

Recreation Enhancements for Urban Streams



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OVERVIEW

The urban landscape can provide recreational opportunities by incorporating various features along urban streams and greenways. Recreational amenities increase local property values, which in turn increases the tax base and offers important social benefits such as better health, quality of life, and an increased appreciation for nature and the environment. The Corps of Engineers (Corps) has provided recreation opportunities in urban settings in three ways, as a part of Corps-operated projects, as a part of environmental restoration efforts, and by supporting others in development of recreation features by providing engineering solutions. Sponsors increasingly demand recreational opportunities to be incorporated into projects, or for Corps projects to accommodate later recreational enhancements by the sponsor.

Greenways that incorporate recreational amenities increase adjacent residential and commercial property values. According to a major study for the real estate industry by American Lives, Inc. (1999), bikeways and greenways are very desirable amenities to today's home buyers, and now surpass golf courses in popularity. There are almost 3,000 miles of greenways in the United States hosting 27 million users per year (American Recreation Coalition 1996). The Corps hosts over 5,000 miles of trails in 42 states (Value to the Nation <http://www.corpsresults.us/recreation/recfastfacts.asp>). These trails are varied and designed to handle hiking, biking, equestrian activities, and off-road vehicle use.

Riparian greenways can provide a critical storage area and buffer for flooding events, particularly when they span the floodplain. A national study of 10 programs that diverted development away from flood-prone areas found that land next to protected floodplains had increased in value by an average of \$10,427 per acre (Burby 1988). Incorporating recreational features provides additional benefits.

Americans spend heavily on recreation; more than \$300 billion annually (Starch 1996). Approximately one third of this spending is by Federal agencies that have direct recreation budgets, such as the Forest Service, Bureau of Land Management, and National Park Service. Trail use is significant, given the 93 million bicyclists, 41 million hikers, 26 million horseback riders, and 10 million cross-country skiers in the U.S. (American Recreation Coalition 1996).

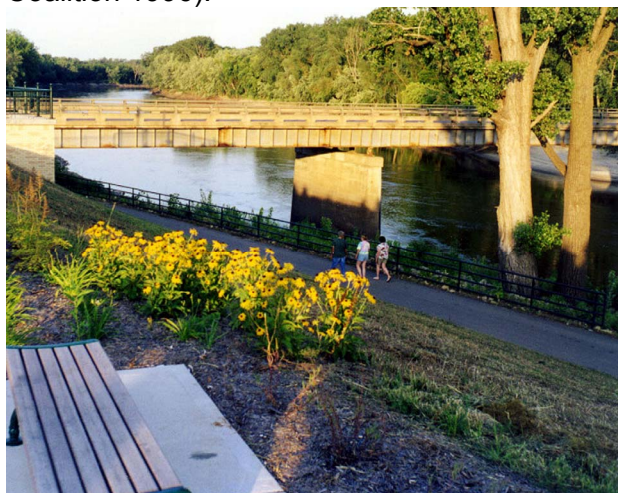


Figure 1. Multi-use trails in urban environments can provide a number of recreation opportunities if properly designed

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Financial statistics from National Park Service studies have shown that trail systems increase the local business in an area through related sales of food, beverages, and gear. An American Recreation Coalition survey (1996) indicated the following percentages of Americans were involved in recreation activities during the last 12 months: picnicking (33 percent), fishing (25 percent), bicycling (21 percent), running (19 percent), boating, hiking, and wildlife viewing (18 percent each), and photography (15 percent).

COMMON RECREATIONAL ACTIVITIES WITHIN A RIPARIAN CORRIDOR

TRAILS

A multi-use walking, running, and biking trail running parallel to a river is probably the single best investment the urban area can make to provide access for the most people to enjoy the river. A revitalization of downtowns has begun with enhancements to urban river systems in San Antonio, Phoenix, Grand Rapids, Denver, and St. Paul, just to name a few.

A network of smaller-scale footpaths can be created off the main trail to allow people to access various places that may be more secluded and benefit particular activities such as fishing, photography, birding, and environmental education that may require quiet and solitude, away from the more active trail traffic. This secondary path network can provide access to the river, a scenic feature such as a waterfall or a bluff overlooking the river, or where the natural resource may have a lower carrying capacity. Greenways and corridors are examples of how a trail system can influence recreation opportunity and even cluster housing developments.

The multi-use trail is typically 6-8 ft wide allowing for people to pass each other comfortably either on foot, walking a dog, on a bike, or in a wheelchair. Surfacing material can be asphalt, or more preferably crushed stone with fines. A trail that provides seating along

the corridor will provide opportunities for people to relax, enjoy the view, and contemplate.

Connecting to adjacent land uses with a trail network can establish a positive community character and allow for all residents to participate. In this way, a successful trail network can shape the identity of the community as one that is healthy and active. Energy and involvement generate more interest and commitment to fitness. Any opportunity to link the trail to a larger system of trails extending beyond the area and connecting to other towns, regions, and states is beneficial. For example, The Rails to Trails Program typically utilizes abandoned railroad lines where the tracks have been removed and a multi-use trail established in its place. There are 762 trails covering 7,830 miles that have been created under the Rails to Trails Program in 48 states. There are 800 national recreation trails, and 19 long-distance trails have been established since the enactment of the National Trails System Act in 1968 (American Recreation Coalition 1996). The National Recreation Trails Database is one place to view trail resources (www.AmericanTrails.org).



Figure 2. Mountain biker enjoying a secondary trail

BOATING

Access to the river for flatwater boating can be planned for the urban stream. This requires a boat ramp constructed from asphalt, geoweb with gravel, or concrete block articulated mats that extend out into the river, providing access at various water levels. The ramp requires adequate space to allow for vehicular access and turning. Parking spaces are needed, including spaces for vehicles with a boat trailer in tow. Signs providing information on the mileage between the launch and takeout points with a map indicating any downstream dams, other downstream hazards, rapids and their classification, and information if water levels change suddenly due to regulated releases are also needed. Encouraging people to share their “float plan” with others is also a good idea. A downstream takeout also needs to be provided with adequate parking at both launch and takeout areas to enable people to set up a shuttle.

BIRDING

Connecting a network of greenways, buffer strips, and /or open spaces maximizes the potential of the greenway for wildlife use while providing opportunities for birding and nature study. Wildlife viewing can be accommodated on site by a series of smaller paths off the main path system, away from vehicular traffic and other high-use areas, noise, and distractions. These small paths can minimally be 12 to 18 in. wide and can be surfaced with sand, stone fines or woodchips. An overlook or high vantage point that people can use to look into the canopy of trees may enhance birding opportunities. Bird watching and avitourism is the fastest growing outdoor activity according to a recent U.S. Department of Agriculture, U.S. Forest Service national survey on recreation (1997). Sources of information for birding trails include the National Audubon Society (2005) http://audubon.org/bird_trails/eastern_sierra.html.



Figure 3. Viewing deck overlooking riparian corridor offers good birding opportunities.

ENVIRONMENTAL EDUCATION

Environmentally, the greenway provides different functions, such as protecting water quality by acting as a filter strip, protecting streambanks from erosion, enhancing wildlife habitats, and creating a movement and dispersal corridor. Footpaths can provide access to various habitats, but should avoid highly erodible features, sensitive areas, and fragile habitats. Boardwalks can traverse wetlands, bogs, or other areas with standing seasonal water that may occur in the riparian corridor.

Environmental education opportunities include both individual experiences and group involvement such as classes in the public school system and organizations providing opportunities to incorporate as many people as possible. Design features such as nature trails that utilize interpretive signs, kiosks, and overlooks may enhance this experience. A shelter or open-air pavilion can provide group-gathering places.

Organizations can sponsor events to perform various types of community service, such as streambank erosion rehabilitation projects, habitat creation, trail clearing, establishment of an interpretive trail, and providing and maintaining information for an information kiosk. Since the inception of the National River Clean-Up Week program in 1992, 100,000 volunteers have participated in 1,600 cleanups

covering 30,000 miles of waterways (Starch 1996). Science-related projects, e.g., water sampling, biological surveys, bird counts, etc. may be achieved by volunteers as part of an organization's mission or school curriculum.



Figure 4. Corps Ranger providing environmental education to a group of young people

PHOTOGRAPHY AND SCENIC VIEWS

Similar to birding, this activity could be accommodated by a footpath network off the main trail to offer a variety of habitats and views. These footpaths will serve birders, fishermen, and others preferring to get off the main trail.

Scenic overlooks are always a popular attraction. The area below the vantage point may need to be cleared of vegetation on a routine schedule. Benches in these areas are nice amenities. Signs should be located so as to avoid obstructing the view. The scenic overlooks should be made handicapped accessible if possible. Railing around the overlook may be necessary for safety concerns depending on the topography.

FISHING

There are approximately 60 million anglers in the United States. Aquatic Resource Education (ARE) Programs are now available in the United States and four territories, reaching seven million people a year with fishing and

environmental messages (Starch 1996). Facilities can be as simple as a footpath providing access to the water or more structured such as a dock providing safe access to the water. Organizations such as Trout Unlimited can sponsor events to create instream fish habitat structures to increase fish populations. This stimulates community involvement and care for the environment.

PARKS AND RECREATIONAL AREAS

Parks, recreational facilities such as parking areas, soccer, and other playing fields, and play areas with shaded seating areas offer green space for active recreation. These areas may already exist and can be connected into the larger corridor network. Kiosks can provide a formal entrance into a natural area, providing visitors with information that may make their visit to the area more meaningful, fun, and safe. Signs can help unite the area within the project bounds and may reflect the style of other signage used by the sponsor, such as an urban park commission. These amenities will increase visitation to an area.

Developing a park or recreational area in a floodplain is compatible with flooding processes due to the relatively low risk of economic damages. Additionally, there are lower risks to the public and the built environment in the case of a high-water event. These areas can be developed between access roads and the vegetated buffers along the river corridor.

COMPATIBILITY ISSUES

Not all sites are compatible with recreation needs, and some forms of recreation are incompatible. The hallmark of the floodplain is change. Recreational opportunities in the floodplain must be designed to adapt to changes that are both seasonal and unpredictable. Seasonal shifts in water levels and use patterns make the availability of many recreational zones highly unpredictable. Ball fields and tennis courts in the floodplain, for example, can present significant problems, especially in the spring and early summer when these facilities are needed. In all cases, the capriciousness of overflow events in the floodplain demands a flexible attitude towards

planned and scheduled uses. When planning for the inclusion of recreational facilities or amenities, the following questions should be considered:

- Is the site adaptable to recreational use?
- Is the recreational use adaptable to the site?

- If multiple recreational uses are being considered, will they be compatible with one another?

Tables 1 and 2 provide an overview of compatibility considerations for recreational use in the riparian corridor.

Table 1. Compatibility of Recreational Enhancements for the Urban Stream

Activity:	Considerations for compatibility:
Hiking, Running and Cross-country Skiing	Trails along the riparian corridor can service numerous pedestrian uses, provided that they are appropriately sized, utilize proper grading and erosion control.
Bicycling	Can combine with pedestrian use if the trail is at least 8 ft wide and has appropriate surfacing. Special considerations may be needed to reduce erosion from mountain biking.
Fishing	Provide footpath access to river for undeveloped access. Provide an accessible way to a fishing dock or pier.
Boating	Significant site improvements for vehicular access may be required for put-in and take-out boat ramps in accordance with the desired vessel use with canoes, kayaks requiring less development.
Photography	Take advantage any geographic features that offer visual interest. For example, providing overlooks, special planting arrangements, etc.
Environmental Education	Can provide interpretive trail or brochure from a sign box. Provide for outdoor classroom opportunities with sufficient space to accommodate classes.
Birding and Wildlife Viewing	May need re-planting and habitat enhancements along stream corridor, and attracting diverse wildlife requires corridors of sufficient size and connectivity.
Playing Fields and Playgrounds	Requires maintenance by mowing. Suitable in low lands adjacent to riparian buffer.
Picnicking	Provide accessible picnic tables and trash receptacles close to access road and parking lot.

Table 2. Compatibility Among Uses (X = fully compatible; - = may not be compatible)

Activity:	Pedestrian	Bicycling	Fishing	Boating	Photography	Environmental Education	Wildlife Viewing	Fields and Playgrounds	Picnicking
Pedestrian	O	-	X	X	X	X	X	X	X
Bicycling	-	O	X	X	X	X	-	-	X
Fishing	X	X	O	X	X	X	X	X	X
Boating	X	X	X	O	X	X	X	X	X
Photography	X	X	X	X	O	X	X	X	X
Environmental Education	X	X	X	X	X	O	X	X	X
Birding & Wildlife Viewing	X	-	X	X	X	X	O	-	X
Fields and Playgrounds	X	-	X	X	X	X	-	O	X
Picnicking	X	X	X	X	X	X	X	X	O

MAINTENANCE CONSIDERATIONS

Recreational facilities should be low maintenance, yet provide for as many recreational opportunities as possible. To effectively achieve this, facilities need to be well designed, yet simple, providing for more than one function. To ensure compliance with key recreational requirements, the Corps is developing Recreation Facility and Customer Service standards to guide construction and operation at Corps-managed areas (<http://corpslakes.usace.army.mil/employees/facilities/review-final.html>). In riparian corridors, construction materials need to be durable, construction techniques simple (not requiring unusual maintenance), and construction easily repairable. Plantings should be low maintenance and preferably composed of native species. In naturalized areas, natural succession should be allowed to occur, so that mowing is limited to active play areas and picnic areas.

The area may need to be closed and precautionary signs may need to be posted to maintain health and safety before and after a high-water event. Maintenance after a high-water event will include removal of drift, debris, and some sediment accumulations. All site facilities should be sanitized if in the area of inundation.

Facilities in the floodplains are subject to high-water events and will require additional maintenance after these events. Therefore designing of facilities for such occurrences is important.

ACCESSIBILITY CONSIDERATIONS

A significant portion of our population will experience either a permanent or temporary disability at some point in their lives and this may impact their ability to use trails or other recreational facilities. According to the National Center on Accessibility (2005) (<http://www.ncaonline.org/monographs/8accessible-trails.shtml>), an "accessible trail is a trail that is accessible to and usable by people with disabilities" and that meets "minimum guidelines established by the U.S. Access Board." Handicapped-accessible picnic tables, shelters, and comfort stations can be installed in close proximity to parking areas for convenience. Examples of accessible trail criteria include: surface, maximum running and cross slopes, tread width, passing space resting intervals, and edge protection (Table 3).

Table 3. Accessible Routes, Outdoor Access and Trails (National Center on Accessibility 2005)

	<i>Access Routes (ADAAG)¹</i>	<i>Outdoor Access Routes</i>	<i>Trails</i>
Surface	Stable, firm, slip resistant	Firm and stable	Firm and stable
Max Running Slope	1:12	1:20 (for any distance) 1:12 (for max 50 ft) 1:10 (for max 30 ft)	1:20 (for any distance) 1:12 (for max 200 ft) 1:10 (for max 30 ft) Exception 1:7 for 5 ft max for open drainage structure
Max Cross Slope	1:50	1:33 Exception- 1:20 for drainage purposes	1:20 Exception - 1:10 at bottom of open drain where clear tread width is a min of 42 in.
Min Clear Tread Width	36 in. 32 in. (for no more than 24 in.)	36 in.	36 in. for any distance
¹ Americans with Disabilities Act (ADA) Accessibility Guidelines (U.S. Departments of Justice and Transportation 1990).			

HOW TO GET STARTED

According to the Urban Land Institute, “as the U.S. population increases by more than 60 million over the next 25 years, the pressure for development to accommodate growth will intensify, as will demand for development to do its part to protect the environment and conserve energy” (Urban Land Institute 2002). Communities interested in creating a greenway or trail can pursue this goal by following some simple steps adapted from the New York Parks and Conservation Association (2005):

1. Develop a vision of what is needed.
2. Reach out to partners to share the vision.
3. Build a network of community elements (local businesses, public officials, schools, hospitals, community groups, landowners) and allow for public input.
4. Develop a strategic plan that sets goals and establishes tasks, examines funding options, and looks out long-term.
5. Conduct a feasibility study to look at issues, solutions, benefits, and costs.
6. Create a master plan for the effort to use in presentations.
7. Acquire and develop the land.
8. Monitor progress toward achieving the desired results of a greenway project.



Figure 5. Secondary trails provide access to scenic views for enjoyment and contemplation

SUMMARY

A community will realize the following benefits from offering recreational amenities in the urban stream corridor:

- Provide enjoyment.
- Increase local property values.
- Promote better health and quality of life.
- Increase appreciation for nature and the environment.

The riparian buffer can offer needed visual, mental, and physical relief from the urban landscape. Additionally it can provide habitat for wildlife and possibly migration corridors if it is connected to larger open-space areas. It can offer so many opportunities to benefit the community, create pride, and a sense of place unique in character to that of the urban area. From an ecosystem perspective, greenways and buffers can accommodate flooding processes that reduce damage in developed areas. Examples of success stories where partners have worked with the Corps to create trails in riparian zones may be found at: <http://corpslakes.usace.army.mil/visitors/action>.

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