2017

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

Diadromous Fisheries Restoration

SPRING DIADROMOUS FISH RUNS

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

- **American Shad in the Connecticut River** experienced the third highest total in the 50-year history of the restoration program, with 543,896 fish passed over the Holyoke Dam in Massachusetts. This is higher than the 385,930 passed last year but significantly less than the record of 721,764 in 1992.
- A fair run of **American Shad in the Shetucket River** with 1,912 fish passed at the Greeneville Dam, compared to 2,669 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.
- Twenty adult **Atlantic Salmon** returned to the Connecticut River this spring, up from last year's total of five. All other states in the Connecticut River watershed discontinued stocking salmon in 2013. Starting in 2018 any adult salmon returning to the river will likely have originated from Connecticut.

A 30 inch long adult female salmon documented on video at the Rainbow fishway, June 13, 2017.

- Runs of **Alewife** were better than the past two years in many locations. The run to Bride Brook had dropped for the third straight year prior to this year's record return of 386,325 fish.
- Runs of **Blueback Herring** were poor just about everywhere. In the Connecticut River, sampling in places like Wethersfield Cove and the lower Farmington River yielded low numbers. Passage numbers at the Holyoke Fish Lift were up slightly from recent years but do not compare to historic lift counts.

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 (2016 Cohort) are now parr residing in outside raceways at BSFH and 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 slightly less than last year's cohort measured at about the same time last year. The difference in these metrics should not affect the viability of the smolts.

Cover: *Fisheries staff, joined by three "Save The Sound" staff, electro-fish for yellow eels on the East Branch Eightmile River. This sample site, located upstream of the former Ed Bills Dam (removed in 2015) has increased densities of smaller sized eels – one of the many benefits of dam removal. (see page 3 for more information).*

- All of the remaining 2016 year class fish at BSFH (approximately 12,000 – 14,000) will be stocked as smolts in the spring of 2018.
- The fish that were imported as eyed eggs this year (2017 year class) continue to do well at BSFH. Approximately 15,000 of these fish will stocked this fall. The remaining fish will be transferred to outdoor raceways to be held for smolt production for 2019.

Iijoki Sea Trout Fin Evaluation, 2017. **Left***: One of the 400 fish sampled at BSFH. This fish (showing-off some great looking fins), and the rest of the cohort imported as eggs in 2016 will be released early next spring.* **Right***: American Fisheries Society Hutton Scholar Shannon Dolan aided the Diadromous crew during the summer; including with the fin evaluation.*

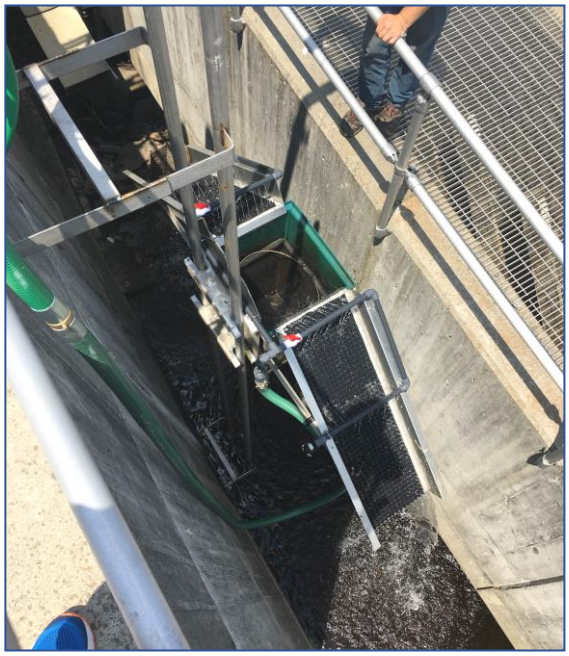
AMERICAN EEL

- **Yellow eel survey**- Electro-fished the yellow eel index sites in the Blackledge River, Pomperaug 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 dams above Long Island Sound to where each site is located. It will also allow staff to monitor the progress of re-colonization as improved passage at dams for American eel is provided.

- **Eel Pass Repairs/Modifications** – Repairs, including new climbing substrate, eel pass covers, and new water supply system, were completed to the **Kinneytown Eel Pass** on the Naugatuck River in Seymour. Modifications to the **Wyassup Lake Eel Pass** (North Stonington) were also completed. The transverse sloped eel ramp, designed to regulate water flow passing into the eel pass exit with changing headpond elevations, was modified to improve its operation (*see photos on next page*). While on site staff also secured the sections of climbing substrate to the aluminum ramp. The **Occum Eel Pass** (Norwich/Sprague) owned and operated by Norwich Public Utilities (NPU), was continually being damaged by debris flowing over the dam's spillway and NPU was unable to make timely repairs resulting in loss of eel passage. NPU suggested that the eel ramp be replaced with an eel lift similar to what was installed at the Greeneville Dam in 2012 and the eel Lift began operation in late June and to date (9/9) has passed 445 eels.

Wyassup Eel Pass. **Left***: Transverse slope allows the eel pass to operate at varying headpond elevations. This eel pass was incorporated into the design of the dam repair with the entrance of the eel pass secured between the dam's wing-wall and a concrete eel guidance wall.* **Right**: *The exit chamber was extended to meet the eel ramp at a lower elevation.*

*The **Occum Eel Lift** being lifted for a check. Located between the Occum Fishway and the wall separating the turbine forebay from the river, the eel lift has two short eel pass ramps leading to a trap. An electric winch is used to raise the ramps and the trap to check for eels. During high flow events, or when the eel lift is not being operated it can be left in the raised position.*



FISHWAY OPERATIONS & MAINTENANCE

- Most fishways were closed for the summer in July [*Rainbow closed on July 12th, Leesville closed on July 31st*].

- The Chapmans Pond Downstream Bypass (Menunketesuck River, Clinton/Westbrook) was modified after the first season of operation revealed that flows through the bypass were too turbulent. Staff increased the height of the chamber walls to better contain the flow and added weirs to double the number of pools which will result in a more appropriate flow pattern entering the bypass pipe.

***Chapmans Pond Bypass**. The stone and masonry side walls of the bypass chamber were raised and concrete was poured on the downstream wall to improve operation.*

FISH PASSAGE PROJECTS

- The **Springborn Dam Removal Project** (Scantic River, Enfield) began in July and is expected to be completed in October. This 26-foot high, State-owned dam was in poor condition and was blocking diadromous fish runs and segregating wild brook trout populations. The planning and design of this dam removal, the largest in the state to date, has been underway for over five years. The DEEP lead is the Water Planning and Management Division with assistance from the Fisheries Division. Much of July and August was spent on mobilization, developing access roads and water handling. The final removal of the rest of the dam and the excavation of the contaminated sediment will be done in September. The $4.5 million project is funded through both a USFWS Hurricane Sandy Resiliency Grant and state bond monies.

When the former pond behind the Springborn Dam was drained, Fisheries staff, including Bruce Williams with the green net, were on hand to rescue stranded fish and mussels and move them to safe habitat.

The Springborn dam was breached on the far side and a diversion canal dug to send river flow over to one side of the former pond, drying up the near side so sediment excavation could be done under dry conditions.

- Construction began on the long-awaited **Scotland Dam Fishlift** (Shetucket River, Windham) as a condition of FERC re-licensing for FirstLight Power. This will be the fourth fishway on the Shetucket River and will allow American Shad and other diadromous species to reach Willimantic. Work is expected to stretch into next year and the lift will hopefully be operational by spring of 2018.

Construction at the Scotland Dam is currently focusing on the installation of pipe to pass downstream migrants, like juvenile shad and adult eels. The pipes will have an opening through the old hydro intake grates and spill the fish on the downstream edge of the dam. The grate will be replaced with new one with a ¾ inch gap that will prevent silver eels from entering and passing through the turbines.

- **Fish Passage Improvement on the Hammonasset River, Madison**- This stream supports many diadromous fish species but an old breached papermill dam was discouraging upstream passage of some species. In low water, the existing breach was difficult for many species to surmount. The Nature Conservancy worked with the land owner, the Madison Land Trust, and the Town of Madison to secure all necessary permits and permission to deepen the existing breach. Fisheries Division staff assisted with the one-day project.

From left to right, Bruce Williams, Steve Gephard, Tim Wildman, Kirk McPherson (all of the Fisheries Division) and Sally Harold of The Nature Conservancy observe while off-camera seasonal staff crank a grip hoist to pull a very large boulder from the breach in the old dam. Sally is trained on the use of the grip hoist and the equipment was provided by the USFWS. Several such massive boulders were moved to create an opening that could be passed by fish in the spring.

- Staff continued to work with partners on the development of future fish passage projects at Blackledge River Dam (Glastonbury), Dolan and Millpond dams (Essex), Noroton River culvert (Stamford), Upper Collinsville Dam (Canton), and a fishlift at the Rainbow Dam (Windsor).

SEA LAMPREY

- **Sea Lamprey nest surveys** are conducted in stream sections upstream of fishways where we lack the ability to count migrating lampreys. Nest surveys allow us to estimate the number of fish that created them and allow year-to-year comparisons. This year we estimated 382 lampreys ascended the Salmon River via the Leesville Fishway (down from 2016= 669). However, with the Norton Dam removed and new habitat available above that project, 127 lamprey were surveyed in the newly opened area. The Eightmile River watershed survey found 21 lampreys nesting in it this year, down from 109 in 2016. The Eightmile River was enumerated using video counts at the Moulson Pond Fishway.

Staff counted sea lamprey nests such as this one, still with spawning fish in it.

- Staff transplanted 96 pre-spawn adult **Sea Lamprey** from the Rainbow fishway in Windsor to the Pequonnock River in Trumbull to re-establish a migratory run.

Adult lamprey being loaded onto a truck for transport.

MISCELLANEOUS ACTIVITIES

- During the spring fish runs, staff **transplanted pre-spawned shad and river herring** from streams with strong runs and released them into streams in which we are promoting run restoration (typically above dams with new or planned fishways). River herring transfers for 2017 have been reported previously but some American Shad transplants occurred in June. This year, two streams were stocked with shad: Mattabesset River- 159 fish, Farmington River- 448 fish. U.S. Fish and Wildlife Service staff assisted with moving the majority of fish into the Farmington River (big thanks to them).

- Assisted Yale University on multiple occasions on Rogers Lake (Old Lyme) with the sampling of juvenile Alewife. Purse seines were used to collect Alewife samples for monthly indexing of abundance and also for genetic analysis.
- Worked with Save the Sound (STS) on a **Dam Removal Monitoring project** funded by the USFWS. The USFWS applied for and secured a grant to study three sites where a dam in Connecticut was recently removed. They sub-contracted with STS. The study includes documenting the responses of local vegetation and fish communities to the dam removals over three years. Staff from the Fisheries Division help guide the study methods for the fish work. Preliminary results show that anadromous fish immediately moved upstream to spawn in two of the three sites, all three sites maintained a slope suitable for fish migration, and all three sites experienced changes in stream substrate that were favorable to supporting stream-residing fish species. The change in species diversity was very rapid at one site but more gradual in the other two sites.

A beautiful wild brook trout sampled from Whitford Brook where the Hyde Pond Dam used to impound water. The stream was pickerel habitat, but now is trout habitat.

- Staff removed stands of the invasive **water chestnut** from sites on the Connecticut River on July 27. Sites included Selden Cove and Salmon River Cove. Many truckloads were hauled away for disposal. This work is part of a collaborative approach between the DEEP, the USFWS (Silvio Conte Fish & Wildlife Refuge) and volunteers. Staff also removed water chestnut from the headpond above the Clarks Pond Dam and Fishway (Milford) in August.

Seasonal Resource Assistant Kirk McPherson sitting on top of a pile of water chestnut being ferried out of Selden Creek

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. During the last quarter our program reviewed twelve CTDOT bridge and culvert replacement projects, ten municipal bridge and culvert replacement projects, and one municipal water diversion project. Permit conditions require HCE staff to assist project contractors during construction to ensure the proper installation of fish passage and habitat structures. Onsite construction management services were provided for the following projects:

- **CABIN BROOK, Colchester (Route 11)**
  Triple metal arch culverts were rehabilitated with new sliplined culverts. Fish passage enhancements included an inlet diversion wall to convey daily flows into a single culvert, a culvert baffle system, and a boulder weir at the outlet to provide a deep holding pool and suitable water depth to facilitate passage into the baffled culvert.

Inlet diversion wall at Cabin Brook conveying stream flows into one culvert.

- **FALLS RIVER, Essex (Walnut Street)**
  This crossing involved a major redesign to provide fish passage as four metal culverts that blocked fish passage due to perched conditions at the outlet will be replaced with a clear span bridge. The stream channel will be restored and boulder clusters installed to provide a diversity of instream habitats.

Boulder cluster being installed in Falls River to provide instream habitat diversity.

- **HEWITT BROOK, Preston (Route 2)**
  A metal arch culvert was replaced with a bottomless culvert and the stream channel was restored to provide upstream fish passage. Large boulders were installed upstream and downstream of the crossing to increase the diversity of instream habitats and provide water velocity refugia.

- **TRIBUTARY TO SHERMAN BROOK, Colchester (Route 2 on/off ramp)**
  An arch metal culvert was replaced with a concrete box culvert sunken one foot below grade. Fish passage enhancements included a low flow channel and boulder weir at the outlet to create deep holding pool for native brook trout population.

- **LYMAN BROOK, Marlborough (Route 66)**
  Twin metal culverts were rehabilitated with new sliplined culverts. Fish passage enhancements included: inlet diversion wall to convey daily lows into a single culvert, v-notch baffle system, concrete 3 weir outlet fishway and holding pool to facilitate passage into fishway.

Concrete fishway and holding pool to facilitate fish passage on Lyman Brook.

- **TRIBUTARY to LYMAN BROOK, Marlborough (Route 66) - 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 40 native brook trout was collected by stream electrofishing. Thirty-two fish were PIT tagged while another eight fish were identified as recaptures from 2016. In addition, a stream-wide mobile search of all tagged fish was conducted in July to assess fish locations prior to monitoring at the culvert in September.

- **MOOSUP RIVER, Brunswick Mill Dam #1 removal**
  American Rivers, in partnership with the HCE program and the USDA Natural Resources Conservation Service, continue to work on the Moosup River dam removal project. This project, being implemented over a ten-year period, includes the removal of five dams, two of which have been removed since 2013. When completed, the project will reconnect fish habitats to over 6.9 miles of the mainstem Moosup River. The partnership recently received all State and Federal regulatory approval to remove Brunswick Mill Dam # 1. Removal, estimated to occur over a 15-day period, is scheduled to take place by the end of September.

Remnants of Brunswick Mill Dam #1, constructed of timber and rock. Removal is scheduled to occur before the end of September.

GRASS CARP PERMITTING

HCE received 58 permit applications during the last quarter for the liberation of triploid grass carp into private and public ponds and lakes. Of those, ten were new applicants that required a site inspection and the remaining applications were for the restocking of previously permitted ponds. The locations of all applications were checked in the DEEP Natural Diversity Database to ensure that the introduction of grass carp would have no impact on threatened or endangered species. Thus far this year (as of 8/31), a total of 116 triploid grass carp permits have been issued. Of the 109 applications received this calendar year, 91 have been permitted for the liberation of grass carp. Fish have been released into ponds in 57 towns across the state. As in the past, some of the new applications have required more research and collaboration with DEEP's Water Planning and Management Division (particularly the Dam Safety unit) to ensure the safe introduction of grass carp into Connecticut waters.

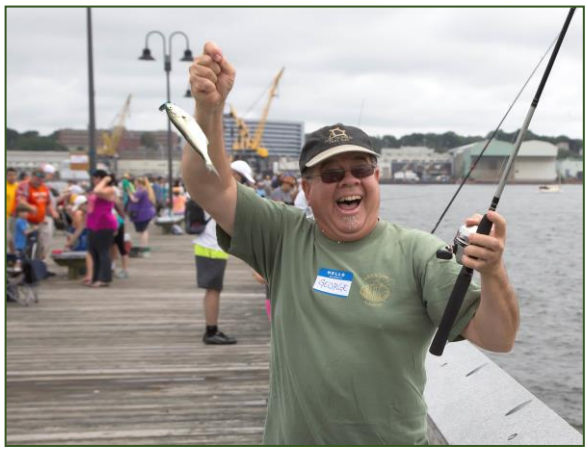
COASTAL HABITAT

Staff reviewed three dredging projects in tidal waters, two bridge/culvert projects that ranged from repairs to full replacements, four aquaculture projects, and two 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.

CARE & Constituent Services

SPECIAL FISHING EVENTS. Over 1,000 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 6th annual Saltwater Fishing Day at Fort Trumbull State Park. The day was planned to coincide with the second FREE Fishing License Day of 2017. This year's crowd of roughly 400 participants was the largest to date! The beautiful weather and good fishing provided a fun-filled family atmosphere. Several "Facebook Live" segments showed another thousand people the great fishing and fun they were missing out on. A variety of marine fish species were caught by participants including snapper bluefish, scup, sea bass, fluke (even a few "keeper" size), butterfish, blue crab, and loads of spider crabs! Thanks to the dozens of incredible CARE volunteers 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/229483687



"PORGY and SNAPPER BLUE": The 6th annual Saltwater Fishing Day at Fort Trumbull State Park was a great success. Fishing was very productive including some nice sized scup (left), and Fisheries Division retiree George Babey (right) even got in on the "snapper blue" action!

- ***FOLLOW-UP (RETENTION) FISHING CLASSES:*** Based upon internal review of our fishing activities to evaluate areas to increase "retention", CARE implemented two "continuation with support" class options, an integral component of the Outdoor Recreation Adoption Model, that link the "trial" phase to "self-identification as an angler".
  - ***Family Fishing Nights***: Hosted five fishing events for 65 graduates (invitations sent to those who provided an email address during registration) of Family Fishing Courses from 2011-2017. Fishing trip locations were spread throughout the state at family friendly locations: Chatfield Hollow State Park (Killingworth), Stratton Brook State Park (Simsbury), Colony Pond (Ansonia), Mohegan Park Pond (Norwich), and Lake Wintergreen (Hamden). These trips were designed to provide a CARE sponsored opportunity for past students to re-engage with fishing.
  - ***Hamden 6th Grader Fishing Nights***: Hosted five fishing events for 60 Hamden 6th grade students and their families at Lake Wintergreen, Hamden. Invitations were sent home with students that

attended a field trip to the CARE center on Forster Pond this spring. Hopefully, this additional fishing experience will increase student's desire and confidence to fish together with their family.

FREE FISHING LICENSE DAYS. The two free fishing license days held in 2017 were on Sunday, June 18 and Saturday, August12. Eight hundred thirty-three people obtained the free 1-day license (453 and 380 respectively).

SUMMER FISHING CLASSES. The CARE *Summer Fishing* crew conducted 49 classes for 1,110 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. Our seasonal summer fishing 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 *– Many summer Fishing classes were taught at community fishing Waters, providing some nice Channel Catfish catches!*

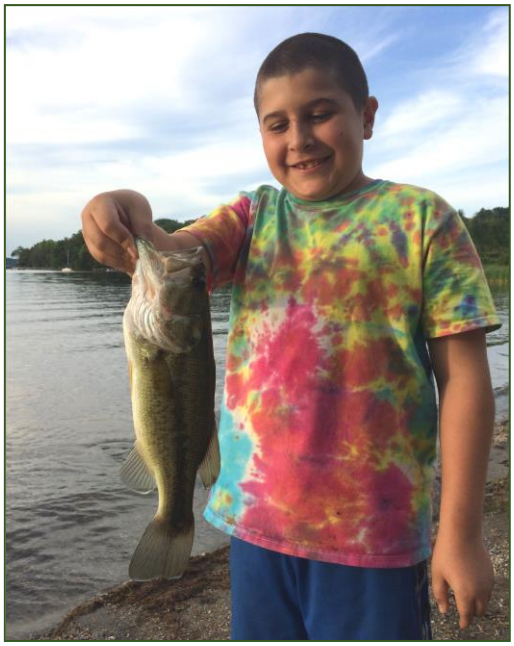
*"**Summer Fishing crew**" – The CARE Summer Fishing crew taught 49 half-day angling education sessions to 1,110 day campers this year, which all included a fishing trip.*

FAMILY FISHING COURSES. CARE Instructors and staff hosted 21 Family Fishing Courses for over 500 students this summer. These courses consist of classroom lessons and conclude with an instructor lead

fishing trip. Several YMCA camps integrated Family Fishing Course lessons into their summer activity sessions after sending staff to attend CARE New Instructor Training in June.

NEW INSTRUCTOR CERTIFICATION. Nine new Instructors completed certification training at the CARE Center this past June, bringing the program total to 757 certified volunteers since 1986. This group of newly Certified CARE volunteer fishing Instructors consisted of two of our CARE summer staff, YMCA camp counselors who will bring our fishing courses into their summer camps, Boy Scout troop leader, Compass Youth Collaborative (Hartford) staff, former CARE students who are taking the next step in stewardship, and a "Women's Only" class graduate who is joining the Instructor role for her next CARE class.

NEW INTERACTIVE FISHING INFORMATION RESOURCE…Something **Fishy in Connecticut** is a new interactive fishing resource for novice and expert alike. This interactive application has lots of great information, including interactive maps and links, providing all you need to know about Connecticut's fisheries. The link is also on our main page at www.ct.gov/deep/fishing.



*"**Bantam Lake and Pachaug Pond**" – **Family Fishing:** A few proud young anglers display their largemouth bass (left -from Bantam Lake) and pumpkinseed (right - from Pachaug Pond) catches during Family Fishing Courses this summer!*

Inland Fish Management & Fish Culture

WARMWATER FISHERIES

LAKE & POND MONITORING. Dissolved oxygen (DO) and temperatures were measured from surface to bottom in July and August at 13 lakes (Beach Pond, Black Pond (Woodstock), Colebrook Reservoir, Crystal Lake (Ellington), Highland Lake, Lake Lillinonah, Mashapaug Lake, Mohawk Pond, West Branch (Hogback) Reservoir, West Hill Pond, Lake Wononskopomuc). Thermoclines (the depth with the greatest temperature decrease within the narrowest band of water) were detected at typical depths (~18 feet) this summer. Due to a cool, wet summer, a layer of cold oxygenated "trout water" (dissolved oxygen concentrations ≥ 4.0 mg/l and temperatures ≤ 19.0 °C) persisted through August in most waterbodies sampled. Temperature/oxygen data were collected from two lakes (Crystal Lake and Highland Lake) in July and August, and will be taken again in September to better document the month-to-month changes in habitat that occur throughout the summer.

NORTHERN PIKE. The statewide Northern Pike production from DEEP managed marshes in 2017 was 2,474 fingerlings, which was well short of the project goal of 12,864 fingerlings. As a result, only Winchester and Bantam lakes were stocked with substantial numbers of fingerlings (see table below). Possible reasons for the production shortfall include: 1) three marshes are no longer suitable for pike production and were not used in 2017 (Upper Haddam, Experimental and Cemetery marshes), 2) at Mansfield Hollow Marsh, insufficient water levels and a late frost may have reduced egg survival, and 3) the pike fry rearing experiment at the Punch Brook ponds on the Burlington Hatchery property did not yield the predicted number of fingerlings. Because the rearing of pike in small hatchery ponds is new to Connecticut hatcheries, techniques to maximize production are still being developed.

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	1,202	95%
Lower Connecticut River	39	3%
Mansfield Hollow Reservoir	61	3%
Pachaug Pond	0	0%
Winchester Lake	1,172	64%

Northern Pike fingerling.

LAKE & POND ANGLER SURVEYS. Open-water angler surveys began on Opening Day (2nd Saturday in April) at **Beach Pond** (Voluntown/Exeter[RI]), **Pachaug Pond** (Griswold), and **Amos Lake** (Preston). Surveys assess angler catch, effort, and opinions of FD management in these lakes. Data obtained will be used by a variety of FD management projects, including the Bass, Northern Pike and Walleye Management Projects. These surveys will conclude on October 31.

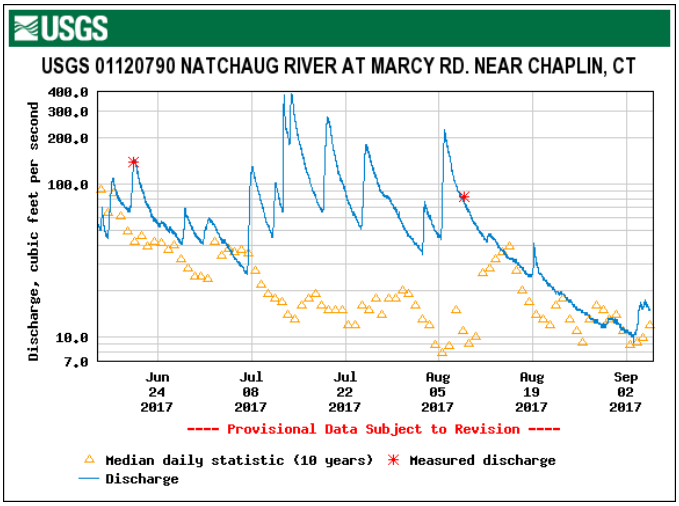
COLDWATER FISHERIES

2017 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 2,000 large (>12 inches) Brown Trout prior to the July 4th holiday. The typical Labor Day stocking (1,700 >12 inch fish) of the Farmington River TMA (from below year round catch and release area to the Rt. 177 bridge in Unionville) was conducted during the week prior to Labor Day. In addition, due to cooler than normal summer water temperatures and reasonably good flows (the opposite of last year's conditions at this time!), the Housatonic River TMA (Cornwall) was stocked with 1,000 > 12 inch Brown Trout and 3,000 "yearling" (5-8 inch fish) Brown Trout and the Bull's Bridge Bass and Trout Management Area was stocked with 500 > 12 inch Brown Trout prior to Labor Day.

2017 FALL BROODSTOCK ATLANTIC SALMON STOCKING: As in the past several years, approximately 1,400 Atlantic Salmon (1,200 2-5 lb. fish and 200 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 Naugatuck and Shetucket rivers, Crystal Lake and Mount Tom Pond.

STREAM MONITORING.

- ***This summer.*** In contrast to the severe drought conditions of last summer, this has turned out to be a cool, wet summer with only 14 days of air temperatures over 90°F. Rain has been fairly consistent for June and July and resulted in above average stream flows. However, sparse rain throughout August resulted in stream flows quickly falling close to long term averages.



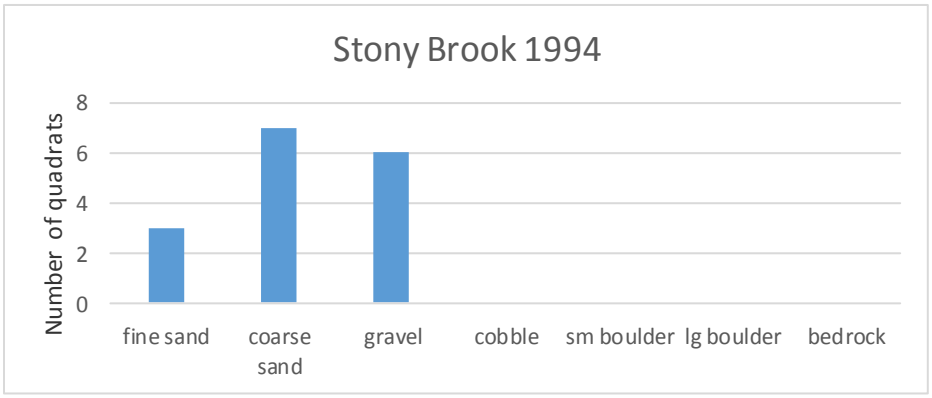
A typical hydrograph from summer, 2017, this one for the Natchaug River (courtesy of USGS).

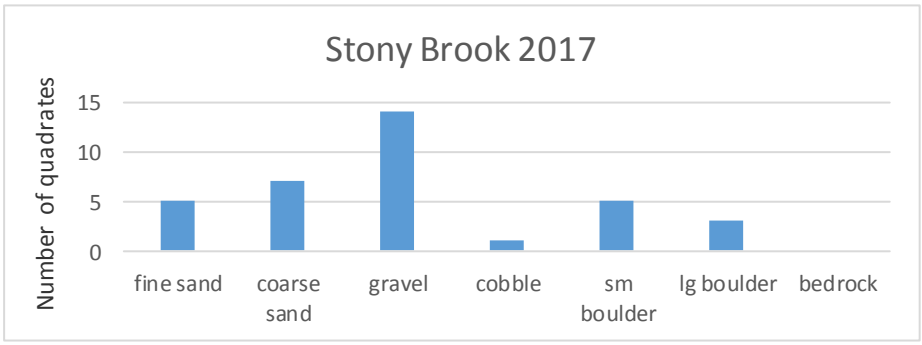
- ***Fish population sampling.*** Stream electrofishing was completed on 190 sites statewide (as of September 1) as part of the coldwater monitoring project. This year, a directed focus of this project was to resample streams (30 sites) where historic fish population data had not been collected since the original Stream Survey study, done over 20 years ago. Other high-priority sample sites were, 1) smaller, previously un-inventoried, headwater streams (73 sites, to expand baseline data on fish species distributions, especially wild brook trout), and 2) streams (20) that were found to be dry in 2016. The resampling of Old Stream Survey sites should allow FD to determine broad-based population shifts occurring over a 10-20 year time frame. Collaborative sampling was done with staff from the Habitat Conservation and Enhancement (HCE) program on 21 stream locations needing fish community data.

Additionally, two sites on the Pequabuck River were sampled collaboratively with staff from DEEP's Water Planning and Land Reuse Bureau (WPLR) and the Radiation unit to collect specimens for radium testing. DEEP Commission Klee assisted with this sampling, which occurred on one of the hottest and most humid days of the entire summer (July 20)! The Commissioner showed himself to be a quick learner on the finer points of netting small fish in a fast flowing stream environment and much to his credit, weathered the intense and demanding climatic conditions of the day.

From left to right, Fisheries Biologist Brian Eltz, WPLR Supervisor Chris Bellucci, and DEEP Commissioner Robert Klee while sampling the Pequabuck River Bristol, CT in July 2017.

- ***Streambed substrate survey.*** It has been 10 years since the Department of Transportation (DOT) stopped using sand for winter road maintenance. Information in the literature suggests that road sand that had entered the stream should have been flushed from the system by this time. During the initial stream survey work (1988-94) substrate composition and embeddedness of the stream bed substrate was evaluated at all survey locations. This year, 30 locations downstream of state highways and interstates were reassessed for substrate composition and level of substrate embeddedness. Initial reviews of a couple of sites indicated larger substrate particles and reduced levels of embeddedness by sand and silt. The next phase will be to review all sites and then to collect fish population samples and test for possible changes in population structures.





1994 and 2017 substrate composition data at Stony Brook.

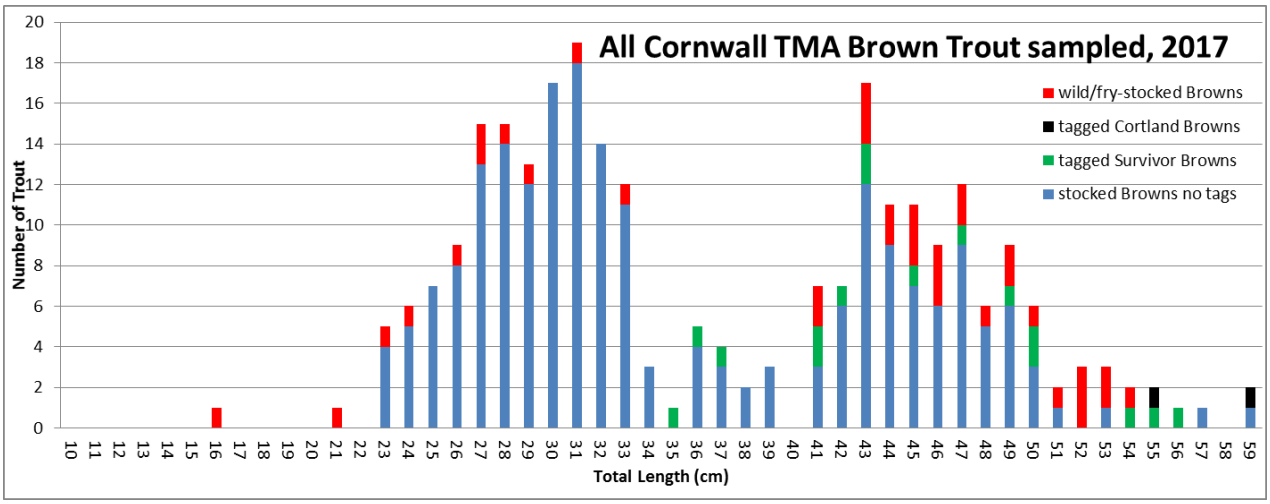
- **Water temperature logger deployment.** Water temperature data loggers were again placed in a number of Connecticut streams this spring. The focus was on long term reference streams. Fish data were collected from eight of these temperature sites and will be used in development of regional water temperature/fish population models.

WILD TROUT STREAM SAMPLING. Thirty-two streams with wild Brook Trout and/or wild Brown Trout populations 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, with some streams showing depressed abundance and reproduction caused by the drought in 2016, while others were surprisingly more resilient, with at least moderate numbers of adults and young-of-year.

With the help of Commissioner Klee and a job-shadow student, the Mill River in Fairfield was sampled to assess changes in trout management designed to maximize the contribution to the fishery from increasingly strong wild brook and brown trout. At three sites where adult trout stocking was discontinued, the abundance of large wild brown trout more than doubled, saturating the stream habitat with a strong and balanced population. It is anticipated that Class 1 Wild Trout regulations will go into effect on this stream section in early 2018, as well as year-round catch-and-release regulations at the Trout Management area just downstream.

DEEP Commissioner Klee (3rd from left) and high school job-shadow student (2nd from left) help the stream sampling team assess the Mill River wild trout population.

HOUSATONIC RIVER SAMPLING. An abbreviated annual electrofishing sample was conducted on the Housatonic River TMA (Cornwall) to determine what the potential effects of last year's severe drought conditions were on the trout and smallmouth bass populations there. Smallmouth numbers and sizes were comparable to other year's samples. Surprisingly good numbers of large-very large holdover brown trout were also sampled this year. Based on the comparatively mild conditions experienced this summer, these fish along with those stocked last fall, this spring and just prior to Labor Day (see trout stocking above) should provide for excellent trout fishing during the forthcoming fall season. The Cornwall TMA was sampled at 4 locations and a total of 276 trout were netted, which provided some very interesting results (see chart on next page). The vast majority of the trout (210, 76%), and all of the large trout (111 over 16 inches) were sampled from the Furnace Brook thermal refuge, again highlighting the importance of this location for trout in the TMA. Elastomer tags were still visible on some the largest fish (up to 23.5 inches) confirming that some fish had held over 4+ years since stocking. Almost all identifiable big Brown Trout were Farmington Survivor strain, or wild-looking fish from ongoing tributary fry stocking efforts. Despite annual stocking of 8,000 rainbow trout, only 12 were sampled, 10 of which were in the Furnace Brook thermal refuge. It is not clear what happened to the rainbow trout, but selective mortality and emigration are possibilities.



Numbers of Brown Trout in each centimeter length group, by origin. Stocked browns with no tags were a mix of Survivors and Cortlands.

The Connecticut Department of Energy and Environmental Protection is an Affirmative Action/Equal Opportunity Employer that is committed to complying with the requirements of the Americans with Disabilities Act. Please contact us at (860) 418-5910 or deep.accommodations@ct.gov if you have a disability and need a communication aid or service; have limited proficiency in English and may need information in another language; or if you wish to file an ADA or Title VI discrimination complaint.