

Upper Winooski Water Quality Planning Process
Draft goals, objectives and potential strategies developed through
discussions in the upper Winooski watershed with community members and
the Agency of Natural Resources in 2009.

I. RECREATION

Goal 1: Encourage people to gain or expand their appreciation of the resource through increased water-based recreational opportunities

Objective 1. Improve access to rivers and ponds and mitigate erosion at recreational access points (e.g. Clearwater - route 2 bridge, east side of Waterbury)

Potential Strategies

- Identify access locations and problems
 - Use GPS units with capability of uploading information about site conditions and develop a GIS layer of existing access sites with associated problems.
 - Use Google earth program to allow a group to add points with descriptions of condition
- identify where increased access points are needed
 - fishing, boating, swimming, sightseeing (waterfalls, covered bridges) obtain/protect public access
 - Work with VTrans to include access at bridges
 - Discuss potential access through Green Mountain Power properties
 - During culvert replacements look for ways to include a recreational access point
 - Assist existing projects that may include access to water based recreational opportunities: Across Vermont: The portion of trail in town goes along the river (Gallison Hill Road, along Winooski river, across river, along river then across Route 2); Central Vermont RPC is developing a trail map)
 - Identify rod and a half easements owned by Dept. of Fish and Wildlife for fishing, hunting, trapping along rivers and provide signage.
 - Balance different uses of the river with recreational uses (example: small hydro impacts on rafting and fishing)
- spread out users by encouraging use of lesser know access points
 - An assessment tool could include the Visitor Experience and Resource Protection model used by the National Park Service
 - Work with the ANR DFPR and Vermont Dept. of Tourism and Marketing

Potential leaders/partners in developing and implementing strategies: regional planning commissions, outfitters (businesses that rent equipment), outdoor retailers, recreational NGOs, conservation commissions, DFW, DFPR, National/Federal lands

Objective 2. Promote water-related activity within a community

Potential Strategies

- Develop maps and guides – create a Winooski Paddler’s trail
- Install signs – Use symbols providing information about recreational opportunities (boat, swimming, fishing)
- Provide education at following places:
 - village/town festivals
 - Friends of the Winooski – tree planting
 - Friends of the Mad – river cleanup in Spring
 - Montpelier HS – river cleanup
 - advertise existing recreational sites at campgrounds, through schools
- Work with the conservation commission/other town groups

Potential leaders/partners in developing and implementing strategies: see above

Goal 2: Support sustainable recreational opportunities.

Objective 1. Encourage the development of a conservation ethic among recreationalists. Inform them about their impact on water resources; empower them to protect the resource and help them appreciate the benefit of a healthy watershed:

Potential Strategies

- Develop a natural resource guide that provides information about various parts of the Winooski. Example: a mussel bed can be found just upstream from the Marshfield's "new" bridge, as an example. Associate good water quality with an enhanced experience.
- Educate about existing water quality conditions and how they affect recreational opportunities
 - Health risks using *E. coli* levels
 - Provide information about conditions needed to support cold water vs. warm water fisheries.
 - Publicize VT Dept. Fish and Wildlife maps of the different fishery locations, trout, bass, etc.
 - connect to water quality, cold water
- Develop signs similar to the Vermont River Conservancy signs along Ct. River.
- Create “rules for the river” cards, to educate those who use the river for kayaking, fishing, etc. Hand out wherever equipment is rented
- Engage all sectors of the public, including children, families,
- Prevent spread of aquatic invasive species and terrestrial invasive species during recreational activities, including didymo and Japanese knotweed
 - Collaborate with Friends of the Winooski and Friends of the Mad River, river wardens to provide education to reduce spread.

Potential leaders/partners in developing and implementing strategies: outdoor retailers/outfitters; NGOs

Goal 3¹. Reduce potential impact to water resource from upland recreational activities

Objective 1. Ensure that use of trails, class four roads do not result in erosion or diversion of streams

- Identify extent of problem
 - Examples: Mad River Valley problems with mountain biking; Stetson Brook, road used for logging, now neglected
- Identify and publicize successful efforts to protect trails from erosion by encouraging or requiring responsible use
 - Mill Stone Touring Center, East Barre, Graniteville
 - Perry Hill, Stowe Mountain Biking Assoc. and FPR close when needed
- Encourage trail building and maintenance practice for water quality protection.
- Encourage the establishment of organized trail systems that are maintained by users or supported by users. Use examples from existing centers (ski)
- National trail-breeding (?) conference (Hardy Avery)

Overall Objective. Develop a clearing house to help inform existing groups of activities to meet previous goals. Perhaps develop a website that describes each group and what they are doing, what is needed to meet goals.

II. CONSERVING FOREST COVER AND WETLANDS

Goal: Preserve forest and wetland landcover, focusing on river corridor protection and watersheds with high quality water resources.

Objective 1: Work collaboratively with other conservation organizations to protect landcover that best protects water resources.

Potential strategies:

- Identify, prioritize and target lands to conserve based on strategies that meet the goals of cooperating organizations as well as the agency's.
- Foster communication, coordination among different conservation and watershed groups to develop the best projects. Presently, existing groups collaborate through a loose tribal network to find easement holders, funding opportunities, etc.
- Assist with funding
 - Source protection loans – provides 3% loan over several years, but needs several appraisals
 - Farm bill to support town forests
 - Vermont Land Trust, Vermont River Conservancy, VTrans Enhancement grants

¹ Goal 3 talks about non water-based recreational opportunities that impact water quality in general, especially higher elevation streams. This goal may actually make more sense to move to another section that looks at strategies for reducing erosion. Perhaps under the section on improving local roads?

Objective 2: Encourage stewardship of private land that promotes the development and protection of land covers that promote healthy watersheds

Potential strategies:

- Educate landowners about importance of protecting forested landcover and wetland through ANR county foresters.
- Educate landowners about incentives that preserve or create landcover that protects water quality: CREP, Current Use/UVA, conservation easements

Objective 3: Encourage municipalities to protect landcover that best provides water quality protection.

Potential strategies:

- Encourage the protection of resources that are of interest to the community, e.g., trout habitat, water supplies, swimming holes, areas that hold floodwaters.
- Tools for protection may include establishment of town forests, inclusion of priorities in town plans, zoning for woodland/woodlot, wildlife protection, scenic ridgeline, riparian/lake buffer (Partners include VLCT)

Objective 4: Encourage state and federal agencies to include protection of landcover that best protects water quality as criteria in their conservation and land management strategies.

Potential strategies:

- Review the Agency's Lands Acquisition Review Committee (LARC) present acquisition strategy: <http://www.vtfpr.org/lands/exsum.cfm>).

III. VILLAGE CENTERS

Goals: Assist village communities in developing a sustainable relationship with adjacent rivers

Objective 1. Increase communities' appreciation of the river and its resources

Potential strategies:

- Increase access to river for swimming, boating and fishing
- Encourage use of flood plain for community gardens and recreational opportunities, while avoiding installation of infrastructure that could be damaged by flood waters or erosion
- Increase community's opportunities to learn about its history with the river and important riparian natural communities, e.g., big flood, use for industry and transportation, fiddle head picking.
- Create a community vision of the river.

Objective 2. Assist community members in adopting stewardship practices that reduces erosion and discharge of pollutants into adjacent rivers and streams

Potential strategies

- Educate about benefits of treating stormwater include less flooding, road erosion, ecosystem protection and recreational opportunities (impress upon community the value of good water quality).
- Assist in discussions about benefit or detriments of hydroelectric energy production in adjacent waters;
- Encourage residents to practice environmental stewardship: infiltrate stormwater generated by their property, proper disposal of pet wastes; reduced use of chemicals and fertilizers around home, maintain septic systems
- Promote healthy tree canopy, especially along waterways and using trees for infiltration with Department of Forest, Parks and Rec. Urban forestry programs.

Objective 3. Help communities develop strategies for reducing impacts from flooding and improving water quality to protect recreational opportunities: Provide resources such as technical assistance in planning and infrastructure replacement and upkeep

Potential strategies

- Provide assistance in replacing undersized culverts or adopting requirements to ensure new culverts are sized and placed correctly
- Provide information about alternative practices to reduce stormwater such as pervious surfaces
- Stormwater management practices mostly focused on phosphorus and sediment removal, allowing too much of the other pollutants to reach the river: oil, gas, heavy metals
- Snow is often stored close to rivers without restrictions, look for alternative sites.
- Assist towns in identifying illicit connections
- Conduct natural resource survey: use it to identify areas to avoid when discharging stormwater. Find method for giving credit to landowners who protect natural area.
- Educate community about use – waste – treatment cycle of water; show them the wastewater treatment plant to help them understand process.
- Educate developers
- Create more LID demonstration sites in villages: existing examples: rain garden in Plainfield and permeable pavers in Montpelier
- Provide assistance to better manage dirt roads
- Most of development is in flood hazard area, making redevelopment a challenge: Work with town to develop protection of flood hazard areas that takes into account the challenges of riverside communities.
- Help town balancing historic preservation with river protection (dams, buildings, infrastructure
- Applying and managing grants to address problems often too much for local governments. Assist with grant management.
- Help town identify owners of houses in floodplain that would be interested in taking advantage of federal buyouts. Assist communities in understanding impact of climate change on storm intensity and increase of potential for damage to infrastructure in floodplain.

IV. FISHERIES

Goal: Protect and improve cold water habitat for fish and other aquatic biota: reduce encroachments including loss of riparian vegetation and the building of infrastructure in river corridor; reduce fragmentation of habitat by dams, culverts, instream ponds (also provide warming, heat downstream waters); reduce sources of sediment and other pollutants; and reduce knotweed, an invasive, replaces trees and shrubs on river banks.

Objectives 1. Reduce the impact of dams on fish habitat:

Potential strategies:

- Inventory of dams in the Winooski – use, ownership, bottom draw, date when relicensing will occur, etc.
- Dam removal in tributaries and mainstem
 - Potential candidate: Sawmill Road in Cabot
- focus on certain areas and then prioritize
- Potential partners include Trout Unlimited, ANR, Fish and Wildlife, Friends of the Winooski
- Potential funding for the removal of a structurally sound dam would include US Fish and Wildlife Service,
- Identify and train project managers
- Change management to ensure consistent flows over dams
 - Wrightsville Dam (?), temperature moderation, siphon water from the bottom of the impoundment instead of allowing warm water spilling over top
 - Waterbury Hydro, bottom draw (is it bottom draw currently?)
 - Marshfield Reservoir, bottom draw (see above), flows unpredictable

Objective 2. Encourage culvert assessments and replacement to allow for appropriate movement of sediment, flows and aquatic organism passage

Potential strategies:

- Develop assessment as a part of geomorphic assessments and use to prioritize culvert replacement (a couple thousand culverts surveyed, less than 5% pass fish)
- Educate towns about how to use the assessments to choose projects to consider for inclusion in capitol budget
- culvert retrofits – ensure aquatic organism passage (AOP)
 - size culverts to the width of the stream
 - build streambeds in the culvert
- AOP is required by Army Corps general permit and state stream alteration permit. Culvert replacement in a 1 square mile watershed or larger requires state stream alteration permit. State stream alteration engineers provide good instructions to town about adequate sizing and placement. Town or landowners replacing or placing culverts in smaller streams do not always seek technical assistance. Find ways to increase awareness of town and landowners about need to install proper sized culverts

- Inform public about available technical assistance for installing or replacing culverts that will address fisheries and stream issues
- Encourage the development of general MOU between funders and community groups that take on projects: funding provides groups with money to address certain number of culverts, in certain area, over certain period of time
- Encourage town groups, e.g., conservation commissions to take an Adopt A Stream program that includes a focus on fish habitat, culvert issue, erosion, etc.
- Educate engineers and public works staff
- Utilize existing groups/organizations that are regionally affiliated with a segment of stream/river

Objective 3. Help people connect with the streams and rivers by making available fishing and other recreational opportunities

Potential strategies:

- Apply for assistance to develop Lake Champlain Basin Program way side signage to publicize the valuable cold water fishery in the Upper Winooski.
- Center town or section of river around high quality fishery to increase tourism. Estimate economic benefits for town and publicize.
- After educational event provide resources that provide audience with steps they can take on their own property and elsewhere to protect water quality and resources.

Objective 4. Protect the integrity of the forested riparian zone

- Reduce knotweed populations and limit its spread. Focus on areas which have little or no population (as well as upstream areas).

Objective 6. Monitor water quality to assess condition of cold water fishery

Potential Strategies

- Measure temperature
- fish assessments are a better indicator than measuring all the factors fish need
- Continue testing for pharmaceuticals from wastewater treatment plant outfalls
 - Test for Prozac, BPA (plastic), estrogen

IV. WATER SUPPLY

Goal: Protect water supplies

Objective 1.: Protect watershed by encouraging protection of forestland. In addition to soaking up stormwater for ground water recharge and not adding pollutants, forest soils absorb VOC, SOC and IOCs.

Potential Strategies

- Encourage management and conservation of forests (see II. Above)

Objective 2.: Educate communities about how landuse affects quality of water supplies

Potential Strategies

- Present at conferences for water operators – Green Mountain Water Environment Association fall conference (a non-profit group of water supply and wastewater treatment professionals formed by the merger of Vermont's two long-active but separate, water treatment and wastewater treatment organizations.)
- Work with regional planning commission (RPC), Vermont League of Cities and Towns to educate communities - RPCs have GIS layers of Source Protection Areas. As of 2007, SPP are reviewed by RPCs. Water Supply reviews mostly for potential contaminants. RPCs could possibly use EPA's 604b money to develop a map showing how land use supports or threatens water supply.
- Source Protection Planning process – Updated every 3 years - When plan updated, DEC water supply division writes letter to water supply operator/town. Letter could include additional information about how to protect watershed.
- Vermont Rural Water could provide information to communities
- Mapping of aquifers may help to encourage towns to protect forested lands around ground water drinking water supplies (Chapter 48 – talks about education and ground water mapping. Water supply rule describes acceptable land uses around source.)
- Make accessible to community existing literature about impacts on water supply from forest fragmentation.

Objective 3. Protect groundwater from pollutants, ensure that stormwater infiltration is done appropriately.

Potential Strategies

- Need to know about how to infiltrate stormwater safely, including appropriate isolation distances needed for different parts of the state, depending on geology.
- Need research to show that new practices haven't resulted in contamination in Vermont of water quality in wells. There is research from other states indicating that well water has not been contaminated by infiltration of stormwater.
 - Find money for UVM grad student research
 - Pull together current research and meet to discuss: Ground water committee, ANR staff person who is overseeing UIC program, UVM

IV. INVASIVE SPECIES (taken from Richmond Flood Plain Forest work plan written with help of The Nature Conservancy)

Goal: Identify Invasive Plant Management Priorities to achieve the greatest ecological benefit while minimizing the total, long-term workload and project costs. Consider the following factors:

- Ecological priorities
- Recreational Land Uses
- Available Resources
- Invasive Management Techniques

Objective: Focus on Early Detection, Rapid Response

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Objective: engage the community to help increase volunteer activity through PUBLIC OUTREACH AND EDUCATION

Potential strategies:	Lead Partners
Outreach and volunteer recruitment, training, support for invasive plant control activities over the next five years, This includes an annual celebration for all volunteers, complete with food, slideshow, and door prizes.	RLT & all partners
Media outreach including radio spots, local newspaper articles, etc.	RLT & all partners
Four public outreach workshops , designed to support volunteer efforts and increase the project’s ecological impact. A: Local natural history focusing on silver maple-ostrich fern floodplain forest ecology, & the threat posed by invasive species B: Hands-on workshop for invasive species identification and removal, designed to kick-off the volunteer season; C: Hands-on workshop for VYCC crew leaders teaching invasive species identification and removal D Workshop about landscaping for wildlife enhancement—focus on removing and replacing invasive species	RLT/TNC
Develop and present a land manager's technical workshop (For land managers throughout the Champlain Basin, to share technical skills in invasives control, and how to implement a community weed management plan).	RLT, TNC
Develop and present workshop and resources for Richmond road crews so that they adopt wise road management practices that reduce the spread of invasive species.	RLT, TNC
Develop a local display on native and invasive plants to educate the public about landscaping with non-invasive plants: To be housed in a visible location in town during the spring planting season, and serve to educate people about alternative non-invasive species useful in landscaping year-round.	RLT, TNC <i>Sandra Fary's class (Camels Hump Middle School??) might be</i>

<u>Potential strategies:</u>	Lead Partners
	<i>interested? Also Master Gardeners; UVM students?</i>
If necessary, develop re-vegetation plans and guidance materials	RLT and TNC
Inspire 10 households to remove invasive species from their landscaping (with a focus on landowners in close proximity to RLT and TNC land?!)	RLT
Complete a weed management plan covering all properties within the project area for all major weeds	TNC, RLT & Cons Comm
Maintenance and updating of GIS and inventory maps	Cons Comm