

WATERSHED

A Newsletter of the Wood-Pawcatuck Watershed Association

Volume 19 No. 4

FALL 2002

Watershed To Get New

Water Allocation Guidelines

Harold R. Ward

Spurred on by the drought of 2002 – now thankfully somewhat relieved by September rains – the RI Water Resources Board (WRB) has begun to develop policies by which water will be allocated to competing uses during times of drought. The Wood-Pawcatuck (WP) is one of the first two watersheds for which these policies will be developed – the other is the Blackstone.

The WP was chosen because the US Geological Survey (USGS) has nearly completed a pilot habitat study for the Queen-Usquepaug and a water availability study for the entire WP basin will be released on November 12 for public comment. These studies will in part form the basis for a much more ambitious, five- year water optimization study that was begun by USGS this year. In sum, the WP is one of the most-studied watersheds in RI, and since it also contains several stressed sub-basins and is an area of significant population growth – the WP was a logical choice for the first round of water allocation policy development.

With grant support from the

Rhode Island Foundation in the amount of \$20,000 to support the role of Watershed Council, WPWA has the resources to devote its staff to program development, and policy-setting process.

WPWA has been involved in this process from the beginning, advocating for the last year for the development of minimum streamflow standards. Streamflow standards are necessary if aquatic habitats are to be maintained for fish and the macroinvertebrates on which fish feed. Direct withdrawals from streams or pumping from wells will reduce streamflow, which can put human use and habitat protection in competition. Withdrawals in the WP increase sharply in the summer as irrigation of farms, gardens and lawns begins, and of course these uses are heaviest at times when rains are infrequent. Water allocation policy will attempt to strike an equitable balance between legitimate human needs (particularly water for drinking and sanitary uses) and maintaining adequate streamflow for aquatic organisms.

The WRB has established numerous committees to advise on the development of water allocation

policy. Brown University professor and WPWA president Harold Ward will participate as a member of the Streamflow Committee, which will discuss minimum standards, and the Registration Committee, which will consider an appropriate system for registering water users. Executive director Lori Urso will serve on the Research Committee, which will review water use studies, and discuss an appropriate system of water user registration. Program director Denise Burgess, who has conducted streamflow studies for WPWA for 3 years, will also participate in some aspect of program development. We anticipate that work done over the past several years on streamflow monitoring and water quality monitoring, and the data obtained from the use of electronic dataloggers this summer, will inform our participation.

The WRB anticipates a 12-month period for fact finding and developing a work plan with budget. By December of 2003, a Water Withdrawal Registration Program would be formed. WPWA will report progress on the development of these policies in this newsletter and on our website as the process proceeds.

Students Present Recommendations on Aquatic Herbicides

From spring to summer, WPWA worked with four Brown University students on a study of aquatic herbicide use in the watershed. The goal of the study was to determine the extent of herbicide use in the watershed, to investigate the reasons for its use, determine its effects on pond ecosystems, and evaluate the current herbicide permitting process in Rhode Island. Toward this end, the students compiled a database of all herbicide treatment permits that have been filed in the last five years, conducted interviews to learn about the permitting process in RI and other nearby states, and gathered information about types of herbicides and alternative

methods of aquatic plant management. The students presented their results at WPWA's annual meeting in May, and wrote a paper that was distributed to stakeholders and posted online.

The general conclusions of the policy study were that authority over permitting ought to be consolidated and given to RIDEM's Office of Water Resources, and that the application process ought to require long-term planning and consideration of alternative management options.

These recommendations were presented to RIDEM in July, at a meeting in which options for revising the permitting process were discussed. This dialogue has the potential to create important changes in the permitting process.

To examine the scientific side of the issue, WPWA interns Katherine Fisher (Brown) and Melany Cheeseman (URI) worked with Dr. Saul Saila and Denise Burgess over the summer to gather water quality data before and after an herbicide application in Locustville Pond. Electronic data loggers were deployed for ten days in order to obtain continuous readings of dissolved oxygen, pH, conductance, and temperature. They also took readings of the same variables in Browning Mill Pond before and after treatment. Firm conclusions about the effects of herbicides on water quality or ecosystem health could not be reached by this analysis alone, but would require further study for a clearer look at the effects of herbicides on aquatic ecosystems.

WPWA & RIDEM Initiate Joint Study in Estuary

An operations report

This past June, WPWA worked with the Rhode Island Department of Environmental Management Office of Water Resources to initiate water quality monitoring in the Pawcatuck River estuary to evaluate the Total Maximum Daily Load (TMDL) of pollutants in the region of the river to seaward of the Route 1 bridge in downtown Westerly. The river has been identified as being at risk for hypoxia during the summer months, and it was decided to deploy electronic dataloggers in the river to determine the extent of the problem.

RIDEM provided the equipment, funding for analysis, and a marine scientist who performed the in-situ sampling and analysis.

On-water operations were conducted using the boat, dock and residence of WPWA volunteer David Luce.

On June 13, 2002, Chris Turner and Veronica Masson (RIDEM), Lori Urso (WPWA), and David Luce surveyed the lower Pawcatuck basin to select sites for the dataloggers. Dissolved oxygen was measured at several possible sites to characterize the range of environments in the estuary, and choose those where it appeared the units would be relatively immune from disturbance. Urso contacted riparian property owners and Westerly Police Chief David Smith, to obtain permission to deploy the dataloggers near docks and pilings.

On July 1, 2002, Turner, Masson and Luce deployed four YSI model 6920 datasondes set to take measurements every 15 min-

utes for 21 days, storing the values in on-board memory.

All the sondes had a combined conductivity, temperature and depth sensor, a chlorophyll sensor and a dissolved oxygen sensor installed. One, numbered AA, had a pH sensor installed as well.

Two sensors, one at the surface (AA) and one (AB) near the bottom, were attached to pilings at a private dock near the Westerly Yacht Club, just upstream from Pawcatuck Rock. Pawcatuck Rock restricts the tidal circulation at that point to an opening about 5 meters deep by 25 meters wide. Both the Westerly and the Stonington wastewater treatment plants discharge into the river upstream of this point. A third sensor (AC) was moored to the bottom about 10 meters from a private dock in Avondale, just

(Cont'd on Page 7)

Learning About Water Quality Through Macro Invertebrates

Macro invertebrates have a lot to tell us about the quality of the streams in which they live. *Invertebrates* include any animals without a backbone. *Macro* refers to things that can be seen with the naked eye. *Benthic* refers to bottom-dwellers. The creatures that we see in streams are classes such as insects, arachnids, crustaceans, mollusks, and worms. These animals have some mobility in the water, but not as much as fish do. They tend to float on downstream currents until they find suitable habitat. Special adaptations help them to stay in their optimal habitats.

Many of these animals, such as riffle beetles, scuds, and freshwater mussels, spend their entire lives in the stream. Others, such as dragonflies, stoneflies, and caddisflies, spend all but their adult stages in water. For some families of megaloptera, such as dobsonflies, this can be up to four years. Certain orders and families, particularly stoneflies, require very clean, well-oxygenated water in which to live. Others can tolerate lower amounts of oxygen, and to some extent sediment and pollution. These would include many families of mayflies and dragonflies. Still others can tolerate very low oxygen conditions and large amounts of pollution. Rat-tailed maggots, some types of snails, and midge larvae are in this category. By taking a look at the com-



Stonefly Larva

munity of macro invertebrates living in a stream, we can then get an idea of what the quality of the water is year round.

This summer, WPWA program director Denise Burgess conducted a pilot study of macro invertebrates in lower order streams of the Pawcatuck Watershed. Volunteers were trained to sample pre-selected sites. These sample sites had been selected for the brook trout analysis and other concurrent studies. The field volunteers were local teachers Roberta Engle, Dan Potts, and Susan Cerrulo, who are also WPWA members. Sara DaSilva, a URI graduate student who has worked for RIDEM and EPA for the past four years doing macro invertebrate sampling around the state, provided training. DaSilva and Burgess designed a sampling methodology that incorporated both EPA and River Watch Network protocols. WPWA interns Melanie Cheeseman (URI) and Katherine Fisher (Brown) also assisted with the project.

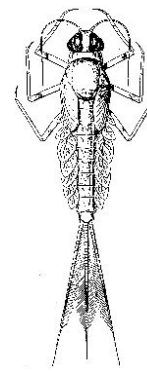
Six sites were sampled and evaluated for water quality: Meadow Brook #2, above Pine Hill Road, Richmond; Meadow Brook #3, above Meadowbrook Pond, Richmond; Locke Brook at Mail Road, Exeter; Queen River at Mail Road, Exeter; Falls River above Austin Farm Road, Exeter; and Breakheart Brook, near Frosty Hollow Road, Exeter. One hundred organisms from each site were sorted according to order in the field. They were also preserved and brought back to the WPWA office for examination under a dissecting scope to further identify down to families. Based on the EPA Index for Water Qual-

ity Rating, the following results were observed:

Meadow Brook #2	Fair
Meadow Brook #3	Good
Locke Brook	Fair
Queen River	Fair
Falls River	Good
Breakheart Brook	Good

Burgess will continue to compare these results to any chemical analysis and other tests done on the sites, and looking at the surrounding land use.

The most surprising observation was the water quality rating difference between the two sites on the Meadow Brook. Site #2 is in the Carolina Management Area, a heavily wooded, protected area.



Mayfly Larva

Site #3 is at the end of long agricultural fields. However, it has a better rating than the first site. This may be due to low flow conditions of the first site. It may also show that the agricultural management practices near the second site are doing a good job of protecting the water quality. This

is important information to know. However, both of these conclusions would be hard to obtain from just doing chemical analysis of the sites.

The pilot project was a necessary step in the successful development of the study. It was a good opportunity to train and utilize volunteers in data collection, and provided some useful information for assessing water quality. WPWA plans to expand the project next year to include up to 20 stream sites in the watershed.

From the Executive Director

This issue of *Watershed* showcases the numerous studies WPWA conducted this summer. The slant has been on science, and that's a good thing.

But WPWA is also conscious of the role of the arts and humanities in inspiring stewardship of the resource.



Currently a workshop, *Drawn To Nature*, is underway at the WPWA campus. Every Wednesday a group of 10 participants, led by artists Ana Flores and Susan Masket, meet to explore the science, and art, of the natural world.

I have also been working with Ana Flores to further develop the *Drawn To Nature* concept into an artist residency and public art component for the campus. Ana and I have submitted some grant proposals and hope to get some good feedback on the idea.

Our priority on improving public access has paid off. With funding from RIDOT for enhancing the Switch Road access, as well as funding from the Small Craft Access Trust for developing the Ashaway River access on Laurel Street, we can show concrete results of a Watershed Council implementing its action plan.

Finally, thanks to all for the membership renewals. We are at close to full renewal from last year, and have welcomed many new members this year. Thanks to you all for supporting our work.

Loui Ursso

WPWA Receives Grant Funds

Rhode Island Foundation
\$20,000

This is year two of a two-year award to support the development of WPWA's role as Watershed Council. Year two focus is on setting policy for water allocation and minimum stream flow standards.

Partnership for Narragansett Bay
\$10,125

The dynamics of fish assemblages are influenced by the amount of flow in a given stream. We intend to quantitatively assess the relative abundance of assemblages at various intervals in the watershed and associate these with physical parameters such as stream flow, substrate composition, numbers of pools, riffles, and other morphological characteristics of the stream.

Small Craft Access Trust (SCAT)
\$10,000

These funds are earmarked for the development of a public access on the Ashaway River, just above the Pawcatuck. The property was donated by Theodore Dionne and family of Ashaway RI.

Town of Stonington
Operational subsidy
\$1000 FY02-03
\$1000 FY01-02

Art for Living: A Benefit Auction
Carolina Mill August 24, 2002
\$10,000 net proceeds

This fabulous event was attended and enjoyed by 100 guests, and our gracious hosts the Quinns. The work of more than 60 artists was showcased..

**Rhode Island
Environmental Educators
Association**

2002 Conference

*Harvesting Environmental
Education*

Saturday, October 26, 2002
8:30 am to 3 pm

Location:
Audubon Society of RI
Environmental Ed Center
Bristol RI

Explore habitats, experience Save the Bay's teaching boat, relate to other formal and informal educators and discover ways you can use the environment to enliven and enrich your teaching.

Workshops:

- Teachers use of the Audubon facility
- Habitat walk (including salt marsh and rocky shore)
- Field studies and plant experiments
- Outdoor survival techniques
- Watershed activities
- Inquiry based study of evolution.
- WASTE (Workshop on Art Strategy for Teaching about the Environment)
- Tour of Blithworld

Conference fee: \$35 (\$25 students)
Includes workshops, buffet lunch, and one year RIEEA membership.

Call for registration information:
(401) 785-3510 x351

Professional Development Contact hours available.

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(Posted after July 15, 2002
and continued from summer
issue)

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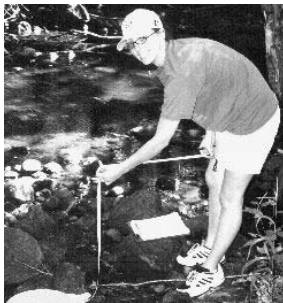
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Life

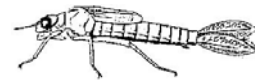
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Picture Perfect Summer 2002

Brook Trout Study



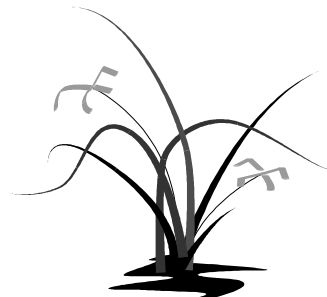
Trout Unlimited volunteers Lawson Cary, Al Ball, and Al Jaffa (above) accompany Dr. Sails and intern Melanie Cheeseman in the field.



Bug Study



Roberta Engle and Dan Potts kick up bugs in a stream, while Denise Burgess and Mel Cheeseman identify bugs in the lab.



Chariho 7th grade students, teacher Dan Potts, and volunteer Bruce Clark, participate in the brook trout study.



Summer Explorers



Summer campers from Roger Williams Park Zoo Camp, and the Norman Bird Sanctuary, explore aquatic life along the river banks.



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.



Quantity:

_____ Wood-Pawcatuck River Routes Map

_____ Walks in the Watershed

_____ Pawcatuck Watershed Report (free)

Add \$1.50 postage and handling per item.

Name _____

Address _____

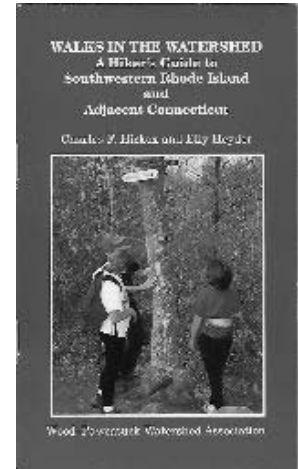
Mail form and payment to:

 WPWA
 203 Arcadia Road
 Hope Valley, RI 02832
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



(Cont'd from Page 2)

upstream of five marinas. It was attached to a buoy so it would float about 1.2 meters below the surface. The fourth sensor (AD) was set in open shallow water about 30 meters north of Pawcatuck Point, well outside of the marked channel. It was clamped horizontally on a concrete block, set to position it about 0.2 meters above the bottom.

On July 15, the sondes were retrieved by Masson and Luce, and the data uploaded to a laptop. The sondes were reset to send their data to new files, and were deployed again. Inadvertently, sonde AB was deployed at site AA (Pawcatuck Rock at the surface), and sonde AA was at site AB (Pawcatuck Rock at the bottom). The only significant difference between the two sondes was

that AA had a pH sensor installed, and AB did not.

On July 29, the sondes were again retrieved by Masson and Luce, and the data uploaded. The barnacles and slime on the sensor housings were removed, the chlorophyll sensor wiper pads were renewed and the membranes of the dissolved oxygen sensors were replaced. The conductivity, oxygen and chlorophyll-A sensors were calibrated, using the one-point, air-saturated, and single point techniques respectively. The pH sensor was calibrated using a two-point calibration method. To confirm and calibrate the data from the sondes, water samples were taken as they were deployed and retrieved.

On July 30, the sondes were deployed to their original locations, in which sonde AA was on the

surface and sonde AB was at the bottom. Redeploying the fourth sonde was particularly difficult. The wind was fresh, about 15 knots. Neither the boat's cheap Danforth-style anchor nor its folding grapnel anchor would hold in the weedy bottom. Upon lifting the concrete block to attach the sonde, the mushroom anchor lost its grip, and the boat floated away. Once attached, the sonde was returned and repositioned as well a possible.

**Welcome New Trustee
Michael McAndrew**

WPWA's Board of Trustees is pleased to announce the addition of new trustee Mike McAndrew of Stonington CT to the board. Mike serves as vintner to Stonington Vineyards.

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.

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203 Arcadia Road, Hope Valley
 at Barberville Dam
 401-539-9017
 info@wpwa.org
 www.wpwa.org

WPWA is **United Way Agency # 7724**



LEAST FLYCATCHER
Empidonax minimus

New steps to the lower Barberville Dam put-in on Arcadia Road were installed by Troop 1 Boy Scouts from Hope Valley.



Opinions expressed in *Watershed* are not necessarily those of WPWA, its Board of Trustees, or staff.

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