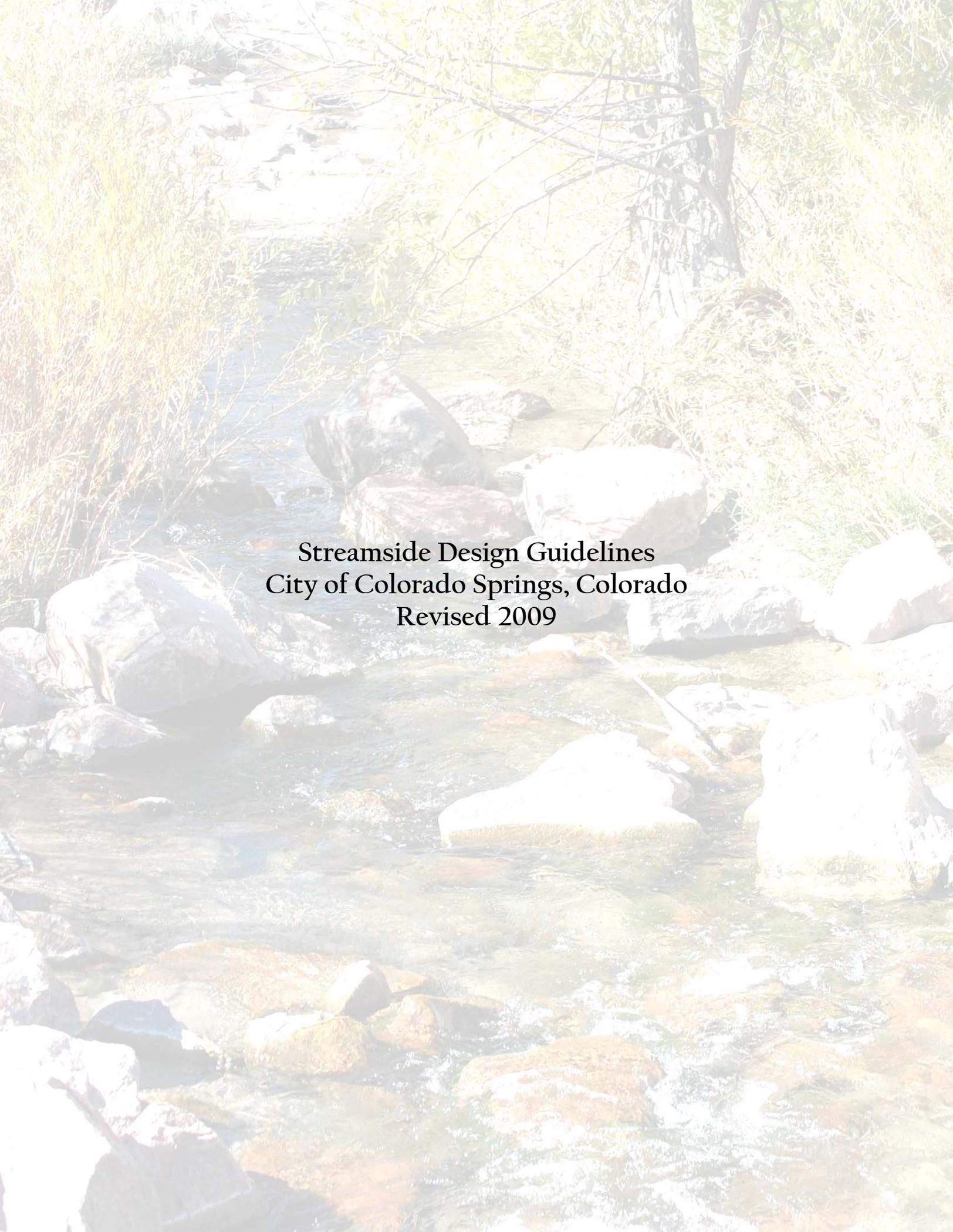


# Streamside Design Guidelines

Revised 2009



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A scenic view of a stream flowing over rocks in a natural setting. The water is clear and shallow, cascading over various sized rocks. The banks are lined with tall grasses and trees, some with bare branches and others with green leaves. The overall atmosphere is peaceful and natural.

**Streamside Design Guidelines**  
**City of Colorado Springs, Colorado**  
**Revised 2009**

# Preface

Early in 2000, neighborhood and conservation groups and City staff came together with one goal in mind: to protect the riparian resources within the City limits. The group noted that valuable site amenities, significant natural features, and wildlife habitat were being lost to development adjacent to the stream and decided this problem needed greater attention. Over many months, a group of stakeholders worked toward a solution that would protect the City's streams. That solution was the first Streamside Ordinance.

## History

The original Streamside Ordinance, Ordinance 02-166, was passed by City Council on November 24, 2002 after many hours of discussion and public process. The first version of the Streamside Design Guidelines was written in conjunction with the original Streamside Ordinance. The guidelines expanded upon the review criteria and explained how to develop in a manner consistent with the intent of the Streamside Ordinance. The original design guidelines were printed January 1, 2003.

Adoption of the first Streamside Ordinance by City Council required a mandatory review of its recommendations and requirements one year, more or less, from the date of its passage. After 16 months of implementation, a presentation on analysis and recommendations to modify the Overlay was presented to the Housing & Building Association (HBA), Council of Neighbors and Organizations (CONO), the City Planning Commission, and the City Council. At that time, staff was given the direction to move forward with the proposed modifications with three goals in mind:

- Simplify;
- Clarify; and
- Maintain the original environmental intent.

Preparation of the updated ordinance included many internal and external work sessions. On November 13, 2007, Ordinance 07-179 was passed by City Council as an amendment to the original Streamside Ordinance. This second version of the Streamside Design Guidelines (the Guidelines) has been revised to reflect changes in the updated Streamside Ordinance.



**FIGURE 1 - Sand Creek.** A well integrated section of Sand Creek adjacent to Single Family homes. This portion includes a trail and wildlife area.

**FIGURE 2 - Cottonwood Creek.** A large vegetation stand has been preserved adjacent to Colorado Springs Fire Station No. 20.



### **Streamside Ordinance Modifications**

The key differences between the original Ordinance, passed in 2002, and the updated Ordinance passed in 2007 are as follows:

- The Code has been simplified.
- The definition of the overlay extent has been clarified.
- The concept of “reference distance” has been eliminated. Instead the width of the overlay has been tailored to the total width of the “Streamside Buffers.”
- The 2007 Ordinance does not employ the 100-year floodplain location in defining the extent of the overlay. The buffer area of the new Ordinance is a consistent width based on the type of the stream. (Ordinance 07-180 was approved in conjunction with the Streamside Ordinance to regulate fill in 100-year floodplains.)
- Individual stream type classifications have been changed and existing trapezoidal channels have been removed from the Streamside Overlay.
- The list of prohibited uses and conditional uses within the Streamside Overlay has been modified.
- The “streamside buffer” has been modified.
- The origin of measurement for the buffer and

overlay has been defined and clarified.

- The number of and width of buffers has changed.

### **How to Use This Document**

These guidelines have been designed to direct an applicant through the process of developing on a property that is adjacent to a stream. The Guidelines include “Essential Points” text boxes for each section, pictures that reflect the positive effect the Streamside Overlay has had on the streams, and a concise step-by-step guide to developing on a streamside property.

The first step in developing a streamside parcel is to determine the location of the Streamside Overlay on the property. Once the location is defined, these guidelines will instruct the applicant on the review process from the pre-application meeting to approval, design techniques, and compatible uses. When a compatible use has been selected, the applicant is ready to develop a plan according to the eleven review criteria; each review criteria is explained individually in the last eleven sections of this document. For a checklist version of the streamside review process, refer to Appendix D.

# Acknowledgements

## Revised Ordinance and Guidelines - 2007-2009

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## **Original Streamside Ordinance and Guidelines - 2002**

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# Table of Contents

<u>Introduction</u>	<u>2</u>
<u>Overlay Location</u>	<u>4</u>
<u>Land Uses and Exemptions</u>	<u>6</u>
<u>Streamside Review Process</u>	<u>8</u>
<u>Eleven Review Criteria</u>	<u>10</u>
<u>Grading and Landform</u>	<u>12</u>
<u>Site Design</u>	<u>14</u>
<u>Wildlife Habitat Preservation</u>	<u>18</u>
<u>Trails and Recreation</u>	<u>20</u>
<u>Floodplain</u>	<u>22</u>
<u>Significant Natural Features</u>	<u>24</u>
<u>Complementary Plans</u>	<u>26</u>
<u>Riparian Buffers and Impervious Surfaces</u>	<u>28</u>
<u>Landscape</u>	<u>36</u>
<u>Stream Bank Stabilization</u>	<u>38</u>
<u>Stream Reclamation</u>	<u>40</u>
<u>Bibliography</u>	<u>43</u>
<u>Glossary</u>	<u>47</u>
<u>Figures and Tables</u>	<u>51</u>
<u>Appendix A - Streamside Ordinance</u>	<u>55</u>
<u>Appendix B - Riparian Plant List</u>	<u>81</u>
<u>Appendix C - Overlay Zone Map</u>	<u>85</u>
<u>Appendix D - Streamside Development Checklist</u>	<u>89</u>

# Introduction

Certain areas of the City are characterized by intermittent and perennial streams which provide significant wildlife habitat, riparian vegetation, open space and multi-use trail opportunities that add to the attractiveness and quality of life of the community. It is the purpose of the Streamside Overlay zone district to guide development and maintenance of the properties adjacent to stream corridors in a manner that is compatible with the environmental conditions and character of these areas.

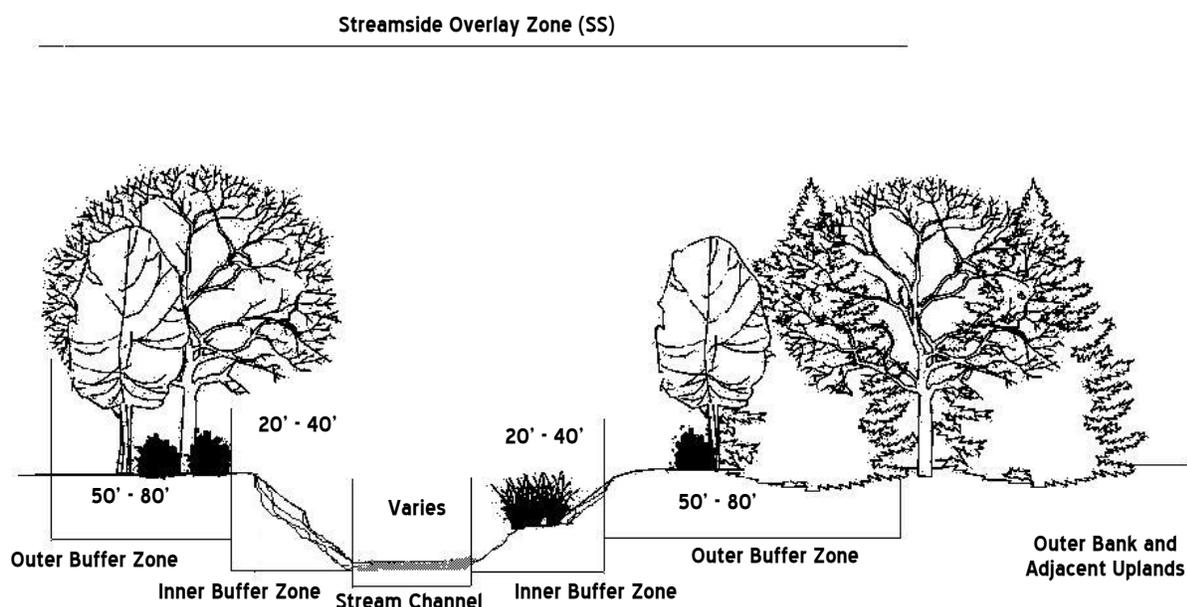
In general, streamside parcels present a unique set of challenges and opportunities to landowners, designers, engineers, planners, developers and nearby residents. Due in part to the dynamic and “living” character of these parcels, stream areas do not easily lend themselves to the application of rigid, physical, development standards. Instead, development on streamside parcels should be carried out in a manner that incorporates some general considerations and steps that will lead to the best utilization of the opportunities existent on a particular piece of land. Through the use of relief mechanisms on

critically constrained parcels and site development techniques, streamside parcels can develop with intensities typical of an urban setting.

The Streamside Ordinance applies to those lands within the City of Colorado Springs which are adjacent to a stream channel, including stream-adjacent wetlands, and within a specified distance of the edge of the stream channel of specific intermittent and perennial streams. The Streamside Overlay extends between 70’ and 120’ beyond the edge of the stream channel; the width is based upon the three-tiered stream typology defined within the buffer section of the Ordinance, found in Appendix A of these guidelines. The Streamside Ordinance is not intended to reduce or prohibit development along streams, but rather aims to arrange development in a fashion that is compatible with natural stream characteristics existent on or adjacent to developing sites.

## The Existing Streamscape

With few exceptions, the streams within Colorado Springs exist in a human-altered state.



**FIGURE 3 - Cross Section of the Streamside Overlay Zone.** The Streamside Overlay Zone is comprised of a stream channel, an inner buffer zone, an outer buffer zone, and the outer bank. The widths of each of these zones varies based on stream type.

Even the upper reaches of streams adjacent to large tracts of undeveloped land exhibit some level of conversion by human activity. In some cases, human impact may be no more intense than a utility corridor or stock dam on a site which is otherwise natural in appearance. On more intensively developed urban sites near the downtown core, however, the streamside may be significantly transformed by stream reconfiguration or long-standing industrial or commercial uses with very little residual, natural character remaining. Between these two extremes lies all manner of partially-developed, streamside scenarios. A few of these sites reflect some integration given to the adjacent stream, but most exhibit rather abrupt separations from adjacent stream frontage.

Past failures in streamside design are seen in the loss of valuable site amenities including significant natural features, wildlife habitat, water quality, natural vegetation, and community visual resources and provide evidence that the local streamscape requires greater attention. There is, however, no single recipe for improving stream-

side sites. Rather, each site should be evaluated against its associated opportunities and constraints within a flexible streamside development review process based on eleven review criteria. An explanation of the Streamside Review Process and each of the eleven review criteria is included in these guidelines.

## ESSENTIAL POINTS

These Design Guidelines are provided as both a reference and a manual to developers, landowners, and builders who are interested in developing land that is located partially or entirely adjacent to a Streamside Overlay zone. Proposed projects to be developed within the Streamside Overlay are required to complete a development plan prior to obtaining a building permit or grading permit within the Streamside area. These Guidelines provide both requirements and guidance to help ensure that project design utilizes adjacent streams as amenities, preserves the streamside character and helps to advance better stream area interaction.



**FIGURE 4 - Cottonwood Creek.** A subdivision abuts this section of Cottonwood Creek in the northeastern part of Colorado Springs. With ample vegetation and numerous trails, Cottonwood Creek is an amenity for both residents and visitors.

# Overlay Location

Any property zoned with the Streamside Overlay (SS) zone district is subject to the regulations of the 2007 Streamside Ordinance. The amount of property subject to the regulations is dependent on the relationship between the SS Overlay and the property line adjacent to the stream. The SS Overlay is comprised of the stream channel, inner buffer zone, and outer buffer zone, all of which are explained in Review Criterion 8 and in the Streamside Ordinance found in Appendix A of this document.

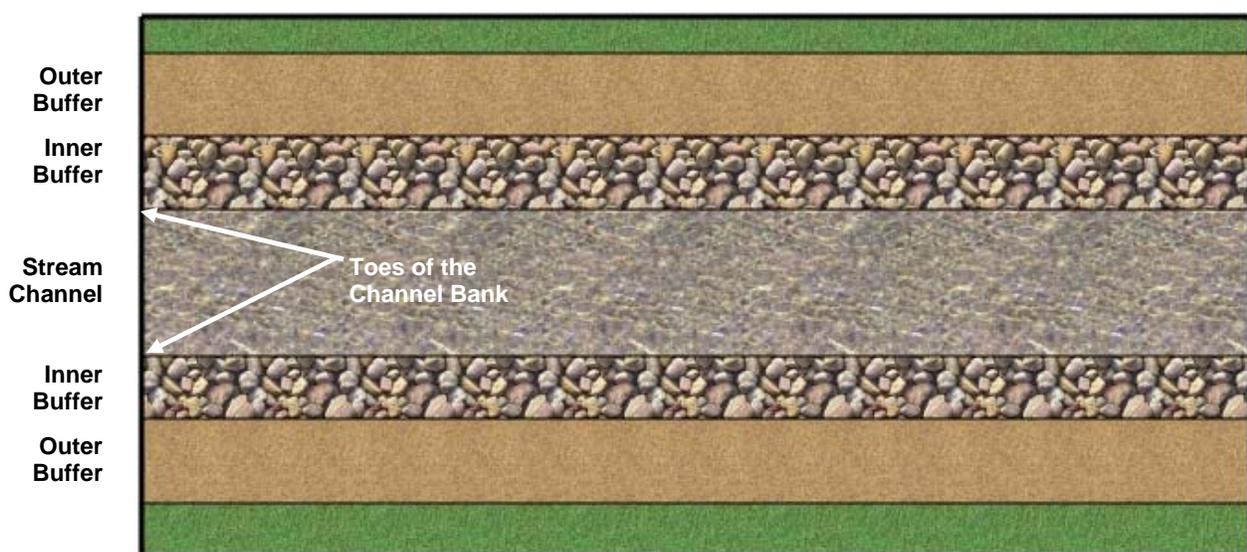
## Identifying Buffer Zones

The first step is to establish the width of the stream channel to determine the type of stream. Type 1 streams are quite narrow at the channel bank, while Type 2 streams are wider and Type 3 streams are the widest. The widths of buffer zones are directly reliant upon stream typology.

For all stream types, the edge of the innermost buffer, or inner buffer zone, begins at the toe of the channel bank; buffer zone widths are then measured from that point outward. The toe of

the channel bank is the point where the sloping bank becomes level or nearly level to the channel bed or water level. The toe is also often identified as the point where bank vegetation terminates with channel substrate, which includes sand, gravel, cobble, boulder and bedrock. The City GIS application, which can be accessed from the Community Development Division or Land Use Review Department webpage at [www.springsgov.com](http://www.springsgov.com), has mapped, to the best practical extent, the location of every stream channel and type.

Inevitably, there will be discrepancies between the mapped data and field conditions. Any property owner or developer of streamside parcels may re-map the toe of the bank, the stream channel, and the corresponding buffers to better represent field conditions or required improvements to the channel. The new boundaries must then be represented on the property's development plan or streamside plan for review and approval.



**FIGURE 5 - Plan View of Streamside Buffers.** The inner and outer buffer locations are based on stream type and are measured outward from the toe of the stream.

TABLE 1 - Buffer Zone Widths.

	Type 1	Type 2	Type 3
<b>Typical Stream Channel Width</b>	Less than 25'	25'-75'	Greater than 75'
<b>Buffer Zone Total</b>	70'	90'	120'
<b>Inner Buffer Zone</b>	20'	30'	40'
<b>Outer Buffer Zone</b>	50'	60'	80'

### Buffer Zone Protection

Prior to any development, including grading, vegetation removal, or any other improvements, the inner buffer zone must be fenced or flagged by the property owner or developer. This flagging is intended to denote the riparian zone in order to keep heavy equipment and other potentially damaging activities out of the protected area. The flags are to remain in place until construction activities are complete.

### ESSENTIAL POINTS

- In the pre-design phase, first determine the stream type and then determine the inner and outer buffer widths.
- If the area subject to the Streamside Overlay is re-mapped, the new boundaries must appear on the site or development plan.
- Ensure the inner buffer zone is fenced or flagged prior to any development.

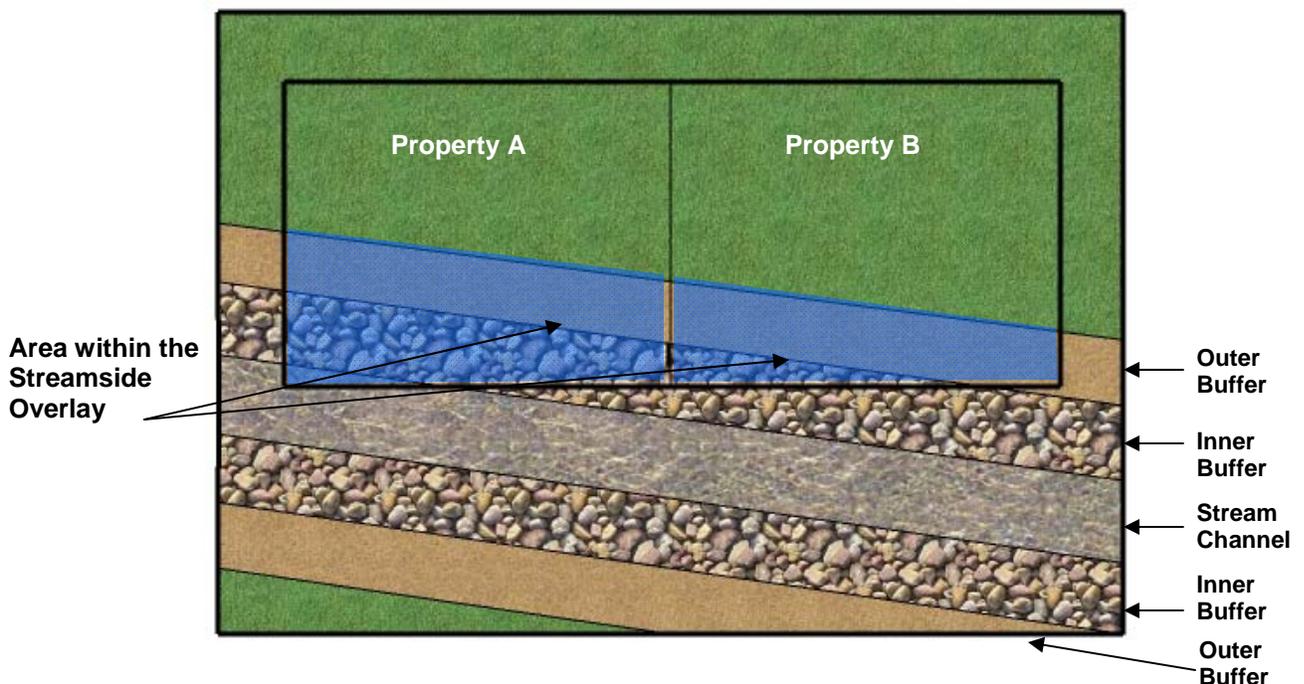


FIGURE 6 - Streamside Overlay Zone Location. Locate the boundaries of the Streamside Overlay and then determine the portion of the land overlaid with the inner and outer buffer zones.

# Land Uses and Exemptions

Due to the nature of the riparian ecosystem, certain land uses are more appropriate than others on streamside parcels. This concept of a land use hierarchy and the reasons behind the rankings are explained below. While some land uses are generally more preferred, other uses are either conditionally permitted or prohibited outright. The following sections describe land use hierarchy in addition to conditional uses, prohibited uses and exemptions from the Streamside Overlay requirements.

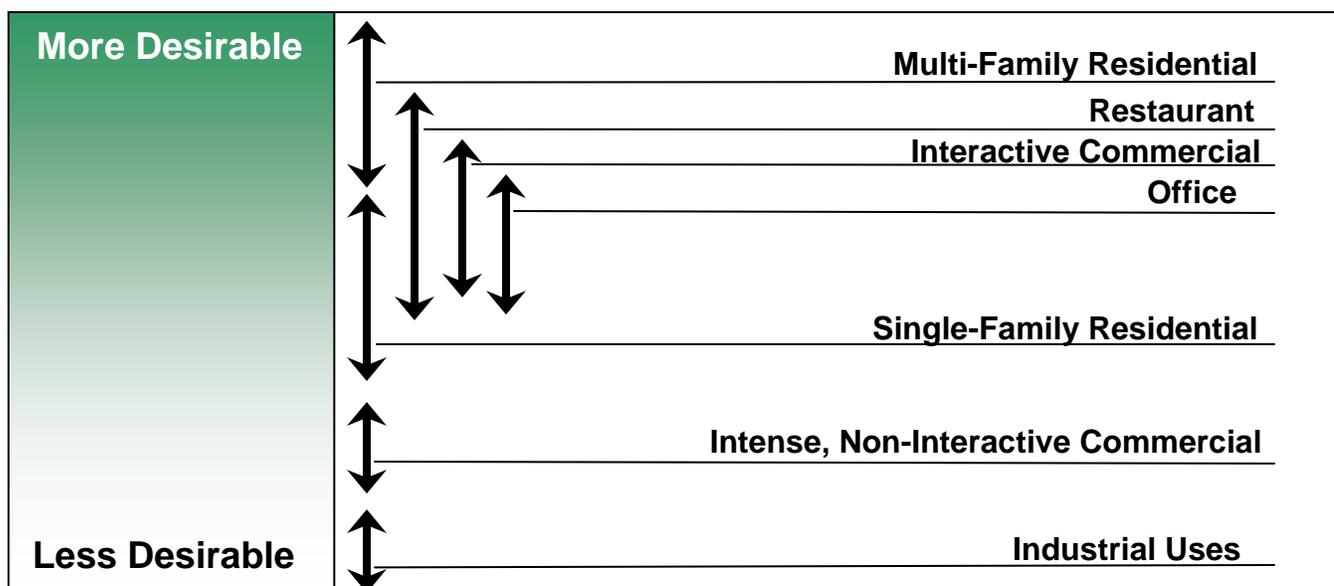
## Land Use Hierarchy

In many parts of the City, the streamside is bordered by industrial and heavy commercial uses. The Streamside Ordinance, however, encourages the active utilization of natural stream areas (trails and open space), which industrial and heavy commercial uses generally cannot provide. Heavy commercial uses including laundry services or convenience food and fuel sales; mining operations; and certain industrial uses such as meat-packing, garbage services or vehicle-dismantling yards; break down the functionality of relationships between different land uses and can also contribute to point and non-point source pollution and degradation of riparian ecosystems. However, beneficial relationships may occur in areas with a high incidence of customer

and/or employee foot traffic if there is not a need for the purchase and distribution of bulky products. The design of multi-family residential, office, restaurant, and recreational business sites can generally incorporate the stream as a development amenity. Single-family developments can also have a positive impact on the stream if the streamside character is considered to be part of the overall subdivision design. Projects that promote more active relationships with the stream and that capitalize on the stream area as an amenity are encouraged.

## Conditional Uses

The following uses have been classified as conditional due to the potential for negative impacts to the streamside. Applications for these uses shall be processed in accordance with Section 7.5.702 of the Zoning Code. When evaluating a conditional use request, site features such as existing or future trail systems shall be considered. In other words, conditional uses may be more appropriate where no streamside trails exist or are planned. To mitigate possible impacts, approval of the following uses may require the additional employment of best management practices (BMPs) or other strategies. Exclusion from this list does not guarantee that additional BMPs and/or mitigation will not be required as



**FIGURE 7 - Land Use Hierarchy.** Certain land uses, including those with high interactivity and low environmental impact, are more compatible with riparian ecosystems than other uses and should be established on parcels with the Streamside Overlay.

part of the development plan approval process. Conditional uses are as follows:

- Automotive and Equipment Services (all uses listed under this category);
- Manufacturing;
- Warehousing and Distribution;
- Construction Sales and Services;
- Mini-Warehouses;
- Construction/Contractor Yard;
- Light Industry;
- Parking Lots (except as an accessory use); and
- Outdoor Storage (whether accessory or principal use)

### **Prohibited Uses**

The following uses and their accessory uses are prohibited on any Streamside Overlay zoned properties, however, prohibited uses legally existing on November 12, 2002, will be allowed to continue, but will not be allowed to expand beyond their current extent.

- Laundry Services;
- Kennels;
- Detention Facilities (including Jails and Halfway Houses);
- Construction Batch Plants;
- Garbage Service Companies;
- Meat-Packing and Related Industries;
- Mining Operations;
- Truck Terminals;
- Stockyards;
- Vehicle Dismantling Yards;
- Commercial Feedlots;
- Landfills;
- Transfer Stations;
- Recycling Processing Centers;
- Large Recycling Collection Centers;
- Convenience Food Sales with Fuel Sales (Gas Stations); and
- Heavy Industry, or uses involved in processes or storage involving potentially or actually hazardous, explosive, flammable, or radioactive materials.

### **Exemptions**

In specific cases, adherence to the requirements of the Streamside Ordinance is not warranted.

In order to address these types of cases, the Streamside Ordinance includes a section to identify specific properties, projects and/or development activities that may be exempted from all or a portion of the Streamside Overlay zone requirements set forth in the Ordinance. Where an exemption is approved, a note shall be included on the development plan or site plan identifying the specific exemptions approved for the project.

The only acceptable exemptions include the following:(for more information, see Section 7.3.508[F] of the Zoning Code).

- New, single-lot residential development;
- Residential additions built before November 12, 2002 and residential additions built after November 12, 2002; with less than a 50% increase in gross footprint and impervious surface area;
- Expansions of 30% or less of the building footprint or accessory impervious area for non-residential and multifamily uses for the area approved as of November 12, 2002;
- Development that is physically or functionally separated from the stream;
- Sites with a prudent line setback adopted prior to November 12, 2002, an exemption is possible for sites with prudent line setback adoption after November 12, 2002, provided requirements are met;
- Sites for public facilities; and
- Sites used for agriculture, private recreation, residential lawns or gardens, or any other similar use that is not contrary to the purpose of this section.

### **ESSENTIAL POINTS**

- **Check to ensure the proposed land use is allowed prior to design. It is possible the use may be exempt from requirements.**
- **Land use compatibility to stream is dependant on the use and how the project is designed to interact with the stream.**

# Streamside Review Process

The development review process for a streamside site does not differ much from the review of any other site. The type of development will determine if either a site plan or development plan is required. Streamside review criteria must be satisfied in addition to the development or site plan review criteria. The review of the application ensures both sets of criteria are met concurrently. The following provides an overview of the two types of applications, along with the design and review stages involved with streamside sites.

## Streamside Development Plans

Development plans are required when land is developed or redeveloped within the City limits and within the Streamside Overlay. Streamside properties cannot be modified in any way, including through site grading, until a development plan has been approved. Streamside Development Plan (SDP) applications must be reviewed and approved prior to the issuance of any building permit.

## Streamside Site Plans

For both new single- and two-family residential developments and additions, a Streamside Site Plan (SSP) is utilized to simplify and facilitate the review of streamside development on small parcels which lack the complexity or scope to justify the full development plan requirements. Typical SSP applications will be for single lot,

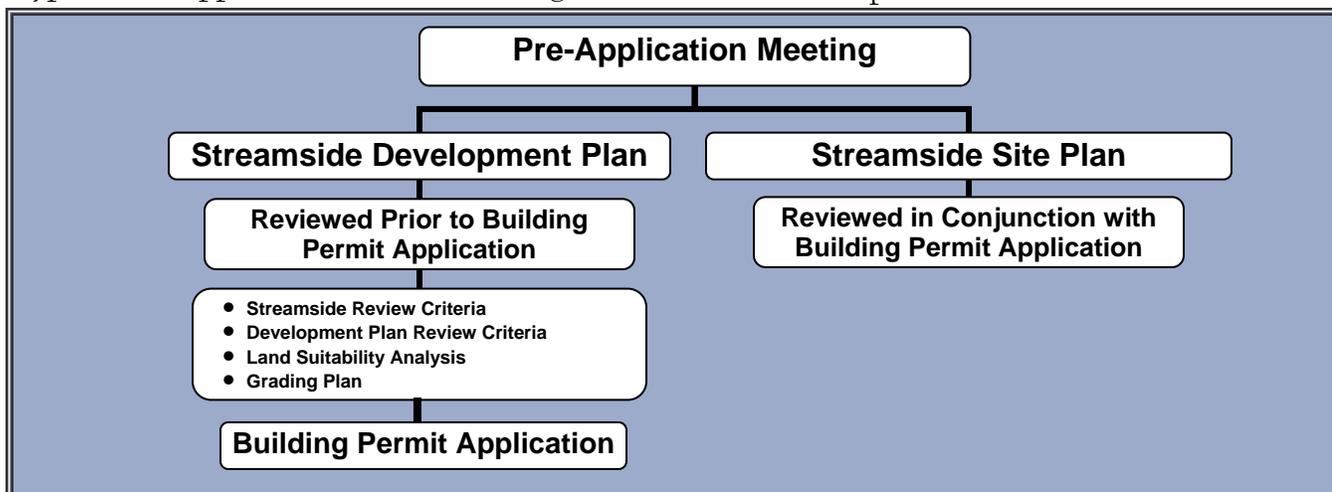
residential developments (new or major additions). These applications will not include elements required by a SDP, such as a Land Suitability Analysis or an approved Grading Plan, unless specifically required. The SSP applications will be reviewed at time of building permit application and will be subject to the normal procedural and administrative requirements for those types of applications.

## Design and Review Stages

### Assessment (Pre-Application Stage)

If an applicant is applying for a SSP, they are encouraged to set up a pre-application meeting; however, if they are applying for a SDP, applicants must set up a pre-application meeting to ensure that adequate lead time is provided for meeting the submittal requirements and to facilitate complementary design of the proposal. The optimal use of a given streamside site is a function of how effectively the applicant, the designer, the reviewing planner and other reviewing agencies are in balancing the site's functional opportunities against its physical constraints.

The Streamside Ordinance is structured to work with the existing zoning of streamside sites; however, rezoning these sites to process them as Planned Unit Developments (PUD) may provide applicants greater flexibility and is encouraged. PUD developments have more latitude when



**FIGURE 8 - Streamside Review Process.** The type of development determines the path and timing of review. For example, larger parcels and more involved development typically requires a development plan, while single-lot residential development requires a site plan.

determining setbacks, building height, and the range of uses on a site. In any case, the applicant should strive to answer the following questions in assessing a possible development site within the Streamside Overlay:

- What is the economic development potential of the property?
- What streamside values are apparent within the area proposed for development?
- What are the public interests in the site?

### **Design (Pre-Application Stage)**

In general, development activity should be discouraged within close proximity to stream channels. Beyond the areas immediately adjacent to the stream channel, a wider range of uses are permitted and the overall intensity is anticipated to be similar to or greater than surrounding non-streamside developments. The outer area may be relatively wide depending on stream type, and preference is given to those developments that are designed to reduce impact in the areas closer to the stream channel.

Since it is the objective of the Streamside Ordinance to protect and enhance streamside areas by promoting appropriate development, the involved stakeholders should focus on steering project design and construction toward attractive and sensitive development, which incorporates the adjacent stream area as an active element of the overall project area. Successful projects should improve the stewardship of vital stream areas within the community. Ultimately, an improved stream network can accrue as an asset to all stakeholders through increased property values for sites adjacent to streams, improved overall quality of the community and by meeting broader public objectives. During the design phase, the applicant should ensure the following questions are addressed:

- Does the proposed development incorporate the stream area as an amenity?
- Does the proposed structure provide a “fronting” elevation to the stream?
- Will the development encourage active and/or passive recreational use of the adjacent stream area?

- Has surface imperviousness of the site been minimized through appropriate parking provisions and pervious paving and flat-work materials?

### **Project Review (Internal Review)**

Due to the additional complexity of streamside sites and the need for more active dialogue on these projects, both City Planning and City Engineering (and, in many cases, Colorado Springs Utilities and/or other agencies) staff will be involved from the initial, pre-application stage to the final disposition of the application. This will ensure that applicants have cohesive guidance on project requirements and that applications will not be delayed due to unresolved, interdepartmental issues. Prior to the review stage, the applicant should ensure the following questions are adequately addressed:

- Have comments from land use review staff, other agency and the public been encouraged as early as possible in the design stage of the project?
- Have the project application and review requirements been met?
- Have any interdepartmental conflicts or issues been fully resolved?
- Has land use review staff provided sufficient support to the applicant in bringing the proposal to successful completion?
- Are there any specific construction requirements in the drainage basin planning study (DBPS)?

## **ESSENTIAL POINTS**

- **Review criteria within the Streamside Ordinance must be satisfied in addition to standard development plan review criteria.**
- **A pre-application meeting is strongly encouraged for Streamside Site Plan applications and is required for Streamside Development Plan applications.**
- **Developers of streamside parcels may consider rezoning to Planned Unit Development (PUD) to add flexibility to the design of the proposed project.**

# Review Criteria

The following criteria are also listed in the Ordinance in Appendix A. Each of the criteria are discussed in detail in the following sections.

## **Grading and Landform**

1. Has the natural landform been maintained within the overlay area and does grading conform to the specific grading limitations of the streamside ordinance as well as all other City grading regulations?

## **Site Design**

2. Does the development incorporate the stream ecosystem into the project design and complement the natural streamside setting? Has the project been designed to link and integrate adjacent properties with the stream corridor using access ways, creek front plazas, employee recreational areas or other site planning and landscaping techniques which include the stream corridor as an amenity?

## **Wildlife Habitat Preservation**

3. Has the project been designed to minimize impact upon wildlife habitat and the riparian ecosystem which exists on or adjacent to the site? Does the project design protect established habitat or any known populations of any threatened or endangered species or species of special concern?

## **Trails and Recreation**

4. Have existing or potential community trail networks and other recreational opportunities been identified and incorporated into the project design?

## **Floodplain**

5. Has the project been designed to protect the subject property from potential flood damage and to accommodate flood storage and conveyance needs?

## **Significant Natural Features**

6. Have all significant natural features within the project streamside area been identified, and has the project been designed to minimize the impact on these features?

## **Complementary Plans**

7. Does the project identify and implement the recommendations of any approved subarea plans (such as the City Greenway Master Plan, City Open Space Plan or a specific Drainage Basin Planning Study (DBPS)) and of any approved City Engineering projects and habitat conservation plans?

## **Riparian Buffers and Impervious Surfaces**

8. Does the project design:
  - Implement a riparian buffer of specified width between the developed portions of the site and the adjacent waterway to assist in preventing point and non-point source pollutants and sediment from entering the waterway?

- Exclude impervious surfaces from the inner buffer zone and meet impervious restrictions across the entire overlay?
- Incorporate all stormwater Best Management Practices (BMPs) required by City Engineering throughout the developed site and adjacent to the buffer to encourage on-site filtration of stormwater and protect water quality?
- Incorporate visual buffer opportunities of the stream between identified existing and/or proposed projects on opposing sides of the stream?

## **Landscape**

9. Are inner and outer buffer zone landscaping standards met? Have disturbed areas been revegetated to minimize erosion and stabilize landscape areas and does the project landscaping design specify plants selected from the riparian plant communities as set forth in Appendix A of the Landscape Policy Manual? Does the proposal meet all other requirements of the City's Landscape Code?

## **Stream Bank Stabilization**

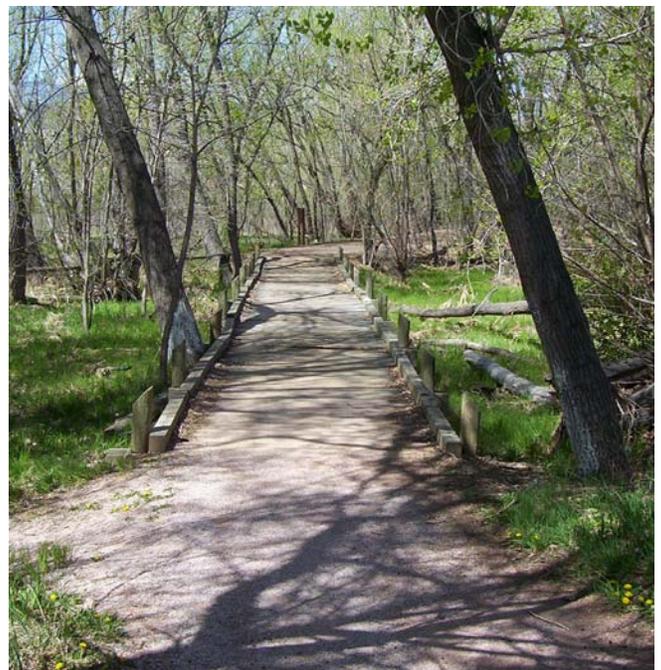
10. Have stream bank and slope areas been identified (particularly those over fifteen percent (15%) slope)? Has the disturbance to these areas and any protective or stabilizing vegetative cover been minimized? Does the plan provide for the suitable revegetation and stabilization of any disturbed areas?

## **Stream Reclamation**

11. Have opportunities to reclaim the drainageway been identified and implemented where practical? For this criterion, reclamation constitutes any action that improves the quality of that drainageway visually, functionally, or recreationally, and brings that drainageway into a more natural condition.



**FIGURE 9 - Criterion 6.** Significant Natural Features provide a natural stream. Ensure to incorporate natural features into the development design.



**FIGURE 10 - Criterion 4.** Trails provide a positive amenity to the stream and allow for stream interaction.

# 1 Grading and Landform

Has the natural landform been maintained within the overlay area and does grading conform to the specific grading limitations of the streamside ordinance as well as all other City grading and filling regulations?

Typically, a natural stream exhibits a shallow slope from its banks to its channel. In the past, however, these shallow slopes have been filled to create larger building pads adjacent to the stream. This practice has far-reaching and long-term consequences, which the Streamside Ordinance seeks to mitigate.

## **The Problem**

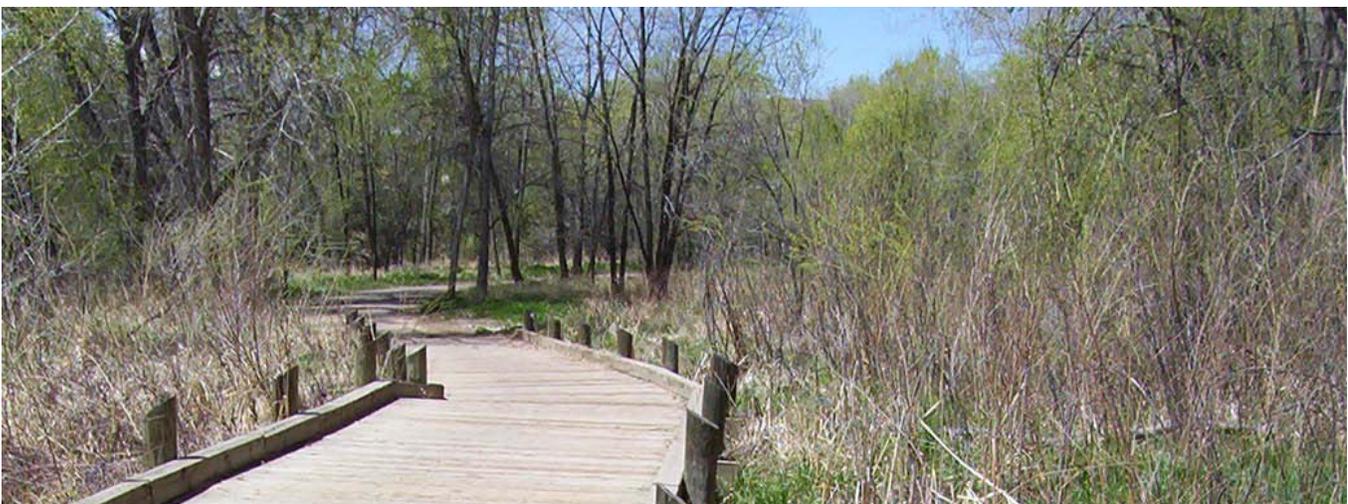
The visual impact of excessive fill is most apparent; however, there are several unseen impacts that excessive fill creates:

- Streamside vegetation is eliminated, impacting vital wildlife and water quality support functions;
- Steep slopes limit the viability of vegetative slope treatments and stability of fill soils;
- Increased volume, velocity and erosion destabilizes the drainageway and downstream banks; and
- The vital stormwater and aesthetic resource provided by the historic floodplain is eliminated, increasing the potential for local flooding.

## **The Solution**

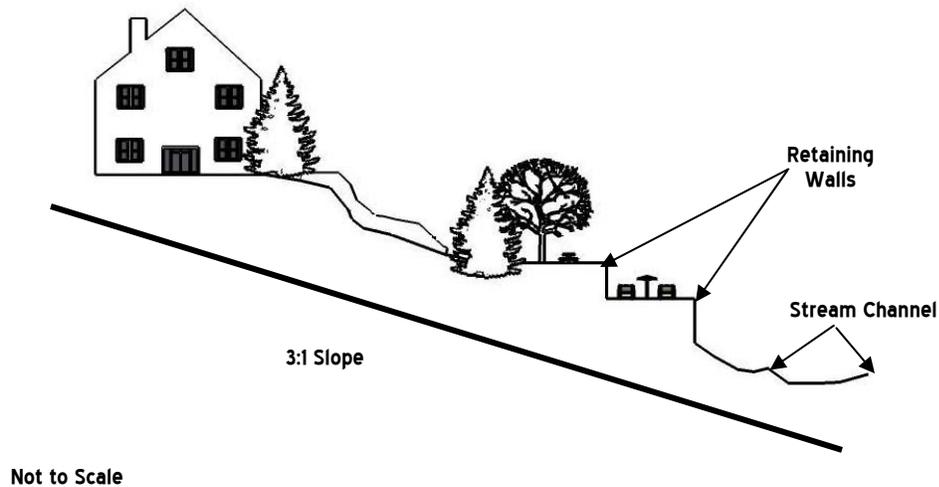
In order to mitigate the problems previously noted, the Ordinance includes grading requirements to promote a more aesthetic and active interface between the developed site and the adjacent stream. Grading limitations encourage the use of buildings designed to utilize existing slopes through the use of walkouts or similar techniques. The natural landform should be maintained where possible, but where grading is necessary, it should be limited and it should be conducted to meet the design intent of the overlay zone. Examples of grading requirements are as follows:

- Minimize any proposed grading within the approved limit of disturbance depicted on the development plan, especially within the inner buffer zone. The graded slope from the stream toe to the top of the bank may not exceed 3:1 unless retaining walls are utilized in accordance with the streamside ordinance (See Figure 12).
- Walls up to six feet in height may be permitted when necessary. The walls will require appropriate landscape screening and safety railings.



**FIGURE 11 - Pikes Peak Greenway.** Minimal grading allows for positive integration of the stream with surrounding developments.

**FIGURE 12 - Grading and Slope.** The Streamside Ordinance seeks to protect existing streams by minimizing grading. Grading for new developments cannot exceed a 3:1 slope unless retaining walls are utilized in accordance with the Streamside Ordinance.



- The lineal extent of any one section of wall may not exceed 2/3 of the length of the stream frontage or 300 feet, whichever is less. Breaks in otherwise continuous wall systems must be separated by a distance of at least 30 feet.
- All grading plans for streamside zoned areas must include a revegetation plan that addresses short and long term erosion and slope stability concerns.
- All proposals within the overlay which require an approved grading and soil erosion control plan must implement protective measures such as fencing or flagging along the outer boundary of the inner buffer zone to ensure that the prohibited activities, storage, or destruction of construction related materials or equipment, are excluded from the inner buffer zone.

### Grading Plan

Sites adjacent to streams are required to submit a grading and revegetation plan concurrently with the development plan. The grading plan will ensure appropriate treatment of stream banks and slopes and protection of the riparian area. This grading plan must be reviewed by both City Land Use Review and approved by

City Engineering before development can occur. No grading shall be permitted outside of the limit of disturbance, defined on either the site plan or development plan and the grading and erosion control plan. Requirements pertaining to the grading plan can be found in Section 7.7.15 and Section 7.8.1 of the Zoning Code.

## ESSENTIAL POINTS

- A development plan, complete with grading and revegetation plan must be approved before any grading or construction can occur.
- Implement protective measures such as fencing or flagging during grading and construction.
- Consider stream restoration when grading is needed to improve the quality of the stream.
- Grading in the floodplain cannot occur without an approved development plan.

# 2 Site Design

Does the development incorporate the stream ecosystem into the project design and complement the natural streamside setting? Has the project been designed to link and integrate adjacent properties with the stream corridor using access ways, creek front plazas, employee recreational areas or other site planning and landscaping techniques which include the stream corridor as an amenity?

Introducing awareness and human activity into a streamside area improves the relationship between development and the stream itself. Activity can take many forms, including accessible pedestrian and bicycle trails for leisure, commuting, or lunchtime recreation, passive and active recreation areas, and attractive outdoor seating area for restaurants, cafes and parks. When planning a new streamside project, designers can include many physical elements that foster this interactivity.

## Site Planning

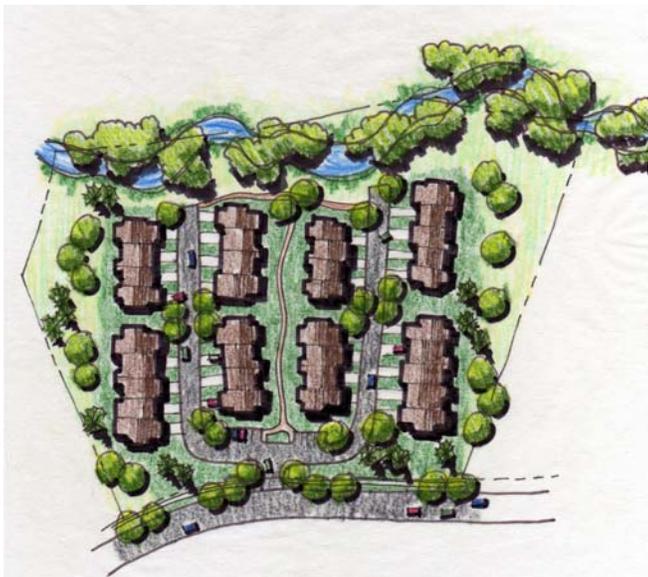
There are several site planning techniques which will enhance the relationship of the developed site with the adjacent stream, including overall layout, grading practices, impervious cover, and barriers.

## Overall Layout

One of the most important phases in any development is the planning stage. In streamside developments, careful attention should be paid to the overall layout of the site. The designer should ensure that the development integrates with the greater streamside character, rather than sets itself apart from it. Figures 13-18 show both preferred and undesirable site designs for streamside parcels.

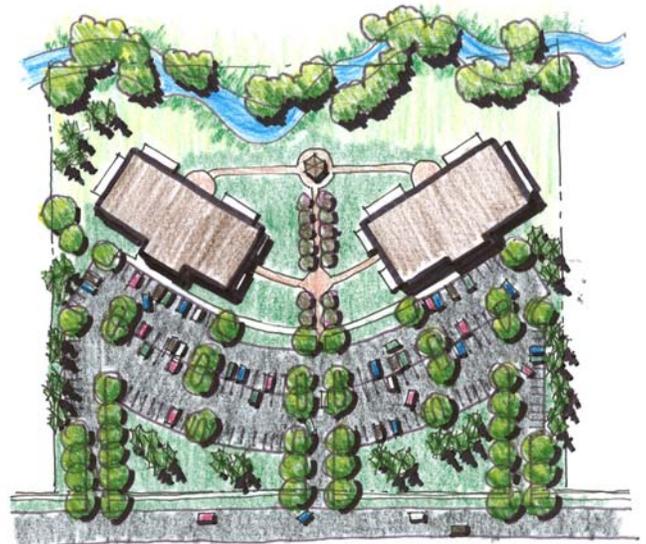
## Grading

The Streamside Ordinance provides specific grading requirements (see Criterion No. 1, Grading and Landform) to deter intrusive filling that has been occurring adjacent to Streamside Overlay zone. Although these requirements are in



**FIGURES 13 & 14 - Residential Streamside Development.** Figure 13 (left) shows a typical multi-family residential concept. The buildings are oriented toward the center of the parcel, eliminating any possible streamside interaction. Figure 14 (right), however, shows a preferred design concept for multi-family residential, where the buildings closest to the stream are oriented so that there is maximum exposure to the stream. View corridors are also protected and provide critical pedestrian linkages to the trail and gazebo that complement this layout.

**FIGURES 15 & 16 - Commercial and Office Development.** Figure 15 (left) shows a typical office or commercial development concept. One large building is oriented so that only a fraction of the interior spaces have streamside exposure. Further, the large parking lot provides separation from the stream with its considerable depth. Figure 16 (right) shows a preferred office or commercial development concept where two smaller buildings sit on either side of a pedestrian path that protects the view corridor to the stream. The pedestrian path also snakes around the development, providing office workers with a place for lunchtime recreation or mid-day strolls. Finally, the buildings are oriented to provide employees with a view of the stream from their individual offices.



part reactive, they seek also to be proactive in incorporating the natural slope into the design conceptualization in the earliest stages of project formulation. This will not only assure that a project can easily meet the Streamside Overlay grading requirements, it will provide development which is further enhanced by an attractive natural setting.

### **Impervious Cover**

Although pavement is necessary, too much can harm the riparian ecosystem and detract from the character of the site. For these reasons, designers should look for every opportunity to reduce unnecessary impervious cover. Extensive impervious flatwork can be avoided by a thorough analysis in the design stage and through the use of pervious finishing materials for walkway/trail treatments. The designer should attempt to use pervious paving treatments in any driveway areas where the level and type of traffic is consistent with this alternative finish.

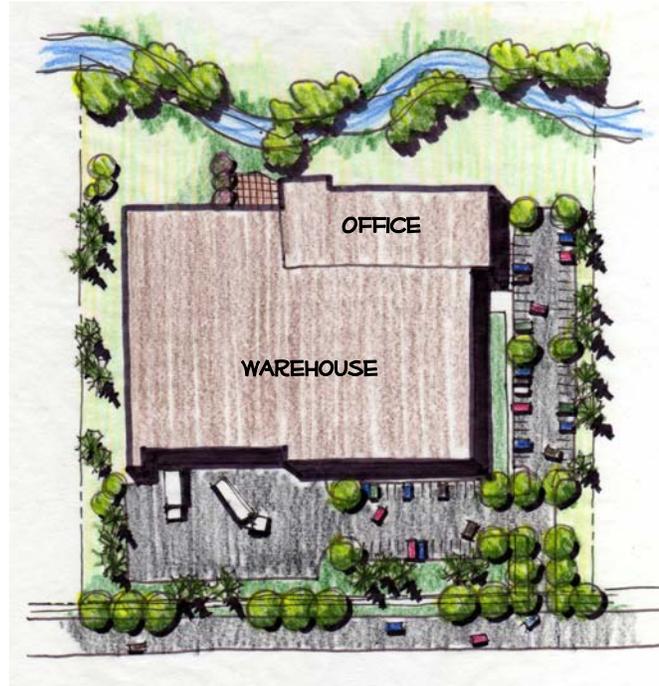
### **Barriers**

Streamside design and development should identify any feature that could act as a barrier to the active and functional interplay between stream area and the developed site. These barriers should be removed from the development if at all possible. Typical barriers include opaque

## **ESSENTIAL POINTS**

- **Design projects to integrate with the streamside.**
- **Utilize existing vegetation and employ interactive architecture to highlight the stream.**
- **Limit the use of impervious surface.**
- **Remove barriers to the streamside where possible. If fencing is needed, design fencing with an open design.**

**FIGURES 17 & 18 - Industrial Development.** Although not as desirable as some streamside uses, industrial developments can be designed to be more compatible with the streamside by locating the office area close to the stream and the loading docks further from it. Figure 17 (left) shows a typical industrial concept that locates the office close to the road rather than close to the stream. Figure 18 (right), however, shows a preferred industrial concept with the office located so that workers can enjoy the stream from their windows. Additionally, an outside patio provides break and lunch space for increased stream interaction. Finally, the loading docks with associated trash and pollutants are located away from the stream.



fencing, lineally extensive retaining walls that prohibit easy access to stream or trail and long, steep slopes, which are not easily traversed on foot. These barriers are not only an obstacle to pedestrians or bicyclists, but inhibit wildlife movement as well. When handled sensitively through thoughtful design, the project area and adjacent stream can enjoy a complementary and mutually beneficial relationship.

### **Architectural Elements**

Architectural elements serve important roles in design compatibility. Elements such as building styles and existing vegetation enhance the development – stream relationship.

### **Building Styles**

Another important design accommodation is to present an attractive building elevation on the side of any proposed building facing the stream. In the past, streamside development often fea-

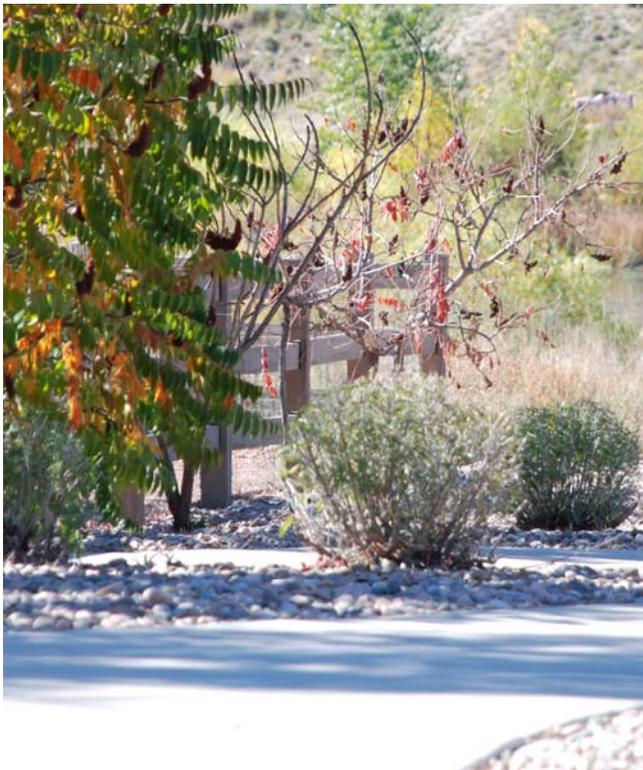
tured blank walls facing the stream, resulting in a dead space in a key transition zone. Attractive and interactive architecture reinforces the active relationship of the building and the stream and also strengthens a sense of stewardship in the occupants of such a building. This may be an entry treatment, or in the case of a walkout-designed structure, may take the form of an elevated deck.

### **Existing Vegetation**

Effectively retaining and utilizing existing stands of natural vegetation in the design of a project affords many benefits. For example, existing vegetation provides both an association with the stream and a context to lend the development important streamside character. The retention of appropriate natural vegetation can present a savings to the developer in meeting his or her landscape obligations. Existing vegetation is often in a mature or established state,

which allows for a smoother transition from the developing site to the adjacent stream setting and serves as a strong and immediate visual buffer to and from other adjacent uses. The only time recommending the use of existing vegetation is not ideal is if invasive weed or trees are present. In this case removal of the invasive weed or trees is recommended as long as care is taken not to destroy valuable natural vegetation.

*A special thank you is extended to **Ron Bevans, ASLA** who graciously illustrated the design concepts in Figures 13-18.*



**FIGURE 19 - Barrier Minimization.** Design techniques, such as the split-rail fencing shown below, can be employed so that visual barriers between developments and adjacent streams are minimized.

# 3 Wildlife Habitat Preservation

Has the project been designed to minimize impact upon wildlife habitat and the riparian ecosystem which exists on or adjacent to the site? Does the project design protect established habitat or any known populations of any threatened or endangered species or species of special concern?

Preserving wildlife habitat is a key consideration of the Streamside Ordinance; careful development of areas adjacent to streams can minimize the disruption of critical riparian vegetation and wildlife access. The Ordinance does not, however, require specific standards in reference to the preservation of wildlife areas. For the most part, wildlife considerations are incorporated as parts of other requirements of the Ordinance. The exception to this statement is the provision for the Preble's Meadow Jumping Mouse (PMJM). A number of Streamside segments in the northern part of the City have documented PMJM habitat. Due to the fact that the PMJM is a Federally Endangered Species, and the PMJM protection standards are very stringent, those stream segments are not included in the Streamside Overlay. Should the status of the PMJM change, the status of the Streamside Overlay Map could be re-evaluated to potentially include those segments. Recommendations and requirements of any U.S. Fish & Wildlife Habitat Conservation Plans should be incorporated in the proposed design, in conformance with Review Criterion No. 7 in these guidelines.

## Riparian Vegetation

The Ordinance encourages the utilization and preservation of significant stands of riparian vegetation and floodplain areas that provide habitat to wildlife. First, the Ordinance ensures the protection of critical habitat by discouraging fill and inappropriate land uses within the floodplain and along the City's streams, and by retaining or supplementing existing riparian vegetation. Riparian areas not only provide habitat for birds and mammals, but also help protect aquatic habitat for fish and macro invertebrates. By providing shade which keeps water temperatures down, filtering pollutants and sediments out of runoff, and serving as a source of woody debris, riparian areas are critical for the protection of aquatic habitats.

The Streamside Ordinance utilizes the Lower Elevation Riparian and Upper Elevation Riparian Signature Plant Community recommendations in the City's Landscape Code. These plant communities include plantings that have naturally occurred within, or are historically adapted to our riparian areas.



**FIGURE 20 - Wildlife Preservation.** Ducks swim in a man-made pond along Sand Creek. This pond was engineered for flood control and also provides habitat for local wildlife.

**FIGURE 21 - Urban Wildlife.** Deer relax near a stream on the west side of town.



### **Wildlife Access**

Many species of wildlife have daily and/or seasonal movement patterns along more or less established corridors. These may be between nesting, resting, roosting, feeding and watering areas. According to the Colorado Natural Resource Conservation Service, riparian areas comprise less than 3% of the State, but support the majority of all vertebrate wildlife species found in Colorado.<sup>1</sup> In El Paso County, habitats along rivers and streams contain the highest density and diversity of wildlife species.<sup>2</sup> Migratory and resident birds have a particularly strong reliance on these areas. The field checklist of birds for Fountain Creek Regional Park and the Colorado Springs State Wildlife Area (along Fountain Creek) indicate that over 270 different bird species have been sighted at these areas of which 60 are nesting species.<sup>3</sup> Not only is wildlife an aesthetic resource in our community, but it has important economic benefits as well. In a study commissioned by the Colorado Division of Wildlife in 2002, it is estimated that hunting, fishing, and wildlife related expenditures contributed over 1.5 billion dollars to the Colorado economy annually.<sup>4</sup>

To protect wildlife corridors, the site grading standards limit the length of walls running along streams that might introduce an obstacle to wildlife movement. Furthermore, bridges, utility corridors, or other elements that bisect the stream are to be designed to limit the size of af-

ected riparian area. When possible, these elements should be designed at right angles to the stream corridor and should provide ample opportunity for wildlife to migrate along the corridor.

By conserving vital vegetation, encouraging appropriate new landscaping, incorporating the recommendations of the U.S. Department of Fish & Wildlife and protecting movement corridors along and across our streams, the Streamside Ordinance will support the continued presence of wildlife in the Pikes Peak area.

*1 United States Department of Agriculture, Colorado Resource Conservation Service, 14*

*2 El Paso County, Ch. 1-B §2.0*

*3 Colorado Field Ornithologists*

*4 Picton et al, 4*

## **ESSENTIAL POINTS**

- **Minimize impact to wildlife and existing riparian vegetation.**
- **Utilize the Lower Elevation Riparian and the Upper Elevation Riparian Signature Plant Communities listed in the City's Landscape Code and Policy Manual.**
- **Implement recommendations of the U.S. Fish & Wildlife.**

# 4 Trails and Recreation

Have existing or potential community trail networks and other recreational opportunities been identified and incorporated into the project design?

Streamside areas and creek corridors represent an important framework and valuable resource in the community's open space system. Creeks and waterways contain the community's rich riparian areas, which represent a very small percentage of all land within the community, yet support approximately 70% of all vertebrate wildlife species. Additionally, riparian areas embody various open space values, including but not limited to, significant vegetation, water resources, recreation opportunities, nature observation and environmental education opportunities, visual resource, urban shaping and buffering, linkages and corridors between existing open space areas.

Trails, both public and private, connect the stream corridors and open spaces to communities and businesses and provide ample opportunity for patrons and residents to experience nature. In designing any proposed streamside development, the inclusion of trails is therefore essential.

Through the subdivision platting process, it may be possible to receive park land credit for trails and open space areas included in the overall design of the development. This scenario is only possible if sufficient park land is being dedicated for park purposes within the vicinity. Park land credit may be given by the Parks, Recreation and Cultural Services Department for open space that contains significant natural resources and provides significant community benefit. Open space credit may be given if the City finds the credit allowed is in the public interest to do so.

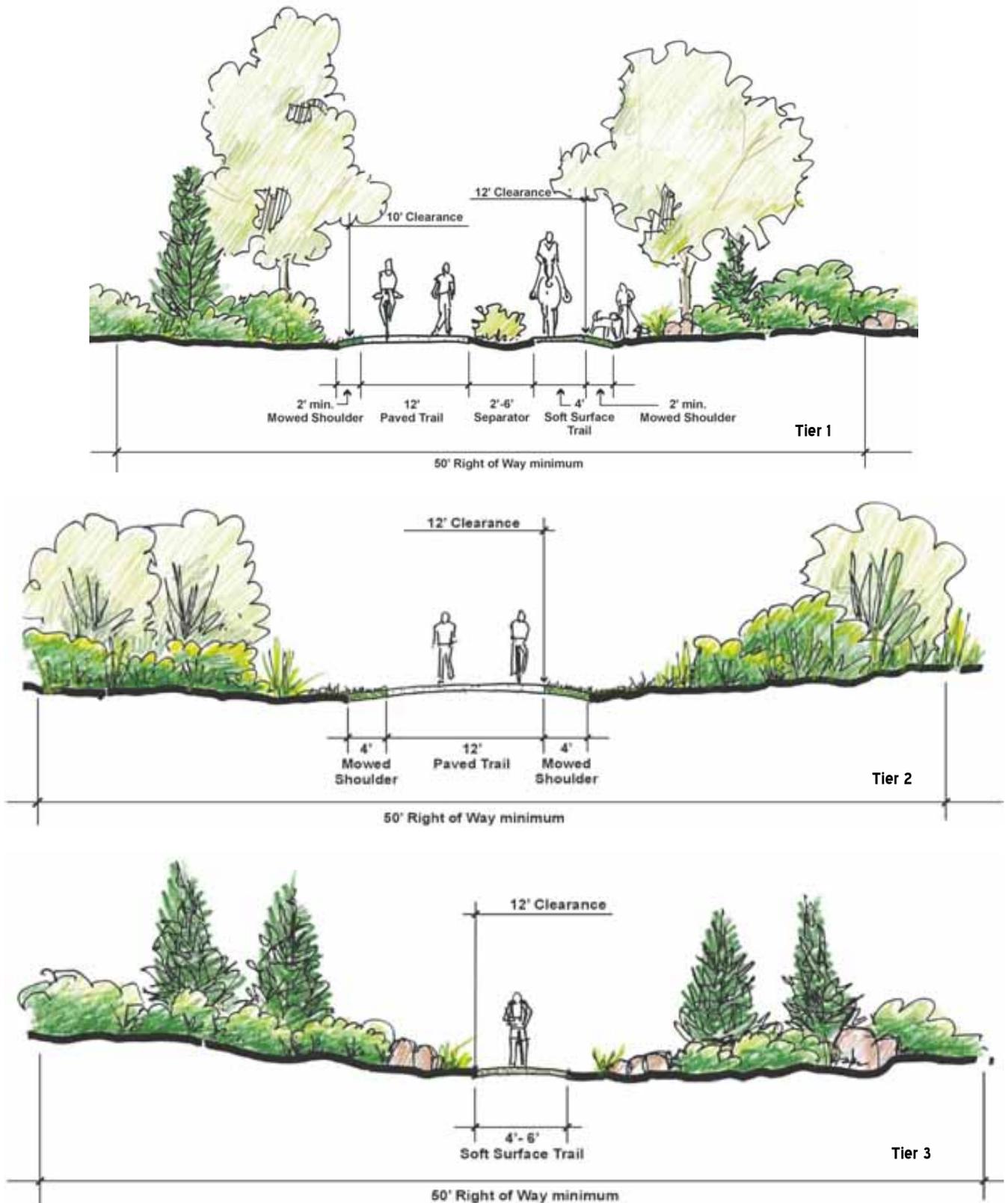
If the applicant believes he or she has acceptable open space in his or her development, he or she needs to contact the Parks Department so the land can be evaluated.

## ESSENTIAL POINTS

- **Plan trails between developments and streams to foster interactivity.**
- **Utilize the floodplain as a trail location.**
- **Credit will only be given for the trail if it is included on the approved Trails Master Plan.**



**FIGURE 22 - Pedestrian Bridge.** A bicyclist shares the trail with a runner, enjoying his day of recreation. The trail meanders Monument Creek, crossing the stream over a pedestrian bridge.



**FIGURE 23 - Trail Hierarchy.** Trails in the City are organized into three tiers. The tier system provides for a variety of levels of activity.

# 5 Floodplain

## Has the project been designed to protect the subject property from potential flood damage and to accommodate flood storage and conveyance needs?

Floodplains are land areas that are susceptible to being inundated by water from rainstorms and runoff. While not conducive to development, the floodplain offers many other benefits including water, biological and cultural resources. The floodplain protects against flood and erosion, promotes and maintains water quality and is instrumental in maintaining groundwater supply and balance. Further, habitats for various flora and fauna are found within areas adjacent to streams. Finally, the floodplain serves as a location for both active and passive recreation, for scientific study and for outdoor education.

The existing floodplain performs an important reservoir function, but as floodplain area is lost to graded fill, the relative stormwater runoff velocities increase or the relative flood level rises. In urban areas, the maximum discharge associated with floods and storm events increases dramatically; peak flows in western urbanized watersheds have been known to increase as much as 3.5 times over natural conditions.<sup>1</sup> When reduced floodplain area is combined with more

frequent and greater volume flood events, the entire watershed has increased exposure to flood damages. Colorado's 10 year average flood damage is equal to \$44,223,000 from 1994 to 2003. This average ranks the State of Colorado as the 21<sup>st</sup> most impacted state in the country during that specific ten year period.<sup>2</sup> For these reasons, adhering to strict development regulations in floodplain areas is both advised and required.

Development that conforms to local and federal flood regulations is less prone to flood damage than preexisting development. The minimum regulations vary depending upon mapping and risk studies that have been done in the community, but generally include:

- Permitting for all proposed new development;
- Reviewing subdivision proposals to assure that they will minimize flood damage;
- Anchoring and floodproofing structures to be built in known floodprone areas;



**FIGURE 24 - Floodplain.** Although floodplains cannot be developed for structures, trails provide an excellent way to enjoy the land.

**FIGURE 25 - Monument Creek.** A pedestrian bridge spans the width of Monument Creek, allowing pedestrians to cross in comfort.



- Safeguarding new water and sewage systems and utility lines from flooding; and
- Enforcing risk zone, base flood elevation, and floodway requirements after the flood insurance map for the area becomes effective.

Additionally, stormwater detention in the watershed can greatly contribute to mitigating the situations described in this section.<sup>3</sup>

The Streamside Ordinance complements federal flood zone development standards by discouraging fill and development within the floodplain by establishing buffer zones and requiring compliance with flood-related criteria. The Streamside Ordinance contributes to regulating development within floodplains, but floodplain management within the City of Colorado Springs is primarily administered by the Regional Floodplain Administration, located at 2880 International Circle. Before considering development within a floodplain, contact the Administration at (719) 327-2907.

In addition, Streamside Ordinance, 07-180 was adopted and prohibits fill within the 100-year floodplain. Three exemptions to this prohibition exist:

- Fill consistent with the Drainage Basin Planning Study (DBPS) and approved by FEMA with a Conditional Letter of Map Revision (CLOMR) and/or a Letter of Map Revision (LOMR);
- Fill in compliance with a development plan; and
- Fill that is part of an approved utility and/or public works project and permitted by a Floodplain Administrator and other appropriate agencies.

<sup>1</sup> Lethbridge

<sup>2</sup> United States Army Corps of Engineers, 18

<sup>3</sup> Lethbridge

## **ESSENTIAL POINTS**

- **Protect the floodplain, as it provides wildlife habitat, protects against flood and erosion, promotes and maintains water quality, and helps to maintain groundwater supply and balance.**
- **Utilize the floodplain for active and passive recreation and outdoor education.**

# 6 Significant Natural Features

Have all significant natural features within the project streamside area been identified, and has the project been designed to minimize the impact on these features?

To ensure protection of the stream and adjacent areas, the Ordinance instituted a requirement for a Land Suitability Analysis (LSA) in conjunction with any master plan, concept plan or development plan within a Streamside Overlay. The analysis should identify features such as rock formations, significant vegetation, endangered species habitat, cultural or historic features, hydrologic features such as groundwater springs and wetlands, and should provide basic information about physical characteristics and features of a site. It is also used to assess the impact of the proposed development across the entire project.

The report shall consist of both a written and graphic analysis of the physical and environmental factors which affect the site. If the site does not contain the elements previously listed or if the site has unique considerations, the Manager may waive certain elements of the land suitability analysis or require additional analyses.

## **Content of the Land Suitability Analysis**

The LSA includes both a graphic and written

component. The graphic component, or Composite Map, should show all components of the LSA overlaid on one sheet to direct the location of proposed land uses and structural development. The written component should summarize the existing site features and constraints and describe how the development of the site will occur in a manner which considers both the opportunities and constraints.

### **Composite Map**

The base of the composite map should show the stream area, including the toe of the channel bank and the boundary of the Streamside Overlay. Slope analysis and general topographic information should also be included in the form of 2 foot contours. The map should also illustrate areas of riparian vegetation and wildlife, including ecological communities and wildlife habitat and migration corridors and any significant natural or manmade features. Finally, any geologic hazards should be identified.

### **Written Text**

The written analysis must address mitigation for the physical constraints and hazards on-site.



**FIGURE 26 - Natural Features.** When evaluating a site for development, ensure a Land Suitability Analysis has been completed to protect significant vegetation. Prior to construction, ensure all features are protected with flagging.

This narrative shall include a bibliography of reference sources and curriculum vitae of the preparer. The latter requirement shall not be construed to imply a standard of qualifications for preparers.

## **Implementation**

After the LSA has been completed, the next step is to determine how to minimize the impact on the natural features that have been identified. The most impacted areas include the stream channel, streamside vegetation, floodplain, and upper bank and adjacent uplands.

### **Stream Channel**

With limited exception, the natural stream channel should be avoided and left undisturbed. Occasionally, temporary disturbance will occur during the installation of any required<sup>1</sup> bank stabilization measures or drainage improvements. Even where stream disruption is anticipated for these improvements, the proposed development should be designed to otherwise avoid the stream. This will allow the stream area to more quickly recover and will localize potential negative impacts of the stabilization and drainage measures.

### **Streamside Vegetation**

Streamside vegetation is of vital importance to stream integrity and quality. This area should have limited disturbance to ensure that it will continue to provide bank stabilization, stormwater runoff filtration and wildlife habitat. To ensure that the streamside and its associated vegetation is protected, it should be flagged or fenced during construction activities. Intermittent stream bank access points for pedestrian users and adjacent footpaths within the densely vegetated area may be appropriate improvements<sup>2</sup>.

### **The Floodplain**

The area within the 100-year floodplain provides for a greater level of interactivity. Land uses which are consistent with the scattered vegetative cover, require little or no impervious cover,

minimize exposure of the stream to elevated levels of pollutants and/or sediments and do not require filling of the floodplain are appropriate. Examples of indicated land uses include residential uses such as lawns, gardens, parking and play areas (where such uses can be implemented in a safe manner), recreational uses such as trails, benches and picnic areas, and nonresidential uses such as golf courses, loading areas and overflow parking. Parking and loading areas are appropriate only where finished with pervious materials. Golf course, lawn and garden uses are appropriate where conditions will limit chemical fertilizer and herbicide applications.

### **Upper Bank and Adjacent Uplands**

The upper bank and adjacent upland is the area of highest interactivity, and development should be encouraged to the extent that factors such as runoff, natural constraints, bank stability and fill limitations will permit. Site design should incorporate any bank features and rock formations where possible. A relatively intense pattern of development will encourage the utilization and stewardship of the many natural elements which combine to form the stream area.

1 As required by City Engineering or in accord with an applicable Drainage Basin Planning Study.

2 In some instances, Habitat Conservation Plans may prohibit this level of access.

## **ESSENTIAL POINTS**

- **A Land Suitability Analysis (LSA) is required in conjunction with a master plan, concept plan, or development plan within the Streamside Overlay Zone.**
- **The LSA should identify those significant natural features found on-site of any proposed development. Any potential negative impacts due to construction should be mitigated.**

# 7 Complementary Plans

Does the project identify and implement the recommendations of any approved subarea plans (such as the City Greenway Master Plan, City Open Space Plan or a specific drainage basin planning study) and of any approved public works projects and habitat conservation plans?

Streamside development is regulated not only by the Streamside Ordinance, but also by complementary plans including subarea plans such as the *Pikes Peak Greenway Plan* and neighborhood and community plans like the *Comprehensive Plan* (opposite page, right).

## **Subarea Plans**

Many sections of the stream system are located adjacent to the boundaries of one or several subarea plans. Subarea plans include Drainage Basin Planning Studies (DPBS) and other topic- and area-specific plans like the *Colorado Springs Open Space Plan* (opposite page, right) and the *Colorado Springs Urban Growth Area Inventory of Sig-*

*nificant Natural Features*. In these areas, more detailed subarea analyses have been done which provide for more specific recommendations than those indicated by the Streamside Ordinance alone. The challenge will be to provide for primary needs within the context of the multifaceted approach to streamside project development review.

## **Neighborhood and Master Plans**

Several areas of the City are master planned; that is, the area is governed by a comprehensive land use plan that typically specifies the location, improvements and sometimes design of the property within the boundaries. When developing in



**FIGURE 27 - Monument Creek.** A view of Monument Creek that has been preserved and protected via the complementary plans adopted by the City Council.



## Colorado Springs Open Space Plan



A Plan for the Conservation of Natural Areas and Greenways



master-planned streamside areas, careful attention must be paid to ensure the recommendations of both the applicable master plan and the Streamside Ordinance are implemented.

### Plan Implementation

The goal of staff during review of streamside sites will be to implement and facilitate compatible, stream-adjacent development practices. In many ways, this can best be accomplished by conducting these reviews at a team level where there are other specific agency requirements or by broadening the analysis through the use of a master plan. Whether one or both approaches are applied, the objective will be to enhance development value both from a developer and community perspective, and to ensure a simpler, but more inclusive approach to development review and administration.

### ESSENTIAL POINTS

- **Development proposals within the Streamside Overlay Zone should ensure not only that all requirements of the Streamside Ordinance are met, but also that the project takes into account the recommendations of complementary plans.**
- **Complementary plans to consider include, but are not limited to, area master plans, neighborhood plans, drainage basin planning studies, the Open Space Plan and the Comprehensive Plan.**
- **During the review of streamside development proposals, staff will also ensure that the objectives of applicable complementary plans are met.**

# 8 Riparian Buffers and Impervious Surfaces

Does the project design:

- Implement a riparian buffer of specified width between the developed portions of the site and the adjacent waterway to assist in preventing point and non-point source pollutants and sediment from entering the waterway?
- Exclude impervious surfaces from the inner buffer zone and meet imperviousness restrictions across the entire overlay?
- Incorporate all stormwater BMPs required by City Engineering throughout the developed site and adjacent to the buffer to encourage on-site filtration of stormwater and protect water quality?
- Incorporate visual buffer opportunities of the stream between identified existing and/or proposed projects on opposing sides of the stream?

The riparian buffer is that area which lies adjacent to the designated stream channel and is used to protect the stream corridor and adjacent wetlands. The streams within the city are divided into three different stream types, dependent on channel size, all of which include stream-side specific buffer widths, vegetation types and allowable uses.

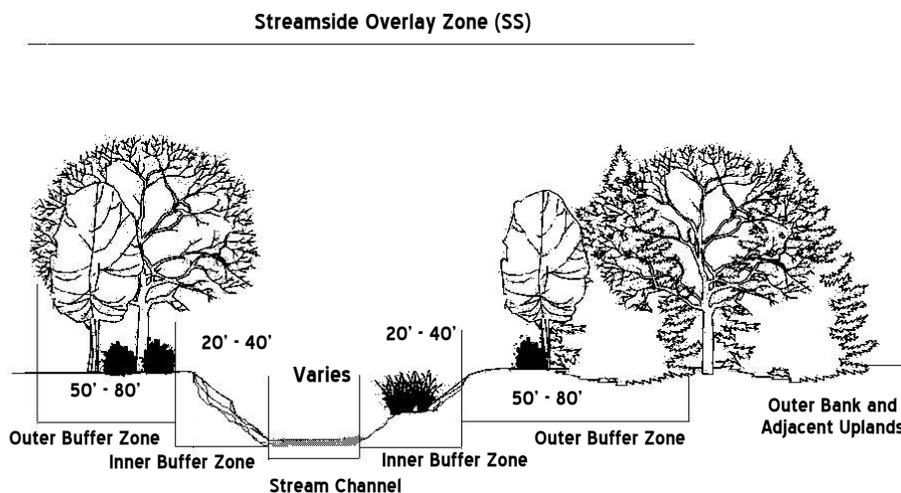
Riparian buffers can serve several purposes:

- Natural stream right-of-way - as most streams shift and widen over time, the buffer provides this room for movement.
- Conduit for floodwaters - natural riparian areas can reduce the impacts of large flood events.

- Stormwater treatment - stormwater runoff from adjacent properties can be treated as it filters through the buffer and its vegetation, removing many pollutants.
- Recreational systems - recreational uses within the inner buffer can provide an attractive complement to the adjacent development.
- Wildlife habitat/corridor - preserves and provides both aquatic and upland habitat and creates or preserves corridors for movement through urban areas.

In the planning of a riparian buffer, several items should be given special consideration:

- Function and value of the water resource;



**FIGURE 28 - Cross Section of the Streamside Overlay Zone.** The Streamside Overlay area is divided into three zones: Stream Channel, Inner Buffer Zone, and Outer Buffer Zone.

**TABLE 2 - Vegetation Requirements and Uses within the Overlay Zone.** Requirements are in addition to the Landscape Code requirements.

<b>Streamside Overlay Zone</b>	<b>Vegetation</b>	<b>Uses</b>
Stream Channel	Little to no vegetation; riparian where present	Stabilization, restoration and flood control only.
Inner Buffer Zone	Riparian vegetation corresponding to Appendix B; 1 tree per 20 feet of stream frontage	Riparian area; flood control, storm-water BMPs, landscaping, and recreational uses; no impervious surfaces.
Outer Buffer Zone	Riparian or upland vegetation; 1 tree per 30' of stream frontage	Upland area; all uses permitted within the underlying zoning and complying with 7.3.508.E.2.d(1)

- Soil type relative to the susceptibility to erosion;
- Vegetation compatibility;
- Site hydrology/drainage;
- Existing vegetation;
- Existing land use;
- Impact of proposed land use;
- Floodplain location; and
- Impact of vegetation on flows.

approval of the Community Development Department. Wetland areas, which are between defined channel banks and are contiguous to the stream itself, are to be considered a part of the stream channel regulation category. Stream bank stabilization, restoration activities, trail cross-

### **Stream Types and Buffers**

Within the city, three stream types are identified and represented on the Streamside Overlay zone on the City Zoning Map (Appendix C). Each streamside type establishes a buffer zone, made up of the stream channel, the inner buffer zone and the outer buffer zone.

#### **Stream Channel**

The protection of the stream channel is critical for flood mitigation, water quality and wildlife habitat. It is identified as the area between the toe of both channel banks. All proposed uses for the stream channel are subject to the review and

### **ESSENTIAL POINTS**

- **Define Stream Channel, Inner Buffer Zone and Outer Buffer Zone.**
- **10% site impervious surface is allowed. If additional Water Quality Capture Volume (WQCV) or stream bank improvements in excess of the DBPS are provided, up to 25% site impervious surface maybe allowed.**
- **Example Stormwater BMPs include Grass Buffers, Grass Swales, Porous Landscape Detention, and Constructed Wetlands Channels.**

	<b>Type 1</b>	<b>Type 2</b>	<b>Type 3</b>
<b>Typical Stream Channel Width</b>	Less than 25'	25'-75'	Greater than 75'
<b>Buffer Total</b>	70'	90'	120'
<b>Inner Buffer</b>	20'	30'	40'
<b>Outer Buffer</b>	50'	60'	80'

**TABLE 3 - Buffer Widths.**

ings, road crossings and flood control activities are typically the only permitted activities within the stream channel.

### Inner Buffer Zone

The Inner Buffer Zone is measured outward from the toe of the channel bank. It is considered a preservation area where uses are restricted to flood control stormwater BMPs, landscaping, utility corridors and recreational trails. Impervious surfaces are not permitted within the Inner Buffer Zone. Specific permitted, prohibited and/or conditional uses (listed in Section 7.3.508.E.2.d(1) of the Zoning Code), impervious surface limitations, grading limitations and landscaping standards apply within the Inner Buffer Zone.

### Outer Buffer Zone

The Outer Buffer Zone extends from the outward edge of the Inner Buffer Zone to the outer extent of the overlay area. The Outer Buffer Zone may often be an area of increased activity to improve the human relationship with adjacent stream area. The full range of uses that are permitted in the base zone (unless listed in Section 7.3.508.E.2.d (1) of the Zoning Code) are permitted in the Outer Buffer Zone. However, specific impervious surface limitations, grading limitations and landscaping standards will apply within the Outer Buffer Zone.

### Impervious Surfaces

An impervious surface is defined as a surface on or in real property where the infiltration of stormwater into the earth has been reduced by manmade improvements such as, but not limited to buildings or other structures; streets, parking

lots, storage areas and driveways (including gravel, dirt or stone driveways – although those constructed with pavers specifically designed to permit groundwater infiltration are considered pervious); brick, stone or paved patio areas; concrete or asphalt sidewalks; paving and compacted surfaces; and other bricked, oiled, macadam or hard-surfaced areas which impede passage of storm waters into the earth's surface. The conversion of pervious areas to rooftops, roads, and parking lots creates a layer of impervious surface in the urban landscape. In natural settings, very little annual rainfall is converted to runoff and about half is infiltrated into the underlying soils and the water table. Conversely, in situations with increased impervious surfaces, surface runoff increases the impact of flood events, increasing erosion and decreasing water quality.

### Site Imperviousness Standards

Those portions of the subject parcel or project that fall within the inner and outer buffer zone of the Streamside Overlay area shall be used to calculate the required limit on impervious surfaces. Wooden decks constructed with spaces between boards with pervious materials such as sand or gravel beneath are considered pervious. When ponds, wetlands, or water quality BMPs are located on the subject property, they are to be considered as pervious surfaces.

### Directions for Calculating Impervious Surface

1. Determine the square footage of the inner and outer buffer zone of the Streamside Overlay zone on each individual parcel. Any area included within the buffer, but not

	Stream Channel	Inner Buffer Zone	Outer Buffer Zone	Outside SS Overlay
% Impervious Allowed	0%	0%	10%	Restricted by base zoning
% Allowed with WQCV or Other Improvements	0%	0%	25%	Restricted by base zoning

TABLE 4 - Impervious Surface.

- within the property should not be included in this calculation.
2. Determine the square footage of impervious materials within the portion of overlay zone on each individual parcel.
  3. Calculate the percentage of impervious surface using the results of steps 1 and 2.
  4. Provide the square footage of impervious surface and percent impervious calculation for each lot on the plan for submittal.

If calculating percent impervious surface for a development with more than one parcel, use steps 1 and 2 above for the entire project to determine total percent impervious surface. The percent impervious surface for specific parcels within a larger development may exceed 10% impervious surface, as long as the threshold is met by the entire development as a whole.

### **Exemptions**

Recreational trails within the overlay zone are exempt from impervious surface calculations and restrictions. Impervious surface outside the Overlay zone is not regulated by the section and is only subject to coverage limitations imposed by the base zone, as applicable.

### **Bonuses**

For special sites with constraints or other issues that do not allow the site to conform to the allowed 10% impervious surface, there is the potential for the site to be allowed to have 25% impervious surface within the Streamside Overlay. In order to qualify for this bonus, the development plan can provide either:

1. Water Quality Capture Volume (WQCV)
  - The approved WQCV detention must be acceptable to City Engineering under its municipal stormwater discharge permit BMP requirements.
  - Types of facilities allowed and design criteria will be determined by City Engineering.

- Detention period determinations must be provided by the applicant; must be prepared by a Professional Engineer, licensed in the state of Colorado; and shall be included as a component of the drainage report.
  - ◊ The detention area must fall outside of the 100-year floodplain, as amended and as it exists prior to any grading, filling and development activity. Determination of qualification under this part shall be made by City Engineering;

- or
2. Streamside improvements that exceed DBPS requirements or other development standards that are acceptable to City Engineering and City Planning. Possible improvements include:
    - Stream bank stabilization and grade control;
    - Replacing concrete stream channels with bioengineering or other stabilization techniques that allow more infiltration yet provide economical maintenance;
    - Ecological restoration activities including invasive species removal;
    - Riparian habitat restoration; and
    - Other significant ecological improvements.

## **Stormwater Best Management Practices**

The stormwater generated from impervious surfaces resulting from development can impact stream hydrology, stream morphology, water quality and aquatic ecology. The Inner and Outer Buffer Zones that have been instituted provide an opportunity to protect the stream from harmful stormwater runoff. The extent of the impact is dependent on climate, land use and the BMPs that have been implemented.<sup>1</sup>

The stream impacts include:

- Stream Hydrology: Urban development affects the environment through changes in the size and frequency of storm runoff

events, changes in base flows of the stream and changes in stream flow velocities during storms results in decrease in travel time for runoff. Peak discharges in a stream that are not detained can increase from urbanization due to decrease in infiltration of rainfall into the ground, loss of buffering vegetation and resultant reduced evapotranspiration. This results in more surface runoff and larger loads of various components found in stormwater.

- **Stream Morphology:** When the hydrology of the watershed changes, the physical characteristics of the stream change. Such changes include stream bed degradation or aggradation, stream widening and stream bank erosion. As the stream profile degrades and the stream tries to widen to accommodate higher flows, in-stream bank erosion increases along with sediment loads. These changes in the stream bed also result in change to the habitat of aquatic life.
- **Water Quality:** Water quality is impacted through urbanization as a result of erosion during construction, changes in stream morphology and washing off of accumulated deposits on the urban landscape. Water quality

problems include turbid water, nutrient enrichment, bacterial contamination, organic matter loads, metals, salts, temperature increases and increased trash and debris.<sup>2</sup>

City Engineering has developed drainage manuals, which are available on the City's website, to assist users in determining what BMPs are applicable for a given site. BMPs are defined as a schedule of activities, prohibitions of practice, maintenance procedures, and other management practices to prevent or reduce the pollution of water of the State of Colorado. BMPs also include treatment requirements, operating procedures and practices to control site runoff, spillage or leaks, waste disposal or drainage from material storage.<sup>3</sup>

The specific runoff from developed impervious surfaces, be they streets, parking lots and to a lesser extent sidewalks and rooftops, can contribute disproportionately to the degradation in the overall quality of stormwater runoff. Parking lots in particular can introduce significant pollutants into a stream system due to stormwater runoff carrying deposits of oil, gas and rubber particles into the stream ecosystem.



**FIGURE 29 - Cottonwood Creek.** Structural and vegetative protection combine along Cottonwood Creek as an example of Stormwater Best Management Practices (BMPs).

**FIGURE 30 - Natural Stream.** Well vegetated natural stream banks protect the water quality of the streams running through them.



To lessen the impact of the stormwater runoff, the inclusion of BMPs, generally within required landscape areas, can be utilized within the overlay zone. BMP facilities may be located throughout the site, reducing the need for inlets and subsurface conveyance systems.

Below are four examples of types of structural BMPs that are appropriate for streamside sites. Other BMPs may be appropriate and will be considered on a case-by-case basis. The allowance for alternative BMPs will be evaluated by City Planning and approved by City Engineering. Grass buffer, grass swale, porous landscape detention and constructed wetlands channel are examples of BMPs and will be discussed in the following sections. Not all of the BMPs listed below have WQCV.

### **Grass Buffer**

Grass buffers (GB) are uniformly graded and densely vegetated areas of turf grass. They require sheet flow to promote filtration, infiltration and settling to reduce runoff pollutants. GBs differ from grass swales, as they are designed to accommodate overland sheet flow

rather than concentrated or channelized flow. They can be used to remove larger sediment from runoff from impervious areas.

Whenever concentrated runoff occurs, it should be evenly distributed across the width of the buffer via a flow spreader. This may be a porous pavement strip or another type of structure to achieve uniform sheet-flow conditions. GBs can also be combined with riparian zones in treating sheet flows and in stabilizing channel banks adjacent to major drainageways and receiving waters. GBs can be interspersed with shrubs and trees to improve their aesthetics and to provide shading. Irrigation in the semi-arid climate of Colorado is required to maintain a healthy and dense grass on GBs to withstand the erosive forces of runoff from impervious areas.

### **Grass Swale**

Grass swales are densely vegetated drainageways with low-pitched side slopes that collect and slowly convey runoff. Design of their longitudinal slope and cross-section size forces the flow to be slow and shallow, thereby facilitating sedimentation while limiting erosion. Berms or

check dams should be installed perpendicular to the flow as needed to slow it down and to encourage settling and infiltration.

### **Porous Landscape Detention**

Porous landscape detention (PLD) consists of a low lying vegetated area underlain by a sand bed with an under-drain pipe. A shallow surcharge zone exists above the PLD for temporary storage of the WQCV. During a storm, accumulated runoff ponds in the vegetated zone and gradually infiltrates into the underlying sand bed, filling the void spaces of the sand. The under-drain gradually dewateres the sand bed and discharges the runoff to a nearby channel, swale, or storm sewer. This BMP allows the WQCV to be provided on a site that has little open area available for stormwater detention.

### **Constructed Wetlands Channel**

Constructed wetland channels (CWC) take advantage of dense natural vegetation (rushes, willows, cattails and reeds) to slow runoff and allow time for sediment settling and biological uptake. A CWC is another form of sedimentation facility and treatment plant. Constructed wetlands differ from natural wetlands as they are artificial and are built to enhance stormwater quality. Sometimes small wetlands that exist along ephemeral drainageways on Colorado's high plains may be enlarged and incorporated into the constructed wetland system. Such action, however, requires the approval of federal and state regulators. Regulations intended to protect natural wetlands recognize a separate classification of wetlands constructed for a water quality treatment. Such wetlands generally are not allowed to be used to mitigate the loss of natural wetlands, but are allowed to be disturbed by maintenance activities. Therefore, the legal and regulatory status of maintaining a wetland constructed for the primary purpose of water quality enhancement is separate from the disturbance of a natural wetland. Nevertheless, any activity that disturbs a constructed wetland should be first cleared through the U.S. Army Corps of Engineers to ensure it is covered by

some form of an individual, general, or nationwide 404 permit.

### **Visual Buffer**

As communities have become more active in planning, streams have come to the forefront in the deliberative process of defining the use and structure of our urban areas. Each successful stream development adds incrementally to the overall value of the stream system, but also benefits from the adjacency of an attractive natural feature. By protecting, enhancing and preserving the vegetation and natural landforms of the stream area, opposing sides of the stream enjoy a gentle, but highly effective separation of activities. Often, these are activities which would otherwise be incompatible are compatible and co-exist harmoniously. By way of example, intensive, stream-compatible business uses can comfortably co-exist with pleasant residential areas when separated by well-developed stream buffers. In the design stage of a streamside project, this potential should be considered and used to the benefit of the developer, the community and the stream area.



**FIGURE 31 - Impervious Surfaces.** Trails do not count toward total allowable impervious surface percentage as they are amenities.

The advantages of stream buffers are evident when properly designed. The physical separation or distance the stream creates allows uses to be separated by a larger distance than may normally be required. Within the physical separation, vegetative visual screens can be incorporated to exceed the landscaping requirements normally required between two uses. Noise mitigation between a streamside compatible industrial use and a residential development can be attained through separation and vegetative visual screens that streamsides provide. Buffering is especially valuable when the project under consideration is bisected by a stream, and development opportunities within the project area exist on both sides of the stream.

1 *Caraco et al*

2 *Ibid.*

3 *City of Colorado Springs*



**FIGURE 32 - Visual Buffers.** Visual buffers, such as mature trees, provide screening between properties.

# 9 Landscape

Are inner and outer buffer zone landscaping standards met? Have disturbed areas been revegetated to minimize erosion and stabilize landscape areas and does the project landscaping design specify plants selected from the riparian plant communities as set forth in Appendix A of the Landscape Policy Manual? Does the proposal meet all other requirements of the City's Landscape Code?

## Intent

A compiled list of native and introduced riparian plants proven successful in semi-arid climates is provided in the *Landscape Code & Policy Manual*, found in Appendix B. When this plant material is strategically designed and applied to the inner and outer buffers, it can provide streamside revegetation and support an integrated landscape design connecting the developed site to the streamside feature.

## Requirements

Any development project within the Streamside Overlay zone is required to meet the Inner and Outer Buffer Zones landscape requirements shown below in Table 5, in conjunction with the *Landscape Code & Policy Manual* requirements.

## Plant Material

Of the eight identified regional plant communities represented in the *Landscape Code & Policy Manual*, plants from the Lower and Upper Elevation Riparian are the most common and naturally exist within the stream channel and Inner Buffer Zone. The Inner Buffer Zone may exist at an elevation comparable to the streamside channel, and in this case should exhibit naturally occurring riparian plants. However, if the Outer Buffer Zone sits at a higher elevation than the

streamside channel, it is likely that prairie or semi-arid shrubland plants will be exhibited. Plant selection is key when determining how to best integrate the built environment landscape with the undisturbed natural features of this community.

The use of any plant genus and species may require coordination with and prior approval from the Army Corps of Engineers and /or the Department of Fish and Wildlife especially when used within the channel or for bank stabilization. Plant species selection shall be dependent upon the regional geographic characteristics of the site. When existing streamside plant material is identified within a Land Suitability Analysis or as part of development plan criteria, the regional geographic characteristic and plant communities shall be considered in plant selection specific to this part for the Inner and Outer Buffer Zones.

## Stormwater Management within the Landscape

The *Landscape Code & Policy Manual* breaks site design into different site categories. Four of these categories present opportunity for integration of the streamside buffer with stormwater management and landscape techniques. This integration will supplement larger water quality and detention pond facilities with the same pur-

	Inner Buffer	Outer Buffer	Outside SS Overlay
<b>Trees</b>	1 tree per 20' of stream frontage	1 tree per 30' of stream frontage	Meet requirements of Landscape Code
<b>Shrubs</b>	Can be substituted at 10 shrubs per 1 tree	Can be substituted at 10 shrubs per 1 tree	
<b>Stabilization</b>	Required if within the 100-yr floodplain	Required if within the 100-year floodplain	
<b>Existing vegetation (in Streamside area)</b>	Can count toward requirements	Can count toward requirements	Cannot count toward site development requirements

**TABLE 5 - Landscape Requirements.** Streamside landscape requirements are dependant on the streamside buffer zone and are required in addition to Landscape Code requirements.

pose—to slow surface water runoff before entering the stream.

### **Landscape Setbacks and Double Frontage Lot Streetscapes**

Landscape setbacks are located adjacent to roadways; however, setbacks do not serve as riparian buffers. The landscape setback area could be used to locate bio-retention, to slow flow rates into the stream, when the landscape treatment matches the stormwater use and meets all setback and screening requirements.

### **Motor Vehicle Lots**

Motor vehicle lots and islands may serve as porous landscape detention areas where the flow is allowed to be held and ultimately infiltrate into the subsurface. Each lot must be engineered to determine the runoff capacity from the parking lot into the islands, and appropriate plant material must be selected for this function. On motor vehicle lots that encroach into the Outer Buffer Zone, the landscape design must mitigate impacts, in addition to meeting minimum screening and onsite category landscape requirements.

### **Internal Landscape**

Stormwater BMP facilities can be readily accommodated within internal landscape areas. In some instances riparian buffers may qualify towards the internal landscape site category requirement, depending on location, size and distribution of the plant material.

### **Landscape Buffers and Screens**

A fifteen-foot landscape buffer, in general, is required between incompatible land uses and can apply on Streamside Overlay zoned properties depending upon adjacent site situations. The landscaping buffer plant requirements can be accommodated within the Inner or Outer Buffer Zones; however, this does not negate the streamside plant requirements. Stormwater facilities such as vegetated swales, bio-retention, or rain gardens could occur within the required landscape buffer when the overall fifteen-foot depth

is met, higher intensity uses are screened, and the intended purpose (buffer/screen) is achieved. In streamside conditions, the six-foot opaque buffer structure, which is typically required by Code, is discouraged. Instead an integrated site design, which brings together the streamside character with the site development, is encouraged.

### **Landscape Preparation**

The location, size and design of all stormwater facilities and related landscape integration shall be provided at the development plan stage and shall be designed to meet landscape and engineering code requirements, found in Chapters 7 and 3 of the City Code, respectively. Specific details such as a cross-section and/or detail to address sub-grade specifications shall be provided prior to building permit.

## **ESSENTIAL POINTS**

- **Compatible plant material should be provided to bridge between the streamside buffer area and the landscaped property.**
- **Streamside landscape requirements are required in addition to Landscape Code & Policy Manual requirements.**
- **Stormwater management techniques should be utilized and integrated within the landscape design along the streamside interface.**

# 10 Stream Bank Stabilization

Have stream bank and slope areas been identified (particularly those over fifteen percent (15%) slope)? Has the disturbance to these areas and any protective or stabilizing vegetative cover been minimized? Does the plan provide for the suitable revegetation and stabilization of any disturbed areas?

Native stream banks and slopes in stable condition with vegetative cover should, in most circumstances, remain undisturbed. In areas where bank stabilization is required, and/or disturbance occurs within the parameters of the Streamside Ordinance, bank stabilization should take place consistent with the applicable drainage basin planning study (DBPS) or through an alternative method such as soil bioengineering. Alternative methods would require review by City Planning and acceptance by City Engineering.

## Techniques

Soil bioengineering is the use of natural vegetative systems, typically through cuttings or pole plantings and rebuild or stabilize slopes. These practices on larger streams or areas experiencing severe erosion would be best suited to a multidisciplinary approach to recommendations of stabilization from individuals with expertise in engineering, soils, biology, plant sciences, landscape architecture, geology and hydrology. Preliminary site investigation and engineering can determine the feasibility of using vegetation as a component of the stream bank stabilization.



**FIGURE 33 - Vegetative Stabilization.** Banks of Cottonwood Creek have been stabilized by planting trees, grasses and shrubs.

The first step in proposing a method for stream bank stabilization would be to reference the current DBPS for the site to review specific engineering recommendations for the subject site. It is imperative that stream flows be used to determine which bank stabilization techniques may be implemented. If the site does not lie within a study area, the design engineer may develop recommendations specific to the site for review and considerations.

In general, there are three techniques to stream bank stabilization:

- Surface Armor—surface armor is designed as a protective material and is in direct contact with the stream bank. Armor could fall under the category of stone, self-adjusting armor (blocks or rubble), rigid armor (concrete or soil cement) and flexible mattress (concrete blocks).<sup>1</sup>
- Indirect Method—the indirect method extends into the stream channel to redirect the flow of the stream and reduce the hydraulic forces of the stream channel to a nonerosive level. A few examples of the indirect method include dikes (permeable and impermeable) and other flow deflectors.<sup>2</sup>
- Vegetative Method—the vegetative method, which includes soil bioengineering, can function as either a surface armor or indirect method.<sup>3</sup>

The most effective stream bank stabilization project will likely include components of all three stream bank stabilization techniques. The challenge is to determine which technique will match the intensity of the flow of the stream during flood conditions and provide adequate protection. Surface armor is often used for long-

term durability, when water velocities are high, when the site could be inundated for long periods of time and when a significant threat to property or life is possible.<sup>4</sup> The Indirect method can be used in conjunction with surface armor to provide redirection of the stream flow, which can reduce erosion caused by the stream channel. Use of the vegetative method could include pole plantings, cuttings and live stakes to offer greater initial resistance to high flows, and would be more resistant to erosion. Typical methods of vegetative or soil bioengineering for slope stabilization include:

- **Anchored cutting systems**—this method employs the use of cuttings that are arranged in bundles, secured to the stream bank and partially buried. This could include brush mattresses, brush layers, fascines, reed rolls, etc.
- **Geo-textile systems**—this method is similar to brush layers, except that this method utilizes fabrics (biodegradable are preferred) in the soil lifts between cuttings. This method allows for the reconstruction of a bank while providing considerable erosion resistance.
- **Integrated systems**—this system involves the use of vegetation in conjunction with structural approaches to stream bank stabilization. This can involve the placement of cuttings during construction or the insertion of cuttings in existing stone revetments.

Cost comparisons between armored systems and vegetative systems show that armored systems have a higher initial cost, minimal maintenance and a higher replacement cost. On the other hand, vegetative systems generally have a lower initial cost, but do have higher management and monitoring costs over the life of the system.<sup>5</sup>

## Landscaping

The application of the vegetative method technique as part of stream bank stabilization would be allowed to count toward the landscape requirements under the *Landscape Code & Policy*

*Manual*. The use of plant materials in slope stabilization and erosion control can be an effective means with which to protect properties and sites from degradation due to runoff. The selection of plant materials appropriate for the desired effect is critical to achieve the intended results. For the best results in bank stabilization, different plant species should be selected with the following traits:

- Deep root systems;
- Fibrous root systems;
- Legumes with deep roots and nitrogen fixing capabilities;
- Tall, leafy crowns; and/or
- Low spreading plants.

## Site Integration

Stream banks and vegetated slopes can become important components in any site design. In addition to applying towards specific landscape requirements, these spaces can also serve as valuable functional resources when incorporated into site design. Areas of grading, building construction, parking and developed landscape components can and should take every opportunity to integrate improvements where appropriate.

1 United States Department of Agriculture, Federal Interagency Stream Restoration Working Group

2 *Ibid.*

3 *Ibid.*

4 *Technical Supplement 14I*

5 *Ibid.*

## ESSENTIAL POINTS

- **There are three techniques for stream bank stabilization—surface armor, indirect, and vegetative.**
- **Landscape requirements can be achieved in conjunction with stabilization techniques.**
- **The use of stream bank stabilization can improve and enhance site integration.**

# 11 Stream Reclamation

Have opportunities to reclaim the drainageway been identified and implemented where practical? For this criterion, reclamation constitutes any action that improves the quality of that drainageway visually, functionally, or recreationally, and brings that drainageway into a more natural condition.

## **Possible Candidate Reclamation Sites**

The urban streamside is directly affected by human activity adjacent to the stream. This activity can incorporate and celebrate or can exclude and degrade the stream. The condition of a stream, natural or lined with concrete, plays a large role in the ability of the stream to be integrated with the project. Natural streams provide many benefits to the community, including:

- Wildlife habitat;
- Aesthetics;
- Recreational opportunities; and
- Stormwater management.

This review criterion encourages the reclamation or restoration of concrete-lined streams to a more natural state. The benefits of reclamation to the community are as follows:

- Improved aesthetics;
- Improved riparian habitat; and
- Improved wildlife habitat.

Examples of stream reclamation include exposing a drainageway that was previously contained within an underground pipe, removal of fill from areas which are within the historic 100-year floodplain, replacement of a concrete channel lining with a lining material that is more natural in appearance, and converting nonconforming uses into conforming uses.

## **Expense and Priority**

The cost of reclamation can be quite high, and all avenues of outside funding should be explored to help offset this cost (additional land acquisition is usually required). In some cases, project stream improvements may qualify the project for assistance from federal agencies which oversee watershed programs. The Federal Emergency Management Agency (FEMA) has relief programs that provide funding for certain watershed improvements, which may include acquisition of developed properties within the floodplain. The cost of stream restoration and the dramatic impact that restoration can have upon



**FIGURE 34 - Concrete Channel.** If possible, concrete channels should be reclaimed to provide a natural amenity adjacent to developments.

overall stream quality suggest the need for full support from reviewing staff. No specific reclamation shall be required except in some cases where the stream fails to meet City drainage requirements or where existing man-made fill areas exceed maximum slopes suitable for revegetation. Where provided, reclamation may qualify the development for partial or total exemption from other Streamside Ordinance requirements.

### **Qualifying Area**

Where stream improvements have been classified by the reviewing planner as reclamation, the adjacent streamside upland may qualify for exemption from other requirements. Developments which qualify for exemption may be further enhanced through treatments recommended by the ordinance and design guidelines, and applicants are encouraged to implement these recommendations.

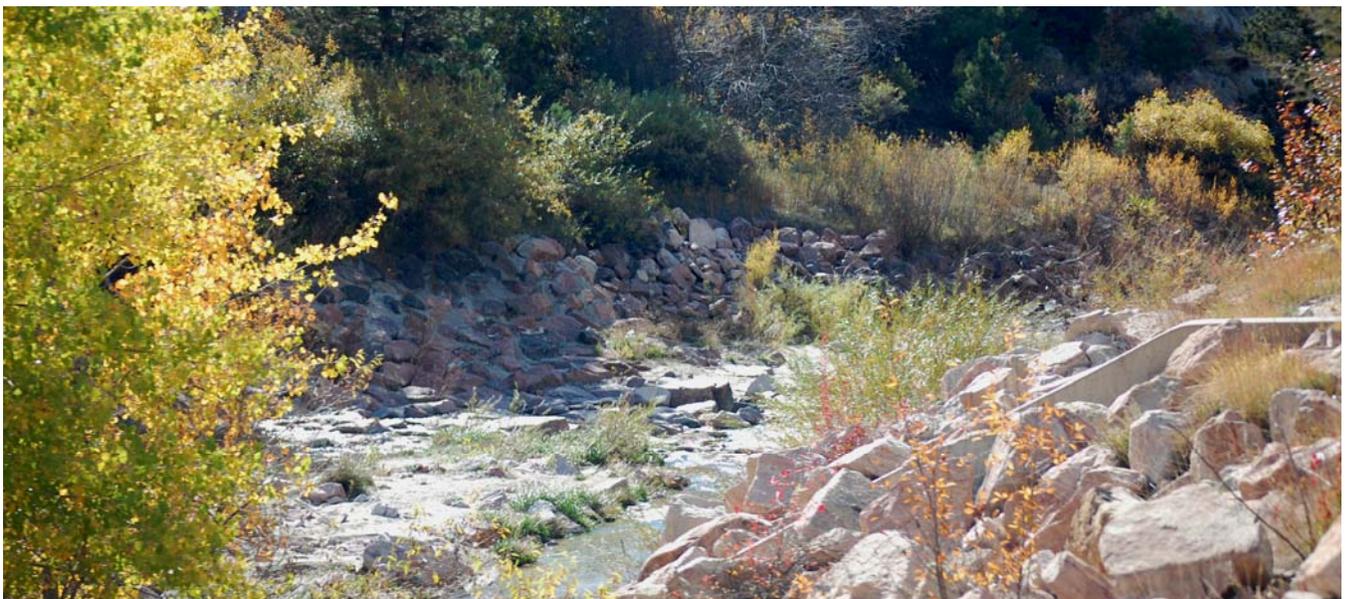
### **Incentives**

Because the desire to reclaim a stream is often overshadowed by the cost of reclamation, the City is willing to consider incentives to encourage stream reclamation. If the reviewing planner determines that variances for development standards (setbacks, height, lot coverage), increased

imperviousness within the Streamside Overlay, and/or decrease in parking requirements are applicable to and appropriate for the development, these may be granted in conjunction with stream reclamation. In addition, support for a use that is classified as a conditional use by the Streamside Overlay or under the zoning of that parcel may be encouraged in conjunction with stream reclamation. Stream reclamation provides a natural streamside appearance that can positively affect the property and potentially the property values.

## **ESSENTIAL POINTS**

- **The stream reclamation process can enhance and provide an amenity to a streamside site.**
- **The reviewing planner and engineer will assist in determining which areas apply for reclamation.**
- **Possible incentives for stream reclamation may be available through the review process.**



**FIGURE 35 - Natural Amenity.** Reclaimed streams can use techniques such as rip rap and vegetation to provide stabilization.





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and  
Further Reading

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# Glossary

Terms and  
Definitions

# Terms and Definitions

**Best Management Practices (BMPs)** - Schedules of activities, prohibitions of practice, maintenance procedures and other management practices to prevent or reduce the pollution of water within a watershed. BMPs also include treatment requirements, operating procedures and practices to control site runoff, spillage or leaks, waste disposal or drainage from material storage.

**Buffer** - An area of intact (or enhanced) vegetation maintained between human activities and a particular natural feature, such as a stream. The buffer reduces potential negative impacts by providing an area around the feature that is a transition from the activity.

**Building Height** - The vertical distance measured from the average elevation of the existing grades adjoining the building to the highest point of the roof surface of a flat roof and to a point five feet (5') below the highest ridge of a gable, hipped or gambrel roof. The average elevation of the existing grade adjoining the building shall be the average of the exposed exterior elevations of all major corners of the building. The height of a stepped or terraced building is the maximum height of any segment of the building.

**Channel Width** - Channel width is measured from the toe of the channel bank on one side of the channel to the toe of the channel bank on the opposite side of the channel.

**Drainage Basin Planning Study (DBPS)** - An engineering and planning study of a drainage basin which is tributary to a major receiving stream. Further information on the preparation of and submittal requirements for a DBPS can be obtained from City Engineering.

**Ecosystem** - An ecological community together with its environment, functioning as a unit.

**Evapotranspiration** - Loss of water from the soil due to the combination of evaporation and the transpiration of plants growing in the soil.

**Floodplain** - Flat land made up of alluvium (sand silt and clay) subject to flooding.

**Habitat Conservation Plan (HCP)** - A plan that, once developed and approved, allows nonfederal landowners to obtain an "incidental take permit" for species that are listed as threatened or endangered under the Endangered Species Act (ESA) in return for conservation commitments. Incidental take permits allow landowners to carry out specified economic activities on their land that may harm threatened or endangered species. Further information on HCPs can be obtained from the U.S. Fish & Wildlife Service.

**Impervious Surface** - A surface on or in real property where the infiltration of stormwater into the earth has been reduced by manmade improvements such as, but not limited to: buildings or other structures; streets, parking lots, storage areas and driveways (including gravel, dirt or stone driveways); brick, stone or paved patio areas; concrete or asphalt sidewalks; paving and compacted surfaces; and other bricked, oiled, macadam or hard-surfaced areas which impede passage of storm waters into the earth's surface.

**Indirect Method** - A method of stream bank stabilization which use techniques that extend into and alter the flow of the channel to prevent erosion along the channel, such as dikes and flow deflectors (e.g. bendaway weirs, "Iowa" barbs, etc.).

**Prudent Line** - The prudent line defines a buffer zone for erosion and flooding potential within which development would not be considered prudent if the channel is to remain in a natural state.

**Riparian Buffer** - The area that lies adjacent to the designated stream channel.

**Riparian Habitat** - The area adjacent to flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

**Riparian Vegetation** - Vegetation that requires the continuous presence of water, or conditions that are more moist than normally found in the area.

**Significant Natural Feature** - Refer to Section 7.2.201 of the City Code.

**Streamside Buffer** - An area of land within a specified distance of the edge of the stream channel. Areas have been identified as significant based upon their typical size, natural and vegetative characteristics, wildlife habitat suitability, open space and recreational opportunities and permitted and/or prohibited land use potential.

**Streamside Site Plan (SSP)** - A plan submitted at the time of building permit application which identifies and addresses site/streamside development requirements and issues. This plan may be used to fulfill the review requirements for certain streamside developments.

**Substrate** - The material forming the underlying layer of streams. Substrates may be bedrock, gravel, boulders, sand, clay, etc.

**Surface Armor** - A stream stabilization technique that uses a material that comes into direct contact with the soil, typically rock, riprap, soil cement, concrete, gabions, concrete block, etc.

**Toe of the Channel Bank** - The toe of the channel bank can be identified as the point where the sloping bank becomes level or nearly level to the channel bed (or water level). It is also often identified as the point where bank vegetation terminates with the channel substrate. Some streams within the City (i.e. Fountain Creek, Monument Creek, Templeton Gap Floodway) have very wide channels which are typically only partially utilized by flowing water; the water flow meanders within the channelized area and is subject to significant fluctuations from year to year.

**Vegetative Method** - A stream bank stabilization technique that functions either as armor or indirect protection, using plant materials in the form of cuttings, stakes, plugs, etc., to provide the stream bank protection or channel deflection.

**Water Quality Capture Volume (WQCV)** - The portion of a site's stormwater runoff which is detained and processed through site BMPs.

**Wetlands** - Those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.





# Figure Index

Figures and  
Tables

# Figures and Tables

<b>Page</b>	<b>Figures</b>
ii	Figure 1—Sand Creek. <i>Erin McCauley, 2008.</i>
iii	Figure 2—Cottonwood Creek. <i>Lonna Thelen, 2008.</i>
2	Figure 3—Cross Section of the Streamside Overlay Zone. <i>Erin McCauley, 2008.</i>
3	Figure 4—Cottonwood Creek. <i>Lonna Thelen, 2008.</i>
4	Figure 5—Plan View of Streamside Buffers. <i>Erin McCauley, 2008.</i>
5	Figure 6—Streamside Overlay Zone Location. <i>Erin McCauley, 2008.</i>
6	Figure 7—Land Use Hierarchy. <i>Erin McCauley, 2008.</i>
8	Figure 8—Streamside Review Process. <i>Erin McCauley, 2008.</i>
11	Figure 9—Criterion 6. <i>Sarah Keith, 2007.</i>
11	Figure 10—Criterion 4. <i>Sarah Keith, 2007.</i>
12	Figure 11—Pikes Peak Greenway. <i>Sarah Keith, 2007.</i>
13	Figure 12—Grading and Slope. <i>Erin McCauley, 2008.</i>
14	Figure 13—Typical Residential Development. <i>Ron Bevans, 2009.</i>
14	Figure 14—Preferred Residential Development. <i>Ron Bevans, 2009.</i>
15	Figure 15—Typical Office or Commercial Development. <i>Ron Bevans, 2009.</i>
15	Figure 16—Preferred Office or Commercial Development. <i>Ron Bevans, 2009.</i>
16	Figure 17—Typical Industrial Development. <i>Ron Bevans, 2009.</i>
16	Figure 18—Preferred Industrial Development. <i>Ron Bevans, 2009.</i>
17	Figure 19—Barrier Minimization. <i>Erin McCauley, 2008.</i>
18	Figure 20—Wildlife Preservation. <i>Erin McCauley, 2008.</i>
19	Figure 21—Urban Wildlife. <i>Erin McCauley, 2008.</i>
20	Figure 22—Pedestrian Bridge. <i>Lonna Thelen, 2008.</i>
21	Figure 23—Trail Hierarchy.
22	Figure 24—Floodplain. <i>Lonna Thelen, 2008.</i>
23	Figure 25—Monument Creek. <i>Lonna Thelen, 2008.</i>
24	Figure 26—Natural Features. <i>Ryan Tefertiller, 2007.</i>
26	Figure 27—Monument Creek. <i>Lonna Thelen, 2008.</i>
28	Figure 28—Cross Section of the Streamside Overlay Zone. <i>Erin McCauley, 2008.</i>

32	Figure 29—Cottonwood Creek. <i>Erin McCauley, 2008.</i>
33	Figure 30—Natural Stream. <i>Lonna Thelen, 2008.</i>
34	Figure 31—Impervious Surfaces. <i>Lonna Thelen, 2008.</i>
35	Figure 32—Visual Buffers. <i>Lonna Thelen, 2008.</i>
38	Figure 33—Vegetative Stabilization. <i>Erin McCauley, 2008.</i>
40	Figure 34—Concrete Channel. <i>Ryan Tefertiller, 2007.</i>
41	Figure 35—Natural Amenity. <i>Lonna Thelen, 2008.</i>

**Page**

**Tables**

5	Table 1—Buffer Zone Widths.
27	Table 2—Vegetation Requirements and Uses within the Overlay Zone.
27	Table 3—Buffer Widths.
28	Table 4—Impervious Surface.
34	Table 5—Landscape Requirements.





# **Appendix A**

Streamside Ordinance, Ordinance

No. 07-179

Revised 2007

# Ordinance 07-179

CITY ATTY'S OFFICE  
CODE CHANGE REVIEW  
ATTY INIT PKK  
DATE 11/9/07

## ORDINANCE NO. 07- 179

AN ORDINANCE REPEALING AND REORDAINING SECTION 508 (STREAMSIDE OVERLAY ZONE) OF PART 5 (OVERLAY DISTRICTS) OF ARTICLE 3 (LAND USE ZONING DISTRICTS) OF CHAPTER 7 (PLANNING, DEVELOPMENT AND BUILDING) OF THE CODE OF THE CITY OF COLORADO SPRINGS 2001, AS AMENDED, PERTAINING TO THE STREAMSIDE OVERLAY ZONE

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF COLORADO SPRINGS:

Section 1. That Section 508 (Streamside Overlay Zone) of Part 5 (Overlay Districts) of Article 3 (Land Use Zoning Districts) of Chapter 7 (Planning, Development and Building) of the Code of the City of Colorado Springs 2001, as amended, is hereby repealed and reordained to read as follows:

### 7.3.508: STREAMSIDE OVERLAY ZONE:

#### A. Purpose, Applicability and Objectives

1. **PURPOSE.** Certain areas of the City are characterized by intermittent and perennial streams which provide significant wildlife habitat, riparian vegetation, water quality protection, flood protection, open space and multi-use trail opportunities which add to the character, attractiveness and quality of life of the community. It is the purpose of the streamside overlay zone district to guide the development and maintenance of the property adjacent to these stream corridors in a manner that is compatible with the environmental conditions, constraints and character of these areas.
2. **APPLICABILITY.** The streamside overlay zone encompasses all land within the stream channel, including stream-adjacent wetlands, and within a specified distance from the toe of the channel bank of specific intermittent and perennial streams within the City, as represented by the official streamside overlay zone as shown on the City zoning map. Streamside overlay zone requirements are not applicable to those wetland areas that extend beyond the mapped streamside overlay zone district boundary. However,

wetlands that are wholly or partially outside of the mapped streamside overlay shall be analyzed and protected as indicated or recommended by a land suitability analysis, when required.

3. **OBJECTIVES.** It is the objective of this section to protect and enhance streamside areas by promoting planned development within the streamside overlay zoned areas to the extent that those developments are found to be in accord with the streamside development plan review criteria and the streamside protection standards found in this section. Those parcels of land that have a significant proportion of streamside overlay zone are encouraged to consider establishing a PUD zone district where density, setbacks, building height, and other issues may be established which allow adequate use of the property while also meeting the streamside overlay zone's requirements and review criteria. If rezoning to PUD is not acceptable, the City may consider variance requests which help the project to meet the streamside overlay zone requirements and review criteria. All rezoning and variance requests shall be considered on a case-by case basis.

#### B. Definitions

**Best Management Practices (BMPs)** - Refer to Section 7.7.1502 of the City Code.

**Channel Width** - Channel width is measured from the toe of the channel bank on one side of the channel to the toe of the channel bank on the other side of the channel.

**Impervious Surface** - Refer to Section 14.8.107(A) of the City Code.

**Prudent Line** - The prudent line defines a buffer zone for erosion and flooding potential within which development would not be considered prudent if the channel is to remain in a natural state.

**Riparian Habitat** – The area adjacent to flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

**Riparian Vegetation** – Vegetation that requires the continuous presence of water, or conditions that are more moist than normally found in the area.

**Significant Natural Feature** - Refer to Section 7.2.201 of the City Code.

**Streamside Buffer** - areas of land within a specified distance of the edge of the stream channel. Areas have been identified as significant based upon

their typical size, natural and vegetative characteristics, wildlife habitat suitability, open space and recreational opportunities and permitted and/or prohibited land use potential.

**Toe of the Channel Bank** - The toe of the channel bank can be identified as the point where the sloping bank becomes level or nearly level to the channel bed (or water level). It is also often identified as the point where bank vegetation terminates with channel substrate (sand, gravel, cobble, boulder or bedrock). Some streams within the City (i.e. Fountain Creek, Monument Creek, Templeton Gap Floodway) have very wide channels which are typically only partially utilized by flowing water; the water flow meanders within the channelized area and is subject to significant fluctuations from year to year.

**Wetland** – those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

- C. **Development Plan Review Criteria:** The purpose of this section is to prescribe criteria to be used to review and evaluate development projects located within streamside overlay areas. In addition to the development plan review criteria as set forth in Section 7.5.502 of this chapter, all development plans submitted for review for property wholly or partially contained within the streamside overlay zone shall be consistent with the recommendations of the streamside design guidelines manual, the land suitability analysis, if required, and shall conform with the following streamside development plan review criteria:
1. Has the natural landform been maintained within the overlay area and does grading conform to the specific grading limitations of the streamside ordinance as well as all other City grading and filling regulations?
  2. Does the development incorporate the stream ecosystem into the project design and complement the natural streamside setting? Has the project been designed to link and integrate adjacent properties with the stream corridor using access ways, creek front plazas, employee recreational areas or other site planning and landscaping techniques which include the stream corridor as an amenity?
  3. Has the project been designed to minimize impact upon wildlife habitat and the riparian ecosystem which exists on or adjacent to the site? Does the project design protect established habitat or any

- known populations of any threatened or endangered species or species of special concern?
4. Have existing or potential community trail networks and other recreational opportunities been identified and incorporated into the project design?
  5. Has the project been designed to protect the subject property from potential flood damage and to accommodate flood storage and conveyance needs?
  6. Have all significant natural features within the project streamside area been identified, and has the project been designed to minimize the impact on these features?
  7. Does the project identify and implement the recommendations of any approved subarea plans (such as the City Greenway Master Plan, City Open Space Plan or a specific drainage basin planning study) and of any approved public works projects and habitat conservation plans?
  8. Does the project design:
    - a. Implement a riparian buffer of specified width between the developed portions of the site and the adjacent waterway to assist in preventing point and non-point source pollutants and sediment from entering the waterway?
    - b. Exclude impervious surfaces from the inner buffer zone and meet imperviousness restrictions across the entire overlay?
    - c. Incorporate all stormwater BMPs required by City Engineering throughout the developed site and adjacent to the buffer to encourage onsite filtration of stormwater and protect water quality?
    - d. Incorporate visual buffer opportunities of the stream between identified existing and/or proposed projects on opposing sides of the stream?
  9. Are inner and outer buffer zone landscaping standards met? Have disturbed areas been revegetated to minimize erosion and stabilize landscape areas and does the project landscaping design specify plants selected from the riparian plant communities as set forth in appendix A of the Landscape Policy Manual? Does the proposal meet all other requirements of the City's Landscape Code?

10. Have stream bank and slope areas been identified (particularly those over fifteen percent (15%) slope)? Has the disturbance to these areas and any protective or stabilizing vegetative cover been minimized? Does the plan provide for the suitable revegetation and stabilization of any disturbed areas?
11. Have opportunities to reclaim the drainageway been identified and implemented where practical? For this criterion, reclamation constitutes any action that improves the quality of that drainageway visually, functionally or recreationally, and brings that drainageway into a more natural condition.

Judgment of the above criteria shall be made using the project justification statement submitted with streamside development plan applications which shall include a narrative discussion of how each streamside development plan review criteria has been considered and applied in the design of the project, and should demonstrate consistency with the opportunities and constraints identified in the project's land suitability analysis. This requirement may be satisfied by the written summary submitted with the land suitability analysis if that summary has been broadened to include analysis of the streamside development plan review criteria.

D. Amendment of the Streamside Overlay Zone Boundary:

1. Establishment by Annexation: The boundary of the streamside overlay zone may be established in conjunction with the determination of zoning district classification of newly annexed areas for stream corridors which exhibit a continuation of the relevant stream characteristics and/or streamside overlay zone already existing within the City.
2. Refinement: Refinements of the streamside overlay boundary, which occur during the development review application process, shall not require an ordinance to amend the overlay boundary if those refinements are otherwise consistent with this section. Typical refinement includes the definition of the edge of the channel and the toe of the bank. The location of the stream channel and toe of the channel bank as illustrated on the City's zoning map will be refined with the review and approval of every streamside development plan and/or streamside site plan. Proposed changes should be supported by a professional survey of the stream channel location and shall be recorded on any plans submitted for the project site. Once established by an approved development plan, the overlay boundary shall remain fixed without regard to changes in the associated stream cross-section unless a subsequent change in the streamside overlay boundary is

specifically requested by the applicant and mutually agreed to by the applicant and the Manager.

3. **Stream Realignment:** Major channel realignment or the elimination of existing stream channels that are identified on the streamside overlay zone in the City zoning map require completion of the formal zone change procedures described in part 6 of article 5 of this Chapter. The proposed realignment must include significant mitigation activities that replace and/or improve upon existing flood control, wildlife habitat, water quality and aesthetic values.

E. **Development Standards.**

The purpose of this section is to prescribe the requirements for submittals, approvals and administration of development review applications and to identify the streamside protection standards for development within streamside overlay areas.

1. **Submittals, Approvals and Administration:**
  - a. **Streamside Development Plan Approval Required:** For any property which is designated on the zoning maps of the City as being within the streamside overlay zone, no grading, filling, dumping, property disturbance or removal of trees or other significant vegetation shall occur, nor shall any building or structure be erected, nor shall any subdivision plat be approved until a streamside development plan has been approved, in accord with this section and article 5, part 5 of this Chapter.
  - b. **Streamside Master Plan and Concept Plan Applications:** Applications for streamside overlay affected concept plans and master plans shall be reviewed for consistency with this section; these plans may be used to identify streamside overlay areas, establish buffer and impervious surface averaging determinations, and to average any other of the streamside standards across the entire respective plan area.
  - c. **Hillside Overlay Conflicts:** Where the streamside overlay overlaps a hillside overlay zone district, the requirements of the streamside overlay zone shall supersede the requirements of the hillside overlay zone within the overlap area.
  - d. **Land Suitability Analysis:**

- (1) **Purpose:** The land suitability analysis provides the basic information about a site's physical characteristics and features and is used to assess the impact of proposed development across the entire project both on and off the site. The report shall consist of both a written and graphic analysis of the physical and environmental factors which affect the site.

As not all sites will contain all of the elements listed, or because some sites may have unique considerations, the Manager may waive certain elements of the land suitability analysis or require additional analyses. The landowner or the authorized representative shall submit in writing a letter stating the reason for any requested waiver and list all exceptions being sought.

- (2) **City Review:** A land suitability analysis shall be required in conjunction with the City's review of the following:

- (A) New master plan including property within a streamside overlay zone.
- (B) Major amendment to a streamside master plan.
- (C) Streamside development plan.
- (D) Streamside concept plan.

- (3) **Content of the Land Suitability Analysis:**

- (A) Graphic portrayal of toe of the channel bank and the streamside overlay boundary
- (B) **Slope Analysis:** Identify slope ranges for parcels to assess the potential of sites for intensity of development and to identify areas of potential hazard. Slope analysis shall be provided in the following increments and use a contour interval of two feet (2'):

Zero to eight percent (0%-8%): Generally suitable for development (outside the 100-year floodplain);

Eight to twelve percent (8%-12%): Increased potential for engineering difficulties, moderate potential for activating site hazards;

Twelve to fifteen percent (12%-15%): Increased potential for engineering difficulties, moderately high potential for activating site hazards;

Fifteen to twenty five percent (15%-25%): High potential for activating hazard potential;

Twenty five percent (25%) and greater slopes: Very high potential for development difficulty, severe hazard potential.

(C) Riparian Vegetation and Wildlife:

(i) Wetland vegetation, grasslands, forbs, thicket vegetation and similar shrubs establish and show the dripline perimeter of all thicket vegetation clusters of ten feet (10') or greater diameter, deciduous trees of six inches (6") or greater diameter and coniferous trees in height of twelve feet (12') or greater cover are major components of streamside areas. Analysis shall show the physical location of vegetation and the following items:

(a) Ecological communities as defined under the National Vegetation Classification System developed by the Nature Conservancy;

(b) Wildlife habitat and migration corridors consistent with current information of the Colorado Division of Wildlife.

(D) Geology, Soils and Natural Features:

(i) Geologic analysis including identification of significant natural features and geologic hazards and constraints which require unusual mitigation during design

and construction of structures and/or infrastructure (e.g., downslope creep, flood hazards and fragile bank areas).

(ii) Soils analysis, utilizing information from the Natural Resource Conservation Service, USDA.

(iii) Natural and manmade features, including identification of significant site features such as streambeds, stream banks, cliff or rocky outcroppings four feet (4') or greater in height, and other drainage and existing land uses. The Colorado Springs open space plan (appendix 4: data sources) shall be consulted in identifying these features.

(E) Map Intervals: Topographic map using two foot (2') contour intervals.

(F) Analysis Package:

(i) Composite Map: The components of the land suitability analysis shall be overlaid and, as a result, a composite map of opportunities and constraints shall be prepared to direct the location of proposed land uses and structural development.

(ii) Written Text: A summary of the existing site features and constraints and how the development of the site will occur in a manner which considers both the opportunities and constraints. The analysis must address mitigation for the site's physical constraints and hazards. This narrative shall include a bibliography of reference sources and curriculum vitae of the preparer. The latter requirement shall not be construed to imply a standard of qualifications for preparers.

e. Financial Assurances May be Required: Where deemed necessary by the Manager, financial assurances may be

required prior to approval of a grading plan or building permit as an offset to the potential cost of reparations to sensitive streamside areas where development is approved to take place adjacent to, and/or within, streamside overlay areas.

- f. **Grading and Erosion Control Plan Approval Required:** No grading of any land which is designated on the zoning map of the City as being within the streamside overlay zone shall be undertaken unless a grading and erosion control and revegetation plan has been approved by both City Engineering and City Planning. The grading plan shall comply with the requirements of part 15, article 7 of this chapter. Grading and erosion control plans must be submitted concurrent with the development plan. The grading and erosion control plan must act to implement and be consistent with the design of the associated streamside development plan. No grading shall be permitted outside of the limit of disturbance as defined on the approved streamside development plan and the approved grading and erosion control plan. Grading is subject to the limitations noted in the streamside protection standards of this section.
  - g. **Streamside Site Plan (SSP) Required:** For those developments noted in subsection (F)(1)(a) and (b), a SSP may be submitted in place of a streamside development plan. The SSP submittal shall not require a land suitability analysis or an approved grading plan unless otherwise required but shall be subject to all other requirements of this section. Review of the SSP shall occur at the time of the building permit application and shall be subject to the normal procedural and administrative requirements for these applications.
2. **Streamside Protection Standards:** The purpose of this section is to prescribe streamside protection standards that apply to development projects located within the streamside overlay zoned areas. Approval of a streamside development plan will demonstrate that the development project meets or exceeds the streamside development plan review criteria and satisfies all of the following streamside protection standards.

This section will identify the purpose and characteristics of the three (3) stream types and the three (3) regulatory zones of each stream type, and will prescribe, in accord with stream type and/or buffer zone: 1) the recommended acceptable streamside improvements and protective measures, 2) the permitted, prohibited and/or

conditional land uses, 3) the allowable site impervious area permitted, and 4) specific provisions regarding grading, landscaping and wall and fence construction.

a. Stream Types and Streamside Buffer Zones.

- (1) Within the City three (3) stream types are identified and are represented on the streamside overlay zone as shown on the City zoning map. The typical characteristics of the stream types are as follows:

Type 1:

Typical channel width less than twenty-five feet (25')

Buffers measure seventy feet (70') wide on both sides of channel

Type 2:

Typical channel width twenty-five (25) – seventy-five (75) feet

Buffers measure ninety feet (90') wide on both sides of channel

Type 3:

Typical channel width greater than seventy-five feet (75')

Buffers measure one hundred twenty feet (120') wide on both sides of channel

- (2) Streamside Buffer Zones. Streamside buffer zones are established within a specified distance of the edge of the stream channel (toe of the channel bank) for each of the specific stream types within the City. Specific buffer zones have been identified as significant based upon their typical size, natural and vegetative characteristics, wildlife habitat suitability, open space and recreational opportunities and permitted and/or prohibited land use potential.

All streamside zoned land falls within one of three regulatory categories: 1) stream channel, 2) inner

buffer zone, or 3) outer buffer zone. Uses, landscaping standards, grading and impervious surface limitations vary depending on buffer zone.

- (A) **Stream Channel.** The protection of the stream channel is critical for flood mitigation, water quality, and wildlife habitat. It is identified as the area between the toe of both channel banks. All proposed uses for the stream channel are subject to the review and approval of City Engineering. Wetland areas which are between defined channel banks and are contiguous to the stream itself are to be considered as part of the stream channel regulatory category. Streambank stabilization, restoration activities, trail crossings and flood control activities are typically the only permitted activities within the stream channel.
- (B) **Inner Buffer Zone.** The inner buffer zone is measured outward from the toe of the channel bank. It is considered a preservation area where uses are restricted to flood control, stormwater BMP's, landscaping, utility corridors and recreational trails. Impervious surfaces are not permitted within the inner buffer zone. Specific permitted, prohibited and/or conditional uses, impervious surface limitations, grading limitations and landscaping standards apply within the inner buffer zone.
- (C) **Outer Buffer Zone.** The outer buffer zone extends from the outward edge of the inner zone to the outer extent of the overlay area. The full range of uses that are permitted in the base zone (unless listed in section 7.3.508.E.2.d.(1)) are permitted in the outer buffer zone. The outer buffer zone may often be an area of increased activity to improve the human relationship with adjacent stream areas. Specific permitted, prohibited and/or conditional uses, impervious surface limitations, grading limitations and landscaping standards apply within the outer buffer zone.

The following table indicates the streamside types, their associated streamside buffer zone widths and a general vegetative and land use characteristic description.

	Streamside Buffers								
	Width			Vegetation			Uses		
	Channel	Inner	Outer	Channel	Inner	Outer	Channel	Inner	Outer
Type 1	Less than 25 feet	20 feet	50 feet	Little to no vegetation; riparian where present	Riparian vegetation corresponding to Appendix B; 1 tree per 20' of stream frontage	Riparian or upland vegetation; 1 tree per 30' of stream frontage	Stabilization, restoration, and flood control only	Riparian area; flood control, stormwater BMPs, landscaping, and recreational uses; no impervious surfaces	Upland area; all uses permitted within the underlying zoning and complying with 7.3.508.E.2
Type 2	25-75 feet	30 feet	60 feet						
Type 3	More than 75 feet	40 feet	80 feet						

- b. **Site Imperviousness Standards:** Those portions of the subject parcel or project that fall within the inner or outer buffer zone of the streamside overlay area shall be used to calculate a ten percent (10%) limit on impervious surface. A streamside development plan shall demonstrate that the ten percent (10%) impervious surface limitation standard is met.
- (1) For the purpose of this section "impervious surface" means a surface on or in real property where the infiltration of storm water into the earth has been reduced by manmade improvements such as, but not limited to, buildings or other structures, streets, parking lots, driveways, patio areas, roofs, sidewalks, paving and compacted surfaces.
  - (2) For purposes of determining percentage impervious surface, the impervious surface calculation shall be based upon the area of the lot or project that is located within the inner and outer buffer zone of the streamside overlay zone boundary.
  - (3) No impervious surface is permitted within the stream channel or inner buffer zone; it may be located within the outer buffer zone area. Recreational trails within

the overlay zone are exempt from impervious surface calculations and restrictions. Impervious surface outside the overlay zone is not regulated by the section and is only subject to coverage limitations imposed by the base zone, as applicable.

- (4) Sites will be allowed up to 2.5 times the above indicated impervious surface allowances (i.e. twenty-five percent (25%) imperviousness) if the plan can provide either:
  - (A) Approved "water quality capture volume" (WQCV) detention which is acceptable to City Engineering under its municipal stormwater discharge permit BMP requirements. Types of facilities allowed and design criteria will be determined by City Engineering. The WQCV and detention period determinations shall be provided by the applicant and must be prepared by a professional engineer licensed in the state of Colorado and shall be included as a component of the drainage report. To qualify for this partial relief of the imperviousness requirements, the detention area must fall outside of the 100-year floodplain, as amended and as it exists prior to any grading, filling and development activity. Determination of qualification under this part shall be made by City Engineering; or
  - (B) Provide streamside improvements that exceed drainage basin planning study requirements or other development standards and are acceptable to City Engineering and City Planning. Improvements that will be considered include, but are not limited to: streambank stabilization and grade control, replacing concrete stream channels with bioengineering or other stabilization techniques that allow more infiltration yet provide economical maintenance, ecological restoration activities including invasive species removal, riparian habitat restoration and other significant ecological improvements. Designs under this option must be approved by City Engineering and City Planning.

- c. **Landscaping Requirements.** In addition to standard City landscaping requirements, any development project within the streamside overlay zone is required to meet the following landscaping standards specific to the inner and outer buffer zones. "Alternative Compliance" as described by City Code section 7.4.307 and the Landscape Policy Manual shall apply to the following requirements:
- (1) **Inner Buffer Zone.** The inner buffer zone shall be vegetated with at least one (1) tree for every twenty feet (20') of stream frontage. Shrubs may be substituted for required trees at the rate of ten (10) shrubs for every tree, with no maximum percentage of shrub substitute. If the inner buffer zone corresponds with the 100-year floodplain, vegetation should be selected to both stabilize the channel bank and protect the stream's flood capacity. Existing appropriate riparian or upland vegetation within the inner buffer may count toward fulfilling this requirement.
  - (2) **Outer Buffer Zone.** The outer buffer zone should be vegetated with at least one tree for every thirty feet (30') of stream frontage. Shrubs may be substituted for required trees at the rate of ten (10) shrubs for every tree, with a maximum of fifty percent (50%) shrub substitute. If the outer buffer zone corresponds with the 100-year floodplain, vegetation should be selected to both stabilize the channel bank and protect the stream's flood capacity. Existing appropriate riparian or upland vegetation within the outer buffer may count toward fulfilling this requirement.
- d. **Streamside Land Uses.** All land uses identified as permitted or conditional uses within a base zone are typically allowed within the streamside overlay zone. However, due to the potential for negative impact and the incompatibility with adjacent stream segments the following principal uses and their accessory uses, when allowed as permitted or conditional uses within their base zone district, shall be processed as follows:
- (1) **Prohibited Uses.** The following uses and their accessory uses are prohibited on any streamside overlay zoned properties. Prohibited uses legally

existing on November 12, 2002, will be allowed to continue, but will not be allowed to expand beyond their current extent in accord with part 12 of article 5 of this Chapter.

Laundry Services

Kennels (commercial only)

Detention Facilities

Construction Batch Plant

Garbage Service Companies

Meat-packing and Related Industries

Mining Operations

Scrap Metals Processing Yard

Truck Terminal

Stockyards

Vehicle Dismantling Yard

Commercial Feedlots

Landfill

Transfer Station

Recycling Processing Center

Large Recycling Collection Center

Convenience Food Sales (with Fuel Sales)

Heavy Industry

- (2) **Conditional Uses.** Due to the potential for negative impacts to the streamside overlay area, the following uses shall be processed as conditional uses as described in Chapter 7, Article 5, Part 7 on any streamside overlay zoned properties. Site features

such as existing or future trail systems shall be considered when evaluating a conditional use request. Approval of the following uses may require additional BMP's and/or additional mitigation as part of the conditional use and streamside development plan review and approval. Exclusion from this list does not guarantee that additional BMPs and/or mitigation will not be required as part of the development plan approval process.

Automotive and Equipment Services

Manufacturing

Warehousing and Distribution

Construction Sales and Services

Mini-Warehouses

Contractor's Yards

Light Industry

Parking Lot (except as an accessory)

Outdoor Storage (whether accessory or principal use)

- e. **Fence Requirements.** Fences constructed within the streamside overlay area must be of an open design allowing the stream to be visible from the subject property. Metal (chain-link or wire) may be added for security, but only as an attachment to an acceptable fence as described in this section. Opaque fencing is prohibited. No fencing shall extend into the 100-year floodplain area. City Planning may waive this requirement for projects where screening of the streamside use is needed for other streamside adjacent properties.
- f. **Grading Requirements.** Grading within the streamside overlay is subject to the following requirements:
  - (1) Proposed grading should be minimized within the approved limit of disturbance, particularly within the inner buffer zone. The overall proposed grading from the toe of a slope adjacent to a stream to the top of the

graded slope may not exceed 3:1 unless retaining walls are utilized in accord with this section.

- (2) Walls of up to six feet (6') in height (maximum) may be permitted. The walls will require appropriate landscape screening, and the lineal extent of any one section of wall may not exceed two-thirds (2/3) of the length of the stream frontage or three hundred feet (300'), whichever is less. Breaks in wall sections required by this ordinance shall be no less than thirty feet (30') in width. Topographic contour information provided on grading plans shall be at the two foot (2') contour interval.
- (3) All grading plans for streamside zoned areas must include a revegetation plan that addresses short and long term erosion and slope stability concerns.
- (4) Protective Measures. All land use proposals within the overlay which require grading and soil erosion control plan approval from City Engineering and City Planning must implement protective measures such as fencing or flagging along the outer boundary of the inner buffer zone to ensure that prohibited activities, storage of construction related materials or equipment, or destruction of any type, are excluded from the inner buffer zone.

- F. Exemptions: The purpose of this section is to identify specific properties, projects and/or development activities that may be exempted from all or a portion of the streamside overlay zone requirements set forth in this section. A note shall be included on the streamside development plan, development plan, or streamside site plan identifying exemptions approved for the project.

The only acceptable exemptions are as follows:

1. Single Dwelling Residential Developments:
  - a. New Residential Development: A single lot for a new single family or two family dwelling that is at least partially within the streamside overlay zone may be reviewed as a streamside site plan. Streamside site plans shall not require the submittal of a streamside development plan or land suitability analysis, but shall otherwise be reviewed for compliance with the requirements of this section.

- b. **Residential Additions:** Single residential dwellings located at least partially within the streamside overlay zone which existed as of November 12, 2002 are exempt unless a building permit is requested and/or additional impervious surface is proposed which would increase the gross footprint and impervious surface area of the development on the lot by fifty percent (50%) or more than that which existed as of November 12, 2002, in which case the streamside site plan requirements apply.
2. **Expansion of Existing Non-Residential and Multifamily Uses:** Proposals to expand building footprints or accessory impervious areas of existing commercial, office, industrial, multifamily and institutional uses by up to thirty percent (30%) of the approved area as of November 12, 2002, are exempt from the streamside overlay zone requirements as long as the following conditions exist:
- a. The land use is permitted within the base zone district.
  - b. The land use is not a prohibited land use type within the streamside overlay zone as set forth in subsection 7.3.508.E.2.d.(1) of this section.
  - c. The expansion project does not include any additional fill material within the overlay portion of the site.
  - d. No new impervious surfaces are proposed within the inner buffer zone as described in Section 7.3.508.E.2.a.(2)(B).
3. **Separated Development:**
- a. **Street Separated:** Properties which are totally or partially contained within the streamside overlay zone but which are completely separated from the identified stream by a public or private street are not subject to the regulations of the streamside overlay zone. The properties shall comply with all other applicable provisions of the City Code for development.
  - b. **Functionally Separated:** Properties which are adjacent to stormwater drainage channels that are completely lined with concrete may be exempted from this section. A project may be exempted if the reviewing planner, the reviewing engineer and public comments taken during the pre-application stage of development review mutually and/or generally support that the portion of the property which is contained within the

streamside overlay zone does not: (1) exhibit any of the important riparian characteristics or recreational opportunities which are intended to be enhanced through the application of this overlay zone; and (2) the proposed development activities will not adversely impact on-site or downstream riparian values. If exempted, the project shall be processed in accord with the standard development plan and grading procedures applicable to the base zone.

4. **Prudent Line Setback:** Streamside overlay zone sites with an active prudent line setback adopted prior to November 12, 2002, are exempt from all streamside overlay regulations of this section. Streamside sites with a prudent line setback adopted after November 12, 2002, are exempt provided that the process of determination and adoption of the setback by City Engineering involves a review by City Planning of the proposed prudent line for compliance with the objectives and requirements of this section. Pursuant to this exemption, a plan (master, concept or development) shall be filed with and approved by City Planning prior to obtaining final approval of a prudent line setback request.
5. **Public Facilities:** Work to install, replace, repair, rehabilitate or maintain public facilities, including but not limited to utilities, stormwater and drainage facilities, trails and parks, is subject to partial exemptions to the streamside overlay zone regulations as follows:
  - a. Grading for the purpose of installing new public utilities, public drainage improvements, trails or park amenities or for the purpose of constructing stream stabilization measures, as required by the City of Colorado Springs Utilities, may be accomplished upon grading plan and erosion control plan approval by both City Planning and City Engineering.
  - b. For emergency repair of public facilities within the streamside overlay zone, approval of a grading plan and erosion control plan is not required prior to commencing work. Emergency situations include water and wastewater pipeline breaks, down power lines, gas line breaks, severe bridge damage, severe channel and roadway damage or other related work requiring immediate attention to protect the public health, safety and welfare.
    - (1) City Planning and City Engineering shall be notified the next workday following commencement of the emergency repair work.

- (2) The execution of emergency repairs shall minimize impacts to the stream environment, particularly wetlands and wildlife habitat.
      - (3) The disturbed area will be restored to pre-emergency conditions as soon as possible following completion of repairs.
      - (4) For administration and planning of these activities, including BMPs during the repair operation and restoration of the disturbed area, City Planning may enter into agreements with other City departments or Colorado Springs Utilities. Any emergency repairs which extend significantly beyond that contemplated within those agreements shall be addressed by joint review and approval of an amendment to the subject agreement.
    - c. The routine replacement, restoration, rehabilitation or maintenance of public facilities may be accomplished through either:
      - (1) A site specific grading plan and erosion control plan approved by both City Planning and City Engineering prior to commencement of the work; or
      - (2) A pre-notification that the work will be performed in accord with BMPs stipulated through an agreement between City Planning and other City departments or Colorado Springs Utilities.
  6. Exempted Uses. The following uses within the streamside overlay zone area shall be exempt from the requirements of this section. However development incidental to the following uses shall still meet the grading and impervious surface standards of this section:

Agricultural uses such as general farming, ranching, nurseries and forestry operations.

Private recreational uses such as golf courses, archery ranges and ballparks.

Residential uses such as lawns, gardens and play areas.

Any other woodland, grassland, wetland, agricultural, horticultural, or recreational uses of land or water not contrary to requirements of this section. (Ord. 02-166)

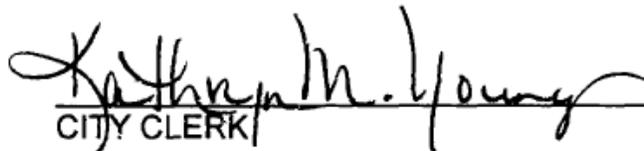
Section 2. This ordinance shall be in full force and effect from and after its passage and publication as provided by Charter.

Section 3. Council deems it appropriate that this ordinance be published by title and summary prepared by the City Clerk and that this ordinance shall be available for inspection and acquisition in the office of the City Clerk.

Introduced, read, passed on first reading and ordered published this 13th day of  
November \_\_\_\_\_, 2007.

  
\_\_\_\_\_  
MAYOR

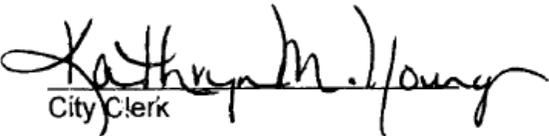
ATTEST:

  
\_\_\_\_\_  
CITY CLERK

Finally passed, adopted and approved this 27th day of November, 2007.

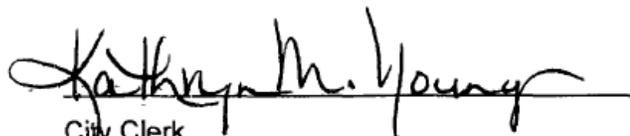
ATTEST:

  
\_\_\_\_\_  
Mayor

  
\_\_\_\_\_  
City Clerk

I HEREBY CERTIFY, that the foregoing ordinance entitled **"AN ORDINANCE REPEALING AND REORDAINING SECTION 508 (STREAMSIDE OVERLAY ZONE) OF PART 5 (OVERLAY DISTRICTS) OF ARTICLE 3 (LAND USE ZONING DISTRICTS) OF CHAPTER 7 (PLANNING, DEVELOPMENT AND BUILDING) OF THE CODE OF THE CITY OF COLORADO SPRINGS 2001, AS AMENDED, PERTAINING TO THE STREAMSIDE OVERLAY ZONE"** was introduced and read at a regular meeting of the City Council of the City of Colorado Springs, held on November 13, 2007; that said ordinance was passed at a regular meeting of the City Council of said City, held on the 27th day of November, 2007, and that the same was published by title and summary, in accordance with Section 3-80 of Article III of the Charter, in the Daily Transcript, a newspaper published and in general circulation in said City, at least ten days before its passage.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of the City, this 27th day of November, 2007.

  
\_\_\_\_\_  
City Clerk







# Appendix B

## Riparian Plant List

# Riparian Plant List

## Lower Elevation Riparian Plant Community

### **Regionally Occurring Native Trees**

*Acer negundo*, Boxelder  
*Betula occidentalis*, Birch: Western  
*Celtis occidentalis*, Hackberry  
*Celtis reticulata*, Hackberry: Netleaf  
*Populus angustifolia*, Cottonwood: Narrow-leaf  
*Populus fremontii*, Cottonwood: Freemont  
*Populus sargentii*, Cottonwood: Plains  
*Salix amygdaloides*, Willow: Peach-leaved

### **Historically Adopted Trees**

*Fraxinus pennsylvanica*, Ash: Green  
*Populus deltoides*, Cottonwood: Common  
*Ulmus pumila*, Elm: Siberian  
*Robinia pseudoacacia*, Locust: Black  
*Elaeagnus angustifolia*, Russian Olive

### **Regionally Occurring Native Shrubs**

*Amelanchier canadensis*, Serviceberry: Shadblow  
*Amorpha fruticosa*, Indigo Bush  
*Cornus stolonifera*, Dogwood: Red Osier  
*Parthenocissus vitacea*, Thicket Creeper  
*Prunus Americana*, Plum: American  
*Prunus besseyi*, Cherry: Sand  
*Prunus pennsylvanica*, Cherry: Pin  
*Prunus virginiana melanocarpa*, Chokecherry  
*Rhus aromatica*, Sumac: Fragrant  
*Rhus trilobata*, Sumac: Three-leaf  
*Ribes aureum*, Currant: Golden  
*Ribes cereum*, Currant: Wax  
*Ribes inerme*, Gooseberry  
*Robinia neomexicana*, Locust: New Mexican  
*Rosa woodsii*, Rose: Woods  
*Rubus deliciosus*, Raspberry: Boulder  
*Rubus idaeus*, Raspberry: Red  
*Rubus parviflorus*, Thimbleberry  
*Salix exigua*, Willow: Coyote  
*Sambucus cerulea*, Elder: Blue  
*Shepherdia argentea*, Buffaloberry: Silver  
*Symphoricarpos oreophilus*, Snowberry: Mountain

*Symphoricarpos oreophilus*, Snowberry: Common  
*Vitis riparia*, Grape: Wild

### **Historically Adapted Shrubs**

*Parthenocissus quinquefolia*, Virginia Creeper:  
Woodbine  
*Salix fragilis*, Willow: Crack  
*Salix purpurea*, Willow: Basket

## Upper Elevation Riparian Plant Community

### **Regionally Occurring Native Trees**

*Abies concolor*, Fir: White  
*Abies lasiocarpa*, Fir: Subalpine  
*Acer grandidentatum*, Maple: Canyon  
*Acer negundo*, Boxelder  
*Alnus tenuifolia*, Alder: Mountain  
*Amelanchier utahensis*, Serviceberry: Utah  
*Betula fontinalis*, Birch: River  
*Betula occidentalis*, Birch: Western  
*Celtis occidentalis*, Hackberry  
*Corylus cornuta*, Hazelnut: Beaked  
*Picea pungens*, Spruce: Colorado Blue  
*Pinus Ponderosa*, Pine: Ponderosa  
*Populus x acuminata*, Cottonwood: Lanceleaf  
*Populus angustifolia*, Cottonwood: Narrowleaf  
*Populus balsamifera*, Poplar: Balsam  
*Populus sargentii*, Cottonwood: Plains  
*Pseudotsuga menziesii*, Douglas Fir  
*Salix amygdaloides*, Willow: Peach-leaved  
*Sorbus scopulina*, Ash: Mountain

### **Historically Adapted Trees**

*Fraxinus pennsylvanica*, Ash: Green

### **Regionally Occurring Native Shrubs**

*Acer glabrum*, Maple: Rocky Mountain  
*Amelanchier alnifolia*, Serviceberry: Saskatoon  
*Amelanchier canadensis*, Serviceberry: Shadblow  
*Betula glandulosa*, Birch: Bog  
*Clematis ligusticifolia*, Virgin's Bower  
*Cornus stolonifera* (syn.: *C. sericea*), Dogwood: Red osier

*Crataegus erythropoda*, Hawthorn  
*Lonicera involucrata*, Twinberry  
*Parthenocissus vitacea*, Thicket Creeper  
*Potentilla fruticosa*, Potentilla: Shrubby  
*Prunus americana*, Plum: American  
*Prunus pensylvanica*, Cherry: Pin  
*Prunus virginiana melanocarpa*, Chokecherry  
*Quercus gambelii*, Oak: Gambel's  
*Ribes aureum*, Currant: Golden  
*Ribes inerme*, Gooseberry: Common  
*Rhus glabra*, Sumac: Smooth  
*Rhus glabra cismontana*, Sumac: Rocky Mountain  
*Robinia neomexicana*, Locust: New Mexico  
*Rosa woodsii*, Rose: Woods  
*Rubus deliciosus*, Raspberry: Boulder  
*Rubus parvifloris*, Thimbleberry  
*Salix exigua*, Willow: Coyote  
*Salix lutea*, Willow: Yellow  
*Sambucus cerulea*, Elder: Blue  
*Shepherdia argentea*, Buffaloberry: Silver  
*Symphoricarpos oreophilus*, Snowberry: Mountain

### **Historically Adapted Shrubs**

*Lonicera tatarica*, Honeysuckle  
*Parthenocissus quinquefolia*, Virginia Creeper

### **Slope Stabilization Plants**

*Schizachyrium scoparium*, Little Bluestem  
*Dalea purpurea*, Prairie Clove  
*Panicum virgatum*, Switch Grass  
*Arctostaphylos uva-ursi*, Kinnikinnick  
*Juniper horizontalis/communis*, Creeping Juniper  
*Mahonia repens*, Mahonia  
*Rhus species*, Sumac  
*Celastrus scandens*, American Bittersweet  
*Parthenocissus quinquefolia*, Virginia Creeper  
*Rosa 'Meidiland' spp.*, Shrub Rose

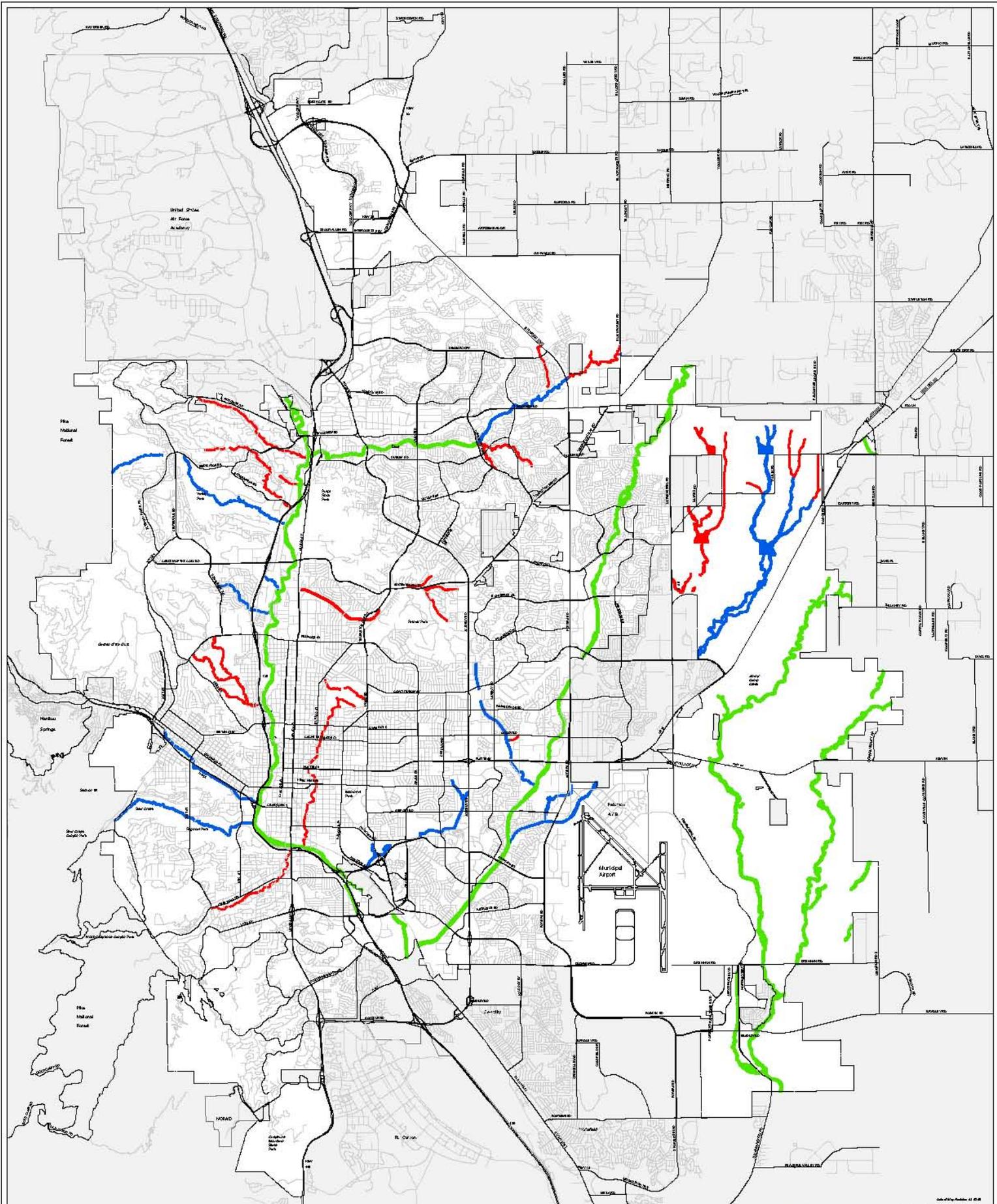




# Appendix C

## Streamside Overlay Map





**Streamside Overlay Types**



Streamside Types



1



2



3



Colorado Springs City Limits



Department of Information Technology  
GIS and ArcView

Copyright 2008 City of Colorado Springs. All rights reserved. This map is a digital file and is not intended to be used for any purpose other than that for which it was created. The City of Colorado Springs is not responsible for any errors or omissions in this map. The City of Colorado Springs is not responsible for any damages or losses resulting from the use of this map. The City of Colorado Springs is not responsible for any claims or lawsuits filed against the City of Colorado Springs or its employees, agents, or representatives, in any court of law, arising out of or in connection with the use of this map. The City of Colorado Springs is not responsible for any claims or lawsuits filed against the City of Colorado Springs or its employees, agents, or representatives, in any court of law, arising out of or in connection with the use of this map.





# Appendix D

## Streamside Development Checklist



# Streamside Development Checklist

1

Determine whether the property has a Streamside Overlay (SS) designation. The City GIS application, which can be accessed from the Community Development Division or Land Use Review Department webpage at [www.springsgov.com](http://www.springsgov.com), has mapped to the best practical extent, the location of every stream channel and type.

2

Determine the buffer type for the stream (i.e. Type 1, 2 or 3). See page 4 of these Guidelines for greater detail.

3

Base the location of the Streamside Overlay on the location of the toe of the channel bank. Extend outward for the Inner and Outer Buffer Zones.

4

Determine which portions of the property are subject to the requirements of the Streamside Ordinance (i.e. the channel and Inner and Outer Buffer Zones). See page 4 for greater detail.

5

Ensure the proposed land use is allowed under the Streamside Ordinance. See page 6 of these Guidelines for greater detail.

*a*

If the use is permitted or conditional, proceed to step 6.

*b*

If the property is exempt, proceed with the traditional planning process.

*c*

If the use is not permitted, find a new use.

6

Determine whether a Streamside Development Plan (SDP) or a Streamside Site Plan (SSP) is required for the proposed development. See Page 8 of these Guidelines for greater detail.

7

Proceed through the SDP or SSP design stages described on page 8, ensuring that the eleven review criteria listed on page 10 are satisfied.