

CHAPTER 5

IDEAS FOR IMPROVEMENT

*“Without habitat, there is no wildlife.
It’s that simple.”*

-Wildlife Habitat Canada



The fact that Erie's landscape has been significantly altered over the past 100-plus years carries with it an opportunity for enhancement or restoration. Enhancement is the ongoing process of managing natural landscapes and planning infrastructure to support and increase the diversity of native habitats, plants, and wildlife species. Restoration is a much larger undertaking and involves recreating the natural complexity of a habitat type, such as native grassland.

The Importance of Enhancement

Natural habitat disappears everyday. Without our management and protection, the benefits and services we depend on from these landscapes will diminish. Natural habitats help absorb and control flood waters, filter pollutants from water, enhance community image and aesthetics, provide buffers, and offer recreation areas for people. They provide food, cover, and passage for native wildlife, and preserve biodiversity of plants and wildlife for future generations. Enhancing and caring for natural habitats improves the quality of life for all.

Using native species for enhancement ensures that the vegetation is adapted to the stress of Erie's natural environment (e.g., drought, wind, and frozen ground), and restores the aesthetic and function of natural plant communities, including maximum use for wildlife.

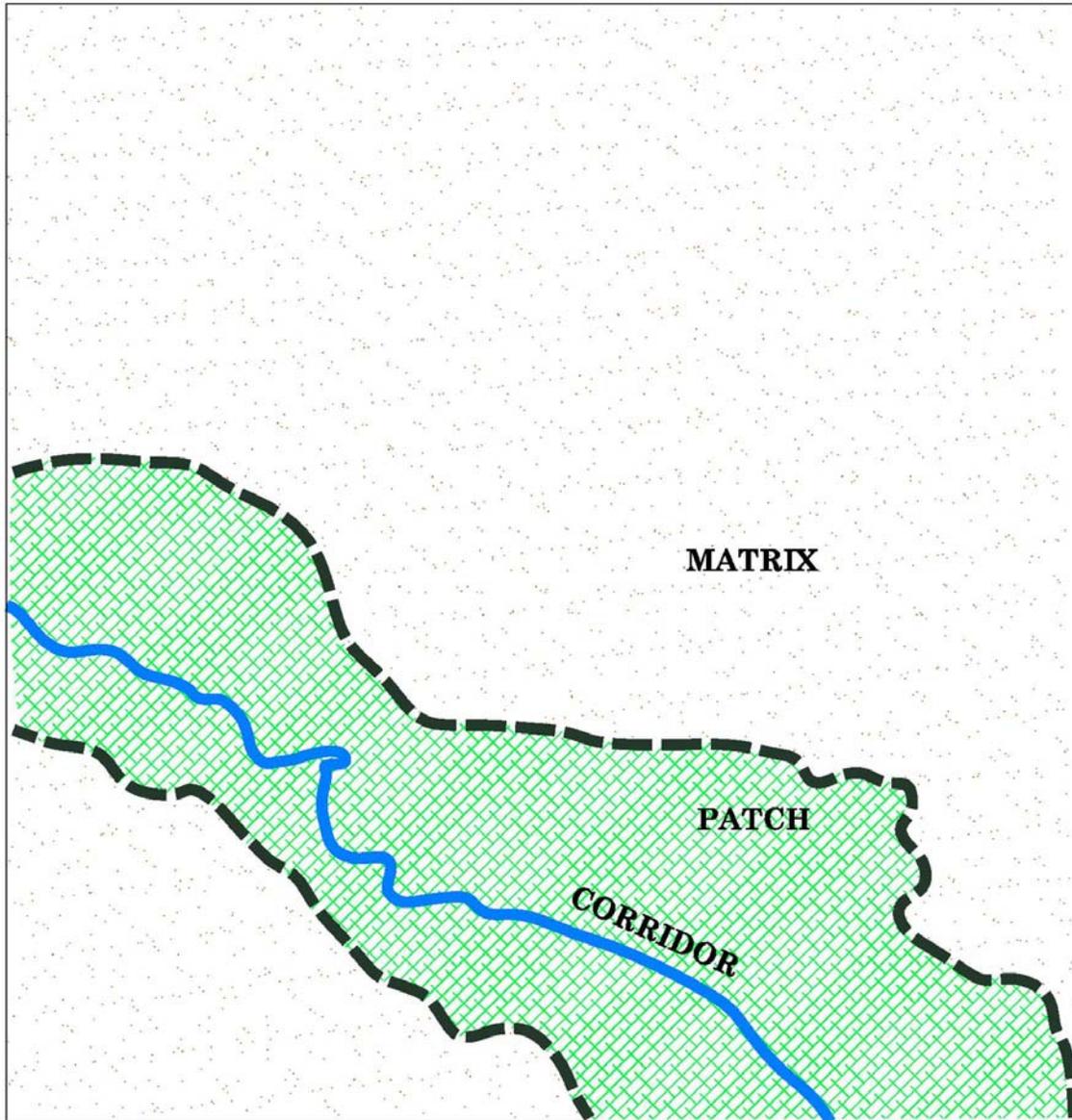
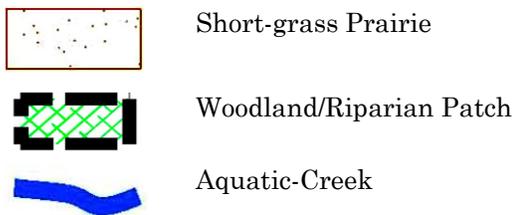


Figure 8. Conceptual Drawing of the Erie Landscape Prior to European Settlement.

Bird's-eye view of the Erie region, pre-settlement: a riparian corridor within a matrix of short-grass prairie.



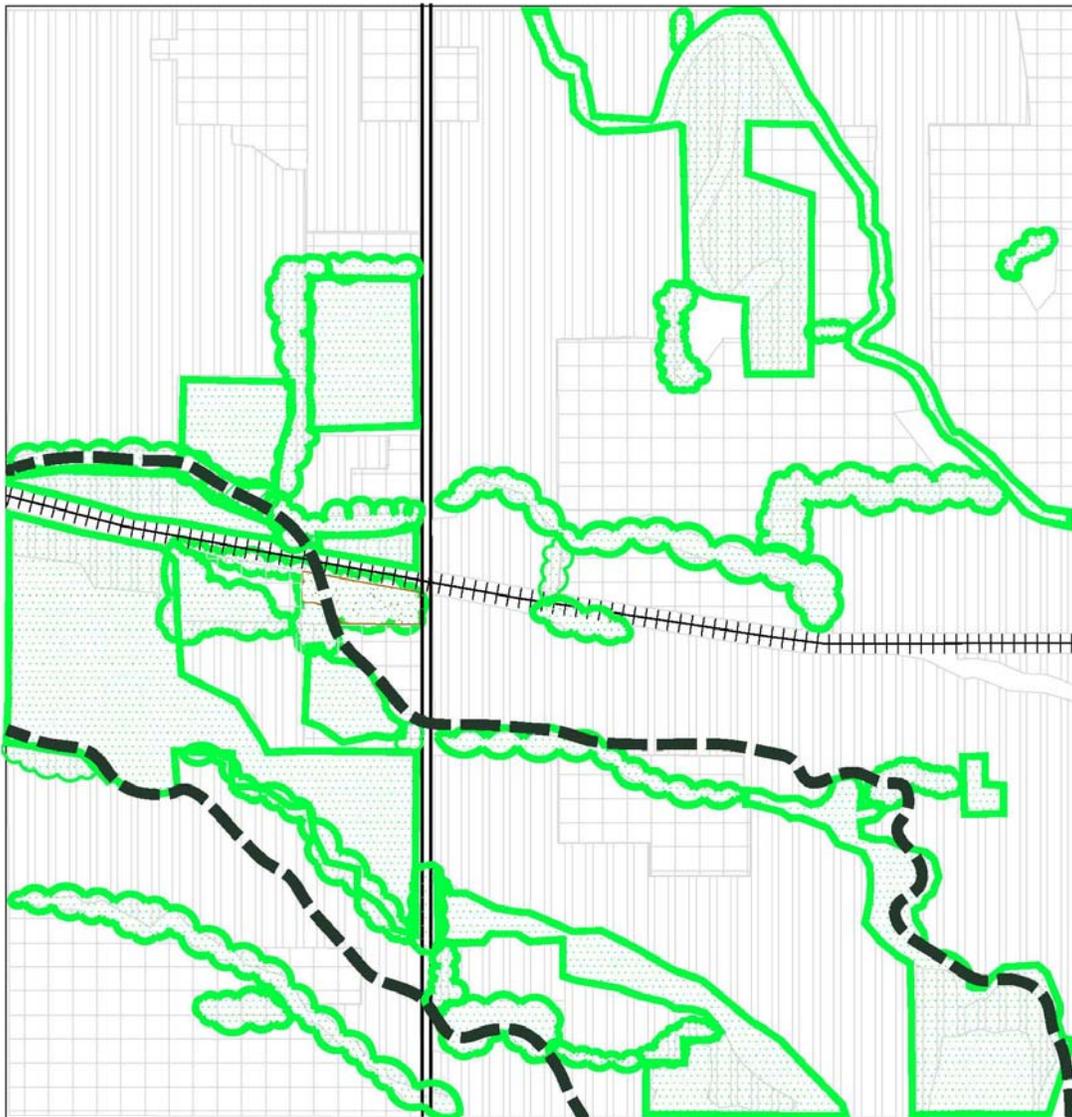


Figure 10. Conceptual Drawing of the Erie Landscape After Enhancement Efforts.

Same hypothetical section of the Erie region, showing the combination of natural areas and enhancements that form a system that is beneficial to wildlife and people.

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|---|--------------------------|---|--|
|  | Designated Natural Areas |  | Enhancements on public or private land: |
|  | Agricultural Land Use | | -Planting or adding to shelterbelts and fencerows |
|  | Residential Land Use | | -Restoring prairie of fallow land |
|  | Historic Riparian Patch | | -Planting a patch of cottonwood trees |
| | | | -Re-shaping ponds and adding a fringe of native wetland vegetation |
| | | | -Bridging a ditch or creek with a structure large enough to allow wildlife passage |
| | | | -Planting fingers of vegetation to extend into neighborhoods |
| | | | -Leaving ditch banks unmown |

Promoting Habitat Enhancement

The Town of Erie's 2005 Comprehensive Plan sets forth a unique and innovative approach to community development by balancing growth with opportunities to enhance Erie's natural landscape. People in all sectors can promote habitat enhancement and thereby help to bring the goals of this plan to reality.

Open Space Planning

County and Town open space planners may view natural areas in the context of large-scale patterns that integrate natural and human communities into a holistic ecosystem. In this setting, enhancement could consist of preserving natural areas in the largest sizes possible, locating development in ways that avoid fragmenting existing natural areas, and creating a network of connected and contiguous natural areas.

Community Planning and Land Developing

Habitat enhancement at the neighborhood level is most successful when incorporated into the planning phase of a development or project. However, there are also opportunities to modify existing landscapes or infrastructure to extend the aesthetics and benefits of natural areas into places where people live. This can be accomplished by paying attention to shapes and slopes, soil and water quality protection, and planting, as described below.

Shapes and Slopes

Grade stormwater detention ponds to create more gradual, naturalistic slopes that can support a diversity of vegetation zones. Detention ponds often have a rectilinear shape, flat bottoms, and an abrupt change from bottom to side slope. The habitat value for native wetland plants and wildlife can be increased by designing the pond with a more organic shape, side slopes with varying gradients, and gradual transitions between the pond bottom and side slopes.



These graded banks of a detention pond support zones of native vegetation. Also note the curved lines of the pond that mimic nature.

Soil and Water Quality Protection

Apply methods such as sediment catch basins and swales to remove sediments and pollution from stormwater before it enters detention ponds and natural waterways. Set aside and conserve topsoil at the start of any earthwork activity, and minimize the time that topsoil is stored before replacement. Prevent soil erosion by limiting the size of graded areas, restoring them as soon as possible, favoring bio-engineering or bio-technical soil stabilization techniques over riprap and concrete, and creating slopes that are not too steep to support vegetation.

Planting

Select native plants appropriate to the area and group them into masses. Avoid straight lines. Locate new plantings strategically to strengthen habitat connections to adjacent mature plantings or natural areas. Optimize the ability of vegetation to span across property lines to increase the size of habitat; small patches of native vegetation in adjoining properties can function ecologically as one large patch if they are contiguous.

Consider sponsoring a public demonstration garden that illustrates these and other principles of landscaping to enhance wildlife habitat.

Healthy soil is the foundation of healthy native plant communities.

Backyard Planning

“Backyard habitat” can be developed and enhanced in much the same way as larger planning areas. Landscaping with native plants provides a natural aesthetic, reduces water and maintenance requirements, and depending on the size and location of a residential property, may create or expand patches that link natural areas and increase the overall amount of habitat throughout Erie. Backyard habitat integrates into the xeriscape

concept of landscape planning, but with a focus on plants native to the immediate area. A backyard wildlife habitat program offers opportunities for public outreach, education, cooperation, and involvement. Enhancement of backyard wildlife habitat is a fundamental component of a community-wide natural areas conservation program.

There are many helpful references for enhancing backyard habitat and landscaping with native plants, as listed in the Bibliography. The National Wildlife Federation offers a backyard habitat certification program based on five basic steps.

Landscaping with the goal of providing wildlife habitat should always take into consideration the size and location of a property and the type of wildlife that might be accommodated. Attracting all wildlife is not appropriate on smaller properties or in more urban locations, where wildlife in the backyard may cause conflicts with people, neighbors, and pets. In these cases, landscape with plants to attract more compatible wildlife such as birds and butterflies.

Overall Land Stewardship

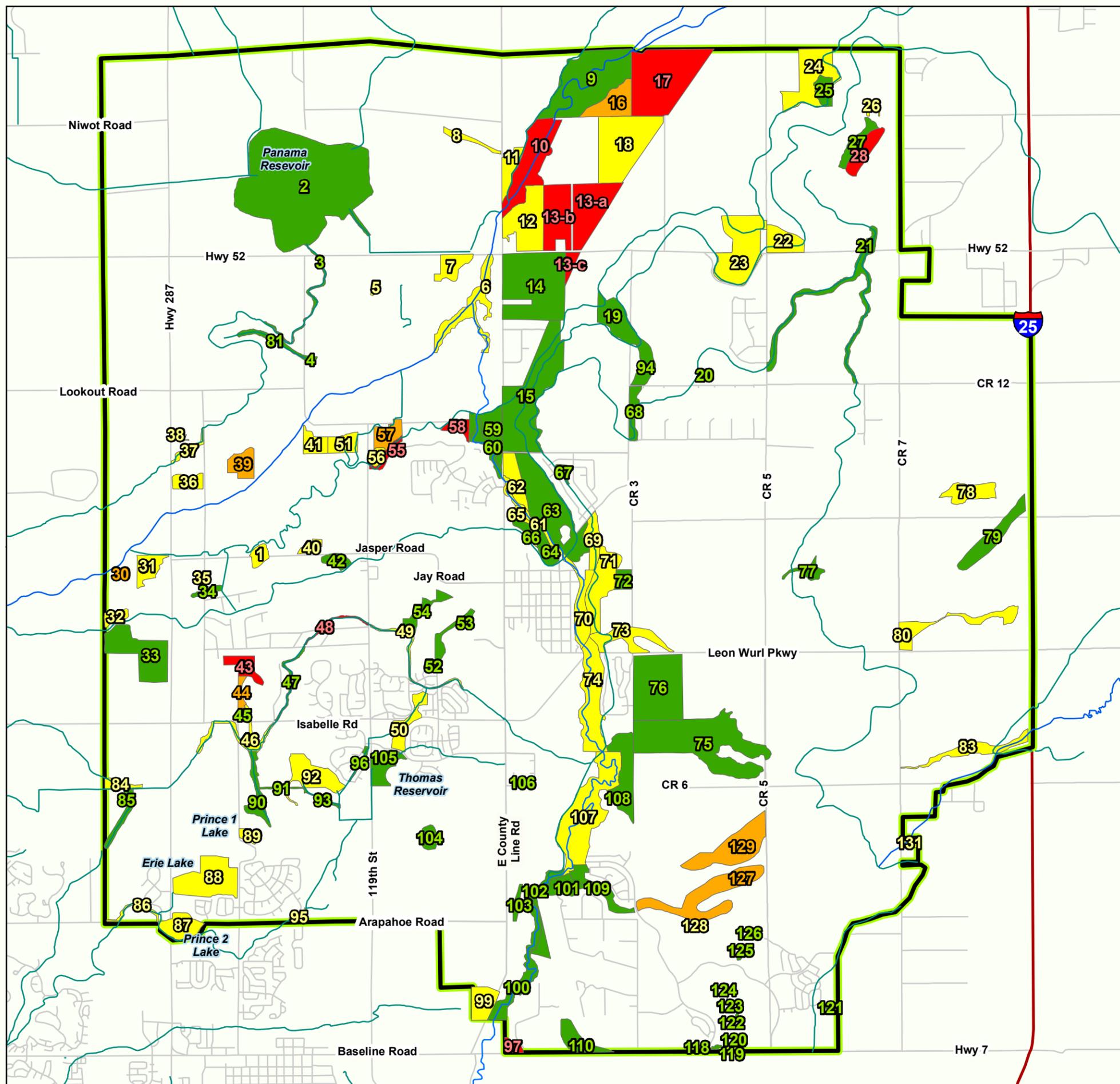
Those who are responsible for the management of natural areas within the Town of Erie – be they public or private entities – can take a more hands-on approach to habitat enhancement. Objectives generally include:

- Map and monitor noxious weed populations
- Remove or otherwise control noxious weeds and other non-native shrubs or trees;
- Manage for a representative array of native plant species and ages within each habitat type;
- Pay attention to water quality and soil conservation; and
- Balance habitat conservation with public access.

Map 9

Town of Erie Natural Areas

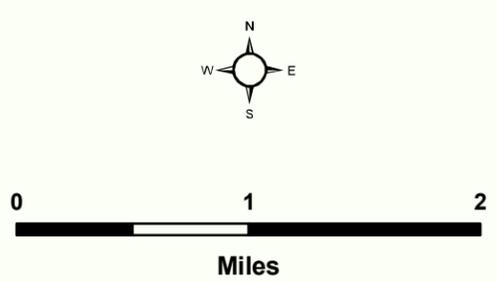
Enhancement Effort



Legend

- Low Effort
- Medium Effort
- High Effort
- Inaccessible
- Planning Area Boundary
- Creek - River - Stream
- Canal - Ditch

Datum: North American 1983 Harn
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Applying Habitat Enhancement to Erie's Habitat Types

The following examples of enhancement ideas for Erie were noted during the field work for this project. Weed control is a need that applies to all habitat types, and is specifically addressed in the next section. For more technical assistance to implement the habitat enhancement recommendations, see the references in the Bibliography.

Agricultural

Enhancement measures that can be taken in an agricultural habitat mainly involve controlling weeds and planting trees and shrubs. Planting or maintaining a shelterbelt of native trees and shrubs protects the adjacent downwind habitat and provides nesting cover, perching sites, and food sources for a variety of birds and other wildlife. The same approach with plantings around farm houses also improves habitat for wild birds.

To enhance a shelterbelt:

- Replace non-native tree species such as Russian-olive and Siberian elm (that can crowd out native trees) with natives.
- Add native evergreens such as Rocky Mountain juniper.
- Retain dead trees and branches for use by cavity-nesting birds and perching birds.
- Plant young trees to replace older and dying ones.
- Plant shrubs close together to create thickets for birds.
- Plant low-growing shrubs to provide wildlife cover near the ground.

This clump of trees and dead standing tree in the midst of open habitat provide critical perching and nesting sites. Note the raptor perched in the top right of the dead cottonwood.



Aquatic

Erie's aquatic habitats vary widely in shape, size, and purpose. Aquatic habitats are part of a larger natural system, or watershed. Each small waterway has the potential to deliver sediment from upstream erosion, pollutants from urban runoff, and weed seeds into that larger system. Therefore, monitoring of natural and human environments and erosion control in upstream areas is important to maintaining the health of local and watershed aquatic habitats. Fluctuating water levels can make these

habitats susceptible to invasion by unwanted exotics species such as Eurasian watermilfoil and New Zealand mudsnails, both of which occur in Boulder Creek. Milfoil is a nonnative aquatic plant that can outcompete native plants. It forms dense mats that can drastically alter a waterbody's ecology as well as decrease recreation value of fishing, boating, and swimming.

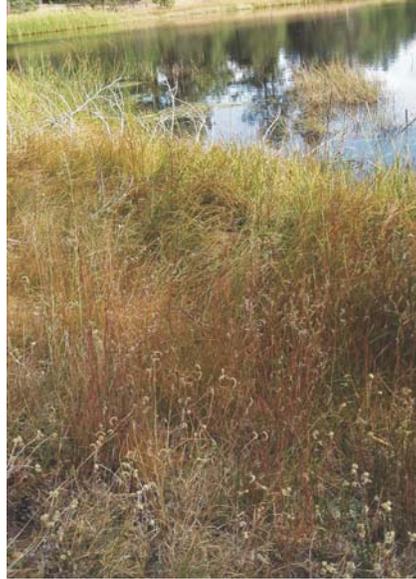
In some cases, improvements can be made to the banks of water bodies. Where space permits, steep banks can be regraded to achieve slopes that can support desirable native plant species and provide a gradual transition from uplands to the water. Trees or willows planted near the water can provide shade and mitigate another characteristic of urban waterways – higher water temperatures. Stream- or pond-side vegetation also supports insects, which are an essential food source for aquatic species.



The trees and willows lining this ditch provide habitat and shade the water.

Natural and human-made aquatic habitats can benefit from unmown native grass and forb buffers adjacent to the water. Buffer strips of dense grass help catch sediment and pollution particles and prevent them from entering the water. Buffers also provide cover that benefit smaller native wildlife such as salamanders, rodents, and ground-dwelling birds by creating a protected space to move through the area.

Unmown native vegetation lining this pond provides a buffer that helps catch sediment and pollution particles before they enter the water.



Visiting aquatic habitats at different times of year show how the water and vegetation change over time. This type of monitoring is the best way to prevent weeds from establishing. You will be able to identify unwelcome changes early and eradicate the weeds before they spread.

Grassland

Historically, grasslands were subjected to sporadic disturbances caused by grazing bison and antelope, burrowing rodents, and prairie fires. Aided by deep roots and microscopic organisms living in the soil and on the ground, grasslands were rejuvenated by these disturbances. Over the past century in Erie, disturbances to grasslands have removed most of the native species and the restorative function they represented. For this reason, it must be recognized that the grasslands present in the Erie planning area are no longer the native grasslands described above. Rather, they can be seen as converted grasslands with enhancement and restoration potential.

Small bare or weedy patches within a larger grassland area can be improved by seeding in the fall after an area has been grazed, mowed, burned, or sprayed with herbicide. Improving the diversity of small-scale areas creates bases from which the plants can disperse naturally into the larger grassland.

The keys to enhancing grasslands are timing, soil replenishment, and weed control. Scheduling the operations to coincide with optimal temperature and precipitation patterns will provide the best results. The best time to plant native grasses such as blue grama, side-oats grama, and little bluestem, and forbs such as globemallow and prairie coneflower is in the fall after the site has been managed for weeds or in mid-summer before the onset of the monsoon rains. It is important to cover bare soil with native grass and

forb seeds or, if the patch is larger, mulch over the seeds so that the area is less vulnerable to weed establishment.

Grasslands thrive when they have some disturbance, but not too much. Prescribed fire is one tool for managing grasslands and has been used locally in Boulder County. It requires a high level of experience and planning. Carefully timed mowing and grazing can help control weeds and improve the vigor of grasslands. Short-term grazing by livestock can also have a positive effect by reducing weeds and invigorating grasslands.

Other

This habitat type is most notable for its weediness as a result of ground disturbance. Weed control is a major issue. However, some of these areas could be considered for full-scale restoration. Grassland restoration requires a major effort and takes a number of years for success to be realized. This approach should be encouraged but is not discussed in detail here.

Enhancement measures that can be taken in agricultural weedy and nonagricultural weedy habitats include:

- *Disking to loosen and aerate compacted soil;*
- *Weed management*
- *Planting species that neutralize the seed-bank so weeds don't take over (e.g., alfalfa); and*
- *Inter-seeding or planting native vegetation to increase diversity*

Wetlands

Wetlands in urban areas often receive high-intensity flows of water that contain small particles and chemicals from landscape, roadway, and household use. There is one wetland plant species that survives best in such conditions: the cattail. Although people tend to associate wetlands with cattails, an abundance of cattails might suggest that a wetland system lacks diversity. There are many additional native wetland plant species whose use should be encouraged.

Also important is pre-treatment of storm water and grading to naturalize slopes. Other enhancement measures in a wetland habitat include ensuring there is a vegetated buffer around the wetland to help absorb rain water energy and soil particles before entering the wetland; planting native ground cover, shrubs, and/or trees to increase plant diversity, habitat structure, and food offerings; restricting human access during waterfowl nesting seasons (mid-May to end of July); and controlling weeds.

Plants and wildlife thrive in contiguous networks of habitat because they are the best representations of whole ecosystems. In Erie many natural areas are linked to one another by the system of ditches. Ditches link the natural water systems, the floodplain, and the uplands that surround them.

Woodland

The most recognizable features of natural woodlands in Erie are the large cottonwood trees usually seen near waterways. Beneath the cottonwoods' tall tree canopy are smaller trees and forbs and grasses that cover the ground.

Enhancement of woodlands first consists of ensuring that each layer – tree canopy, shrub, and ground cover – is evenly represented. Often, several older cottonwoods may be observed with no younger trees growing up to replace them. Where stands are aging, new cottonwood plantings will ensure a tree canopy for the future. A variety of native shrubs will provide food sources such as fruits from wild plum, chokecherry, and wild roses in addition to nesting and hiding cover for birds. If the ground is lacking cover, appropriate native grasses, shrubs, and forbs can be seeded or planted. Another structural component of the ground cover layer are the dead limbs, branches, and leaves that fall from larger trees. These are extremely beneficial to wildlife and to long-term soil nutrition if left in place.

Magnificent plains cottonwoods
are part of Erie's riparian
woodlands

(Site 84).



Weed Management

The on-site evaluation of natural areas confirmed that the most important challenge for enhancement of Erie's natural areas is weed control. The best starting point for weed management is a thorough inspection of an area to determine which weed species are present and where they are

located. Preparing an Integrated Weed Management Plan is recommended. The integrated approach incorporates different methods tailored to the specific situation. These include mechanical (removing seed heads or mowing); chemical (herbicides); and biological (release of biocontrol insects) methods.

The three most common noxious weeds in the Erie planning area are Canada thistle, musk thistle, and teasel. Two non-native, invasive trees are also of concern, namely Russian-olive and Siberian elm. Basic habitat, life form, and control strategies are briefly described here, and the resources listed in the Bibliography can be consulted to help develop an Integrated Weed Management Plan.

Canada thistle is a long-lived perennial plant that reproduces both from seed and by root sprouts that shoot off of its spreading root system. Canada thistle colonizes disturbed areas such as roadsides and also grasslands, agricultural fields, and wetlands through production of numerous fluffy seeds that float in the air. When stems are cut, it sends up numerous new shoots from the roots allowing it to rapidly colonize large areas. Control requires successive treatments of herbicide and cutting over two or more growing seasons to finally deplete the plant's energy reserves that are stored in the root system.



Canada thistle is a perennial plant 2 to 6 feet tall. It grows in patches due to horizontal rhizome growth. Flowers are typically pink to purple and spineless. Plants and flowers are smaller than the musk thistle (another common noxious weed).

Musk thistle is a tall thistle that reproduces only from seed. This biennial plant's life cycle has two stages: a rosette of leaves near the ground the first year that grows into a flowering and seed-producing plant the second year. To control this weed, seed production must be stopped. This is accomplished by cutting and removing the first-year growth before the plant can flower and also by removing seed heads before seeds can disperse or applying herbicide to first-year rosettes.



Musk thistle is a biennial plant that can reach 6.5 feet in height. Leaves and stems are coarsely spiny. Flowers are 1 ¼ to 2 inches wide and pink to violet in color. Musk thistle grows from a taproot rather than a rhizomatous root as in Canada thistle.

Common teasel is a biennial found in sunny areas with moist soils. It spreads rapidly from seed and can become established in natural or disturbed areas in a short time. Its aggressive rate of spread can decimate the diversity of moist habitats by establishing quickly and completely displacing native plants. For mechanical control, plants must be cut prior to setting seed. This often must be done twice in a growing season. Seed reserves may remain in the soil and therefore full control will require removal of new shoots over a number of years.



Common teasel is easy to recognize in late summer and fall by its distinctive seed head. It spreads rapidly and likes moist areas.

Siberian elm and Russian-olive are non-native trees, and both are prolific seed producers. Russian-olives can dominate riparian woodlands. Siberian elm requires less water to establish and invade windbreaks, hedgerows, grasslands, and woodlands. When these trees are cut down, the stumps must be treated to prevent resprouting.



Russian-olive trees
colonizing a pasture

The basic steps in developing an Integrated Weed Management Plan are as follows:

- *Describe the property.*
- *Inventory the property for weeds.*
- *Formulate management goals and objectives.*
- *Set priorities for weed management.*
- *Select management actions.*
- *Develop an Integrated Weed Management Plan.*
- *Develop a monitoring plan.*

(From Creating an Integrated Weed Management Plan: A Handbook for Owners and Managers of Lands with Natural Values. Volume IV - Available from the Colorado Natural Areas Program at <http://parks.state.co.us/NaturalResources/CNAP/Publications/>)

Monitoring and preventing weed establishment refers to more than just noxious weeds. Species not considered noxious by Boulder County, such as common mullein, escaped rye, and cheatgrass, can be aggressive, invasive, or both and can lower species diversity by out-competing native and planted species. Technical assistance is readily available for weed control and resources are listed below.

A good starting point for help is the county weed supervisor at the following agencies:

Boulder County Cooperative Extension

303-441-6131 ext. 6110

<http://www.coopext.colostate.edu/boulder/AG/agweeds.shtml>

Weld County Weed Division

970-304-6496 ext. 3770

http://www.co.weld.co.us/departments/weed_pest/index.html

Recreational Trails

Ideally, trails guide pedestrians and bikers to points of interest, such as grassland vistas and wetlands at the edge of a pond, while minimizing impact to natural resources. People benefit because they have an opportunity to see and protect native plants and wildlife. Plants and wildlife benefit because humans generally stay on designated trails, causing fewer impacts such as trampling and disturbance to the natural habitat.

Several parameters work in combination to determine the location, surface material, and width of trails, including mode (e.g., pedestrian, bicycle, or equestrian accessible), public input, property ownership, maintenance allocations, land use, and terrain. Over time, these considerations can be integrated with natural resource inventory data to develop a site-specific management and trail location strategy for Erie's natural areas. In the interim, this discussion provides general guidelines for locating trails in natural areas.

People are sometimes surprised to learn that trails and human activity have an impact on wildlife. Many native bird species avoid nesting near trails. Often predators (foxes and coyotes) use trails, resulting in higher predation levels near trails. Small mammals generally avoid crossing trails because of the lack of cover.

Level of Access

Level of access to a natural area is a primary management consideration. Based on the current and potential habitat value, a trail can provide complete access to a site, access to resilient areas only, or access during certain defined periods. Trails should avoid intrusion into intact patches of high-quality habitat. One way to protect sensitive environments is to provide a defined viewing area so that wildlife habitats and trails are separated by distance. Another is to construct a boardwalk for experiencing wetland or aquatic environments up close without trampling the sensitive surface. Or simply route the trail at the periphery of a high-quality habitat and provide varying views into it.

Limiting Disturbance

To minimize the negative impact of trails on native habitat, it is best to locate them on previously disturbed ground such as livestock paths, utility line rights-of-way, or abandoned roads. Trail construction and habitat enhancement complement each other well and each can help build support for the other. In this case, keep in mind the future rather than current habitat type and quality when determining trail location in the area to be restored.

Soften the impact of trails by avoiding straight lines, making them narrow, and using crusher fines (or other soft base) rather than a hard surface.

Trails in Riparian Corridors

From a human perspective, it is desirable to run trails parallel to creeks. How close to the creek can a trail get? This must be determined on a case-by-case basis, depending on the type and width of trail, intensity of use, and condition of the natural area. In trails literature, recommendations for buffer widths range from 35 to 300 feet. A general principle would be to place the trail on the outside or upland edge of the riparian woodland that lines the creek, or on a topographic bench above the creek. Trails should skirt the perimeter of intact patches that, in this context, might include a cottonwood forest, dense willows thicket, or a chokecherry and wild plum thicket.

Occasional spur trails can provide access to water in strategically selected locations, or a trail can be routed closer to a creek. Trail-related facilities should be grouped together where possible. For example, a creek drop structure, pedestrian bridge, water access, and a utility crossing can all occur within the same footprint.

A final factor to weigh when determining trail location in a riparian corridor is the dynamic nature of the floodplain. Mud and debris accumulation, fallen trees or branches, and newly created ponds result from active natural processes. A trail located within an area that has a 2-year probability of flood recurrence will require more frequent maintenance of the trail surface than one that is near the 10-year or 100-year floodplain.

Trails and Lakes

Trails near lakes also require evaluation of the level of access appropriate to the setting and habitat quality. Access options at lakes with higher-quality habitat might be a boardwalk and viewing blind only or a perimeter trail that stays close to the shore on a portion of the lake but moves outward for the majority to protect a large wetland habitat. The middle range of access could be a narrow native soil surface trail that follows the perimeter for all except one section of sensitive habitat. There, the trail can either end in a viewing platform or move away and be screened from the lake by both distance and vegetation. A lake that is selected for the least restrictive access may have a wider paved trail around the entire perimeter, with a vegetated buffer of at least 30 feet between the trail and the lake edge.

Interpretation

For every limitation in access to a natural area, there is also an opportunity for education and interpretation. Information provided in signs, brochures, programs, and the Town of Erie website can explain the reasons for trail access levels, encourage participation in natural areas stewardship, and build awareness of natural areas.

Ongoing Management

After a trail is in place, periodic monitoring will help natural area managers determine whether trail-related impacts are within the tolerance limits of the habitat type as well as understand potential weed issues. Ongoing collection of natural resource and trail user feedback is a

NATURAL AREAS INVENTORY, TOWN OF ERIE, COLORADO

management tool to help successfully balance public use and resource stewardship.