Mianus River Park

Appendices for Managing Natural Resources & Recreation: An Action Plan

Recommendations by the
National Park Service
Rivers, Trails & Conservation Assistance Program
to
City of Stamford, Town of Greenwich, State of Connecticut and the many Friends of Mianus River Park

September 2006

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Additional Notes about Action Plan

Gateway Arrival Zones

By creating a transitional arrival area, you give visitors time and a place to downshift their minds and bodies from "Drive" into "Park."
The amenities and quality of the parking lot, trailhead information, directional signage and landscape will help set the tone and expectations for visitors. Those amenities transition from highly designed to mostly natural.

Stamford - Merriebrook Road

- ☐ Grade the parking lot in Stamford to improve drainage and appearances.
- ☐ Install signage to serve visitor needs for information and set expectations for behavior.
    - Entry sign at driveway entrance to Merriebrook Road.
    - Welcome & Orientation trailhead: map, map dispenser, "Doggie Doo" dispenser, etc.
- ☐ Install a set of stairs on the steep slope from the barn down to Merriebrook Road to control erosion and make it easier for people to walk. This will also show concern for the comfort of visitors.
- ☐ Find a tenant or municipal use for the red barn so the building is no longer an eyesore and fire hazard.

Greenwich - Conewaugh Road

- ☐ Install signage to serve visitor needs for information and set expectations for behavior.

Pedestrian-only Buffer Zone along the River

Essential for allowing over-used areas to recover. Areas with severely compacted soils will need active restoration to re-vegetate. [Note: if this were a wildlife refuge, we would consider closing the riverfront to nearly all human activity. Creating a riparian zone with reduced impact uses is a reasonable measure given the need to balance recreational pursuits and resource conservation.]

Set buffer width according to landscape cues:

- ☐ Nearest trails
- ☐ Slope - extend the buffer to the top of any steep slopes
- ☐ Discourage bikes, wheelchairs and dogs.
- ☐ Create one dog swimming area where anglers do not tend to congregate and where a wide area can be stabilized: existing site adjacent to The Flats makes sense for these reasons and because dogs and owners clearly like this spot.

Revegetation Zones

By establishing a progression of successfully revegetated areas, the health of the park will improve and visitors will see results. It is essential to teach visitors why exotic plants are removed and how native species contribute to the health of the park ecosystem. Whenever possible, link benefits to specific species (i.e., Pileated Woodpeckers depend on these for….) to establish compelling reasons for actions.

- ☐ To minimize visitor frustration over "keep-out" areas and the presence of fences, limit the number of revegetation zones to one (large) or two (small) plots.
- ☐ Always post signs on the fencing to explain the function and value of the fence and the plants inside:
    - Habitat, food, cover, soil health, erosion control, beauty,
- ☐ Ask visitors not to damage the fencing, and to report problems.
- ☐ Post a sign after the fencing has been moved to point out results and encourage care for the plants.

Trail Hierarchy

Main Trails

Tread of eight to 14 feet wide
Cleared corridor 10- to 16-feet wide and 10 feet high.
Hardened surface, is often an old roadbed; generally smooth and suitable for wheelchairs.
Several are linked into loops with color coded confidence markers and that connect to a major trailhead.
Slopes minimized though not all are ADA compliant (suitable for wheelchairs).
Identify how much of the major trails from each trailhead is ADA accessible. Mark that on maps and on the trailhead sign.
Look for obstacles that can be eliminated to open up trail to wheelchairs.
Drainage structures are substantial and may be engineered.
When considering upgrades to create a main trail, be careful to assess viability of the landscape to accommodate a larger trail before getting your heart set on it.
Identify main trails with identifiers of standardized size and design.

Side, or Connector Trails

Tread of six to eight feet wide.
Cleared corridor that is at least eight feet wide and ten feet high.
Surface is usually packed soil, sometimes with fill and stone dust added, and sometimes stony and uneven.
More variable slopes.
Drainage is handled by crowning and cross-slopes, as much as possible without culverts and waterbars.
Identify side and connector trails with identifiers of standardized size and design.

Closures

Excessive slope: greater than ___ percent.
Too close to vernal pools, wetlands and the river.
Redundant - too many trails going to the same place.
Make closures convincingly, so visitors do not re-open them. Use camouflage techniques, including piles of brush, "planted" slash, deadfall logs, and fences with signs if necessary,

Trail Network Ideas
Colors for main loop trails/roads
Directional arrows for major connector trails
No action for side and small trails -- leave the mystery and sense of discovery.
Close destructive and unnecessary trails **convincingly**.
Pedestrian-only zone signs
No access zone signs (for plant restoration areas)
Interpretive theme trails
Trail maps

Mountain Bike Playground

Consider establishing a "playground" area in the park, or somewhere in the region, where mountain bikers can challenge themselves and play on technical structures, and where they are responsible for its maintenance. This may take pressure off the rest of the park.

- ☐ Begin with one playground site on a trial basis.
- ☐ Locate it with attention to environmental constraints and logistics (and travel patterns) of the trail system.
- ☐ Consider establishing an additional site or two based on performance.
- ☐ Attempt this only with commitment by mountain bikers (NEMBA is essential) to design and manage the playground.
- ☐ Post unconventional and engaging signs to enlist the support of cyclists, including responsible riding in the rest of the park: moderate speeds, no bootleg trails, no free-riding off trail, etc.

Bank Stabilization for River Access

The shoreline is riddled with problems, ranging from stones artificially placed at the toe of the riverbank slope, to erosion from human and canine access to the river. The chain-link-wrapped telephone pole set in the bank by the Flats is a well-intentioned attempt at shoreline stabilization, however, it is time to replace it with one of the more effective techniques now available. Since this is also the primary location for river access by dogs, the new design should serve their needs, too.

- ☐ Engage a river restoration professional to design and oversee installation.
- ☐ Understand that work in and along the river will require time-consuming permitting review.
- ☐ Given their commitment to, and knowledge of, the river, the local Trout Unlimited Chapter is well-suited to play a lead role with this project.
- ☐ A small working group of anglers and dog walkers should be involved in the design of this project with the city and a river specialist.
- ☐ Each year, take on one or two of the dozens of erosion problems up and down the river, again with the aid of a river specialist. Volunteers may be able to do installation, as long as heavy equipment is not necessary and plans are carefully followed.
- ☐ On all of these sites, annual maintenance will be essential.

- □ Explain these restoration project in signage and handouts to enlist support of anglers and dog walkers. Discourage river access by dogs at any other point along the river.

Quiet Zones

Mianus River Park is a busy place often full of energetic activity. It is also 220 acres of mature forest and dramatic landscape that inspires contemplation and wonder. In its current trajectory, the park is destined to become busy from one end to the other. Look at a map of the region and you will see why the park will continue to attract more visitors and hubbub.

- □ Consider the value of having one or several refuges of tranquility within the park for quiet, stillness, meditation and reflection.
- □ As important as setting aside the actual space is sending out the message: this is a place for exercise, fresh air, **and calm.** This will help to balance the parks reputation for high intensity activity.
- □ Locate this zone in an area that is off to the side of heavy traffic patterns and desire lines (where people just **want** to go).
- □ On existing trails within a zone, consider two approaches:
    - Leave all trails unmarked to encourage unstructured wandering and walking meditation and
    - Close unnecessary trails to restore natural landscape.
- □ Characterize the zones not with prohibitions, but with attractive descriptions and suggested activities: birding and nature observation, meditation (stationary and walking), T'ai Ch'i, art-making, silence, etc.
- □ An obvious candidate to test this concept is Hemlock Gorge.
- □ Next, consider the south end of the park in Stamford, next to Treetops.

Events

Trading Places: National Trails Day *(always the first Saturday in June)*
All user groups will hold demonstrations and tutorials for others: fly fishing; mountain biking; obedience and retrieving demo; riparian restoration; birding; archeology; orienteering; water supply

Informational Table: several weekends Spring and Fall
Volunteers will have handouts and be available to answer questions about the restoration, management plan, Friends of MRP group,

Mountain Biking: Safe Riding clinic

Trail workshop: Design and reconstruction clinic with hands-on work.

Ambassadors: Cruise the park on selected weekends to encourage good behavior, especially during mud season to stay on main, hardened trails.

The Mianus River Park Matrix - 2006

Current and Desired Conditions with Actions to Get There

Characteristic	Current Conditions	Desired Conditions	Actions & Measures of Progress
Vegetation & Forest Floor	Widespread presence of invasives in the understory: Euonymus; Norway maple; ……..	No invasives. Healthy, mature oak forest.	☐ Pull a few Euonymus as part of every trail work day until they are gone from the park! -or- ☐ Have a full-blown Euonymus attack in November before the ground freezes. ☐ Replace orange fencing, then ☐ Plant The Flats in October 2005 with approved, native species. ☐ Care for newly planted vegetation until they are well established. ☐ Prune or remove badly damaged trees and shrubs. ☐ Cut and remove Norway maples and _____ unless they are providing riverbank stabilization. ☐ Mulch barren forest floor with oak leaves from Fall leaf collections. ☐ In 2005, document

			conditions (erosion, compacted soil, riverbank instability, loss of vegetation, signage, drainage, and use patterns, such as where dogs enter and exit the river, for example) along the approximately one-mile study area riparian corridor. ☐ Repeat the photo documentation annually at the same time of year. ☐
Trails & Wayfinding System	Too many trails, including bootleg and approved segments. Drainage problems in need of waterbars and re-grading. Overly wide trails, especially in seasonally wet areas. Confusing trail intersections. Trails on ridiculously steep slopes by the river.	Coherent trail network that is easy to follow without getting lost. Heavy use is focused on high-capacity trails. All use diverted from sensitive areas - riverfront, wetlands, vernal pools, etc. No bootleg trails.	☐ Draft a trail development and closure plan in Fall 2005. Implement the plan in Winter and Spring 2006 trail work days: close undesirable trails, post color loop markers, and print (and post on web) an updated trail guide. ☐

River	Toe of slope is lined with stones. Rocks have been removed from the riverbed		☐ Replant eroded banks ☐ Place coconut coils/mats to arrest erosion and start seedlings.
River Access	Dogs and anglers get into the river at many locations. Their activity in the river overlaps, leading at times to direct conflict.	Access to and from the river is limited to separated, designated entry/exit points for dogs and people.	☐ Evaluate entire riverfront and, in conjunction with users, identify feasible/suitable access points for anglers and dogs. ☐ Establish provisional access points, harden the bank as necessary with approved methods, publicize it, and learn from experience. ☐
Parking Lot & The Lodge	Potholes. No signage to orient visitors. No directions for parking. Eroded, steep "path" to park entrance. The Lodge is deteriorating and will, before long, be compromised.	Well-drained and graded parking lot. Setting will be an attractive and informative gateway to the park. A well-maintained Lodge will serve a variety of public functions, including a center of recreation and conservation activity for the park.	☐

Neighbor Relations	Workshops and meetings are publicized indirectly to neighbors.	Neighbors are aware of efforts by the City and citizens to manage for resource protection and visitor safety and enjoyment. Neighbors are advocates for good use and management of the park.	☐ Walk the park with Mr. Brownstein to understand his concerns. ☐ Offer other neighbors a "Walk in the Park" to learn about current changes and long-term objectives. ☐
Visitor Experience	Experiences vary from very good to awful. Conflicts between users is common, especially during temperate weekends. Abundance of unleashed dogs dramatically limits	Few user conflicts. Park is a destination for active and passive recreation celebrations and education.	☐ Ambassadors of various user groups routinely "patrol" and educate peers. ☐ Survey users periodically to measure quality of experience. ☐
Dogs	Virtually all are off leash. Other visitors are often jumped on. Clawing the banks to get out - causing erosion.	Dogs on leash and under control - no jumping on others. Entering and exiting the river at designated points with hardened banks.	☐ Commitment from dog walkers to control dogs. ☐ Post and "enforce" leash law through ambassadors. ☐
Signage and Wayfinding			☐ Build and install an interpretive sign at The Flats to explain trail work, fencing, plantings, and euonymus removal. ☐
Trail Maintenance			

Events	Monthly trail work events since June 2005. Mostly unprogrammed activity, though groups do convene for rides, dog walks, and birding outings. Opening day of fishing season(s) is an event.		□ Continue to hold trail work days on a regular schedule. Hold ribbon-cutting in Fall 2005 to celebrate accomplishments. Hold ribbon cutting in Spring 2006 to celebrate new way-finding system. □
Partnerships & Management	City organizes periodic meetings of citizens and trail work days, serves as liaison to Parks Commission and other city departments, and . City administers DEP grant.		□ …

Trail Monitor Report

Monitor names: _____

Trail Segment: _____

GPS coordinates: _____

Trail Log distance _____ from landmark _____

Date of monitoring: _____

Description of Conditions (verbal and sketch, if possible)

Ticklers:

☐ *tread surface*
☐ *tire damage to tread*

☐ *drainage*
☐ *watercourse*

☐ *bootleg trail*

☐ *steps*

☐ *bridge*
☐ *boardwalk*
☐ *railings*

☐ *fallen trees*
☐ *overgrown brush*
☐ *invasive vegetation to remove*
☐ *native vegetation to restore*

☐ *sign face*
☐ *sign base*
☐ *confidence markers*

☐ *vandalism*

☐

Potential Treatments (verbal and sketch, if possible)

Ticklers:

☐ *lay/add stone dust*
☐ *make/restore full bench cut*

☐ *reshape tread contours*
☐ *install/restore waterbar*
☐ *clear culverts and drainage*
☐ *restore sheet flow off trail*

☐ *re-route trail*

☐ *replace sign face*
☐ *repair sign base*
☐ *replace confidence markers*

☐ *remove invasives*
☐ *prune vegetation*
☐ *plant natives*
☐

☐

☐

☐

☐

Tools

- ☐ First Aid Kit
- ☐ Cell phone or radio and emergency phone numbers
- ☐ Liability waiver forms
- ☐ Checklist for a Safe Trail Work Day (two-pager)
- ☐ Gloves
- ☐ Safety glasses or Goggles
- ☐ Knee pads
- ☐ Sun block
- ☐ Bug dope
- ☐ Water, lots of water, and snacks

- ☐ Folding saw or bow saw (or buck saw!)
- ☐ Loppers
- ☐ Hand pruners
- ☐ Grass whip or Swizzle stick

- ☐ Grub hoe (also known as a Hazel hoe or Adze hoe)
- ☐ McLeod (a trail rake and tread smoothing tool)
- ☐ Rakes: garden, leaf, and/or fire

- ☐ Digging bar
- ☐ Rock bar/Pry bar/Crow bar
- ☐ Peavey (to roll large logs)

- ☐ Pick mattock or Cutter mattock

- ☐ Shovels: long-handle, D handle, flat
- ☐ Post-hole digger

- ☐ Sledgehammer and/or Hand sledge

- ☐ Wheelbarrow
- ☐ Garden cart
- ☐ Canvas bags
- ☐ Five-gallon plastic buckets

- ☐ Measuring wheel or GPS unit
- ☐ Clinometer or level (digital or bubble)
- ☐ Tape measure
- ☐ Flagging
- ☐

Labor

Minimum and ideal numbers of volunteers for each project:

Estimated total person-hours:

Special needs:

specialized tools

strength

protective clothing

tool competence

Trail Monitor Gear Shopping List

Ben Meadows
800 241 6401
www.benmeadows.com
or
Forestry Suppliers
800 647 5368
www.forestry-suppliers.com

[ ] GPS unit

[ ] Measuring Wheel
Rolatape Measure Master 50
Ben Meadows #4JB-103364
$101.00

[ ] Digital Camera

[ ] Digital Recorder

[ ] Tape Measure
Stanley Fat Max 50 Feet
Ben Meadows #4JB-79054
$14.70
[Also available in 100-foot length.]

[ ] Clinometer
Suunto Self-damping Clinometer and Skylon Case: Percent and Degrees
Ben Meadows #4JB-102200
[Description: PM-5/360PC/Percent and Degrees]
$115.00

[ ] Leather Clinometer Case
Ben Meadows #4JB-102214
$7.50
[Why use a synthetic case when you can have leather for $7.50?]

[ ] Notebooks
Rite in the Rain Field Books and Notebooks
Ben Meadows 2004 catalog pages 67-71.
[Take your pick; they come in all shapes, sizes and formats.]

Tools

See the AMC, SCA and IMBA books for excellent descriptions of tools and their safe use; no need to reproduce all of their knowledge here.

Tools for Volunteers

Permitted

The hand tools you see in the AMC and SCA books are all you'll ever need for normal trail work.

Tools that require swinging demand clear direction and constant vigilance to prevent accidents. **Every** person needs to be on the lookout.

With casual volunteers, try to avoid using double-bitted tools, such as Pulaskis (ax and grub hoe on one handle) whenever possible. A single purpose grub hoe will be easier and safer to swing.

In experienced hands, a pick mattock, or a pick cutter, is an essential tool to loosen rock and cut roots.

Axes should be used as little as possible and only by an experienced person, preferably the owner of the ax. Isolate the ax work in a large radius for safety. Steel toe boots are a must.

Forbidden

If it's a power tool, don't allow volunteers to use it.

The only exception would be, for example, a professional arborist who volunteers to pitch in. First, confirm their competence (do they insist on wearing protective gear?, is their equipment in good condition?), then turn over to them supervision of work around their chain saw, drill, or other power tool.

Don't allow **anyone** to use hatchets or machetes. Bow saws, loppers and pruning shears will do the job better and more safely.

If heavy machinery is needed, schedule that work before the volunteer work day. The volunteers can work the next weekend (in peace, quiet and safety) to do clean-up and follow-up.

Never, ever let volunteers near a chipper.

And don't let volunteers set up cables and cable winches. That's a job for a pros only.

Tools to Own

Figure out which tools volunteers can't provide and buy the ones that will make your life easier. Good candidates include:

- Grub hoe (also known as a Hazel Hoe or Adze Hoe, the best tool for making bench cuts, water bars and for changing the tread slope);
- McLeod (a trail rake and tread smoothing tool, good for clearing leaf litter and finishing the tread surface);
- Folding saw (or small bow saw, but the folding saw is easier to carry);
- Post-hole digger (for sign posts); and
- Digging bar and/or a Rock bar (for loosening soil, prying rocks, and compacting soil).

Guidelines for Trails in Riparian Areas

Compiled by Jennifer Waite
National Park Service Rivers & Trails Program
January 2006

Riparian: *of or pertaining to, the bank of a river or lake*
Riparian areas: *ecosystems comprised of streams, rivers, lakes, wetlands and floodplains, extending up and down streams and along lakeshores, including all land directly affected by surface water*
Riparian habitat*: naturally vegetated land adjacent to surface waters, extending from the ordinary high water mark (or top of bank) of a surface water into adjacent communities (Conserving VT's Natural Heritage, VT Fish & Wildlife)*

Ecological values of riparian buffers *(from VT ANR Riparian Buffer Guidance):*
Protection of water quality through filtration of sediments, nutrients, pathogens, and toxics in runoff
Protection of aquatic habitat
Protection of terrestrial habitat
Protection of channel, lakeshore and floodplain stability (flood control, ice damage control)
Protection of aesthetic values

Information Source	Recommended riparian buffer width	Additional recommendations	Trails in buffer zones - recommendations
Conserving Vermont's Natural Heritage – A Guide to Community-Based Planning *VT Fish & Wildlife, 2004*	100' "a naturally vegetated 100' wide riparian buffer on each side of a stream will protect many of the functions associated with healthy riparian habitat"	330' "a 330' buffer will protect nearly all the functions we value in riparian habitat, including high-quality cover for many wildlife species"	Establish design guidelines for foot paths that specify limits on the amount and type of vegetation cleared. Create a riparian vegetation management plan that includes foot path guidelines
Riparian Buffer Guidance *VT Agency of Natural Resources, 2005*	100' This guidance is for ANR participation in Act 250 hearings; For wetlands, buffers are: Class I – 100' Class 2 – 50'	Agency may recommend greater widths for sites with rare, threatened, endangered, or sensitive species, sensitive natural communities, or necessary habitats OR geomorphically unstable channels ***Technical Papers*** associated with the Guidance report summarizes recommended buffer widths from a variety of studies	The Agency supports pedestrian access through the riparian buffer to a waterbody, "except where limitations are necessary to control erosion or destruction of vegetation, or where special habitat values would be no longer supported if unrestricted access were allowed." No clearing of trees >4" in diameter, no stump or root removal, no mechanized earth-moving equipment, and design the path for sustainability and erosion control
River Banks & Buffers for the Connecticut River Watershed *Connecticut River Joint Commissions, 2000*	35-100' for most functions (eroding streambanks, sediment and contaminant filtering, fisheries)	300'+ for certain "interior forest" wildlife species, but smaller buffers provide important linking habitat for birds and mammals	Establish well defined, well designed and well signed trails to create a sustainable, enjoyable experience Don't run trails constantly along the water; locate trail away from water with spurs to the water at specific points Restrict access in sensitive zones

Trail Design recommendations for trails in riparian corridors:

- Good riparian trails take planning; collect all of your data first, do ecological inventory first, to identify special areas
- Orchestrate a team for your effort that represents many types of expertise
- Trails are for people, so have a specific idea of what the trail is supposed to accomplish for the community
- Look at the trail as a chance to enhance degraded riparian zones and leverage resources for restoration (for example, through replanting, stabilization, or by making the trail the spine of an invasive plant control and native plant restoration project)
- Include path management guidelines in your riparian buffer plan (for example, these kinds of design guidelines, and specifying when a trail might be closed, as in flood times or nesting season)
- Make your riparian corridor zones wide enough to accomplish ecological goals and a nature path
- Use natural surface materials
- Give people access to the water early on in the trail, then periodically
- Use established guidelines for sustainable trail construction (Lightly on the Land by the Student Conservation Association) and for wetland trail design and construction (US Forest Service)
- Develop maintenance guidelines – for example:
    - -be quick in clearing trees away that have fallen over the trail, to keep people from making “go-around” trails
    - -pack in and pack out materials for trail repair; don’t dig “borrow pits” for soil for trail repair, and break up any limbs or brush cleared from the trail before spreading it away from the trail
- Select a path route that’s higher, flatter and drier, and not always near the water; always leave a healthy fringe of vegetation between the water and the trail when they do come close
- Use large rocks to “armor” places where the trail visits the water’s edge, to prevent erosion but allow access

Considerations for Boardwalk Trail Construction

August 2005

As new trail construction that is connected to a currently accessible trail, a boardwalk trail must comply with the Americans with Disabilities Act.

The boardwalk should be at least the width of the existing trail leading to it. (Legally, it must be at least 36 inches wide.) See the attached excerpt from the Americans with Disabilities Act Accessibility Guidelines, known as ADAAG, standards for details about ramp width, slope, and cross-slope standards.

Railings will be required. See ADAAG for requirements.

The transition from trail to boardwalk ramp must be flush and not create a grade transition.

The alignment of the trail and access ramps to the boardwalk must allow users to anticipate the approach.

Based on an informal survey of trail engineers, the cost of engineering, materials and construction of an eight-foot-wide boardwalk on helical piers may range from $250 to $400 per linear foot.

Conversion of Slope Measurements

Slopes are expressed in three different units: percent, ratio and degrees. Here are the slopes you'll see in ADA rules.

Percent	Ratio	Degrees
1	1:100	0.5
2	1:50	1.1
5	1:20	2.9
7.1	1:14	4.1
8.3	1:12	4.8
10	1:10	5.7
12.5	1:8	7.1
20	1:5	11.3

Americans with Disabilities Act Accessibility Guidelines (ADAAG)

See http://www.access-board.gov/adaag/html/adaag.htm#4.8 to activate hot links, shown in blue.

4.8 Ramps.

4.8.1* General. Any part of an accessible route with a slope greater than 1:20 shall be considered a ramp and shall comply with 4.8. Appendix Note

4.8.2* Slope and Rise. The least possible slope shall be used for any ramp. The maximum slope of a ramp in new construction shall be 1:12. The maximum rise for any run shall be 30 in (760 mm) (see Fig. 16). Curb ramps and ramps to be constructed on existing sites or in existing buildings or facilities may have slopes and rises as allowed in 4.1.6(3)(a) if space limitations prohibit the use of a 1:12 slope or less. Appendix Note

4.8.3 Clear Width. The minimum clear width of a ramp shall be 36 in (915 mm).

4.8.4* Landings. Ramps shall have level landings at bottom and top of each ramp and each ramp run. Landings shall have the following features:

(1) The landing shall be at least as wide as the ramp run leading to it.

(2) The landing length shall be a minimum of 60 in (1525 mm) clear.

(3) If ramps change direction at landings, the minimum landing size shall be 60 in by 60 in (1525 mm by 1525 mm).

(4) If a doorway is located at a landing, then the area in front of the doorway shall comply with 4.13.6. Appendix Note

4.8.5* Handrails. If a ramp run has a rise greater than 6 in (150 mm) or a horizontal projection greater than 72 in (1830 mm), then it shall have handrails on both sides. Handrails are not required on curb ramps or adjacent to seating in assembly areas. Handrails shall comply with 4.26 and shall have the following features:

(1) Handrails shall be provided along both sides of ramp segments. The inside handrail on switchback or dogleg ramps shall always be continuous.

(2) If handrails are not continuous, they shall extend at least 12 in (305 mm) beyond the top and bottom of the ramp segment and shall be parallel with the floor or ground surface (see Fig. 17).

(3) The clear space between the handrail and the wall shall be 1 - 1/2 in (38 mm).

(4) Gripping surfaces shall be continuous.

(5) Top of handrail gripping surfaces shall be mounted between 34 in and 38 in (865 mm and 965 mm) above ramp surfaces.

(6) Ends of handrails shall be either rounded or returned smoothly to floor, wall, or post.

(7) Handrails shall not rotate within their fittings. Appendix Note

4.8.6 Cross Slope and Surfaces. The cross slope of ramp surfaces shall be no greater than 1:50. Ramp surfaces shall comply with 4.5.

4.8.7 Edge Protection. Ramps and landings with drop-offs shall have curbs, walls, railings, or projecting surfaces that prevent people from slipping off the ramp. Curbs shall be a minimum of 2 in (50 mm) high (see Fig. 17).

4.8.8 Outdoor Conditions. Outdoor ramps and their approaches shall be designed so that water will not accumulate on walking surfaces.

References

Stay up to date with Connecticut Forest & Parks Association for trail maintenance materials they provide to Blue Blaze Trail volunteers: 860 346 2372, or www.ctwoodlands.org.

Selected Trail Construction and Maintenance References

(adapted from US Forest Service)

The following two books are must-have items. They each cover the topic from soup to nuts, including tool safety and technique.

- Birkby, Robert C. 1996. **Lightly on the Land: The SCA Manual of Backcountry Work Skills.** Student Conservation Association. The Mountaineers. ISBN 0-89886-491-7. 272 p.
- Demrow, Carl; Salisbury, David. 1998. **The Complete Guide to Trail Building and Maintenance. 3d ed.** Boston, MA: Appalachian Mountain Club. ISBN 1-878239-54-6. 246 p.

This is the best reference book for signage.

- Suzanne Trapp et al. **Signs, Trails & Wayside Exhibits: Connecting People and Places**. UW-SP Foundation Press: University of Wisconsin at Stevens Point. 1994. 715/346-2076. (Easily available online.)

These are all useful references.

- Birchard, William, Jr. and Proudman, Robert D. 2000. **Appalachian Trail Design, Construction, and Maintenance: 2nd ed.** Harpers Ferry, WV: Appalachian Trail Conference. ISBN 1-917953-72-X. 237 p.
- International Mountain Bike Association. **Trail Solutions: IMBA's Guide to Building Sweet Singletrack.** Boulder, CO: IMBA. ISBN 0-9755023-0-1. 272 p.
- Monlux, Steve; Vachowski, Brian. 2000. **Geosynthetics for trails in wet areas: 2000 edition.** Gen. Tech. Rep. 0023-2838-MTDC. Missoula, MT: U.S. Department of Agriculture, Forest Service, Missoula Technology and Development Center. 18 p. (Copies available at 406-329-3978.)
- Moore, Roger L., Vicki Lafarge, and Charles L. Tracy. **Organizing Outdoor Volunteers, 2nd ed.** Boston, MA: Appalachian Mountain Club. 111p.

These videos could be loaned to your volunteers and used as the basis for a skills workshop and discussion.

- U.S. Department of Agriculture, Forest Service. 1992. **Surface water control techniques for trail maintenance (video).** Missoula, MT: U.S. Department of Agriculture, Forest Service, Missoula Technology and Development Center. 27 minutes. (Copies available at 406-329-3978.)
- U.S. Department of Agriculture, Forest Service. 1994. **Trails in wet areas--turnpike and puncheon construction (video).** Missoula, MT: U.S. Department of

Agriculture, Forest Service, Missoula Technology and Development Center. 22 minutes. (Copies available at 406-329-3978.)

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Sources for Hands-on Training

Connecticut Forest & Parks Association [www.ctwoodlands.org]
They hold excellent hands-on trail workshops.

New England Mountain Bike Association and International Mountain Bike Association [www.nemba.org]
IMBA has two professional Trail Care Crews that tour the country running hands-on trail workshops. Check with the Connecticut Chapter of NEMBA (New England Mountain Bike Association) to learn about their next visit to Connecticut.

Appalachian Mountain Club [www.outdoors.org]
Check with AMC about upcoming trail work clinics by and for volunteers.

Selected Trail Construction and Maintenance References

(adapted from US Forest Service)

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- U.S. Department of Agriculture, Forest Service. 1999. **Health and safety code handbook.** FSH 6709.11. Washington, DC: U.S. Department of Agriculture, Forest Service. 503 p. (Reference copies available at Forest Service offices nationwide.)
- U.S. Department of Agriculture, Forest Service. 1985. **Trails management handbook.** FSH 2309.18. Washington, DC: U.S. Department of Agriculture, Forest Service. (Reference copies available at Forest Service offices nationwide.)

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- Weisgerber, Bernie; Vachowski, Brian. 1999. **An ax to grind: a practical ax manual.** Tech. Rep. 9923-2823-MTDC. Missoula, MT: U.S. Department of Agriculture, Forest Service, Missoula Technology and Development Center. 60 p. (Copies available at 406-329-3978.)

Long Island Sound Riparian Toolbox - http://www.hydroqual.com/projects/riparian/
This is a "toolbox" of riparian buffer management developed by the Long Island Sound NEP, assembling existing materials of use to local officials in drafting and implementing regulations to protect riparian areas. The site allows users to view, read, copy, or download documents, including: public education brochures, model regulations, scientific articles regarding riparian buffers, a glossary of terms, GIS data, etc. The materials presented here contain results of the library and web-based research and compose the Riparian Buffer Toolbox.

Planning a Trail Work Event

Planning and Publicizing
Begin with the recognition that it is best:

(a) to complete one well-done job,
(b) to quit before your crew gets pooped, and
(c) to have a work plan that flexes with the weather and capabilities of your crew.

For large groups, and casual volunteers, the most sustainable trail work days run from 8 or 9 to noon. That's plenty of time to be productive, then have a potluck picnic lunch and get home in time to enjoy the afternoon.

Experienced and smaller crews can rev up their engines and work hard and safely after lunch. And it may be essential to wrap up a construction or trail work project.

Obviously, to take on a complicated, more-than-one-day job, break it into logical steps so there is closure at the end of each day, and so the site is not left in a dangerous, half-baked condition.

If you can publicize a schedule of work days for the year or season (first Saturdays, from 9 to noon, for example), do it.

Then, follow the Safety Checklist for Trail Work Days.

Write up your shopping list, then ask for donations from the municipalities, or local companies, before assuming you need to pay.

<u>Recruiting volunteers</u>
Besides contacting your mailing list of volunteers and volunteer prospects, consider making an arrangement with a local alcohol/drug rehab transition house. These folks can really appreciate being part of such a hands-on service project. It may also be an advantage to schedule their work on a weekday.

Other sources include scout troops and corporations or local companies.

Warning about mega-volunteer work days. Before you agree to host a work day for more than about 20 volunteers, consider carefully whether you, the trail, and your To Do List are up to it. Companies like GE can mobilize 80 to 100 volunteers, especially on community service days. One hundred volunteers need **a lot** of very simple work, a lot of tools and gloves, and a lot of supervision.

In a short time, they can accomplish a lot and they can make a lot of mistakes. I've actually seen a volunteer get into an argument with a neighbor after the volunteer cut a small tree on her property! Ouch.

And you really don’t want a crowd of bored volunteers wondering why you weren’t ready for them.

Liability waivers
Check with the appropriate attorneys and get them signed before letting anyone pick up a tool.

Chain of command
To emphasize a point you’ll see in the Checklist below: Have a Trail Boss who is in charge and able to make decisions without second-guesses. If it’s a big crew, have a clear chain of command, so decisions can be made when and where they are needed.

Trail work days are no place for chaos or free-form improvisation.

Safety Checklist for Trail Work Days

(useful for trail walks, too)*

Preparation:

- ❑ A clear and attainable goal for the day, a work plan and a required tool and materials list. Focus your efforts to minimize the number of tools.
- ❑ Tools: sharp and in good repair. Provide crew with a clothing and equipment list from among the following: hat, hard hat, long-sleeve shirt, long pants, cool clothing, coat, rain gear, gloves, boots, sunscreen, sunglasses, food, water, bug dope, goggles or safety glasses, ear protection, etc.
- ❑ Water and cups.
- ❑ First Aid Kit.
- ❑ Evacuation plan: how would you get an injured person out and how would an EMS crew get in?
- ❑ Cell phone with numbers for emergency services; confirm you'll have a signal at the work site.
- ❑ Deal with insurance needs and get *hold harmless* waivers.
- ❑ Tech-nu lotion/soap and Fels Naptha soap for poison ivy.
- ❑ Tick repellent, pliers and info about protecting against and removing them.
- ❑ Gloves, if crew cannot supply their own; bring extras even if they do.
- ❑ Check the weather report with heat exhaustion, hypothermia and lightning in mind.

Before you Start:

- ❑ Confidentially, collect information about medical conditions of the crew: asthma, bee sting allergy, chronic back/joint condition, etc.
- ❑ Assess adequacy of crew's clothing and equipment.
- ❑ Assume no prior knowledge of safety.

Start-ups:

- ❑ Designate a roving Trail Boss.
- ❑ Establish a chain of command for decision-making.
- ❑ Work Defensively. Continuously wonder "What if…" as in What if that tree falls? What if those rocks slide? What if someone gets cut badly?
- ❑ Authorize (indeed, require) **every** person to speak up when he or she spots a potential problem. Agree on a signal for "everyone pause until we solve the problem I see," such as "STOP!" No grief is to be heaped on the person who causes a false alarm.
- ❑ Preach safety rules and practice them to set the right example.
- ❑ Precede the start of the day with a Tailgate Safety Talk:
  - ❑ to preview each day's goal,
  - ❑ to point out risks,
  - ❑ to request suggestions for improvements,
  - ❑ to set the rules and expectations and
  - ❑ to shift everyone's minds into safety and teamwork gear.
- ❑ Remind everyone to keep a straight back and lift with the legs. Establish signals for lifting and carrying in groups of two or more.

- Circle of Safety –or- Circle of Danger: establish a 10-foot clear zone around each worker when working or walking. “I’m working inside my dime.” Passage through someone else’s “dime” requires acknowledgement in advance. Each crew person is responsible for keeping his or her Circle clear.
- Stabilize the footing of work areas as much as possible by clearing loose rock, sticks, etc.
- Teach how to carry tools: at your side with sharp end pointed away. Use sheaths and guards. Never on your shoulder!
- Give permission for each person to set their own limits and take breaks. “Don’t do any job you feel uncomfortable about.”
- Take ticks seriously. Offer bug repellant. Encourage people to tuck in their pants legs.

During the day:

- Close the trail work area to users – or – make arrangements for the passage of users through the work area: escort with an explanation, move crew off the trail and stand quietly for passage of horses, etc.
- Encourage crew to eat snacks; hungry crews are distracted, weak, and short-tempered.
- Have scheduled water breaks. Exhort crews to drink **before** they feel thirsty; thirsty crews have poor judgment. (Yellow urine means you’re already dehydrated.)
- Watch for hypothermia or heat exhaustion.
- When weather compromises vision, footing and tool safety, end the work day.
- Stop work and take cover at the **first sign** of lightning.
- Point out hazardous plants: poison ivy and oak, nettles, thorns, etc.
- Quietly dismiss any crew member who is a hazard.

After lunch:

- It’s a dangerous time for injury, so before re-commencing:
  - stretch lightly to loosen tight muscles,
  - have a refresher Tailgate Talk to re-focus attention, and
  - review the day’s goal and the morning’s accomplishments.

Late in the day:

- Watch for fatigue and end the day before it leads to accidents.

The Five Fundamentals

1. The Right Protective Gear
2. The Right Food & Water
3. The Right Work Plan and Tools
4. The Right Training
5. The Right Attitude

*(*Adapted from SCA’s **Lightly on the Land** and*
AMC’s Complete Guide to Trail Building and Maintenance.)

Managing Volunteers

United Way's 14 Steps to Success*

1. Get a clear organizational commitment to run a volunteer program.
   Don't think of volunteers as an add-on. Decide to use volunteers well, or don't use them at all. For most fishway operations, volunteers are vital. In fishway planning, certain tasks may lend themselves to volunteers e.g., hosting an informational meeting.

2. Write up a menu of all roles that volunteers might serve.
   Don't overlook using volunteers to run your volunteer program! Having an Operations & Maintenance manual should indicate where volunteers can be useful.

3. Write clear, specific job descriptions and guidelines for volunteers.
   This is the most important step in a successful program. Descriptions need not be long, just clear and specific -- usually, a half-page will do. An Operations & Maintenance manual should indicate specific tasks for volunteers.

4. Set up a simple record-keeping system.
   Write a one-page application form for prospective volunteers. And create a log sheet for each volunteer to jot down hours worked and accomplishments. This yields valuable statistics for fundraising proposals and assures volunteers that you want to know how hard they are working.

5. Recruit prospective volunteers constantly.
   Promote your volunteer openings among target audiences and distribute application forms until you have a waiting list.

6. Interview, select and assign volunteers.
   Match skills with needs: technical skills, interpersonal skills and physical skills. Conduct a friendly, yet formal, interview. Use the conversation to set expectations.

7. Provide a well-organized orientation.
   Volunteers want to know <u>exactly</u> what they are expected to do. The better you explain Who, What, Where, Why and How at the beginning, the less you will have to answer those questions later. Well-informed volunteers are happy volunteers.

8. Have a steady supply of things to do.
   Or at least predict the busy and the slack times of year so volunteers can plan ahead. Your volunteers may or may not have paying jobs; nevertheless, they all have other responsibilities that you must respect.

9. Establish and maintain good relations between paid staff (or board members) and volunteers. Volunteers can be just as professional as those who get a paycheck. Be sure to treat them that way.

10. Provide volunteers with the appropriate level and kind of supervision.
    Supervision varies with the work and the individual. Monitor for more than mistakes: *catch* your volunteers doing things right. See Step #13.

11. Offer training to enhance current skills and to cultivate new skills.

While some volunteers are happy to find a niche and stay put, others will become leaders in your group.

12. Evaluate your volunteer program periodically.
    Evaluate the work of your volunteers; this gives you a basis for recognition. And evaluate your program, too. Ask a Volunteer Coordinator from another group to critique your approach. Pick any group with a vigorous volunteer program; it need not be a conservation group.

13. Recognize good work. Recognize good work. Recognize good work.
    Never miss an opportunity to give genuine, positive feedback and recognition. When volunteers are ready for new challenges, provide them.

14. Make changes in response to suggestions and changing conditions.
    Listen carefully to volunteer suggestions and criticisms. Keep track of your volunteer needs as your monitoring and educational programs change.

Eight Ways to Recognize Good Work

Restaurant gift certificates
Framed trail-related artwork
Volunteer of the Year awards
Lapel pins to recognize length of service
Photographs & press releases to local newspapers
Celebratory pot-luck dinner at the end of each year
A round of applause and recognition at a public event
Sponsor a volunteer to a trails conference as a delegate or speaker

** This material adapted with permission from workshop materials of the Voluntary Action Center, a service of the United Way of Massachusetts Bay.*

Notes from Andy Robinson's Fundraising Workshop on "How to Bullet-proof a Proposal" using the Project Evaluation Tool

John Monroe

You can use the Project Evaluation Tool as an individual or as a group activity. Start by laying out your funding concept as if you were presenting it to a prospective donor. (Could be outlined on paper, or someone could ad lib it out loud.) Then, in column 1, you (or the group) list the all the plusses you can think of.

Next, list the minuses in column 2. Include weaknesses in the project concept itself, in the ability of the organization to deliver, in the way the concept is expressed, in assumptions that a cynic might make about the concept, etc. Imagine you are just looking for reasons to trash this proposal; what would you come up with?

Next, what questions linger in your mind about the concept: what if it succeeds better than expected, what are the dangers of achieving what you propose, what if it flounders, what if you had twice (or half) as much money as you're requesting, is there another organization that could do this, what happens after the current phase, etc.

Now the real work… Take the first column and make sure the positives are all in your proposal. Highlight the best of the best. [Then knock out all the passive tenses and long sentences.]

Take the second column and fix any negatives that can be fixed (like the proposal has jargon and techno-speak), re-work the concept to eliminate legitimate weaknesses of the concept, explain how you will anticipate unavoidable weaknesses and deal with them, and recognize openly (as much as you want to) negatives that are a fact of life to show the reader you are well aware of them.

Lastly, work in answers to important questions from column 3 to show you've thought it through.

What I like best about this approach is the way it humanizes the audience for your proposal. How will the warm-blooded human-being on the other side of the equation react to your ideas?

As I describe the tool, it sounds time-consuming. We practiced on a project during workshop and improved the proposal drastically in half an hour.

Let's Leave With List

the first step in agenda planning

"Desired outcomes" are measurable results you want from a meeting or retreat. Once we have drafted and clarified your list of desired outcomes, I will begin to draft the agenda and think about potential activities and meeting formats. This is often the most important contribution I make to a meeting - to build a logical and interesting agenda on a solid foundation.

Rather than use "desired outcomes" jargon, I use "By _:__, Let's Leave With:" as the heading on the agenda. We will begin the meeting by asking for agreement of the participants to focus on the list. We'll revisit it at the end to measure our success.

During the meeting, it will be our touchstone any time we begin to wander. It is much more effective for the facilitator (or chair) to enforce the group's agreement on the Let's Leave With list than to cut off wandering conversations with the clock. It's **everyone's** job to focus, not just a time-keeper's.

You'll notice that each sample below includes the ending "so that." By completing the sentence after *so that,* you can test the value of each proposed outcome.

- □ A substantial outcome will lead to a compelling *so that.* You'll know this one belongs on the list.
- □ A flimsy outcome will make you wonder, *Why **are** we spending time on this?* If that's the case, either rework the outcome to find the real issue or delete it from your draft.

There are two broad categories of outcomes: knowledge and products. I have offered below some ticklers to start your thinking. Don't feel limited by these suggestions, but do begin every outcome with a solid noun: understanding; agreement; commitment; recognition; a decision; etc.

<u>Knowledge - examples</u>
Understanding of current reality, or a pressing situation or problem *so that.…*

Understanding of potential solutions, courses of action, risks, etc. *so that.…*

Understanding of our history *so that.…*

Recognition and understanding of conflicting attitudes/ideas/perspectives *so that.…*

Products - examples
A decision to [spend money, hire a contractor, run an event, approve a budget, etc.] *so that…*

Agreement on next steps *so that…*

A working draft of a document *so that…*

A decision by each committee member to _____ *so that…*

Once your list is solid, please put it in some kind of order: logical or priority.

Now that we have identified **Rational Objectives**, I need you to consider your **Experiential Objectives** for the meeting:

- What is the context of this meeting?
  - When did they last meet?
  - How well do they know/like one another?
  - Have they recently had a major success, failure, or other significant event?
- What kind of experience do you hope participants will have?
- What kinds of interaction to you feel they need, or does their situation demand?
- How do you hope they will feel as the meeting concludes?

Experiential Objectives - examples
Get better acquainted, get to know one another's strengths and skills

Build trust

Celebrate recent accomplishments

Feel more collegial

Let go of emotional and interpersonal baggage; resolve longstanding tensions

Share enthusiasm for our shared mission and upcoming challenges

Feel confident that we can achieve what we want

Rules and Regulations Summary in Mianus River Park

January, 2006

Property Owners

City of Stamford
Town of Greenwich
State of CT
[Aquarion]

DOGS

Stamford

Ordinance

- Stamford Ordinance 997, Chapter 111. Dogs and Other Animals, Section 111-11. Dog Regulations B. (2) (a.)

No person owning, keeping or having custody of any dog shall permit such dog on any public street or sidewalk or other public place unless such dog is on a leash held securely by such person.

Penalty

- Stamford Ordinance 997, Chapter 111. Dogs and Other Animals, Section 111-11. Dog Regulations F. (2)

Any person who violates this section shall be fined fifty dollars ($50) for the first offense and one hundred dollars ($100) for each subsequent offense, unless otherwise specified in this section.

- Stamford Ordinance 997, Chapter 111. Dogs and Other Animals, Section 111-11. Dog Regulations F. (1)

  If any dog bites someone in an unprovoked attack, the owner, keeper or person in custody of such dog shall be fined one hundred dollars ($100).

Ordinance

- Stamford Ordinance 997, Chapter 111. Dogs and Other Animals, Section 111-7. Deposit of dog feces on city property or other property. B.

Owners and custodians to be responsible. Any person who owns a dog or has custody of a dog, which dog has caused its feces to be deposited upon any city property or upon the property of another, shall immediately remove such feces or cause it to be removed and shall dispose of it in a sanitary manner. A person will be considered to have disposed of feces in a sanitary manner if such person places such material in a bag or wrapper made of paper, plastic or some similar material and places it in a refuse container which is regularly emptied by the City of Stamford Department of Sanitation or some other refuse collector, or otherwise disposes of such material on their own property.

Penalty

- Stamford Ordinance 997, Chapter 111. Dogs and Other Animals, Section 111-7. Deposit of dog feces on city property or other property.

  Any person who violates this section shall be subject to a fine of seventy-five dollars ($75).

Greenwich

Ordinance

- Greenwich Municipal Code. Article 2. Parks and Recreation Places. Sec. 7-25. Pets.

  No owners, keeper or person having charge of a dog or other animal shall permit or allow or be responsible for permitting or allowing such dog or animal to run loose or roam at large at any time upon any park, with the exception of off-leash dog park areas as designated by the Director, or to injure, chase, harass or otherwise disturb any person or any species of wildlife. Nothing herein shall prevent the Director from prohibiting dogs or other animals from specific parks, recreational places or facilities, buildings or structures or any part thereof.

Penalty

Any person who violates this section shall be subject to a fine of seventy-five dollars ($75). [Greenwich Police/Animal Control Division (622-8299) = enforcement entity]

State of Connecticut

Ordinance

- State of Connecticut Department of Environmental Protection, Bureau of Outdoor Recreation, General Regulations. Section 23-4-1(f)(2). Pets and riding animals.

  Pets and riding animals, including but not limited to dogs and horses, are prohibited in the following areas of state parks and forests at all times: all buildings, swimming areas and other areas so posted. No pet or riding animal shall enter a water body in which there is a DEP swimming area from anywhere on the DEP property containing that swimming area or from and contiguous DEP property. Riding animals are permitted in all other areas, and pets are permitted in all other areas, provided, they are on a leash no longer than seven (7) feet and are under the control of their owner or keeper.

Penalty

- State of Connecticut Department of Environmental Protection, Bureau of Outdoor Recreation, General Regulations. Section 23-4-5(a)(1). Eviction.

  Violation of any provision of Sections 23-4-1 through 23-4-4 of the Regulations of Connecticut State Agencies shall be sufficient cause for eviction for a period of not less than twenty-four hours but not more than one year.

- State of Connecticut Department of Environmental Protection, Bureau of Outdoor Recreation, General Regulations. Section 23-4-5(a)(2). Eviction.

  No person evicted with written notice shall enter any state park or forest during the eviction period.

- State of Connecticut Department of Environmental Protection, Bureau of Outdoor Recreation, General Regulations. Section 23-4-5(b)(2)(A). Penalties.

  Any person who violates any provision of Sections 23-4-1 to 23-4-4, inclusive, of these regulations shall pay a fine of thirty-five dollars ($35.00).

- State of Connecticut Department of Environmental Protection, Bureau of Outdoor Recreation, General Regulations. Section 23-4-5(b)(2)(B). Penalties.

  Any person who enters a state park or forest during an eviction period in violation of Section 23-4-5(a) of these regulations shall pay a fine of seventy-five dollars ($75.00).

Aquarion Water Company

David Medd
Operations Manager Aquarion Water Company, Southern Division
August 2, 2004

Aquarion Water Company has no official position regarding dogs and the river. They do not allow any recreation on their terminal reservoirs (those that have a treatment plant or intake located on them). Mianus River Park is located upstream from the treatment plant. Allowing dogs to swim in the river poses less of a health risk than dog owners not curbing or cleaning/picking up after their dogs. Aquarion does not have a regular sampling location upstream of the plant at this time, but they do have a great deal of water quality data from the treatment plant itself. In general, the total/fecal coliform counts of the raw water entering this plant are much greater (by orders of magnitude) compared with the Putnam plant, located off DeKraft Road. Some of this is attributable to a reservoir versus stream supply and the number of homes with septic system adjacent to the river. Regardless, the water quality still meets State health standards and is easily treated at the treatment plant.

Hours

Stamford ---------- *6:00 a.m. to 10 p.m.*

Greenwich ---------- Daylight hours

State of Connecticut ---------- 8:00 a.m. to sunset

Visual Stream Assessment

Trout Unlimited / NPS Rivers & Trails
18 Low Avenue
Concord, NH 03301-4902
Tel 603-226-3436 / Fax 603-224-0091

December 19, 2003

John Monroe
Connecticut & Rhode Island Director
National Park Service – Rivers and Trails Program
15 State Street
Boston, MA 02109-3572

RE: Mianus River Assessment

Dear John:

Please find attached a worksheet that summarizes the results of my visual assessment of the Mianus River in Stamford, Connecticut. I work jointly for Trout Unlimited and the National Park Service, and specialize in stream assessment and restoration.

On December 2, 2003, I spent half a day walking the west bank of the Mianus River in Mianus River Park in Stamford, CT. For several hours, I was accompanied by Walter Kirkman and Harry Leigh of Mianus Chapter Trout Unlimited, Mike Anderson of Aquarion Water Company and you. Collectively, these individuals provided helpful background information about the Mianus River and the surrounding city park.

The purpose of the site walk was to develop a preliminary assessment of the condition of key natural resources in and along the Mianus River. The results of the assessment can be used by the City of Stamford, park users and other interested parties as they work to find consensus on existing conditions and to identify possible solutions.

After walking along approximately one mile of the riverbank with the individuals named above, I conducted a visual assessment of the Mianus River using the Natural Resource Conservation Service Stream Visual Assessment Protocol (NWCC Technical Note 99–1, December 1998). The Stream Visual Assessment Protocol (SVAP) provides a basic ecological assessment. It is intended to be the first level in a four-part hierarchy of assessment protocols that facilitate stream restoration. A more in-depth and sophisticated assessment(s) should be performed prior to undertaking any instream restoration activities.

The SVAP assigns scores for the fifteen parameters listed below, and concludes with narratives of the suspected causes of observed problems, as well as recommendations for

further steps in the planning process.

Channel condition
Hydrologic alteration
Riparian zone width
Bank stability
Canopy cover
Water appearance
Nutrient enrichment
Manure presence [*]
Salinity [*]
Barriers to fish movement
Instream fish cover
Pools
Riffle embeddedness
Invertebrate habitat
Macroinvertebrates observed

[* These criteria are part of the protocol, but are not relevant to this reach of the Mianus River.]

The results of the assessment indicate that the surveyed reach of the Mianus River is in fair condition. The assessment resulted in a score of 7.42 points out of a possible of 10 points. It should be noted that a score of 7.5 points would categorize the reach as being in good condition. Those parameters with scores in the marginal or low-suboptimal range were riparian zone, instream fish cover, pools and riffle embeddedness. These scores are consistent with the impacts of moderate to heavy traffic in the riparian zone and upstream flow management.

In many ways, the river is in relatively good condition. Areas of erosion and bank instability are limited. There is little if any down-cutting of the channel bed and few areas of channel incision. There is good access to floodplain areas. Mature trees on both banks provide good canopy cover and help to maintain the cool water temperatures needed for coldwater fish species like trout.

However, there are also a number of ecological impacts that are the result of human activities. Riparian areas are degraded as a result of heavy use of both established and bootleg trails. Understory vegetation is sparse or absent in many areas. Banks are trampled and prone to accelerated rates of erosion in some locations. Historic bank stabilization measures that used instream boulders for protection at the toe of slope reduced the availability of instream fish cover. Available fish cover is further reduced by the removal of woody debris from the channel. Moderate riffle embeddedness and limited channel widening are likely the result of upstream flow management.

Many of these problems are relatively easy to address. Closure of riparian zones to foot and bike traffic would help restore understory vegetation and bank stability. Closures could be supplemented with plantings of native riparian vegetation. Eroding banks could be stabilized using a combination of bioengineering and natural channel design measures. Instream fish habitat and cover could be improved by encouraging the reintroduction of

woody debris and replacement of native boulders. Public awareness could be heightened by the installation of interpretative signs.

I hope that this information is helpful to the City of Stamford and other stakeholders. Please let me know if you have any questions, or if I can be of further assistance.

Sincerely,

Jim MacCartney
River Restoration Specialist

Stream Visual Assessment Protocol Worksheet

Stream name:	***Mianus River***			**Location:**	***Mianus River Park – Stamford, CT***
Evaluator's name:	***Jim MacCartney and John Monroe***			**Drainage area:**	***30.5 square miles***
Date:	***December 2, 2003***	**Time:**	***11:00 AM***	**Gradient (slope):**	***Moderate – .003***
Today's weather:	***Snow squalls***	**Past 2 – 5 days:**	***Rain***	**Active channel width:**	***35 feet***
Dominant land use (percent total):	***Forested 60% / Residential 40%***			**Dominant substrate:**	***Large cobble / Sand***

Habitat Parameter	Optimal	Sub-optimal	Marginal	Poor	Score
Channel Condition	Natural channel; no structures, dikes. No evidence of downcutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain width.	Channel actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.	
SCORE	10	7	3	1	***8***
Hydrologic Alteration	Flooding every 1.5 to 2 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the flood plain. Channel is not incised.	Flooding occurs only once every 3 to 5 years; limited channel incision. or Withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6 to 10 years; channel deeply incised. or Withdrawals, significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to flood plain or dam operations prevent flood flows. or Withdrawals have caused severe loss of low flow habitat. or Flooding occurs on a 1-year rain event or less.	
Score	10	7	3	1	***7***
Riparian Zone	Natural vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. or If less than one width, covers entire floodplain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. or Lack of regeneration. or Filtering function moderately compromised.	
Score	10	8	5	3	1	***5***
Bank Stability	Banks are stable; banks are low (at an elevation of active flood plain); 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the baseflow elevation.	Moderately stable; banks are low (at an elevation of active flood plain); less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the baseflow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5 or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature tress falling into stream annually, numerous slope failures apparent).	
Score	10	7	3	1	***9***
Water Appearance	Very clear, or clear but tea-colored; objects visible a depth 3 to 6 feet (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy, especially after storm event, but clears rapidly; objects visible at depth 1.5 to 3 feet; may have slightly green color; no oil sheen on water surface.	Considerable cloudiness most of the time; objects visible to depth 0.5 to 1.5 feet; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. or Moderate odor of ammonia or rotten eggs.	Very turbid or muddy appearance most of the time; objects visible to depth , 0.5 feet; slow moving water may be bright green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. or Strong odor of chemicals, oil, sewage, other pollutants.	
Score	10	7	3	1	***8***
Nutrient enrichment	Clear water along entire reach; diverse aquatic plant community includes low quantities of many species	Fairly clear or slightly greenish water along entire reach; moderate algal growth on stream	Greenish water along entire reach; overabundance of lush green macrophytes; abundant algal growth,	Pea green, gray, or brown water along entire reach; dense stands of macrophytes clog stream;	

	of macrophytes; little algal growth present.	substrates.	especially during warmer months.	severe algal blooms create thick algal mats in stream.	
Score	10	7	3	1	***8***
Habitat Parameter	**Optimal**	**Sub-optimal**	**Marginal**	**Poor**	**Score**
Barriers to fish movement	No barriers.	Seasonal water Withdrawals inhibit movement within the reach.	Drop structures, culverts, dams, or diversions (< 1 foot drop) within the reach.	Drop structures, culverts, dams, or diversions (> 1 foot drop) within 3 miles of the reach.	Drop structures, culverts, dams, or diversions (> 1 foot drop) within the reach.	
Score	10	8	5	3	1	***10***
Instream fish cover	>7 cover types available.	6 to 7 cover types available.	4 to 5 cover types available.	2 to 3 cover types available.	None to 1 cover type available.	
Score	10	8	5	3	1	***6***
Pools	Deep and shallow pools abundant; greater than 30% of the pool bottom is obscure due to depth, or the pools are at least 5 feet deep.	Pools present, but not abundant; from 10 to 30% of the pool bottom is obscure due to depth, or the pools are at least 3 feet deep.	Pools present, but shallow; from 5 to 10% of the pool bottom is obscure due to depth, or the pools are less than 3 feet deep.	Pools absent, or the entire bottom is discernible.	
Score	10	7	3	1	***6***
Insect/invertebrate habitat	At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.	
Score	10	7	3	1	***7***
Canopy cover (if applicable) Coldwater fishery	> 75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	>50% shaded in reach. or >75% in reach, but upstream 2 to 3 miles poorly shaded.	20 to 50% shaded.	< 20% of water surface in reach shaded.	
Score	10	7	3	1	***9***
Canopy cover (if applicable) Warmwater fishery	25 to 90% of water surface shaded; mixture of conditions.	> 90% shaded; full canopy; same shading condition throughout the reach.	(intentionally blank)	< 25% water surface shaded in reach.	
Score	10	7		1	***n/a***
Manure presence (if applicable)	(Intentionally blank)	Evidence of livestock access to riparian zone.	Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. or Untreated human waste discharge pipes present.	
Score		5	3	1	***n/a***
Salinity (if applicable)	(Intentionally blank)	Minimal wilting, bleaching, leaf burn, or stunting of aquatic vegetation; some salt-tolerant streamside vegetation.	Aquatic vegetation may show significant wilting, bleaching, leaf burn, or stunting; dominance of salt-tolerant streamside vegetation.	Severe wilting, bleaching, leaf burn, or stunting; presence of only salt tolerant aquatic vegetation; most streamside vegetation salt tolerant.	
Score		5	3	1	***n/a***
Riffle embeddedness (if applicable)	Gravel or cobble particles are < 20% embedded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Riffle is completely embedded.	
Score	10	8	5	3	1	***6***
Macroinvertebrates observed (optional)	Community dominated by Group I or intolerant species with good species diversity. Examples include caddisflies, mayflies, stoneflies, hellgrammites.	Community dominated by Group II or facultative species, such as damselflies, dragonflies, aquatic sowbugs, blackflies, crayfish.	Community dominated by Group III or tolerant species, such as midges, craneflies, horseflies, leeches, aquatic earthworms, tubificid worms.	Very reduced number of species or near absence of all macroinvertebrates.	
Score	15	6	2	-3	***n/a***
Overall Score	<6.0 Poor 6.1 – 7.4 Fair 7.5 – 8.9 Good >9.0 Excellent	***Fair***	(Total points divided by number of parameters scored)	***89/12***	***7.42***

Suspected causes of observed problems: *Degraded riparian zones appear to be the result of moderate to heavy use by mountain bikers, dog walkers, hikers, and anglers. These activities have trampled vegetation accelerated erosion, and reduced bank stability. Past bank stabilization activities that used instream boulders for toe protection reduced the availability of instream fish cover. Flow*

management at upstream dams has decreased the frequency of bankfull flows and resulted in some channel widening while also diminishing the ability of the river to transport sediment and redistribute woody debris.

Recommendations: *Riparian zones should be closed to foot and bike traffic. Eroding banks should be stabilized and riparian areas replanted with native vegetation. Instream habitat and fish cover should be restored by reintroducing woody debris and native boulder materials. Interpretative signs that describe restoration measures and encourage public cooperation should be posted.*

Mianus River Park
Riverfront Trail Assessment

John Monroe
National Park Service - Rivers & Trails Program
June 2004

I. Background and Methodology

In the next 20 years, dozens of East Coast cities and towns will face the issues that confront you today in Stamford: year-round, intense and sometimes-conflicting recreational activities of many people in a relatively small space. Your efforts to work together and become stewards (as well as visitors) of park resources may well become a model for those cities and towns.

This assessment of existing conditions is based on four site walks of the river corridor in Mianus River Park in Stamford, Connecticut: July 2002; April 2003; December 2003; and May 2004.

While the park covers 220 acres and has miles of trails, this assessment looks only at the condition of riparian ("alongside the river") trails from the Merriebrook Lane bridge upstream to Hemlock Pool, a distance of about 4,700 feet. This focus does not diminish the importance of natural resource and visitor experience issues that extend across the park and into Greenwich. It does recognize that the intensity of those issues is greatest in and along the Mianus River. This is, therefore, a logical place to begin the conversation and to launch efforts to deal with those issues.

The accompanying schematic map shows the overview of my individual comments. Detailed "GIS" maps with precisely located features can be produced as a next step. ["GIS" is computer-based mapping that allows layers of data to be managed and used in analysis and monitoring.]

My observations result from walking the park on four weekdays in Winter, Spring and Summer. I kept to the western side of the river since the upper portion on the eastern bank of this reach is private property and because this is where the visitors are. My observations are also informed by a series of meetings with City staff as well as conversations with people who use and care about the park: walkers, anglers, mountain bikers, dog walkers, municipal officials, neighbors, river advocates and water company officials. I'll refer to them collectively as "visitors."

My response to park conditions and use issues is based on professional experience in environmental education and watershed advocacy, along with 13 years of "rivers & trails" work throughout New England with the National Park Service (www.nps.gov/rtca).

This assessment of existing conditions is intended for use at Design Workshop #1 on June 16, 2004. I've kept my comments brief in hopes they will be useful in the workshop conversation.

I'll write up thoughts about potential actions for Workshop #2, once we are ready to move to that step.

II. Observations on Existing Conditions Overall

My observations are organized, first, into comments that apply to the whole focus area and, second, into comments that apply to one or more of four segments. The segments are described below and on the accompanying schematic map.

Trail System

The setting of this trail system is dramatic and appealing with the combination of mature forest, scenic river, escarpment and large rocks.

It is beautiful and relaxing place in all kinds of weather, from snowstorms to humid summer days.

It is a peaceful antidote to the heat, hurry and intensity of urban life.

A "bootleg" trail follows the river, much of the way from Merriebrook Lane to the Hemlock Pool. ["Bootleg" trails are unofficial and undesirable trails from the land manager's point of view.]

The bootleg riverfront trail is in many places actually bootleg trail **network**; there are too many trails and they cover too much of the riparian corridor.

The bootleg riverfront trail has three major pinch points due to:
a rock outcrop (1), a tributary (2) and steep erodable soils (3). [See map.]

The major trails are wide and have poorly defined edges.

Trail intersections are larger than they need to be, meaning that impacts, such as loss of vegetation and soil compaction, are expansive.

Drainage

Poor drainage on trails is due to the interruption of natural sheet flow across the trails, due to creation of barriers, blocked culverts and low spots.

In places of heavy travel, major trails are uncrowned and poorly drained.

Wet areas in trail tread are leading to widening and braiding of trails (increasing their negative impacts).

Intensity of Use

Park is used continuously and year-round, from dawn to dusk. [There is likely after-dark activity, too.] This park does not appear to get much of a rest seasonally.

The greatest destruction of vegetation and soil is found immediately adjacent to the river, in the riparian zone, often right to the water's edge.

Soil erosion on the banks is an acute problem in at least 13 spots and throughout Segment C, roughly 900 feet [see map].

Heaviest visitor traffic appears to be on the River Road Trail between Merriebrook Lane and the intersection with Inner Road Trail. This is the "Interstate 95 highway" of this trail system.

Dogs often run unleashed.

People and dogs enter and exit the river at many locations. Canine and human tracks in the dirt and mud are obvious.

There is, judging from marks on the land, a general acceptance that it is OK to be anywhere in this river corridor for any reason.

Visitor Attitudes

There are strong loyalties to the park, often from the perspective of a single use.

Long-standing resentments exist between many of the visitor groups. Sometimes those resentments are handled diplomatically and constructively; sometimes they get ugly.

Blame is directed at other groups freely.

Though it may not be widely recognized, every visitor to the park (and every person with a management role) owns some of the blame and is essential to any solution.

Context
The river is a public drinking water source; Aquarion withdraws water downstream.

The park is in the midst of urban and dense suburban development, including major transportation corridors.

The park attracts many repeat visitors because it is the best of its type in the region.

Visitors come from Stamford and regionally. And, obviously, the park is easily accessible for residents of metropolitan New York.

The park is not prominent from adjacent streets; it's close by, but not easy to find.

The park is well-known by neighbors and long-time visitors.

III. Observations on Existing Conditions by Segment

Segment A: Merriebrook Lane to Main Trailhead
Primary access in Stamford is on Merriebrook Lane, with a few parking spaces on the lane and a few more by the Lodge.

The bootleg riverfront trail begins with a vengeance just past the bridge. Drainage from the driveway currently erodes soil into the river, creating an 18-inch step down from the pavement.

Visitors are understandably drawn to enter the park here by their desire to walk by the bubbling river. Moreover, a "Private Drive" sign (and the uphill climb) may discourage some visitors from continuing up to the official Trailhead, away from the river.

Along this first stretch of bootleg trail, there are two areas prone to wetness.

Visitors will continue to follow this "desire line;" fortunately, the landscape offers better potential routes than the existing bootleg path.

Segment B: Merriebrook Lane Trailhead to River "S" Curve
The trailhead provides a convenient place for posting announcements and educational material.

The access road gate and stones prevent motorized vehicles from entering at this point.

A trail descends steeply to the right toward the river. The slope and direction of this trail makes it prone to erosion.

The area at the base of this trail shows loss of vegetation and heavy wear and tear from overuse. The trail loses definition and extends everywhere.

Along the River Road trail, there are a number of bootleg connections to the riverfront in this segment. Again, too many ill-defined trails spread impacts across the landscape.

Segment C: River "S" Curve to Fork of River Road and Inner Road Trails
Broad loss of vegetation, including groundcover, woody plants and tree branches. The ground looks scoured in this area.

This 900-foot section is the most damaged landscape in the focus area. It combines soil erosion, water quality impacts and visitor conflicts.

Along this segment, I have witnessed the following conflict situations:
Dense multiple-use traffic on the main access trail.
Soggy tread area resulting in braiding (widening) of the trail and erosion, including deep mountain bike tire tracks.
Dogs interfering with anglers in the river.
Dogs clawing their way up and down erodable banks.
Dogs (good-naturedly) jumping on walkers.

Segment D: Fork of River Road and Inner Road to Hemlock Pool
Adjacent to the intersection of Inner Road and River Road trails, there is a high and steep bank that is being severely eroded. Human and canine tracks are evident across the slope.

The bootleg riverfront trail resumes upriver, adjacent to the unnamed trail on the map.

Some well-intended steps were installed, but the site is too steep and the soil is too soft for sustainability.

The view upriver will continue to be a strong attraction to walk (or slide) down the steep bank to the river, but better alternatives are possible.

Between here and the big bend are six points of severe erosion into the river. There are three more points of severe erosion from the big bend up to Hemlock Pool.

The access point at Hemlock Pool is a textbook example of the results of severe and long-term shoreline erosion.