same development site. Springfield's Development Code allows for "cluster development" as a means of density transfer when protecting resource lands. Hardship variances shall be granted to property owners who land would be rendered not buildable by the application of the setbacks and standards described above

Environmental Consequences

Limiting conflicting residential development will largely retain the wetland and riparian functions that are described in Section 6.1. These values would be retained, in part, by setbacks that would limit development on or near resource sites. Thus the environmental impacts of prohibiting conflicting uses include preservation of wildlife habitat, fish habitat, water quality function, and/or hydrologic control function; and or preservation of rare plant communities, federal or state listed species, or locally unique native plant communities. Employing low impact development standards within the impact area will help preserve site vegetation and the hydrology of affected riparian and wetland sites.

Economic Consequences

The section below discusses the economic consequences of limiting the impact of conflicting uses on significant wetland and riparian resource sites at both the study area and property owner levels. Often, impacts are less significant at the study area level than for the individual property owner. The ESEE analysis addresses the characteristics of the resource site in relation to property owner interests.

Study Area Level

Springfield's inventoried wetlands and riparian resource sites cover about 133 acres of land (developed and undeveloped) that is zoned for residential use. When the 150-foot impact area is added, the total area is about 567 acres. Keep in mind that the 150-foot impact area is not a buffer. The impact area is based on best available science, and defines the distance from a resource site within which development is likely to have an ecological impact. State planning rules require cities to define such impact areas and describe the Economic, Social, Environmental and Energy (ESEE) consequences of allowing conflicting uses to impact natural resource sites.

Table 8-5 Wetland and Riparian Areas Affecting Lands With Residential Zoning

Site Type	LDR	MDR	HDR	*Total Acres
Wetland Acres	70.52	4.15	0	74.67
Riparian Acres	45.16	11.86	1.18	58.20
*Total Acres	**115.68**	**16.01**	**1.18**	**132.87**
150-Foot Impact Areas				
Wetland Impact Areas	169.04	11.86	0	180.9
Riparian Impact Areas	200.91	45.92	5.98	252.81
*Total Acres	**369.95**	**57.78**	**5.98**	**433.71**
Grand Total	**485.63**	**73.79**	**7.16**	**566.58**

*Some riparian sites also appear on the Local Wetland Inventory. These lands are counted twice in the totals shown on each of the tables in this section.

Table 8-6 *Vacant Wetland and Riparian Areas ¼ Acre or Larger

Site Type	LDR	MDR	Total Acres
Wetland Acres	40.48	1.09	41.57
Riparian Acres	16.75	6.46	23.21
Total Acres	**57.23**	**7.55**	**64.78**
Wetland Impact Area Acres	62.26	2.2	64.46
Riparian Impact Area Acres	46.97	17.93	64.90
Total Acres	**109.23**	**20.13**	**129.36**
Grand Total	**166.46**	**27.68**	**191.14**

*Vacant lands were identified through the use of property class codes which are used by the Lane County Assessor's Office for taxation purposes.

An analysis of the economic consequences of prohibiting conflicting residential development requires consideration of the impacts on vacant land that can be feasibly developed in the future. Most of Springfield's wetlands and riparian corridors are already bounded by development. Of the 567 acres mentioned above, only about 250 acres are vacant. About 25 percent of the vacant wetland and riparian acreage consists of small fragments of land that are often not developable. For the purpose of this study, vacant lots that are ¼ acre or larger are considered as feasible for infill development. The total acreage (including impact areas) for all vacant lots that are ¼ acre or larger is about 191 acres.

About 38 acres of underutilized land are located within the resource areas (including impact areas). Underutilized parcels include single family homes on parcels larger than ½ acre that could be subdivided and built at higher densities in the future.

Table 8-7. Underutilized Residential Land Associated with Resource Areas

Site Type	LDR	MDR	Total
Underutilized Wetland Acres and Impact Areas	19.04	.52	19.56
Underutilized Riparian Acres and Impact areas	17.94	.69	18.63
Total	**36.98**	**1.21**	**38.19**

*Underutilized land was computed by identifying existing single family homes located on lots that are ½ acre or larger. Leaving ¼ acre for the existing home, it is assumed that in the future, land in excess of that could be subdivided and additional residential units built. The figures above show total acreage within the impact area and the acreage of the parcels associated with the resource sites.

At the study area level, the economic consequences of *limited protection* on resource sites and their respective buffers on *vacant* residential properties can be measured in terms of acres of land lost for development. The proposed protection program would place a development setback on significant wetlands and riparian corridors. Those riparian and wetland areas identified as Water Quality Limited Streams and or tributaries are already subject to 50-foot or 75-foot setbacks.

The proposed protection program would apply the same 50 and 75-foot setbacks on wetlands and riparian corridors that are already applied by stormwater quality regulations adopted by the City of Springfield. The program would also require low impact development strategies to be employed for new development within 150 feet of resource sites.

Table 8-8 below shows the gross residential acreage impacted by the proposed setback protections with no consideration for how the development design might reduce those impacts. If the recommended setbacks are adopted, about 21.55 acres of property affected by wetlands and 31.79 acres of property affected by riparian areas would be lost to development. The total potential impact is about 53.34 acres.

The true acreage lost will depend upon the arrangement of lots and public infrastructure. For example, the acres lost to setbacks may be reduced by placing required stormwater facilities within those setbacks. The rear yards of single family lots in a subdivision could be arranged to back up to resource areas. The setbacks would become part of the backyard for many new homes.

As mentioned above, 50 and 75-foot setbacks are already applied to many wetlands and riparian sites through stormwater quality protections that are already in place. The affect of the program of protection recommended in this study adds a 25-foot setback to those streams and wetlands not covered by the stormwater protections. The 25-foot setbacks shown on Table 8-8 below would be applied to the remaining significant wetlands and riparian corridors. The 25-foot setback for development would remove about 10.54 acres from wetland properties and 3.64 acres from riparian properties.

The program would also require low impact development strategies to be employed for new development within 150 feet of remaining sites.

Table 8-8. Residential Wetland and Riparian Acreage within Proposed Protection Setbacks

Setback Distance	Vacant LDR Acres	Vacant MDR Acres	Total Acres
Wetland Setbacks			
25 foot	9.95	.59	**10.54**
50 foot	9.4	2.73	**12.13**
75 foot	4.97	4.15	**9.12**
Total	**24.32**	**7.47**	**31.79**
Riparian Setbacks			
25 foot	3.42	.22	**3.64**
50 foot	6.06	2.73	**8.79**
75 foot	4.97	4.15	**9.12**
Total	**14.45**	**7.1**	**21.55**
Grand Total	**38.77**	**14.57**	**53.34**

Table 8-9. Residential Wetland and Riparian Acreage within Proposed Protection Setbacks

Setback Distance	Vacant LDR Acres	Potential Dwelling Units @ 4 units per gross acre	Vacant MDR Acres	Potential Dwelling Units @ 12 units per gross acre	Total Units
Wetland Setbacks					
25 foot	9.95	40	.59	7	**47**
50 foot	9.4	38	2.73	33	**71**
75 foot	4.97	20	4.15	50	**70**
Total	**24.32**	**98 units**	**7.47**	**90 Units**	**188**
Riparian Setbacks					
25 foot	3.42	14	.22	3	**17**
50 foot	6.06	24	2.73	33	**57**
75 foot	4.97	20	4.15	50	**70**
Total	**14.45**	**58 Units**	**7.1**	**86 Units**	**144**
Grand Total	**38.77**	**156 Units**	**14.57**	**176 Units**	**332 Units**

Table 8-9 shows the impact of recommended setbacks on the capacity to site new dwelling units. The proposed protection setbacks would reduce the capacity to site 156 single family homes and about 176 multi-family units.

Local protection programs are required by state law to grant a variance to property owners whose property would be rendered unbuildable by such setbacks or other protection policies. The proposed protection plan also offers the flexibility of locating required stormwater detention facilities within setback areas which will further reduce the true impact of protection measures on property owners.

From the property owner and developer's point of view, an adopted protection program will provide greater certainty regarding site development. Although buildable area would be reduced, developing outside the 25-75 foot setbacks generally negates the cost imposed by conducting formal delineations. If, on the other hand, a developer were to propose limited development within a wetland or riparian setback, a resource delineation (and DSL concurrence in this delineation) would be required.

The Springfield Development Code allows "cluster development," a form of density transfer, to allow a developer or property owner, to secure most of the value that might be lost through protection of a resource site. The value of a cluster-housing unit may not be the same as a single-family housing unit on a 5,000 square foot lot. However, well designed cluster developments have proven to be very marketable in the Eugene Springfield area (the Arbors and Cold Springs developments are two examples). By allowing more dwelling units to be sited in a smaller location, the cost per unit for infrastructure can be reduced or spread across more units. In some cases, cluster dwellings can be marketed as affordable housing or as first homes.

Springfield's Development Code provision for cluster development at least allows the *option* of density transfer to avoid loss of property value when protecting resource sites.

Positive Economic Consequences

There are positive economic consequences associated with resource conservation. First, referenced studies demonstrate that wetlands and riparian areas can add value to developments — both for neighbors and for purchasers of lots or units in the development. Conserving wetlands through density transfer and thoughtful design would probably increase neighboring property values as well as the sales price of lots and houses in new development.

Second, potential costs for storm water management, flood control and federally mandated water quality improvement program may decrease if wetlands and riparian areas are not developed. These resource sites should be viewed as part of the storm water management system. Often, when wetlands and riparian corridors are destroyed, their functions must be recreated through artificial detention and water quality ponds, at considerable public expense. Springfield is facing major costs in meeting federal NPDES permitting requirements; costs that could increase if wetland and riparian water quality functions are lost. It is conceivable that long term, flood insurance rates could also increase as flood studies revise flood plain boundaries in the face of increasing urban runoff.

Third, there could be a positive economic value by providing a clear and objective *local* process for resolving development/wetland conflicts. If the local, review process is clearly spelled out in an adopted protection program and implemented in through the Springfield Development Code, the uncertainty and delay costs could decrease for everyone involved.

Social Consequences

The social consequences of fully protecting wetland and riparian resource sites in this category would be mixed, but are largely positive. On the positive side, housing costs could be reduced, assuming that the developer passes on potential development savings from cluster housing to the consumer. Out-of-direction travel to avoid resource sites, and associated pollution and traffic impacts could be slightly increased, although thoughtful design can usually avoid this problem. Density transfer as allowed in the Springfield Development Code provides opportunities to mitigate, or even reverse, negative social consequences, through clustering of development and integrating wetlands into the overall design of the residential development.

Wetlands and riparian corridors usually add amenity value to residentially developed land, and would only marginally reduce the amount of buildable land. Social consequences (open space, views, more affordable cluster housing, better urban design) would be positive as a result of conserving the wetland area, which could be used as open space for the residential development. Resource sites provide educational opportunities for those living near them, which would be maintained. They also provide opportunities for urban quiet and solitude, which has positive social consequences. The OFWAM analysis that was conducted on each wetland site describes some of the social qualities of each wetland in this category that would be conserved through

planned residential development and density transfer. That report includes specific measures for educational potential, visual/aesthetic quality, and recreational opportunities. The social consequences of conserving resources sites are retention of the qualities that help make each wetland and riparian area *significant.*

Energy Consequences

Energy consequences of resource conservation are also mixed, but are largely positive. With density transfer provisions, wetlands and riparian corridors could be conserved without major loss of housing unit potential, and without significant impact on the Springfield UGB. Higher urban densities could be achieved, resulting in more efficient use of infrastructure, shorter travel distances, and reliance on less energy consumptive modes of travel.

Wetland and riparian vegetation can have a moderating effect on neighborhood climate. Trees provide shade that cools buildings in the summer and serve as a windbreak in the winter. At a macro level, plants absorb sunlight and transpire during the growing season, slightly reducing ambient air temperatures. Resource sites can also provide local recreational opportunities, thus reducing the need to drive for outdoor experiences. Thus, conservation of local resource sites could have additional positive energy consequences.

8.4 ESEE Consequences of Allowing, Limiting or Prohibiting Conflicting Commercial and Industrial Uses

The following sections discuss the general ESEE consequences of allowing, limiting or prohibiting conflicting commercial and industrial land uses (development) to impact significant wetland and riparian corridors that are the subject of this report. The analysis below addresses the likely ESEE consequences of allowing conflicting uses to impact riparian and wetland resource sites. The discussion summarizes the range of possible consequences. Not all consequences are expected to occur at every site, or even at most sites. A site-specific analysis of the likely impacts of development on each of Springfield's significant wetlands and riparian areas follows in Section 9.0.

The structure of the ESEE analysis often requires repetitive discussion of the same information and the repetitive use of the same tables which serve as a data base for the analysis. For example the text and tables used to discuss the impact of allowing development near a wetland are often the same tables and text to describe the impacts of prohibiting development, but from a different perspective. Identical copies of various tables have been inserted in the report to relieve the reader from the burden of flipping back and forth through this large document to find the information discussed in the text.

Information has been derived from the Lane County Assessor's records to identify commercial and industrial land that is vacant or has re-development potential. The Assessor's property class codes provide information about whether a parcel is developed or vacant. This method of identifying vacant property is not without error, but it provides a reasonable assessment of the impacts. In some cases, land which appears vacant around an industrial site is in fact intended to distance the site from other nearby uses or is land being held for future expansion of the existing

use. Errors in this process will be on the side of over estimating the impact of the resource acreage on commercial and industrial lands.

Consequences of Fully Allowing Conflicting Commercial/Industrial Development

Table 8-10 summarizes the potential conflict between future commercial and industrial development and Springfield's resource areas. The table shows the acreage of the resource areas as well as the adjacent 150-ft. impact areas. Table 8-11 shows the amount of vacant commercial and industrial land that is affected by resource acreage. About 335 acres of commercial and industrial land lay within the boundaries of Springfield's wetland and riparian resource sites. Of that, about 132 acres is vacant. The impact areas around these resource areas cover about 538 acres of land of which about 159 acres is vacant.

Table 8-10. Wetland and Riparian Resource Areas Affecting Lands With Commercial and Industrial Zoning

Site Type	CC	MRC	NC	GO	HI	LMI	CI	SHI	BK	QM	*Total Acres
Resource Areas											
Wetland Acres	12.25	0	.42	0	30.51	71.61	.35	11.53	24.08	2.46	153.21
Riparian Acres	2.78	5.6	0	.16	87.03	41.09	13.84	1.48	29.73	0	181.71
Total Acres	**15.03**	**5.6**	**0.42**	**0.16**	**117.54**	**112.7**	**14.19**	**13.01**	**53.81**	**2.46**	**334.92**
150-Foot Impact Areas											
Wetland Impact Areas	27.58	0	.47	0	113.31	72.12	5.01	33.18	15.83	9.7	277.2
Riparian Impact Areas	7.49	22.58	0	1.37	88.58	97.23	25.7	3.96	10.54	3.72	261.17
*Total Acres	**35.07**	**22.58**	**0.47**	**1.37**	**201.89**	**169.35**	**30.71**	**37.14**	**26.37**	**13.42**	**538.37**
Grand Total	**50.10**	**28.18**	**.89**	**1.53**	**319.43**	**282.05**	**44.36**	**50.15**	**80.18**	**15.88**	**873.29**

*Some riparian sites also appear on the Local Wetland Inventory. These lands are counted twice in the totals shown on each of the tables in this section.

Table 8-11. Vacant Wetland and Riparian Resource Areas Affecting Lands With Commercial and Industrial Zoning

Site Type	CC	MRC	NC	GO	HI	LMI	CI	SHI	BK	QM	*Total Acres
Resource Areas											
Wetland Acres	.07	0	0	0	12.62	27.65	.35	0	.13	0	40.82
Riparian Acres	2.78	0	0	0	68.31	16.48	3.22	0	.21	0	91.00
Total Acres	**2.85**	**0**	**0**	**0**	**80.93**	**44.13**	**3.57**	**0**	**0.34**	**0**	**131.82**
150-Foot Impact Areas											
Wetland Impact Areas	3.69	0	0	0	52.76	20.72	4.25	0	.99	0	82.41

Riparian Impact Areas	5.14	1.91	0	0	26.83	32.87	8.53	0	1.41	0	76.69
*Total Acres	**8.83**	**1.91**	**0**	**0**	**79.59**	**53.59**	**12.78**	**0**	**2.4**	**0**	**159.1**
Grand Total	**11.68**	**1.91**	**0**	**0**	**160.52**	**97.72**	**16.35**	**0**	**2.74**	**0**	**290.92**
*Vacant lands were identified through the use of property class codes which are used by the Lane County Assessor's Office for taxation purposes.											

Environmental Consequences

Springfield's resource sites should be considered as part of a much larger ecological system of urban wetlands and stream corridors in the Springfield area. The intrinsic value of any particular riparian or wetland is affected by the degree of human intrusion and its connection with stream corridors and other natural resources. Wetlands and riparian areas contribute directly to decreased flooding potential and to improved water quantity and quality, fish and wildlife habitat, and groundwater recharge.

Table 8-11 shows that fully allowing conflicting uses to impact resource lands and impact areas would mean the loss of about 290.92 acres of vacant land for development. If the resource sites themselves were preserved, but the impact areas were allowed to be developed, the loss would be about 131.82 acres. The site specific impacts are described in Section 9.0 below.

Wetlands decrease flooding potential by providing flood water storage, dissipating the force of moving water, and by allowing storm water to seep gradually into the ground rather than moving rapidly over the surface and increasing flood damage and erosion. Wetlands improve water quantity and quality in a number of ways. Vegetated soils allow water to filter downward to the groundwater reservoir, adding volume to surface waters during low flow periods. Wetlands allow sediment to settle out and be trapped by vegetation before it reaches streams. Natural vegetation also absorbs chemicals and heavy metals, reducing water pollution. Thus, loss of wetlands contributes to flooding and reduces the quantity and quality of ground and surface water.

Varying levels of plant and animal diversity characterize wetlands. Wetlands provide fish and wildlife habitat by contributing to an integrated stream corridor ecosystem, which provides food, water, shelter, breeding and rearing areas for aquatic and terrestrial animals and birds. Reductions in the quality, quantity and availability of food, water, cover and living space have significant detrimental effects on wildlife. Wetlands that are connected to other natural resources allow travel corridors for wildlife.

When industrial or commercial development replaces native vegetation, the habitat value of the resource site decreases dramatically. Industrial/commercial development in wetland and riparian areas does not necessarily eliminate all fish and wildlife habitat, but changes the habitat in a way that decreases biodiversity, because only more aggressive and adaptable species can survive under changed ecological circumstances.

Commercial/industrial development in resource replaces native vegetation with impervious surface area, and contributes to flooding, reduced groundwater recharge, and increased sediment and nutrient loading (from lawns, wastes, etc.). The result is decreased water quantity and quality, and diminished fish and wildlife habitat. Industrial/commercial development usually

poses less of a threat to the ecological integrity of significant resource sites from children, pets and recreational activities. However, commercial/industrial development does pose specific threats to wetlands and riparian areas, including garbage and littering, disposal of industrial wastes, runoff from large parking lots, use of fertilizers and pesticides, fences and other structures which limit wildlife access, noise, and glare.

The Oregon Freshwater Wetland Assessment Methodology (OFWAM) describes and analyzes nine criteria for wetland evaluation and characterization. Springfield's OFWAM analysis was applied to each wetland site on the Local Wetland Inventory. Several riparian resource sites are also inventoried wetlands and were thus included in the OFWAM analysis.

The Wildlife Habitat Assessment (WHA) was used to assess the habitat value of Springfield's riparian resource areas and many of the wetlands that are part of this study. The WHA tool evaluates the relative availability of water, food, cover, and the level of interspersion and disturbance for riparian sites. In doing so, the WHA describes the habitat functions served by the resource site. The WHA provided a comparative score for identifying Springfield's highest value riparian areas.

The environmental consequence of fully allowing commercial/industrial development over Springfield's wetland and riparian resource sites is that the functions and values identified by the OFWAM and WHA studies would be lost.

Economic Consequences

The economic consequences of not protecting significant resource sites would be different, depending on the level of analysis. For the property owner, the economic impacts of allowing full commercial or industrial development of the site would be positive.

Assessor's records show that commercial and industrial land values vary widely. Tables 8-12 and 8-13 below provides a very rough estimate of the land value that would be lost if resource sites and impact areas were fully protected. The estimated value per acre for each zoning district was computed using the sum of the assessed values of all vacant land within commercial and industrial zoning districts divided by the vacant acreage in zone. The result was a crude assessed value per vacant acre. Fully allowing development of the resource sites and impact areas would avoid the loss of about $16,859,468 in property value.

Tables 8-14 and 8-15 show the potential impact of resource protection on Springfield's capacity to locate businesses and factories. These impacts are expressed in terms lost job capacity. If conflicting commercial and industrial uses were fully allowed to impact resource areas and their associated impact areas, Springfield would preserve the capacity to site about 2995 jobs. If the resource sites were protected, but their associated impact areas were allowed to develop, capacity for 1679 jobs would be preserved and about 1316 would be lost.

Table 8-12. Assessed Property Value Impacts
Vacant Commercial and Industrial Resource Areas

Zoning District	Vacant Resource Acreage	Assessed Value per Vacant Acre	Estimated Value
Wetland Resource Area			
Light-Medium Industrial	27.65	$65,369	$1,807,453
Heavy Industrial	12.60	$32,467	$409,084
Special Heavy Industrial	0	$32,467	$0
Campus Industrial	.35	$165,772	$58,020
Quarry Mining	0	$5,035	$0
Booth Kelly MU	.13	$45,311	$5,890
Community Commercial	.07	$265,376	$18,576
Neighborhood Commercial	0	$265,376	$0
General Office	0	$265,376	$0
Major Retail Commercial	0	$539,360	$0
Total	**40.8**		**$2,299,023**
Riparian Resource Area			
Light-Medium Industrial	16.48	$65,369	$1,077,281
Heavy Industrial	68.31	$32,467	$2,217,821
Special Heavy Industrial	0	$32,467	$0
Campus Industrial	3.22	$165,772	$533,786
Quarry Mining	0	$5,035	$0
Booth Kelly MU	.21	$45,311	$9,515
Community Commercial	2.78	$265,376	$737,745
Neighborhood Commercial	0	$265,376	$0
General Office	0	$265,376	$0
Major Retail Commercial	0	$539,360	$0
Total	**91**		**$4,576,148**
Grand Total	**131.80**		**$6,875,171**

Table 8-13. Assessed Property Value Impacts
Vacant Commercial and Industrial Resource Impact Areas

Zoning District	Vacant Impact Acreage	Assessed Value per Vacant Acre	Estimated Value
Wetland Impact Area			
Light-Medium Industrial	20.72	$65,369	$1,354,445
Heavy Industrial	52.76	$32,467	$1,712,959
Campus Industrial	4.25	$32,467	$137,985
Special Heavy Industrial	0	$165,772	$0
Quarry Mining	0	$5,035	$0
Booth Kelly MU	.99	$45,311	$44,858
Community Commercial	3.69	$265,376	$979,237
Neighborhood Commercial	0	$265,376	$0
General Office	0	$265,376	$0
Major Retail Commercial	0	$539,360	$0
Total	**82.41**		**$4,229,484**
Riparian Impact Areas			
Light-Medium Industrial	32.87	$65,369	$2,148,679
Heavy Industrial	26.83	$32,467	$871,090
Campus Industrial	8.53	$32,467	$276,944

Zoning District	Vacant Impact Acreage	Assessed Value per Vacant Acre	Estimated Value
Special Heavy Industrial	0	$165,772	$0
Quarry Mining	0	$5,035	$0
Booth Kelly MU	1.41	$45,311	$63,889
Community Commercial	5.14	$265,376	$1,364,033
Neighborhood Commercial	0	$265,376	$0
General Office	0	$265,376	$0
Major Retail Commercial	1.91	$539,360	$1,030,178
Total	**76.69**		**$5,754,813**
Grand Total	**139.06**		**$9,984,297**

Table 8-14. Job Capacity Losses
Vacant Commercial and Industrial Resource Areas

Zoning District	Vacant Acreage	*Assumed Jobs per Acre	Potential Lost Job Capacity
Wetlands			
Light-Medium Industrial	27.65	13.4	371
Heavy Industrial	12.60	6.5	82
Special Heavy Industrial	0	6.5	0
Campus Industrial	.35	25	9
Quarry Mining	0	6.5	0
Booth Kelly MU	.13	13.4	2
Community Commercial	.07	36.1	3
Neighborhood Commercial	0	36.1	0
General Office	0	25	0
Major Retail Commercial	0	31.1	0
Total	**40.8**		**467**
Riparian Area			
Light-Medium Industrial	16.48	13.4	221
Heavy Industrial	68.31	6.5	444
Special Heavy Industrial	0	6.5	0
Campus Industrial	3.22	25	81
Quarry Mining	0	6.5	0
Booth Kelly MU	.21	13.4	3
Community Commercial	2.78	36.1	100
Neighborhood Commercial	0	36.1	0
General Office	0	25	0
Major Retail Commercial	0	31.1	0
Total	**91**		**849**
Grand Total	**131.80**		**1316**
The employees per acre ratios were derived from the Springfield Commercial Lands Study (pg. B-4) that was adopted in 2000.			

Table 8-15. Job Capacity Losses
Vacant Commercial and Industrial within 150-ft. Resource Impact Areas

Zoning District	Vacant Impact Acreage	*Assumed Jobs per Acre	Potential Lost Job Capacity
Wetlands			
Light-Medium Industrial	20.72	13.4	278
Heavy Industrial	52.76	6.5	343
Campus Industrial	4.25	25	106
Special Heavy Industrial	0	6.5	0
Quarry Mining	0	6.5	0
Booth Kelly MU	.99	13.4	13
Community Commercial	3.69	36.1	133
Neighborhood Commercial	0	36.1	0
General Office	0	25	0
Major Retail Commercial	0	31.1	0
Total	**82.41**		**873**
Riparian Areas			
Light-Medium Industrial	32.87	13.4	214
Heavy Industrial	26.83	6.5	174
Campus Industrial	8.53	25	213
Quarry Mining	0	6.5	0
Booth Kelly MU	1.41	13.4	19
Community Commercial	5.14	36.1	186
Neighborhood Commercial	0	36.1	0
General Office	0	36.1	0
Major Retail Commercial	1.91	31.1	0
Total	**76.69**		**806**
Grand Total	**139.06**		**1679**
The employees per acre ratios were derived from the Springfield Commercial Lands Study (pg. B-4) that was adopted in 2000.			

It is unclear what affect the presence of a resource has on assessed values. What is clear is that full protection of resource sites located on commercial and industrial land could result in considerable lost value to property owners. However, these costs need to be balanced against the cost of off-site mitigation or payment of in-lieu fees, which is estimated at $60,000 to $100,000 an acre. Thus, the off-site mitigation costs (in the event that off-site mitigation was approved by DSL and the Army Corps) would be considerable. Economic consequences vary considerably based on individual site conditions, as noted in the discussion of the economic consequences of conserving resource areas, below.

From the industrial or commercial developer's point of view, the lack of local regulations could mean decreased uncertainty and design costs. The costs of additional consultant time could be avoided, the thought and energy required to design the project may be reduced, and there would be less local government discretion and perhaps greater certainty in the review process. On the other hand, there are a number of less obvious economic consequences that need to be considered. First, wetland and riparian areas can add amenity value to developments – especially business and campus industrial parks. It is less likely that conservation of these resource areas would benefit standard commercial or industrial developments, except as a means of storm water quantity and quality control.

Second, local governments and property owners face potential increases in storm water management, flood control and federally mandated water quality improvement costs as wetlands are developed. Wetlands and riparian areas should be viewed as part of the storm water management system; often, when these resource sites are destroyed, their functions must be re-created as sumps, or artificial detention and water quality ponds, at considerable private and public expense. The City of Springfield as well as industrial/commercial property owners are facing major costs in meeting federal NPDES permitting requirements – costs that could increase if wetland and riparian water quality functions are lost. Flood insurance rates may also increase in the future, based on flood studies that may have to be revised because they under-estimated urban run-off rates.

Third, there could be a negative economic value by not providing a clear and objective *local* process for resolving development/resource conflicts. If the local review process is not clearly spelled out in the Springfield Development Code, the uncertainty and delay costs could increase for everyone involved.

Social Consequences

The social consequences of fully allowing unrestricted commercial/industrial development of significant wetland and riparian resource sites are mixed. On the positive side, needed employment opportunities and convenient shopping and service opportunities in the Springfield UGB would be maintained. By maintaining the full amount of vacant and underutilized commercial/ industrial land inside the Urban Growth Boundary, expansion of the UGB onto farm and grazing land could be delayed.

The social value of providing employment within the Springfield UGB is significant. If employment, commerce and services are concentrated inside the existing UGB, commuter travel could be minimized, which has positive social impacts. Pollution could be reduced, there could be more disposable income for other consumer wants, productivity could increase and there could be more leisure time to spend on non-work/non-shopping activities. In addition, development costs could be reduced, assuming that the wetland or riparian site would not be otherwise protected under state and federal regulations.

There also would be negative social consequences. If development was to occur on resource sites covering commercial/industrial land, urban setting and water based recreational functions and values, among others, would be lost. Open space views for travelers along the Hwy 126 and I-5 Corridor could be adversely affected. Workers would not have the advantage of open space views or places to spend free time.

Wetlands and riparian corridors usually add some amenity value to commercial/industrial developed land, and only marginally reduce the amount of buildable land. Social consequences (lost open space and views) would be adverse as a result of developing a resource area, which could otherwise be used as open space for the residential development. Wetlands and riparian areas provide educational opportunities for those working near them, which would be lost. They also provide opportunities for urban quiet and solitude, the lack of which has adverse social consequences.

Energy Consequences

Energy consequences of unrestricted commercial/industrial development of wetland and riparian areas are also mixed. Assuming standard development practices, the results of building over the wetland could be more efficient use of commercial/industrial land, which could prevent premature expansion of the UGB, higher urban densities, more efficient use of infrastructure, shorter travel distances and less out-of-direction travel. From a solar perspective, it is possible that vegetation from forested wetlands and riparian corridors could shade south-facing windows, thus reducing solar access. In summary, the adverse energy consequences could be significant.

On the negative side, wetland vegetation has a moderating effect on climate. Trees provide shade that cool buildings in the summer and serve as a windbreak in the winter. At a macro level, plants absorb sunlight and transpire during the growing season, slightly reducing ambient air temperatures. Resource areas also provide local recreational opportunities, thus reducing the need to drive for outdoor experiences. Thus, loss of wetland and riparian vegetation would have some adverse energy consequences.

Consequences of Prohibiting Conflicting Commercial/Industrial Development

This portion of the ESEE analysis looks at the impacts of conserving a significant wetland and riparian resource sites on the conflicting use – in this case, commercial/industrial development.

Environmental Consequences

The environmental values that would be retained by conservation of wetlands are described above. Site-specific ESEE found in Section 9.0 of this report describes and analyzes the environmental qualities of each wetland in this category, which would be largely retained by prohibiting development on and near wetlands and riparian corridors, and restricting commercial/industrial development within the 150-foot impact area. Even with "full protection" of significant resource sites, activities associated with commercial/industrial development (increased human activity, run-off, toxic spills, noise, glare, trespass, etc.), which cannot be fully controlled by land use regulations, would probably degrade wetland values over time. The environmental consequences of conserving wetland and riparian resources are that these qualities, which make each resource significant, would be maintained.

Economic Consequences

It is useful to look at the economic consequences of conserving the significant wetland and riparian resource sites from different points of view. Impacts are often different at the study area level than from the point of view of the individual property owner. The ESEE analyses for each individual significant resource site address the special characteristics of that site in relation to property owner interests.

Study Area Level

Statewide Planning Goal 9 (Economy) requires that cities conduct an "economic opportunities analysis" that describes the types of industries and businesses that are likely to locate in the community and identifies the siting needs of such "targeted industries". Goal 9 also requires local governments to provide "at least an adequate supply" of suitable industrial and commercial sites that meet local industrial and commercial siting criteria. At the study area level, there are measurable economic consequences associated with prohibiting industrial and commercial development within all resource sites and their impact areas. Table 8-16 shows the potential loss of vacant commercial and industrial land that could result from full resource protection.

Table 8-16. Vacant Wetland and Riparian Resource Areas Affecting Lands With Commercial and Industrial Zoning

Site Type	CC	MRC	NC	GO	HI	LMI	CI	SHI	BK	QM	*Total Acres
Resource Areas											
Wetland Acres	.07	0	0	0	12.62	27.65	.35	0	.13	0	40.82
Riparian Acres	2.78	0	0	0	68.31	16.48	3.22	0	.21	0	91.00
Total Acres	**2.85**	**0**	**0**	**0**	**80.93**	**44.13**	**3.57**	**0**	**0.34**	**0**	**131.82**
150-Foot Impact Areas											
Wetland Impact Areas	3.69	0	0	0	52.76	20.72	4.25	0	.99	0	82.41
Riparian Impact Areas	5.14	1.91	0	0	26.83	32.87	8.53	0	1.41	0	76.69
*Total Acres	**8.83**	**1.91**	**0**	**0**	**79.59**	**53.59**	**12.78**	**0**	**2.4**	**0**	**159.1**
Grand Total	**11.68**	**1.91**	**0**	**0**	**160.52**	**97.72**	**16.35**	**0**	**2.74**	**0**	**290.92**
*Vacant lands were identified through the use of property class codes which are used by the Lane County Assessor's Office for taxation purposes.											

At this writing, there are approximately 955 acres of vacant commercial and industrial land within Springfield's UGB. This is a rough estimate of the acreage available for future commercial and industrial development based on a search of the Assessors records for parcels with property class codes indicating vacant land.

An estimated 132 acres of vacant wetland and riparian acres are affected by conflicting commercial and industrial uses. This represents about 14% of the vacant commercial and industrial land in Springfield. An additional 159 acres of impact area are affected by conflicting uses. In total, fully protecting wetland and riparian areas and their associated impact areas would mean a loss of 291 acres from the land which could conceivably be developed for commercial or industrial purposes.

Tables 8-17 and 8-18 below multiplies the resource and impact areas acreage by the by the average assessed value-per-acre for vacant land as shown in the Assessors records. This provides a very rough estimate of the land value that might be lost if wetlands and riparian areas and their associated impact areas were fully protected. The value-per-acre was derived by using the Assessor's property class codes to identify vacant commercial and industrial property within

the Springfield UGB. The assessed land values were then totaled by zoning district and divided by the acreage for each zone. As can be seen, the value-per-acre figures vary widely. The table shows a potential loss $16,859,468 if both resource and impact areas were fully protected. The potential loss would be reduced to $9,984,297 if only the resource areas were fully protected.

Table 8-17. Assessed Property Value Impacts
Vacant Commercial and Industrial Resource Areas

Zoning District	Vacant Resource Acreage	Assessed Value per Vacant Acre	Estimated Value
Wetland Resource Area			
Light-Medium Industrial	27.65	$65,369	$1,807,453
Heavy Industrial	12.60	$32,467	$409,084
Special Heavy Industrial	0	$32,467	$0
Campus Industrial	.35	$165,772	$58,020
Quarry Mining	0	$5,035	$0
Booth Kelly MU	.13	$45,311	$5,890
Community Commercial	.07	$265,376	$18,576
Neighborhood Commercial	0	$265,376	$0
General Office	0	$265,376	$0
Major Retail Commercial	0	$539,360	$0
Total	**40.8**		**$2,299,023**
Riparian Resource Area			
Light-Medium Industrial	16.48	$65,369	$1,077,281
Heavy Industrial	68.31	$32,467	$2,217,821
Special Heavy Industrial	0	$32,467	$0
Campus Industrial	3.22	$165,772	$533,786
Quarry Mining	0	$5,035	$0
Booth Kelly MU	.21	$45,311	$9,515
Community Commercial	2.78	$265,376	$737,745
Neighborhood Commercial	0	$265,376	$0
General Office	0	$265,376	$0
Major Retail Commercial	0	$539,360	$0
Total	**91**		**$4,576,148**
Grand Total	**131.80**		**$6,875,171**

Table 8-18. Assessed Property Value Impacts
Vacant Commercial and Industrial Resource Impact Areas

Zoning District	Vacant Impact Acreage	Assessed Value per Vacant Acre	Estimated Value
Wetland Impact Area			
Light-Medium Industrial	20.72	$65,369	$1,354,445
Heavy Industrial	52.76	$32,467	$1,712,959
Campus Industrial	4.25	$32,467	$137,985
Special Heavy Industrial	0	$165,772	$0

Zoning District	Vacant Impact Acreage	Assessed Value per Vacant Acre	Estimated Value
Quarry Mining	0	$5,035	$0
Booth Kelly MU	.99	$45,311	$44,858
Community Commercial	3.69	$265,376	$979,237
Neighborhood Commercial	0	$265,376	$0
General Office	0	$265,376	$0
Major Retail Commercial	0	$539,360	$0
Total	**82.41**		**$4,229,484**
Riparian Impact Areas			
Light-Medium Industrial	32.87	$65,369	$2,148,679
Heavy Industrial	26.83	$32,467	$871,090
Campus Industrial	8.53	$32,467	$276,944
Special Heavy Industrial	0	$165,772	$0
Quarry Mining	0	$5,035	$0
Booth Kelly MU	1.41	$45,311	$63,889
Community Commercial	5.14	$265,376	$1,364,033
Neighborhood Commercial	0	$265,376	$0
General Office	0	$265,376	$0
Major Retail Commercial	1.91	$539,360	$1,030,178
Total	**76.69**		**$5,754,813**
Grand Total	**139.06**		**$9,984,297**

Table 8-19 below, shows the assumed ratio of employees-per-acre in commercial and industrial zoning districts and the potential job capacity that would be lost if the resource and associated impact areas were fully protected. The employees per acre ratios were derived from the Springfield Commercial Lands Study (pg. B-4) that was adopted in 2000. The table indicates that would be the lost capacity of approximately 2995 commercial and industrial jobs if all resource sites and their respective impact areas were fully protected. If only the resource areas were fully protected and development occurred in the impact area, the lost job capacity would fall to 1316.

Table 8-19. Job Capacity Losses
Vacant Commercial and Industrial Resource Areas

Zoning District	Vacant Acreage	Assumed Jobs per Acre	Potential Lost Job Capacity
Wetlands			
Light-Medium Industrial	27.65	13.4	371
Heavy Industrial	12.60	6.5	82
Special Heavy Industrial	0	6.5	0
Campus Industrial	.35	25	9
Quarry Mining	0	6.5	0
Booth Kelly MU	.13	13.4	2
Community Commercial	.07	36.1	3
Neighborhood Commercial	0	36.1	0
General Office	0	25	0
Major Retail Commercial	0	31.1	0
Total	**40.8**		**467**

Zoning District	Vacant Acreage	Assumed Jobs per Acre	Potential Lost Job Capacity
Riparian Area			
Light-Medium Industrial	16.48	13.4	221
Heavy Industrial	68.31	6.5	444
Special Heavy Industrial	0	6.5	0
Campus Industrial	3.22	25	81
Quarry Mining	0	6.5	0
Booth Kelly MU	.21	13.4	3
Community Commercial	2.78	36.1	100
Neighborhood Commercial	0	36.1	0
General Office	0	25	0
Major Retail Commercial	0	31.1	0
Total	**91**		**849**
Grand Total	**131.80**		**1316**
The employees per acre ratios were derived from the Springfield Commercial Lands Study (pg. B-4) that was adopted in 2000.			

Table 8-20. Job Capacity Losses
Vacant Commercial and Industrial Resource Impact Areas

Zoning District	Vacant Impact Acreage	Assumed Jobs per Acre	Potential Lost Job Capacity
Wetlands			
Light-Medium Industrial	20.72	13.4	278
Heavy Industrial	52.76	6.5	343
Campus Industrial	4.25	25	106
Special Heavy Industrial	0	6.5	0
Quarry Mining	0	6.5	0
Booth Kelly MU	.99	13.4	13
Community Commercial	3.69	36.1	133
Neighborhood Commercial	0	36.1	0
General Office	0	25	0
Major Retail Commercial	0	31.1	0
Total	**82.41**		**873**
Riparian Areas			
Light-Medium Industrial	32.87	13.4	214
Heavy Industrial	26.83	6.5	174
Campus Industrial	8.53	25	213
Quarry Mining	0	6.5	0
Booth Kelly MU	1.41	13.4	19
Community Commercial	5.14	36.1	186
Neighborhood Commercial	0	36.1	0
General Office	0	36.1	0
Major Retail Commercial	1.91	31.1	0
Total	**76.69**		**806**
Grand Total	**139.06**		**1679**
*The employees per acre ratios were derived from the Springfield Commercial Lands Study (pg. B-4) that			

Zoning District	Vacant Impact Acreage	Assumed Jobs per Acre	Potential Lost Job Capacity
was adopted in 2000.			

Springfield has invested considerable public dollars in providing infrastructure (transportation, sewer, water, storm drainage, utilities) to commercial and industrial land within the UGB. The return on public investment would be reduced in proportion to the amount of industrial land that cannot be developed due to wetland or other constraints.

Location of Resource Area on the Property

Wetlands and riparian areas often serve as effective boundaries separating property ownerships. In several cases, we are associated with riparian corridors. In such cases, wetland conservation has little or no additional adverse economic impact. In situations where the wetland covers most of a small property, or blocks all access to a property, the economic consequences could be extremely adverse, and make it impossible to completely avoid the wetland. Such situations are noted in the ESEE analyses associated with individual properties.

Developer Impact

From the developer's point of view, local regulations could mean increased design costs. It is often easier and less time-consuming to develop over a resource area, particularly wetlands, rather than around them, especially where large, rectangular buildings are required. The costs of additional consultant time could increase, as could the level of thought and energy required to design the project. There would be greater local government discretion and perhaps greater uncertainty in the review process. This uncertainty can be minimized though clear local standards for development in or near resource areas.

Flexibility needs to be built into these local standards to allow officials and developers to resolve obstacles to construction while preserving the functions and values of the resource. Certainty can be provided through rigid standards. Flexibility sometimes requires some uncertainty. A review process that provides developers a choice between meeting clear and objective standards (check list approach to design review) and a discretionary process that focuses on performance standards may provide the balance needed to allow development near resources to proceed.

As noted above, all locally *significant* wetlands many riparian corridors are regulated by state and federal standards anyway, so that the supply of industrial and commercial land will be reduced somewhat in any event. By mapping resource areas, buyers and sellers of industrial and commercial properties will have a much better idea of how much of their land is actually buildable, and how much would be subject to local, state or federal regulations.

Positive Economic Consequences

On the other hand, there are positive economic consequences associated with wetland and riparian conservation. First, many studies have demonstrated that resource areas can add value to developments - both for neighboring properties and for commercial/industrial developments. Conserving resource areas through thoughtful design can increase neighboring property values

and may, depending on the nature of the proposed commercial/industrial use, increase lease or sales price of space or lots.

Second, potential costs for storm water management, flood control and federally mandated water quality improvement program could decrease if wetlands were not developed. Wetlands and riparian corridors should be viewed as part of the storm water management system. Often, when wetlands and riparian areas are destroyed, their functions must be re-created as sumps, or artificial detention and water quality ponds, at considerable public expense. Springfield is facing major costs in meeting federal NPDES permitting requirements; costs that could increase if resource water quality functions are lost. Flood insurance rates may also increase in the future, based on flood studies that may have to be revised because they underestimated urban runoff rates.

Third, there could be a positive economic value by providing a clear and objective *local* process for resolving development/resource conflicts. If the local review process is clearly spelled out in the Springfield Development Code, uncertainty and delay costs could decrease for everyone involved.

Social Consequences

The social consequences of conserving significant wetland resource sites are mixed. In order to conserve significant resource sites that are zoned for industrial and commercial uses, the opportunity for jobs close to urban housing may be diminished. If all significant wetland and riparian resource sites were conserved, then 291 acres and 2995 jobs could be displaced to land outside the existing UGB. The importance of close-in employment opportunities needs to be balanced against the clear benefits of resource conservation.

On the positive side, resource areas may add amenity value to developed land. The social consequences (open space and views) would be positive as a result of conserving the significant resource areas, which can be used as open space for employees and the general shopping public. Wetlands and riparian areas provide educational opportunities for those working near them, which would be maintained. Resource areas also provide opportunities for urban quiet and solitude, which has positive social consequences.

Energy Consequences

Energy consequences of resource conservation are also mixed, but in this case would be largely negative. Resource lands cannot be preserved on commercial/industrial land without impacts on the acreage needed to accommodate jobs in Springfield. Urban jobs could be displaced to more distant areas (Coburg is an example of this trend), increasing travel time, congestion, and stress. Especially along the major corridors, where transportation access is a key locational factor, the energy consequences of resource conservation would be significant and adverse.

It is less likely that vegetation from forested wetlands riparian areas would shade large industrial or commercial users, or significantly impair solar access. Riparian vegetation can have a moderating effect on nearby areas. Trees provide shade that cools buildings in the summer serve

as a windbreak in the winter. At a macro level, plants absorb sunlight and transpire during the growing season, slightly reducing ambient air temperatures. Resource sites can also provide local recreational opportunities, thus reducing the need to drive for outdoor experiences. Thus, conservation of wetland and riparian vegetation would have additional positive energy consequences.

Consequences of Limiting Conflicting Commercial/Industrial Development

This portion of the ESEE analysis looks at the impacts of limiting conflicting commercial and industrial on wetland and riparian sites. As mentioned above, the consequences of limiting conflicting uses depends on the measures used to "limit" impacts. The proposed program of protection for riparian and wetland corridors would establish 25-foot setbacks from resource sites (50-75 foot setbacks from large rivers and fish-bearing streams such as the Willamette River). Low impact development strategies will be employed when building within 150-feet of each resource site. Public facilities and street improvements would be allowed to impact resource sites and their impact areas after considering alternatives and impact reduction standards. Replacement and expansion of existing structures would also be allowed, subject to mitigation standards. Hardship variances shall be granted to property owners who land would be rendered not buildable by the application of the setbacks and standards described above

Environmental Consequences

Limiting conflicting residential development will largely retain the wetland and riparian functions that are described in Section 6.1. These values would be retained, in part, by setbacks that would limit development on or near resource sites. Thus the environmental impacts of prohibiting conflicting uses include preservation of wildlife habitat, fish habitat, water quality function, and/or hydrologic control function; and or preservation of rare plant communities, federal or state listed species, or locally unique native plant communities. Employing low impact development standards within the impact area will help preserve site vegetation and the hydrology of affected riparian and wetland sites.

Economic Consequences

The section below discusses the economic consequences of limiting the impact of conflicting uses on significant wetland and riparian resource sites at both the study area and property owner levels. Often, impacts are less significant at the study area level than for the individual property owner. The ESEE analysis addresses the characteristics of the resource site in relation to property owner interests.

Study Area Level

Table 8-21 shows that Springfield's inventoried wetlands and riparian resource sites cover about 334.92 acres of land (developed and undeveloped) that is zoned for commercial and industrial use. When the 150-foot impact area is added, the total area is about 873 acres. Keep in mind that the 150-foot impact area is not a buffer. The impact area is based on best available science, and defines the distance from a resource site within which development is likely to have an

ecological impact. State planning rules require cities to define such impact areas and describe the Economic, Social, Environmental and Energy (ESEE) consequences of allowing conflicting uses to impact natural resource sites.

Table 8-21. Wetland and Riparian Resource Areas Affecting Lands With Commercial and Industrial Zoning

Site Type	CC	MRC	NC	GO	HI	LMI	CI	SHI	BK	QM	*Total Acres
Resource Areas											
Wetland Acres	12.25	0	.42	0	30.51	71.61	.35	11.53	24.08	2.46	153.21
Riparian Acres	2.78	5.6	0	.16	87.03	41.09	13.84	1.48	29.73	0	181.71
Total Acres	**15.03**	**5.6**	**0.42**	**0.16**	**117.54**	**112.7**	**14.19**	**13.01**	**53.81**	**2.46**	**334.92**
150-Foot Impact Areas											
Wetland Impact Areas	27.58	0	.47	0	113.31	72.12	5.01	33.18	15.83	9.7	277.2
Riparian Impact Areas	7.49	22.58	0	1.37	88.58	97.23	25.7	3.96	10.54	3.72	261.17
*Total Acres	**35.07**	**22.58**	**0.47**	**1.37**	**201.89**	**169.35**	**30.71**	**37.14**	**26.37**	**13.42**	**538.37**
Grand Total	**50.10**	**28.18**	**.89**	**1.53**	**319.43**	**282.05**	**44.36**	**50.15**	**80.18**	**15.88**	**873.29**

Table 8-22. <u>Vacant</u> Wetland and Riparian Resource Areas Affecting Lands With Commercial and Industrial Zoning

Site Type	CC	MRC	NC	GO	HI	LMI	CI	SHI	BK	QM	*Total Acres
Resource Areas											
Wetland Acres	.07	0	0	0	12.62	27.65	.35	0	.13	0	40.82
Riparian Acres	2.78	0	0	0	68.31	16.48	3.22	0	.21	0	91.00
Total Acres	**2.85**	**0**	**0**	**0**	**80.93**	**44.13**	**3.57**	**0**	**0.34**	**0**	**131.82**
150-Foot Impact Areas											
Wetland Impact Areas	3.69	0	0	0	52.76	20.72	4.25	0	.99	0	82.41
Riparian Impact Areas	5.14	1.91	0	0	26.83	32.87	8.53	0	1.41	0	76.69
*Total Acres	**8.83**	**1.91**	**0**	**0**	**79.59**	**53.59**	**12.78**	**0**	**2.4**	**0**	**159.1**
Grand Total	**11.68**	**1.91**	**0**	**0**	**160.52**	**97.72**	**16.35**	**0**	**2.74**	**0**	**290.92**
*Vacant lands were identified through the use of property class codes which are used by the Lane County Assessor's Office for taxation purposes.											

The economic consequences of *limited protection* on resource sites and their respective development setbacks on *vacant* commercial and industrial properties can be measured in terms of acres of land lost for development and the lost capacity to site the businesses and factories that create jobs. The proposed protection program would minimize development within resource sites

place a development setback on significant wetlands and riparian corridors. Table 8-22 shows this protection would mean the loss of about 131.82 acres of land for development that lay within the boundaries of wetlands and riparian areas.

Those riparian and wetland areas identified as Water Quality Limited Streams and or tributaries are already subject to 50-foot or 75-foot setbacks. The proposed protection program would apply the same 50 and 75-foot setbacks on wetlands and riparian corridors that are already applied by stormwater quality regulations adopted by the City of Springfield. The program would also require low impact development strategies to be employed for new development within 150 feet of resource sites.

Table 8-23 below shows the vacant commercial and industrial acreage impacted by the proposed setback protections with no consideration for how the development design might reduce those impacts. If the recommended setbacks are adopted, about 31 acres of property affected by wetlands and 25 acres of property affected by riparian areas would be lost to development. The total potential impact is about 56.10 acres.

Table 8-23. Vacant Commercial and Industrial Land within Proposed Setbacks

Zoning District	25 ft. Setback	50 ft. Setback	75 ft. Setback	Total Acres
Wetlands				
Light-Medium Industrial	4.81	.82	0	5.63
Heavy Industrial	2.01	19.15	0	21.16
Campus Industrial	0	2.56	0	2.56
Special Heavy Industrial	0	0	0	0
Quarry Mining	0	0	0	0
Booth Kelly MU	0	.47	0	.47
Community Commercial	1.47	.11	0	1.58
Neighborhood Commercial	0	0	0	0
General Office	0	0	0	0
Major Retail Commercial	0	0	0	0
Total	**8.29**	**23.11**	**0**	**31.4**
Riparian Areas				
Light-Medium Industrial	2.05	4.72	1.26	8.03
Heavy Industrial	1.22	8.93	0	10.15
Campus Industrial	0	2.83	.03	2.86
Special Heavy Industrial	0	0	0	0
Quarry Mining	0	0	0	0
Booth Kelly MU	0	.82	0	.82
Community	0	0	2.6	2.6

Zoning District	25 ft. Setback	50 ft. Setback	75 ft. Setback	Total Acres
Commercial				
Neighborhood Commercial	0	0	0	0
General Office	0	0	0	0
Major Retail Commercial	0	.24	0	.24
Total	**3.27**	**17.54**	**3.89**	**24.7**
Grand Total	**11.56**	**40.65**	**3.89**	**56.10**

The true acreage lost will depend upon the arrangement of lots and public infrastructure. For example, the acres lost to setbacks may be reduced by placing required stormwater facilities within those setbacks.

As mentioned above, 50 and 75-foot setbacks are already applied to many wetlands and riparian sites through stormwater quality protections that are already in place. The affect of the proposed program of protection recommended in this study adds a 25-foot setback to those streams and wetlands not covered by the stormwater protections. The 25-foot setbacks shown on Table 8-23 above would be applied to the remaining significant wetlands and riparian corridors. The 25-foot setback for development would remove about 8 acres from wetland properties and 3 acres from riparian properties.

The program would also require low impact development strategies to be employed for new development within 150 feet of remaining sites.

Table 8-24 below multiplies the acreage within the 25, 50 and 75 foot recommended setbacks by the average assessed value-per-acre for vacant land as shown in the Assessors records. This provides a very rough estimate of the land value that might be lost if the recommended setbacks are adopted. The value-per-acre was derived by using the Assessor's property class codes to identify vacant commercial and industrial property within the Springfield UGB. The assessed land values were then totaled by zoning district and divided by the acreage for each zone. As can be seen, the value-per-acre figures vary widely. Table 8-24 shows the value of the wetland and riparian resource lands that would be lost if they were fully protected to be $3,938,532. The 50 and 75 foot setbacks are already required under Springfield's stormwater quality protection program. The 25-foot setback required by this study represents a lost value of about $940,402.

Table 8-24. Potential Lost Property Value within Proposed Setbacks

Zoning District	25 ft. Setback	50 ft. Setback	75 ft. Setback	Total Acres	Assessed Value per Acre	Assessed Vacant Land Value Lost	Value Lost to 25 ft. Setback
Wetlands							
Light-Medium Industrial	4.81	.82	0	5.63	$65,369	$368,027	$314,425
Heavy Industrial	2.01	19.15	0	21.16	$32,467	$687,002	$62,258
Campus Industrial	0	2.56	0	2.56	$165,772	$424,376	0
Special Heavy Industrial	0	0	0	0	$32,467	0	0
Quarry Mining	0	0	0	0	$5,035	0	0
Booth Kelly MU	0	.47	0	.47	$45,311	$21,296	0
Community Commercial	1.47	.11	0	1.58	$265,376	$419,294	$390,103
Neighborhood Commercial	0	0	0	0	$265,376	0	0
General Office	0	0	0	0	$265,376	0	0
Major Retail Commercial	0	0	0	0	$539,360	0	0
Total	**8.29**	**23.11**	**0**	**31.4**		**$1,919,995**	**$766,786**
Riparian Areas							
Light-Medium Industrial	2.05	4.72	1.26	8.03	$65,369	$524,913	$134,006
Heavy Industrial	1.22	8.93	0	10.15	$32,467	$329,540	$39,610
Campus Industrial	0	2.83	.03	2.86	$165,772	474,107	0
Special Heavy Industrial	0	0	0	0	$32,467	0	0
Quarry Mining	0	0	0	0	$5,035	0	0
Booth Kelly MU	0	.82	0	.82	$45,311	0	0
Community Commercial	0	0	2.6	2.6	$265,376	689,977	0
Neighborhood Commercial	0	0	0	0	$265,376	0	0
General Office	0	0	0	0	$265,376	0	0
Major Retail Commercial	0	.24	0	.24	$539,360	0	0
Total	**3.27**	**17.54**	**3.89**	**24.7**		**$2,018,537**	**$173,616**
Grand Total	**11.56**	**40.65**	**3.89**	**56.10**		**$3,938,532**	**$940,402**

Table 8-25 shows the impact of recommended setbacks on the capacity to site new businesses and factories and the jobs they create. The proposed protection setbacks would reduce the capacity to site 691 jobs. Setting aside the lost capacity tied to the 50 and 75 foot setbacks stemming from the stormwater requirements, the proposed 25 foot setbacks added by this protection program reduces job capacity by about 12 acres or 165 jobs, added to the 1316 jobs that would be lost to protection of the resource sites themselves.

Table 8-25. Potential Lost Job Capacity within Proposed Setbacks

Zoning District	25 ft. Setback	50 ft. Setback	75 ft. Setback	Total Acres	*Assumed Jobs per Acre	Potential Lost Job Capacity within Setbacks	Capacity Lost to 25 ft. Setback
Wetlands							
Light-Medium Industrial	4.81	.82	0	5.63	13.4	75	64
Heavy Industrial	2.01	19.15	0	21.16	6.5	138	13
Campus Industrial	0	2.56	0	2.56	25	64	0
Special Heavy Industrial	0	0	0	0	6.5	0	0
Quarry Mining	0	0	0	0	6.5	0	0
Booth Kelly MU	0	.47	0	.47	13.4	6	0
Community Commercial	1.47	.11	0	1.58	36.1	57	53
Neighborhood Commercial	0	0	0	0	36.1	0	0
General Office	0	0	0	0	25	0	0
Major Retail Commercial	0	0	0	0	31.1	0	0
Total	**8.29**	**23.11**	**0**	**31.4**		**340**	**130**
Riparian Areas							
Light-Medium Industrial	2.05	4.72	1.26	8.03	13.4	108	27
Heavy Industrial	1.22	8.93	0	10.15	6.5	66	8
Campus Industrial	0	2.83	.03	2.86	25	72	0
Special Heavy Industrial	0	0	0	0	6.5	0	0
Quarry Mining	0	0	0	0	6.5	0	0
Booth Kelly MU	0	.82	0	.82	13.4	11	0
Community	0	0	2.6	2.6	36.1	94	0

Zoning District	25 ft. Setback	50 ft. Setback	75 ft. Setback	Total Acres	*Assumed Jobs per Acre	Potential Lost Job Capacity within Setbacks	Capacity Lost to 25 ft. Setback
Commercial							
Neighborhood Commercial	0	0	0	0	36.1	0	0
General Office	0	0	0	0	25	0	0
Major Retail Commercial	0	.24	0	.24	31.1	0	0
Total	**3.27**	**17.54**	**3.89**	**24.7**		**351**	**35**
Grand Total	**11.56**	**40.65**	**3.89**	**56.10**		**691**	**165**
The employees per acre ratios were derived from the Springfield Commercial Lands Study (pg. B-4) that was adopted in 2000.							

Local protection programs are required by state law to grant a variance to property owners whose property would be rendered unbuildable by such setbacks or other protection policies. The proposed protection plan also offers the flexibility of locating required stormwater detention facilities within setback areas which will further reduce the true impact of protection measures on property owners.

From the property owner and developer's point of view, an adopted protection program will provide greater certainty regarding site development. Although buildable area would be reduced, developing outside the 25-75 foot setbacks generally negates the cost imposed by conducting formal delineations. If, on the other hand, a developer were to propose limited development within a wetland or riparian setback, a resource delineation (and DSL concurrence in this delineation) would be required.

Environmental Consequences

The environmental values that would be retained by conservation of resource sites are described above. The OFWAM analysis and report describes and analyzes the environmental qualities of each wetland in this category, which would be largely retained by prohibiting development on and near wetlands, or partially retained by restricting commercial/industrial development within the 25-foot buffer area. The ESEE analysis anticipates that public facilities and streets will be constructed through certain resource areas, and that impacts from public facility construction will be reduced through a combination of local, state and federal mitigation standards.

Economic Consequences

It is useful to look at the economic consequences of conserving the significant resource sites from different points of view. Impacts are often different at the study area level than from the point of view of the individual property owner. The ESEE analyses for each individual significant wetland resource site address the special characteristics of that site in relation to property owner interests.

Study Area Level

At the study area level, the economic consequences of *avoiding* wetland and riparian areas on commercial/ industrial properties are significant. As of 2005, Table 8-22 shows the Springfield UGB included an estimated 13.49 acres of vacant, and underutilized commercial lands are in conflict with resource sites. An estimated 2.85 acres are within resource boundaries and 10.74 acres are within their associated impact acres.

More significantly, Table 8-22 shows there are approximately 409.15 acres of vacant, and underutilized industrial zoned land that are in conflict with resource sites and their impact areas. About 128.97 acres are located within resource boundaries and 280.18 acres are within their associated impact areas.

Tables 8-19 and 8-20 show there would be a lost capacity of 322 commercial jobs if all resource sites and their impact areas were fully protected. The tables show there would be a lost capacity affecting 2109 industrial jobs if the sites and impact areas were fully protected.

Springfield has also invested considerable public dollars in providing infrastructure (transportation, sewer, water, storm drainage, utilities) to commercial and industrial land in the UGB. The return on public investment would be reduced in proportion to the amount of commercial and industrial land that could not be developed due to wetland or other constraints.

Location of Wetland on Property

Wetlands often serve as effective boundaries separating property ownerships. In several cases, wetlands are associated with riparian corridors. In such cases, wetland conservation has no additional adverse economic impact. In situations where the resource site covers most of a small property, or blocks all access to a property, the economic consequences could be adverse, and make it impossible to completely avoid the resource.

Developer Impact

From the developer's point of view, local regulations would mean increased regulatory certainty but reduced land area for development. It is often easier and less time-consuming to develop over a resource, rather than around it, especially where large, rectangular buildings are required. The costs of additional consultant time could increase, as could the level of thought and energy required to design the project.

Positive Economic Consequences

On the other hand, there are positive economic consequences associated with resource conservation. First, many studies have demonstrated that wetlands and riparian areas can add value to developments – both for neighboring properties and for the commercial/industrial developments. Conserving resource sites through thoughtful design would probably increase neighboring property values and may, depending on the nature of the proposed commercial/ industrial use, increase lease or sales price of space or lots.

Second, potential costs for storm water management, flood control and federally mandated water quality improvement program could decrease if resource sites are not developed. Wetlands and riparian areas should be viewed as part of the storm water management system; often, when resource sites are destroyed, their functions must be re-created as sumps, or artificial detention and water quality ponds, at considerable public expense. Springfield is facing major costs in meeting federal NPDES permitting requirements; costs that could increase if resource water quality functions are lost. Flood insurance rates may also increase in the future, based on flood studies that may have to be revised because they underestimated urban runoff rates.

Third, there may be a positive economic value by providing a clear and objective *local* process for resolving development/wetland conflicts. If the local review process is clearly spelled out in the Springfield Development Code, the uncertainty and delay costs could decrease for everyone involved.

8.5 ESEE Consequences of Allowing Conflicting Transportation and Public Facilities

This supplemental ESEE analysis is concerned with public facilities that are needed to support urban development, such as streets, trails, sewer, storm drainage, and water facilities. Major sanitary sewer, water, storm drainage or transportation facilities usually are recognized on the City's facilities master plans and Transportation System Plan (TSP). Public facilities also include private utilities (electrical, cable, telephone and gas), airport facilities, power facilities (substations and transmission) and communication towers, and storm drainage facilities. These public projects are, by definition, necessary to support planned urban development. Not included under the public facilities definition are schools, hospitals and similar institutional uses.

Conflicting Land Uses

A. Sewage collection facilities and lines;
B. Water treatment and storage facilities, and lines;
C. Storm water detention facilities and collection lines;
D. Transportation facilities, including multi-use paths and streets;
E. Electrical substations and major transmission lines (including non-public lines);
F. Communication towers (including private and public towers);
G. Above and below ground utilities - including telephone, electrical, gas, and cable TV.

Conflicting Land Use Activities

A. Maintenance and reconstruction of public facilities, including vegetation management (mowing, trimming, tree removal and spraying), excavation and installation of new facilities; and
B. Construction impacts, including short-term impacts (noise, runoff, erosion, disruption of vegetation, etc.) resulting from construction of conflicting uses.

The ESEE Analysis should consider whether wetland resource sites and their impact areas can be avoided by the planned public facility, and if not, how the impacts of the planned public facility

project can be reduced. Avoidance is often most difficult for this category, because (a) gravity flow sewer lines often are most economical and energy efficient if constructed within a drainage corridor, and (b) planned road extensions are often most economical and direct when constructed in wetlands, because wetlands frequently have been passed over as development sites. Many public facilities, especially those constructed to support individual developments, are not recognized on public facility plans. Occasionally such facilities must cross a wetland to reach sewer, water, storm drainage, or transportation facilities. The level of protection afforded a wetland in this circumstance depends on the City's policy determination, based in part on this analysis, and in part on public testimony.

Consequences of Fully Allowing Conflicting Public and Transportation Facilities Conflicting Uses

Environmental Consequences

In most cases, allowing the conflicting public facility does not mean that the LSW would be destroyed. The environmental consequences of constructing and maintaining planned public facilities depend on the answer to two primary questions:

1. Can the wetland or riparian resource be avoided, either partially or completely? and,
2. If avoidance is impractical, can the project be constructed so as to mitigate adverse impacts?

These determinations can only be made on a site-specific basis.

The OFWAM analysis describes the functions and values of wetlands and many riparian areas that could be adversely affected by the location and construction of public facilities projects. That report includes specific measures of ecological integrity, wetland wildlife habitat, and flood control. If unrestricted public facilities construction were permitted through the wetland, it would mean that the qualities that make each wetland significant would be compromised. The Wildlife Habitat Assessment (WHA) report ranks the wildlife habitat functions and values for each riparian and many wetland sites.

Wetlands and riparian areas contribute directly to decreased flooding potential and to improved water quantity and quality, fish and wildlife habitat, and groundwater recharge. Resource areas decrease flooding potential by providing flood water storage, dissipating the force of moving water, and by allowing storm water to seep gradually into the ground rather than moving rapidly over the surface. Wetlands and riparian areas improve water quantity and quality in a number of ways. Vegetated soils allow water to filter downward to the groundwater reservoir, adding volume to surface waters during low flow. They allow sediment to settle out or be trapped by wetland vegetation before it reaches streams. Natural vegetation also absorbs hazardous chemicals and heavy metals, reducing water pollution. Thus, loss of resource sites caused by public infrastructure contributes to flooding and reduces the quantity and quality of ground and surface water.

Varying levels of plant and animal diversity characterize wetlands. Wetlands and riparian areas provide improve fish and wildlife habitat by contributing to an integrated stream corridor

ecosystem, which provides food, water, shelter, breeding and rearing areas for aquatic and terrestrial animals and birds. Reductions in the quality, quantity and availability of food, water, cover and living space all have significant detrimental effects on wildlife.

Of the many types of public facilities, street construction is often the most destructive of resource values. Often the choice for routing major streets is between removing existing development, and constructing the street through a resource site, because the site was previously passed over by development. Street construction could result in draining wetlands and riparian areas, removing native vegetation, or bisecting resource sites with consequent loss of connectivity. Run-off from impervious surface areas could also adversely affect water quality. Traffic along the street can kill wetland and riparian dependent wildlife. Moreover, streets provide public access to resource sites, which could result in a variety of adverse impacts, including vandalism, garbage dumping, and increased human and pet activity.

An effective way to minimize these impacts is to jog streets around resource sites, and limit public access (which also limits wildlife access) from the street through fencing. Opening a natural area to public view makes it a public asset that is more likely to be cared for.

Planned street locations are particularly problematical for resource sites in Springfield, because future major streets often have been planned through some undeveloped wetland and riparian areas. This illustrates the conflict between the public need for street connectivity and resource conservation.

Sanitary sewer construction can also have significant adverse impacts. Gravity flow sewers are often routed through wetlands precisely because wetlands are lowlands. In addition to short-term impacts for vegetation removal and excavation, improper construction of bedding for sewer lines can drain a wetland permanently. An effective means of minimizing sewer impacts is to design the sewer line to avoid the wetland. Where this is impossible, appropriate design and construction methods can often bring the wetland back to its original condition within a few years.

Storm sewer construction can have major adverse impacts on wetland and riparian functions and values especially on water quality. Where closed conduit systems deposit large quantities of untreated storm water directly to a wetland, wetland functions and values can be compromised in a short period of time. Although principal functions of resource areas include nutrient attenuation, flood control, and sediment reduction, the design and construction of storm water control systems should avoid over-taxing the capacity of individual resource sites to perform these functions.

Water system improvements probably have the least adverse impact on wetland and riparian functions and values. Their design and construction does not require a great deal of space, and they are typically constructed at high, rather than lower, elevations. Where water lines must cross through a resource area, their impacts can be readily reduced through proper design and re-vegetation.

Economic Consequences

State and federal wetland regulations require that avoidance be considered as the first option where wetlands and riparian resources stand in the way of planned public facilities. Avoidance can increase the costs of public facilities construction and maintenance, due to a) increased costs of constructing longer streets or lines, b) increased costs of acquiring upland (and possibly developed properties) adjacent to resource sites, c) increased costs for pumping stations which may be required if gravity flow systems cannot be constructed, d) increased commuting costs for out-of-direction travel, and e) increased maintenance costs for longer or less direct streets or lines.

Avoidance is often most difficult for this conflicting use category. As noted above, gravity low sanitary and storm sewer lines often are most economical and energy efficient if constructed within a drainage corridor, where wetlands and riparian corridors tend to be located. Planned road extensions are often most economical and direct when constructed through, rather than around wetlands, because wetlands frequently have been passed over as development sites.

The costs mentioned above need to be balanced against the cost of on- or off-site mitigation, which may range from approximately $60,000 to $100,000 an acre, depending on the type of wetland or resource area. Thus, the off-site mitigation costs (in the event that off-site mitigation were to be approved by DSL and the Army Corps) may be considerable.

Economic consequences vary considerably based on individual site conditions, as noted in the site-specific ESEE analyses where planned public facilities are identified as a conflicting use. As noted above, *avoidance and mitigation* must be considered in any case. However, from the project manager's point of view, fewer *local* regulations could mean decreased uncertainty and design costs. The costs of additional consultant time could be avoided, the thought and energy required to design the project could be reduced, and there would be less local planning discretion and perhaps greater certainty in the review process.

Social Consequences

The social consequences of allowing planned public facilities are mixed. Public facilities projects are essential to serve existing and planned population and employment growth in Springfield. On the positive side, public construction and maintenance costs would probably be lessened if wetland and riparian impacts were either avoided or reduced. By maintaining all of the buildable land currently inside the Urban Growth Boundary, the efficiency of service provision would be maintained. Out-of-direction travel to avoid resource sites, and associated pollution and traffic impacts could be slightly reduced, assuming that future streets are designed in a "grid" pattern.

Social consequences (lost open space and views) would be adverse as a result of constructing public facilities through those wetland sites that could otherwise be used as public open space. Wetlands and riparian areas provide educational opportunities for those living near them, which could be lost. Resource areas also provide opportunities for urban quiet and solitude, the lack of which has adverse social consequences

The OFWAM analysis identifies social qualities of each wetland and many riparian sites in this category that would be compromised by unrestricted public facilities construction. That report includes specific criteria for educational potential, visual/aesthetic quality, and recreational opportunities. The social consequences of allowing public facilities construction over the wetland are that the human-related qualities that help make each wetland significant would be lost.

Energy Consequences

The energy consequences of allowing planned public facilities are generally positive. Straight streets (which do not jog to avoid wetlands) are the most efficient way of moving traffic. Straight sewer lines built near stream beds (where wetlands are most often found) require fewer pump stations and conserve more energy. On the other hand, integration of wetlands into area-wide drainage programs would be much more energy efficient than filling wetlands and constructing closed conduit systems. Other energy consequences counter-balance each other, as described in other supplemental ESEE analyses.

Consequences of Prohibiting Conflicting Public and Transportation Facilities Conflicting Uses

This portion of the ESEE analysis looks at the impacts of fully protecting wetlands and riparian areas by prohibiting the construction and maintenance of planned public facilities.

Environmental Consequences

The environmental values that would be retained by full protection of wetlands are described above. The OFWAM analysis describes the environmental qualities of each wetland and many riparian areas in this category, which would be largely retained by prohibiting public facilities construction and maintenance on and near wetlands. Even with "full protection" of resource areas, there are activities associated with public facilities construction and maintenance (increased human activity, runoff noise, glare, trespass, vandalism, etc.), which cannot be fully controlled by land use regulations or design techniques, that would probably degrade wetland resource values over time. The OFWAM report describes and analyzes nine criteria for wetland evaluation and characterization. That report includes four specific biological measures that are compromised by development: wildlife habitat, fish habitat, water quality, and hydrological control. These four criteria are evaluated in the following manner: **wildlife habitat** evaluates the habitat diversity for species generally associated with wetlands and wetland edges; **fish habitat** evaluates how the wetland contributes to fish habitat in streams, ponds or lakes associated with the wetland; **water quality** evaluates the potential of a wetland to reduce the impacts that excess nutrients in storm water runoff have on downstream waters; **hydrological control** evaluates the effectiveness of a wetland in storing floodwaters and reducing downstream flood peaks.

The Wildlife Habitat Assessment (WHA) was used to evaluate riparian sites in terms of relative quantity, quality, diversity and seasonality of the components that appear at the site. Also considered were the degree and permanence of physical and human disturbance, proximity to

other water-related and upland areas, and unique features including wildlife, flora and rarity of habitat.

The environmental consequences of conserving wetland and riparian areas are that prohibiting conflicting uses and conserving wetland and riparian resources would maintain these qualities, which make each resource area significant.

Economic Consequences

The economic consequences of conserving significant wetland and riparian resource sites that lie in the path of planned public facilities are mixed, but largely negative. Resource areas are often selected as preferred transportation routes because of their undeveloped status. Design, construction and maintenance costs generally would increase, as streets, sanitary sewer collection systems, and water storage and distribution systems are redesigned to avoid or mitigate wetlands. Long-term public maintenance costs could also increase. In other words, there are public as well as private costs associated with maintaining water quality and urban wildlife habitat.

From the City's perspective, considerable public dollars have already been invested in planning for and constructing infrastructure (transportation, sewer, water, storm drainage, utilities) to serve buildable land in Springfield. The return on public investment would be reduced in proportion to the amount of open space land that cannot be developed or used for active recreational use, due to wetland and riparian resource conservation.

However, most of these economic impacts will likely occur whether or not each wetland or riparian resource site is locally regulated, because of state and federal avoidance and mitigation requirements. While locally *significant* wetlands are regulated by state and federal standards anyway, local regulations could require that the environmental and social functions and values of resource sites be considered in the public facilities design process. This would probably translate into increased design, construction and maintenance cost.

Social Consequences

The social consequences of fully protecting wetlands and riparian areas can be made positive through appropriate design of planned public facilities. On the positive side, the public would benefit from conservation of resource areas because natural, urban open space would be conserved. On the other hand, wetland avoidance and mitigation for public facilities costs public tax dollars. Overall, taxes could increase to support more environmentally sensitive design and construction of planned public facilities.

On the negative side, if planned public facilities could not be constructed to serve existing and planned growth, the social consequences of resource conservation would be serious and adverse. Public facilities projects are essential to serving existing and planned population and employment growth in the city. Conserving wetlands and riparian areas could mean decreasing the amount of buildable land inside the current Urban Growth Boundary, and slightly less efficient service provision if expansion of the UGB to had to occur sooner. Out-of-direction

travel to avoid resource sites, and associated pollution and traffic impacts could be slightly increased.

The OFWAM analysis describes the social qualities of each wetland and many riparian areas in this category that would be compromised by public facilities construction and maintenance. Urban educational opportunities and aesthetic values are especially important when considering conflicts with removal of open space. The OFWAM analysis includes specific measures for educational potential, visual/aesthetic quality, and recreational opportunities. The social consequences of conserving the wetlands and riparian areas are that the qualities that help make each resource site significant would be maintained. Wetlands and riparian areas can also play an integral role in the development and implementation of a comprehensive stormwater management/resource management/open space program.

Energy Consequences

Energy consequences of wetland and riparian conservation are also mixed, but are tilted somewhat to the negative. Connecting streets must jog or not be constructed at all to avoid resource sites, which means increased out-of-direction travel and slower traffic in most cases. Avoidance of streambeds in the construction of sewer lines often means more pump stations, which requires more energy. On the other hand, integration of resource areas into area-wide drainage programs would be much more energy efficient than filling wetlands and riparian areas and constructing closed conduit systems. Other energy consequences counter-balance each other, as described in other supplemental ESEE.

Consequences of Limiting Conflicting Public and Transportation Facilities

Environmental Consequences

The OFWAM analysis describes the environmental qualities of each wetland and many riparian areas in this category, which would be partially retained by allowing public and transportation facilities where no reasonable alternative exists, and with appropriate impact reduction standards. Where streets can jog in one direction or another to skirt the edge, rather than the center, of a wetland complex this should be considered. With impact reduction, this would allow most wetland functions and values to be retained.

The site-specific ESEE analyses note several instances where new streets are proposed through significant wetland and riparian areas, both in residential and industrial areas. In such situations, resource values would be substantially reduced by street construction, even with impact reduction.

Economic Consequences

Several of Springfield's planned streets and utilities are shown as running directly through locally significant wetlands. The limited protection option allows public facilities, including

streets, to be constructed consistent with existing plans – where no reasonable alternative exists. However, it is likely that local transportation planners did not take resource lands and mitigation costs into consideration at the time these plans were developed.

Since wetland and riparian mitigation typically costs typically run in the $60- $100,000 per acre range, it would may be worthwhile to re-visit some street locations in light of the ESEE benefits that resource areas provide, as well as the cost of mitigation. For the agency constructing the public facility, it could be more economical to construct through resource areas, because these undeveloped areas often provide the most direct and least costly (per pipe or street mile) alternative. In many cases, the only other alternative would be to construct the street through existing industrial, commercial or residential development – which might not be considered a as "reasonable." Thus, from a city investment standpoint, the most economical option may be going through the wetland or riparian site, while meeting the substantial public costs necessary to meet DSL mitigation requirements, and to replicate the needed functions of the resource.

From the property owner's point of view, increased transportation access is normally a benefit. However, as noted in several site-specific ESEE analyses, once the public street is constructed and resource impact reduction occurs (especially if the mitigation is "on site"), there may be little room left for residential, commercial or industrial development. In such situations, the property's value is twice reduced: first from lost of buildable area to street right-of-way, and second, the loss of buildable area to on-site mitigation, which in most cases, is preferred. In such situations, the property owner could opt to sell the entire parcel to the agency constructing the road, rather than attempt to develop what's left of a parcel with a new road and resource mitigation site. Thus, from the perspective of achieving the highest and best use of a particular industrial, commercial or residential property, it may make sense to consider not extending the street through some wetland and riparian sites, and allow the property owner to develop portions of the site without resource conflicts.

On the other hand, potential costs for storm water management, flood control and federally mandated water quality improvement program could decrease if wetlands and riparian resources are not impacted or only partially impacted. Wetlands and riparian sites should be viewed as part of the storm water management system; often, when wetlands are destroyed, their functions must be re-created as sumps, or artificial detention and water quality ponds, at considerable public expense. Springfield is facing major costs in meeting federal NPDES permitting requirements, costs that could increase if wetland and riparian water quality functions are lost. Flood insurance rates may also increase in the future, based on flood studies that may have to be revised because they under-estimated urban run-off rates.

Social Consequences

Springfield's planned street and utility system has been designed to provide direct, functional routes to minimize facility construction and maintenance costs, and to avoid acquisition of developed industrial, commercial and residential property. Minimizing public costs, reducing vehicle miles traveled, and reducing the loss of established homes and businesses all have positive social value.

On the other hand, wetlands and riparian corridors in residential areas provide visual relief from uninterrupted development, and they make much better neighbors than major streets in residential areas. Thus, there can be positive social benefits associated with maintaining the resource site and not building the street through residential areas. This argument is less compelling for industrial and commercial areas, where efficient access probably has more social utility than maintaining resource areas.

In some cases, the extremes discussed above could be avoided through appropriate location and design of planned public facilities. By jogging streets to avoid wetlands and riparian areas, the monotony of long, straight streets through undifferentiated neighborhoods could be avoided. Conserved resource sites provide visual relief for commuters, businesses and residents alike. A sanitary sewer project through a drainage corridor can have positive social and educational benefits (in addition to providing a basic service), by constructing pedestrian pathways as part of the project. Even water reservoirs can be attractively designed to blend in with the natural environment, rather than contrasting with it.

Energy Consequences

The energy consequences of allowing public and transportation facilities to be routed through resource sites – where there are not reasonable alternatives and with environmental impact reduction – are generally positive. Simply put, out-of-direction travel increases energy usage. The decrease in travel distance needs to be weighed against energy conservation benefits associated with wetlands and riparian vegetation (i.e., temperature modification, shade, reduced heat reflection from impervious services).

Parks and Recreational Uses

The Metro Plan includes a "Parks and Open Space" designation that applies to public parks and open space. Parks are discretionary uses in Springfield's residential zones. Parks are permitted outright in most commercial zones. It is a common misconception that wetland and riparian resources sites are protected from development by virtue of their being located within a park. Although resource values and park uses can co-exist in an urban setting, recreational use of wetland and riparian resource sites do have adverse impacts.

Conflicting Land Uses

A. Recreational buildings and accessory structures such as restroom facilities and parking lots;

B. Developed parks, including such facilities as tennis courts, ball diamonds and picnic grounds; and

C. Passive parks, including facilities such as pedestrian and bicycle trails, access roads, viewing stations and parking lots.

Conflicting Land Use Activities

A. Construction impacts, including short term impacts (noise, runoff, erosion, disruption of vegetation, etc.) resulting from construction of conflicting uses;

B. Water quality impacts, including surface water runoff, runoff from streets and parking lots, and fertilized and sprayed lawns and gardens; and

C. Outdoor lighting, which could adversely affect wildlife.

8.6 ESEE Consequences of Allowing Conflicting Vegetation Removal and Grading

Native Vegetation Removal and Grading Supplemental ESEE Analysis

Removal of native vegetation, whether as a result of clearing, excavation, commercial harvesting, or farming, can adversely affect wetland functions and values. All wetland and riparian resource sites are potentially affected by vegetation removal and excavation. This focus of this analysis is on removal of *native plant species*. Removal of non-native (introduced) species, such as Himalayan blackberries, is not considered a conflicting use; indeed it is usually beneficial to wetland resources, if done properly.

DSL regulations limit wetland fill and removal, but not vegetation removal. Outside of riparian areas associated with fish-bearing streams, existing regulations limit vegetation removal primarily through the land use review process (land divisions, site plan review, planned developments). Article 38—Tree Felling Standards limits the removal of trees and vegetation with a diameter of 5 inches or more. The intent of the Article is to help retain natural vegetation, natural water features, natural water features, scenic quality, wildlife habitat and archaeological sites to the maximum extent possible on urbanizable land. Timber harvesting is secondary to preservation of other natural resources and cultural values within the Urban Growth Boundary. Significant tree removal is only permitted when specific development plans have been approved by the City, consistent with plan policies and City Development regulations.

Land Use Activities Conflicts

A. Tree-cutting and clearing of native vegetation, which destroys habitat, destroys scenic value and increases erosion;

B. Grading, fill and removal whether related to permitted construction or not.

C. Spraying for disease and weed control, which may destroy or impair native vegetation and habitat, and may sicken or kill wildlife; and

D. Road construction, construction of staging areas and impacts from native vegetation removal.

In urban areas, every site has conflicting uses. Even passive park areas, which are intended to "preserve" the resource, usually involve some level of development to allow for public access.

Therefore, to some extent, all resource sites are impacted by conflicting uses, although the level of conflict allowed is highly restricted.

Consequences of Prohibiting Native Vegetation Removal and Grading

This supplemental ESEE analysis looks at the consequences of fully protecting wetland and riparian areas and their associated impact areas from *all* grading and vegetation removal. Generally, the environmental consequences would be positive, but economic consequences (especially for individual property owners) would be negative, due to loss of buildable land.

Environmental Consequences

Urban wetlands and riparian areas should be considered as part of a much larger ecological system of wetlands, stream corridors and vegetated uplands. The intrinsic value of any particular resource site is affected by the quality and quantity of native vegetation cover. Most of the functions and values of wetland and riparian resources are adversely affected by loss of native vegetation.

Ecological integrity, wildlife habitat, visual/aesthetic quality, sediment trapping, and nutrient attenuation are all dependent upon maintenance of native vegetation. In fact, a critical focus of many resource restoration projects is the removal of non-native wetland and riparian plants and replacement with native species. One of the greatest threats to native species is habitat loss. Invasive non-native species are a major component of habitat loss, which in turn leads to loss of biodiversity, often causing local extinctions of native plants and animals.

Maintenance of wetland and riparian vegetation contributes directly to improved water quantity, quality, and fish and wildlife habitat. The retention of native vegetation is a critical element in these resource functions and values. Wetlands and riparian areas decrease flooding potential by providing flood water storage, dissipating the force of moving water, and by allowing storm water to seep gradually into the ground rather than moving rapidly over the surface. Without native vegetative cover, the potential for flood damage and erosion increases. Vegetated soils allow water to filter downward to the groundwater reservoir, adding volume to surface waters during low flow periods. Wetlands allow sediment to settle out and be trapped by vegetation before it reaches streams. Native vegetation also absorbs chemicals and heavy metals, reducing water pollution. Thus degradation of wetlands and riparian caused by vegetation removal, contributes to the direct loss of resource functions and values.

When native vegetation is removed, the value of the wetland for habitat decreases dramatically. Spraying, cutting, or scraping of vegetation is often considered to be "routine maintenance", but has the effect of changing the vegetative regime and habitat qualities of wetlands and riparian areas. The removal of native vegetation usually results in replacement with introduced and hardier species.

The environmental values that would be retained by conservation of wetlands are described above, and are extremely positive. The Oregon Freshwater Wetland Assessment Methodology (OFWAM) analysis describes the environmental qualities of each wetland and many riparian in

this category, which would be largely retained by prohibiting vegetation removal on and near wetlands. Even with "full protection" of wetland and riparian vegetation, activities associated with development (pets, children, ATVs, run-off, etc.), which cannot be fully controlled by land use regulations, could result in loss or degradation of resource vegetation over time.

The OFWAM analysis describes and analyzes nine criteria for wetland evaluation and characterization. That report includes four specific biological measures that are compromised by development: wildlife habitat, fish habitat, water quality, and hydrological control. These four criteria are evaluated in the following manner: **wildlife habitat** evaluates the habitat diversity for species generally associated with wetlands and wetland edges; **fish habitat** evaluates how the wetland contributes to fish habitat in streams, ponds or lakes associated with the wetland; **water quality** evaluates the potential of a wetland to reduce the impacts that excess nutrients in storm water runoff have on downstream waters; **hydrological control** evaluates the effectiveness of a wetland in storing floodwaters and reducing downstream flood peaks.

The Wildlife Habitat Assessment (WHA) was used to evaluate riparian sites in terms of relative quantity, quality, diversity and seasonality of the components that appear at the site. Also considered were the degree and permanence of physical and human disturbance, proximity to other water-related and upland areas, and unique features including wildlife, flora and rarity of habitat.

The environmental consequences of fully protecting wetland and riparian areas and their impact area from all grading and native vegetation removal would be positive.

Economic Consequences

Prohibiting all grading and native vegetation removal within wetlands and riparian areas and their impact areas would have some direct negative economic consequences to the property owner (loss of buildable land) and indirect economic consequences to the community (lower land use efficiency and higher per unit costs for providing public facilities and services). Prohibiting all grading and vegetation removal within the impact area could also increase site preparation construction costs.

There are a number of positive economic consequences associated with completely prohibiting vegetation removal or excavation within a resource site and its impact area. To the extent that wetlands and riparian sites contribute to the economic value of a property (scenic, open space, etc.), this value could be diminished if native vegetation was removed or the site converted from a natural state. Conserving native vegetation can have positive economic value, by minimizing erosion and maximizing water quality, which can increase the economic value of urban property. Especially in residential areas, prohibiting vegetation removal within resource sites and their impact areas would have positive economic impacts for neighboring residential property owners, whose properties would benefit from nearby open space.

It is useful to look at the economic consequences of conserving resource sites from different points of view. Often, impacts are less significant at the study area level than from the point of view of the individual property owner. The ESEE analyses for each individual significant

wetland and riparian resource site addresses the special characteristics of each site in relation to property owner interests.

On the other hand, developers and homeowners increasingly recognize the economic value of natural areas. It is not uncommon for developers, homeowners or governments to place "conservation easements" over wetlands and riparian corridors to ensure their maintenance in a natural state. As public attitudes towards wetlands and riparian resources change, native vegetation removal will have more pronounced and adverse economic impacts on neighboring property owners.

Social Consequences

The social consequences of protecting all native vegetation on resource sites and their respective impact areas are mixed. On the positive side, wetland and riparian vegetation could add amenity value to residentially developed land. Social consequences *(natural* open space, views, undisturbed wildlife habitat areas close to population centers) would be positive as a result of conserving the resource vegetation. Resource sites *with native vegetation* provide educational opportunities for those living near them, which would be maintained.

On the negative side, conservation of native vegetation precludes a "park-like" appearance, which has its own social appeal. Wetlands, which are mowed and maintained primarily for human use, could have increased open space value to some people. In addition, a prohibition on removal of native vegetation can conflict with the need to mow or otherwise remove vegetation as a fire protection measure.

The OFWAM report describes and analyzes the social qualities of each wetland in this category, which would be preserved by retaining native vegetation. That report includes specific measures for educational potential, visual/aesthetic quality, and water based recreational opportunities. The social consequences of conserving resource vegetation would be virtually the same as the consequences of conserving the wetland itself. In many cases, it is the quality and quantity of the wetland and riparian vegetation that makes the resource site *significant.*

Energy Consequences

The energy consequences of native vegetation conservation are not major. From a solar perspective, it is possible that vegetation from forested wetlands and riparian areas could shade south-facing windows of houses, thus reducing solar access, although this is less likely with taller buildings.

On the negative side, conservation of resource vegetation would have a moderating effect on climate. Trees provide shade, which cool buildings in the summer and serve as a windbreak in the winter. At a macro level, plants absorb sunlight and transpire during the growing season, slightly reducing ambient air temperatures. Wetlands and riparian areas with *native vegetation* provide the opportunity to experience "nature" directly and locally, without having to utilize energy to reach the countryside.

Consequences of Fully Allowing Native Vegetation Removal and Grading

Environmental Consequences

Urban wetlands and riparian areas should be considered as part of a much larger ecological system of wetlands, stream corridors and vegetated uplands. The intrinsic value of any particular resource site is affected by the quality and quantity of native vegetation cover. Most of the functions and values of wetland and riparian resources would be adversely affected by loss of native vegetation.

Ecological integrity, wetland wildlife habitat, visual/aesthetic quality, sediment trapping, and nutrient attenuation are all dependent upon maintenance of native vegetation. In fact, a critical focus of many wetland impact reduction projects is the removal of non-native plants and replacement with native species. One of the greatest threats to native species is habitat loss. Invasive non-native species are a major component of habitat loss, which in turn leads to loss of biodiversity, often causing local extinctions of native plants and animals.

Retention of wetland and riparian vegetation contributes directly to improved water quantity, quality, and fish and wildlife habitat. The retention of native vegetation is a critical element in these resource functions and values. Wetlands and riparian areas decrease flooding potential by providing flood water storage, dissipating the force of moving water, and by allowing storm water to seep gradually into the ground rather than moving rapidly over the surface. Without native vegetative cover, the potential for flood damage and erosion increases. Vegetated soils allow water to filter downward to the groundwater reservoir, adding volume to surface waters during low flow periods. Wetlands and riparian areas allow sediment to settle out and be trapped by vegetation before it reaches streams. Native vegetation also absorbs chemicals and heavy metals, reducing water pollution. Thus degradation of wetlands and riparian resource sites caused by vegetation removal, contributes to the direct loss of resource functions and values.

When native vegetation is removed, the value of wetland and riparian sites for habitat decreases dramatically. Spraying, cutting, or scraping of vegetation is often considered to be "routine maintenance", but has the effect of changing the vegetative regime and habitat qualities of a resource area. The removal of native vegetation usually results in replacement with introduced and hardier species.

Springfield's OFWAM report describes and analyzes nine criteria for wetland evaluation and characterization. That report includes four specific biological measures that are compromised by development: wildlife habitat, fish habitat, water quality, and hydrological control. These four criteria are evaluated in the following manner: **wildlife habitat** evaluates the habitat diversity for species generally associated with wetlands and wetland edges; **fish habitat** evaluates how the wetland contributes to fish habitat in streams, ponds or lakes associated with the wetland; **water quality** evaluates the potential of a wetland to reduce the impacts that excess nutrients in storm water runoff have on downstream waters; **hydrological control** evaluates the effectiveness of a wetland in storing floodwaters and reducing downstream flood peaks.

The Wildlife Habitat Assessment (WHA) was used to evaluate riparian sites in terms of relative quantity, quality, diversity and seasonality of the components that appear at the site. Also considered were the degree and permanence of physical and human disturbance, proximity to other water-related and upland areas, and unique features including wildlife, flora and rarity of habitat.

The environmental consequences of allowing native vegetation removal on wetlands and riparian sites - whether through excavation, maintenance, chemical or mechanical removal - are that the qualities that make each resource significant would be lost.

Economic Consequences

Allowing unrestricted grading and vegetation removal could marginally reduce site preparation construction costs, but otherwise has few positive economic consequences. Unrestricted grading activities would likely have adverse off-site economic consequences, due to increased erosion and possible alteration of natural drainage systems. Removal of native vegetation may result in use of property for lawns or gardens. Where a more manicured appearance is perceived as a desirable property trait, there could be a slight increase property values, although maintenance costs also increase.

On the other hand, developers and homeowners increasingly recognize the economic value of natural areas. It is not uncommon for developers, homeowners or governments to place "conservation easements" over wetlands and riparian corridors to ensure their maintenance in a natural state. As public attitudes towards resource areas change, native vegetation removal will have more pronounced and adverse economic impacts on neighboring property owners.

Social Consequences

The consequences of allowing unrestricted vegetation removal and/or excavation on social values associated with significant wetland and riparian resource sites are largely adverse. Educational and amenity values of affected resource areas would be lost. On the positive side, native vegetation removal allows for creation of a more "park-like" appearance, which has its own social appeal. Wetlands that are mowed and maintained primarily for human use could have increased open space value to some people, and increased fire resistance.

On the other hand, retention of native vegetation in urban wetland and riparian resource areas is what makes such sites *valuable* for those who live and work nearby. Over the last decade, the public attitude toward resource conservation has changed dramatically. Neighborhood property owners and associations, joining with environmental groups, have opposed developments that result in a loss of wetland and riparian values. Citizens have a much greater awareness, and place a much higher value, on conserving both the natural appearance and wildlife habitat values of resource sites.

Energy Consequences

The energy consequences of unrestricted native vegetation removal and grading would result in the loss of the moderating effect that water areas and vegetation have on local climate. Trees provide shade that cools buildings in the summer and serve as a windbreak in the winter. Plants absorb sunlight and transpire during the growing season, slightly reducing ambient air temperatures. Wetlands also provide local "natural" opportunities, thus reducing the need to utilize energy to reach outdoor experiences.

Consequences of Limiting Native Vegetation Removal and Grading

This supplemental ESEE analysis considers the consequences of limiting vegetation removal and grading as prescribed in proposed wetland regulations. Vegetation removal and grading would be limited for wetlands and riparian areas and their recommended setback areas (not to be confused with the impact area), and public facilities would be permitted with impact reduction (where no reasonable alternative exists).

Environmental Consequences

Most of the environmental values discussed in the full protection option would be retained under this option – provided that full compensation for reduced resource values occurred. For lower quality wetlands and riparian sites, the marginal environmental value associated with restricting development within near the resource is relatively small. For high value wetlands, the environmental consequences of encroaching on the resource would be greater. The OFWAM analysis and WHA report includes specific measures for ecological integrity, wetland wildlife habitat, sediment trapping, and aesthetics. With impact reduction, most of these qualities can be retained.

Economic Consequences

Limiting vegetation removal and grading to the area outside the wetland setback (except for public facilities) would have direct adverse economic consequences for the property owner, because buildable land area would be restricted. Economic impacts would be less, however, than under the "full resource protection" option. Removal of native vegetation may result in use of property for lawns or gardens. Where a more manicured appearance is perceived as a desirable property trait, there may be a slight increase property values.

On the other hand, the limited protection option addresses several adverse economic consequences associated with unrestricted vegetation removal or excavation. To the extent that wetlands contribute to the economic value of a property (scenic, open space, etc.), this value would be seriously diminished if native vegetation was completely removed or the site converted from a natural state. Conserving native vegetation can have positive economic value, by minimizing erosion and maximizing water quality, which can increase the economic value of urban property.

It is useful to look at the economic consequences of conserving the significant wetland and riparian resource site from different points of view. Often, impacts are less significant at the study area level than from the point of view of the individual property owner. The ESEE analysis for each *individual* significant wetland resource site addresses the special characteristics of that site in relation to property owner interests.

Social Consequences

The social consequences of conserving native vegetation on significant wetland resource sites are mixed. On the positive side, wetland vegetation could add amenity value to residentially developed land. Social consequences *(natural* open space, views, undisturbed wildlife habitat areas close to population centers) would be positive as a result of conserving the wetland vegetation. Wetlands *with native vegetation* provide educational opportunities for those living near them, which would be maintained.

On the negative side, conservation of native vegetation precludes a "park-like" appearance, which has its own social appeal. Wetlands, which are mowed and maintained primarily for human use, could have increased open space value to some people, and increased fire resistance.

The OFWAM analysis describes and analyzes the social qualities of each wetland and many riparian areas in this category, which would be largely conserved by retaining native vegetation. That report includes specific measures for educational potential, visual/aesthetic quality, and water based recreational opportunities. The social consequences of conserving wetland and riparian vegetation are virtually the same as the consequences of conserving the resource itself. In many cases, it is the quality and quantity of the wetland and riparian vegetation that makes the resource site *significant.*

Energy Consequences

The energy consequences of native vegetation conservation are not major. From a solar perspective, it is possible that vegetation from forested wetlands and riparian corridors could shade south-facing windows of houses, thus reducing solar access, although this is less likely with taller buildings. On the positive side, conservation of vegetation would have a moderating effect on climate. Trees provide shade that cools buildings in the summer and serve as a windbreak in the winter. At a macro level, plants absorb sunlight and transpire during the growing season, slightly reducing ambient air temperatures. Wetlands and riparian areas with *native vegetation* provide the opportunity to experience "nature" directly and locally, without having to utilize energy to reach the countryside.

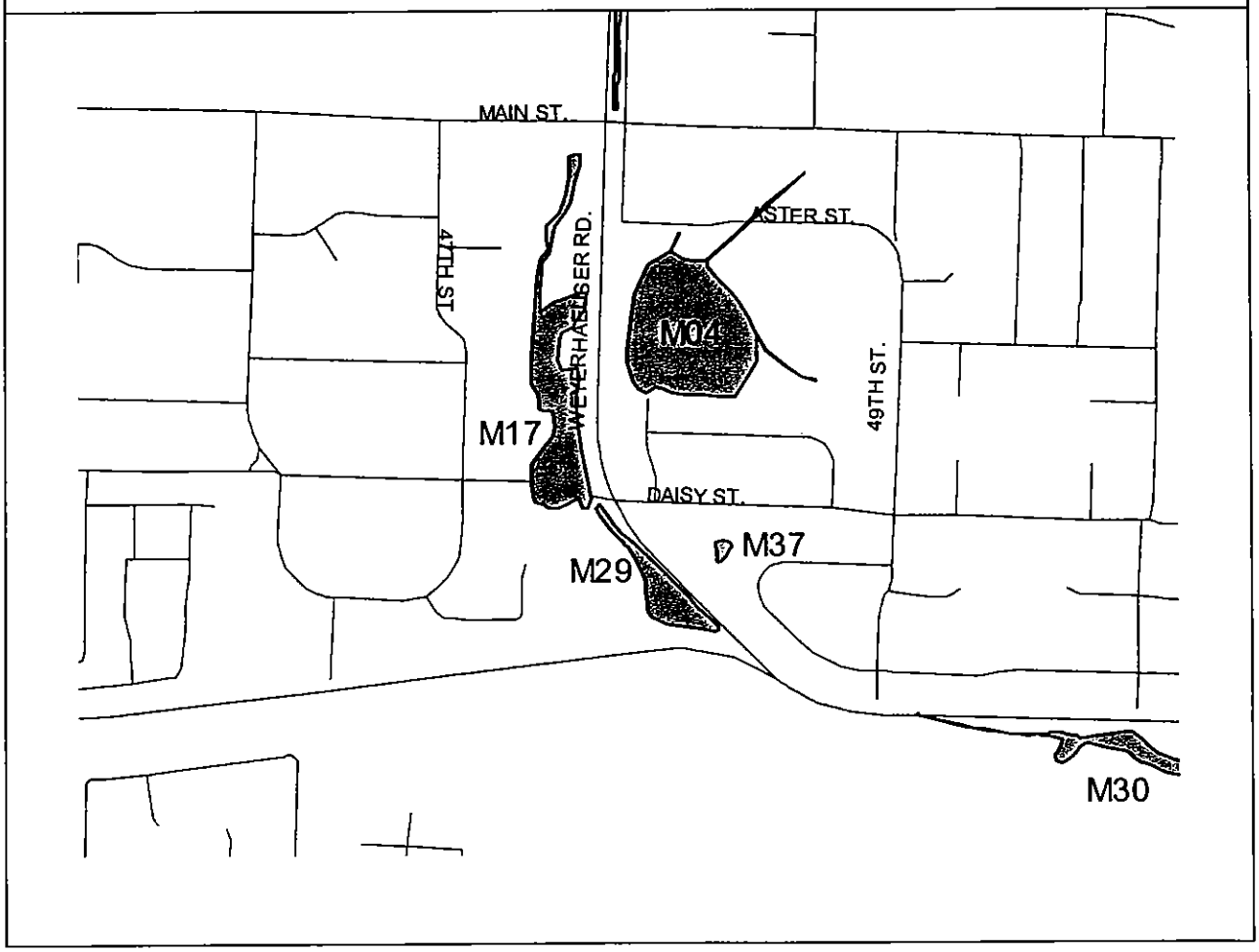
9.0 Site-Specific ESEE Evaluation

The following site-specific Environmental, Social, Energy, and Economic (ESEE) analysis addresses how conflicting uses, if allowed, could adversely impact each significant wetland or riparian resource site as well as how protecting each resource site may impact those uses. The general consequences of protecting significant resource sites are addressed Section 8.1-8.6 of this report.

9.1 Wetland Resource Sites

Site: **M04** Cascade Drive-in	Acres: 5.03	OFWAM: Special Interest for Protection- site is inhabited by a federally listed endangered plant species. **High Quality Wetlands**	Springfield Waterways Channel Assessment: Not Assessed
	Type: PEM		Inventoried Riparian Resource? No.

Goal 5 Recommendation: Limit conflicting uses. Implement the protections provided in the development agreement that was approved by DSL and the Corps of Engineers to limit conflicting uses and protect the habitat for a federally protected plant specie.



Description:

Wetland M4 is 5.03 acres and classified as PEM. The site is an abandoned drive-in theater that was highly disturbed from past agricultural uses and grading for the drive-in operation. The site has since been developed as an assisted living facility and post office. The development was allowed under a plan approved by the Division of State Lands. The site was drained to the south and west by deep drainage ditches.

The wetland is roundish in shape and located in the southwest corner of the site. Sparse Oregon ash and big leaf maple trees were scattered throughout the site. The herbaceous layer is dominated by tufted hair-grass *(Deschampsia cespitosa),* tall fescue, bulrush *(Scirpus* sp.), camas *(Camassia quamash),* creeping buttercup and gumweed *(Grindelia integrifolia).* Four individual plants of rare Bradshaw's lomatium (*Lomatium bradshawii)* were observed on this site. Soils are dark in color with mottling and some surface staining indicating the seasonal presence of surface water in depressions. Hydrology was directly observed in May, 1993. Wetland/upland boundaries were determined where the vegetation changed and there were no indicators of hydrology.

Wetland and Impact Area Summary

Wetland Acreage	5.03
Impact Area Acreage	12.33
Combined Wetland and Impact Area	17.36
Vacant Acres within the Combined Area	2.42
Number of Parcels Affected	22
Combined Parcel Acreage	33.05

Conflicting Uses by Acre and Zoning District

SITE ID	CC	LDR	HI	TOTAL ACRES
M-04*	5.03	0	0	5.03
M-04 Impact Area	9.68	1.55	1.1	12.33
Total	14.71	1.55	1.1	17.36

Conflicting Uses by Vacant Acre and Zoning District

SITE ID	CC	LDR	HI	TOTAL ACRES
M-04*	.02	0	0	0
M-04 Impact Area	2.4	0	0	0
Total	2.42	0	0	0

Existing Protections

Is the site protected by minimum development setbacks and site plan review standards described in 31.240 of the Springfield Development Code? **No**

The wetland area is protected by provisions of a development agreement that set aside much of the wetland for protection, including those areas that provide habitat for known occurrences of Bradshaw's lomatium.

Site Specific ESEE Analysis for M-04

This section discusses ESEE impacts that are specific to this particular site. For a broader discussion of the ESEE consequences of allowing, limiting or prohibiting conflicting uses on wetlands, see the General ESEE Analysis found in Section 8 of this report.

Environmental Consequences

Fully allowing conflicting commercial and residential uses would mean the loss of a known habitat area for a federally protected specie. The wetland's water quality function is degraded. Its hydrologic control function is also degraded. The site has potential for enhancement.

A policy of limiting conflicting uses has been adopted by federal, state and local officials. The resource site is currently protected through a development agreement that allows development around the wetland, but protects it from fill and disruption of its hydrology. Some enhancement measures were approved as part of the development agreement. The Oregon Division of State Lands and US Army Corps of Engineers reviewed and approved development plans for the surrounding area.

Social Consequences

The wetland was rated as not aesthetically pleasing and not appropriate for recreational or educational uses by the OFWAM analysis. Limiting conflicting residential and commercial uses has allowed for the construction of an assisted living facility for the elderly and infirm. A post office has also been located on the site. These facilities provide a public benefit. Limiting conflicting uses under the approved development agreement will protect the site and allow residents observe and enjoy the resource.

Economic Consequences

Fully protecting M04 from conflicting uses would mean the loss of 2.42 acres of vacant commercial land within the combined wetland and impact area boundaries. Limiting conflicting uses would allow some development to occur while protecting the majority of resource functions and values.

Energy Consequences

None of note.

Recommended Program for Protection

Limit conflicting uses. Implement the protections provided in the development agreement for Jenna Estates that was approved by DSL and the Corps of Engineers to limit conflicting uses and protect the habitat for the listed plant specie. Continue coordination with the Oregon Division of State Lands and the Corps of Engineers to assure that as the area surrounding the M-04 develops, that approved in the development agreement are enforced.

Impact of Protection Measures on Vacant Acreage and Buildable Land Inventory

Impact on Vacant Acreage by Zoning District

SITE ID	CC	TOTAL ACRES
M-04	0	0
M-04 25-ft. Setback	0	0
Total	0	0

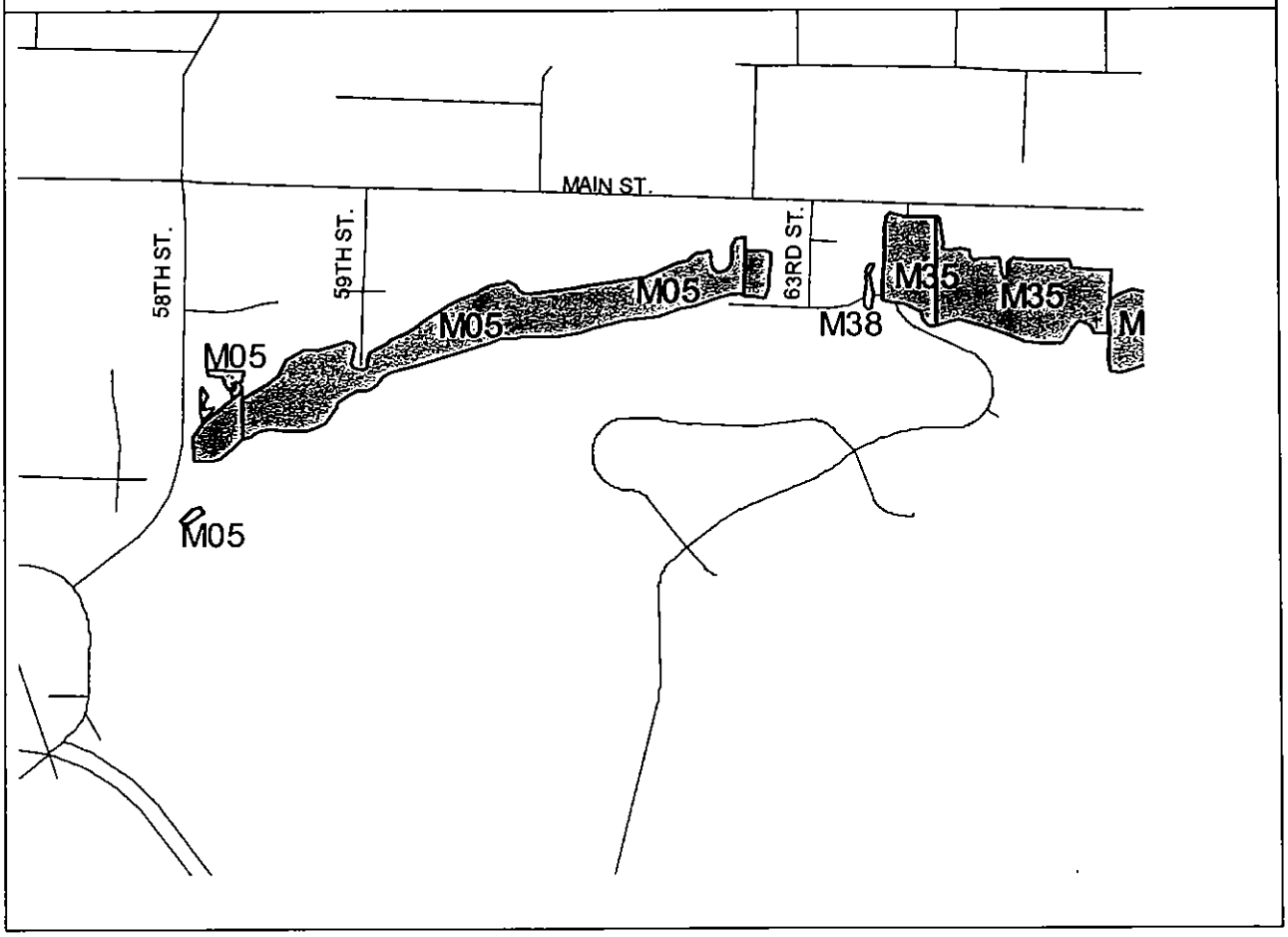
None of M-04 is classified as vacant by the Lane County Assessor's Office. Limiting conflicting uses would allow some development to occur within the wetland area where the developer could show how the essential functions of the resource area could be preserved or enhanced

Reduction in the Buildable Land Inventory:

The resource, M-04 was not counted in the inventory of buildable lands by the Eugene-Springfield Metropolitan Area Residential Land and Housing Study. Therefore the fully protecting the wetland acreage would not reduce the inventory.

Site: **M05** **Aster St. Wetland**	Acres: 9.12	OFWAM: Provides diverse wildlife habitat; Hydrologic control function is intact (flood retention).	Springfield Waterways Channel Assessment: Aster Channel 7.2 (Fair)
	Type: PFO PSS PEM	**High Quality Wetlands**	Inventoried Riparian Resource? No.

Goal 5 Recommendation: Limit conflicting uses that may impact the wetland. Maintain a 25-foot development setback from the wetland. Allow development within the 150-foot impact area using low impact development practices that are appropriate for the soil, water table and other site characteristics.



Description:

Wetland M5 is 9.12 acres and classified as PFO, palustrine scrub-shrub (PSS) and PEM. The wetland is located at the foot of Potato Hill (south of Main Street and north of Potato Hill). Hydrology was directly observed in May, 1993. Soils were dark in color with mottles. Overstory dominant species include Oregon ash and black cottonwood. Understory dominants include

Himalayan blackberry *(Rubus discolor), rose (Rosa* sp.) and Dougla' spirea *(Spiraea douglasii).* Dominant ground cover species included tuftedhair-grass, big-leafed lupine *(Lupinus polyphyllus),* red fescue, meadow foxtail, soft rush, creeping buttercup and sedge *(Carex* sp.). Wetland/upland boundaries were determined where the vegetation changed and there were no indicators of hydrology.

Additional information from the *Inventory and Channel Assessment Report for Springfield Waterways*

Aster Channel

Water/Bank Profile details

- Channel profile is mostly ponded with one U-shaped reach. Bank slopes are between 6% and 52% with an average of 19.5%.
- Bed material consists primarily of silt/sand/clay.
- Culverts and fences were recorded as in-channel structures.

Riparian Profile details

- Plant community of hardwoods and one reach that is grass/field.
- Dominant invasive plant species: *Rubus armeniacus* (Armenian Blackberry).
- No co-dominant invasive plant species was recorded.
- Invasive plant species listed as present: *Holcus lanatus* (Velvet Grass), *Rubus laciniatus* (Evergreen Blackberry), and *Convolvulus sp.* (Morning Glory/Bindweed).
- Others invasive plant species observed in the system: *Phalaris arundinacea* (Reed Canary-grass), *Hedera helix* (English Ivy), *Phalaris aquatica* (Harding grass), *Parentucellia viscosa* (Parentucellia), *Buddleia davidii* (Butterfly bush), and *Mentha pulegium* (Penny royall).
- No invasive animals/amphibian was recorded.
- No damage by invasive animals/amphibian was recorded.
- No wildlife was observed.
- No wildlife evidence was recorded.
- *Camassia quamash* (Common Camas), *Epilobium densiflorum* (Dense Spike-Primrose), *Eryngium petiolatum* (Rush-leaf Coyote thistle), and *Juncus patens* (Spreading Rush) were recorded for seed collection.
- Neighborhood education and riparian buffer enhancement were recorded for project opportunities.
- A chicken house, and a property owner driving a tractor through the channel was noted in the comments section.

Scoring and Overall Health rating details

Averages for the system are listed below. Criteria averages were derived by adding each criteria score together and dividing it by the number of reaches. Overall health rating averages were derived by adding each health rating for each reach together then dividing it by the number of reaches.

Scored Criteria	Criteria Averages on a Scale of 1 to 10
Channel Condition	3.2
Water Appearance	0 dry
Nutrient Enrichment	0 dry
Bank Stability	9.2
Canopy Density/Cover	5.6
Invasive Damage – P	6.2
Invasive Damage – A/A	10.0
Waste Presence	8.8
Barriers to Fish (SBW)	0 N/A
Insect/Invert Habitat (SBW)	0 N/A
In-stream Fish Cover (SBW)	0 N/A
Average Overall Health Rating	7.2 = Fair

Wetland and Impact Area Summary

Wetland Acreage	9.12
Impact Area Acreage	19.43
Combined Wetland and Impact Area	28.55
Vacant Acres within the Combined Area	8.61
Number of Parcels Affected	16
Combined Parcel Acreage	27.31

Conflicting Uses by Acre and Zoning District

SITE ID	CC	LDR	MDR	NC	TOTAL ACRES
M-05	0	4.55	4.15	.42	9.12
M-05 Impact Area	.05	8.36	10.55	.47	19.43
Total	.05	12.91	14.7	.89	28.55

Conflicting Uses by Vacant Acre and Zoning District

SITE ID	CC	LDR	MDR	NC	TOTAL ACRES
M-05	0	2.04	1.09	0	3.13
M-05 Impact Area	0	3.28	2.2	0	5.48
Total	0	5.32	3.29	0	8.61

Existing Protections

Is the site protected by minimum development setbacks and site plan review standards described in 31.240 of the Springfield Development Code? **No**

Site Specific ESEE Analysis for M-05

This section discusses ESEE impacts that are specific to this particular site. For a broader discussion of the ESEE consequences of allowing, limiting or prohibiting conflicting uses on wetlands, see the General ESEE Analysis found in Section 8 of this report.

Environmental Consequences

M-05 is a high quality ash-forested wetland that provides diverse wildlife habitat. While the water quality function of the wetland has been impacted, the hydrologic control function is intact. Fully allowing conflicting residential development would mean the loss of the habitat and hydrologic control functions. The natural hydrologic control could be mimicked with engineered facilities (at a cost), but the habitat values would be significantly be degraded. Limiting conflicting uses would allow for some residential infill development to occur while maintaining a significant level of wetland function.

Social Consequences

The site is aesthetically pleasing, but was not judged to be appropriate for recreational or educational use by the OFWAM analysis. If conflicting uses are fully allowed, the aesthetic value of the site could be lost.

Economic Consequences

Fully protecting the site would mean the loss of 8.61 acres of vacant residential land within the combined wetland and impact area boundaries. The lost hydrologic control function of the wetland would result in more expensive engineered facilities to retain run-off from the residential development on Potato Hill. Limiting conflicting uses could allow for most of the vacant land to be developed. If that development was tempered by low impact development practices, much of the wetland function could be preserved.

Energy Consequences

None of note.

Recommended Program for Protection

Limit conflicting uses that may impact the wetland. Maintain a 25-foot development setback from the wetland. Allow development within the impact area using low impact development practices that are appropriate for the soil, water table and other site characteristics.

Impact of Protection Measures on Vacant Acreage and Buildable Land Inventory

Impact on Vacant Acreage by Zoning District

SITE ID	LDR	MDR	TOTAL ACRES
M-05	2.04	1.09	3.13
M-05 25-ft. Setback	.53	.37	.9
Total	2.57	1.46	4.03

About 3.13 acres of M-05 is classified as vacant by the Lane County Assessor's Office. The vacant acreage includes portions of 11 lots. Limiting conflicting uses would allow some development to occur within the wetland area where the developer could show how the essential functions of the wetland could be preserved or enhanced. A 25-foot development setback is recommended.

A 25-foot setback would affect .9 acres of vacant residential land. The affect of the setback on buildable land could be reduced by aligning development such that yards and other open space that is within the setback. Stormwater management facilities required for development can be placed within the setback under Article 31.240.

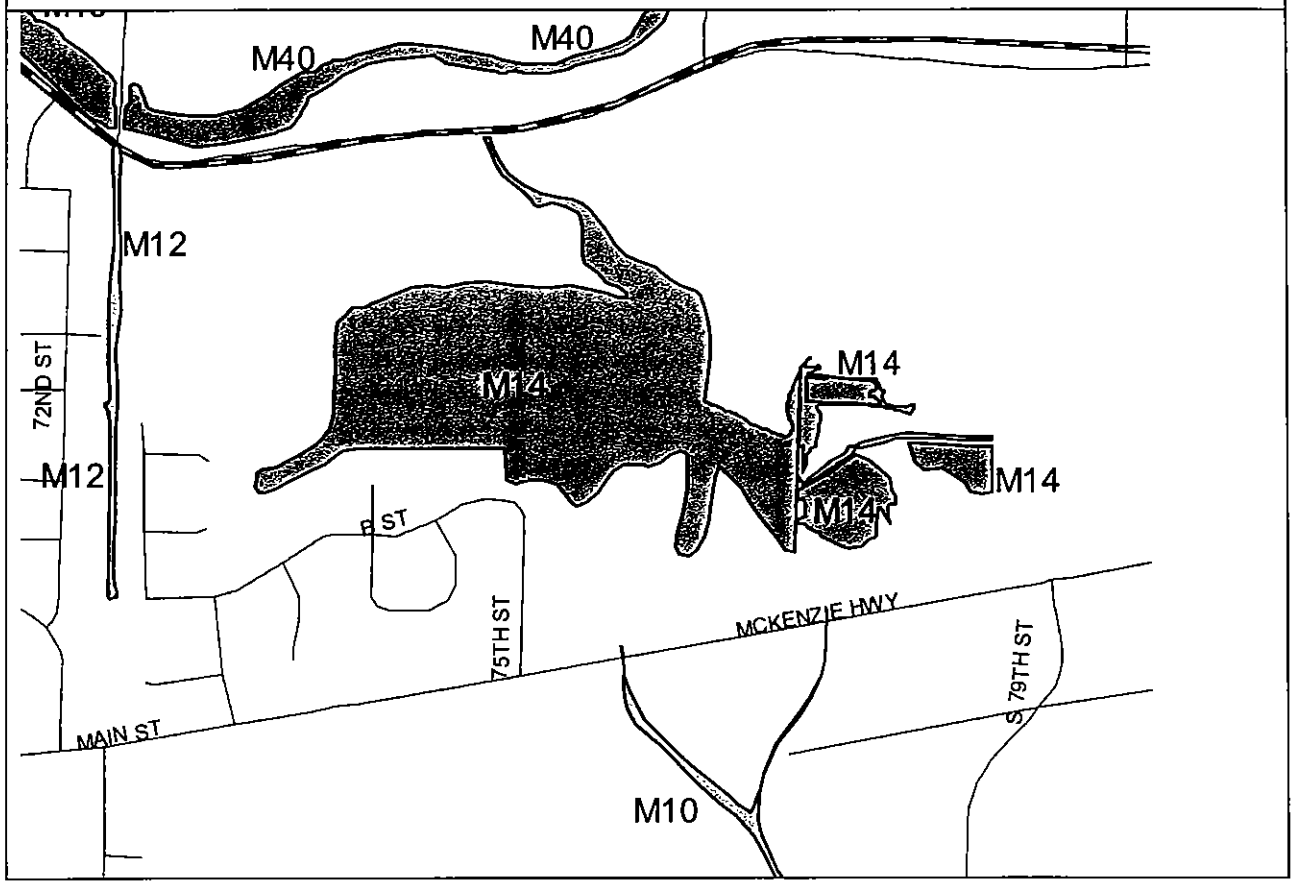
Employing low impact development practices within 150 feet of the wetland could reduce the impact of nearby development on the resource. Some low impact development practices are already incorporated into the stormwater quality protection standards found in Article 31.

Reduction in the Buildable Land Inventory:

M-05 was not counted in the inventory of buildable lands by the Eugene-Springfield Metropolitan Area Residential Land and Housing Study. Therefore the fully protecting the wetland acreage would not reduce the inventory. As mentioned above, the 25-foot development setback may affect about .9 acres, however this area can be incorporated into the overall development without a significant loss of buildable area.

Site: **M14** **75th Street Wetland**	Acres: 30.73	OFWAM: Provides diverse wildlife habitat; Wetland is aesthetically pleasing.	Springfield Waterways Channel Assessment: 75th Street Creek 6.4 (Fair)
	Type: PEM, PFO	Moderate Quality Wetlands	Inventoried Riparian Resource? Yes- S24 WHA Score: 55 **High Quality Resource**

Goal 5 Recommendation: Limit conflicting uses that may impact the wetland. Maintain an average 25-foot development setback from the wetland. Allow development within the 150-foot impact area using low impact development practices that are appropriate for the soil, water table and other site characteristics. The documented presence of a state and federally listed specie within the general vicinity requires coordination with the Oregon Department of Fish and Wildlife to determine what (if any) additional measures may be needed.



Description:

Wetland M14 is 33.45 acres and classified as PEM/PFO. The wetland is located on the east end of Springfield's UGB, just north of Main Street. The site is been historically used as a pasture for cattle and sheep. Hydrology was directly observed in an excavated drainage that traverses the wetland. Property owners stated that there is a flow control device somewhere upstream that

controls the amount of water flowing through the drainage. Direct hydrology was observed in the canal and the palustrine areas of the wetland in May, 1993. Soils were dark in color with mottles. Overstory dominant species included Oregon ash, black cottonwood and cultivated apple *(Pyrus malus)*. Understory dominant species include Douglas spirea *(Spiraea douglasii)* and baldhip rose *(Rosa gymnocarpa)*. Ground cover dominant species included meadow foxtail, red fescue, creeping buttercup, soft rush, velvet-grass and birds-foot trefoil *(Lotus corniculatus)*, Wetland/upland boundaries were determined where the vegetation changed and there were no indicators of hydrology.

Additional information from the *Inventory and Channel Report for Springfield Waterways*

75th Street Creek
Riparian Profile Details

- Plant community is hardwoods and grass/field with one reach being dominated by invasive species.
- Dominant invasive plant species: *Rubus armeniacus* (Armenian Blackberry) and *Holcus lanatus* (Velvet Grass).
- Co-dominant invasive plant species: *Rubus armeniacus* (Armenian Blackberry), *Holcus lanatus* (Velvet Grass), and *Solanum dulcamara* (Nightshade).
- Invasive plant species listed as present: *Holcus lanatus* (Velvet Grass), *Hedera helix* (English Ivy), *Dipsacus fullonum* (Teasel), and *Rubus armeniacus* (Armenian Blackberry).
- Others invasive plant species observed in the system: *Convolvulus sp.* (Morning Glory/Bindweed), *Rubus laciniatus* (Evergreen Blackberry), *Phalaris arundinacea* (Reed Canary-grass), *and Buddleia davidii* (Butterfly bush).
- No invasive animals/amphibian was recorded.
- No damage by invasive animals/amphibian was recorded.
- No wildlife was observed.
- Deer and Coyote scat was recorded as wildlife evidence.
- *Camassia quamash* (Common Camas) was identified for seed collection.
- Riparian buffer enhancement and bank stabilization were recorded for project opportunities.

Channel Assessment Scoring and Overall Health Rating Details

Averages for the system are listed below. Criteria averages were derived by adding each criteria score together and dividing it by the number of reaches. Overall health rating averages were derived by adding each health rating for each reach together then dividing it by the number of reaches.

Scored Criteria	Criteria Averages on a Scale of 1 to 10
Channel Condition	6.0
Water Appearance	0 dry
Nutrient Enrichment	0 dry
Bank Stability	4.0

Scored Criteria	Criteria Averages on a Scale of 1 to 10
Canopy Density/Cover	6.0
Invasive Damage – P	5.4
Invasive Damage – A/A	10.0
Waste Presence	7.9
Barriers to Fish (SBW)	8.9
Insect/Invert Habitat (SBW)	6.7
In-stream Fish Cover (SBW)	2.6
Average Overall Health Rating	6.4 = Fair

Wetland and Impact Area Summary

Wetland Acreage	30.73
Impact Area Acreage	34.82
Combined Wetland and Impact Area	65.55
Vacant Acres within the Combined Area	33.53
Number of Parcels Affected	36
Combined Parcel Acreage	148.2

Conflicting Uses by Acre and Zoning District

SITE ID	LDR	PLO	TOTAL ACRES
M-14	24.56	6.17	30.73
M-14 Impact Area	18.67	16.15	34.82
Total	43.23	22.32	65.55

Conflicting Uses by Vacant Acre and Zoning District

SITE ID	LDR	PLO	TOTAL ACRES
M-14	20.97	.93	21.9
M-14 Impact Area	8.63	3.00	11.63
Total	29.6	3.93	33.53

Existing Protections

Is the site protected by minimum development setbacks and site plan review standards described in 31.240 of the Springfield Development Code? **Yes.**

75th Street Creek is a drainage channel that runs north-south through the middle of the wetland, draining to Cedar Creek. The channel is identified as a tributary to a water-quality limited watercourse (Cedar Creek) and is protected by a 50-foot development setback and a site plan review requirement.

Site Specific ESEE Analysis for M-14

This section discusses ESEE impacts that are specific to this particular site. For a broader discussion of the ESEE consequences of allowing, limiting or prohibiting conflicting uses on wetlands, see the General ESEE Analysis found in Section 8 of this report.

Environmental Consequences

M-14 is a moderate quality wetland that provides diverse wildlife habitat. The water quality and hydrologic control functions have been impacted. Fully allowing conflicting uses would mean the loss that habitat function. The site is associated with Gray Creek, a "High Quality" inventoried riparian resource site (S-24) and 75th Street Creek, a tributary to a water quality limited watercourse.

Social Consequences

The site has been judged aesthetically pleasing but not appropriate for educational or recreational uses by the OFWAM analysis. The wetland includes large tracts of both private and publicly owned land including Bob Artz Park, and School District 19 property, which seems to contradict the finding that it is not appropriate for educational and recreational uses. Fully allowing conflicting uses would degrade the aesthetic appeal of the site as well as the potential public recreational and educational uses. Limiting conflicting uses could allow public uses while minimizing degradation of M-14's wetland function.

Economic Consequences

The site is traversed in part by Gray Creek (east-west) and the 75th Street Creek which runs north through the middle of the site and connects with Cedar Creek. 75th Street Creek is an important waterway for conveying storm water from the Thurston Hills to the south. Fully allowing conflicting uses would require engineered facilities to replace these stormwater management functions.

Fully protecting M-14 would mean the loss of 29.6 acres of vacant residential land within the combined wetland and impact area boundaries. Full protection could mean the loss of 3.93 acres of public land for school and park use as well.

Limiting conflicting uses could allow for much of the vacant land to be developed. If that development was tempered by low impact development practices, much of the wetland function could be preserved.

Energy Consequences

None of note.

Recommended Program for Protection

Limit conflicting uses that may impact the wetland. Maintain an average 25-foot development setback from the wetland. Allow development within the 150-foot impact area using low impact development practices that are appropriate for the soil, water table and other site characteristics. The documented presence of a state and federally listed specie within the general vicinity requires coordination with the Oregon Department of Fish and Wildlife to determine what (if any) additional measures may be needed.

Recommended Program for Protection

Limit conflicting uses that may impact the wetland. Maintain a 25-foot development setback from the wetland. Allow development within the impact area using low impact development practices that are appropriate for the soil, water table and other site characteristics.

Impact of Protection Measures on Vacant Acreage and Buildable Land Inventory

Impact on Vacant Acreage by Zoning District

SITE ID	LDR	PLO	TOTAL ACRES
M-14	20.97	.93	21.9
M-14 25-ft. Setback	2.17	.59	2.76
Total	23.14	1.52	24.66

About 21.9 acres of M-14 is classified as vacant by the Lane County Assessor's Office. The vacant acreage includes portions of 15 lots. Limiting conflicting uses would allow some development to occur within the wetland area where the developer could show how the essential functions of the wetland could be preserved or enhanced. A 25-foot development setback is recommended.

A 25-foot setback would affect 2.76 acres of vacant residential land. The affect of the setback on buildable land could be reduced by aligning development such that back yards and other open space is within the setback. Stormwater management facilities required for development can be placed within the setback under Article 31.240.

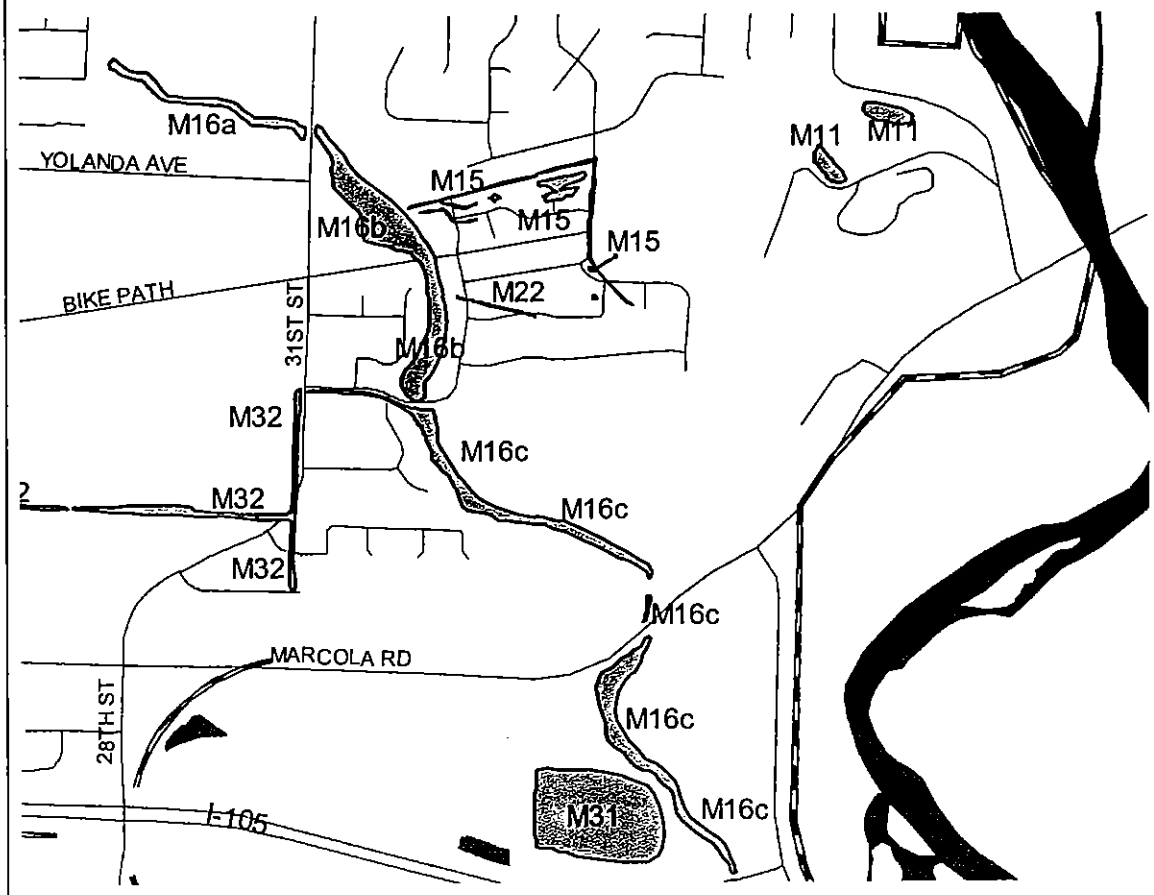
Employing low impact development practices within 150 feet of the wetland could reduce the impact of nearby development on the resource. Some low impact development practices are already incorporated into the stormwater quality protection standards found in Article 31.

Reduction in the Buildable Land Inventory:

M-14 was not counted in the inventory of buildable lands by the Eugene-Springfield Metropolitan Area Residential Land and Housing Study. Therefore the fully protecting the wetland acreage would not reduce the inventory. As mentioned above, the 25-foot development setback may affect about 2.76 acres, however this area can be incorporated into the overall development without a significant loss of buildable area.

Site:	Acres:	OFWAM :	Springfield Waterways Channel Assessment:
M16 a-c **Irving Slough**	12.53 Type: PFO, POW, RLP, RLP PEM	**M16a-** Water quality and hydrologic functions are intact. **High Quality Wetlands** M16b- Hydrologic functions are intact. Moderate Quality M16c- Hydrologic functions are intact. Moderate Quality	Irving Slough 5.9 (Poor) Inventoried Riparian Resource? Yes- S20, S21 WHA Score: S20 (M16a-b): 67 S21 (M16c): 47 **High Quality Resource**

Goal 5 Recommendation: Limit conflicting uses that may impact the resource. Maintain an average 25-foot development setback from the resource. Allow development within the impact area using low impact development practices that are appropriate for the soil, water table and other site characteristics. The documented presence of a state and federally listed specie in the general vicinity requires coordination with the Oregon Department of Fish and Wildlife to determine what (if any) additional measures may be needed.



Description:

Wetland M16 is 13.96 acres and classified as PFO/POW/RLP/PEM. This wetland is called Irving Slough. The overstory in the forested areas was dominated by Oregon ash, black cottonwood and big leaf maple. The understory dominant species included trailing blackberry, Himalayan blackberry and willow. Ground cover dominant species included reed canarygrass *(Phalaris arundinacea),* common plantain *(Plantago major),* soft rush and meadow foxtail. Soils were dark in color and mottled. Hydrology was observed in May, 1993. The majority of the drainage has been excavated to create a well-defined channel and the limits in these areas are the top of the bank. The natural flow of this drainage has been altered: the area drains to the west from tax lot 20 1 and from tax lot 400 it drains to the southeast. Wetland/upland boundaries were determined where the vegetation changed and there were no indicators of hydrology.

Additional information from the *Inventory and Channel Report for Springfield Waterways August 2004*

Irving Slough

Riparian Profile Details

- Plant community of mostly hardwoods, then dominated by invasive species and grass/field.
- Dominant invasive plant species: *Rubus armeniacus* (Armenian Blackberry) and *Solanum dulcamara* (Nightshade).
- Co-dominant invasive plant species: *Phalaris arundinacea* (Reed Canary-grass), *Rubus armeniacus* (Armenian Blackberry), *Solanum dulcamara* (Nightshade), and *Hedera helix* (English Ivy).
- Invasive plant species listed as present: *Holcus lanatus* (Velvet Grass), *Dipsacus fullonum* (Teasel), *Solanum dulcamara* (Nightshade), *Hedera helix* (English Ivy), and *Phalaris arundinacea* (Reed Canary-grass).
- Others invasive plant species observed in the system: *Mentha pulegium* (Penny Royal), *Phalaris aquatica* (Harding grass), *Convolvulus sp.* (Morning Glory/Bindweed), and *Buddleia davidii* (Butterfly Bush).
- Nutria and bullfrogs were recorded as invasive animals/amphibian.
- Tunneling, undercutting of banks and stripping of vegetation were recorded as damage by invasive animals/amphibian.
- Minnows, carp, ducks, geese, Blue Heron and Bluegill were recorded as other wildlife observed.
- Deer scat was recoded for wildlife evidence.
- No plant species were identified for seed collection.
- Riparian buffer enhancement, neighborhood education and bank stabilization were recorded for project opportunities.

Channel Assessment Scoring and Overall Health Rating Details

Averages for the system are listed below. Criteria averages were derived by adding each criteria score together and dividing it by the number of reaches. Overall health rating averages were

derived by adding the health ratings for all reaches together then dividing by the number of reaches.

Scored Criteria	Criteria Averages on a Scale of 1 to 10
Channel Condition	3.4
Water Appearance	7.6
Nutrient Enrichment	7.5
Bank Stability	6.0
Canopy Density/Cover	4.0
Invasive Damage – P	2.9
Invasive Damage – A/A	8.8
Waste Presence	9.2
Barriers to Fish (SBW)	7.4
Insect/Invert Habitat (SBW)	5.6
In-stream Fish Cover (SBW)	3.5
Average Overall Health Rating	5.9 = Poor

Wetland and Impact Area Summary

Wetland Acreage	12.53
Impact Area Acreage	51.49
Combined Wetland and Impact Area	64.02
Vacant Acres within the Combined Area	17.08
Number of Parcels Affected	197
Combined Parcel Acreage	99.11

Conflicting Uses by Acre and Zoning District

SITE ID	LDR	HI	LMI	CI	PLO	TOTAL ACRES
M-16A	1.33	0	0	0	0	1.33
M-16A Impact Area	10.27	0	0	0	0	10.27
M-16B	5.51	0	0	0	0	5.51
M-16B Impact Area	12.26	0	0	0	.02	12.28
M-16C	2.26	2.88	.55	0	0	5.69
M-16C Impact Area	12.94	12.09	3.37	.49	.05	28.94
Total	44.57	14.97	3.92	0.49	0.07	64.02

Conflicting Uses by Vacant Acre and Zoning District

SITE ID	LDR	HI	LMI	CI	PLO	TOTAL ACRES
M-16A	.18	0	0	0	0	.18
M-16A Impact Area	1.23		0	0	0	1.23
M-16B	.21	0	0	0	0	.21
M-16B Impact Area	1.62	0	0	0	0	1.62
M-16C	1.26	2.33	0	0	0	3.59
M-16C Impact Area	6.27	3.98	0	0	0	10.25
Total	10.77	6.31	0	0	0	17.08

Existing Protections

Is the site protected by minimum development setbacks and site plan review standards described in 31.240 of the Springfield Development Code? **No**

Site Specific ESEE Analysis for M-16(a-c)

This section discusses ESEE impacts that are specific to this particular site. For a broader discussion of the ESEE consequences of allowing, limiting or prohibiting conflicting uses on wetlands, see the General ESEE Analysis found in Section 8 of this report.

Environmental Consequences

M-16a is a high quality wetland whose water quality and hydrologic control functions are intact. M-16b and M-16c are rated as moderate quality wetlands. The water quality function for M-16a and M-16b has been impacted, but their hydrologic control function is still intact. Each of the wetland segments provide habitat for some wildlife species. Fully allowing conflicting uses would mean the loss of the habitat, water quality and hydrologic control functions.

Social Consequences

M-16a, b, and c, were judged not to be appropriate for educational or recreational purposes by the OFWAM analysis. The wetlands are not generally considered aesthetically pleasing. M-16a and M-16b provide an amenity for many established residences the wetland. Fully allowing conflicting uses would mean the loss of a community water feature that has high potential for restoration.

Economic Consequences

Fully allowing conflicting uses would mean the loss of 17.08 acres of vacant residential and industrial land within the combined resource and impact area. The hydrologic and water quality functions could be duplicated using engineered facilities, but at a high cost. Limiting conflicting uses could allow continued natural function while retaining the opportunity to develop additional residential neighborhoods within the existing urban growth boundary.

Energy Consequences

None of note.

Recommended Program for Protection

Limit conflicting uses that may impact the resource. Maintain an average 25-foot development setback from the resource. Allow development within the impact area using low impact development practices that are appropriate for the soil, water table and other site characteristics. The documented presence of a state and federally listed specie in the general vicinity requires coordination with the Oregon Department of Fish and Wildlife to determine what (if any) additional measures may be needed.

Impact of Protection Measures on Vacant Acreage and Buildable Land Inventory

Impact on Vacant Acreage by Zoning District

SITE ID	LDR	HI	LMI	CI	PLO	TOTAL ACRES
M-16A	.18	0	0	0	0	.18
M-16A 25-ft Setback	.16	0	0	0	0	.16
M-16B	.21	0	0	0	0	.21
M-16B 25-ft Setback	.11	0	0	0	0	.11
M-16C	2.26	2.88	.55	0	0	5.69
M-16C 25-ft. Setback	1.97	2.01	.60	0	0	4.58
Total	4.89	4.89	1.15	0	0	10.93

About 6.08 acres of M-16A is classified as vacant by the Lane County Assessor's Office. The vacant acreage includes portions of 28 lots. Limiting conflicting uses would allow some development to occur within the wetland area where the developer could show how the essential functions of the wetland could be preserved or enhanced. A 25-foot development setback is recommended.

A 25-foot setback would affect 4.85 acres of vacant residential and industrial land. The affect of the setback on buildable land could be reduced by aligning development such that back yards, landscaping and other open space is within the setback. Stormwater management facilities required for development can be placed within the setback under Article 31.240.

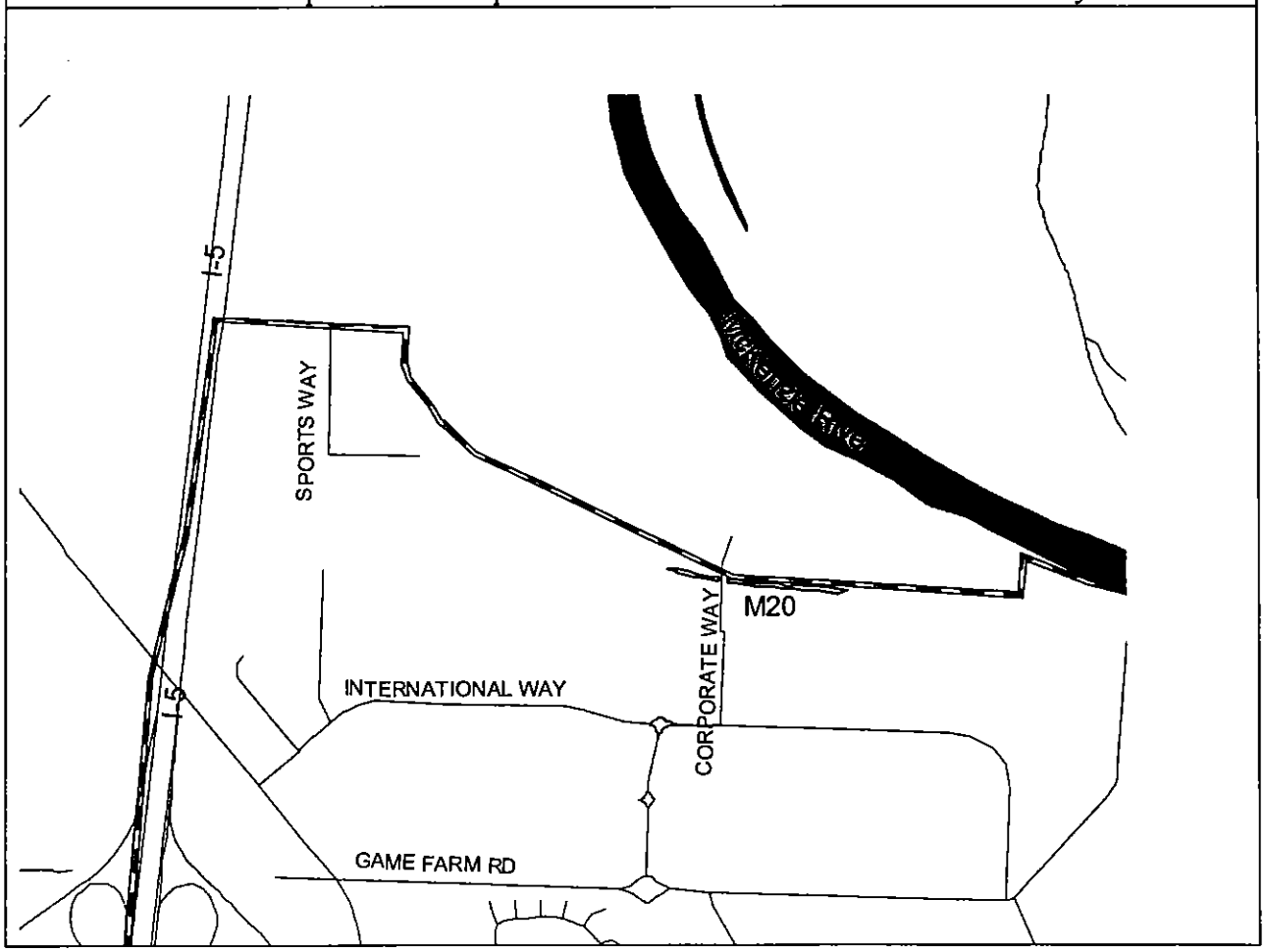
Employing low impact development practices within 150 feet of the wetland could reduce the impact of nearby development on the resource. Some low impact development practices are already incorporated into the stormwater quality protection standards found in Article 31.

Reduction in the Buildable Land Inventory:

M-16 (a-c) was not counted in the inventory of buildable lands by the Eugene-Springfield Metropolitan Area Residential Land and Housing Study. Therefore the fully protecting the wetland acreage would not reduce the inventory. As mentioned above, the 25-foot development setback may affect about 4.85 acres, however this area can be incorporated into the overall development without a significant loss of buildable area.

Site: **M20** **Maple Island Slough**	Acres: 0.35 Type: RLP	OFWAM: Provides diverse wildlife habitat; Hydrologic control function is intact. **High Quality Wetlands**	Springfield Waterways Channel Assessment: Not Assessed Inventoried Riparian Resource? Yes: S17 WHA Score: 67 **High Quality Resource**

Goal 5 Recommendation: Limit conflicting uses and employ low impact development practices when developing within 150 feet of the resource site. M20 is associated with Maple Island Slough. The Slough is tributary to a water quality limited watercourse and is protected by a 50-foot setback and a site plan review requirement. No additional setbacks are necessary.



Description:

Wetland M20 is 0.52 acres (.35 is within Springfield UGB) and classified as RLP. The wetland is located adjacent to Maple Island Slough, a tributary of the McKenzie River, on the northwest end of Springfield's UGB. The surrounding land was planted with mint *(Mentha* sp.) fields and filbert orchards. Direct hydrology was observed in the canal where on-site evaluation was

conducted. Soils were dark in color with mottles. Willow and Himalayan blackberries lined the banks of the creek with reed canarygrass and velvet-grass dominating the bottom of the canal. Wetland limits are contained within the well-defined banks. Water has been impounded by roads. Where off-site determination was necessary on the western portion, wetland boundaries were determined through use of black and white and infrared aerial photo interpretation.

Wetland and Impact Area Summary

Wetland Acreage	.35
Impact Area Acreage	4.52
Combined Wetland and Impact Area	4.87
Vacant Acres within the Combined Area	4.25
Number of Parcels Affected	5
Combined Parcel Acreage	27.1

Conflicting Uses by Acre and Zoning District

SITE ID	CI	TOTAL ACRES
M-20	.35	.35
M-20 Impact Area	4.52	4.52
Total	4.87	4.87

Conflicting Uses by Vacant Acre and Zoning District

SITE ID	CI	TOTAL ACRES
M-20	.35	.35
M-20 Impact Area	4.25	4.25
Total	4.6	4.6

Existing Protections

Is the site protected by minimum development setbacks and site plan review standards described in 31.240 of the Springfield Development Code? **Yes.**

M20 is associated with Maple Island Slough. The Slough is tributary to a water quality limited watercourse and is protected by a 50-foot setback and a site plan review requirement.

Site Specific ESEE Analysis for M-20

This section discusses ESEE impacts that are specific to this particular site. For a broader discussion of the ESEE consequences of allowing, limiting or prohibiting conflicting uses on wetlands, see the General ESEE Analysis found in Section 8 of this report.

Environmental Consequences

M-20 is rated as a high quality wetland. It is part of the Maple Island Slough, a highly rated riparian resource site in Springfield. The wetland provides diverse wildlife habitat and the water quality control function of the site is intact. Fully allowing conflicting uses would mean the loss of these functions.

Social Consequences

The wetland was judged not to be appropriate for recreational or educational use by the OFWAM analysis. The wetland is considered to be aesthetically pleasing.

Economic Consequences

Fully protecting M-20 would mean the loss of 4.6 acres of vacant industrial land within the combined wetland and impact area boundaries.

Energy Consequences

None of note.

Recommended Program for Protection

Limit conflicting uses and employ low impact development practices when developing within 150 feet of the resource site. M20 is associated with Maple Island Slough. The Slough is tributary to a water quality limited watercourse and is protected by a 50-foot setback and a site plan review requirement. No additional setbacks are necessary.

Impact of Protection Measures on Vacant Acreage and Buildable Land Inventory

Impact on Vacant Acreage by Zoning District

SITE ID	CI	TOTAL ACRES
M-20	.35	.35
M-20 50-ft. Setback	1.28	1.28
Total	1.63	1.63

About .35 acres of M-20 is classified as vacant by the Lane County Assessor's Office. The vacant acreage includes portions of 2 lots. Limiting conflicting uses would allow some development to occur within the wetland area where the developer could show how the essential functions of the wetland could be preserved or enhanced. A 50-foot development setback is already required for the wetland under Article. No additional setback is proposed.

A 50-foot setback would affect 1.28 acres of vacant industrial land. The affect of the setback on buildable land could be reduced by aligning development such that yards and other open space are within the setback. Stormwater management facilities required for development can be placed within the setback under Article 31.240.

Employing low impact development practices within 150 feet of the wetland could reduce the impact of nearby development on the resource. Some low impact development practices are already incorporated into the stormwater quality protection standards found in Article 31.

Reduction in the Buildable Land Inventory:

M-20 was not counted in the inventory of buildable lands by the Eugene-Springfield Metropolitan Area Residential Land and Housing Study. Therefore the fully protecting the wetland acreage would not reduce the inventory. A 50-foot development setback is required under stormwater provisions of the Springfield Development Code, and thus the 1.28 acre impact of the setback is not attributed to this report.