

# WATERSHED

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A Newsletter of the Wood-Pawcatuck Watershed Association

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Volume 21 No. 2

SPRING 2004

## Brook Trout Characteristics Subject of Ongoing Study

Saul B. Saila

The brook trout is one of possibly two native (indigenous) salmonid species in the Wood-Pawcatuck Watershed. The other is the Atlantic salmon, about which Wood-Pawcatuck Watershed Association (WPWA) expects to provide additional information at a later date. WPWA has recently completed studies related to habitat preferences and requirements for the brook trout in this region. Reports are available on our website ([www.wpwa.org](http://www.wpwa.org)) for those interested in the details of the analyses. This material is an attempt to distill the detailed information as well as to provide some life history data from the published literature into a more readable and interesting message. We hope that this material, written just prior to the opening of trout fishing season in RI and CT, may also contribute in some

positive way to both fishers' and non-fishers' appreciation of this very interesting, colorful, and tasty fish. The species, first described (formally named) by Mitchell in 1814 from a location near New York City, has several common names, including brook trout, speckled trout, square-tail, char or spotted char, salter, coaster, and sea trout.

Brook trout (a preferred common name) are a very colorful salmonid species. The colors include an olive-green back with lighter sides which become silvery white on the underside. The back region of the fish has wavy worm-like markings (vermiculations), and the lower fins (pectoral, ventral, and anal) all have beautiful white leading edges. In addition to pale spots on the sides there are also small red spots surrounded by a pale blue halo. The lower flanks and belly region of mature male fish become reddish with some black pigmentation as well. These colors intensify

greatly just prior to and during the breeding season.

Brook trout are frequently separated into two forms. The first is a short-lived (2-4 years) small fish (about 7-10 in.) at a maximum size. It is found in small, cold water streams and similar small ponds. This form is currently typical of native fish in our watershed. The second form is much more long-lived (7-10 years) and relatively large (up to several pounds). It is usually associated with large lakes and rivers, as well as estuaries. It is our belief that prior to the construction of dams in our watershed streams, that large salter brook trout were fairly common in occurrence. These sea run trout may have been mistakenly called salmon by early settlers because the flesh of salter trout is also of reddish color due to a diet consisting largely of crustaceans (shrimp, amphipods, and copepods).

Spawning of the brook trout takes place in the fall (from late September to early November) depending on the weather and

## WPWA Announces 2004 Water Quality Monitoring Program

WPWA has been a leader in Southern New England for volunteer monitoring of lakes, ponds, rivers, and streams. Since the initiation of Watershed Watch in 1989, WPWA continues to pioneer new types of volunteer-lead monitoring in the Pawcatuck Watershed. Last year, a total of 66 sites were monitored in the watershed, including 18 ponds and lakes and 48 stream sites. This amazing accomplishment is thanks to 60 volunteers who gave up several of their Saturday mornings to collecting water samples.

While the volunteers provide their time for free, there are costs associated with this important program, such as purchase and maintenance of equipment, laboratory analysis, supplies, data management, and reporting.

Sponsorship of monitoring sites in the Pawcatuck Watershed is shared by WPWA (40 sites), North Stonington Citizen Land Alliance (13), Hopkinton Conservation Commission (3), Town of South Kingstown (1), Narragansett Chapter of Trout Unlimited (4), RI Department of Environmental Management (4) and URI Watershed Watch (1).

Last year, WPWA volunteers collected nutrient samples on 42 small order (wadeable) streams, a special initiative with a goal of identifying areas that may be contributing significant amounts of Nitrogen or Phosphorus into the Pawcatuck River system. Other than Chickasheen Brook, preliminary results showed that 21 stream sites exceed the EPA's recommended guidelines for Total Nitrogen at least once and 33 sites exceeded guidelines for Total Phosphorus.

For 2004, our plan is to focus

on the main-stem of the Pawcatuck River, where the RIDEM has indicated a need for additional data. WPWA will continue to monitor several sites on the Queen River, as well as the pond sites standard to our annual program. We are considering additional sites in Hopkinton along the Ashaway River and Tomaquag Brook.

As we prepare for the coming season of monitoring, WPWA would like to thank all of those who went out in boats or waded into streams to help us keep an eye on the health of the watershed. We are still looking for monitors for the sites on the Ashaway River, Tomaquag Brook, Pawcatuck River at Kenyon, and Pawcatuck River at Bradford.

A complete listing of monitoring sites and volunteers follows. For more information contact [denise.poyer@wpwa.org](mailto:denise.poyer@wpwa.org).

<i>Monitor</i>	<i>Monitoring Site</i>	<i>Sponsor</i>
<b>Connecticut Sites:</b>		
Ben Simonds	ASSEKONK BROOK @ Jeremy Hill Rd.	NSCLA/WPWA
	ASSEKONK BROOK @ Rt. 2	NSCLA/WPWA
	SHUNUCK RIVER @Main St.	NSCLA/WPWA
	SHUNUCK RIVER @ Rt. 49	NSCLA/WPWA
Amy Drake & Jessica Wiwczar	GLADE BROOK @ Pine Woods Rd.	NSCLA/WPWA
	GREEN FALLS RIVER #1 @ Green Falls Rd.	NSCLA
	GREEN FALLS RIVER #2 @ Putker Rd.	NSCLA
	GREEN FALLS RIVER #3 @ Clark Falls Rd.	NSCLA
	WYASSUP BROOK @ Clark Falls Rd..	NSCLA/WPWA
	PENDLETON HILL BROOK @ Grindstone Hill	NSCLA/WPWA
Julie & Bruce Dionne	LEWIS POND OUTLET @ Boom Bridge Rd.	WPWA
Joseph DiBrino, Joanne Stevens & Doug Carocari	SPAULDING POND	NSCLA
	WYASSUP LAKE	NSCLA
<b>Rhode Island Sites</b>		
David & Cassandra Crandall	ALTON POND	WPWA
Michael Blatt	ASHVILLE POND	RIDEM
Bill Jones, Lorraine Joubert, & Natalie Ndiaye	BARBER POND	WPWA

<i>Monitor</i>	<i>Monitoring Site</i>	<i>Sponsor</i>
Bill Fontaine	BOONE LAKE	WPWA
Al Ball, Lawson Cary, & Larry Hinchley	FALLS RIVER FLAT RIVER @ Plain Rd. BREAKHEART BROOK @ Frosty Hollow Road KELLY BROOK @ Falls River Rd.	TU TU WPWA WPWA
Ed Blamires, Heidi, Beth & Bill Wright WPWA interns	BREAKHEART POND  ACID FACTORY BROOK @ Plain Mtg House Rd PERRY HEALY BROOK @ Klondike Rd.	RIDEM  WPWA WPWA
Melissa Sousa Eric Scheildrop	BROWNING MILL POND BRUSHY BROOK @ Sawmill Rd. BRUSHY BROOK @ Woody Hill Rd. MOSCOW BROOK @ Sawmill Rd.	RIDEM HOPKINTON CC HOPKINTON CC HOPKINTON CC
John Topping URIWW Heather Lightner Peter Stack	CEDAR SWAMP BROOK @ Kings Factory Rd. CHICKASHEEN BROOK (5 sites) FISHERVILLE BROOK @ William Reynolds Rd. LOCK BROOK @ Glen Rock Rd. RAKE FACTORY BROOK @ Glen Rock Rd. SHERMAN BROOK @ Dugway Bridge Rd. HUNDRED ACRE POND	WPWA URIWW WPWA WPWA WPWA WPWA WPWA
Dave Whelan & Duncan Hunter Sam Curry	LOCKE BROOK @ Mail Rd. QUEEN RIVER @ Mail Road	WPWA WPWA
Amy Tait-Kamradt Rod Dair Anne Marie Tavares & Ken Young Werner Wiskari Mal Cooper & Jake Wise Roberta Engle	LOCUSTVILLE POND LONG POND MEADOWBROOK POND  PASQUISET POND PAWCATUCK RIVER @ Avondale Boat Yard PAWCATUCK RIVER @ Biscuit City Rd. USQUEPAUG @ Rt. 2 PAWCATUCK RIVER @ Bradford (near Rt. 91)	WPWA RIDEM WPWA  WPWA WPWA WPWA WPWA WPWA
Mitch Saloman & Jim Latimer Keith Manning Julie & Bruce Dionne	PAWCATUCK RIVER @ Burdickville Rd. PAWCATUCK RIVER @ Rt. 91 TANEY BROOK @ Shannock Hill Rd.	WPWA WPWA WPWA
Sue Cerullo	QUEENS FORT BROOK @ Dawley Rd. QUEEN RIVER @ Rt. 102, Golf Course QUEENS RIVER @ Sand Bridge (TNC) QUEENS RIVER @ William Reynold's Rd.	WPWA WPWA WPWA WPWA
Peter Brownelle Jim Cummings Carol McTaggart	QUEEN RIVER @ USQUEPAUG ROARING BROOK @ Arcadia Rd. ROARING BROOK @ Summit Rd.	WPWA WPWA WPWA
Virginia Carter, James Mofett, & Sindy Hempstead Bart Hurley, Gerry Matteo, & Virginia Wooten Michael Blecharzcyk Kate & Joe Abarr Jim & Sher Schroer, L.Green	TUCKER POND  WATCHAUG POND  WOOD RIVER @ Switch Road WYOMING POND YAWGOO POND	S. KINGSTOWN  WPWA  WPWA WPWA WPWA

## From the President

To give the Director a break from the quarterly routine of column preparation, I've agreed to put down a few thoughts in a President's Column from time to time.

Over the past twelve months, many of the residents of our watershed have viewed with increasing concern proposals to develop large tracts of open land for industrial and commercial purposes. The comprehensive plans in communities where these developments are being proposed claim that preserving rural character is a high value and yet our local governments are approving developments that are antithetical to these values. Other than a hope that such developments will raise more tax revenues than their services consume, our communities are likely to realize little benefit and the financial gains will flow entirely to the developer. Put a different way, the town confers a benefit for the developer by allowing more lucrative development through a zone change, and retains little to none of those benefits.

A recent study conducted by the Southern New England Forest Consortium titled "Land Conservation, Development and Property Taxes in Rhode Island" points out that generally "towns with the most development have higher rather than lower tax bill (rates)" and "commercial and industrial developments, although they generally provide more in taxes than they directly

cost the town to service, create jobs that lead to residential development" ...which in turn cost more in services than they pay in taxes.

However, town governments under pressure to increase tax revenues in the short run could capture some of the benefits of the approvals they are granting for large-scale development through the use of Transferable Development Rights (TDR). In its simplest form, when the town rezones land in a way that substantially increases its value (for example, converting residential to commercial zone), the town could require a developer to purchase development rights for the larger-scale development, and use the land to buy development rights on farms or open space the town would like to preserve. The result is that development is concentrated and sprawl is discouraged - a practice usually called "Smart Growth". The Town of Richmond currently is considering this option, and other rural towns would be well advised to consider this strategy when rezoning for a large scale development is proposed.

For further information on TDR, feel free to contact me at: [Harold\\_Ward@brown.edu](mailto:Harold_Ward@brown.edu).

Harold R. Ward



## Spring and Summer Events

**May 1** Earth Day River and Access Clean-Up *Saturday 10 am to 1 pm.* Call 401-539-9017 to volunteer.

**May 1** AMC Naturalist Wetlands Program *Saturday 10 am to 2 pm.*

**June 5, 12, 19, & 26** --- Wood River Source to Sea Canoe Trips Over 4 Saturdays in June you can paddle a different section of the Wood River from its source in Exeter, through the confluence with the Pawcatuck River, and then to mouth in Little Narragansett Bay. Put-in time is 9 am. \$10 per person; \$7 for WPWA, RICKA, or AMC members. **PRE-REGISTRATION IS REQUIRED.**

**June 19** RI Rivers Day Check newspapers for Rivers Day events all over South County.

**July 9** Family Fun Fishing Day *Friday 10 am-1 pm.* Kids learn to fish at a well stocked pond managed by RI DEM Aquatic Education Program. Fishing poles are available or bring your own. \$5 per person covers bait and hotdog picnic. **PRE-REGISTRATION IS REQUIRED.**

**July 16** Fly-tying Workshop *Friday 5-7 pm.* Youths and adults can learn to tie their own flies from experienced flyfishermen from Trout Unlimited. \$5 for snacks and materials. **PRE-REGISTRATION IS REQUIRED.**

**July 23** Fly-fishing the Wood River *Friday 5 to 7 pm.* Learn to flip that fly just right and get other tips from flyfishing enthusiasts from Trout Unlimited. \$5 per person. **PRE-REGISTRATION IS REQUIRED.**

**July 30** Family Fun Fishing Day *Friday 10 am-1 pm.* Kids learn to fish at a well stocked pond managed by RI DEM Aquatic Education Program. Fishing poles are available or bring your own. \$5 per person covers bait and a hotdog lunch. **PRE-REGISTRATION IS REQUIRED.**

**Members Thanked for Gifts and Memberships**

Since January, several members have joined or renewed, and additional Annual Appeal gifts have been received. We sincerely appreciate the generosity of all who support us throughout the year.

**Memberships:**

- Joellen Anderson
- Peter and Sandra Arnold
- Ted and Jo-Ann Bates
- Marc A. Chartier
- Joel B. Dirlam
- Robert and Sara Enos
- John D. Glasheen
- Stephen and Jean Grillo
- Ted and Wendy Hackman
- Mabel Hempstead
- Glann S. Jackson
- Brother Kevin Kiernan
- Peter Klenk
- Diana Kushner
- Locustville Pond Association
- Joseph and Teresa Mellor
- Wane B. Mollohan
- Christopher Morren
- Robert O'Neill, Jr.
- Gus Pagel
- Molly Palmer and Dan Shea
- Anne M. Preuss
- Richard B. Quinn
- Keith and Amy Richards
- George J. Sadue
- Eric and Catherine Taylor
- Robert and Patricia Thompson
- William and Heidi Wright

**Annual Appeal Donors:**

**Leadership Giving** (\$1000 and up)

Country Cape Antiques Shows

**Major Donor** (\$500 to 999)

Eric and Christina Bibler

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

- Joanne D'Alcom
- Joel B. Dirlam
- Kurt and Mary Lenzen
- Pfizer Foundation
- William J. Riggs, III
- Thomas P. Sculco

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

- John Drew
- Robert B. Hertling, Jr.
- Brother Kevin Kiernan
- Rob and Peggy Leeson
- Robert O'Neill, Jr.
- John R. Payne, Jr.
- Stonington Garden Club

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

- Daniel and Maureen Abarr
- William F. MacLean
- Marilyn Malina
- David and Elizabeth McNab
- H.A. Nomer
- Ralph P. Perri, Jr.

\* \* \* \* \*

**Voluntown Peace Farm**

An effort to preserve the 57 acre Voluntown Peace Farm property in Voluntown, CT has taken shape.

The newly formed Voluntown Peace Trust, a 501c-3 non profit organization, will purchase all 57 acres in June of this year. More than \$100,000 has been raised for the initial down payment, with an additional \$200,000 needed by May 22. After purchasing the property, the Voluntown Peace Trust will share supervision of the farm's activities with the North-eastern Cooperative for Nonviolence, currently being formed. If successful, the Peace Trust intends to use the property as a confer-

ence center, summer camp for inner-city youth, and farming site.

The Voluntown Peace Trust hopes to assist in the preservation of the historic & natural character of the Quinebaug-Shetucket corridor, also called the "Last Green Valley" by saving this land from development. The history of the land is unique. The Voluntown Peace Farm resulted from a Society of Friends' ad hoc committee on Non-Violent Action Against Nuclear Weapons which was organized in 1957 by Quaker pacifist Lawrence Scott to protest against nuclear tests in Las Vegas, Nevada. In September 1958, it re-organized as the permanent Committee for Nonviolent Action. Prominent among its regional offices was the New England chapter located in Voluntown, CT under the leadership of Marjorie and Robert Swann.

Although the national Committee for Nonviolent Action merged with the War Resisters League in 1967, the Voluntown Peace Farm continued as the New England Committee for Nonviolent Action for years more, eventually evolving into the Community for Non-violent Action whose records terminate in 1973. The Farm's emphasis in the 1970s was increasingly more focused on alternative community centered economics, land use issues, land trusts, and the "Land for the Landless" movement.

All donations are welcome and can be sent to Anne Scheibner at St Francis House, Box 2185, New London 06320. For further information call Anne Scheibner at: (860) 437-8890 or e-mail apscorp@aol.com.

## Brook Trout

*Cont'd from Page 1*

water conditions. The temperature of the water at spawning time is about 40 to 50 degrees Fahrenheit. Males are more precocious than females. That is, they reach sexual maturity at an earlier age, sometimes in their first year of life for the smaller form. Males also precede females to the breeding grounds, which consist of relatively fast flowing water with a gravelly substrate. However, it is the female fish which creates a depression in the gravel by fanning movements of the tail region. This depression is termed a "redd" and it is utilized for egg deposition. Ova (eggs) are discharged into the redd by the female, accompanied by one male which discharges sperm at the same time. The fertilized eggs are then carefully covered with gravel and they develop into embryos in the interstices of the gravel. These developing eggs are extremely vulnerable to fine sediment deposition, because resulting reduced oxygen flow induces high egg mortality and escapement of developed embryos through coarse sediment interstices is inhibited. A rough rule of thumb is that the eggs take 50 days at 50 degrees F to develop into newly hatched larvae that have a yolk sac.

Each degree of lower temperature increases hatching

time by about one day per degree. For each degree of temperature increase, hatching time decreases by about one day when they emerge from the redd. However, 53 degrees F is about the maximum tolerable hatching temperature for this species.

Our habitat study indicated that sampled stream reaches with a preponderance of fine sediments negatively influenced brook trout abundance. However, our study in the Wood-Pawcatuck Watershed demonstrated that the most significant negative influence on brook trout relative abundance was the proximity to dams. Dams not only impede movement of the fish, but also prevent excursions to and from an estuary, thus preventing development of a salter brook trout fishery in much of our watershed area. Additionally dams also raise summer water temperature by several degrees over that found in the free-flowing streams above the impoundment. This impounded warm water provides a habitat for several so-called warm water fish, such as largemouth bass, bluegills and brown bullheads. These fish not only tolerate warmer temperature but they also provide severe competition for food and space with the trout, which are already physiologically depressed by the warmer water.

A second data set consisting of sites from southeastern Connecti-

cut sampled by the CT Department of Environmental Protection was also analyzed to examine the relationship between habitat variables and a relative abundance of brook trout. In this case proximity to dams was not reported. However, this more extensive survey included more habitat variables. Results of a similar analysis indicated that stream width, depth and alkalinity were important variables affecting brook trout relative abundance. From this study we conclude that it may be feasible to buffer certain streams in order to stabilize pH values and to improve the growth rate and survival of this species. This would involve adding calcium carbonate (limestone) to improve the acid combining capacity of some poorly buffered streams.

In summary, we believe the brook trout in our watershed area are seriously limited in movement due to dams. As a result they are restricted to small forms found only in low order streams. We also believe it is possible to improve growth and survival of this species by increasing the acid combining capacity of the water and the stream substrate. This can be done relatively easily, and safely, by adding palletized limestone into the stream sediment in riffle areas. This will increase the buffering capacity of the water, and also the pH, making conditions more favorable for growth. The limestone is a non-toxic, innocuous substance in the stream, so the danger of overdoing is minimal.

**WPWA CANOE AND HIKING GUIDES**

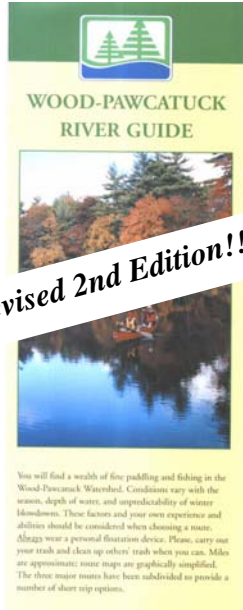
Order Form

**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.

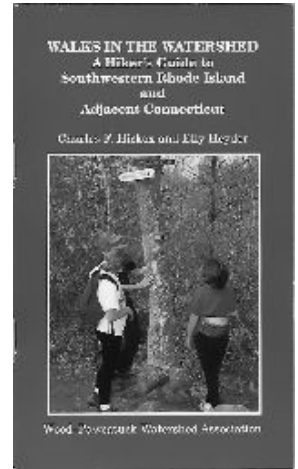


**Walks in the Watershed**

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

**Recent Grants Announced**

**Community Foundation of Southeastern CT**

\$12,000

This award is for a multi-year assessment of habitat and water quality condition in the Shunock River system at Parke Pond, above and below the dam.

**John Wald Science Grant**

\$3,000

This award will fund a study of the effects of small dams on habitat quality in low order streams in the watershed.

**Rhode Island Rivers Council**

\$6,000

Made possible by a legislative appropriation to the RI Rivers Council, this award will support a strategic membership development program for WPWA in 2004.

**WPWA thanks David Baldwin**

WPWA is very grateful to member David Baldwin for donating his time, and materials, to complete the roof on our main office building, a finishing touch on our recently-completed conference center construction. David and his children have been frequent visitors to our facility over the years, coming by to fish on opening day, and throughout the season. His time and skill has saved the association a significant expense with this donation of services, and again we extend our appreciation to Dave.

**Fishing season is OPEN!**

The official fishing season for licensed anglers started on Sat., April 10 in RI, and Sat., April 17 in CT. Happy fishing!

**Come visit our new campus!**

To all members and friends: our facility renovations are complete! After more than two years of construction, our headquarters on the Wood River at Barberville Dam has a beautiful new look, inside and out. All of us here at WPWA are very proud of the work that was the combined effort of numerous craftsmen and tradesmen.

Watch for news of an upcoming "ribbon cutting" ceremony here on site, and a photo spread in our next newsletter. We'll also be conducting programs here during the spring and summer that you may like to attend. Meantime, feel free to come by and visit anytime—we're anxious to show off!



**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.

**Board of Trustees**

- Harold Ward (Woodville), President
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**WPWA Staff**

- Lori Urso, Executive Director
- Denise Poyer, Program Director
- Melany Cheeseman, Program Assistant

**WPWA Campus**

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



Wood-Pawcatuck  
Watershed Association



A look inside WPWA's new conference facility at our Barberville campus.

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

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