



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

## A Changing Climate Is Impacting Rhode Island's Fragile Ecosystems

By Alex Burrows and Tanner Steeves



Restoration work involving planting native seedlings to protect coastal and saltmarsh habitats. Photo courtesy of T. Steeves

The Ninigret section of Charlestown is well known to Rhode Islanders and visitors as one of the most beautiful natural heritage sites in the state. The forested trails, grassland, coastal pond and salt marshes host a wide variety of wildlife and marine species which make it a unique and beloved natural space. Unfortunately, the Ninigret salt marsh and salt marshes all along the East Coast are being threatened and degraded. Increases in global temperature are causing sea levels to rise at an accelerated rate, and as a result, Rhode Island's fragile yet essential habitats are disappearing. A loss of salt marsh habitat will have long term effects on Rhode Island's fisheries, wildlife, coasts and people.

Salt marshes are unique coastal habitats that develop along sheltered coastlines within intertidal zones and between terrestrial and aquatic habitat, and they are vital to both humans and wildlife. These unique ecosystems provide crucial habitat to multiple species of birds, fish, invertebrates, and many other organisms. Vegetation becomes established as sediment accumulates in inter-tidal areas. Over time, roots from the vegetation become entangled and form a thick mat, which helps to hold the marsh together and prevent erosion.

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## Forging A Connection: Impact of Dams on Ecosystems

By Corey Pelletier

On a daily basis, we drive our cars from place to place using a network of roads and highways. What we cannot often see from the vantage point of a vehicle is how the roads intersect with our waterways, such as streams, rivers, lakes and ponds. Bridges and culverts allow the water to flow beneath our man-made travel networks, but it is not without obstacles. Safe and efficient travel is important; not only for us but also for fish and other animals that live in our waterways. Just as we need to travel in our daily lives, fish need to travel to feed or spawn in different locations within the river system. These intersections between two worlds often create



Photo courtesy of C. Pelletier

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### 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.



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## Rhode Island Striped Bass Recipe

Rhode Island is well known for its great striped bass fishing all along the coast and even in some brackish rivers. Try out this delicious striped bass recipe this summer. Rhode Island saltwater fishing licenses are only \$7.00 for residents, \$10.00 for Non-residents, or just grab a 7-Day license for only \$5.00 while on vacation. You can get saltwater licenses at [www.saltwater.ri.gov](http://www.saltwater.ri.gov), or at certain bait and tackle shops. For more information email [DEM.MarineFisheries@dem.ri.gov](mailto:DEM.MarineFisheries@dem.ri.gov) or call 401-423-1923.

### Ingredients:

- Four striped bass fillets, skins on (about 6 oz. each)
- 1/4 Cup olive oil
- 1 lemon, for juice and garnish
- 1 lime, for juice and garnish
- 1/8 teaspoon: salt, black pepper, garlic powder, steak seasoning, sweet basil, oregano & lemon pepper (mix together in bowl)

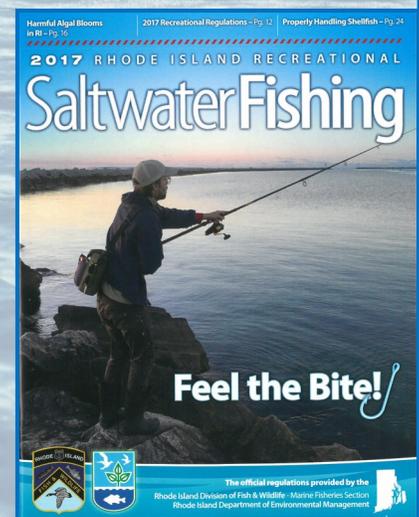
### Directions:

Put fish in a large shallow bowl, coat with oil, lemon and lime juice. Add your spice mixture of garlic, steak seasoning, sweet basil, oregano, salt, black pepper and lemon pepper. Cover with tin foil or plastic wrap and let stand 30 minutes.

Heat grill (medium heat, 400°) and once ready, put skin side down on grill. Grill until skin is lightly browned and has starting to crisp. Carefully turn fillets and cook until well-browned and cooked through, center will be opaque. Garnish with both lemon and lime wedges. Lemon zest optional.

Don't forget to pick up a copy of the  
2017-2018 Rhode Island Saltwater Fishing  
Guide, now available at locations where  
fishing licenses are sold, or at:

<http://www.eregulations.com/rhodeisland/fishing/saltwater/>



Take the opportunity to share your culinary skills! Send us your best recipes for RI caught fish or wild game and we will feature them in an upcoming Wild Rhode Island !

## Rhode Island Saltmarsh continued from page 1



**Small channels improve tidal flushing and help drain fresh water that had become impounded at upper sections of the high marsh. Photo courtesy of T. Steeves**

These ecosystems are typically distinguished into two areas as low marsh and high marsh habitat. Low marsh habitat is almost always inundated at high tide, while high marsh habitat is less frequently flooded, usually by the highest tide. This results in differing levels of salinity, moisture content, and soil composition. These factors determine what types of vegetation will grow in specific areas; grasses are more common in low marsh areas while high marsh habitat tends to consist of more low-growing shrubs. The vegetation within salt marshes provides critical nesting habitat for birds like the salt marsh sparrow (*Ammodramus caudacutus*), seaside sparrow (*Ammodramus maritimus*), and willet (*Tringa semipalmata*). Salt marshes are also beneficial to humans as they protect coastlines from erosion, and filter sediment from the water as the tide ebbs and flows.

Sea level rise, as a result of climate change, threatens the persistence of salt marshes. Low and high marsh habitat become inundated by seawater, causing a change in the composition of the marsh by increasing salinity and moisture and decreasing oxygen in certain areas, and ultimately degrading the habitat. As the mean high tide line creeps further inland, salt marshes are unable to migrate at a similar rate, resulting in significant habitat loss. Projections show that sea levels in the northeastern United States are expected to rise several feet by 2100 (NOAA); even a small proportion of this estimate will have grave consequences to Rhode Island salt marshes. This change will affect coastal communities by reducing salt marshes' capability to act as a buffer from storms, protect shorelines, and serve as a natural filter. Nesting habitat for birds that rely on these ecosystems would also be eliminated, and the populations of many other species of flora and fauna would be reduced. It is important that we take steps to preserve these delicate ecosystems not only for their aesthetic value, but for the crucial role they play in the well-being of our communities and the longevity of wildlife populations.

RIDEM and other conservation organizations are working proactively to enhance and sustain these critical habitats. At Ninigret Pond, a large area of salt marsh owned by RIDEM is undergoing an extensive restoration to adapt the salt marsh to higher water levels by the Coastal Resources Management Council (CRMC) and Save The Bay. A technique called thin layer deposition was completed in early 2017, wherein dredged material removed from the Charlestown breachway was spread across the marsh surface to raise the elevation of the marsh by approximately one foot across nearly 20 acres. Vegetation will naturally recolonize the site, and thousands of seedlings were planted to help facilitate the revegetation process. Small channels known as runnels were also installed to improve tidal flushing and help drain fresh water that had become impounded at upper sections of the high marsh. This innovative project will improve the Ninigret salt marsh and help future attempts at salt marsh adaptation as conservationists work to help these ecosystems persist before they are permanently lost.



**Saltmarshes benefit people by protecting coastlines from storms and cleaning water by filtering sediment. Photo courtesy of T. Steeves**

## Forging A Connection continued from page 1

a barrier for natural movement and migration, sometimes negatively impacting our fish and wildlife.

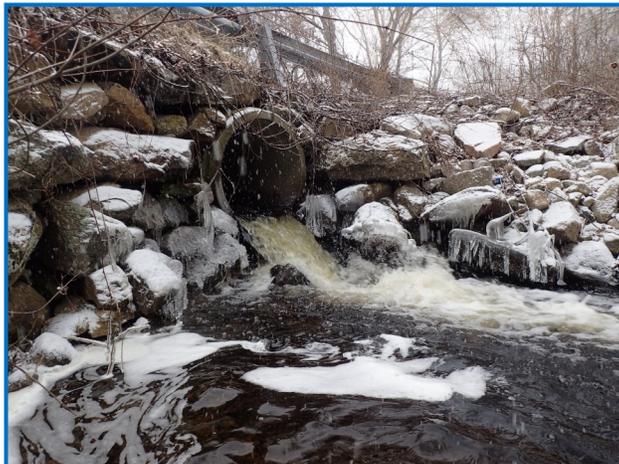
Similar to the effect of impassable culverts, dams have an even greater impact on travel in river systems. All but the lowest dams create a barrier for upstream fish and wildlife passage. Through the 19<sup>th</sup> and 20<sup>th</sup> centuries, dams were constructed in most river systems for power generation and flood storage. Many of these dams still exist today; in fact, most systems include at least one dam.

Streams contain a variety of habitats which provide unique accommodations for different species. Even for a single species, different life stages require specific habitat requirements for survival. In addition to fish, streams are home to a variety of amphibians, invertebrates and even mammals, which all play a role in the ecosystem. Culverts and dams which act as barriers can have varying effects on species by limiting migration, reducing access to spawning habitat, and limiting forage availability. To put this in perspective, imagine if

towns were walled off with no form of transportation outside of those walls. Think about the dynamics of food, health, and public interaction in a resource-limited and confined setting. This idea is similar to a section of stream restricted by upstream and downstream obstructions acting to restrain the aquatic organisms that live there.

One native species of concern that has suffered from the effects of “fragmentation,” or seclusion due to barriers, is the eastern brook trout. As a species that has specific water quality and habitat requirements for survival, reduction of stream connectivity actively isolates populations. Brook trout spawn in headwater streams in the upper watershed that contain gravel substrate and infiltration of cold, well-oxygenated groundwater. Their primary forage habitat is different; they prefer sections of river further downstream with large pools, riffles, boulders, woody debris, and undercut banks.

Cold water is also imperative for the survival of these fish, and often varies throughout a stream. Impoundments from dams, primarily during summer months, warm the slow-moving water and the resulting outflow from the dam can be well above the survival temperature limits of brook trout. Wild brook trout need access to a variety of habitats for survival, and barriers such as culverts and dams inhibit this necessary movement.



**Culverts and dams which act as barriers can have varying effects to species, including limiting migration, reducing access to spawning habitat, and limiting forage availability.**  
Photo courtesy of C. Pelletier

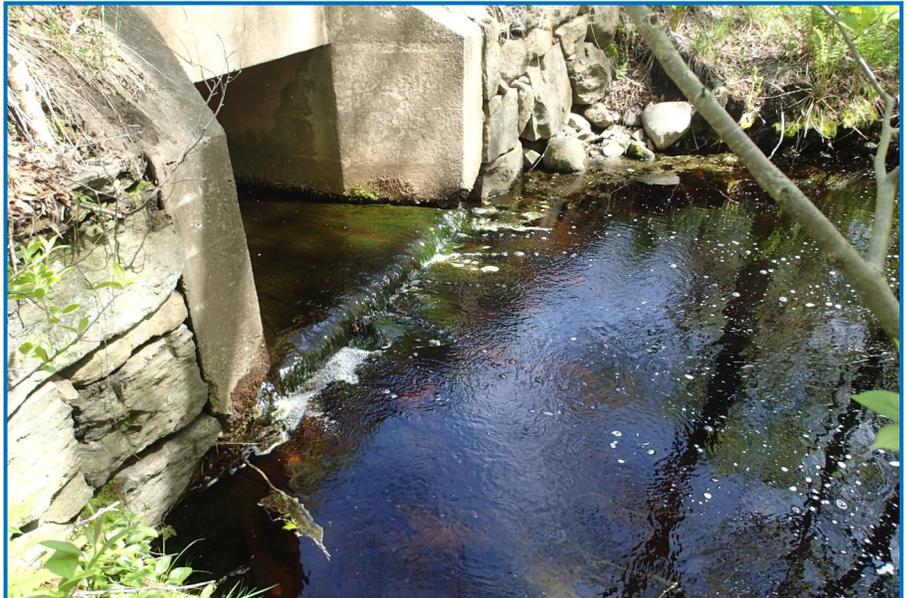


Photo courtesy of C. Pelletier

## Forging a Connection continued from page 4

Freshwater mussels are another organism that is often overlooked when discussing stream habitat and passage. Many of our streams and rivers contain freshwater mussels, which play a critical role in maintaining good water quality. Mussels are filter feeders which feed on algae and other particles in the water, including contaminants that may be present. Freshwater mussels rely on a host fish for reproduction. They release their larvae as fish swim by, and the larvae attach to the gills of the host. Stream connectivity becomes important at this life stage of the mussel for the purpose of dispersal. The larvae remain attached to the fish until ready to drop off and sink to the bottom where it will spend the rest of its life on the stream bed.

The effect of impassable culverts and dams on mussels is the same as with other invertebrates and fish: isolation. In terms of an entire stream or river population, reduced dispersal and movement put the organisms at a greater risk for a decline and even extirpation: the disappearance of a species from an area where it once thrived. Fish ladders, which allow fish to travel around the barrier, are installed at dams and other blockades where passage provides significant ecological, recreational, or commercial importance. The fish ladders often provide efficient passage for a target species, but passage by other fish or aquatic organisms can be difficult or impossible. Dam removals are an ideal resolution for restoring the natural flow of streams and rivers and restoring connectivity for animals to pass freely. More and more culvert replacements incorporate open bottom designs which allow for continuous natural stream bed and flow.



**Dam removals are an ideal resolution for restoring natural flow of streams and rivers and the associated connectivity for organism passage. Photo courtesy of C. Pelletier**

Projects allowing effective aquatic organism passage are important for the above reasons, but come with a higher cost compared to a simple repair or replacement of the current system. There is often the need for additional funding and education for improving connectivity at culvert repair and replacement projects. Dam removals accompany a vast set of issues, including cost and public opposition for intrinsic and aesthetic reasons. Outreach from the public, non-governmental organizations, as well as state and federal agencies is important for recommendation of waterway connectivity to be considered in project designs.

In a time when we realize more than ever the importance of maintaining quality habitat for our native species, it is imperative that we improve the connectivity of waterways. It takes the efforts of many to restore our waterways to the most natural state possible, and provide the reasoning to value the ecological importance of these restorations over economic-driven reasons. The decision to favor stream connectivity and restoration will not only benefit our fish and wildlife, but also our ecosystems, public recreation, and public safety.

## IMPROVEMENTS AT WORDEN POND BOAT ACCESS AND PARKING AREA

### By Veronica Masson

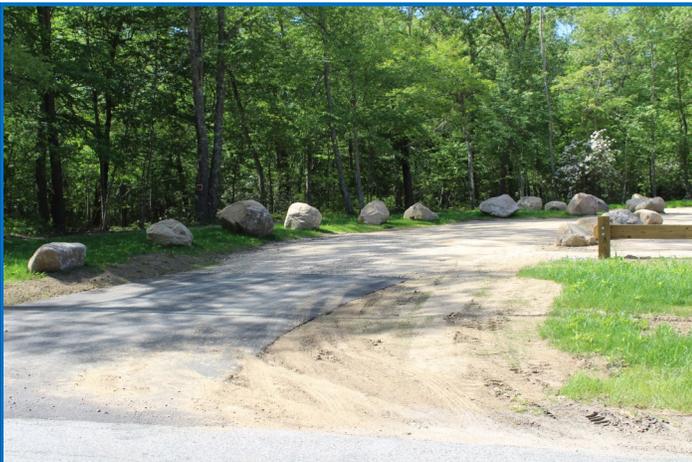
A new parking area has been constructed for the very popular Worden Pond Boat Ramp in South Kingstown. The site is located at the southeast edge of the pond along Worden's Pond Road. At just over 1,000 acres, Worden Pond is the largest natural pond in Rhode Island and provides an excellent fishing and recreational opportunity. The pond connects to both the Chipuxet (upstream) and Pawcatuck (downstream) Rivers.

The original parking area offered approximately ten parking spaces for cars with trailers, and it often filled up quickly. As a result, overflow parking occurred along the road way, causing a problematic situation. In 2013, a parcel of land across the street from the boat ramp was purchased by DEM from the Boy Scouts of America. The Division of Fish and Wildlife requested funding from the USFWS Wild-



life and Sport Fish Restoration program to improve the site to create expanded parking availability. Construction was completed in spring of 2017, and the new parking area is now open for use. The new lot provides parking spaces for an additional 13 vehicles with trailers. A walkway was created on the opposite side of the road and is protected by a guard rail for pedestrians to traverse safely from the parking lot to the boat ramp. Additionally, a floating dock was installed alongside the boat ramp to assist boaters with launching and retrieving their boats.

Photos by Ashley Schipritt



*Kid's Corner!* Presented by the Aquatic Resource Education Program

Herring are ANADROMOUS fish, which means that they live in the ocean but swim into rivers and streams to reproduce. People have built dams over many years that have blocked fish from swimming upstream to where they used to lay their eggs.

Now, in many places fish ladders are being built and dams are being removed so that fish can freely swim upstream again.

These projects not only help herring, but many other species of fish that live in the stream year round.

Examples of local fish that are helped are:

**BROOK TROUT**

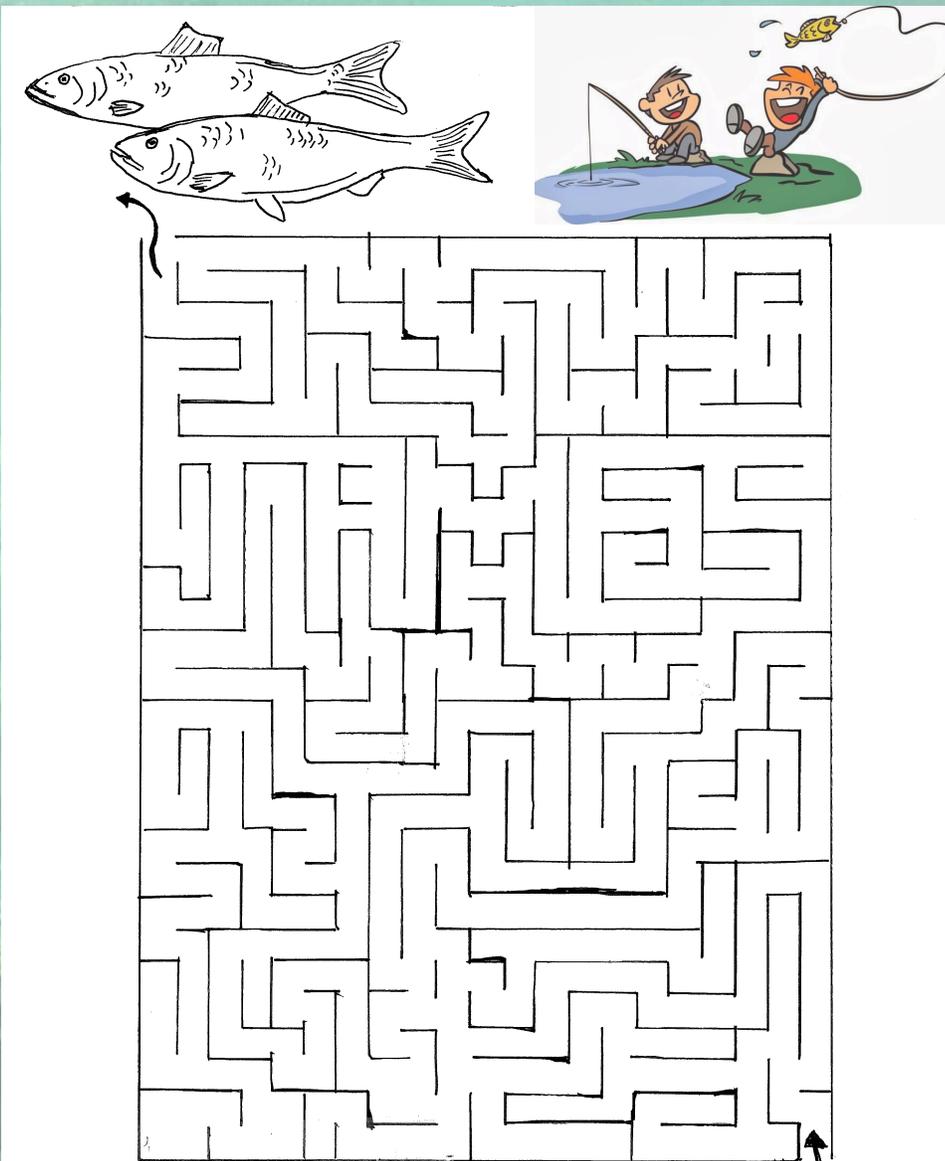
**CATFISH**

**WHITE SUCKER**

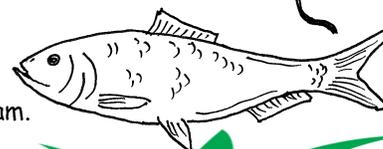
**COMMON SHINER**

**FALLFISH**

**DACE**



Help this herring find her way through the maze so she can connect with her friends upstream.



## Fluorescent Orange Requirement Reminder For The Upcoming Hunting Season

Hunting season is just around the corner in Rhode Island's Wildlife Management Areas. Although these areas are set aside for hunting, wildlife management and conservation, the public is allowed to utilize this space as well for other recreational activities. For those who are using these public spaces for hiking, biking, and other uses, it is important to remember that there are fluorescent orange requirements for all R.I. state management areas.

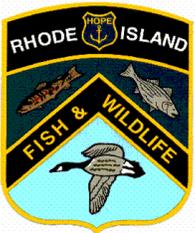


From the second Saturday in September (Sept. 9, 2017) to the last day of February (Feb. 28, 2018) and from the third Saturday in April (Apr. 21, 2018) to the last day of May (May 31, 2018) all other users must wear at least 200 square inches (i.e.- a baseball cap) of solid daylight fluorescent orange. In addition, all users of state management areas and undeveloped state parks are required to wear 500 square inches (cap and vest) during all portions of the shotgun deer season (December 2–17). The orange must be worn above the waist and be visible from all directions.



There are additional orange requirements and exemptions for hunters, which can be found in the Rhode Island Hunting and Trapping Regulations Guide. For more information, please email [DEM.DFW@dem.ri.gov](mailto:DEM.DFW@dem.ri.gov) or call 401-789-0281.

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