

# Batten Kill News



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*The MISSION of the Vermont Department of Fish and Wildlife is the conservation of fish, wildlife, and plants and their habitats for the people of Vermont. In order to accomplish this mission, the integrity, diversity, and vitality of all natural systems must be protected.*

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## *Is That Light at the End of the Tunnel?*

Throughout the current fishing season there has been a steady inflow of reports from anglers experiencing fairly good catches in the Batten Kill of small brown and brook trout. The size of these fish have been typically in the range of 6 to 9 inches which places them in the yearling size class, i.e. fish hatched in the Spring of 2000. Additionally, large brown trout in excess of 16 inches have been showing up now and again. While angler feedback has been largely anecdotal, fish population surveys conducted in both Vermont and New York this



summer appear to substantiate anglers' observations and indicate the brown trout population may be rebounding from multiple years of exceedingly low abundance and poor

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Sampling location	Year	Size class, inches				
		YOY	<6	6-9.9	10-11.9	≥12
West Arlington	2001	245	14	129	7	7
	2000	723	0	14	0	7
	1998	113	8	30	8	23
Arlington	2001	459	8	193	0	24
	2000	463	8	138	8	32
	1998	106	0	287	0	91
Manchester	2001	969	125	62	21	52
	2000	360	85	63	21	63
	1998	209	55	88	66	22
East Dorset	2001	334	420	105	38	48
	2000	130	50	80	60	20
	1998	67	96	96	0	29

## Batten Kill Habitat Surveys

Field crews from the Vermont Fish and Wildlife Department and U.S. Forest Service/Green Mountain National Forest just completed the second summer of inventorying aquatic and riparian habitat in the Batten Kill. Last year, a single crew surveyed a total of 4.6 miles beginning near the New York state line and ending at the mouth of Benedict Hollow Brook. This year, the survey picked up where it left off and completed another 6.5 miles or to the Hill Farm bridge in Sunderland. Two other crews conducted more detailed assessments of fish cover habitat not only in the Batten Kill but in the Mettawee, Poultney, Castleton, and Dog Rivers. The latter rivers have been identified as reference wild brown trout streams that will be used in a comparative analysis of their habitat conditions (fish cover, water chemistry, temperatures, and flows) and trout populations with those of the Kill.

Preliminary results of last year's survey include the identification of 59 habitat units within the 4.6 mile main stem reach. The units break down to 34 pools (58%) and 25 riffles (42%). In terms of proportion of reach length, pool and riffle habitats accounted for 3.6 miles (78%) and slightly over one mile (22%), respectively. This represents a pool-to-riffle ration of 3.6:1. On the basis of total wetted area, the reach measured 46 acres of which pool habitat comprises 77% and 23% is riffles. The average distance between pools on the lower main stem is 162 feet.

Pool depths average 4.9 feet with a range of 2.8-9.5 feet. The average residual pool depth (i.e., depth

controlled by the pool tail crews that might be expected to occur under extreme drought conditions) is 3.3 feet and are in the range of 0.9-7.7 feet. Riffle depths average 1.3 feet (range 0.8-1.9 feet).



Bank instability in the reach as evidenced by significant erosion is estimated at 1.3% of the total length of both banks. The amount of unstable bank along the left bank (River Road side) is estimated at 472 feet and the right bank (Route 131 side) is 180 feet.

Other channel measurements were made of a sample of riffle units. Results of these are presented in the table below. Average wetted channel width is 76.4 feet.

Additional analysis of data collected during the Summer 2000 habitat survey (e.g., pool class quality, substrate composition, large woody debris abundance) is in progress and will be reported in the final report after the remaining river has been surveyed. Plans are to survey habitat up to the Dufresne Pond dam by Summer 2003 or sooner. Highlights of the 2001 survey will appear in the winter issue of this newsletter.

### Floodprone and bankfull measurements and ratios for five sampled riffles in Reach 1 of the Batten Kill main stem.

Riffle number	Measured width, feet		Entrenchment ratio	Bankfull depth (feet) at 1/4, 1/2 and 3/4 channel width				Width:depth ratio
	Floodprone	Bankfull		1/4	1/2	3/4	Average	
2	135	112	1.2	2.3	2.8	3.2	2.8	40.5
7	478	78	6.1	3.5	4.2	4.3	4.0	19.5
12	675	86	7.8	4.9	4.9	4.9	5.0	17.2
17	500	106	4.7	7.6	7.3	7.1	7.3	14.5
13	471	111	4.2	3.7	4.0	3.8	3.8	29.0

## Batten Kill Alliance Update

In the last issue of this newsletter (Winter 2001), there was an article on the formation and activity of a newly-established bi-state watershed group dedicated to the Batten Kill and its stewardship. Since then, the coalition of New York and Vermont participants have accomplished much and has become formally organized into a cooperative not-for-profit organization...**Batten Kill Watershed Alliance**. The purpose of the Alliance is to coordinate, educate, and promote the stewardship and enhancement of the Batten Kill watershed in both states. Bylaws have been adopted with statements of the organization's goals and objectives. The goals are:



- Identify, prioritize, and publicize threats to water quality and to riparian aquatic species;
- Devise and implement creative responses to threats to water quality and riparian and aquatic life which distribute the burdens of the solutions fairly;
- Nurture a greater public sense of stewardship for the watershed's natural resources and a more active involvement on the part of governments and agencies in protecting and enhancing the watershed's natural resources.

A Board of Directors has been elected and is comprised of the following persons: Sheldon Brown (NY), Cynthia Browning (VT), Bill Bullock (VT), Alan Calfee (VT), Greg Cuda (NY), Peter Hetko (NY), Doug Reed (NY), Jim Walker (VT), and Charles Wilson (NY).

“The traditional engineering approach to river development has failed to incorporate the practical, physical, aesthetic, and financial advantages of approaching river management as maintenance of natural tendencies in river channel behavior.”

— *Luna Leopold*

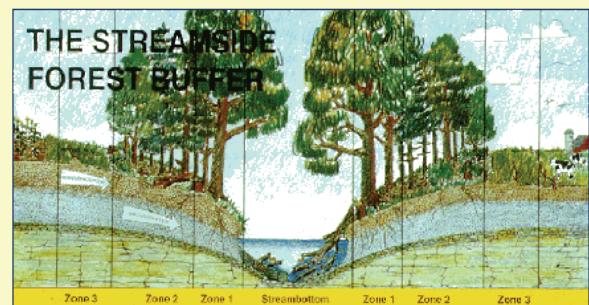
## Batten Kill Buffer Outreach Program

Batten Kill landowners will soon be getting in their mail a brochure *Better Buffers for the Batten Kill* suggesting how riparian landowners can manage their property for a healthier river. Emphasis is placed on maintaining or restoring vegetation along streambanks as the single most important action landowners can undertake to promote and protect the health of the river and its tributaries. The brochure also provides landowners the opportunity to apply for plant materials and free, but limited, planting assistance.

Beginning in Spring 2002 the Batten Kill Outreach Program will make available to landowners in the watershed a limited number of native trees and shrubs at no cost. Requests for plant materials will be considered on a first come-first serve basis, except that landowners whose Batten Kill streambanks are eroding or under threat of erosion will be given priority.

With the help of a local youth program, planting assistance will also be provided in the Spring of 2002 for some landowners requesting plant materials and who are unable to plant the trees and shrubs on their own. Even if landowners do not wish to take advantage of the plant offer, they are encouraged to adopt and implement the recommendations mentioned in the brochure.

### Buffer Establishment & Restoration



For additional information about the program and more information on buffers, contact: Bennington County Conservation District, PO Box 505, Bennington, VT 05201 or call (802) 442-2275.

## FYI

Some of the terminology used in this issue may be unfamiliar to many readers but are sure to turn up in future newsletters.

**Bankfull:** A term used to describe the streamflow which occurs on an average interval of once every 1.5 years. Flows of this magnitude transport the sediment load over time and have the greatest influence on the formation and removal bars, meanders and bends, and generally do the work resulting in the average morphologic characteristics of channels. Bankfull widths are measured in riffle sections.

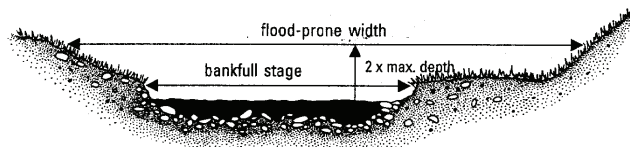
**Fluvial Geomorphology:** The study of the interactions between climate, geology, topography, vegetation, and land use on a watershed scale as factors determining the size, shape, and other characteristics of stream and river channels.

**Floodprone Width:** The portion of the river valley floor potentially inundated during a 50-year flood event, or estimated as twice the maximum bankfull depth.

**Entrenchment Ratio:** A vertical description of the stream expressed as the ratio of the floodprone width divided by the bankfull width in a riffle section. As the ratio approaches 1.0, entrenchment increases indicating a greater confinement of flood flows to the river channel and reduced access to the floodplain.

**Residual Pool Depth:** The volume of water passing through the cross-sectional area of a channel per unit time, e.g. cubic feet per second (CFS).

**Width:Depth Ratio:** The bankfull width divided by bankfull average depth in a riffle section.



## Other Projects in the Works

- *Analysis of water chemistry in the Batten Kill and reference trout streams.* Trout Unlimited (TU) grant to Vermont Departments of Fish and Wildlife (VDFW) and Environmental Conservation (VDEC), \$10,000. In progress.
- *Evaluation of the long-term record of river flows for the Batten Kill and reference trout streams.* U.S. Forest Service (USFS) funding, \$32,000. In progress.
- *Inventory and characterization of physical habitat conditions and morphological features of the Batten Kill using a geomorphology-based approach.* USFS funding to Green Mountain College, \$11,169. In progress.
- *Inventory of riparian vegetation and land use along the Batten Kill.* VDEC grant to Bennington County Regional Commission, \$6,970. Pending.
- *Monitoring erosion at the Rockwell slide on the Batten Kill.* The Batten Kill Conservancy. In progress.
- *Stabilization of streambank erosion on the Batten Kill (Shepard property) in Arlington using tree and root wad revetments and riparian vegetation replanting.* U.S. Fish & Wildlife Service (USFWS), Natural Resource Conservation Service, Bennington County Conservation District (BCCD), USFS, and VDFW, \$5,500. Completed.
- *Batten Kill Buffer Outreach Program.* CPRi Communications, TU National Embrace-A-Stream Program, Southwest Vermont Chapter of TU, BCCD, USFWS, USFS, and Vermont Agency of Natural Resources Conservation License Plate Program, \$23,000. In progress.
- *Arlington Covered Bridge streambank stabilization project.* Town of Arlington, Arlington High School Alternative Education Program, Orvis Company, TU, BCCD, and NRCS, \$1,000+. Completed.



Rockwell slide

## *Is That Light at the End of the Tunnel?*

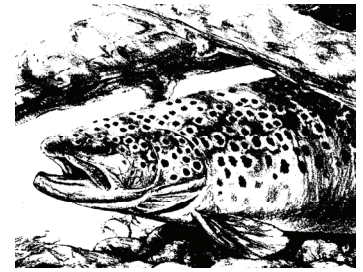
*(continued from page 1)*

fishing quality. Preliminary results from this year's electrofishing surveys for four locations on Vermont's portion of the river are given in the table on page 1. Values are for brown trout expressed as numbers of fish per mile.

The data generally show increased numbers of young-of-the-year trout (YOY) over densities observed in 1998. YOY estimates for 2000 and 2001 compared against 1998 show increases ranging from 72% to 540% with an overall average of over 280%. Yearling brown trout numbers resulting from the moderately strong 2000 year class were also greater than 1998 and 2000 density estimates for 3 out of the 4 sampling locations. Because of the depressed year classes occurring prior to 2000, the abundance of trout greater than 10 inches remains relatively low.

What does all of this foretell for the fishery? Initially these results may indicate a brown trout population in recovery. However, it is too early at this point to know for certain. Whether or not strong year classes are sustainable over the next several years and year-to-year-survival is adequate to allow the recruitment of adequate numbers of fish into the spawning population and sport fishery remains to be seen. Continued monitoring is needed and will be done, but nonetheless it doesn't hurt to keep our fingers crossed.

## *Trout Need Cover!*



*Illustration by Mike Stidham*

Cover is recognized as one of the essential components of trout habitat. It is defined as areas where fish can find shelter to rest and seek refuge from predators. In streams, cover can take many forms including water depth, surface turbulence, coarse substrate (e.g., boulders and cobbles), undercut streambanks, aquatic and overhanging riparian vegetation, woody debris (e.g., log snags and roots), and any other structures that provide fish with a secure place to conserve energy or evade threats. A stream or river lacking adequate cover, even though all other habitat requirements (water quality, temperature, food, and spawning areas) are met, is a poor place for trout to live over the long term and will usually be reflected by lower population densities. Adult brown trout are very dependent on the presence of cover and are largely confined to it except when feeding and spawning. Research has shown brown trout prefer cover that is associated with locations low in the water column, and provide tactile stimulation and low light conditions.

The retention, and in some situations addition, of cover components in trout streams is critical. All too frequently valuable cover is removed from streams as a result of conflicting land use and water based recreational activities. Stripping streambanks of vegetation, especially overhanging shrubs and grasses, such as for the purpose of "tidying up" the riparian zone or established lawns to the water edge or as a result of livestock grazing are detrimental to trout habitat as well as can have other negative affects on stream habitat (e.g., water quality degradation and temperature increases). The removal or cutting of downed trees and other wood debris from the channel, such as to clear way for canoes, reduces available trout cover. These activities are not recommended and should be avoided.

If a downed tree appears to be posing a navigation hazard or having the potential for causing stream channel instability, you are encouraged to seek advice from resource managers before removing the structure. Usually an easy solution to the problem can be identified which at the same time is not detrimental to trout habitat. For additional information or assistance, contact the Vermont Department of Fish and Wildlife at (802) 885-8855.

## **THE BATTEN KILL NEWS IS ON-LINE!**



*The Batten Kill News* is now on the Vermont Department of Fish and Wildlife's home page.

[www.vtfishandwildlife.com/Battenkill/index.htm](http://www.vtfishandwildlife.com/Battenkill/index.htm)

## Check Out These Web Sites

**VT Agency of Natural Resources**  
[www.anr.state.vt.us](http://www.anr.state.vt.us)

**Trout Unlimited**  
[www.tu.org](http://www.tu.org)

**Battenkill Conservancy-NY**  
[www.crisny.org/not-for-profit/bcny/](http://www.crisny.org/not-for-profit/bcny/)

**River Watch Network**  
[www.riverwatch.org](http://www.riverwatch.org)

**U.S. Forest Service**  
[www.fs.fed.us](http://www.fs.fed.us)

**U.S. Fish and Wildlife Service**  
[www.fws.gov](http://www.fws.gov)

**Aldo Leopold**  
[www.aldoleopold.org](http://www.aldoleopold.org)  
[www.naturenet.com/alnc](http://www.naturenet.com/alnc)



**Buffer Strips: Common Sense Conservation**  
[www.nhq.nrcs.usda.gov/CCS/Buffers.html](http://www.nhq.nrcs.usda.gov/CCS/Buffers.html)

**Buffer Strips for Riparian Zones**  
[www.forestry.iastate.edu/ext/buffstrips.html](http://www.forestry.iastate.edu/ext/buffstrips.html)

**Introduction to Stream Geomorphology**  
[cayuganet.org/owla/riparian/fluvial15.html](http://cayuganet.org/owla/riparian/fluvial15.html)

**Natural Stream Processes**  
[www5.bae.ncsu.edu/bae/programs/extension/wqg/sri/rv-crs-1.pdf](http://www5.bae.ncsu.edu/bae/programs/extension/wqg/sri/rv-crs-1.pdf)

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This publication is available upon request in large print, braille, or audio cassette.

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