

# Batten Kill News



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*The MISSION of the Vermont Fish & Wildlife Department 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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## What's in the Tackle Box for 2005?



Over a year has passed since the last issue of the *Batten Kill News* (Summer/Fall 2003) was released. Therefore, there is much to report with regard to all the work that has taken place since then by the many involved in looking into causes for the reduction in brown trout abundance in the river. This newsletter will attempt to bring readers up to date, as well as what is planned over the upcoming months.

Since the beginning of the 2000 open-water trout season, the lower 20 miles of the Batten Kill, i.e. Dufresne Pond downstream to the New York state line, has been restricted to catch-and-release (no harvest) fishing only. The test water regulation (#1028) is currently scheduled to run through December 31, 2005. Where management of the Batten Kill fishery goes from there is now under consideration, although no specific regulatory proposal is on the table at this time. The Department does plan to extend the test water regulation one additional year (through the 2006 season) to allow for a full review of the range of management options, as well as provide for public participation and the rule making process. Stay tuned for developments.

As the Department heads into the home stretch toward developing a long-range management plan for the Batten Kill's trout fishery, much still remains to be done. Final reports of the many

studies conducted over the past five years need to be written by the investigators (see *Fishing for Answers*, page 4). The Batten Kill Study Team will evaluate the results of these studies and develop conclusions and recommendations. Information produced from these investigations is to serve several important purposes:

- (1) Identify likely causes for the poor recruitment of wild brown trout to the fishery, and in turn narrow down appropriate management needs and opportunities for restoration of the fishery;
- (2) Establish baseline data from which future changes in the trout populations, aquatic and riparian habitats, and water quality may be assessed;
- (3) Assemble information needed to identify, plan, and design priority habitat improvement activities.

Study results will be shared with the public this fall via an open house public outreach and information sharing type forum. This will be an excellent opportunity for the public to learn more about individual investigations, what we know about the river now that was not known five years ago, and, of course, ask questions of the researchers. The Batten Kill Watershed Alliance has agreed to coordinate and facilitate the forum.

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## Brown Trout: Homebodies or Wanderers?

The simplest answer to the question is that depends on the time of year. In the lead-in article of the last issue of *Batten Kill News*, several questions were posed about brown trout movements and habitat use in the river. Where do adults spawn? How frequently do they change locations? Do they have a home range? What habitats do they prefer? And, so on. A study, which kicked off in 2003 and continued through 2004, provided a peek into the lives of adult wild brown trout. Even though the results confirm some of our previous assumptions about brown trout behavior, other observations were illuminating.


During the first year of the study a dozen adult brown trout had radio transmitters surgically implanted in their body cavities, so that their locations and movements within the river could be tracked remotely and with minimal interference to their normal activity patterns. These fish were tagged and released in late August 2003 and monitored routinely through early June 2004, when the battery power source for the tags was anticipated to run out. Within weeks of the tags shutting down, a second batch of 16 fish were similarly tagged and released. These fish were studied through the end of 2004 with many of those fish still transmitting signals and being monitored less intensively at the present time.

Results of the radio-tracking study will be presented in a detailed final report, but at this time here are some of our preliminary observations:

- Fish released in 2003 demonstrated greater initial mobility than 2004 fish. This may be the result of two factors: (1) time of year when released, and (2) release location relative to where fish were originally captured. Unlike in 2003, most of the 2004 fish were released in the vicinity to their capture location and hence expended less time getting back “home.”



*Environmental Assistant, Carmen Herold-Lind, conducted the 2004 radio tracking study.*

- Fish in both years showed strong fidelity to specific locations, i.e. sites where originally captured. While 2003 fish exhibited much mobility leading up to spawning, most returned to their home site by the following winter or spring. 2004 fish typically spent much of the year at their home locations. The most notable exception being the spawning season, when many, but not all, trout migrated considerable distances to other locations in the main river or in tributaries but only to return home several days or weeks later.
- Fish had occupied established home ranges varying in length from about 100 feet to in excess of half a mile. Within the home range, fish typically occupied one or several specific locations, moved about daily on a limited basis, or in some cases moved considerable distance in response to environmental stimuli (e.g., periodic increase in river flow, such as caused by rain events).
- During both the 2003 and 2004 spawning seasons, fish were tracked moving from their home locations to ascend the Green River and Roaring Brook. One fish in the first year went as far upstream in the Green River as Beartown, and this year one fish in Roaring Branch was tracked to East Kansas. Another fish in 2003 accessed Camden Creek in New York, swam upstream back into Vermont, and was located in Terry Brook at West Sandgate.
- Fish demonstrated a clear preference for pools over riffles. The presence of cover (e.g., deep water, large wood) was an important habitat component. While being recluses much of the time, the approach of dusk does appear to incite them to leave their usual daytime haunts for more open water locations, such as the tail of pools.
- Most fish occupied sites during daylight hours that were not frequented by canoes, tubes, or swimmers whether any of these recreational activities were occurring or not on any given day. In the few cases when recreational activity occurred in the vicinity of trout, the fish assumed a location just outside the area of disturbance and returned to its usual lair soon after the “threat” passed. If fish were in good cover, not even direct recreational activity caused fish to flee the site for another refuge. 

# Yearling Trout Survival and the Predation Hypothesis

by Kristian Omland, Ph.D. and Donna Parrish, Ph.D.  
Vermont Cooperative Fish & Wildlife Research Unit



Readers of the *Batten Kill News* (Spring 2003 issue) may recall that we had inferred from annual trout survey data that there appeared to be a population bottleneck for Batten Kill brown trout in the 6-10" size class, basically yearling trout. Readers may also recall that we were eager to put on our waders and get out into the Kill to collect new data to zero in on the cause of the bottleneck. We can now update you on our progress in that endeavor.

During the summer of 2003, we set out to observe directly what we had inferred indirectly from the annual survey data. Briefly, we set out to compare survival rates among different sizes of brown trout to test the hypothesis that there is a bottleneck in population growth associated with mortality of yearling trout. Ecologists use a method they call "mark-recapture" to study survival. The general idea is that we mark a sample of animals at the beginning of the study, and then return a number of times over the course of the study to recapture the marked animals. Of course some marked animals are missed even though they are still alive, but based on the number of those that appear in the third or subsequent surveys, it is possible to estimate how many were still alive but did not happen to be captured in the second survey versus how many had died. Mark-recapture is among the best-developed methods in an animal ecologist's toolbox, and we were optimistic about being able to compare the survival of brown trout of different sizes.

This particular study was not successful, at least not as planned. The reason was typical of any unsatisfactory fishing trip: not enough fish were caught! We had hoped to capture and tag at least 100 brown trout in each of four size ranges. We had no problem finding yearlings when we tagged our sample in June — we captured and tagged 90 brown trout in the 4-6" size range. However, we only tagged 36 in the 6-8" range, 10 in the 8-10" range, and a mere 2 in the 10-12" range. Ironically, we caught plenty of fish that were larger than what we were interested in. Twenty-eight brown trout larger than 12", some well over 20", were also tagged. Anglers

familiar with the fishing experience on the Kill over the last few years will not be surprised by the size distribution represented by those numbers. Our quantitative sample confirms what anglers have been reporting, namely, that there are plenty of new recruits and relatively numerous large trout, but few mid-size trout. After our initial effort yielded such radically skewed numbers, it was clear that simply increasing our effort would not effectively satisfy the original design. Instead, we changed the framework in which we would analyze the data, abandoning the tried-and-true mark-recapture method in lieu of developing a computer simulation approach for which we are still working out the bugs.

For our 2004 work, we shifted our perspective. Instead of thinking about whether yearling trout are subject to excessive mortality, we thought about what might be eating yearling trout. One obvious candidate was portrayed in the preceding paragraph, namely the monster brown trout cruising the waters of the Kill (in the eyes of at least this researcher a trout longer than 20" qualifies as a monster). Other predator candidates included birds, like mergansers, kingfishers, and herons; and mammals, particularly otters and mink. From that list we zeroed in the most abundant predator, the common merganser (see *Common Merganser*, page 9). We, with a team of summer interns, were out on Vermont's trout streams nearly every day last summer causing large trout to regurgitate their breakfasts, counting fish-eating birds, and collecting samples of mergansers to analyze the contents of their stomachs.

In addition to float trips on the Kill, our study included the Mettawee, Poultney, Castleton, and Dog rivers, and the Stevens Branch (a Winooski River tributary) — all good wild trout streams. We confirmed mergansers to be abundant on those streams, more so than any other fish-eating bird (although kingfishers were a close second). On average, we found a density of one merganser for every 2 miles of stream, although the numbers were

(Continued on page 10)

## Fishing For Answers: An Overview of Batten Kill Studies, 2000-04

Since the summer of 2000, state and federal agencies, and other cooperators, partners, and contractors have been engaged in numerous studies designed to investigate and assess the possible influence of likely factors contributing to the persistent low abundance of catchable-size wild brown trout in the Batten Kill. These activities have focused on monitoring trout populations; evaluating the availability and condition of critical habitat on which these populations are dependent; and assessing the role of predation, disease, and other factors affecting trout abundance, health, and behavior. In addition to these investigations, as opportunities have arisen, work has been proceeding to address specifically identified habitat problems, such as restoration of streambank vegetation and stabilization of eroding banks. Below is a synopsis of studies completed or near to completion.

### ***Assessment Activities***

#### **Trout Population Monitoring at Index Sites on the Batten Kill and Four Reference Wild 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 Department.

Principal Funding Source: Vermont Fish & Wildlife Department.

Schedule and Status: Began 2000; anticipated completion 2004 or 2005; results reported annually.

#### **Batten Kill Habitat Survey**

Purpose: Inventory stream and riparian habitat in the 20 miles of the Batten Kill main stem from the New York state line upstream to Dufresne Pond dam; assemble baseline data of current habitat conditions and evaluate with respect to the optimal habitat requirements for brown and brook trout; provide guidance with determining the need, siting, and design of future habitat improvement activities.

Project Leaders: Christopher Bernier & Kenneth Cox, Vermont Fish & Wildlife Department.

Principal Funding Source: Vermont Fish & Wildlife Department.

Schedule and Status: Began 2000; field data collection completed 2003; data analysis and reporting are in progress; completion 2005.

#### **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

by summer water temperatures.

Project Leaders: Rich Kirn & Kenneth Cox, Vermont Fish & Wildlife Department; Scott Wixsom, U.S. Forest Service-Green Mountain National Forest.

Principal Funding Sources: Vermont Fish & Wildlife Dept.; U.S. Forest Service-GMNF.

Schedule and Status: Began 2000; field data collection completed 2003; data analysis and reporting are in progress; completion 2005.

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

Purpose: Inventory and evaluate the quantity and quality of instream trout cover; determine whether intra- and inter-stream differences in wild trout populations may be limited by this habitat component.

Project Leaders: Kenneth Cox, Vermont Fish & Wildlife Department; Scott Wixsom, U.S. Forest Service.

Principal Funding Sources: U.S. Forest Service-GMNF; Vermont Fish & Wildlife Department.

Schedule and Status: Began 2001; field data collection completed 2003; data analysis and reporting are in progress; completion 2005.

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

Purpose: Investigate the affects of natural river conditions and human land uses on channel morphology, stability, and habitat conditions in the Batten Kill.

Project Leader: John Field, Green Mountain College.

Principal Funding Source: U.S. Forest Service-GMNF.

Schedule and Status: Began 2001; completed 2001.

#### **A Comparative Assessment of the Chemical Characteristics of the Batten Kill with Other Wild Trout Streams in Vermont.**

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

Project Leader: Doug Burnham, Vermont Environmental Conservation Department.

Principal Funding Sources: Vermont Environmental Conservation Department; U.S. Forest Service-GMNF.

Schedule and Status: Began 2001; completed 2003.

*(Continued on page 8)*

# Get Help Improving Fish & Wildlife Habitat

by Mary Beth Adler

Many landowners in Vermont are interested in managing their property for fish and wildlife. Recently the Vermont Fish & Wildlife Department (VFWD) partnered with the United States Department of Agriculture's Natural Resources Conservation Service (NRCS) to help provide technical assistance for the USDA Wildlife Habitat Incentives Program (WHIP). WHIP is a voluntary federal program that helps landowners interested in creating and enhancing quality wildlife habitat on their property. The program provides technical and financial assistance to landowners through NRCS as part of the 2002 Farm Bill. Since its implementation in 1998, almost 11,000 participants have taken advantage of the program, improving fish and wildlife habitat on more than 1.6 million acres across the United States.

The objectives of WHIP are:


- 1) Implement parts of the eligible participant's conservation plan that create, restore, and enhance fish and wildlife habitat;
- 2) Enter into agreement to provide financial assistance in the form of cost share payments to enhance habitat on eligible land;
- 3) Provide program participants with technical assistance and educational materials regarding wildlife habitat needs; and
- 4) Foster a positive public attitude toward wildlife, wildlife habitat, and land stewardship.

NRCS and VFWD have joined in this WHIP partnership to enhance this program on the ground in Vermont. The Fish & Wildlife Department has two habitat specialists who, along with department biologists, will work with NRCS staff and landowners in the planning and implementation of WHIP plans. These trained staff will be helping develop the habitat plans, give recommendations on how to carry out conservation practices to realize the best possible results, and follow up and certify that the practices have been completed properly. They will also be available to offer general fish and wildlife expertise to landowners in the program.

If you own land or manage land and are interested in wildlife, WHIP might be a program for you. State

and municipal can also enroll in WHIP. To apply for the WHIP program, a landowner must file an application, which is available at their local NRCS field office (USDA Service Center) or online at [www.sc.egov.usda.gov](http://www.sc.egov.usda.gov). Their regional District Conservationist (DC) will make an initial site visit to the property, suggest habitat improvement practices, and, using a point system, rank the applicant based on type, quality, and quantity of habitat. If your land is accepted into the program, the DC and a habitat specialist will design a wildlife habitat development plan detailing the practices to be carried out, a schedule for their completion, and a cost-share basis. The WHIP agreements are generally 5 to 10 years in duration. Once a practice is completed and certified, NRCS authorizes payment of the cost share amount to the landowner.

The cost-sharing agreements provide up to 75% of the cost of certain fish and wildlife habitat improvement practices. Establishment or improvement of riparian forest buffers, stream restoration, management of deer yards, and restoration and management of declining habitats are just a few of the practices in the program. In Vermont, there is also 100 percent reimbursement available to landowners for improvements made to three special habitats — deer wintering areas in the Northeast Kingdom, Clayplain Forests in the Champlain Valley, and early-successional habitat development and management in the southern portion of the state.

For more information about WHIP, contact the local USDA JNRCS office (Jenny Kimberly, Bennington District) at 802.442.2275, or habitat specialist Mary Beth Adler at 802.885.8836. You can also find information online at [www.nrcs.usda.gov/programs/WHIP/Index.html](http://www.nrcs.usda.gov/programs/WHIP/Index.html). 



## Public Hearing to Discuss Possible Removal of Dufresne Pond Dam

During the 2004 Vermont legislative session, the Secretary of the Agency of Natural Resources was directed to investigate removal of Dufresne Pond dam in Manchester and to report back to the legislature before January 15, 2005. The report was submitted on schedule and provides an assessment of the existing dam, including structural and design deficiencies; options to remediate the structure, including cost estimates and time line for dam removal; and the Agency's preferred alternative.

Based on the study, the Agency recommends that Dufresne Pond dam be removed in 2006. The estimated cost of the project is \$191,000. The costs of other alternative actions, which address the dam's structural problems, are in the range of \$201,000 and \$376,000.

The dam is the last structure of its kind remaining on the Batten Kill main stem in Vermont. It was originally constructed in 1908 to power an adjacent sawmill. Later in the 1940s, it was used to supply water to the Peterson Factory and the Fisher and Son's stone crushing operation. And, in 1957, the dam was acquired by the State and has since then been managed by the Vermont Fish & Wildlife Department to provide recreational fishing. The pond is stocked annually in the spring with yearling brook trout for put-and-take fishing.

Over the years, the dam has required expensive maintenance with the most recent repairs done in 1998 and additional work is needed to stabilize the structure and make it safe. Also, the dam and pond have negative affects on the health of the Batten Kill. Temperature monitoring above and below the dam in 2003 demonstrated the impoundment behind the dam acts as a temperature sink during the summer and warms up the river downstream of the dam enough to exceed the thermal limits of brook trout. The pond also creates habitat for undesirable aquatic organisms. Each summer the pond becomes choked with aquatic vegetation. The pond has also become habitat for largemouth bass, which prey on young trout. Removal of the dam would not only correct these problems but will eliminate a barrier to the upstream movement of fish and other aquatic organisms, such as trout attempting to get to spawning habitat located above the dam. The report discusses other benefits of dam removal.

Dam removal will not result in the loss of fishing opportunities now provided by Dufresne Pond.

Instead, the Department will reallocate the annual stocking of brook trout to Bullhead Pond, located about three miles north of Manchester Center. This pond is state property and at present is an underdeveloped and underutilized fishery resource.


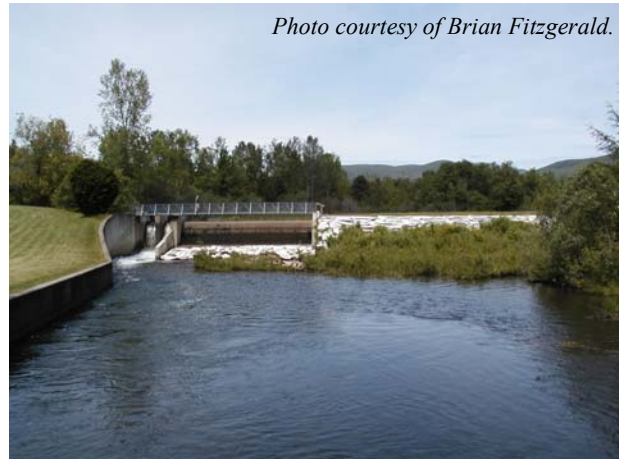
The Manchester Conservation Commission and Manchester Rod and Gun Club are sponsoring a public meeting to discuss Dufresne Dam on April 26 beginning at 6:00 p.m. Representatives of the Agency of Natural Resources will make a presentation on their work to date, followed by an informal discussion of issues associated with the dam and its possible removal. The meeting will be held at the Rod and Gun Club headquarters, which is located at the Dana L. Thompson Memorial Park off Route 30 in Manchester. Questions about the report to the legislature should be directed to Brian T. Fitzgerald, Water Quality Division, Vermont Department of Environmental Conservation at phone 802.241.3468 or email [brian.fitzgerald@anr.state.vt.us](mailto:brian.fitzgerald@anr.state.vt.us). 

Photo courtesy of Brian Fitzgerald.




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***“Fishing is much more than fish. It is the great occasion when we may return to the fine simplicity of our forefathers.*”**

— Herbert Hoover

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***“My biggest worry is that my wife (when I'm dead) will sell my fishing gear for what I said I paid for it.”*”**

— Koos Brandt


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# What's in the Tackle Box for 2005? *(cont. from page 1)*

On the habitat front, plans are moving forward with a multi-year habitat improvement project on the lower Batten Kill. The project, as now planned, could affect as much as 2,700 feet of river and is to emphasize increasing instream trout cover, a critical brown trout habitat deficiency identified in the Batten Kill. The landowner is now enrolled in the Wildlife Habitat Incentives Program (see *Get Help Improving Fish & Wildlife Habitat*, page 5).

Hopefully other landowners with river frontage will take an interest in the program thereby extending habitat restoration beyond this particular river section to the benefit of trout on a much larger scale. Beginning this summer, field surveys within the project area will be conducted, such as detailed measurements of river channel morphology and fish habitat. The project will serve as a demonstration

and enable evaluating trout population response to the improvements. Project planning, funding, design, and construction will involve the Batten Kill Watershed Alliance, Natural Resource Conservation Service, Bennington County Conservation District, U.S. Forest Service, Vermont Fish & Wildlife Department, and possibly other agencies and conservation groups.

Annual monitoring of brown trout populations in the Batten Kill continued in 2004. Late summer brown trout abundance (fish/mile for each of five size-classes) was estimated by electrofishing surveys and are presented in the following table. For comparison, estimates are also given for the years 1998-2003. Populations were not sampled in 1999. 

Sampling Location	Year	Size classes, inches					YOY	Sampling Location	Year	Size classes, inches				
		<6	6-9.9	10-11.9	≥12	<6				6-9.9	10-11.9	≥12		
West Arlington	2004	367	0	29	0	0		Manchester	2004	250	104	31	42	10
	2003	273	7	36	7	22			2003	1,073	42	21	0	10
	2002	568	0	43	22	7			2002	281	62	52	10	42
	2001	245	14	129	7	7			2001	969	125	62	21	52
	2000	723	0	14	0	7			2000	360	95	63	21	63
	1998	113	8	30	8	23			1998	209	55	88	66	22
Arlington	2004	451	0	177	16	16		East Dorset	2004	95	134	95	0	0
	2003	339	8	81	8	8			2003	563	57	29	0	10
	2002	580	8	56	32	40			2002	344	105	153	29	38
	2001	468	8	193	0	24			2001	334	420	105	38	48
	2000	463	8	138	8	32			2000	130	50	80	60	20
	1998	106	0	287	0	91			1998	67	96	96	0	29



*“There he stands, draped in more equipment than a telephone lineman, trying to outwit an organism with a brain no bigger than a bread crumb, and getting licked in the process.”*

— Paul O’Neil

## Fishing For Answers: An Overview of Batten Kill Studies, 2000-04 *(cont. from page 4)*

### **Evaluation of Suspended Sediments on Wild Trout Production in the Batten Kill.**

Purpose: Determine the effects of suspended sediments on trout spawning substrate and wild trout production.

Project Leader: Keith Nislow, U.S. Forest Service-Northeast Research Station.

Principal Funding Source: U.S. Forest Service-GMNF.

Schedule and Status: Began 2001; data analysis and reporting are in progress; completion 2005.

### **Evaluation of the River Flows as Possible Factors Affecting Wild Trout Production and Recruitment in the Batten Kill and Four Reference Streams.**

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 changes in wild trout production and recruitment.

Project Leader: Keith Nislow, U.S. Forest Service-Northeast Research Station.

Principal Funding Source: U.S. Forest Service-GMNF.

Schedule and Status: Began 2001; data analysis and reporting are in progress; completion 2005.

### **Inventory and Mapping of Existing Land Use Classes along the Batten Kill, 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; develop a database to store and analyze information and generate maps as tools to monitor future land use changes and assist in planning and resource protection and enhancement efforts.

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

Principal Funding Sources: Vermont Environmental Conservation Department.

Schedule and Status: Began 2001; completed 2002.

### **Mass Failure at Two Bank Slides on the Batten Kill.**

Purpose: Assess the rate of erosion and potential quality of sediment input to the Batten Kill from bank erosion at two sites; the confluence of the Roaring Branch and Batten Kill, and 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.

Schedule and Status: Began 2001; completed 2005.

### **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, Dog, Mettawee, Poultney, and Castleton rivers and determine where limitations to 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.

Schedule and Status: Began 2002; data analysis and reporting are in progress; completion 2005.

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

Purpose: Evaluate streambed 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 Environmental Conservation Department; John Field, Field Geology Services.

Principal Funding Source: U.S. Forest Service-GMNF.

Schedule and Status: Began 2002; data analysis and reporting are in progress; completion 2005.

### **Seasonal Movements, Behavior, and Habitat Use of Adult Wild Brown Trout in the Batten Kill.**

Purpose: Investigate the seasonal activities and habitat preferences of adult wild brown trout in the Batten Kill watershed as may be influenced by habitat availability; changing environment conditions, and human activity on the river.

Project Leader: Kenneth Cox, Vermont Fish & Wildlife Department.

Principal Funding Sources: U.S. Forest Service-GMNF; Vermont Fish & Wildlife Department.

Schedule and Status: Began 2003; field data collection 2003 and 2004; data analysis and reporting are in progress; completion 2005.

*(Continued on page 9)*

## Fishing For Answers: An Overview of Batten Kill Studies, 2000-04 *(cont. from page 8)*

### Fish Pathogen Investigations in the Batten Kill.

**Purpose:** Continue monitoring brook and brown trout populations in the Batten Kill watershed for disease-causing organisms and determine whether the presence of pathogens may be resulting in significant mortality.

**Project Leaders:** Barbara Johnston and Tom Jones, Vermont Fish & Wildlife Department.

**Principal Funding Source:** U.S. Forest Service-GMNF; Vermont Fish & Wildlife Department.

**Schedule and Status:** Began 2004; completed 2005.

### Predation and Yearling Trout Survival in the Batten Kill and Five Other Wild Trout Streams in Vermont.


**Purpose:** Assess the significance of common merganser and brown trout predation on trout recruitment in the Batten Kill, Dog, Mettawee, Poultney, and Castleton rivers and the Stevens Branch of the Winooski River; application of predator-prey and population models to determine if the decline in brown trout abundance in the Batten Kill might be attributed to excessive predation.

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

**Principal Funding Source:** U.S. Forest Service-GMNF.

**Schedule and Status:** Began 2004; data analysis and reporting are in progress; completion 2005.

### Habitat Restoration Activities

- **Stabilization of Eroding Bank on the Shepard Property, Arlington.**
- **Stabilization of the Wastewater Treatment Facility Slide on the Batten Kill, Manchester.**
- **Restoration of Riparian Vegetation on Hill Farm Riverside Conservation Lands, Sunderland.** 

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***“We cannot solve the problems we have created with the same thinking that created them.”***

— Albert Einstein

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## Common Merganser *Mergus merganser*

**Description:** A large duck (average 25”) with a long, slim neck and long, thin, serrated, hooked red bill. Males are distinctive: body mostly white with some black on back and wings; head is dark green. Females and juveniles have predominantly gray body; head is chestnut brown with slicked back feathered crest.




**Range:** Southern Canada and Alaska south throughout the lower 48 states.

**Habitat:** Breeding habitat includes clear water ponds, lakes, and rivers with forested shorelines. In winter, mergansers retreat from ice-covered waters to occupy open fresh and brackish rivers, lakes, and coastal bays.

**Nesting:** Typically nest in cavity trees but, when such sites are lacking, may construct nest on or in the ground wherever the nest can be hidden from view, such as among tree roots in an undercut streambank, in thick vegetation, or among boulders on shore. Clutch size may range from 6-17 eggs, although 9-12 is more typical. One brood is produced per year.

**Foraging:** A wide variety of fishes, including trout and salmon, are the primary food of the common merganser, although other organisms may be consumed (e.g., crayfish, molluscs, amphibians).

### References:

- Bellrose, F.C. 1978. Ducks, geese, and swans of North America, 2nd edition. Stackpole Books, Harrisburg, Pennsylvania.
- DeGraaf, R.M. and D.D. Rudis. 1986. New England Wildlife; habitat, natural history and distribution. U.S. Department of Agriculture, Food Service, Northeast Forest Experimental Station, General Technical Report NE-108., Broomall, Pennsylvania.
- NGS (National Geographic Society). 1987. Field guide to the birds of North America, 2nd edition. NGS, Washington, DC. 

# Yearling Trout Survival and the Predation Hypothesis

(cont. from page 3)

variable among streams and across the months of the summer. We believe that the mergansers move around quite a bit subjecting our counts to an extra source of uncertainty. Interestingly, we did not find mergansers numbers on the Kill to be as high as expected given the river's productivity. The Poultney, Castleton, and Dog rivers all had similar densities of mergansers as the Kill.

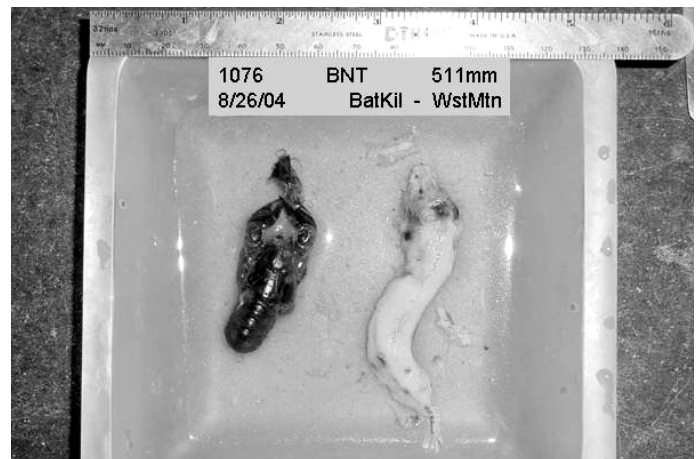
When we looked at what large brown trout and mergansers had been eating, we found some interesting results (Figure 2). Of 39 brown trout (length range 10-23") stomachs pumped, we found fish of one kind or another in about half but trout in only two. Both trout involved young-of-the-year only about 2" long — not in the size range we are concerned about. On the other hand, half of the 26 merganser stomachs sampled contained fish with trout present in at least four. The remaining stomachs, mostly from young ducks, had insects, crayfish, amphibians, or seeds. We are still working on identifying vertebrae, other bones, and fin rays

from some of the stomach samples, so the number of documented cases of mergansers preying on trout could go up. More importantly, three of the four trout that we found in merganser stomachs were yearling size fish (approximately 4"), and the other was a 8" brook trout — all in the size class we have been concerned about.

We are proceeding to use a modeling approach to address some basic questions about the plausibility of mergansers and other predators causing the population decline. For example, given our estimate of merganser density on the Kill, observations about their propensity to eat trout, and published estimates of how much a merganser eats in a year, we may ask the question: could mergansers have eaten enough trout to cause a decline as severe as the one experienced in the Kill? Or, looking at the other side of the coin, how many trout would each duck have to eat to cause such a severe decline? Could they plausibly eat that many? 🐟



**Figure 1.** Ken Cox (VT Fish & Wildlife) prepares a 15" brown trout to be tagged. The rice grain sized PIT (passive integrated transponder) tags are barely visible in the jar in the toolbox. Tags are injected into the fish body cavity using the syringe seen on the measuring board. Later upon recapture, the fish is scanned using the reader to the right of the toolbox, enabling it to be identified by its unique ten-character code.



**Figure 2.** Regurgitated stomach contents of a large brown trout, in this case a fairly intact crayfish (left) and a decomposed but still recognizable sculpin (right).

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***"The fishing was good; it was the catching that was bad."***

— A. K. Best

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## Volunteers Pitch in to Restore Trees along Batten Kill River Bank

For the second spring in a row, volunteers sacrificed a Saturday of early season trout fishing to work toward improving riparian habitat on the banks of the Batten Kill. On May 1, 2004, eight strong backs planted 45 trees on the Fish & Wildlife Department's Hill Farm Riverside Conservation Lands in Sunderland. An assortment of five tree species was planted: red maple, white ash, American basswood, river birch, and American elm. Unlike in 2003, larger plant materials were planted in 2004. Each tree measured between 6 and 8 feet in height. The crew greatly appreciated Cliff Ward's contribution of his front end bucket loader to move the burlap balled trees weighing as much as 60 pounds each. In the end, trees were restored to about 700 feet of Batten Kill river frontage. Cost of acquiring the trees was paid for by a Wildlife Conservation Restoration Program grant. 🐟



**Front Row:** Gary Kolanda, Eva Cox, Doug Lyons and Molly (trusty canine companion). **Back Row:** Gene Davis, Roy Lamberton, Greg Cuda, Cliff Ward, and Randy Schmidt.

### Coming Events

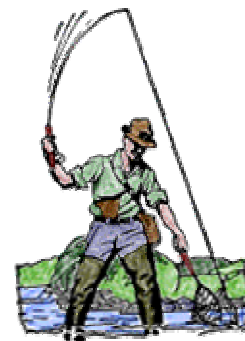
- **Saturday, April 9.** Opening Day of 2005 Trout Season.
- **Tuesday, April 26.** Dufresne Pond Public Meeting, 6:00 p.m. at the Manchester Rod & Gun Club, Dana L. Thompson Memorial Park in Manchester.
- **Saturday, May 21.** First Annual Gone Fly Fishing and Craft Fair, 11:00 a.m. to 3:00 p.m. at the Batten Kill Inn on Route 7A in Sunderland.
- **Saturday & Sunday, May 28 & 29; Saturday and Sunday, June 4 & 5.** Orvis Days Seminars in Manchester.
- **Saturday, June 9.** Free Fishing

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*“Without habitat, there is no wildlife. It’s that simple.”*

— Wildlife Habitat Canada

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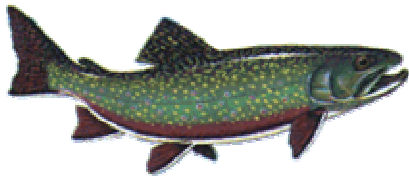
*“All the romance of trout fishing exists in the mind of the angler and is no way shared by the fish.”*

— Harold F. Blaisdell

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## Report Profiles Threats to Wild Brook Trout

In November 2004, Trout Unlimited released a report on threats to New England's wild brook trout. The report examines the effects of development sprawl, invasive species, decreasing clean water supplies, acid rain, and other factors on brook trout and its habitat, as well as identifies ways citizens can become involved in brook trout restoration. The report *The New England Brook Trout: Protecting a Fish, Restoring a Region* is available on-line at [http://www.tu.org/pdf/home/Trout\\_casestmt\\_FINAL.pdf](http://www.tu.org/pdf/home/Trout_casestmt_FINAL.pdf).



## Check Out These Web Sites

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



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

**New York State Department of Environmental Conservation**  
[www.dec.state.ny.us/website/dfwmr/fish/whirldis.html](http://www.dec.state.ny.us/website/dfwmr/fish/whirldis.html)

**Battenkill Conservancy-New York**  
[http://www.battenkillconservancy\\_ny.org/](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

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