Volume 2, Issue 4 Autumn 2009

Wild Rhode Island



this study, are probably the most

species in Narragansett Bay. Since

the beginning of the Juvenile Fin-

fish Survey in 1986, our under-

of these species has increased

substantially. Patterns of spatial

and temporal abundance, growth

rates, and habitat requirements

are better understood today than

they were in 1986. Associations

standing of the juvenile life stage

economically important finfish

A Quarterly Publication from the Division of Fish and Wildlife, RI Department of Environmental Management

Narragansett Bay Juvenile Finfish Survey by Jason McNamee & J. Christopher Powell

The year 2009 marked the 23rd year for the Narragansett Bay Juvenile Finfish survey. This survey is one of the major projects conducted annually by the Division of Fish and Wildlife, Marine Fisheries Section. The survey consists of sampling 18 stations around Narragansett Bay (see Figure 1) once a month, from June through October, with a 61m X 3.05m beach seine deployed from a boat. Individuals of all finfish species are quantified for length and number. Species of invertebrates are also identified



and estimated for abundance. Every effort is made to return all fish and invertebrates to the water alive.

Winter flounder, tautog, bluefish, scup, and members of the clupeid family (menhaden, river herring, sea herring), the target species for

with other species and correlations with water quality are emerging. Previous to this study information on juveniles of many recreational and commercially important species in Narragansett Bay was ex-

tremely limited. Data collected from each year's survey provides information on the relative abundance, temporal and spatial distribution of each species in Narra-

Continued on page 2

	Species Spotlight: Brook Trout by Alan Libby		
Inside this issue:	The brook trout (Salvelinus fontinalis) is one of Rhode Is- land's most colorful		
Foxes in Rhode 3 Island	freshwater fishes. It is characterized by light spots and wavy, sinu- ous markings (vermiculations) on a dark olive body. Red spots surrounded by blue halos are also found alor The belly is orange or red and edges of the lower fins are bri and backed by a black stripe. leading edges are readily appa viewed from above the water's Young brook trout, in addition		
A Delight of 6 Words			The brook trout is an endemic species that was originally found in northeastern North Amer- ica from Newfoundland, west to Ontario and the Hudson Bay and Great Lakes drainages, south, through the Appalachian Mountains as far as Georgia. In the southern Appalachians, they are confined to the cooler mountain streams. Brook trout have now been widely introduced elsewhere in North America and in many other parts of the world sometimes to the detriment of local spe- cies.
Kids Corner 7		stripe. The white ly apparent when water's surface. Idition to having dy and white lead- fins are also charac-	
Wild RI Calendar 8	light spots on a dark body ing edges on the lower fin terized by dark, vertical bl marks on their sides.		
			Continued on page 5

THE DIVISION OF FISH AND WILDLIFE MISSION STATEMENT:

Our mission is to ensure that the Freshwater, Marine and Wildlife resources of the State of Rhode Island will be conserved and managed for equitable and sustainable use.

Wild Rhode Island



W. Michael Sullivan, Ph.D. Director, Rhode Island Department of Environmental Management

Larry Mouradjian, Associate Director, Bureau of Natural Resources

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Narragansett Bay Juvenile Finfish Survey by Jason McNamee and J. Christopher Powell

gansett Bay during the survey period. Length-frequency data characterizes the juvenile population structure for each species and is used to estimate annual growth rates. Composition of the fish community structure at each station and bay-wide is also characterized. Data analyzed for each year is compared with that from previous years to identify annual variations and population trends. An example of the data collected for winter flounder is provided in

Figure 2. During the normal process of sampling, data on weather and tidal stage are also collected. Measurements of water temperature, salinity and dissolved oxygen are taken close to the bottom with a YSI 85.

The Narragansett Bay Seine survey represents the first comprehensive effort to gather data on juvenile finfish in Narragansett Bay and incorporates these data into species management plans. The data are kept in a large database at the Ft. Wetherill Marine Laboratory. In addition to their use by stock assessment biologists at the Division of Fish & Wildlife, these data are used by the Atlantic States Marine Fisheries Commission (ASMFC) in developing coastwide Fisheries Management Plans. The Juvenile Finfish Survey has also been identified as one of the monitoring studies incorporated into the Narragansett Bay Estuary Program's long term monitoring program. These data have also been used in developing dredging windows and sequencing for a variety of projects in Narragansett Bay. Juvenile finfish and their habitat data have been used for evaluating a myriad of coastal development proposals from outfalls to residential docks to large-scale marinas.

From a fisheries management perspective the importance of long term monitoring of juvenile finfish populations cannot be overemphasized. Juve-

nile abundance indices are valuable in developing and modifying species management plans. Changes in year class strengths can be monitored, changes in management strategy anticipated, and regulations can be promulgated in advance of a "crisis" situation. With the development of management plans for other species in progress or proposed, these kinds of data sets are becoming more important to fisheries managers and it is imperative that monitoring studies like this be continued.





Figure 2. Example of data collected. Annual abundance of winter flounder (CPUE = catch per unit of effort).



Volume 2, Issue 3

Species Spotlight: Foxes in Rhode Island by Charles Brown



Two fox species occur in Rhode Island, the red fox (*Vulpes vulpes*) and the gray fox (*Urocyon cinereoargenteus*). Both are similar in size and have comparable body characteristics: long legs, slender body, long snout, large ears, long fur, and a long, bushy tail. Adults of both species typically weigh between eight and fifteen pounds.

The red fox, as the name implies is reddish in color but can also be quite variable, particularly with the season. In spring and summer the orangey-red color of the fall and winter coat changes to a pale yellowish color following molting. Some red foxes are not red at all but may have melanistic (black) coat color or various mixes of gray, yellow, or white. These variations are referred to as "silver fox" or "cross fox" in the fur industry. Red foxes are characterized by a white tip on the tail. With the exception of an occasional coyote (which typically have a black tipped tail) they are the only North American canid with a white tipped tail.

The gray fox has reddish coloration on the neck, back of the ears, legs, and along their lower sides, but is predominantly a salt-and-pepper gray color. The throat and belly are white. Gray fox always have a black-tipped tail and have a black line running down the top of the tail.

Distribution

The red fox is the most widely distributed carnivore on the planet. It occurs throughout most of North America, Asia, Europe, parts of northern Africa, and following introduction by humans, now much of Australia. Its status as a native species in parts of the United States is complicated by the fact that during the colonial times and later, introductions or stocking programs were conducted with red foxes brought in from Europe. These introductions apparently occurred more commonly in the southeastern U.S., where red fox were either scarce or did not occur at that time and were done to supply animals for sport hunting with hounds. It is believed that the red fox was present in New England at the time of European settlement and likely ranged as far south as Pennsylvania. Red fox benefited not only from intentional introductions but also from clearing of forests for agriculture, as they prefer open or fragmented landscapes. Red foxes are widely

distributed throughout Rhode Island with the exception of Block Island and some of the smaller islands of Narragansett Bay.

The gray fox has a more southerly distribution pattern currently occurring throughout much of the eastern U.S. from southern Canada into Central America and the northern part of South America. Grav fox are more often associated with forested habitats and in general, less likely to occur in the open agricultural landscapes preferred by the red fox. The distinction of habitat preference separating the two species is less distinct today than in the past, with both species utilizing human altered landscapes and often sharing the same habitats. As with the red fox, the historical status of the gray fox in Rhode Island and New England is not completely clear. In "A Game Survey of Rhode Island", dated 1941 and published by the Rhode Island Wildlife Federation, the author's note that the gray fox did not occur in Rhode Island prior to 1900. In "The Mammals of Rhode Island" (1968) authors John Cronan and Albert Brooks cite literature sources from the 1600s that mention both red and gray fox in New England. Cronan and Brooks state that



gray fox did not occur on Aquidneck Island at the time of their publication and that it did not occur on Conanicut Island prior to the construction of the Jamestown Bridge in 1939. Today the gray fox like the red is widely distributed in the state but less common on Aquidneck or Conanicut Islands and does not occur on Block Island, Prudence Island or the smaller islands of Narragansett Bay.

Diet

Both species eat a wide variety of food items, taking advantage of what is most readily available. They prey on small mammals including rabbits, squirrels, and mice, birds, reptiles and amphibians, and insects such as grasshoppers and beetles. They also eat wild and cultivated fruits and berries such as apples, grapes, and blueberries and will scavenge carrion (dead animals), trash, and pet food.

Foxes in Rhode Island by Charles Brown



Reproduction and Life History

Mating season for both species takes place in late winter and pups of both species are born in March or April. A mated pair of adult foxes will establish a territory and defend it from intrusion by other foxes. Female red foxes often seek out abandoned woodchuck burrows for their den sites. These may often be located under sheds elevated on blocks or at the edge of residential backyards. Gray foxes will also use abandoned burrows but also use hollow logs and trees, brush piles and less frequently denning in close proximity to people. Once the denning season is over, den sites are abandoned. Male foxes of both species participate in raising the young and will bring food for the female following the birth of the pups. At about five or six weeks of age the pups will begin to explore the area around the den. By eight weeks the pups are weaned. During the weaning period both adults forage continuously to provision the growing pups. Once weaned the pups will learn to forage on their own and will gradually receive less food from their parents. By late summer the young are self sufficient and begin to disperse from their parent's territory.

Starting in the breeding season, foxes of both species use vocalizations to communicate various messages to their mates, rivals, and young. These barks, shrieks, whines, and yells have been variously described by callers to the Fish and Wildlife offices as "an animal being killed" or "a woman screaming" amongst other things and are often incorrectly attributed to fishers or other animals.

Management

Both fox species are currently classified as furbearers under Rhode Island general law. Since the ban on the use of foothold traps was implemented by the General Assembly in 1978, the harvest of foxes by trappers has diminished to nearly zero. Today's harvest consists of salvaged road-kills and the few foxes that can be coaxed into a cage trap. In some years prior to the ban, when pelt prices were high, the combined harvest of both species exceeded 800 animals annually. Misconceptions about traps and trapping and a general lack of understanding about the benefits of regulated trapping make it difficult to change existing laws.

Fox are one of several furbearers in Rhode Island for which there is an open hunting season. For 2009-2010 the season opens October 17, 2009 and runs through February 28, 2010, with the exception of closures during the shotgun deer season (see abstract for details). Foxes are typically lured into the hunter's range using electronic or mouth operated calls which mimic the distress sounds of prey animals such as rabbits.

Prior to the arrival of the coyote, no wild animal likely received as much negative response from farmers, sportsmen, and wildlife managers alike. A predator of poultry and perceived by many as responsible for the decline in game species such as grouse, quail, pheasant, and rabbits, officials took steps to reduce the num-

ber of foxes in the state. In 1893, the Rhode Island state legislature adopted a bounty system for foxes as a means to reduce their numbers. The state paid \$3.00 for each fox carcass presented. This bounty system remained in place until 1933 when it was repealed by the legislature. Seven years later the bounty system was reinstated and remained in effect until 1969 when it was repealed again. During the 1940s an average of 1000 foxes were submitted annually and in some years exceeding the budget allocated for bounty payments. During the 1960s the average number submitted per year was slightly more than 300.

Today, bounties are no longer considered an effective wildlife management tool. Although they do eat rabbits and other game species, foxes and other predators also provide benefits to people in the amounts of rodents and other nuisance species they consume and as a game species sought after by trappers and hunters.



CALLING ALL TEACHERS!!

The 2009-2010 school year has begun but before settling into the traditional school routine, check out some of our Aquatic Resource Education (ARE) programs for school-aged children. We offer a variety of field trips including *Marine Ecology* at the Jerusalem Coastal Lab and Rose Island, *Freshwater Fishing* at the Carolina Trout Hatchery and in-school programming such as the very popular Salmon in the Classroom. Some of our new classroom programs include *Elementary Horseshoe Crab Rearing* and the *Pre-school Traveling Tidepool*! For a more detailed description of school programs offered by the ARE program visit us on the web at www.dem.ri.gov. Click on Offices and Divisions, Fish and Wildlife then Freshwater Fisheries for more information.

Brook Trout by Alan Libby

Brook trout prefer cool, clear, well oxygenated water that is less than 20 degrees Celsius (°C), but can tolerate temperatures greater than 22°C for short periods of time and will actively seek out thermal refuges elsewhere as summer water temperatures increase. This native coldwater species was the sixth most widely distributed species collected during a statewide survey of the state's streams and ponds, occurring in more than a third of the locations samincubate within the gravelly substrate for 50 to 100 days, depending, among other things, on temperature, pH, and adequate water flows. Upon hatching, the yolk sac fry remain in the gravel until the yolk is absorbed before they become free swimming.

Growth varies greatly throughout their range depending on conditions. Brook trout have the tendency to overpopulate small streams, resulting in large numbers of small fish. Based



on surveys in the Falls River, Exeter, there are few twoyear and older brook trout in RI's streams. Two year old fish averaged approximately 8 inches in length. Brook trout stocked in RI are typically greater than 10 inches or more in length. The largest brook trout caught in RI was a specimen 21 inches in length and weighing more than three pounds. Larger brook trout, weighing more than 14 pounds, have been caught in Canada.

Historically, brook trout were once

pled (Figure 1). Data collected during this survey were used to develop a map of the cold water fisheries of the state (Figure 2). This information was included in the state's water quality regulations to offer extra protection for these cold water streams.

Anadromous populations of brook trout (i.e., fish that live in saltwater but spawn in fresh water) occur in the more northerly latitudes of North America. Sea-run brook trout or "salters," as they are sometimes known, are found from southern Massachusetts, north to the Hudson Bay region of Canada. Salters having recently migrated into freshwater, do not have the same vivid appearance as resident brook trout. These fish have an overall silvery appearance, but that is lost 10 to 14 days after entering fresh water.

Naturally reproducing populations are found in many of the state's coldwater streams. Brook trout spawn in fall. When water temperatures are suitable, they move into gravelly headwater streams. When conditions are right they may also spawn over gravelly areas in lakes where there is an upwelling of water. A nest called a redd is created by the female by fanning away any silt or debris from the selected area with its caudal fin. When spawning has been completed the eggs are covered by gravel that has been fanned from an area immediately upstream of the redd. The eggs more prevalent throughout their native range. The unregulated manipulation of forests and streams, however, has contributed to their decline. The need for timber and land for agriculture stripped local forests of their protective cover. These practices have led to the degradation of the aquatic environment with silt, pollutants, and increased water temperatures. Rivers and streams have also been altered to provide water for drinking, agriculture, and power for industry. Dams and poorly designed culverts that were placed at many road crossings have fragmented riverine habitat preventing brook trout form returning to their natal streams to spawn. Also contributing to their decline has been the introduction of non-native species into areas where they did not normally exist.

Brook trout are carnivorous, feeding on a wide variety of organisms such as aquatic and terrestrial insects, crustaceans, mollusks, and fish, including the young of their own species and at sea they also feed on crustaceans and fish they encounter. Brook trout are a highly esteemed game fish that will readily take live bait or an angler's fly or other type of artificial lure.

Crossword Answer key: ACROSS: 1. salmonid, 4. spawn, 5. trout, 7. raceway, 8. cold, 11. river, 12. fry, 13. gills, 14. native, 17. wild. DOWN: 1. scales, 2. milt, 3. hatcheries, 4. streams, 6. redd, 9. oxygen, 10. gravel, 15. tails, 16. eggs.

A Delight of Words

Many have probably heard phrases like a pride of lions, a herd of elephants, a gaggle of geese and a swarm of bees. These phrases incorporate aspects of the behavior or appearance of particular animals.

In the 1400s and 1500s these and many other phrases describing groups of animals and objects were widely used. During that time the English language was undergoing a grand expansion. Many of these phrases were originally published in *The Egerton Manuscript* (1450) and *The Book of St. Albans* (1486). James Lipton researched and complied these lists and other in *An Exaltation of Larks*, first in 1968, with an updated version in 1991. The book has groupings of many other things besides animals including musicians, politicians, scientists and sportsmen, for instance, a family of biologists, a drift of fishermen, a number of statisticians, a colony of bacteriologists, a plague of epidemiologists, a stalk of foresters and a blast of hunters.

The following is a list of animal-related phrases used in everyday speech.



Excerpted from: *An Exaltation of Larks: The Ultimate Edition*, by James Lipton. Published in 1968, 1977 and again in 1991 by Penguin Group, USA.

Page 6

Kids Corner! Presented by the Aquatic Resource Education Program

BROOK TROUT

Brook Trout, Rhode Island's only native trout species, spawn, or lay their eggs in the fall. Brook trout are members of the Salmonid family of fish and thrive in our cold water streams and rivers. Brook trout create nests, or redds, in the sand and gravel of shallow streambeds. The female fans its tail over the redd site and then deposits up to 100,000 eggs. The males fertilize the eggs with milt. Once fertilized, the eggs develop and hatch to become fry. Fry are baby fish that have a yolk sac. Once the yolk sac is absorbed, the fry are ready to eat bugs that live in the bottom of the stream. In the wild, brook trout normally reach about 7-12 inches in length.

To protect the native fish from being over fished and exploited, Rhode Island has hatcheries designed to raise trout for fishermen and women. By raising the trout in the hatchery, the fish are protected from being eaten by predators such as otter, birds and other fish. The eggs are raised in an incubator system and then transferred to raceways where they are grown them a size of 1 lb. These fish are then stocked in rivers, ponds, and streams throughout Rhode Island for all to enjoy.

CROSSWORD CLUES

ACROSS

 Brook Trout belong to the _____ family of fish.

4. Brook trout _____ in the fall, which means they lay and fertilize their eggs.

5. Brook _____ are beautifully colored fish.

7. Trout raised in a hatchery are kept in a cement holding area called a _____.

8. Trout live in the Northern regions of the world because they like _____ water.



11. Trout can be found in a where there is a constant flow of cold water.

12. Trout just hatched from eggs are referred to as _____.

13. All fish have_____ which allow them to breathe under water.

14. Brook trout are the only _____ species of trout in Rhode Island; rainbow and brown trout come from other areas of the world.

17. A term which refers to a trout that is not hatched and raised in a hatchery is referred to as a _____ trout.

DOWN

1. Outside covering of fish is referred to as _____.

2. Males release _____ which fertilizes the eggs.

3. In Rhode Island there are four _____ that raise trout.

4. Rhode Island has a number of shallow _____ which are ideal waterways for brook trout.

6. In the wild, trout make a nest, to deposit their eggs, called a _____.

9. Like humans, trout need to have a lot of _____ in the water to breathe.

10. Trout prefer to build their nests in sand and _____ areas in the streambed.

15. Trout use their _____ to fan the sand and make their redd.

16. Female trout lay _____ in the nest that are later fertilized by the male.

Brook Trout Crossword

Calendar October–December 2009

Introduction to Saltwater Flyfishing. Saturday, October 17, 2009 9am-3pm.



Introduction to Saltwater Flyfishing is a one-day workshop highlighting the basics of flyfishing including equipment needed, fly tying, fly casting, and fishing at the Charles-

town Breachway. Registration re-

For information, contact Kimberly Sullivan at



kimberly.sullivan@dem.ri.gov or (401) 789-0281.

Opening Dates for the 2009-2010 Rhode Island hunting season.

Don't forget your fluorescent orange!

Check the abstract for dates.

The following is a selection of Opening Dates for the 2009-2010 Rhode Island hunting season. For more information regarding these or additional hunting dates please see the 2009-2010 Hunting and Trapping Abstract and the Waterfowl Hunting Season Guide 2009-2010. They may be found on DEM's website at:www.dem.ri.gov/ pubs/regs/regs/fishwild/hunt0910.pdf

September 1-30 Early Resident Canada Goose season (special permit required).

September 19–October 3 Mourning Dove season.

October 1 Opening of Archery Deer

season.

October 9–12 Season for Ducks and Coots begins.

October 10 Sea Duck season begins. October 10-11 Junior Hunter Pheasant season.

October 17 Opening of Small Game season (pheasant, squirrel, rabbit).

October 30 Prudence & Patience Island Deer season begins.

November 1 Woodcock season begins. November 4 Opening of Muzzleloader

Deer season.

- November 21 Opening of Regular Canada Goose season.
- December 5 Shotgun Deer season begins.
- December 6 Opening of Brant season.

This program receives Federal financial assistance in Sport Fish and/or Wildlife Restoration. Under Title VI of the 1964 Civil Rights Act, Section 504 of the Rehabilitation Act of 1973, Title II of the Americans with Disabilities Act of 1990, the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972. The U.S. Department of the Interior prohibits discrimination of the basis of race, color, national origin, age, sex or disability. If you believe that you have been discriminated against in any program, activity, or facility as described above or if you desire further information please write to: The Office for Human Resources, U. S. Fish and Wildlife Service, 4040 N. Fairfax Drive, Room 300, Arlington, VA. 22203



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