

# WATERSHED

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A Newsletter of the Wood-Pawcatuck Watershed Association

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Volume 20 No. 2

SPRING 2003

## Levels of Mercury in Predatory Fish are Focus of Study

Dr. Saul Saila

If you interested in learning more about the sources and significance of mercury in our watershed area, read on.

Mercury (Hg is the chemical abbreviation) is an interesting element which is a liquid metal at ambient temperatures and pressures. Sometimes it is referred to as quicksilver due to its silvery luster and high surface tension in its liquid phase. An early use of mercury was in thermometers because it expands at a constant rate for a large range of temperatures. Mercury has also been used in batteries, mercury vapor lamps, fungicides and other agricultural products.

Why should we be concerned about mercury in our watershed area? If it is present, where does it come from? According to the U.S. Environmental Protection Agency, most of the mercury currently found in our fish and aquatic environment comes from coal-fired power plants. The second most important source is from waste incinerators. Mercury becomes airborne as a vapor when discharged as smokestack waste from the above-mentioned industries. Once airborne, it can travel great distances (hundreds to thousands of miles) from its source. It ultimately precipitates on to the land and water. When the mercury enters water (from rainfall or runoff) elemental mercury is transformed into methylmercury, the most toxic and dangerous form. This transformation is usually accomplished by microorganisms. Methylmercury accumulates in fish, and it increases in concentration as it moves up the aquatic food chain to large predatory fish. This implies that large predatory fish (such as largemouth

bass, smallmouth bass, chain pickerel and pike) contain the highest concentrations found in our watershed area. Virtually all of the mercury found in fish (more than 90%) occurs in the methyl form. It binds tightly to the proteins in fish flesh and does not reduce its concentration during cooking.

Nearly all freshwater and marine fish contain trace amounts of mercury, because this element naturally occurs in low concentrations in both sea water and fresh water from dissolution of mercury occurring in rocks and minerals. However, certain fish species (those which are primarily large predators) contain higher concentrations than the smaller and less predatory species. Fish are a primary source of mercury observed in humans, and methylmercury, when ingested is almost immediately absorbed from the digestive tract and tends to accumulate in the brain and kidneys. Adult methylmercury poisoning is characterized by damage to specific brain areas, such as the visual cortex or parts of the cerebellum. The fetal brain is much more sensitive to low levels of methylmercury. The most severe health warnings concerning mercury in fish have been issued to pregnant women, nursing women and women who are planning pregnancy, as well as to children under six years of age.

How concerned should the average adult angler and/or consumer of fish be if not belonging to the restricted group of women and children indicated above? In an effort to provide more information for decision making regarding this element in consumption of local fish, scientists on behalf of WPWA have researched available data related to mercury concentrations in selected fish species, in particular largemouth bass, which are an important predatory species in our area and for which a reasonable amount of data are currently available. (Cont'd on page 6)

## Sharing Poetry in the Wild

Ana Flores

Coinciding with the opening of Fishing season in mid-April, a community art and nature project will be unveiled in the Wood Pawcatuck Watershed. "Poetry of the Wild," designed by WPWA artist in residence Ana Flores, and funded in part by the RI State Council on the Arts, is a series of artful boxes, designated "poetry boxes," shaped and built like bird-houses. From April 19 until June 21, the boxes will be installed at 16 different sites including fishing access areas on the Wood and Pawcatuck Rivers, trail heads in the Arcadia and Carolina Management Areas, and at Napatree Point in Watch Hill at the outlet of the Pawcatuck Watershed. Inside each box will be a different poem about the natural world by, as well as a notebook and pencils so that users of public riparian areas can record thoughts, poems, and

wildlife sightings. The project has numerous levels of community engagement including students from Charlestown, Ashaway, and the Nuweetoon School in Exeter. The collective activities include assembling and decorating the boxes, choosing poems to go into each box, installing the boxes, and weekly monitoring by volunteer "poetry wardens." The creation of numerous boxes will be done with the help of the school children and an advisory committee that includes Paula Ruisi of Westerly, Marnie Lacouture of Exeter, Eileen DeMaio of Richmond and Darlene Trew Crist of Wickford. By mid April, the boxes will be in place, encouraging members of the community to seek them out, and at the same time discover wild places and the river in their neighborhoods. Maps and announcements will be posted throughout the area.

Flores hopes the project will en-

courage multi-generational interaction with the landscape of the watershed, integrate the arts into watershed education, and promote the awareness of the connection between nature and creative expression. "The need to express ourselves came



Look for poetry boxes such as this throughout the watershed this spring.

out of our direct connection to the natural world. I wanted this project not to detract from the wildness that we are still so fortunate to have around us but to help punctuate it. Ideally I would hope to encourage people to engage with nature with the consciousness of poets; treading lightly and responsibly, sharing their thoughts and not their trash". (Cont'd next page)

## Remembering John Connolly River lover and steward

John Connolly spent many days of his relatively short life on the Pawcatuck River. Though he was raised in the Pawtuxet area, he always longed to leave the city for the quality of life offered by the Pawcatuck Watershed.



John married his sweetheart, Leila, who grew up along the river in Burdickville. Together they enjoyed times in the peaceful village, where John would teach their children, Graham and

Evan, about Osprey, other birds, and aquatic wildlife. He often brought his boys to Meadowbrook Pond where they could fish and enjoy the outdoors.

When he passed away in March, John's wife Leila requested that donations be made in his memory to WPWA, because "one of his greatest legacies will be the value of the love and respect for the river and all of nature."

We are grateful to those who remembered John in this way:

- Amy Mongillo
- Rhonda R. Godfrey
- Carol and Jack Lundgren
- Meg Cottam and Dennis Madden
- Earl and Barbara Cottam
- Eleanor Tatro
- Doug Riggs
- Mrs. Connolly's English Class
- at Toll Gate High School
- Toll Gate High School Faculty,
- Staff, and Students
- Laura, Ed, Lindsey, Kaitlyn, and
- Jennifer Maschler
- Teamsters Local Union No. 64
- Mr. And Mrs. Michael N. Zaino
- The Sumner Family
- Kirke Everson
- Mr. & Mrs. Eric and Gail Cambio

## Affordable Housing Amendment Pushes Zoning Limits

A letter from:

Cumberland Concerned Citizens  
Lincoln Concerned Citizens  
Charlestown Concerned Citizens  
Exeter Concerned Citizens  
Westerly Concerned Citizens

As a result of last year's "for-profit" amendment to the state affordable housing act, more and more towns across this state are coming under attack. This amendment, since it passed on June 28, 2002 at the "urging" of the RI Builders Association (RIBA), with no input from the towns, in a short time has spawned five proposed "luxury condo" developments on over 400 acres of green space in the state's suburban and rural communities. Typically, the developers ask for up to 10 times more units, or up to 900% density bonus, compared to what would be available under the town's zoning regulations. Most of the units are priced at a "market", or very unaffordable price. We believe (and this concern is echoed by many town officials) that the law was passed in such a hurry that even the safeguards to ensure that some affordable units actually get built (along with 80% luxury units) apparently seem to have been "forgotten" in the process.

We all are united in our support to finding solutions to affordable housing problems. However, it is apparent that the affordable housing issues are being exploited by RIBA's lawyers, who are pressuring Zoning Boards across the state to approve projects that are completely inconsistent with local comprehensive plans, zoning, and

often even minimal environmental standards. These lawyers have gone on a well-orchestrated crusade to convince the towns that they have little choice but to swallow these nonconforming (but very profitable for developers) projects being jammed down the towns' throats, regardless of the cost to the communities or damage to the environment.

Months of public hearings on the first such proposed project (343 units in an area zoned for 30) in Cumberland have just ended...in great confusion. The end result for that town, after spending tens of thousands of dollars to defend its comprehensive plan, is uncertain; Cumberland's Zoning Board, which until now has never been asked to solely approve a major subdivision or a complicated land development project, is clearly uncomfortable with its new role of the penultimate judge and jury, with its Chairman deriding, in his own words, this "stupid law" that put his board in this position. The residents are determined to uphold their town's comprehensive plan and challenge any compromise their town may be pressured into by the developers. Statewide, the confusion is about to give way to endless litigation, and we fear this is what's in store for most of RI towns in the very near future.

Citizens throughout Rhode Island are astonished that laws with such far-reaching and devastating ramifications can be passed in our state at the behest of a special interest group with no public input.

We are saddened that RIBA's top brass seems intent on exploiting the affordable housing issue in a transparent attempt to maximize

profits on the backs of the communities, with no real regard for those in need of affordable housing. As supporters of affordable housing, we worry that this kind of abuse will result in damage to this cause from alienating communities across the state and leading to cuts in federal funding.

We urge our elected leaders in the General Assembly to pass Bills H 5367 and S 300 that help rectify the situation. We believe towns must retain their local control of land use and the comprehensive planning process (with its imbedded system of checks and balances and ways to address local and state-wide issues) and that the rights of ordinary citizens should not be violated in order to benefit the richest few.

We also urge town officials across the state to vigorously defend their comprehensive plans. The RI Supreme Court decision in Coventry vs. OMNI is clear - the developers cannot throw your comprehensive plans, your zoning, or your rights out of the window.

Call for information: 401- 727-2552/ 401-339-6727/ 401-658-1766/ 401-364-6721, or visit [www.geocities.com/limerockconcerned/citizens.html](http://www.geocities.com/limerockconcerned/citizens.html)

### (Cont'd from previous page)

There will be a presentation and a reading of the poems installed in the boxes on April 30th, 7-9 pm at the Westerly Public Library. The results of the project will be celebrated on June 27th at the WPWA campus with an evening of poetry and music on the banks of the river. For more information, or to volunteer as a poetry warden, contact WPWA at 401-539-9017, or

## From the Executive Director

Now that spring has arrived (has it? there's still snow out there!) we can look forward to busier days here at WPWA, and hopefully before long the (near) completion of our construction projects. If you have not been by our office, take a drive over. On the outside we are nearly as lovely as we can be. Our buildings are shingled, new windows and doors, soon we will rebuild out deck over the river. On the inside we continue to chip away at our plans, working toward a wonderful facility that the public can enjoy.



Sadly, along with the successes of the recent past have come losses. In March we lost a good friend, member, and volunteer, Joyce Schnappauf, who dedicated her time to monitoring river quality as a Watershed Watch volunteer and Queen Watershed Action Team member, and in many other ways. She was always cheerful, fun to talk to, and loved our rivers. Joyce will be sorely missed.

Another river steward, John Connolly, passed away suddenly in March. John leaves a legacy of love for the watershed. (see story page 2).

On a positive note, our program director, Denise Burgess, married her sweetheart and hiking buddy, Ed Poyer, in a lovely ceremony in Narragansett on April 5, 2003. All of us at WPWA are very happy for Ed and Denise, and wish them a lifetime of love and togetherness.

*Lois Ursso*

## Springtime Events

### Opening Day

Saturday April 12, 2003

6am—10am

Free coffee will be served at our Barberville location to anglers with reusable coffee mugs. Wherever you fish on this day or any day—be aware of litter! Carry out what you carry in.

### Earth Day

#### Public Access Cleanups

Saturday, April 26, 2003

10am—3pm

Join us for the annual beautification of our public access areas. Bags, gloves, and refreshment provided. And it makes you feel good to help out!

### WPWA Annual Meeting

Wood River Inn

Thursday, May 8, 2003

6—8:30pm

Presentation of annual report, installation of board members, dinner, drinks, and a fun time. (Meal is optional)

### Well-Water Workshop

WPWA Campus

Tuesday, April 29, 2003

7—8pm

(see page 7 for information)

### Poetry of the Wild

Westerly Public Library

Wednesday, April 30, 2003; 7pm

Poetry reading and presentation of poetry collection box project.

WPWA Campus

Thursday, June 27, 2003

An evening of poetry and music.

## Annual Appeal

2002—2003

Thank you for your support!

**Leadership Giving** (\$1000 and up)  
Country Cape Antiques Shows

**Trustee's Circle** (\$100 to 249)

Joseph and Joan Ceo

Mary E. Lenzen

**Watershed Club** (\$50 to 99)

Albert J. Ball

Richard Flynn

Brother Kevin Kiernan

Peggy and Rob Leeson

Suzanne G. Mac Lear

**Stream of Friends** (up to \$49)

John Butler

Gloria M. Courtois

Joe Czerwinski

Linda Taylor Green (on her behalf)

Joyce and William Schnappauf

*If you believe we have missed your name in error, we apologize. Please call 401-539-9017 to inquire.*

### (Saila—Cont'd from Page 6)

In summary, although large predatory fish may contain levels of mercury that are above the established threshold, occasional consumption of these fish by adults (exclusive of pregnant or nursing women, and children below 6 years of age) is acceptable but should be limited to approximately once per month. Hatchery reared and stocked trout are safe to eat in terms of their mercury content as are the smaller species. This is also true of native brook trout because they are relatively short lived and are not highly predatory. We are excited about this work to date, and hope this is only a beginning to a more comprehensive future analysis of mercury in our local fish and habitats.

## Optimization Model Promises Better Data

Denise Burgess Poyer

**The Pawcatuck Optimization Model is a new initiative of the Natural Resource Conservation Service (NRCS) and the US Geological Survey (USGS) in the Pawcatuck Watershed. When developed within the next 3 to 4 years, this model will help planners, communities, regulator agencies, water resource boards, and many others better assess existing water use needs and strategically plan for new uses.**

The USGS will collect a large amount of data from the measurement the amount of available surface and groundwater in the entire watershed. To do this they have added 9 new continuous read gauges to the 9 permanent ones already existing, along with 36 new and existing partial record gauges and a number of new groundwater wells. A continuous read gauge has the ability to record the stream height at set intervals around the clock. The partial record gauges require someone to go out to the site and record the stream height. All of these sites require a USGS staff to measure the flow at frequent intervals. They use the information to develop and refine a stage/discharge relationship curve, which is a graph or curve of the relationship of the stream height and the volume of water flowing through the stream at that height.

With the flow volumes of so many streams and rivers in the

Pawcatuck watershed being accurately recorded this year, WPWA will be able to expand stream quality sampling. From May to October, WPWA needs volunteers to collect monthly samples of nitrogen, phosphorus, and bacteria at each of the stream sites that USGS is gauging. URI Watershed Watch will analyze the samples for the concentration of nutrients in the stream. With the flow information, we will be able to determine the volume of the nutrients, or nutrient loading, in most of the streams, and may help us pinpoint sources of excessive nutrients. Previous studies by the USGS have found high levels of nitrogen in the Pawcatuck estuary. Since these levels have been found above the wastewater treatment plants, that means the source of the nitrogen must come from upstream in the watershed. WPWA hopes that by coupling our Volunteer Water Quality Monitoring Program with the data gathering of USGS we will be able to identify areas of concern in the Pawcatuck Watershed.

Ultimately, the data from USGS will be used to develop a "Conjunctive Use Optimization Model," which NRCS describes as two linked computer models—one that looks at groundwater supply and flow, and one that looks at those parameters for surface water—to illustrate the integrated effects of water use in the watershed. The model will be able to demonstrate the impact on stream levels from a groundwater well pumping nearby, for example. The "optimization" component involves additional features to assist in predicting, for example, potential irrigation well

areas with least impact on stream flow. Once developed, the model will be capable of determining:

- impacts of present and future water withdrawals on stream and groundwater levels;
- specified minimum stream flow needed to support aquatic habitat and meet commercial needs
- optimum locations and rates of new water withdrawals minimal impacts on stream flows and ground water levels, and maintaining supply for established or priority users;
- the best course for decision makers in assessing different management schemes in a situation of limited water availability and usage; the best areas for development in terms of these water availability issues; and,
- the sustainable yield for the hydrologic system over the long term.

The goal of NRCS is to provide the scientific information needed to help resolve water use conflicts. Their partners in this project include RI Water Resources Board, Southern RI Con-

### Scouts Honor



Members of Boy Scout Troop 1 Hope Valley celebrate their achievement of Eagle Scout. Many of these young men performed community service projects with WPWA. Congratulations to all!!

**Mercury in Fish** (Cont'd from page 1)

Details regarding the methodologies used for analyses, the assumptions and the statistical results from testing specific hypotheses are described in a report with the same title as this article, and it is available for perusal on the WPWA A web site. The results can be briefly summarized as follows.

A.) The variables which influence the mercury levels of largemouth bass were found to be: 1) size (total length), 2) location (pond or reservoir) of capture, and 3) year of capture. The first two variables explain about 80% of the variance, and the year of capture and other factors account for the remaining 20 percent. From this analysis, it is suggested that the contribution of the year of capture is sufficiently small so that samples of the same species taken from the same locations can be safely combined (such as from year to year). This will permit more critical comparisons because sample size is important in improving the precision of comparative studies. To the interested angler, this also indicates that reported mercury concentrations in a particular location are not expected to change quickly from one fishing season to another.

B.) Total lengths and mercury concentrations for largemouth bass from six locations were compared. No significant differences in the average size of the bass from the six sites were found; however, a similar analysis of the average total mercury concentrations indicated highly significant differences among the six locations. It was found that the locations sepa-

rated into two relatively homogeneous groups. The first group (high mercury concentrations) included Eisenhower Lake and Wincheck Pond. The second group (lower mercury levels) consisted of Chapman Pond, Alton Pond, Simmons Reservoir and Belleville Pond. No adequate explanation for these differences in the total mercury concentrations of similar sized fish could be found from this work. Several variables seem to deserve further examination. These include pH and total alkalinity of the water, sediment characteristics (such as total organic carbon and exchange capacity) as well as environmental conditions (such as the amount of surrounding marsh or swamp land).

C.) A comparison was made of the length-weight relationships which provide a measure of the relative condition (fatness) of the largemouth bass for which lengths and weights were available. Four watershed locations included Eisenhower Lake and Wincheck Pond with high mercury levels as well as Chapman Pond and Alton Pond with lower levels of mercury. No statistically significant differences in the relative condition of bass from these four locations were found. The higher mercury concentrations in bass do not appear to adversely affect their relative condition. This has been a somewhat complex analysis to demonstrate that higher mercury levels do not induce skinnier fish!

D.) A comparison was also made of the growth curves of largemouth bass based on growth information derived from increments in the scales of captured

fish by RI Division of Fish and Wildlife. Results conclude that growth of largemouth bass during years 1 through 7 was not statistically different among the four locations. These results also suggest no adverse effects of increased mercury levels on the growth rate of this species.

E.) Graphs describing the relationship between fish size and total mercury were derived for both largemouth bass as well as for chain pickerel from selected Rhode Island waters. Copies of these graphs are available from WPWA, and may be used as a basic aid to anglers in estimating the average total mercury concentration of fish which they have captured. The procedure simply involves measuring or estimating the length of either a largemouth bass or chain pickerel in inches and placing your finger on the estimated fish length on the graph, then moving your finger straight up until it intersects the curve drawn on the graph, then moving your finger horizontally to the left until it intersects the left side of the graph. The mercury level read from this point is the average concentration of mercury expected in a fish of that size taken from Rhode Island waters. It is generally recognized that 0.3 ppm (parts per million) is considered a safe upper limit for total mercury. These figures show that this concentration level occurs at a relatively small size for both largemouth bass and chain pickerel. Hopefully, this information will be of interest and use to all anglers, and perhaps it may lead to more catch and release activity for these species.

(Saila—Cont'd Page 4)

**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.

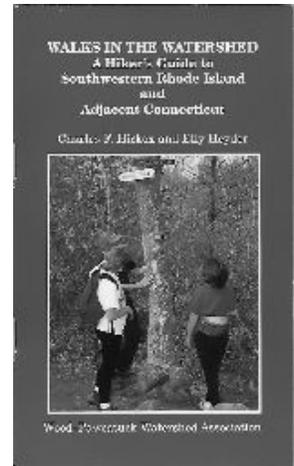


***Walks in the Watershed***

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*

\_\_\_\_\_ *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**

**WPWA Announces Grant Awards**

**RI Foundation**  
 Arts-based Professional Development Grant  
 \$600.00  
 This award supports an artistic approach to professional development of WPWA's Board of Trustees.

**Country Cape Antiques Shows**  
 \$1536.00

Our friend Chuck and Jan Thompson once again support our watershed programs with this annual gift.

**Mitch and Betty Salomon Endowment**  
 \$335.00

To support regional approach to watershed management..

**Well Water Workshop for Homeowners**

As a private well owner, you are responsible for the quality of your drinking water. However, there are environmental hazards you may not be aware of.

During this workshop you will learn how you can protect your private well through:

- ◆ Regular Testing
- ◆ Well Maintenance
- ◆ Safeguard the Land and Water Near You
- ◆ Good Housekeeping Practices for Protecting Your Private Well

A demonstration of Groundwater Models and general information about water in the environment will be given. Factsheets outlining how to get your well

tested, as well as protection and treatment methods, will be available for participants

This workshop is may be of special interest to homeowners along water fronts of rivers and ponds.

**Date: Tuesday, April 29, 2003**  
**Time: 7:00 – 8:30 PM**  
**Place: WPWA Campus**  
**203 Arcadia Rd,**  
**Hope Valley, RI 02832**

**This program is free and open to the public.** For more information or to register, call URI Cooperative Extension at **874-5398**. Co-sponsored by URI Cooperative Extension, RI



### 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 extra contribution of \$ \_\_\_\_\_

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

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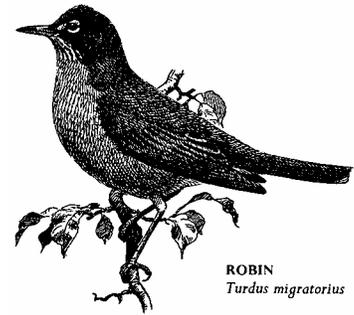
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- Denise Poyer, Program Director
- Ana Flores, Artist in Residence

### WPWA Campus

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



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



Looking across the river into North Stonington CT from Westerly RI

Bulk Rate  
 US Postage  
 PAID  
 Non Profit  
 Permit No. 9  
 Hope Valley  
 RI

Wood-Pawcatuck Watershed Association  
 203 Arcadia Road  
 Hope Valley, RI 02832