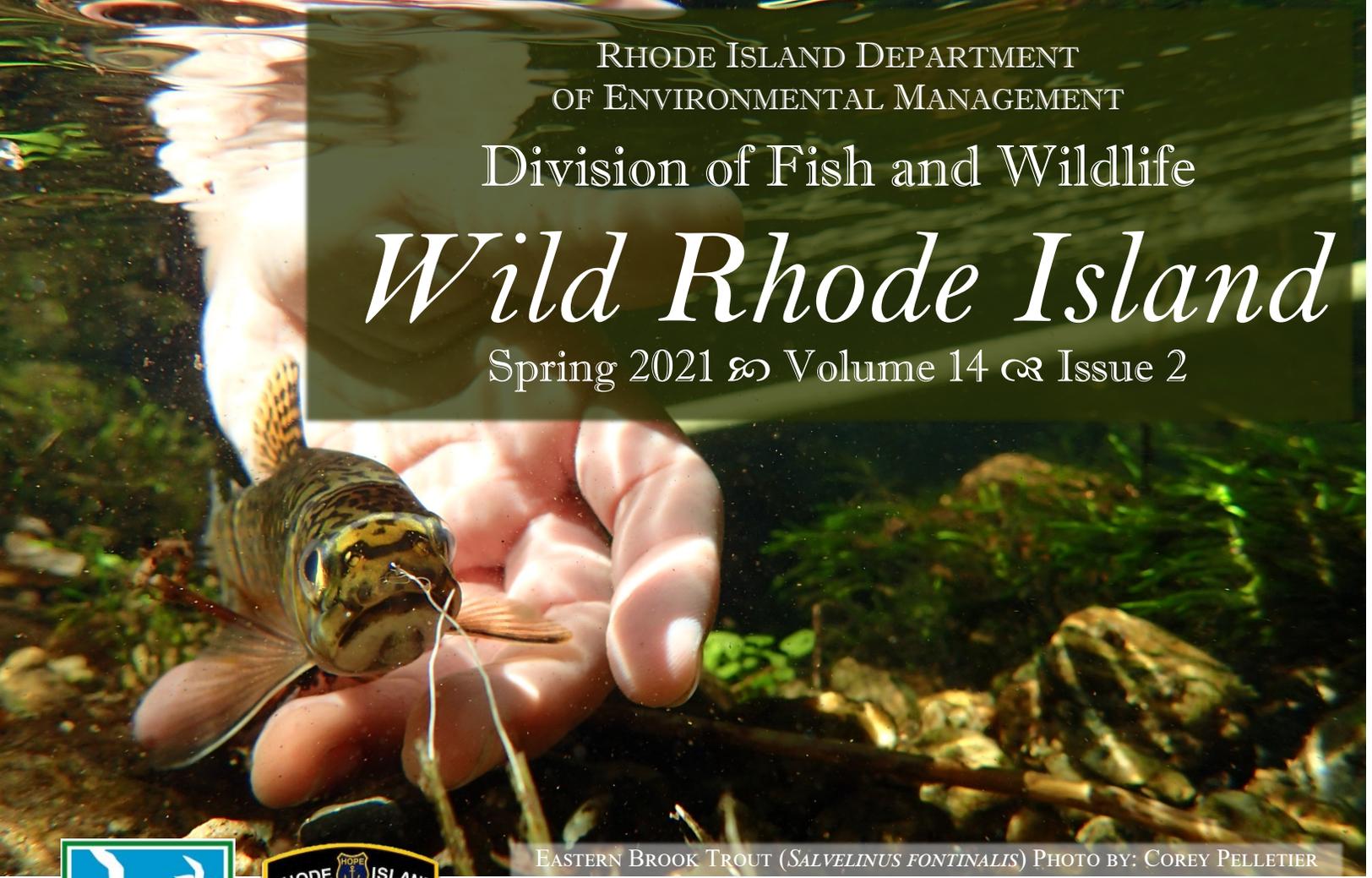


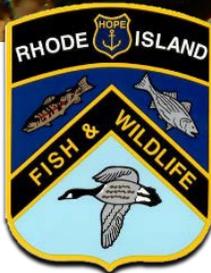
Division of Fish and Wildlife

# Wild Rhode Island

Spring 2021 ∞ Volume 14 ∞ Issue 2



EASTERN BROOK TROUT (*SALVELINUS FONTINALIS*) PHOTO BY: COREY PELLETIER



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## Species Spotlight: Eastern Brook Trout (*Salvelinus fontinalis*)

By Lindsay Dalton, Seasonal Fisheries Biotechnician, DFW

### IDENTIFICATION

The brook trout (*Salvelinus fontinalis*) is one of Rhode Island's most colorful freshwater fishes. Sometimes referred to as brook char, they can be identified from above by their dark olive body with brown or green worm-like marks known as vermiculations. These marks get lighter on the sides of the trout, where bright red spots surrounded by a blue halo may also appear. The belly is orange or red, and during the fall spawning season this color intensifies in males. The lower fins are red with a strip of black and white along the top edge. The white leading edges of the fins are readily apparent when viewed from above. Young brook trout, also called parr, are characterized by dark vertical blotches on their sides, which fade as they grow.

Fig 3: A sea-run brook trout caught by RIDEM researchers. Photo credit: Alan Libby

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# THE DIVISION OF FISH AND WILDLIFE MISSION STATEMENT

*Our mission is to ensure that the freshwater, wildlife, and marine resources of the state of Rhode Island will be conserved and managed for equitable and sustainable use.*



Photo courtesy of Mike Stultz



*Wild Rhode Island is a quarterly publication created by the Rhode Island Department of Environmental Management, Division of Fish and Wildlife. Printing is supported by the Aquatic Resource Education Program and the Hunter Safety Education Program.*

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WE ARE EXCITED TO ANNOUNCE THAT THIS HIGHLY ANTICIPATED PUBLICATION IS NOW AVAILABLE FOR PURCHASE.

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# MANDROS PROPERTY, TIVERTON, R.I.

## FEATURED STATE LAND: DIVISION OF FISH & WILDLIFE

BY: VERONICA MASSON, FEDERAL AID COORDINATOR, DFW

The Mandros property is located in Tiverton, in the East Bay section of Rhode Island, abutting DEM's 120-acre Tiverton Rod & Gun Club property. The East Bay has few opportunities for public recreation and hunting. The Tiverton Rod & Gun club acquisition in 2012 helped to alleviate this problem, and this new acquisition will more than double the size of the publicly accessible property.

The property consists of forest land with a stream, a wetland complex, and several stone walls.

The forest graduates through three forest types - from a younger black and red oak canopy with a huckleberry, princess pine, and bracken fern understory, to a red maple canopy with a spicebush understory, and then to a more mature white oak, holly and hemlock canopy with a thick understory of mountain laurel. A small seasonal stream flows along the eastern boundary of the parcel from north to south. The wetlands on the property are part of the larger "Great Swamp", which, at 400 acres, is one of the two largest remaining forested swamps in eastern Rhode Island. This forested wetland lies adjacent to an unfragmented block of wetland and forest habitat that is approximately 2,000 acres, and itself a focus of great conservation interest. Tiverton Great Swamp constitutes the largest natural aquifer in this portion of Rhode Island and it supplies a significant proportion of the freshwater flows to the West Branch of the Westport River, a critical habitat for waterfowl, shorebirds, and migratory birds.

The dominant tree species of this wetland is red maple - along with a diversity of associates including ash, American holly, yellow birch, black gum, and hemlock. Beneath this canopy, there is a well-developed shrub layer which is an important feature for many bird species that rely on or heavily use forested wetlands, including wood thrush and the worm-eating warbler.

Common mammalian game species that inhabit or have the potential to inhabit the area include white-tailed deer (*Odocoileus virginianus*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), gray squirrel (*Sciurus carolinensis*), raccoon (*Procyon lotor*), skunk (*Mephitis mephitis*), opossum (*Didelphis virginiana*), and mink (*Mustela vison*). Tiverton Great Swamp provides nesting habitat for wood duck and supports a diversity of neotropical migrants and other land birds.

The acquisition of this property will provide the public new wildlife-oriented recreational opportunities in the East Bay. The property will be incorporated into DEM, Division of Fish and Wildlife's management area system. Specific management actions that may be undertaken could include trail maintenance to facilitate recreational use by sportsmen and the general public, and habitat management as needed for wildlife.

Mandros, Tiverton



RI DEM DIVISION OF FISH AND WILDLIFE

## HOW TO SANITIZE BOOTS, WADERS AND OTHER EQUIPMENT TO PROTECT WETLAND WILDLIFE

Rhode Island has an abundance of beautiful ponds, rivers and streams that provide a peaceful escape into nature. These wetlands are brimming with wildlife such as frogs, toads, turtles and fish. Exploring new areas is a great way to connect to nature, but it's imperative that we prevent the spread of disease while we are discovering new landscapes. Moving from one wetland to another requires the proper sanitation process to protect our native species.

*Photo: Dean Birch*

### How are these diseases spread?

Bacterial, viral and fungal pathogens can cause disease in wetland wildlife. These pathogens can be spread when boots or other equipment come into direct contact with the water or soil and are then brought to another wetland. Walking or paddling through an infected area has the potential to spread the disease to an uninfected area.

### What equipment should be sanitized?

Boots, waders, kayaks, canoes, paddles, nets, buckets, and any other item that has come into contact with the water.

### When should I sanitize?

Sanitize after each visit to a wetland (pond, stream, swamp etc.) and before moving from one wetland to another that is out of short walking distance.

### What will I need?

- A Bucket of Soapy Water
- A Scrub Brush
- 3% Bleach Solution\* in a Spray Bottle [1:32 dilution (bleach:water)]
- A Hose or Gallon of Water

### What are the steps?

1. Remove all debris (mud, plants etc.) with hose and/or scrub brush
2. Wash with soapy water
3. Rinse with water
4. Spray thoroughly with diluted bleach including the bottoms of boots/waders\*\*
5. Wait 5 minutes
6. Rinse with water

*Thank you for helping conserve Rhode Island's wetland wildlife.*



\*Bleach solution only remains effective for 1 week

\*\*If sanitizing your equipment onsite, be sure you are at least 50 meters from any natural water source.

## DISEASES AFFECTING WETLAND WILDLIFE

**CHYTRIDIOMYCOSIS** is an infectious disease caused by the Chytrid Fungus (*Batrachochytrium dendrobatidis*) that has devastated amphibian populations world-wide. The Chytrid fungus causes thickening of the normally permeable skin, disrupting an amphibian's ability to absorb water and breathe. This disease has caused declines in over 500 frog and salamander species. This fungus does not affect humans.

**SYMPTOMS:** Amphibians infected with this fungus may be lethargic, swim in circles, sit with legs outstretched or bask in hot temperatures, when healthy amphibians are hiding. Mass die-offs caused by Chytrid fungus have been observed around the world.

For more information visit: <https://www.northeastwildlife.org/disease/chytridiomycosis>

**RANAVIRUS**, or Large Mouth Bass Virus, is an infectious disease affecting reptiles, amphibians and fish with a 90-100% mortality rate. There are several different kinds of Ranavirus that impact species at different levels. This disease is believed to be responsible for many recent massive mortality events around the world and unchecked could eliminate entire species.

**SYMPTOMS:** Amphibians infected with Ranavirus may display weak or erratic swimming, hemorrhaging in the skin, especially by the hind legs and vent, gaping for air and lethargy. Reptiles, specifically turtles, will display weakness, have swollen eyelids, ulcers on their feet, and discharge from the nose and mouth. Fish infected with Ranavirus may display hyper-buoyancy, spiral swimming and lethargy, which are attributed to damage to the swim bladder. *This disease cannot be transmitted to humans, but all freshwater fish should be thoroughly cooked before eating.*

For more information visit: <https://www.northeastwildlife.org/disease/ranavirus>

*Please report any suspected infections of Chytrid Fungus or Ranavirus, such as large numbers of dead amphibians or fish, to:*



RI DEM Fish & Wildlife (401) 789-0281

# SPECIES SPOTLIGHT: EASTERN BROOK TROUT (*SALVELINUS FONTINALIS*) CONTINUED FROM PG. 1

BY LINDSAY DALTON



Fig 1. Brook trout. Photo by Corey Pelletier

## HABITAT AND ECOLOGY

The brook trout is the only native trout species in Rhode Island. In addition to wild populations found in coldwater streams, RI Division of Fish & Wildlife (DFW) stocks hatchery fish in numerous ponds around the state. Brook trout prefer cool, clear, well oxygenated water that is less than 20°C (68°F) but can tolerate temperatures greater than 22°C (72°F) for short periods of time. 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. They are a highly esteemed game fish that will readily take live bait or an angler's fly or other type of artificial lure.

Brook trout 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 sampled. They can be found in northeastern North America 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 native species.

## LIFE HISTORY

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 fanning away any silt or debris from the selected area with its tail creating a depression in the streambed. Females deposit their eggs followed by fertilization by the male. When spawning has been completed, the female fans the sediment above the redd, covering her eggs for protection. The eggs incubate within the gravelly substrate for 50 to 100 days, depending on water temperature, pH, and flows, among other variables. After hatching, brook trout larvae are still attached to their yolk sac and they remain hidden in the redd until they have absorbed it completely. At that point they leave the nest as fry and are able to feed on their own.

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 as far south as Rhode Island, 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 (Libby, 2013).

## CONSERVATION EFFORTS

While they are not an endangered species, brook trout are considered a species of greatest conservation need in Rhode Island. Brook trout are known as an indicator species in coldwater streams and rivers. Their dependence on coldwater temperatures and adequate flow make them an indicator of a healthy, productive, coldwater ecosystem. However, these types of streams face numerous threats in the Ocean State today. DFW is acting by collecting data and preserving these habitats in our state in order to save existing brook trout populations and ensure they survive for generations to come.

Among the greatest threats to the brook trout are habitat fragmentation from development and rising stream temperatures. There are more than 600 dams in Rhode

Island's river and streams. Dams create obstacles that prevent fish from accessing important habitats and raise water temperatures by increasing the surface area exposed to sunlight. Reconnecting fragmented rivers and streams restores habitat and can lower water temperatures by allowing cold groundwater from the river's source to flow further downstream. Removing dams and installing fish ladders helps to restore connectivity. (RIDEM, 2015).

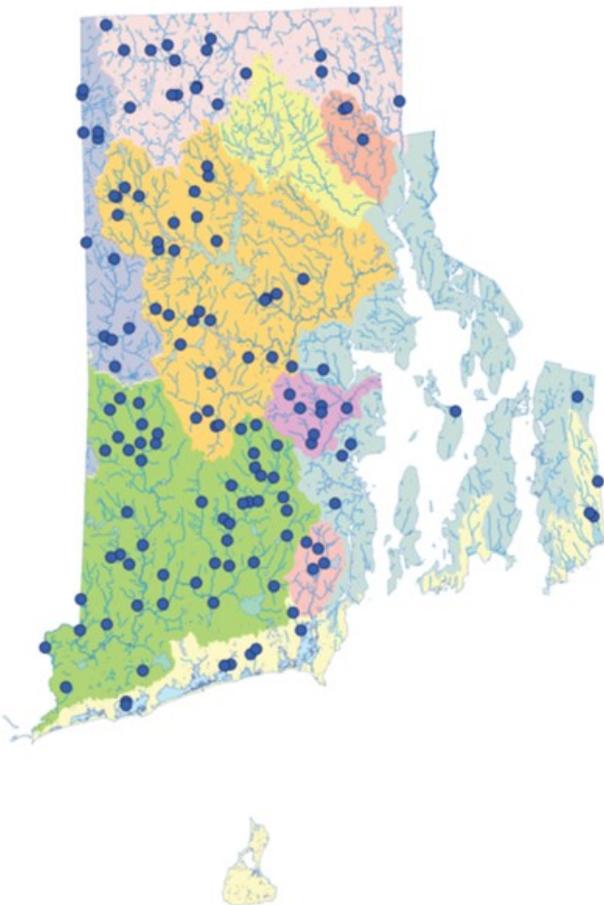
Road-stream crossings can also create an obstacle to fish passage. If a culvert is placed too high on the downstream side of the road, brook trout are unable to make the jump to swim upstream. If a culvert barrel is too narrow or too wide, the flow inside may be either too shallow or too turbulent for brook trout to pass through. Lastly, sediment and debris can build up around the upstream side of the culvert, preventing fish from entering and swimming downstream. Properly designed culverts must consider the unique conditions at each road crossing to ensure that fish can access the full

extent of their upstream habitat. (Bates, 2003)

Vegetation along a riverbank normally prevents soil from eroding and helps filter pollutants out of runoff, but it is sometimes cleared away in preparation for development or for agricultural uses. On an eroded riverbank, runoff from nearby roads can flow directly into streams, carrying sediment and pollutants that damage areas on the riverbed where brook trout would normally construct their redds. Erosion widens rivers which makes them shallower, and more susceptible to drought and rising air temperature (RIDEM, 2015).

Preventing or repairing erosion along riverbanks will help our rivers run deeper and cooler, providing a better habitat for coldwater fish like the brook trout (RIDEM, 2015). To that end, DFW has worked with Trout Unlimited since 2018 on the *Trees for Trout* program that was featured in our Winter 2021 issue. The program uses donated Christmas trees to create revetments along the banks of the Wood River and tributaries which will eventually fill in with sediment and replace the eroded riverbank.

Fig 2. Brook trout distribution in Rhode Island based on surveys conducted from 1993 to 2007 (A. Libby, 2013)



DFW monitors water temperatures during the summer to identify streams that are able to maintain cooler temperatures throughout the hottest parts of the year. This information is used to figure out which streams need protection, and where habitat restoration projects will have the biggest impact. The good news for brook trout is that they are the sixth most widely distributed fish species in the state. With that being said, populations sizes are limited as a result of high summertime water temperatures and a variety of human related impacts. Research is being conducted to identify isolated populations, physical barriers, and poor habitat quality. Improving habitat and connectivity in streams will be crucial for future survival of brook trout as temperatures rise due to climate change and development continues.

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# The Hitchhikers Guide to the Gulf Stream

By Katie Rodrigue, Principal Biologist, RIDEM Division of Marine Fisheries

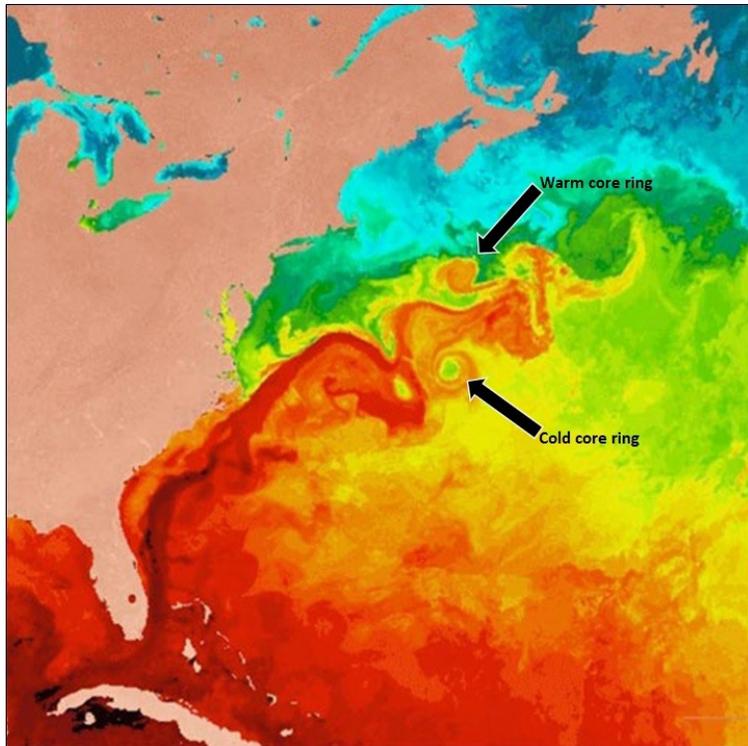


Figure 1: Satellite imagery of sea surface temperature. The red "ribbon" is the Gulf Stream current, carrying warm water from the Gulf of Mexico north. Photo credit: NASA.

Late summer in Rhode Island is an exciting time – warm weather, beautiful beaches, and a crisp New England autumn just around the corner. But did you know it also means a greater diversity of fishes in little Rhody's coastal waters? This is due in part to an influx of juvenile tropical fish that arrive in summer and stick around until the water cools in the fall. That's right – you can find a variety of fish typically found on a snorkeling excursion in the Caribbean, such as groupers and butterflyfish, right here in the northeast. But these visitors don't swim the 1,000+ mile journey to get here – they hitch a ride on the Gulf Stream.

To reproduce, many fish use a strategy called broadcast spawning. During spawning events, males and females release a large amount of eggs and sperm into the water column, in hopes that they will mix and some

of the eggs will become fertilized and develop into larvae. These larvae are then at the mercy of the ocean currents, drifting along as they develop and eventually settling in waters sometimes far from where they were spawned. The tropical travelers we see in Rhode Island are carried by the Gulf Stream current.

The Gulf Stream is one of the strongest ocean currents on Earth, moving warm water from the Gulf of Mexico and the Caribbean northeast along the coast of the US and Canada, and eventually towards Europe (Figure 1). Although there are some seasonal changes in the position of the Gulf Stream, it generally begins to flow away from the coast near Cape Hatteras, North Carolina. Here the current widens and meanders, causing wave-like patterns to emerge. These patterns can eventually form loops that pinch off from the Gulf stream, creating spinning rings of water called eddies. These eddies are important, as they allow water to be transported away from the Gulf Stream. There are two types of rings: warm core rings and cold core rings. Cold core rings form off southward bending meanders, allowing colder nutrient-rich water from north of the Gulf Stream to be moved south towards the Sargasso Sea. In contrast, warm core rings form off northward bending meanders between the Gulf Stream and the continental slope, bringing warmer water and any tropical fish larvae living in them towards the coast. Warm core rings move west and are usually reabsorbed back into the Gulf Stream as they are "pinched" between the main flow of the stream and the shallow depths of the continental shelf. Often, these rings come close enough to the shelf to deposit tropical hitchhikers into coastal currents. These unusual organisms are eventually transported inland to coastal waters such as Narragansett Bay and Rhode Island's coastal ponds.

The RI DEM Division of Marine Fisheries conducts a number of surveys to monitor fish and invertebrate

populations and distributions throughout the waters of Narragansett Bay, Block Island Sound, and the coastal ponds. In mid to late summer, tropical species are frequently caught on these surveys. The species encountered can vary widely from year to year, but several are common and make up the majority of the RI DMF trawl and seine surveys' tropical catches, including blue runner, crevalle jacks, Atlantic needlefish, inshore lizardfish, and permit. However, these monitoring surveys use nets and are not very effective at catching fish that hide in reef structures such as butterflyfish, groupers, short bigeyes, and triggerfish. By utilizing other approaches, such as fish traps or SCUBA, native and tropical reef dwelling fish can also be observed. Some other species encountered in recent years include grey snapper, spotfin butterflyfish, scamp grouper, and the flame box crab.

Most of the tropical species that ride the Gulf Stream to RI are juveniles, although adults of some species also make the summer trip. These organisms are able to live comfortably and grow in our waters during the summer and early fall when the water temperatures are at their highest, especially in shallow protected environments like the coastal ponds, which act as a nursery for many native and tropical species. However, tropical organisms are not adapted to our New England winters, and although some may migrate away, most do not survive when temperatures drop too low. This is why we do not see established populations of these species in RI. However, with a warming climate, we are seeing shifts in the species composition of RI waters away from demersal (fish that live near the sea floor) New England species such as winter flounder and hake, to warm-water pelagic species (fish that live in the water column) more characteristic of the mid-Atlantic, such as butterflyfish and scup (Collie et al. 2008). Additionally, there has been an increase in the number of tropical fish caught in the RI DMF monthly trawl survey over time, which may suggest that more tropical fish are being carried into our waters now than in the past.

So, when you're enjoying the beautiful marine ecosystems of Rhode Island next summer, keep an eye

Scamp grouper



Spotfin butterflyfish



Flame box crab



Short bigeye

Photo credit: Pat Barrett and Coly Ares, RI DMF



Blue runner



Inshore lizard fish



Permit fish



Needlefish



Photos: Anna Gerber-Williams, Coly Ares, and John Lake, RI DMF

out for these unusual tropical travelers. One great location to explore is our own Fort Wetherill State Park in Jamestown, where several types of tropical species can be spotted along the rocky shore or in eel grass beds. You never know what unique species you might find.

Collie, J.S., A.D. Wood, and H.P. Jeffries. 2008. Long-term shifts in the species composition of a coastal fish community. *Can. J. Fish. Aquat. Sci.* 65:1352-1365.

Found a mystery fish and need help identifying it? Take a picture and post it on the [RIDEM Facebook Page](#) or email the Division of Marine Fisheries

 <https://www.facebook.com/RhodeIslandDEM/>  
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For more information on the fascinating research and monitoring work conducted by the RI DEM Division of Marine Fisheries, [click here!](#)

 <http://www.dem.ri.gov/programs/marine-fisheries/>

Adult grey triggerfish caught in a survey using fish traps



Smooth butterfly ray



Photo credits: Rich Balouskus and Scott Olszewski, RIDMF

To read about the different surveys conducted by the Division of Marine Fisheries, [click here!](#)  
[www.dem.ri.gov/programs/marine-fisheries/surveys-pubs/index.php](http://www.dem.ri.gov/programs/marine-fisheries/surveys-pubs/index.php)

## Record-Breaking Rainbow Trout Caught in South Kingstown!

By Kimberly Sullivan, Aquatic Resource Education Coordinator



A partially ice-covered pond did not deter Joe Rogers from fishing his favorite fishing hole on December 30, 2020. Casting into the open spaces of Barber Pond in West Kingstown, he was pleasantly surprised when he got a hit and even more ecstatic as he started reeling in his catch. Once the fish was landed, Joe Rogers of North Kingstown was shocked as he held a catch of a lifetime, a monster rainbow trout. After the initial shock wore off, he packed up his catch and drove over to Quaker Lane Bait and Tackle in North Kingstown, one of the official weigh stations with the ability to certify state record fish. The rainbow trout weighed in at 12 lbs., 9.12oz and measured 29.75 inches. Joe's fish broke the long-standing rainbow trout record of 11 lbs. set in 1991 by Martin Wencek.

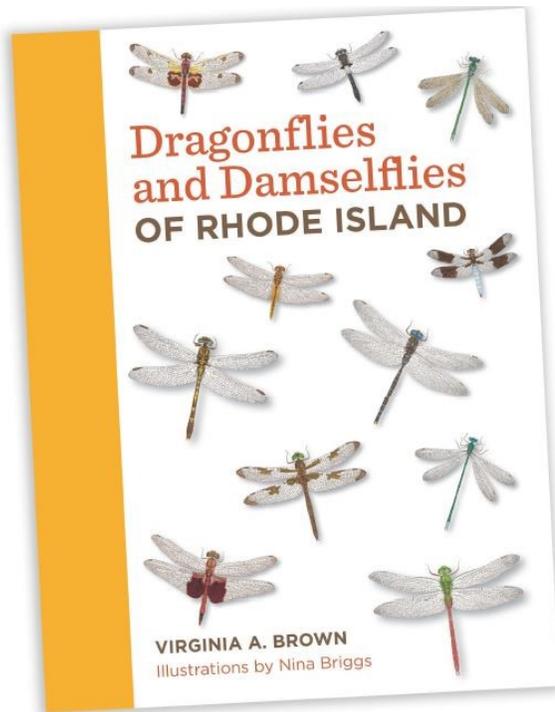
When asked where the fish originated, KC Fernstrom, the State Hatchery Manager, stated that the fish actually came from the Perryville Hatchery in South Kingstown and was one of several rainbow trout that had been held over for the past few years for the exact purpose of stocking larger fish for the public. "Every year we put out record trout so we are excited that someone caught one and brought it to a weigh station to weigh."

RIDEM Division would like to offer our congratulations to Joe for his phenomenal catch!

# *Dragonflies and Damselflies of Rhode Island*

By: Ginger Brown, Illustrated By: Nina Briggs

Available for Purchase



We are very excited to announce the arrival of the highly anticipated new publication *Dragonflies and Damselflies of Rhode Island*. a compilation of three decades of inventorying and monitoring of dragonflies and damselflies inhabiting the state. This is the first time these species have been comprehensively compiled and identified in a publication specific to Rhode Island. Written by Virginia A. Brown and illustrated by Nina Briggs, this new resource is suitable for experienced naturalists as well as beginners who love the outdoors.

The 384-page book includes the identification, range, distribution, abundance, habitat details, and conservation needs of all 138 species of dragonflies and damselflies in Rhode Island and original colorful illustrations of each species. The natural history of each species, along with flight season graphs and local distribution maps, are included. The book also contains personal notes about encounters with these fascinating insects.

The author, Virginia Brown, has over 30 years of experience as a professional biologist and has been a staff member at The Nature Conservancy of Rhode Island, Rhode Island Natural History Survey, and the Cape Cod Museum of Natural History. Over 70 volunteers and professionals also donated their time to make this publication possible.

The project was funded by the US Fish and Wildlife Service State Wildlife Grants Program.

Books may be purchased for \$25 including postage and handling. Accepted forms of payment are check or money order. Please allow up to 6 weeks for processing and delivery. To purchase your own copy, please contact [DEM.DFW@dem.ri.gov](mailto:DEM.DFW@dem.ri.gov) to receive an order form.

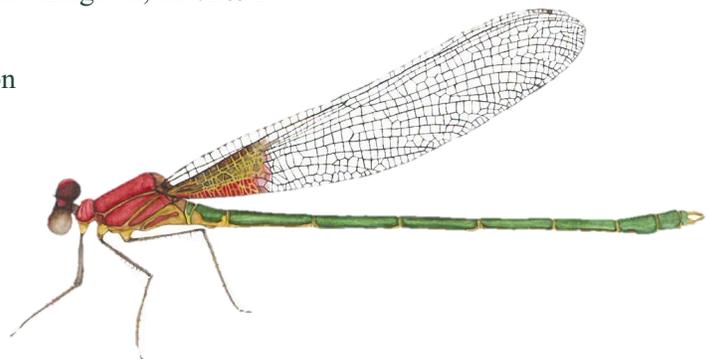
**Details:** Hardcover, color illustrations and maps, 384 pages

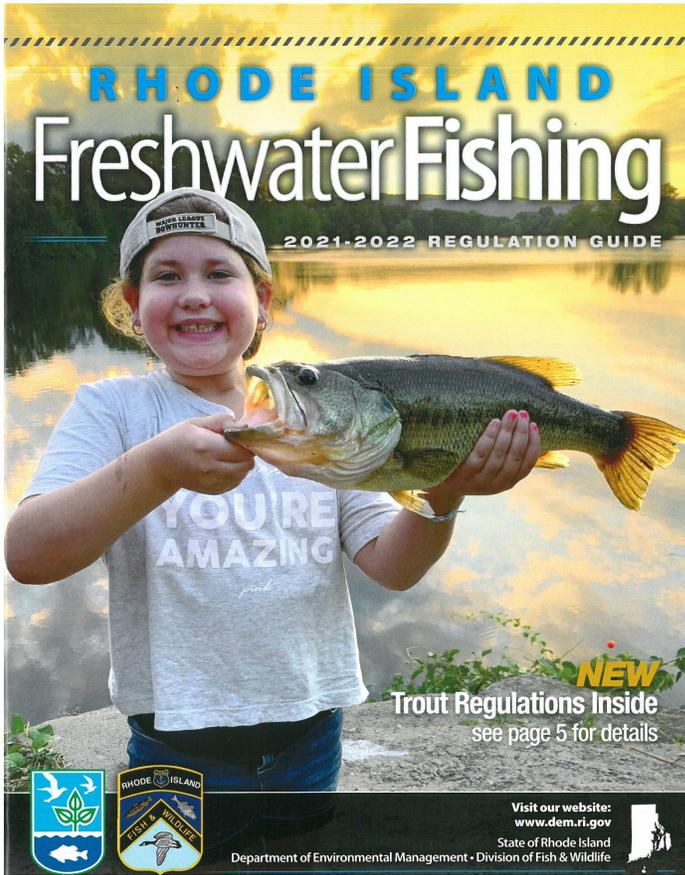
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 DIVISION OF FISH & WILDLIFE  
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