

Batten Kill News



Volume 4, Issue 1

Winter/Spring 2003

Inside this issue:

Batten Kill Studies & Investigations	2-3
2002 Habitat & Trout Cover Survey	4
Population Modeling: the Sherlock Holmes Approach to the	5
“Working for Wildlife” Seeks	6
Land Acquisition on the Batten Kill to Protect Habitat &	6
Preferred Newsletter Format	7
Check Out These Web Sites	8

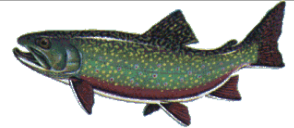


The MISSION of the Vermont Department of Fish & Wildlife is the conservation of fish, wildlife, and plants and their habitats for the people of Vermont. In order to accomplish this mission, the integrity, diversity, and vitality of all natural systems must be protected.

Vermont Agency of Natural Resources
 Department of Fish & Wildlife
 103 So. Main Street, 10 So. Waterbury, VT 05671-0501
 802-241-3700

Editor: Kenneth Cox
Designer: Melissa Currier

More on Whirling Disease



In the *Summer/Fall 2002* issue of this newsletter, it was reported that the whirling disease parasite *Myxobolus cerebralis* was discovered infecting trout inhabiting both Vermont and New York sections of the Batten Kill. This is a disease of salmonid fishes and can result in significant losses of fish in both hatchery and natural environments. Western states, such as Montana and Colorado, have seen declines in wild trout fisheries infected with the parasite, although eastern states, namely New York and Pennsylvania, have yet to document any serious declines in their wild populations. Even so, there remains much for fishery scientists to learn about the parasite and what factors trigger disease outbreaks and fish losses. Knowing that the parasite does occur in the Batten Kill should not be taken lightly. It represents a potential threat to the health of Vermont's trout populations and the quality of our angling.

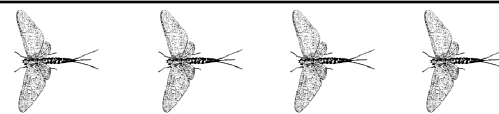
Unfortunately, there are no simple solutions to the management of this disease. Once the parasite becomes established in a water body, it cannot be eliminated. However, all river users need to be made aware of the risk their activities potentially can contribute toward spreading the parasite beyond its present distribution and into other waters all around the state. We all are the critical control point to containing the disease to where it occurs now and protecting other waters from possible infection.

The last newsletter identified several common sense measures that all river users need to be made aware of and to adopt in their day-to-day use and enjoyment of the Batten Kill and our other waters. With the fishing season and other water-based recreation just around the corner, we wish to remind everyone of these precautionary measures and encourage you to practice them.

- ▶ Inspect and clean all equipment, including waders, boots, fishing gear, canoes, boats, and trailers, float tubes, and any other equipment of mud and aquatic plants before leaving the river. Thoroughly rinse and dry equipment and gear, preferably in the sun, before using it again.
- ▶ Never transport any fish, dead or alive, or water from one water body to another.
- ▶ Do not import fish of any kind from another state without first obtaining a permit from the Vermont Fish & Wildlife Department. Bringing fish into the state without the required permit can introduce diseases and parasites and is illegal in Vermont. The Department has a fish health certification program which identifies commercial hatcheries that are free of serious fish diseases.

(Continued on page 6)

Batten Kill Studies & Investigations



The past three years have seen a substantial amount of work put into investigating possible factors which may have contributed to the decline in the Batten Kill brown trout population during the 1990s. These activities have and continue to involve state and federal agencies, colleges and universities, and conservation and planning groups. For the most part this work has been supported by funds appropriated to the U.S. Forest Service-Green Mountain National Forest through the efforts of Senator James Jeffords and dedicated to the Batten Kill watershed. The following studies are either in progress or have been completed to date:



Trout Population Monitoring at Index Sites on the Batten Kill and Four Reference Trout Streams

Purpose: Estimate annual abundance and size and/or age structures of wild trout populations in the Batten Kill, Dog, Mettawee, Poultney, and Castleton rivers.

Project leader: Kenneth Cox, Vermont Fish & Wildlife Dept.

Principal funding source: Vermont Fish & Wildlife Dept.

Year began: 2000; anticipated completion: 2004 or 2005.

Batten Kill Habitat Survey

Purpose: Inventory stream and riparian habitat in 20 miles of the Batten Kill from the New York state line upstream to the base of Dufresne Dam; create and maintain a habitat database; evaluate current habitat conditions in the main stem.

Project leaders: Christopher Bernier & Ken Cox, Vermont Fish & Wildlife Dept.

Principal funding source: Vermont Fish & Wildlife Dept.

Year Began: 2000; anticipated completion: 2003.

Summer Stream Temperature Monitoring and Assessment for Trout Habitat Suitability in the Batten Kill and Four Reference Streams

Purpose: Determine whether intra- and inter-stream differences in wild trout population biomass may be influenced by summer water temperatures.

Project leaders: Ken Cox & Rich Kirn, Vermont Fish & Wildlife Dept.; Scott Wixsom, U.S. Forest Service-Green Mountain National Forest.

Principal funding source: Vermont Fish & Wildlife Dept., U.S. Forest Service-GMNF.

Year began: 2000; anticipated completion: 2004 or 2005.

Trout Cover Survey of the Batten Kill and Four Reference Trout Streams

Purpose: Inventory and evaluate the abundance of available suitable trout cover habitat in the Batten Kill, Dog, Mettawee, Poultney, and Castleton rivers.

Project leaders: Ken Cox, Vermont Fish & Wildlife Dept.; Scott Wixsom, U.S. Forest Service-GMNF.

Principal funding source: U.S. Forest Service-GMNF.

Year began: 2001; anticipated completion: 2003 or 2004.

A Geomorphological Study of Channel Stability and Physical Habitat Conditions of the Batten Kill in Vermont

Purpose: Investigate how natural conditions and human land use affect channel morphology, channel stability, and physical habitat conditions in the Batten Kill.

Project leader: John Field, Green Mountain College.

Principal funding source: U.S. Forest Service-GMNF.

Year began: 2001; completed: 2001.

A comparative Assessment of the Chemical Characteristics of the Batten Kill with Several Other Wild Trout Streams in Vermont

Purpose: Determine whether intra- and inter-stream differences in wild trout population biomass may be influenced by biological productivity-related water chemistry parameters.

Project leader: Doug Burnham, Vermont Dept. of Environmental Conservation.

Principal funding sources: Vermont Dept. of Environmental Conservation and U.S. Forest Service-GMNF.

Year began: 2001; completed: 2003.

Evaluation of the Influence of Suspended Sediments on Wild Trout Production in the Batten Kill

Purpose: By quantifying suspended sediments settling on trout spawning substrates determine whether low trout production may be associated with high sediment concentrations.

Project leader: Keith Nislow, U.S. Forest Service-Northeastern Research Station.

(Continued on page 3)

Batten Kill Studies & Investigations *(cont. from page 2)*

Principal funding source: U.S. Forest Service-GMNF.
Year began: 2001; anticipated completion: 2003.

Evaluation of the Long-Term Record of River Flows for the Batten Kill and Four Reference Streams as Possible Factors Affecting Wild Trout Production and Recruitment

Purpose: Using long-term river flow records for the Batten Kill, Dog, Mettawee, Poultney, and Castleton Rivers identify if significant changes in flow regimes have occurred and whether inter-annual variations in flow are associated with wild trout production and recruitment.

Project leader: Keith Nislow, U.S. Forest Service-Northeastern Research Station.

Principal funding source: U.S. Forest Service-GMNF.
Year began: 2001; anticipated completion: 2003.

Inventory and Mapping of Existing Land Use and Land Classes along the Batten Kill, the Green River, and West Branch using Digitized Orthophotography

Purpose: Identify, quantify, and map current land uses and riparian conditions along the Batten Kill main stem and two tributaries; database and maps to be used to monitor future land use changes and assist planning and resource protection efforts.

Project leader: Jim Henderson, Bennington County Regional Planning Commission.

Principal funding sources: Vermont Dept. of Environmental Conservation.

Year began: 2001; completed: 2002.

Mass Failure Monitoring at Two Banks Slides on the Batten Kill

Purpose: Assess the rate of erosion and potential quantity of sediment input to the Batten Kill from bank slides at the confluence of the Roaring Branch and the main river and another at the Manchester Wastewater Treatment Facility.

Project leaders: Scott Wixsom and Dan McKinley, U.S. Forest Service-GMNF.

Principal funding source: U.S. Forest Service-GMNF.
Year began: 2001; completion: 2001.

Batten Kill Watershed Alliance

Purpose: Provide support funding for an Executive Director position, who has responsibility for building public support for BKWA initiatives, including developing a BKWA strategic plan incorporating public outreach and input.

Sponsors: Bennington County Conservation District; U.S. Forest Service-GMNF.

Progress: An Executive Director was hired, a series of listening meetings were held around the Batten Kill Watershed, and a draft strategic plan is expected by Spring 2003.



Modeling Analysis of Trout Population Trends in the Batten Kill and Four Reference Streams

Purpose: Investigate the long-term patterns of trout populations in the Batten Kill, Mettawee, Poultney, Castleton, and Dog rivers and determine where the limitations in recruitment to the fisheries are occurring.

Project leaders: Kristian Omland and Donna Parrish, Vermont Cooperative Fish & Wildlife Research Unit, University of Vermont.

Principal funding source: U.S. Forest Service-GMNF.

Year began: 2002; anticipated completion: 2003.

Geomorphic Characterization of the Batten Kill Watershed and the Role of Sediment Deposition in Habitat Forming Processes

Purpose: Evaluate stream bed features and their quality as habitat for aquatic biota through an assessment of current and historic sediment transport and deposition patterns.

Project leaders: Mike Kline, Vermont Department of Environmental Conservation; John Field, Field Geology Services; Jim Henderson, Bennington County Regional Commission.

Principal funding source: U.S. Forest Service-GMNF.

Year began: 2002; anticipated completion: 2004.

The Batten Kill Study Team is currently reviewing several other proposals which, if accepted, would be implemented over the next two years. Many of the above studies will be winding down during the next three years. Data analysis and report preparation will be consuming a considerable amount of time by all involved.

2002 Habitat and Trout Cover Survey Highlights

Last summer the Vermont Fish & Wildlife Department and U.S. Forest Service continued quantitative surveys of aquatic and riparian habitat and trout cover in the Batten Kill. The multi-year habitat survey began in 2000 with the goal of completing an inventory of the lower river in Vermont in 2003. This project is on schedule with only about two miles remaining to be done this summer. When completed, in excess of 8,000 field measurements will have been made and recorded for 20 miles of river beginning at the New York state line and ending at Dufresne dam in Manchester. All data are being stored in a computerized database. The trout cover survey continues and is expected to be completed in either 2003 or 2004.

In 2003, Fish & Wildlife Department personnel surveyed 7.4 miles of river. To date, 18.4 miles of the Batten Kill main stem have been inventoried. The following statistics summarize the habitat in River Reaches 4 and 5.

- ▶ Reach 4 begins downstream of the Hill Farm bridge in Sunderland and extends upstream 9 miles to the mouth of Lye Brook in Manchester. A total of 57 habitat units (87.7% pools; 12.3% riffles) were identified. The combined lengths of pool and riffle habitats in the reach are 8.5 and 0.5 miles, respectively. The riffle to pool ratio is 18.2:1. Average wetted channel width is 52.1 feet. Reach 4 has a total wetted area of 58.6 acres (94.8% pool; 5.2% riffle). The average distance between pools is 50.7 feet.
- ▶ Survey of Reach 5 was not completed in 2002, therefore the following statistics do not represent the entire river segment. The surveyed portion on the main stem measures 1.7 miles in length and begins where Reach 4 left off. So far, 43 habitat units have been inventoried of which 58.1% are pools and 41.9% are riffles. In terms of linear distance, pool and riffle habitat are represented about evenly and, therefore, the pool to riffle ratio is 1:1. Average wetted channel width is 41.7 feet. The total wetted area of the surveyed portion of Reach 5 is slightly over four acres (47% pools; 53% riffles). The average distance between pools is 183.2 feet.
- ▶ Pool depths in Reach 4 average 6 feet with a range of 2.3-16 feet. Average pool depth in Reach 5 is 3.8 feet (range 2.4-7 feet). Average residual or base flow pool depths in Reach 4 and 5 are 4.1 and 3 feet, respectively. Residual pool depths in Reach 4 ranged from 0.6-14.2 feet, and in Reach 5 from 1.4-6.2 feet.
- ▶ Bank instability as linear feet of stream bank experiencing significant erosion is estimated to be 5.6% in Reach 4 and 1.7% in Reach 5. Reach 5 contains the large bank slide located a short distance downstream of the Union Street bridge. Estimates for all reaches completed to date range from 1-5.6%.

Trout Unlimited Battenkill Day

May 11

10:00 a.m.-4:00 p.m.



Georgi Museum,
Shushan, NY

Bring the family to this fun day on the river banks. River sampling, demonstrations,

*“What we do on land is mirrored
in the water...”*

— Central Lake Ontario Conservation
Authority



Population Modeling: the Sherlock Holmes Approach to the Batten Kill Question

Editor's note: *The following article was prepared by Kristian Omland and Donna Parrish of the Vermont Cooperative Fish & Wildlife Research Unit at the University of Vermont. Drs. Omland and Parrish are doing this work under contract with the U.S. Forest Service-Green Mountain National Forest.*



Several years ago, a book was published under the title *The Ecological Detective*. Intriguing though that may sound, it is not a mystery novel but a statistics manual of sorts written by two fisheries biologists. The authors promote a new way of analyzing data based on mathematical models. We have adopted this approach in our work on trout population dynamics in the Batten Kill.

In much the same way that a forensics investigation, whether of a suspicious death or the space shuttle tragedy, depends on piecing together bits of evidence after events have occurred, trying to figure out what has gone awry in the Kill depends on interpreting data that have been collected over the years. In this sense our science depends less on experimentation than on data analysis. Consider this analogy. Investigators trying to figure out what happened to *Columbia* cannot launch numerous other shuttles with different potential problems while controlling all other factors — that would be neither morally or economically acceptable. Instead, they gather evidence ranging from fragments of the shuttle to data beamed down before the explosion, and weigh various potential explanations against that evidence. Interestingly, in their press conferences about the *Columbia* disaster, NASA officials and subsequently representatives of the independent commission have emphasized that they are not focusing on a single potential explanation; instead, they are intent on gathering all available evidence first, and only then weighing how various different potential explanations square with that evidence. This is precisely the approach recommended by the authors of *The Ecological Detective*.

Input from fisheries biologists, anglers, and others yielded a long list of factors that may be impinging on the brown trout population in the Kill. Those factors range from declining habitat quality due to

lack of cover in the stream to problems caused by water pollution to increasing mortality due to disease or predators. Our task is to think through how each of those factors may effect birth, survival, and growth rates of trout, write down the corresponding mathematical models, and weigh how much the data at hand square with each of those models.

We are lucky in that the data at hand are very rich, at least by the standards of ecology. Biologists from the state Department of Fish & Wildlife have surveyed the trout populations in the Kill regularly since the mid 1980s accumulating a vast database of trout abundance, size, and age at several stations over the years. In addition, they have accumulated certain data about habitat and water quality. We are now in the midst of fitting the various mathematical models (which correspond to the factors mentioned above) to those data, and using statistics to weigh the degree to which the data support each model.

Rich though the data are, they do not at this time point to a “smoking gun” — at least not one that we have found so far. Nonetheless, we are making progress. Tentative indications are that the bottleneck in the population is affecting midsize trout, say those that are 6 to 8 inches long. That pattern appears to be associated with at least two of the factors from the Batten Kill Study Team list: declining habitat quality due to lack of cover in the stream and possibly increasing activity of bird and mammal predators. Importantly, early indications do not implicate problems at the early stages of the trout life cycle, which might be associated with water pollution or siltation.

While our investigation is not unlike that of the space shuttle disaster in that we are initially limited to evidence from the past, it differs in that the process that we are concerned about is ongoing; we can gather new data. Given the tentative indication that there may be excessive mortality of midsize trout, possible causes and the required data to evaluate them are being pursued. The Vermont Cooperative Fish & Wildlife Research Unit has offered its services to assist the Study Team with this detective work — in that way, we hope to untie ourselves from our computers, get our feet in the water, and come a little closer to identifying factors affecting the observed changes in the Kill's brown trout population.

“Working for Wildlife” Seeks Volunteers

If you are an angler, hunter, hiker, logger, birdwatcher, snowmobiler, photographer, forester, or anyone else who enjoys the outdoors, here’s your chance to give something back to our streams, woods, and wildlife. Come join your friends, neighbors, project coordinators, and Vermont Fish & Wildlife staff as they help improve habitat for Vermont’s fish and wildlife.

“Working for Wildlife” day this year is **Saturday, April 26th** at project locations across Vermont with two projects planned for Bennington County. If your interest is the Batten Kill, then perhaps you would like to take part in river bank tree planting. Participants of all ages are welcome. For details, contact Shelly Stiles, Bennington County Conservation District at 802-442-2275 or e-mail stiles@together.net.



Land Acquisition on the Batten Kill to Protect Habitat & Public Access

Recently the Vermont House & Conservation Board approved a \$22,000 grant toward the purchase of 16 acres of fish and wildlife habitat to be added to streambank lands already managed by the Vermont Fish & Wildlife Department along the Batten Kill. These funds in addition to \$10,000 previously granted by the Chicago based Trout & Salmon Foundation completed fund raising for the acquisition of this Manchester property. Purchase of the property has been a coordinated effort between the Town of Manchester Conservation Commission and the Department.

The property, known as the Greenberg parcel, is owned by Mrs. Edith Greenberg, a long time resident of Manchester. The land with 200 feet of frontage on the Batten Kill, abuts a 13-acre parcel, including streambank, already owned by the Department. In total, this purchase increases the amount of land on the Batten Kill upstream of Dufresne dam to 124 acres. These lands are one important part of a strategy to ensure protection of critical fish and wildlife habitat on the river and maintaining public access to and enjoyment of these resources.

Local conservation groups, who have given support for the acquisition of the property, are the Manchester Rod & Gun Club and Southwest Chapter of Trout Unlimited. Also, associated costs for the project (e.g., appraisal, title search, closing fees) were covered by the State of Vermont; Migratory Waterfowl Stamp Program.

More on Whirling Disease

(cont. from page 1)

- ▶ Do not clean fish or dispose of their parts in streams and lakes. Dispose fish entrails and skeletal parts as dry waste that will go to a landfill or bury in the ground away from water. Infected fish may hold whirling disease spores, and with improper disposal of fish parts, the disease can be spread to uninfected waters.

The Vermont Fish & Wildlife Department plans to conduct additional sampling of trout during the upcoming summer field season to get a more complete picture of how widely the parasite is distributed in the Batten Kill watershed.

“Many men go fishing all their lives without knowing that it is not fish they are after.”

— Henry David Thoreau



Preferred Newsletter Format and Change of Address

The *Batten Kill News* is now on the Department of Fish & Wildlife homepage (www.vtfishandwildlife.com). Advantages of the on-line version include improved image quality/color and direct access to links. In the interest of saving paper and postage, readers are encouraged to use the Internet to access the newsletter. Readers indicating a preference for the internet option will be notified via e-mail when the latest version has been posted on the F&W home page. **If we do not hear back from you, we will assume that there is no change to your address or to your format preference.**

Please fill out the form or e-mail melissa.currier@anr.state.vt.us with the following information:

Name: _____

Organization: _____

Street Address: _____

City/Town: _____ State: ____ Zip: _____

My preference is:

- will read newsletter on F&W homepage e-mail address: _____
- continue to receive printed copy through the mail (*provide mailing address below if different from that given above*)

Name: _____

Street Address: _____

City/Town: _____ State: ____ Zip: _____

Please return form to:

VT Dept. of Fish & Wildlife, 100 Mineral Street, Suite 302, Springfield, VT 05156-3168



“Often I have been exhausted on trout streams, uncomfortable, wet, cold, briar scarred, sunburned, mosquito bitten, but never, with a fly rod in my hand have I been in a place that was less than beautiful.”

— Charles Kuralt, broadcast journalist

Check Out These Web Sites

VT Agency of Natural Resources
www.anr.state.vt.us

U.S. Forest Service
www.fs.fed.us

The Whirling Disease Foundation
www.whirling-disease.org

New York State Department of Environmental Conservation
www.dec.state.ny.us/website/dfwmr/fish/whirldis.html

Montana Whirling Disease Task Force
www.whirlingdisease.org

Battenkill Conservancy-New York
http://www.battenkillconservancy_ny.org/



The Vermont Agency of Natural Resources is an equal opportunity agency and offers all persons the benefits of participation in each of its programs and competing in all areas of employment, regardless of race, color, religion, sex, national origin, age, disability, sexual preference, or other non-merit factors.

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

BATTEN KILL NEWS

Vermont Department of Fish & Wildlife
100 Mineral Street, Suite 302
Springfield, Vermont 05156-3168
Phone: (802) 885-8855
Fax: (802) 885-8890
E-mail: kenneth.cox@anr.state.vt.us



www.vtfishandwildlife.com