would continue to provide stormwater conveyance and storage functions. On the other hand, full local protection would marginally increase energy consumption because land development patterns would be somewhat less efficient.

No Local Protection Option

Providing no local protection means that development would be allowed to the edge of the stream bank or wetland. The lack of vegetation adjacent to streams or

wetlands would increase stormwater flows and increase sedimentation in streams, thus reducing the effectiveness of a stream's stormwater retention and conveyance function. The lack of streamside vegetation would also mean that stream corridors would no longer provide effective shading and windbreak functions.

Limited Protection Option (Application of the RCW)

The energy consequences of applying RCW protection to relatively developed streams and wetlands would also be positive, because adjacent vegetation would be restored over time, maintaining and improving the shading, windbreak and stormwater functions of fish-bearing streams and wetlands within Pendleton's UGB. Moreover, the limited protection option allows infill development in existing developed areas, which increases land use efficiency and energy conservation.

Conclusion for Relatively Developed Stream Corridors

On balance, the ESEE consequences analysis supports implementation of RCW provisions to allow a 50% setback reduction along developed stream corridors and wetlands in exchange for stream bank and riparian restoration within the remaining 25-foot corridor.

- The RCW ordinance provides for a 50-foot riparian buffer along undeveloped stream reaches and wetlands. Allowed uses include public facilities necessary to support development, water related uses, and passive recreational uses.
- The RCW ordinance also provides for a 50-foot riparian corridor along developed stream reaches and wetlands; however, this corridor may be reduced to 25 feet in exchange for restoration of riparian vegetation and stream bank stabilization within the reduced setback area.