2018

Inland Fisheries Program Notes & Updates (Summer)

Connecticut Department of Energy & Environmental Protection
Bureau of Natural Resources
Fisheries Division
79 Elm Street, Hartford, CT 06106

860-424-3474 www.ct.gov/deep/fishing www.facebook.com/ctfishandwildlife

News & Notes of Interest

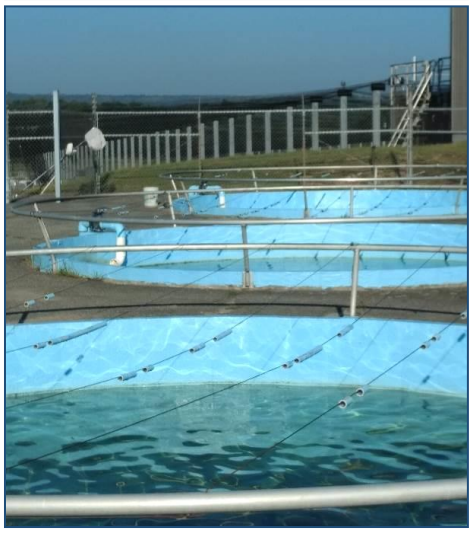
HATCHERY UPDATES.

Quinebaug Valley State Trout Hatchery:

- **New Grader and Fish Counters.** A few years ago Quinebaug received a brand new fish grader with electronic micro counters. The grading and electronic counting process has become one of our most valuable tools. We have used this equipment for two production cycles now and all staff are well trained at running fish through in a safe manner. What once was a five or six person job can now be efficiently completed with two people. We can grade and count 25,000 fish per hour and dedicate staff to other important projects on the farm.
- **Liquid Oxygen System completed in March 2018.** The new liquid oxygen system is working very well. The previous system where oxygen was generated on site was aging and unable to provide oxygen to the entire facility. After many decades of running aerators to keep fish alive they have been turned off.

Gas storage unit for the new liquid oxygen system at the Quinebaug Hatchery.

- **Pipe Cleaning Project and Visitor Tanks.** Our Maintainers have unclogged every fresh water pipe (30 total) in the intermediate rearing building. Flows were continuously being decreased over the past several years due to iron build up. We are currently working on the broodstock raceway pipes. We had a complete blockage and multiple broken valves in the visitor tank center many years ago. Staff unclogged those pipes, replaced the valves, and epoxy coated the concrete tanks. These visitor tanks are original 1971 construction but now look like new again.



Freshly refurbished visitor tanks at the Quinebaug hatchery.

- **Well Cleaning Rehabilitation.** Over the past 3 years the Quinebaug hatchery has switched over to a new well cleaning method called Aqua Freed. This environmentally friendly method of controlled injection uses liquified and gaseous Carbon Dioxide to remove mineral encrustation (iron, manganese and calcium), as well as sulfate reducing and slime forming bacteria. We are now on a yearly rotation, with the recent second cleaning of Well 3 we have seen a 65% increase in water flow.

Cover: *The new fish grader that has been fully integrated into the production process at the Quinebaug Valley State Trout Hatchery. This equipment is just one of a number of updates, repairs and enhancements at our hatcheries. See above and the next page for details.*

One of the new replacement "mud valves".

- **Mud Valves and Butterfly Valve Operators.** The Quinebaug staff has gone through the intermediate rearing building and replaced half of the failing "mud valves" in the sludge collection basins, 15 in total. We have also replaced 30 of the mud valves in the grow-out production area. Additional work has been completed to repair all 40 butterfly valve operators. For the past 15 years the valves would no longer turn without the use of a pipe wrench. They now function correctly and can be hand turned as designed quickly and easily.

- **LED Lighting.** A few years ago Quinebaug had LED installed in each fish production building. The lighting intensity mimics the natural sun so well that our first generation of broodstock under these lights are actually spawning a month earlier than before. This will give the ability for staff to stagger the egg take throughout the summer to provide a better product to the anglers and biologists by manipulating the photoperiod.

- **Tiger Trout Production.** This past July the Quinebaug staff spawned some of its finest brown and brook trout for high quality hybrid tiger trout eggs. These tigers will be available to CT anglers in the spring of 2020. In an effort to improve growth rates and minimize early mortality we are heat shocking half of these eggs. We are comparing survivability to the standard unshocked eggs that we typically produce here at Quinebaug.

Kensington Valley State Fish Hatchery. At Kensington, we **will start spawning Seeforellen strain Brown Trout again next year** and will be increasing production of spring adult Cortland strain Brown Trout from 20,000 to 40,000 for 2020. This increase is to balance out a 15,000 reduction at Burlington where several dirt ponds in the very poor condition are being taken out of production.

HYDRILLA UPDATE. Until recently, hydrilla was found at only a few locations in CT. This invasive aquatic plant can spread aggressively (it can grow up to a foot a day), form dense mats of vegetation and can be very difficult to control. In 2015 it was found in two publicly accessible waterbodies:

Coventry Lake. In the fall of 2015, hydrilla was found in Coventry Lake (Coventry) and DEEP began efforts to eliminate hydrilla from Coventry Lake. DEEP, in consultation with the Town of Coventry, contracted with SOLitude Lake Management, a lake management contractor, to provide management services including plant surveys and active management (herbicide treatments, benthic barriers, etc.). The lake was surveyed extensively in 2015 prior to treatment, and in 2016 and 2017 following treatment of target areas. Hydrilla was originally found only in a shallow nine acre cove. Treatment with a contact herbicide (endothall) and benthic barriers succeeded in reducing weed densities in target areas but has not been able to prevent spread to other areas in the lake and a more aggressive approach (a systemic herbicide over a larger lake area) was determined to be necessary in 2018.

This year, DEEP and the Town of Coventry are jointly funding a "whole lake" treatment of the hydrilla using a systemic herbicide (fluridone) and to conduct additional pre and post surveys to confirm the success of the treatment and the need for additional control work. This summer the initial fluridone treatment and one booster application were completed. A second booster application will be conducted

in mid-September with a post treatment plant survey conducted in October. It is expected that several more years of these treatments will be needed to eliminate hydrilla as a threat in Coventry Lake.

Connecticut River. In 2015 hydrilla was found in in a difficult to access portion of Keeney Cove by botanists participating in a "Bioblitz" conducted around the Two Rivers Magnet School, East Hartford. Later that year DEEP staff observed several patches of hydrilla mixed in among the aquatic plants growing in the river at Glastonbury's Riverfront Park and Boathouse. Based on the observed growth, it appeared that hydrilla had been in the river for a couple of years and it was likely to be dispersed downstream of Hartford. As a result, eradication from the Connecticut River was deemed not practical.

In 2017, DEEP fisheries staff conducting fish surveys (night electrofishing) identified hydrilla in several new locations including Wethersfield Cove, Crow Point Cove, and in the mainstem in Enfield where it was found scattered along the west shore from the Massachusetts border down to the Enfield Town launch in Thompsonville. Additionally, volunteers and staff from organizations with strong interests in protecting the river including the Connecticut River Conservancy (CRC) began looking for hydrilla during their surveys for another invasive, water chestnut, and also collected hydrilla from the lower Mattabesset River. The presence of hydrilla near the Massachusetts border also suggested that a source population for the hydrilla found in these areas of the river may exist in Massachusetts. In 2018 the coalition of groups expanded to include the other three states (MA, NH, VT) along the Connecticut River. Unfortunately, some surveys have found further spread of hydrilla in the Connecticut section. DEEP recently prepared signs informing users of the presence of hydrilla in the river that have been posted at state boat launches. The signs have also been provided to Riverfront Recapture for posting at their facilities, to the CRC for distribution at other locations, and to other states as a template for use there.

Sign recently prepared and posted informing CT river users of the presence of hydrilla in the river (similar signs were prepared for Coventry Lake). These signs were also distributed to other groups.

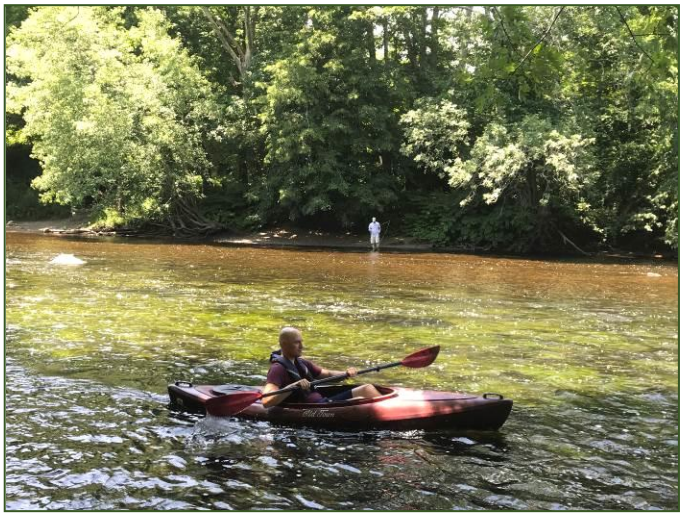
TAXONOMIC ADVISORY COMMITTEE (TAC). The TAC is a group of fisheries professionals comprising researchers and fisheries managers (including DEEP staff) who are charged with reviewing fish population and distribution data in order to make recommendations on the endangered, threatened, or special concern status of Connecticut's fish species. So far there is one petition to add Threespine Sticklebacks as a species of concern. There was also a question about the status of the Spotfin Killifish that needs to be resolved. As part of the work associated with the TAC, an unsuccessful attempt was made to collect Burbot tissue for DNA analysis. There is reason to believe that the Burbots in the Hollenbeck and Mad River systems may be unique due to their unusual life history (small streams), small size of maturation and isolated nature of the population. If the DNA analysis were to show a genetic difference, they might be listed as a new species. This would not change the status of the population, as they are already listed as endangered. Another attempt will be made to sample this population sometime in the next year.

Inland Fish Management & Fish Culture

RIVERS & STREAMS

"GET AWAY WATERS" are flowing waters, which give the perception of being in fairly remote areas as they have s long stretches of access and shoreline absent of significant development. Examples include; Ten Mile River (Kent), Housatonic River (Sharon to New Milford), Salmon River (Colchester), the Shetucket River (Windham to Sprague), and the Quinebaug River Putnam to Norwich). To increase the awareness of these fishing opportunities in Connecticut, staff collected information on how to set up a social media campaign and how to define target markets and audience. Multi-media materials were collected along the Quinebaug River including photos and short video clips showing the launches and positive usage by boaters and anglers.

Approximately 300 float fishing trips were estimated from an angler survey conducted in 2015. It is estimated that during a year with typical flows the Quinebaug River could support close to 100 times more trips (35,000). Potential target audiences have been identified and an initial marketing plan is being prepared.



Kayaker and angler on the Quinebaug River. Although it offers numerous recreational opportunities this river is currently an underutilized resource for boaters and anglers.

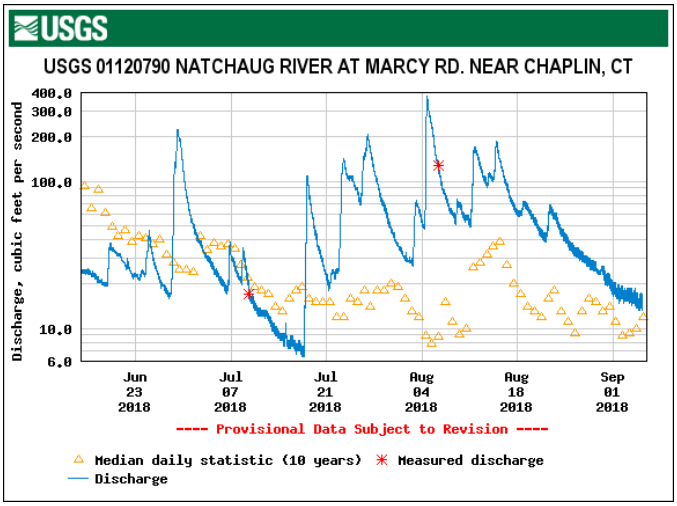
FISH MONITORING.

- **NEW SAMPLING GEAR.** As of June 1st, the Fisheries Division began use of the new Smith-Root Generator Powered Pulsator (GPP) stream shocking unit. The new equipment has improved safety features over the older Coffelt equipment, and has proven to be effective at sampling fish populations in the field.

Photo of a Smith-Root GPP stream shocking unit (courtesy of Smith-Root).

- **THIS SUMMER.** This summer turned out to be a warm, wet summer with 31 days of air temperatures over 90°F. Rain had been fairly consistent for July through mid-August and resulted in

above average stream flows. However, sparse rain through late August – early September resulted in stream flows quickly falling close to long term averages. Water temperatures taken during sampling efforts showed that warmer surface flows dominated over cold water ground flows as most cold and cool-water streams had elevated water temperatures due to increase flows. This will likely have a negative effect on coldwater fish populations in some systems.



A typical hydrograph from summer, 2018, this one is for the Natchaug River (courtesy of USGS).

- **GENERAL FISH COMMUNITY SAMPLING.** Stream electrofishing was completed on nearly 60 sites statewide (as of September 5th). This year, a directed focus of this project was to resample streams (32 sites) where historic wild brook trout population data had been collected during the original Stream Survey study, completed over 20 years ago. Other high-priority sample sites were long-term reference sites, general monitoring sites, and smaller, previously un-inventoried, headwater streams.
  - The resampling of historic wild brook trout sites this summer showed that 34% (11 sites) of all sites (32 total) no longer had wild brook trout present. While this may be alarming, it does not mean that brook trout have been extirpated from these streams. But it does mean, that further work may be needed in other areas of each stream to determine their true fate.
  - Collaborative sampling was done with staff from the Habitat Conservation and Enhancement (HCE) program on 15 stream locations.
  - Two sites on the Quinnipiac River were sampled collaboratively with staff from DEEP's Water Protection and Land Reuse Bureau (WPLR).
  - Fish populations were assessed at several culverts in northwest Connecticut, to help prioritize efforts by Housatonic Valley Association to work with area towns to replace aging infrastructure that may be barriers to fish, with specific attention to native Brook Trout. While some candidate streams had no trout (or no fish), and some contained wild Brown Trout, others had wild Brook Trout

Photo of crew using Smith-Root LR-24 Backpack Electrofishing units this summer.

populations that could potentially benefit from barrier culvert removal and replacement with more fish-friendly options.

A beautiful brook trout collected (and returned to the stream) during sampling this summer.

A nice pumpkinseed collected (and returned to the stream) during sampling this summer.

- **WILD TROUT STREAM SAMPLING.** Ninety-six sites on 44 streams in western CT were sampled to assess effectiveness of special regulations, and to help determine long-term population trends and responses to past weather and flows. Findings varied from stream to stream, but many showed depressed abundance and reproduction of wild trout populations, most likely caused by the drought in 2016, and possibly other more recent weather events.

- **SLIMY SCULPIN MYSTERY?** Preliminary sampling was initiated to assess Slimy Sculpin populations in Connecticut. These unusual little fish have very restricted ranges, and are a "Species of Special Concern" in CT. Of particular interest was the apparent "explosion" of this species in several major tributaries of the upper Pomperaug River watershed in Woodbury (Sprain Brook, Weekeepeemee River, and Nonewaug River), challenging traditional theories regarding their need for cold pristine stream conditions, as well as bringing to light other factors that may benefit this species. Meristic deviations in fin ray counts, lateral line pores, tooth patch shape and size, and other physical features of the Pomperaug population are interesting but not completely understood at this time. UConn researcher Dr. Eric Schultz and student Josh Tellier, with support from DEEP Fisheries, have put together an income-tax-checkoff-funded grant proposal to continue to pursue the answers to these questions, as well as to broaden our knowledge of other possible changes to sculpin populations in CT, and possible future impacts of Climate Change to this coldwater species.

Slimy Sculpin collected from the Weekeepeemee River (Woodbury) in summer, 2018. The sculpin population has recently exploded in this area.

- **WATER TEMPERATURE MONITORING.** Water temperature data loggers (HOBO onset) were again placed in a number of Connecticut streams this spring/summer. The focus was on long-term reference streams. Fish data were collected from five of these temperature sites and will be used in development of regional water temperature/fish population models.

Photo of HOBO onset data logger (courtesy of onset HOBO Data Loggers). These devices are 3-4 inches in length.

- **STREAM FLOW**. In cooperation with the Thames Valley Chapter of Trout Unlimited, flow monitoring was completed at the five stream flow gages on Merrick and Beaver Brook. Merrick Brook is one of the best cold water resources in eastern Connecticut. The intent of this project is to help determine sources of ground water in the system, key information to protect this important resource. The most downstream gage (Station Road) allowed us to document sudden changes in the flows in the Shetucket River (because high Shetucket flows backup into lower Merrick Brook). This has been important with the changes in the hydro operations at Scotland Dam.

Flow logger at Gager Hill Road on Beaver Brook.

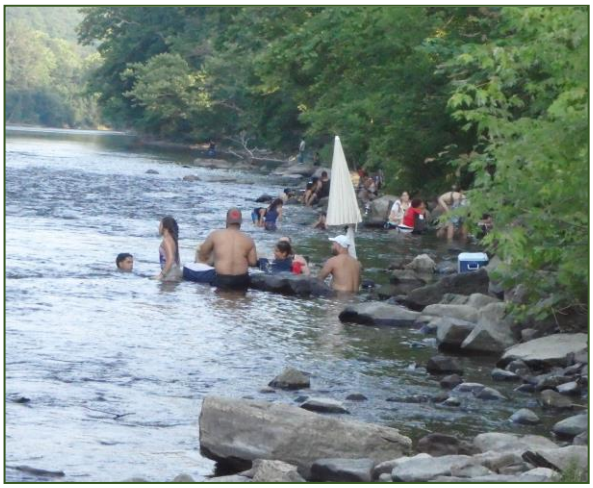
Taking spot measurements to create a ratings curve for the logger station.

- **HOUSATONIC RIVER.**
  - Thermal Refuge enhancement work was completed in the spring at Furnace Brook and Mill Brook in Cornwall, and Kent Falls Brook in Kent, by DEEP Fisheries staff, Housatonic Valley Association (HVA) interns, and volunteers. These efforts paid off in July, when flows in the river were low and warm, and refuges were packed with trout; up to 1,000 trout in Furnace Brook Refuge alone. No electrofishing was conducted on the Housatonic River in 2018.
  - At sample sites on upper Furnace Brook, above the Route 4 fish ladder, more stocked Brown Trout that swam up from the Housatonic, were sampled than ever before (33). The high mid-summer flows, combined with major repairs and re-engineering of the fish ladder, facilitated the

movement of these fish upstream to coldwater habitat in this Class 2 WTMA, where many will likely remain to spawn this fall.

Hundreds of trout packed into Furnace Brook thermal refuge in July, 2018, after enhancement work was completed in the spring.

- A Recreational User Survey was conducted on the upper 45 miles of the Housatonic, from the Massachusetts line downstream to Lake Lillinonah. In recent years, more and more river access has been lost due to inconsiderate users leaving public areas in poor condition. Conditions were vastly improved at select sites where access was restricted by local authorities and Appalachian Trail (AT) maintainers (i.e. where North Kent Road and River Road were gated and barricaded to protect North Kent Pool), or aggressively supervised and monitored by physical presence of volunteer AT stewards all day, on every weekend and holiday (i.e., Bulls Bridge at the Appalachian Trail head). At sites that remained open with only limited or no supervision/monitoring, conditions appeared to deteriorate even more, so that scenic areas like Great Falls in Falls Village, and the lower portions of the Bulls Bridge Bass and Trout Management Area, on Eversource (CL&P) land in Kent, New Milford and Sherman, accumulated increasing amounts of trash. This despite Fisheries seasonals surveying users and removing garbage on all 81 survey runs, and HVA seasonal stewards engaging users at several of the most abused sites on weekends. Continued illegal harvest of trout and bass was also documented in unsupervised areas of the Bulls Bridge Catch-and-Release Management Area. The



Portions of the Housatonic often attract a lot of users during the summer.

Unfortunately, some weekend picnickers habitually leave mountains of trash behind.

best solution to this unacceptable situation is not immediately clear, but likely will involve educational initiatives (such as materials describing fisheries management in the area and/or promoting "Carry-in, Carry-out" ethics), further collaboration with local entities and seeking more regular and consistent law enforcement presence.

TROUT AND SALMON STOCKING

- **2018 SUMMER TROUT STOCKING.** The Farmington River Trout Management Area (TMA) on the West Branch Farmington River from the Goodwin Dam to the year round catch and release area, was stocked with 1,800 large (>12 inches) Brown Trout prior to the July 4th holiday. The typical Labor Day stocking (1,800 >12 inch fish) of the Farmington River TMA (from below year round catch and release area to the Rt. 177 bridge in Unionville) was not conducted due to warm water temperatures. Providing adequate water temperatures stocking should be completed during the week of 9/10 – 9/14.
- **2018 FALL TROUT STOCKING.** Nearly 24,000 catchable-sized trout have been produced for stocking this fall. Of these, nearly 12,000 (rainbows and browns) will approach 14 inches in length. Additionally 500 will be broodstock brook trout that average between 2-5 pounds (> 14 in.). Brown Trout fingerlings (26,000, 5 in. average) will be stocked into select waterbodies to grow to a larger catchable size to support the spring trout fishery. Stay tuned for our fall stocking reports on Facebook!
- **2018 FALL BROODSTOCK ATLANTIC SALMON STOCKING:** As in the past several years, approximately 1,225 Atlantic Salmon (1,000 2-5 lb. fish and 225 fish averaging 10 lbs. apiece) will be stocked later this fall. These salmon are produced at the Kensington State Fish Hatchery and will be stocked into the Broodstock areas on the Naugatuck and Shetucket Rivers and into Crystal Lake and Mount Tom Pond.
- **BROWN TROUT FRY** stocking efforts on the upper Shepaug River, Furnace Brook-Cornwall, Kent Falls Brook, and many other streams around the State continue to produce catchable-size wild-looking Brown Trout in abundance (some up to 20 inches!).

BROOK/BROWN TROUT RESTORATION.

- The transfer of the brook trout from Birch Mountain to an unnamed tributary to Globe Hollow Reservoir in Manchester appears very successful. The population density is at 245 fish/km (7,260/ha) which is good for a small stream (1.5 meter average width). The numbers and sizes of the Brook Trout indicate there was a good spawn in the tributary during the fall of 2017 with good survival and growth of the young of year brook trout that were transferred into the tributary last fall.
- Reintroduced native Brook Trout in Deep Brook, Newtown have successfully spawned a second year, as evidenced by numerous 2-3 inch long young-of-year. Older age groups were also still present, and will hopefully spawn successfully again this fall.
- Reintroduced Brook Trout, as well as wild Brown Trout, in the Mill River in Fairfield are still thriving, and benefiting from the new catch-and-release regulations on two more sections of the river.

LAKES & PONDS

LAKE & POND WATER COLUMN MONITORING. Dissolved oxygen (DO) concentrations and temperature were measured from surface to bottom at two lakes, Highland Lake (Winchester) and Crystal Lake (Ellington) in July. Thermoclines (the depth with the greatest temperature change within the narrowest band of water) were detected at typical depths (~18 feet). Also, a very large/deep layer of cold oxygenated "trout water" (dissolved oxygen concentrations ≥ 4.0 mg/l and temperatures ≤ 19.0 °C) existed from the thermocline to near the lake bottom at both locations. Temperature/oxygen data will be collected from both of these waterbodies again in August and September to see if these suitable summer habitat conditions for trout persist throughout the summer. In addition to these waters, temperature/oxygen conditions were monitored in eight other waterbodies throughout the state, Beach Pond, Black Pond (Woodstock), Colebrook Reservoir, Crystal Lake, Highland Lake, Long Pond (Stonington), West Branch (Hogback) Reservoir and West Hill Pond in August. Both Highland Lake and Crystal Lake will be sampled again in September to provide a full over-summer temperature/oxygen profile in these important Trout Management Lakes.

KOKANEE SALMON. Kokanee that are surplus to the stocking needs for West Hill Pond and East Twin Lake have been stocked into Beach Pond over the past three years in response to the decline in the lake's Alewife population. A fishable population of Kokanee salmon existed in Beach Pond in the 1960's, but due to the introduction of Alewives (a direct competitor for food with Kokanee), the salmon population declined and stocking was discontinued. To check for the presence of Alewives, we set a series of five vertical gill nets in Beach Pond during August of 2018. No Alewives were captured, but 11 juvenile Kokanee (~4" fish) were caught in the nets. These salmon were from this past spring's fingerling stocking and were in excellent physical condition. This is a very good sign that the stocked salmon are surviving and that alewife abundance is very low or nonexistent. We will collect information on the number of adult Kokanee present beginning in the fall of 2019.

LAKE & POND ANGLER SURVEYS. No angler surveys were conducted during 2018. Moving forward, due to staffing constraints this will no longer be a separate job as it has been for a number of years, but rather will be a tool used to answer questions for each project should it be needed.

WALLEYE. The order for 24,400 4-inch Walleye and 3,500 6-inch to 8-inch Walleye to be stocked in our public Walleye Management Lakes (WMLs) in 2018 was placed. The fish should arrive sometime in October.

CHANNEL CATFISH. Major changes are being proposed for our annual for Channel Catfish stocking. We would like to move away from the stocking of yearlings (9-11 inch fish) because aging work done on two of our yearling lakes has shown that it takes multiple years for yearlings to reach a size that anglers would consider worthy to take home for a meal (~14 inches). Instead of yearlings, we will be stocking all our Channel Catfish Management Lakes (CCMLs) with adult size (14-18 inch) fish. A stocking plan is currently being developed to accommodate this proposed change.

NORTHERN PIKE. The statewide Northern Pike production from DEEP managed marshes in 2018 was hugely successful! A total of 21,734 fingerlings were produced this year, which is 168% higher than the project goal of 12,864 fingerlings. The 2018 production total ranks as the fourth highest year for live fish stocked. The number of fingerlings produced during the three higher years came from seven marshes whereas this year we ran four. With such a banner production all waters that we stock with Northern Pike received well above their projected allotment of fish and we even had surplus fingerlings available to stock the upper portion of the Connecticut River above Hartford.

Number of Northern Pike fingerlings stocked into Connecticut's Pike Management Lakes and the Lower Connecticut River.

Lake	*Number Stocked*	*% of Target Number*
Bantam Lake	2,830	149%
Lower Connecticut River	1,558	104%
Upper Connecticut River	2,162	Surplus
Mansfield Hollow Reservoir	3,739	163%
Pachaug Pond	7,282	173%
Winchester Lake	2,542	207%

Stocking the upper portion of the Connecticut River is something we have only been able to do twice in recent history (2003 and 2004). It is unclear why this year was such a banner success in production as weather patterns appeared to be very similar to prior years with poor production.

In addition to the large number of fingerling pike we were able to produce this year we purchased 245 yearling pike from Zetts Fish Farm and Hatcheries Inc, PA (April, 2018). Of these, 120 were stocked into Mansfield Hollow Reservoir (average size 11.2 inches) and 125 were stocked into Winchester Lake (average size 11.9 inches).

MARSH MADNESS. After working for nearly a decade to get the Haddam Northern Pike spawning marsh system dredged to address the accretion issue in the channels and the over growth of woody vegetation in and around the drainage channels, mowing and dredging work began in early July of this year. This system includes an upper and a lower section separated by a dike.

Remediation funding from the Connecticut Department of Transportation procured by Brian Murphy of the Habitat Conservation and Enhancement (HCE) program is being paid to the CT DEEP's Wildlife Division's Wetland Restoration and Mosquito Control Management program for this project. Work was ongoing through the summer and will continue into early fall to remove (by mowing) the woody vegetation that has encroached on and in many locations into the drainage channels. The channels are also being dredged down to the hard channel bottom to remove, in some locations, 2-3 feet of organic material that has accumulated since the last time this activity was carried out in 1999. By performing this activity we will be able to drain both marshes thoroughly during the juvenile collection period, which since 2014 has been the major issue preventing us from operating the Upper marsh (*see the following page for before and after images of this work*).

Lastly, to ensure a consistent number of pike fingerlings to stock annually (DEEP march production is highly variable), DEEP Fisheries will be ordering 9,500 fingerlings (4-6 inches) from West Central Bait & Fisheries Co. Inc., MN. These pike should arrive late spring/early summer 2019.

On the left is Seasonal Resource Assistant Kevin Job standing in the Lower marsh near the dike that separates the Lower from the Upper marshes in mid-June 2012. This photo shows the condition that persisted in this marsh beginning around 2009 and continued until dredging began in summer 2018. On the right is the same area after mowing and dredging work was completed in the Lower marsh (early September 2018).

The Upper marsh prior to the remediation project. Left photo is the left channel, the center photo is the main center channel and the right photo is the right channel of the Upper marsh showing the conditions that persisted since 2009 and continued to worsen until the remediation project began in the summer of 2018.

Same locations on the Upper marsh following mowing and dredging.

BRIDLE SHINER. We sampled Bashan Lake on Aug 17th to look for any indication that the Bridle Shiners resident in the lake survived the 2-year drawdown event. We concentrated our efforts on the cove where Fisheries HCE staff had last sampled the shiners prior to the draw down (late 2015). We did find 7 Bridle Shiners present after several seine hauls. The crew worked from the outer edge of the cove toward the back. There is a small stream that ran through the cove and it appears that a sediment berm caused the formation of a small pool in the back of the cove and prevented the cove from draining out completely during the extended drawdown. Management of the aquatic plant growth in Bashan Lake by the local lake association is ongoing and will continue to be proposed, including use of herbicides and winter drawdown. HCE staff have recommended designation of this cove as a "no herbicide treatment area" to ensure the long term protection of this listed species in Bashan Lake. It will also be important to insure that mechanical or other methods do not remove aquatic plants needed for spawning by the Bridle Shiner.

A 2016 aerial photo (Google Earth) from near the end of the extended drawdown of Bashan Lake. The pool that provided Bridle Shiner habitat during the drawdown can be seen in the photo.

Habitat Conservation and Enhancement

CTDOT CULVERT PROJECTS, FISH PASSAGE AND INSTREAM HABITAT ENHANCEMENTS

HCE staff review all Connecticut Department of Transportation (DOT) bridge and culvert replacement projects as well as many locally regulated projects. Staff ensure that such projects are designed to allow the unrestricted movement of fish upstream and downstream and do not degrade aquatic and riparian habitats. In addition, instream habitat structures are often recommended to restore/enhance instream habitat features or to mitigate unavoidable habitat losses. Permit conditions require project contractors to be assisted by HCE staff during construction to ensure the proper installation of fish passage and habitat structures. During the last quarter our program reviewed over 6 proposed bridge and culvert replacement projects.

- **HOCKANUM RIVER– bridge replacement.**
  HCE assisted with boulder placement within a dewatered section of streambed of the Hockanum River for a new bridge replacement project.

- **PORTER BROOK– culvert/slipline project.**
  Biologists Brian Eltz (middle) and Neal Hagstrom (right) electrofishing Porter Brook relative to proposed culvert slipline project within headwaters of Porter Brook along Route 384.

- **BEAVER POND BROOK, Waterbury– culvert/slipline project.**
  Staff provided guidance on the relocation of Beaver Pond Brook in Waterbury and the installation of fish habitat structures, including rock weirs and root wads. Root wad revetments provide bank stabilization and create instream fish habitat.

- **TRANSYLVANIA BROOK, Southbury– bridge replacement project.**
  Staff also intervened at a joint DOT/municipal bridge replacement project on Translyvania Brook in Southbury when heavy rains coupled with poor water handling design resulted in streambank and streambed wash-out. Staff worked with all parties to restore the stream channel and modify the plans to ensure future wash-outs would not occur.

COASTAL PERMITTING

Reviewed two dredging projects in tidal waters, four bridge/culvert projects that ranged from repairs to full replacements, two aquaculture projects, and eight dock projects. Measures were recommended, as needed, to maintain fish migratory corridors, avoid interference with river herring spawning migrations, and avoid impacts to winter flounder reproduction.

FOLLY BROOK, Manchester - Eversource transmission line right of way riparian planting

A post-project site evaluation of vegetative clearing associated with the the Eversource Transmission Line Right of Way Expansion Project resulted in a determination that a signficant amount of tree canopy loss had occurred along an approximate 400 foot segment of Folly Brook (Manchester) south of Bidwell Street. As a consequence, Eversource was directed by HCE staff to restore the immediate streambank with a mixture of wetland shrub vegetation to restore lost riparian function along this riparian corridor. A diverse mixture of plants were installed that included spicebush, serviceberry, and species of willow and dogwood.

Photograph of recently installed shrub vegetation along Folly Brook, Manchester

GRASS CARP PROGRAM

HCE received 48 applications for the liberation of Triploid Grass Carp into private and public ponds and lakes during the second quarter of 2018 (June/July/August). Thirty of these applications have been fully processed (permits issued), while the remaining 18 have requirements that need to be met prior to the issuance of permits. Such requirements included barrier installation, approval by the DEEP's Dam Safety program, or a review by the DEEP's Natural Diversity Database (NDDB) program to document the presence of any sensitive species). Of the 48 received, 23 were new applications and therefore a site visit was required to assess the need for the installation of a barrier and to determine what nuisance aquatic vegetation was present. The remaining 25 applications were for the restocking of previously permitted ponds/lakes. All applications were checked in the NDDB to ensure that no species of interest would be impacted by the introduction of these herbivorous fish. Of the 102 applications that have been received in 2018, 74 have been granted permits. In addition, 17 permits were issued for applications received prior to 2018. In all, 96 permits (including five re-issues) have been issued for the release of Triploid Grass Carp into lakes and ponds located in 59 towns throughout Connecticut in 2018.

TRIBUTARY TO LYMAN BROOK, Marlborough (Route 2) = Fish Passage Monitoring.

This project is part of a three-year study conducted by HCE staff to evaluate native Brook Trout passage performance at a culvert slipline project that was retrofitted with an outlet fishway and culvert baffles. Project equipment was funded by CTDOT. Passage is being assessed with the use of passive integrated transponder (PIT) tag monitoring system. Study findings will be used to facilitate fish passage design for future culvert sliplining or culvert modification projects. A total of 85 native Brook Trout were collected by stream electrofishing. Sixty-one fish were PIT tagged while one fish was identified as a recapture from tagging in 2017.

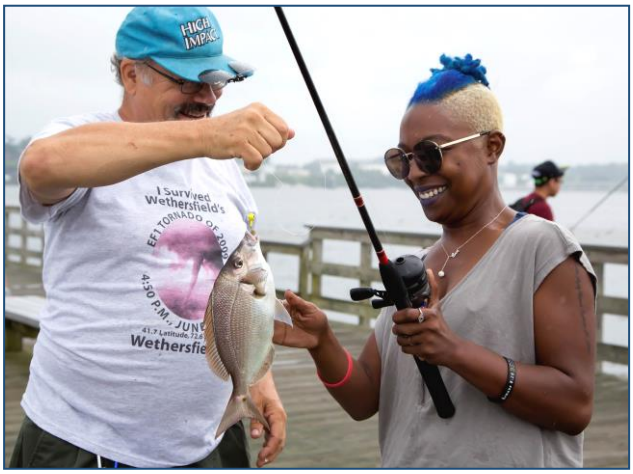
Biologists Brian Murphy (left) and Tim Wildman (right) PIT tagging adult native Brook Trout.

Photo of a 'chunky' native Brook Trout 17 cm in total length prior to tagging.

CARE & Constituent Services

SPECIAL FISHING EVENTS. Over 900 people attended a variety of special fishing events that CARE offered this summer. Highlights include:

- ***SALT WATER FISHING DAY*:** Partnered with State Parks Division and No Child Left Inside® to host the 7th annual Saltwater Fishing Day at Fort Trumbull State Park. The day was planned to coincide with the second FREE Fishing License Day of 2018. Over 200 participants braved a rainy day and were rewarded with fantastic fishing! A variety of marine fish species were caught by participants including dozens and dozens of keeper sized porgy and snapper bluefish. Many families went home with at least a few fresh fish fillets for the fry pan. Thanks to the dozens of dedicated CARE volunteer Instructors for making this event such a success year after year. CARE Instructor Jim Murtagh put together this photo slide-show highlighting the day: https://vimeo.com/284596523

  ***Saltwater Fishing Day**: Fishing was fantastic at the 7th annual Saltwater Fishing Day at Fort Trumbull State Park! A great time was had by all – as can be seen by the face of CARE Instructor Jeff Rogala and a successful participant!*

- ***TAKE A VET FISHING:*** CARE Instructors assisted in several "Take A Vet" fishing days this summer, including the 1st annual "Women Veteran Only" fishing day on August 30th. A nice crowd of lady veterans enjoyed a day relaxing and fishing at Killams Point in Branford.
- ***FAMILY FISHING NIGHTS*:** Hosted 3 fishing events for 42 Family Fishing Course graduates. The family friendly locations included; Colony Pond (Ansonia), Mohegan Park Pond (Norwich), and Lake Wintergreen (Hamden). These trips were designed to increase the potential of successfully recruiting new anglers by providing additional CARE support, after student have completed the basics of fishing class. Recruitment is more successful with multiple contacts following the initial fishing experience.
- ***YMCA FISHING CAMPS:*** CARE staff provided training and fishing equipment to counselors at YMCA camps Chase (Burlington), Ingersoll (Portland), and Mohawk (Cornwall) this summer. Counselors were then able to conduct fishing programs all summer for over 300 campers!
- ***COPS AND BOBBERS:*** Partnered with the U.S. Fish and Wildlife Service and Hartford Police and Fire Departments to offer the third and final "Cops and Bobbers" fishing event of 2018 for 40 participants at Keney Park Pond in Hartford.

FAMILY FISHING COURSES. CARE Instructors and staff hosted 13 multiple meeting "Family Fishing Courses" for 313 students this summer. These courses are our very best product in creating anglers. Each course consists of classroom lessons and conclude with an instructor lead fishing trip.

SUMMER FISHING CLASSES. The CARE *Summer Fishing* program concluded its 20th season of teaching fishing to summer campers! A total of 51 classes were conducted for 1,084 day campers around the state. Each class consists of learning how to setup a rod and reel, how to tie the improved clinch knot, a fish ID and ecology lesson, and concludes with an hour of fishing. Several classes were cancelled due to rain, causing a decrease in students and classes conducted compared to past years. Again this summer, our seasonal Interpretive Guide staff received numerous compliments from partner organizations and our constituents for their patience, knowledge, and passion of teaching fishing to kids and families.

Summer Fishing: *The CARE Summer Fishing crew taught 51 half-day angling education classes (which all included a fishing trip) to 1,084 day campers this summer. Seasonal Interpretive Guide matt Rieger is shown here giving a lesson on marine fish identification and ecology at Fort Trumbull State Park.*

CARE CENTER FIELD TRIPS. The CARE Center on Forster Pond hosted the last field trips of the 2018 school year in June. During May and June, a total of 21 classrooms and 600 sixth graders and parents from Hamden Public Schools and East Lyme Middle School visited the CARE center for a day focused on angling instruction and fishing! Prior to the field trip, teachers incorporated lessons on aquatic habitat, ecology, and fish identification and morphology into their classrooms. While at the CARE Center on Forster Pond, students enjoy a day of hands-on angling skills building and a fishing trip!

NEW INSTRUCTOR CERTIFICATION. The CARE program welcomed 10 new Certified Instructors this past June (nearly 800 citizens of Connecticut have been certified since 1986)! This group of newly Certified CARE volunteer fishing Instructors consisted of four of our CARE summer staff, YMCA counselors who will bring our fishing courses into their summer camps, and passionate anglers who are taking the next step in stewardship!

Diadromous Fisheries Restoration

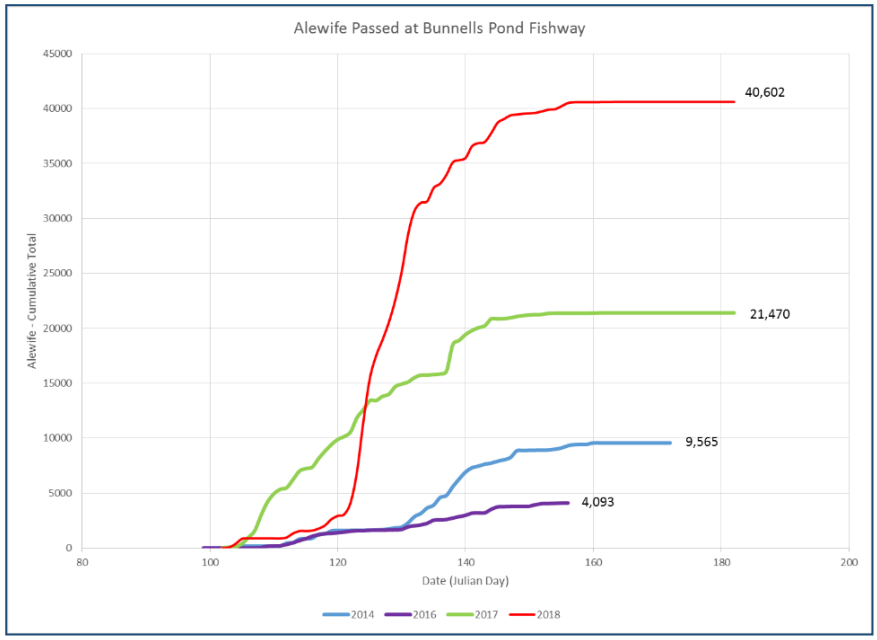
SPRING DIADROMOUS FISH RUNS

The spring fish runs ended in July with the following highlights:

- **American Shad in the Connecticut River** experienced a moderate run this season, with 275,232 fish passed over the Holyoke Dam in Massachusetts. This is much lower than the 543,896 passed last year but is above the long-term average. The shad count at the **Rainbow Dam Fishway**, on the tributary Farmington River, was 388, as compared to 615 last year.

American Shad passing the viewing window at the Rainbow fishway.

- This year saw a fair run of **American Shad in the Shetucket River** with 1,216 fish passed at the Greeneville Dam, compared to 1,912 last year. American Shad counts at this facility tend to fluctuate from year to year and this year's count ranks below both the long term average and the ten year average.
- Runs of **Alewife** in Connecticut were better than last year in many locations. The run to Bride Brook continued to be strong, ending the season at 395,026. Another highlight of the season was the Bunnells Pond Fishway (Pequonnock River, Bridgeport). The fishway exit is equipped with a motion-detecting video system that allows staff to enumerate passage. A total of 40,602 Alewife was passed in 2018, far surpassing last year's total of 21,470.



Alewife yearly passage totals at Bunnells Pond Fishway. The figure depicts the size and timing of the Alewife run through the fishway since 2014 (note: camera malfunction prevented enumeration in 2015). This year (red line) the run got going later in the season than last year (green line) but by May 9th (Julian date #129) had overtaken the previous record year of 2017.

- Runs of **Blueback Herring** were poor just about everywhere in Connecticut. Passage numbers at the Holyoke Fish Lift were up slightly from recent years but do not compare to historic counts.
- Two adult **Atlantic Salmon** were documented passing the Holyoke Dam Fishlift. No other salmon were reported in the Connecticut River watershed. All states with the exception of the Connecticut discontinued salmon stocking after 2013. The salmon that returned to Holyoke either went out to sea as 3-year old smolts, or were strays from tributaries in Connecticut.
- **Sea Lamprey nest surveys** are conducted in stream sections upstream of fishways where we lack the ability to count migrating adult Sea Lampreys. Nest surveys allow us to estimate the number of fish that created them and allow year-to-year comparisons. On July 9th and 12th, staff (assisted by The Nature Conservancy) counted 93 nests upstream of the Leesville Dam on the Salmon River. This resulted in an estimate of 254 Sea Lampreys (down from 382 in 2017). Data show that Sea Lampreys continue to colonize habitat in the upper Jeremy River that is now accessible after the removal of the Norton Mill Dam: 166 Sea Lamprey were estimated to have spawned in that portion of the watershed as compared to 127 in 2017.

Staff counted Sea Lamprey nests such as this one, with spawning fish still present. The surveys are conducted after spawning is over so spawners are rarely seen.

AMERICAN EEL

- **Yellow eel survey**- Electro-fished American Eel index sites in the Blackledge River and sites within the Housatonic, Natchaug and Scantic river drainages. Sampling these sites allow staff to compare local American Eel densities with the number of downstream dams (to Long Island Sound). The data will also allow staff to monitor the progress of re-colonization as improved passage for American Eel at dams is provided.
- **Upstream passage monitoring of American Eel** - Eel passage through the monitored eel passes will continue until mid-October and to date over 93,000 eels have been passed upstream (Fishing Brook = 41,593; Chapmans Pond = 45,859; Mill River Eel Pass = 3,466; Greeneville Dam = 1,588; and Kinneytown Dam = 769).
- **Downstream passage monitoring of American Eel (silver phase)** – The Groton Utilities Conte Airlift Bypass (CAB) has been installed and has begun operation for its third season. No migrating eels have been captured yet, probably due to the warm weather. The Connecticut Water Company is currently constructing a CAB at their Kelseytown Reservoir in Clinton with the hopes of starting operation this September.

SEA-RUN BROWN TROUT

Work continued on monitoring the **Iijoki strain of sea-run Brown Trout** at Burlington State Fish Hatchery (BSFH):

- The trout imported last year as eggs (2017 year class) are now parr residing in outside raceways at BSTH. They were sampled in August to evaluate growth and fin condition. Studies suggest that anadromous salmonids stocked as smolts with good fin condition have a higher rate of return as adults compared to those that are stocked as smolts having poor fin condition. Data are currently being analyzed, but preliminary results indicate that fin condition, average length and weight are very similar to the previous year.
- All of the remaining 2017 year class fish at BSFH (approximately 12,000 – 14,000) will be stocked as smolts in the spring of 2019.
- The fish that were imported as eyed eggs this year (2018 year class) continue to do well at BSFH. Approximately 15,000 of these fish will be stocked this fall. The remaining fish will be transferred to outdoor raceways to be held for smolt production for 2020.

FISHWAY OPERATIONS & MAINTENANCE

- Most fishways were closed for the summer at the end of June or in early July. The **Rainbow Dam Fishway** (Farmington River, Windsor) and the **Leesville Dam Fishway** were closed in early July.
- The Fisheries Division has recently received complaints that the new **Scotland Dam Fishlift** (Shetucket River, Windham) is not operating. This fishlift, like most fishways in Connecticut, cease operation in the summer when there are no fish moving. There is no need for this fishlift to operate throughout the summer. The fishlift's owner, FirstLight Power, conducted evaluation studies of upstream passage at this facility in the spring and will initiate downstream passage studies in the fall.
- Staff replaced the existing wooden fishway baffles at the **Hummers Pond Fishway** (Fence Creek, Madison) with aluminum ones fabricated by students at Asnuntuck Community College.
- **Chalker Millpond Fishway** (Chalker Brook, Old Saybrook). Staff repaired damaged fishway weirs.

Seasonal Resource Assistant Peter Grundy installing new baffles in the Hummers Pond Fishway.

FISH PASSAGE PROJECTS

- **Flock Process Dam Removal** (Norwalk River, Norwalk)- This was the first dam on the Norwalk River and it had been a barrier to migratory fishes for over 150 years. The Town of Norwalk received "Hurricane Sandy" funding from the U.S. Fish & Wildlife Service and Section 319 funds from DEEP to pay for the removal. Fisheries Division staff have assisted the Town with the project for many years.

After many years of delays, the dam finally came out in August. Out-of-stream site work will continue into September.

Left. *The Flock Process Dam being removed, three feet of the top of the dam has already been removed when this photo was taken.* Right. *The same location as the photo on the left, with the dam gone. Note the double-leader tree stump in both photos.*

- **Cannondale Dam Breach** (Norwalk River, Wilton). This is the third dam on the Norwalk River and years ago the Division worked with many parties to build a small fishway around it. However, the dam sprung a leak which drained the pond so that the fishway was dry and non-functional, yet the dam still blocked fish runs. This summer, staff worked with Trout Unlimited and The Nature Conservancy to enlarge the breach in the dam so that fish could pass through and continue upstream. It is hoped that eventually the dam owner will seek a full removal of this decrepit dam but in the meantime this notch will provide fish passage.

Bruce Williams (with jackhammer) and Dave Ellis (green shirt) of the Diadromous Program work on creating a notch in the Cannondale Dam while volunteers from Trout Unlimited and Sally Harold of The Nature Conservancy (gray t-shirt) look on.

- **Macedonia Brook Dam Breach (Macedonia Brook, Kent School, Kent)-** In the summer, the Housatonic River gets very warm and trout crowd into cool tributaries. A small dam under a bridge at the Kent School has blocked trout from getting very far upstream in Macedonia Brook. Trout Unlimited worked with the school and the Kent Inland Wetlands Commission to get permission to notch this unregulated dam. Staff assisted for two of the hottest days of the summer using sandbags, jackhammers, and a concrete saw to open up access to this cool brook.

Fisheries staff begin to build a cofferdam to dewater the central portion of Macedonia Brook Dam. Left to Right: Dave Ellis, Bruce Williams, Jake Perfetto (seasonal worker), Tim Wildman, Steve Gephard, and Kirk McPherson (seasonal worker).

This photo shows the completed notch with flow restored. Trout will be able to swim through that notch to get above the dam.

- **Heminway Dam Removal** (Steele Brook, Watertown). The Town of Watertown owns this orphan dam that has contamination issues and has sought to remove it for years. DEEP provided critical funding to help move this project forward and work began in August. Progress has been slow due to rain but the pace is expected to pick up during the fall. There are downstream dams yet to be addressed so this removal will not yet promote anadromous fish restoration but the Division has supported this project as a step in a long-term process to rehabilitate Steele Brook.

Heminway Pond spillway with a breach and stone filter used to drain the pond. This project will require the diversion of flow and considerable moving of sediment before the entire dam is removed.

- Other projects expected to occur later this summer/fall are the **Dolan Pond Fishway** (Falls River, Essex) and the **Old Papermill Pond Dam Removal** (East Aspetuck River, New Milford).

- Staff continued to work with dam owners and regulators on hydroelectric development projects including new projects at the **Upper Collinsville Dam** (Farmington River, Canton) and the **Pomperaug River Dam** (Pomperaug River, Woodbury) as well as an upcoming re-licensing of the **WyreWynd Project** (Aspinook Dam, Quinebaug River, Griswold).

PUBLIC OUTREACH AND MISCELLANEOUS

- Provided a tour and technical information at the Rocky Neck Culvert (critical fish passage for Bride Brook Alewife) for a national meeting of Restore America's Estuaries, hosted by **Save the Sound**.
- Staff offered remarks at the ribbon-cutting event hosted by the **Quinnipiac River Watershed Association's** expanded river canoe trail. The Division had previously provided support for interpretive signage along the river.
- Continued to work with the **Mystic Aquarium**, providing technical advice on its new exhibit about Long Island Sound and is working with the Aquarium to plan events for the International Year of the Salmon (2019).
- Staff was interviewed by a journalist with **Sea Grant** about shad fishing in Connecticut. The article will appear in a future edition of its newsletter.
- Steve Gephard attended the annual meeting of the **American Fisheries Society** in Atlantic City, NJ and made a presentation on Sea Lamprey restoration and co-authored a paper presented by Brian Murphy of the HCE program on the Lyman Brook Tributary culvert- PIT tagging study. Dave Ellis also attended the meeting and helped organize and moderate a symposium on shad and river herring.
- Staff helped run the annual meeting of the **Riverine Migratory Corridor work group** of the Long Island Sound Study. This meeting is attended by various NGO and agency staff who work in Connecticut on fishway and dam removal projects. The objective is to update the database on projects and share information and ideas.