WATERSHED

A Newsletter of the Wood-Pawcatuck Watershed Association

Volume 20 No. 3 AUTUMN 2003

CT State Legislature Gets Briefed on Stream Flow Analysis

Similar to efforts in neighboring Rhode Island, the State of Connecticut is taking stock in its surface water resources, with an initiative to study minimum stream flows necessary to sustain aquatic life.

The Shunock and Green Falls Rivers are CT's two major basins in the Pawcatuck Watershed. WPWA has been involved in the analysis of the Shunock basin by studying relative abundance of brook trout and other species in the Assekonk Brook, part of the Shunock River Watershed. Included in our statistical analysis of habitat factors affecting fish communities will be data from past sampling efforts by the CT Department of Environmental Protection (CTDEP).

The USGS is also conducting stream flow measurements in the Green Falls River and Shunock River subbasins as part of the Pawcatuck Optimization Project. This project, funded by USDA, will determine water availability, both surface and subsurface, in the Pawcatuck Watershed.

The State of Connecticut is now launching a statewide study.

The following is from a report presented to the state Legislative Program Review & Investigations Committee

Background

The CTDEP estimates Connecticut has about 8,000 miles of rivers and streams. According to the CT Department of Public Health (DPH), the state has over 3,200 public water systems. Approximately 84 percent of the state's population (2.8 million people) receives water from one of the 600 community water systems operating throughout the state. Community water systems serve at least 25 people throughout the year and many utilize reservoirs as a primary water source. In addition to drinking water, reservoir water is used for a multitude of other purposes, including providing stream flow water to sustain downstream ecosystems.

The CT legislature most recently creating a state Water Planning Council and required it to examine the state's water policy and management system, including stream flow. The council developed a draft report with its major findings and recommended action steps which was submitted to the legislature in December 2002. The second act made the council a permanent body and requires it to annually submit its findings to the legislature.

Area of Focus

The study will determine if the state has a coherent and comprehensive policy, planning process, and management structure governing minimum stream flow, and whether such policy achieves a responsible balance between protecting present and anticipated water supply needs and a viable stream and riverbed ecosystem as a natural resource that is largely dependent on the same water source. *(Cont'd next page)*

WPWA marks 20 years with Poetry Box Auction and Gala

Thanks to the generosity of numerous area artists and volunteers, WPWA supporters celebrated 20 years of work on behalf of the watershed with a riverside gala and art auction on September 21st. Featured in the auction were several of the original Poetry Boxes from last spring's successful project, as well as numerous bird houses sculptures created by

(cont'd page 7)

Poetry boxes await bids in the silent auction.

Brook Trout Study Continues

Under the direction of Dr. Saul Saila and Denise Poyer, WPWA continued its study of brook trout habitat in the watershed this summer. Funding for this phase of the study was provided by the U.S. EPA through the Partnership for Narragansett Bay. Grant funds supported the purchase of a Smith-Root Backpack Electrofisher, some laboratory analysis, and a summer intern.

Eben Lewis and Mel Cheeseman, recent graduates of URI's Environmental Management program, and volunteers from WPWA and Trout Unlimited, conducted species inventories at 14 low order stream sites. Over 350 fish were counted.

The sampling process involves using the electrofisher to temporarily stun the fish for capture. They are measured, identified, and released unharmed into the stream. Habitat assessments are also performed, and parameters such as stream flow, dissolved oxygen, substrate composition, and temperature are logged.

The data from this study will be used to determine the significance of stream habitat variables and their effects on fish species, with the focus on native brook trout.

The **chart on Page 3** provides an inventory of fish found at each site on particular days. Watch our website for a full report.

Thank you to Lawson Cary, Bill Osmanski, Susan Cerrulo, Ben Lord, Jared Lombardo, and the campers from W. Alton Jones who assisted with the study.

(Cont'd from previous page)

Areas of Analysis

1. Examine the state's current stream flow policy(ies) to determine whether a coherent and comprehensive policy exists. Identifying whether the state has an adequate water supply to support its stream flow policy, and whether the policy balances the need for water as a utility with that of water as a natural resource. The study will also identify and assess any existing standards governing stream flow, as well as consumption requirements on part of water suppliers.

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2. Examine the state's stream flow planning and management structures. Determine if the state adequately plans for stream flow. Assess the overall efficiency and effectiveness of the management structure in place to support and oversee the state's stream flow system, including enforcement of current stream flow regulations. Verify whether proper and accurate stream flow data are collected, analyzed, and reported as part of an overall management system.

3. Evaluate the state's Water Diversion Act and its relevancy to stream flow. Assess any interrelationship between the water diversion permitting process within DEP and stream flow. Examine whether the state's current water diversion system affects the balance between water as a utility, including drinking water, and water / stream flow as a natural resource for ecological purposes. Determine and assess the level of interagency communication, cooperation, and coordination among the entities responsible for planning and managing the state's water supply as it relates to stream flow, specifically DEP, DPH, and water suppliers.

4. Examine the degree to which the state considers and balances the overall views and desires of stream flow advocates with those of water suppliers in water policy planning, development, and management.

5. Evaluate the progress made in implementing the action steps outlined in the Water Planning Council's report recently submitted to the legislature as they relate to stream flow, as well as examining and assessing any other reports regarding stream flow in Connecticut.

For more information about water policy in Connecticut visit the CTDEP Bureau of Water Management at http://www.dep.state.ct.us/wtr/index.htm

2003 Table

Wood-Pawcatuck Watershed Association

Fish Assemblage Study 2003

	Sampling Date	*7/1/03*	*7/7/03*	*7/10/03*	*7/15/03*	*7/16/03*	*7/23/03*	*7/30/03*	*8/5/03*	*8/6/03*	*8/12/03*	*8/13/03*	*8/20/03*	*8/27/03*	*9/9/03*			
Common Name	**Site Species**	**Sherman Brook**	**Queens @ Stoney Lane**	**Tomaquag Brook @ Collins Rd.**	**Acid Factory (Below Eisenhower Dam)**	**Acid Factory (Below Butler Pond)**	**Roaring Brook @ Arcadia Hatchery**	**Cedar Swamp Brook (Old Mill Rd.)**	**Roaring Brook (Above pond)**	**Perry Healy Brook**	**Parris Brook**	**Kelley Brook @Falls River Rd.**	**Glen Rock Brook**	**Chickasheen Brook**	**Assekonk Brook @ Rt. 2**	**Total**	***Macro-Habitat***	***Pollution Tolerance***
American Eel (3)	*Anguilla rostrata*			2	11					2		2			2	**19**	*MG*	*T*
Atlantic Salmon (2)	*Salmo salar*											1				**1**	*FS*	*I*
Longnose/ Blacknose Dace (**)	*Rhinichthys atratulus*				50		1					9			1	**61**	*FS*	*I*
Bluegill (4)	*Lepomis macrochirus*			6	6		5	8		2				1	2	**30**	*MG*	*T*
Brook Trout (5)	*Salvelinus fontinalis*	18	9						48	7	2	14	57			**155**	*FS*	*I*
Brown Bullhead/ Catfish (**)	*Ameiuras nebulosus*													6		**6**	*MG*	*T*
Common Shiner (**)	*Luxilus cornutus*						1									**1**	*MG*	*T*
Fallfish (**)	*Semotilus corporalis*										2					**2**	*FS*	*M*
Golden Shiner (**)	*Notemigonus cryoleucas*			3			1								1	**5**	*MG*	*T*
Largemouth Bass (4)	*Micropterus salmoides*							3			1					**4**	*MG*	*M*
Pumpkinseed/ Common Sunfish (**)	*Lepomis gibbosus*			3	4	6	20								7	**40**	*MG*	*M*
Chain Pickerel/ Grass Pickerel (**)	*Esox americanus*			1		3		2		1	2			3	8	**20**	*MG*	*M*
Tesselated / Johnny /Fantail Darter (**)	*Etheostoma olmstedi*				1					2	2				1	**6**	*FS*	*I*
Common Sucker (**)	*Catostomus commersoni*														1	**1**	*FD*	*T*
	Total	18	**9**	**15**	**72**	**9**	**28**	**13**	**48**	**14**	**9**	**26**	**57**	**10**	**23**	**351**		

(**) native primary freshwater species; (2) anadromous; (3) catadromous; (4) introduced; (5) primarily resident, but also has anadromous populations

Macrohabitat:FD= Fluovial Dependant; FS= Fluvial Specialist; MG= Microhabitat Generalist

Pollution Tolerance: I= Intolerant; M= Intermediate; T= Tolerant

From the Executive Director

A Note About Renewals…..

Each year in June, members are asked to renew their memberships by paying annual dues. The membership period is June 1 to May 31. In June, a first notice is sent, followed by a reminder usually in September. Sometimes mistakes get by and those who have already paid get a reminder. We apologize for this.

Some members choose to pay their dues at different times of the year, for example in December., or February. While we have no problem with this, please keep in mind that with a small staff we are limited to a fairly simple system that cannot easily track alternate membership schedules. Dues paid during the year are credited to the current period, not the following one. We also use bulk mailing to save on time and expense. While we endeavor to accommodate our members as best we can, it is far more cost effective to send out renewals all at once.

Again we apologize if individual members are offended by reminder letters when they believe they have fulfilled their membership obligation, but we can only follow one schedule. Simply ignore the additional letter. Or if your concerned, give us a quick call. Whenever we receive your donation we will update your membership. Be assured that there will be no drastic repercussion from this. We appreciate the support of our members any time of year.

Lori Urso

WPWA Receives Grant Funds

RI General Assembly

Sponsor: Senator Kevin A. Breene
$ 5,000
This legislative award supports nutrient sampling in watershed tributaries.

Sen. Breene pays a visit to WPWA. With Saul Saila and Lori Urso.

Town of Charlestown

$ 600
This FY04 appropriation provides general operating support.

Town of Richmond

$ 500 operational
This FY04 appropriation provides general operating support.

Ninigret Rod and Gun Club

$ 1960
This gift supports recreational fishing instruction and fly-fishing education programs of WPWA. Its sponsor, the Ninigret Rod and Gun Club, is an old time club, founded many years ago to promote hunting and fishing in the southern Rhode Island area.

Watershed Libraries Receive Books from Sisson Fund

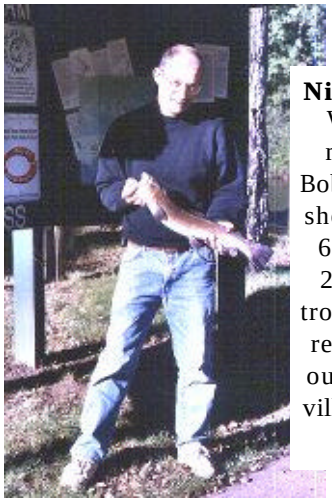
With funding from its Philip R.Sisson Memorial Fund endowment, WPWA has purchased children's books for several libraries within the Pawcatuck Watershed.

Each of the twelve libraries in the watershed was invited to submit requests for two books. Seven libraries chose to participate include Westerly, Kingston, Charlestown, Richmond, and West Greenwich RI, and North Stonington and Voluntown CT.

The Philip R. Sisson Memorial Fund was established by bequest of the late Philip R. Sisson to the WPWA in 1989.

Watershed loses a friend in Swimmer

WPWA mourns the passing of Evelyn Swimmer, an employee of the National Park Service, and a pioneer in the study of the Pawcatuck Watershed. In the early 1980's, Evenly served as project leader for the National Park Service study on the Wood and Pawcatuck Rivers. The findings of Evelyn and the study were an inspiration to then-director of RIDEM W. Edward Wood, who went on to form our watershed association. Evelyn's many contributions include her work with communities in resource conservation and public partnership, the *Riverwork Book*, the *Community Toolbox*, *Beyond Signs*, and much more. Evelyn was a unique and dedicated conservationist whose work will continue to serve the environmental community.



Nice Catch! WPWA member Bob Cotnoir shows off a 6 pound, 25.5 inch trout caught recently at our Barberville fishing access.

Logging Temperature For Clues on Stream Viability

Denise J. Poyer

In our ongoing mission to understand important facets of the watershed, WPWA launched a new study this past summer that employs temperature loggers originally designed to record frozen food temperatures. WPWA purchased 25 small temperature loggers, called "I-buttons". These temperature loggers are small waterproof devices, about the size of a nickel, that can be unobtrusively installed in rivers and streams. They can record over 1,000 points of information during a deployment. We set them to record temperature every hour for one to two months. We are able to go out into the field, download the information, and reset them to begin recording a new set of data points, using a laptop computer. This past summer we had them in the water from mid-August to late September along the Chipuxet, Queen, Beaver, and Wood Rivers. Next year we hope to record a full summer of temperature data.

Temperature is a critical part of any aquatic system with summer the most critical time. A few degrees one way or another can determine what lives in the stream and what cannot. One of the functions of temperature is the amount of dissolved oxygen the water can retain. In general, the warmer the water, the less oxygen it can hold. At 10 degrees C (50° F), the maximum amount of dissolved oxygen water can hold is 11.3 parts per million (ppm), also known as mg/L. At 20° C (68° F) water can only hold 9.1 ppm of oxygen. When you get to 25° C (77° F) the most oxygen the water can hold is 8.1 ppm. There may be other factors at work that also decrease the amount of oxygen available to the aquatic inhabitants. To put this in perspective, there are 220,000 ppm of oxygen in the air we breath, but no more than 14 ppm in water. Even a small decrease in dissolved oxygen can adversely affect aquatic life.

Another issue with higher temperatures is increased chemical reactions in the water. Some metals, such as mercury and lead, are normally bound in the sediments. However during certain circumstances, such as highly acidic or anoxic conditions, higher temperatures will accelerate reactions that cause metal compounds to become soluble. Higher water temperatures will also retain more of the metal compound in the water column.

Algae blooms are increased in warm water. These algae blooms can further decrease the oxygen content of a water body. The decreased oxygen can cause more acidic conditions which allow more sediment bound elements to convert to soluble compounds and continue the cycle. A number of stressors to the system, such as a high oxygen demand caused by plant decay and the warm water, can quickly set up conditions that will kill or drive out fish and invertebrates.

High water temperatures can definitely make the difference in the animal communities found in streams and rivers. Some species of fish are very susceptible to the changes caused by warm water. They are biologically adapted to cold water. As soon as the water warms beyond a certain point, their biological processes begin to shut down. It is believed that Brook Trout do not grow any larger in water that is greater than 18° C (64.4° F). Above 20° C they stop feeding and cannot survive in water warmer then 23° C (73.4° F) except in laboratory conditions. Even then, under very controlled methods, including complete saturation with dissolved oxygen, they do not live beyond 25° C (77° F).

There are many factors that affect water temperature. One is the amount of vegetation cover over the open water. A high percentage of trees and shrubs along a stream provide more shade to keep the water cool. That is why a 100 to 200 foot buffer of natural vegetation along a stream bank is required under RI Wetland Regulations. Land use practices, such as golf courses, agricultural fields, or lawns that remove vegetation right down to the stream bank can contribute to warming problems of a stream. The source of the stream water is another factor affecting water temperature. Streams that are groundwater recharged in the summer, what is often referred to as "spring fed", are going to remain much cooler than streams that get their flow from surface water. The ground water stays at approximately 12.8 ° C (55 ° F) throughout the year. Problems may arise if groundwater is routinely withdrawn in large quantities near a stream bed, as in the case of irrigation wells. This may result in diverting cool water from that stream. Dams will also warm the water in a stream. behind the (Cont'd on Page 7)

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(New and renewed members since last newsletter was published)

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WPWA CANOE AND HIKING GUIDES

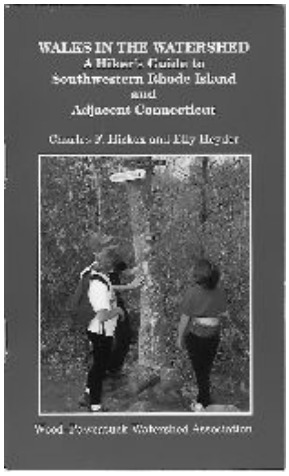
Order Form

Wood-Pawcatuck River Guide

By Charlie Hickox and Elly Heyder
$4.50 per copy ($3.50 members)
Navigate the Wood and Pawcatuck Rivers from source to sea with this colorful folded map.

Walks in the Watershed

By Charlie Hickox and Elly Heyder
$4.50 per copy ($3.50 members)
Sixteen of the watershed's best loop hikes contained in a handy pocket-sized guide



Quantity:
_____ *Wood-Pawcatuck River Routes Map*
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Add $1.50 postage and handling per item.

*Name*_____

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Mail form and payment to:
WPWA
203 Arcadia Road
Hope Valley, RI 02832

(Continued from Page 5)

impoundment as water slows down and spreads out, it will become heated by sunlight and warm air. Water flowing from the impoundment down stream is now much warmer. During our Fish Assemblage study these past two years we characteristically found only warm water fish below almost any size impoundment. Other factors that affect water temperature are the amount of precipitation, water volume, and any discharges into the stream. Discharges from industrial sources may contain water used to cool machinery. As expected this water is much warmer than the normal stream water, and can raise temperatures for quite a way downstream. This is known as thermal pollution.

By recording the daily, weekly, and monthly fluctuations of stream water temperatures, WPWA hopes to, first of all, identify good brook trout habitat. With further studies we also hope to locate and document sources of unusual thermal warming and perhaps look at simple remedial steps to take to correct them.

Art Auction (cont'd from page 2)

very talented and generous artists.

Attendees enjoyed a riverside picnic on a lovely Sunday afternoon, and had the opportunity to bid on one-of-a-kind pieces, many of which had been featured in RI Monthly Magazine and other publications.

The successful event raised $5000 to support the association. WPWA wishes to thank all those who participated in the event.

Craig Weiss, Bob and Gail Ornstein with the "Ohio License Plate Box" sculpture.

Right: Colorful box created by the Tinga Tinga Artists Cooperative in Dar es Salaam, Africa. **Below:** Musicians with Wood River as backdrop. *Photos by Pete Lacouture.*

Application for Membership

Name_____

Street_____

City_____State____Zip_____

Phone_____Email_____

_____Individual $25
_____Family $40
_____Contributor $50
_____Corporate $100
_____Supporter $100
_____Sponsor $250
_____Patron $500
_____Benefactor $1000

In addition to my dues, I am enclosing an additional contribution of $_____

All but $5.00 of your dues is tax deductible within the limits of the law.

WPWA Campus

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at Barberville Dam
401-539-9017
info@wpwa.org
www.wpwa.org

WOOD THRUSH
Hylocichla mustelina

Carpenter John McCabe works on the ceiling of WPWA's conference facility, the final phase of our renovation project.

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