

# CONNECTICUT'S SALMONID ACTION PLAN (2021-2025)

Trout and salmon, referred to collectively as salmonids, are among the most popular recreational freshwater fish in Connecticut.

The purpose of this plan is to maintain and improve recreational salmonid fishing and to conserve wild populations in Connecticut.



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This action plan would not have been possible without contributions from the following Fisheries Division staff: Pete Aarrestad, Andrew Bade, Tom Chairvolotti, Bryan Decker, Neal Hagstrom (retired), Jaimie Hays, Michael Humphreys, Ed Machowski, Chris Martin, Brian Murphy (retired), Tim Wildman, Bruce Williams, and Rick VanNostrand (retired)



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**Sport Fish Restoration:** The [Dingell-Johnson program](#) is a cooperative effort involving Federal and State government agencies, the sport fishing industry, anglers and boaters. The program increases sport fishing and boating opportunities through wise investment of excise tax dollars in sport fishery development and management projects. Funds are derived from a 10 percent Federal excise tax on selected fishing tackle and equipment. The Wallop-Breaux Amendment of 1984 expanded the program by adding more tackle and sport fishing equipment under the excise tax and included the Federal fuel taxes attributable to motor boats and small engines. The program has helped State agencies restore and better manage America's fisheries resources.

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### A Message from Mason\*

Greetings fellow trout and salmon anglers, I personally thank you for your passion for our trout and salmon fisheries. Your long-term support is critical to insure generations to come experience the same or better opportunities as we. The five-year plan outlines well thought out actions, developed with your input, focused on improving both our stocked fisheries as well as our self-sustaining wild trout.

The Environmental Conservation Branch has three tenants as we move all of our programs forward; Operational Efficiency (plan Goal 1, 2, 3); Resource Sustainability (plan goals 5, 6, 7) and Equitable Access (plan goals 3, 4, 7). Each of these overarching tenants combined with synergistic goals within the plan coupled with your continued support will continue the long tradition of trout and salmon fishing in Connecticut.

\*Mason Trumble, is the Deputy Commissioner, Environmental Conservation Branch, Connecticut Department of Energy and Environmental Protection. Mason enjoys fishing in all forms from striped bass along the shoreline to pike fishing through the ice. He especially loves to fly fish and even though he has been fortunate to catch sea-run brown trout in Patagonia, bonefish in Belize and cutthroat trout in Idaho, he most enjoys spending the last few hours of a summer evening fishing at one of the many exceptional trout streams and rivers **right here in Connecticut!**



*The actions described within this plan will ensure quality trout fishing for current and future generations*

**The Purpose** of this action plan\* is to provide a suite of actions that will maintain and improve recreational salmonid fishing and to conserve wild populations in Connecticut. Looking ahead, the Fisheries Division will be more adaptive and responsive with salmonid production, distribution, and conservation in order to meet the changing desires and preferences of Connecticut’s residents. The plan focuses on four themes:

**Grow Fish, Catch Fish, Conserve Fish, and Public Engagement.**

**\*Action Plan vs. Management Plan:**

This document is an Action Plan, which is a compilation of tangible items to consider and implement. These actions are presented by theme, goal, and objective.

This action plan differs from traditional Fisheries Management Plans, which describe how fish populations are manipulated through a variety of techniques including regulations (seasons, gear, size limits) and stocking.

**Contents:**

Introduction	5
Past and Current Salmonid Management in Connecticut	7
Theme 1: Grow Fish 1. Maximize efficient production and distribution of salmonids at State Fish Hatcheries 2. Increase the size of fish produced at State Hatcheries	10
Theme 2: Catch Fish 3. Improve access to stocked salmonids 4. Provide a diversity of fish and fishing opportunities that appeal to a wide range of preferences and desires	18
Theme 3: Conserve Fish 5. Maintain a legacy population of Connecticut River strain Atlantic Salmon 6. Conserve wild trout populations	28
Theme 4: Public Engagement 7. Increase awareness and relevancy of salmonid fisheries	36
Appendix A: A List of Goals by Theme	39

**Introduction:** Trout and salmon, referred to collectively as salmonids, are among the most popular recreational freshwater fish in Connecticut. The management of these fish dates back to 1866 with the establishment of the [Connecticut Fisheries Commission](#). Since that time, salmonid management in Connecticut has transitioned from exclusively fry-based stocking (late 1800's) to supporting a five fish per day statewide daily limit by stocking predominantly adult-sized fish (most of the 1900's) and creating a diverse set of trout and salmon fishing opportunities via regulations (2000 to current).

In response to shifting angler preferences, the Fisheries Division published [A Trout Management Plan for Connecticut's Rivers and Streams](#)<sup>3</sup>. This publication set a solid foundation for present-day trout management, but continued shifts in angler attitudes and behaviors, as well as other new challenges in the 20 years since, have created a need for further refinement of present-day salmonid management.

- The public lost fishing access, especially along streams. Changes in property ownership often result in loss of access due to new owners disallowing fishing and/or inadequate understanding or transfer of long-standing fishing easements (legal access for fishing codified within a property deed).
- Participation in fishing is starting to increase again after a 20-year decline.
- Climatic, environmental, and landscape changes (increasing water temperatures, increased development, surface water, and ground water diversions) are degrading or eliminating existing habitat for coldwater-dependent species.
- The preferences of many Connecticut's anglers continue to shift from harvest towards catch and release.

Critical to the long-term sustainability of salmonids, and fishing in general, is increasing the relevancy of fishing to Connecticut residents. Approximately 180,000 people obtain a license to fish in Connecticut annually. With a population of just over three million, a large pool of potential participants remains. Future actions related to salmonid management must consider how to improve dissemination of the many [benefits of fishing](#) in order to entice new people to take up fishing (**recruitment**), re-ignite the passion for those where it is smoldering (**reactivation**), and keep those currently fishing enthusiastic and supportive of our salmonid management and fisheries (**retention**).

To help develop this plan, the Fisheries Division emailed a survey seeking angler preferences for trout and salmon fishing to over 50,000 fishing license holders, hosted six trout and salmon forums around



*Trout fishing in Connecticut has a long tradition of bringing families together to enjoy our natural resources*

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<sup>3</sup> [Hyatt et al 1999, A Trout Management Plan for Connecticut's Streams and Rivers](#)

the state, and hosted one webinar (September to November 2019)<sup>4</sup>. The purpose was to gain input from trout and salmon anglers and have face-to-face discussion focused on four key questions relating to trout and salmon:

1. What makes a good fishing trip?
2. What are things you feel the Fisheries Division does well?
3. Where do you think the Fisheries Division could improve?
4. What are some actions you would take to increase the number of people fishing?

Based on public input and Fisheries Division research, this plan will identify specific objectives and actions related to the following seven overarching goals under four themes:

#### **Theme 1: Grow Fish**

1. **Maximize efficient production and distribution of salmonids at State Fish Hatcheries**
2. **Increase the size of fish produced at State Hatcheries**

#### **Theme 2: Catch Fish**

3. **Improve access to stocked salmonids**
4. **Provide a diversity of fish and fishing opportunities that appeal to a wide range of preferences and desires**

#### **Theme 3: Conserve Fish**

5. **Maintain a legacy population of Connecticut River strain Atlantic Salmon**
6. **Conserve wild trout populations**

#### **Theme 4: Public Engagement**

7. **Increase awareness and relevancy of salmonid fisheries**



*Trout fishing at dawn is a perfect way to de-stress and start the day*

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<sup>4</sup> [A Summary of Public Input Related to Trout and Salmon Fishing in Connecticut](#)

## Past and Current Salmonid Management in Connecticut

Largely in response to the extirpation of [Atlantic Salmon](#)<sup>5</sup> from the Connecticut River watershed, formal state-based fisheries management began with the formation of the [Connecticut Fisheries Commission in 1866](#). One of the stated objectives of the Commission was to re-establish [Atlantic Salmon](#), [Brook Trout](#), and [American Shad](#) populations in Connecticut's waters. A second objective was to replenish Connecticut's depleted fish resources through the import and introduction of a variety of non-native gamefish species .

Early restoration efforts (1870-1890) focused on obtaining fertilized eggs, hatching them streamside, and stocking the newly hatched fry. With advances in fish culture knowledge and technique, the state began to rear the fry within the hatchery until they reached adult size. Connecticut's first hatchery to rear trout for multiple years (to adult size) was in Windsor Locks (1899 to the early 1970's). The production and stocking of large trout became very popular with Connecticut's anglers and created a demand on the state to produce ever-increasing numbers of trout used for "put-and-take" fishing.

**Native** – A fish found within its original geographic range without human influence.

**Non-Native** - A fish occurring outside of its original geographic range where it did not historically exist. This can occur naturally or via movement by humans

**Introduced** - A non-native fish brought by humans to a geographic range where it previously did not exist naturally.

**Invasive** - Generally describes a non-native fish that becomes established and has a negative impact on one or more native species or habitats.



*The State of Connecticut began mass producing adult-sized trout, after World War 2, to support the growing number of anglers and their desire to catch and keep trout*

Currently the Fisheries Division operates [three hatcheries](#); [Burlington](#), [Kensington](#), and [Quinebaug Valley](#). The primary purpose of these hatcheries is to produce the trout and salmon needed to support [recreational fisheries management](#) goals and objectives. Trout and salmon are stocked in areas that

<sup>5</sup> Gephard, S. [CT DEEP's Origins Linked to Early Efforts to Restore Salmon](#)

provide access to trout fishing opportunities throughout the year. Largely due to decades of extensive stocking of catchable-sized fish, and the diversity of options established in [A Trout Management Plan for Connecticut's Rivers and Streams](#) (Hyatt et al. 1999), salmonids continue to be among the most highly sought-after gamefish in CT, generating ~1.2 million fishing trips and over \$36 million per year annually to the State's economy<sup>6</sup>.



*Brought online in 1971, the Quinebaug Hatchery was the largest fish hatchery east of the Mississippi River. Today this facility produces the majority of our standard-size trout for the state*

## Connecticut's Hatchery Facilities

- 1) **Quinebaug Valley State Trout Hatchery** is the largest and newest State Fish Hatchery (established 1971) and produces approximately 500,000 trout (~328,000 pounds) each year. It was renovated in the mid-1990's and is currently undergoing a multiyear upgrade to decrease energy costs and improve fish production efficiencies.
- 2) **Burlington State Fish Hatchery**, Connecticut's oldest operating fish hatchery, established in 1923, is smaller than Quinebaug and produces approximately 350,000 salmonids (~100,000 pounds) each year. Energy costs for this hatchery are minimal due to its gravity enhanced water flow system and artesian wells that require no electricity to pump water. However, upgrades to the hatchery's infrastructure (rearing tanks, piping and water control structures) are currently underway. Two unique fish, the "Survivor" strain Brown trout and Kokanee are raised at this location.
- 3) **Kensington State Fish Hatchery**, opened in 1934 and renovated occasionally over time, produces Atlantic Salmon for Connecticut's Atlantic Salmon Legacy Program and the Salmon-in-Schools program. This hatchery is currently re-establishing a broodline of the Seeforellen Brown Trout strain. All totaled, this hatchery produces approximately 30,000 pounds of trout and salmon per year.

<sup>6</sup> [National Survey of Fishing, Hunting, & Wildlife-Associated Recreation \(FHWAR\): 2011](#)





*Hatchery production was necessary to support angler demand for catching a "limit" of trout*



*Recent angler surveys indicate that many anglers prefer to release their fish (versus take home a daily limit)*

Until the early 1990's trout management consisted almost entirely of put-and-take stocking of yearling and adult-size hatchery-reared trout (Brook, Brown, Rainbow and the hybrid [Tiger Trout](#)). In stocked streams, statewide harvest regulations (five fish per day creel limit, no length limit) were designed to distribute the harvest of stocked fish amongst the greatest number of anglers. Based upon changing angler preferences and desires, the Fisheries Division created the first catch and release [Trout Management Area](#) (Willimantic River in 1976), [Broodstock Atlantic Salmon Areas](#) (1991), and the first [Wild Trout Management Area](#) (Tankerhoosen River in 1993).

Using data obtained during a [statewide stream survey project](#) (1988-1995), the Fisheries Division published [A Trout Management Plan for Connecticut's Rivers and Streams](#) (Hyatt et al. 1999). The first document of its type for Connecticut, the purpose was to describe various management strategies designed to meet angler desires and preferences related to trout fishing in rivers and streams. The plan defined several management strategies: creation and addition of three classes of Wild Trout Management Areas, addition of Trout Management Areas that allow seasonal harvest, the creation of [Trophy Trout Areas](#) (stocked with larger than average size trout) and the creation of [Trout Parks](#) (designed for high catch rates). Several years after the plan was implemented, the Fisheries Division again responded to the continually changing desires of anglers and created [Trout Management Lakes](#) and [Community Fishing Waters](#).

**Feral**- A domestic or cultivated fish that escaped (or was placed by humans) into a natural environment and lives for an extended period in that environment. Similar to hold-over.

**Hold-over** – A fish that was intentionally stocked into a natural environment and has spent at least one calendar year in that environment. In Connecticut, management goals often call for producing hold-over fish because they can be “wild” in appearance and often grow to a large size.

**Hybrid** – A fish resulting from a cross between different species.

**Stocked** – Fish, of hatchery origin (cultivated), that was placed into a natural environment by humans

**Wild** – Fish that hatch and grow in a natural environment; not cultivated or domesticated.

Now, two decades after the 1999 Trout Management Plan was published and implemented, we find that the needs and attitudes of some Connecticut anglers are again shifting. Whereas anglers in the past typically kept almost all the fish they caught, today they are releasing most of the fish they catch. In many cases, the preference is to release a fish, even very large “hold-over” fish, to provide the opportunity for repeat catch events.

In addition, unprecedented technological innovation and shifts in how families spend their time have changed the structure of day-to-day life. Opportunities for outdoor recreation, including fishing for salmonids, are increasingly overlooked in favor of structured extracurricular activities and social media use. At the same time, a population shift from rural to urban and suburban communities has limited outdoor recreation opportunities for many.

## THEME 1: GROW FISH

### 1. Maximize efficient production and distribution of salmonids at State Fish Hatcheries

The Fisheries Division has [three hatcheries](#). The newest is the 50 year old [Quinebaug Valley State Fish Hatchery](#) (1971), followed by the [Kensington State Fish Hatchery](#) (1932), and finally the oldest, the 98 year old [Burlington State Fish Hatchery](#) (1923). Each of these hatcheries have a different total production, as measured by pounds of fish they can produce.

Rearing trout and salmon requires food, water, and space to grow. Of the three, food is the easiest to address, as quality commercial feed is readily available for purchase. More limiting to production is the amount of water and space, as both are critical to hatchery operation. At the Quinebaug and Kensington hatcheries, the water for the facility is pumped from a series of wells. This continual pumping of water is costly in both equipment and energy consumption. Regular cleaning of the wells and pump maintenance are critical to keep water flowing. Without preventative maintenance, the water supply may become limited due to fouled wells, leaky pipes, broken valves, and leaky tanks, or pumps that are not working. Burlington operates on both surface water supply and artesian wells so does not require pumping of water. To date, these three facilities have been functioning to maximize the total number of fish produced (same total poundage of fish) given the amount of raw water available. Recent replacements of deficient piping,



*Hatchery operations vary greatly in CT ranging from Quinebaug's interior contoled environments (top) to Burlington's hand-dug sand lined ponds (bottom)*

valves, and pumps, as well as the periodic cleaning of wells, have increased available water and hatchery capacity. Continually making improvements and modifications, such as recirculating the water and taking advantage of the latest aquaculture techniques and technologies to implement energy efficient processes, will ensure efficient production at our State Fish Hatcheries.

Space to grow is a third major factor contributing to total fish production at the hatcheries. Space can become limiting when the tanks/ponds cannot be used due to structural issues, which can result in reduced fish production.

The rearing of trout and salmon requires significant energy. Going forward, the hatchery system will continue to look for innovative ways to gain efficiencies and reduce overall energy and water consumption.

Predatory animals, especially fish-eating birds, also reduce the number of trout produced. Preventing access to the fish by covering ponds with netting and placing physical barriers around the ponds is critical to prevent loss. Existing netting and barriers should be maintained or replaced with regular frequency.

**Goal 1.1: Create a stable funding allocation for hatchery operation**

<b>Objective 1.1.A: Develop a five-year business plan for the hatchery system</b>	
Actions	<ul style="list-style-type: none"> <li>• Strategically identify critical infrastructure upgrades and maintenance needs</li> <li>• Develop a schedule for upgrades and maintenance</li> <li>• Allocate the appropriate funding</li> </ul>
People	Hatchery Staff; Financial Management Division; Director of Fisheries
By Year 1	Assemble team; develop list; develop schedule (annual, bi-annual, every 5 years, onetime cost); seek cost information; start to assemble plan
By Year 5	Plan is developed and implemented; funding allocated
Evaluation	Plan is complete and made public

**Goal 1.2: Continue to focus on improving and maintaining hatchery infrastructure**

<b>Objective 1.2.A: Conduct preventative maintenance on all hatchery equipment at all facilities as necessary</b>	
Actions	<ul style="list-style-type: none"> <li>• Continue annual well cleaning (Quinebaug = 3; Kensington = 1; Burlington = 0)</li> <li>• Continue to clean and repair concrete raceways and growing tanks at a set frequency</li> <li>• Continue to maintain pumps, valves, and piping</li> <li>• Maintain/replace/install barriers to predators</li> </ul>
People	Hatchery Staff; DEEP Support Services; Financial Management Division; Contractors as necessary
By Year 1	Develop schedule and procedure; establish contracts
By Year 5	Wells are cleaned annually; maintenance following schedule
Evaluation	Reduction in equipment failure; accounting of maintained and repairs; increase in fish production; decrease in loss of fish

<b>Objective 1.2.B: Improve hatchery infrastructure</b>	
Actions	<ul style="list-style-type: none"> <li>• Replace antiquated piping, valves, pumps, and tanks/ponds at Burlington</li> <li>• Install netting or other barriers to predators</li> <li>• Implement electrical and water saving measures</li> <li>• Acquire new hatchery stocking trucks on a regular schedule</li> <li>• Evaluate options for leasing vehicles</li> </ul>
People	Hatchery Staff; DEEP Support Services; Financial Management Division; Contractors as necessary
By Year 1	Develop an infrastructure improvement plan and replacement schedule
By Year 5	Re-evaluate plan and adjust as necessary
Evaluation	Increase in number/poundage of fish; increase in efficiency; reduction in equipment failure
<b>Objective 1.2.C: Continue to seek capital funding for projects of significant scope and cost</b>	
Actions	<ul style="list-style-type: none"> <li>• Identify large projects to improve the efficiency of state hatcheries</li> </ul>
People	Hatchery Staff; Financial Management Division; DEEP Support Services; Contractors as necessary; State Bond Commission
By Year 1	Continue planning and developing capacity to pursue bonding
By Year 5	Bonding commitments provided
Evaluation	Project implementation and gain in efficiency and improved operations
<b>Objective 1.2.D: Decrease the consumption of raw well water and electricity required for trout and salmon production</b>	
Actions	<ul style="list-style-type: none"> <li>• Develop the infrastructure to properly disinfect re-circulated water (versus all raw well water) at Quinebaug Hatchery</li> <li>• Continue to identify and eliminate water loss via leaking piping and tanks at the Burlington Hatchery</li> <li>• Continue to install energy saving equipment and LED lighting at all facilities</li> <li>• Install variable drive pumps where appropriate at Kensington and Quinebaug</li> <li>• Implement solar electricity generation where appropriate</li> </ul>
People	Hatchery staff; Financial Management Division; DEEP Support Services; Contractors as necessary; State Bond Commission
By Year 1	Continue planning and developing capacity
By Year 5	Improvements have been made to reduce use of raw well water and electricity
Evaluation	Reduction of raw water use (via leaks identified and repaired); reduction on volume of water pumped; reduction in electrical usage (at least 10%)

**Goal 1.3: Reduce losses of fish to predation**

<b>Objective 1.3.A: Install anti-predation structures such as netting, shoreline blocks, pond covers, and other mechanisms where appropriate</b>
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Actions	<ul style="list-style-type: none"> <li>• Inventory areas subject to predation</li> <li>• Identify appropriate anti-predation structures</li> <li>• Identify special engineering needs/construction needs</li> <li>• Acquire materials</li> <li>• Install</li> </ul>
People	Hatchery Staff; Financial Management Division; DEEP Support Services; Contractors as necessary
By Year 1	Create inventory of locations needing anti-predation structures and/or upgrade existing anti-predation structures
By Year 5	100% of all ponds have anti-predation structures installed
Evaluation	Document decrease in loss of fish to predation; Fewer predators observed within/around ponds

**Goal 1.4: Distribute trout and salmon efficiently**

<b>Objective 1.4.A: Gain efficiency in the distribution of trout and salmon</b>	
Actions	<ul style="list-style-type: none"> <li>• Maintain use of liquid oxygen during fish transport</li> <li>• Utilize GPS mapping applications to save time and reduce fuel consumption</li> <li>• Determine actions required to eliminate some “transfer loads” from Quinebaug Hatchery to Burlington Hatchery</li> <li>• Continue to collaborate with local fish and game clubs who have capacity to raise trout on their property</li> </ul>
People	Hatchery Staff; Financial Management Division; Coldwater Fish Management Staff; Office of Information Management Staff
By Year 1	Implement a pilot GPS mapping/navigation program; begin discussion on transfer load options
By Year 5	At least 50% of fleet is equipped and using GPS mapping/navigation
Evaluation	Annual report of tasks completed; plan for transfer loads complete

**Goal 1.5: Continue to maintain the highest level of professional development**

<b>Objective 1.5.A: Seek to have a talented and diverse work force</b>	
Actions	<ul style="list-style-type: none"> <li>• Offer professional development to keep existing staff trained on the latest in salmonid aquaculture techniques and strategies</li> <li>• Continue to recruit talented fish culturists</li> <li>• Support interest in aquaculture as a career <ul style="list-style-type: none"> <li>○ Develop internships with colleges/universities, community colleges, and state vocational/agriculture high schools. Especially within CT’s urban centers</li> <li>○ Develop satellite salmonid rearing at state vocational/agriculture high schools, especially within CT’s urban centers</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>○ Attend Job Fairs at community colleges/universities to increase visibility, especially within urban centers</li> <li>○ Create series of educational videos for the DEEP Webpage that highlight hatchery operations and the science of aquaculture</li> </ul>
People	Hatchery Staff; DEEP Human Resources; Bureau of Aquaculture; Department of Education; Colleges/Universities and High Schools
By Year 1	Develop list of potential partners and begin correspondence; develop a formalized intern program between schools and hatchery; develop core set of coursework and professional development training opportunities; compile a list of staff and their completed specialized training
By Year 5	A minimum of three interns per year are successfully completing the program; implement schedule for all staff to have specialized training
Evaluation	Number of schools/interns participating; number of staff with specialized training and the amount of training completed

## **2. Increase the size of fish produced at State Hatcheries**

The demand for salmonid fishing opportunities in Connecticut far exceeds the natural production of our lakes and streams. Therefore, the production of trout and salmon within our hatcheries is an essential part of recreational salmonid management in Connecticut. Traditionally, the production and distribution of trout and salmon has been a collaborative effort between the people growing the fish (hatcheries) and the people determining stocking rates and locations (biologists). The goal was to “produce as many

**The balance between quantity and size at our State Fish Hatcheries.** The following question was included in the trout and salmon preference questionnaire distributed as part of the public discussion process in 2019. The question had three scenarios and an option for “other.” Four hundred ninety-six (496) people provided a response.

**Question:** “Our state fish hatcheries can produce a fixed total weight of fish each year. Our biologists currently work to balance the total number of standard size fish (range 9-11 inches) we can stock against growing as many larger fish (greater than 12 inches average size) as possible. Knowing this, how would you prefer to see the Fisheries Division allocate the space at the hatchery?”

**57% (269) chose,** “Continue to balance the total number of fish while also making as many larger size fish as possible (meaning we would continue to produce the majority of fish in the standard size while having some larger fish available).”

**12% (59) chose,** “I would like to see the hatchery make the greatest number of standard size fish possible (meaning the total number of fish could be greater, but they would all be of the standard size).”

**18% (84) chose,** “I would like to see the hatchery grow the greatest number of largest fish possible (means potentially much fewer total number of fish available, but those stocked are much larger than the standard size).”

**12% (57) opted** to provide an alternative preference via “other.”

trout as possible” but, due to the nature of raising fish, the actual number of fish could fluctuate greatly from year to year. Using the total number of fish often led to disappointed anglers when production was less than years prior. An alternative measure of production is total pounds produced. Each hatchery has the capacity to produce a maximum number of pounds; large numbers of smaller fish or fewer numbers of large fish will produce similar poundage as growth rates are typically faster in lower densities. This can be reflected as lots of smaller sized fish, fewer larger fish, or a balancing number and size.

The opportunity to catch a large, beautiful fish was very important to those who provided input during the face-to-face trout and salmon public discussions held in 2019<sup>7</sup>. While most indicated they would not be disappointed to catch “cookie-cutter” stocked fish, there was strong consensus that catching the occasional large hold-over or beautiful-looking stocked fish was strongly associated with a “good day of fishing.”

In addition, the majority of responses (57%) to our questionnaire indicated the Fisheries Division should *“Continue to balance the total number of fish while also making as many larger size fish as possible (meaning we would continue to produce the majority of fish in the standard size while having some larger fish available).”*

Therefore, the second main theme of this five-year plan is to increase the average size of trout and salmon and to produce a greater number of our “specialty fish”. Specialty fish are larger and therefore more desirable fish, for many. Over the next few years, fisheries biologists will work to refine production goals that will lead to an increase in the average size of our stocked salmonids and produce a greater number of large, desirable fish.

**“Specialty Fish”** are grown within our hatcheries longer than the standard-size trout. These fish are raised with specific applications in mind (put and take or to increase the potential to “hold-over”). Many of these fish are greater than 12 inches and weigh over a pound or more. Some examples include the “Survivor” Brown Trout, fall stocked large Brook Trout, Tiger Trout, retired spawning stock, and Seeforellen strain Brown Trout.



*Specialty fish, like the production of large Brook Trout, are very popular with anglers. The fish are grown longer within the hatchery, which take space and resources, however, when caught are quite memorable*

<sup>7</sup> [A Summary of Public Input Related to Trout and Salmon in Connecticut](#)

The number of fish produced will need to decrease to accomplish this goal. Reduced hatchery densities will improve growth and result in fewer, but larger, salmonids.

**Goal 2.1: Increase the “standard-size” from 9-11 inch (2.0 fish per pound) trout to 10-12 inches (1.8 fish per pound)**

<b>Objective 2.1.A: Increase the average size of standard production trout at Quinebaug Hatchery by approximately one inch</b>	
Actions	<ul style="list-style-type: none"> <li>• Decrease the maximum total poundage from 500,000 to 480,000 to provide more room within each tank for growth</li> <li>• Reduce the density of fish in rearing tanks</li> <li>• Begin to grow triploid fish as they grow more rapidly in the hatchery environment</li> <li>• Increase the percentage of Rainbow Trout as they grow more rapidly in the hatchery environment.</li> </ul>
People	Hatchery Staff; Coldwater Fish Management Staff
By Year 1	Develop a strategy to reduce density of fish and increase the percentage of Rainbow Trout; acquire equipment for trial production of triploid trout
By Year 5	Fully implement strategy; increase triploid and Rainbow Trout production
Evaluation	Measured increased size at Quinebaug; number of triploid fish produced at Quinebaug

**Goal 2.2: Increase the number of “specialty trout”**

<b>Objective 2.2.A: Increase the quantity of “specialty trout” to 100,000 fish annually</b>	
Actions	<ul style="list-style-type: none"> <li>• Reduce the density of fish in rearing tanks</li> <li>• Begin to grow triploid fish as they grow faster</li> <li>• Continue to grow <ul style="list-style-type: none"> <li>○ Large Brook Trout (stocked into Mohawk Pond and Black Pond each fall)</li> <li>○ Large trout stocked into March season TMLs each year</li> <li>○ &gt;12” trout stocked into Trophy Trout Areas each spring</li> <li>○ 3,000-4,000 14+ inch Seeforellen (stocked into Trout Management Lakes starting fall of 2021)</li> <li>○ Maintain annual stocking of 2,500 surplus trout broodstock (stocked mostly into Trophy Trout Areas during spring stocking)</li> <li>○ Annual stocking of 6,500 Tiger Trout</li> </ul> </li> <li>• Refine enumeration and reporting of the number of fish produced that are 14 inches (1.0/pound) or more</li> </ul>
People	Hatchery Staff; Coldwater Fish Management Staff
By Year 1	Develop a strategy/plan to increase production of specialty trout
By Year 5	Fully implement strategy and increase production of specialty trout to 100,000 fish



Evaluation	Annual reporting of fish stocking; angler catch and satisfaction within rivers and lakes
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<b>Objective 2.2.B: Increase production of Atlantic Salmon for the Atlantic Salmon Management Areas</b>	
Actions	<ul style="list-style-type: none"> <li>• Increase the number of age 2+ Atlantic Salmon stocked by 20% starting in fall of 2020</li> <li>• Continue to produce a total of 250 age 3+ Atlantic Salmon for the Naugatuck and Shetucket Rivers annually</li> <li>• Install anti-predator control structures around holding ponds</li> </ul>
People	Hatchery Staff; Coldwater Fish Management Staff
By Year 1	Implement actions to increase the production of Atlantic salmon
By Year 5	Revise space allocations as necessary to maintain production numbers
Evaluation	Annual reporting of fish stocking; angler catch and satisfaction with rivers and lakes

**Goal 2.3: Continue to manage waters where “hold-over” production is practical**

<b>Objective 2.3.A: Maintain/create hold-over fisheries where appropriate</b>	
Actions	<ul style="list-style-type: none"> <li>• Stock up to 24,000 Seeforellen fingerlings into Lake Wonoscopomuc and the Saugatuck Reservoir in the spring of 2021, 2022, and 2023 to establish a put and grow fishery</li> <li>• Stock up to 6,000 14+ inch Seeforellen into Trout Management Lakes starting fall of 2021</li> <li>• Continue “Survivor” stocking of 1,000 large 16+ adults into the West Branch Farmington River</li> <li>• Continue to stock “Survivor” fall fingerlings into the Pequabuck and Hockanum River TMAs each fall (~5,000 combined)</li> <li>• Continue to stock 3,000 “Survivor” standard (10-12 inch) adults into the Housatonic River TMA (Cornwall) each fall</li> <li>• Continue to stock 1,000 “Survivor” large (12+ inch) adults into the Housatonic River Cornwall TMA each fall</li> <li>• Continue to stock “Survivor” yearlings into the Housatonic, Farmington, and Bull’s Bridge Trout Management Areas (~7,000 combined) each spring</li> <li>• Assess stockings as necessary</li> <li>• Monitor forage and habitat as necessary</li> </ul>
People	Hatchery Staff; Coldwater Fish Management Staff
By Year 1	Implement the action plan for Trout Management Lakes <sup>8</sup> ; production and distribution of “Survivor” Brown Trout;
By Year 5	Review and revise the action plan for Trout Management Lakes annually; production of “Survivor” Brown Trout is maintained and meeting management goals

<sup>8</sup> [A Management Plan for Connecticut’s Coldwater Lakes](#) (Machowski and Eltz 2016)

Evaluation	Annual reporting of fish stocking; angler catch and satisfaction; fish abundance and size within lakes and rivers
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*Hold-over trout tend to be highly prized due to their size and beauty*

## **THEME 2: CATCH FISH**

### **3. Improve access to stocked salmonids (both physical and informational)**

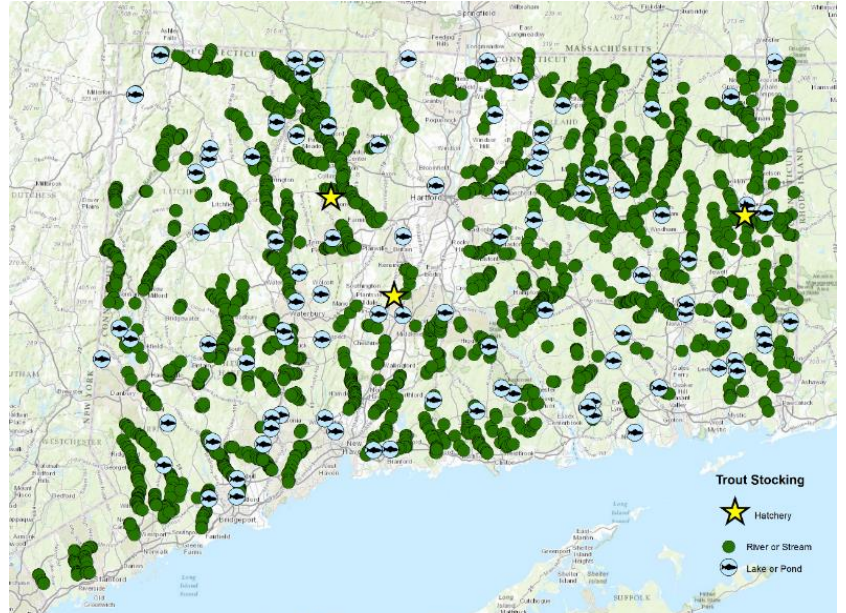
Access to fish and fishing has several facets, including; legal physical access to the water, presence of catchable fish, and information about fishing opportunities. The third goal of this five-year plan is to improve access to stocked salmonids with reference to each of these facets.

Distribution (stocking) of salmonids is one of the Fisheries Division’s most visible and well-known activities. Each year it takes over 450 truckloads to stock salmonids at over 2,000 unique locations. The opportunity to catch freshly stocked fish is highly anticipated and daily stocking announcements motivate many anglers to hit the water.

***Ideally, the Fisheries Division would like to have every stocked fish caught at least once.***

**Ideally, the Fisheries Division would like to have every stocked fish caught at least once.** To accomplish this, the Fisheries Division must continually evaluate and react to angler preferences and desires. This evaluation may lead to modification of the stocking strategy and implementing a distribution plan (e.g. location, timing, and allocation) so that the time between stocking and legal fishing is minimized or eliminated. Stocking fish, especially during the “in-season” period, ensures the fish are immediately accessible for public benefit and enjoyment.

As recommended in “*A Trout Management Plan for Rivers and Streams*” (Hyatt et al. 1999), considerable effort has been expended by the Fisheries Division to “fine-tune” the put-and-take fisheries by adjusting the stocking density and species mix to optimize catch rates, duration of catch opportunity, and increase angler satisfaction. Looking ahead, the Fisheries Division needs to refine the allocation of salmonids to maximize angler satisfaction through proactively optimizing timing, quantity, and location. This will involve reallocating fish from waterbodies with little to no return (nobody fishing) to places where many people fish or locations where public access is greater. Such reallocation, while perhaps not popular for a few, will benefit a greater number of anglers by increasing the overall catch efficiency. Stocking logistics are challenging. The timing and location of distribution must consider rate of predation, emigration, likelihood of poaching, and environmental factors including ice coverage, snow covered access, volume of stream flow, water temperature, and habitat. Continual collaboration between fisheries management staff and hatchery program staff is critical for successful distribution.



*Connecticut stocks nearly 2,000 locations with the trout raised through our Hatchery system*

#### **When Does DEEP Stock?**

Stocking occurs during one of three periods.

**“Pre-season,”** is prior to Opening Day (second Saturday of April). Depending upon the weather, pre-season stocking usually begins in late February. Most of these stockings are to prepare waters, closed to fishing at the end of February, for Opening Day (second Saturday in April). Some stocking during the pre-season is to support catch and release fishing in seasonal and year-round Trout Management Areas and fishing during the bonus “March Season” in Trout Management Lakes.

**“In-season”** is from Opening Day until the annual allocation for spring stocking is exhausted (usually mid to late May). These stockings are to replenish waters with additional fish during the time when water conditions are perfect for trout.

**“Late-season”** stocking events are those after Memorial Day, including fall stocking, and are used to provide a boost to fishing around the July 4<sup>th</sup> and Labor Day holidays. Fall stockings have traditionally focused on TMAs, Trout Parks, and heavily fished trout lakes that are accessible throughout the ice fishing season too. The number of fish available for fall stocking is a small percentage of the annual production.



Nearly 200 different rivers and streams are stocked with trout

**Goal 3.1: Maximize catch of stocked fish**

<b>Objective 3.1.A: Stock fish in appropriate quantity, frequency, and location.</b>	
<p>Actions</p>	<ul style="list-style-type: none"> <li>• Develop a stocking classification system for all waters where timing, quantity of fish, species composition, and frequency of stocking optimize catch rates               <ul style="list-style-type: none"> <li>○ Evaluate and revise stocking practices for all waters as needed</li> <li>○ Continue to acquire and evaluate fishing preference data as it relates to trout stocking via a variety of survey methods</li> </ul> </li> <li>• Evaluate lake stocking practices               <ul style="list-style-type: none"> <li>○ Develop a stocking density per acre model for lakes to optimize catch rates (prevent over or under stocking)</li> <li>○ Adjust total allocation and frequency of stocking based on angler usage</li> <li>○ Consider dropping lakes experiencing very low rates of trout fishing pressure, thus allowing for reallocation of more trout in other lakes (those with better habitat, access, and higher angler usage rates)</li> </ul> </li> <li>• Evaluate river stocking practices               <ul style="list-style-type: none"> <li>○ Develop a stocking density (per mile of stream) model for rivers to optimize catch rates (prevent over or under stocking)</li> <li>○ Adjust total allocation and frequency of stocking based on angler usage</li> <li>○ Consider dropping rivers experiencing very low rates of trout fishing pressure, thus allowing for reallocation of more trout in other rivers (those with better habitat, access, and higher angler usage rates)</li> </ul> </li> <li>• Refine pre-season, in-season, and late-season stocking allocations               <ul style="list-style-type: none"> <li>○ Modify stocking allocations, where necessary, to optimize opportunity for catch</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>○ Minimize the amount of time between stocking and legal fishing (to reduce loss to predation, poaching, and weather-related events).</li> </ul>
People	Coldwater Fish Management Staff; Hatchery Staff
By Year 1	Assemble stocking and usage data; develop initial assessment
By Year 5	Implement recommended revisions and density-based stocking
Evaluation	Annual report of work accomplished; angler satisfaction with catch and allocations; annual Fish Distribution Report
<b>Objective 3.1.B: Evaluate and devise innovative ways to implement more year-round fishing opportunities (i.e. catch and release only while stocking)</b>	
Actions	<ul style="list-style-type: none"> <li>● Identify potential actions to reduce the amount of time waters are closed to fishing <ul style="list-style-type: none"> <li>○ Evaluate year-round fishing (no closed season or Opening Day)</li> <li>○ Change regulation to allow fishing in streams not stocked by the state (wild trout streams)</li> <li>○ Create additional seasonal TMAs on popular fishing waters (e.g., Scantic, Natchaug, etc.)</li> </ul> </li> <li>● Maintain fry stocking in waters supportive of trout fishing during summer months (WTMA class 2 &amp; class 3)</li> <li>● Expand the number of waters stocked in the fall</li> <li>● Coordinate with and assist sister Divisions in keeping key state parks and boat ramps accessible year-round</li> </ul>
People	Coldwater Fish Management Staff; Bureau of Outdoor Recreation
By Year 1	Initiate development of alternatives and list of potential changes
By Year 5	Implement changes/improvements for increased fishing; disseminate information about changes
Evaluation	Annual update of accomplishments/changes; angler satisfaction
<b>Objective 3.1.C: Continue to provide timely and accurate stocking related information (let people know where and when fish were stocked)</b>	
Actions	<ul style="list-style-type: none"> <li>● Continue to distribute stocking information via a variety of outlets (reports, web, social media)</li> <li>● Coordinate with the Office of Communications</li> <li>● Integrate actions with the Fisheries Division’s R3 program</li> <li>● Educate and Disseminate information to those who are unaware that this information exists</li> </ul>
People	Coldwater Fish Management Staff; DEEP Office of Communications Staff; Division and Agency R3 staff
By Year 1	Improve efforts through collaboration with stakeholders
By Year 5	Integration within Fisheries R3 plan
Evaluation	Annual report of update/accomplishments; increased participation; angler indicated increase in relevancy



*Fishing is dependent upon public access to the water. Public land and fishing easements (legal access within a land deed) are the best ways to ensure large sections of water are available to fish*

**Goal 3.2: Maintain and acquire access to waters**

<b>Objective 3.2.A: Maintain and acquire fishing access</b>	
Actions	<ul style="list-style-type: none"> <li>• Work with DEEP Land Management Unit to develop a public-facing map of fishing access points and existing fishing right easements</li> <li>• Have hatchery staff confirm public access at stocking locations (while stocking)</li> <li>• Improve visibility of signage, especially to indicate legal public access</li> <li>• Identify new areas of non-state owned property with public access (land trust, municipalities, water companies, non-governmental organizations, etc.) that are open to the public and have safe and easy access (handicap access, groomed shorelines) and initiate stocking</li> <li>• Support the acquisition of property or easements when appropriate</li> </ul>
People	Hatchery Staff; Coldwater Fish Management Staff; Land Management Staff; Bureau of Outdoor Recreation; Bureau of Support Services; Land Trusts; Landowners; Municipalities
By Year 1	Continue collaboration with DEEP Land Management and Acquisition
By Year 5	Published interactive mapping application; maintenance of easement and property access data
Evaluation	Annual report of tasks accomplished; map is being utilized by public; angler input on relevancy

#### 4. Provide a diversity of fish and fishing opportunities that appeal to a wide range of preferences and desires

Prior to the *Trout Management Plan for Connecticut's Rivers and Streams* (Hyatt et al. 1999), there were only a few opportunities to fish for stocked fish year round (stocked waters were closed to all fishing for several months), stocking was almost exclusively done to support put-and-take, and there was a single statewide regulation of five fish per angler per day with no minimum size limit. Connecticut's trout management plan established a diverse set of management strategies as well as a diversity of species and sizes. This plan was largely in response to changing angler preferences and a wealth of quantifiable data on Connecticut's streams such as habitat, trout production potential, fisheries potential, and angler participation, attitudes, and preferences.



*One of Connecticut's most well know Trout Mangement Area is on the West Branch Farmington River in the towns of Hartland, Barkhamsted, and New Hartford*



*Connecticut stocks nearly 100 lakes and ponds providing quality fishing from boat or shoreline*

One of the four key questions asked during the 2019 trout and salmon public discussions was, “What are some things you feel the Fisheries Division is doing well?” Many indicated it was the diversity of trout fishing options<sup>9</sup>, meaning the different species, sizes, and regulations made available to anglers through the efforts of the Fisheries Division. Thus, the fourth theme of this five-year plan is to maintain the opportunity to catch a diversity of fish (species, size, and wild/stocked).

Several goals, objectives, and actions overlap with this goal: “Provide a diversity of fish and fishing opportunities that appeal to a wide range of preferences and desires”, including [Trout Management Areas](#), [Trout Management Lakes](#), [Trout Parks](#), [Trophy Trout Areas](#), [Atlantic Salmon Management Areas](#), and Waters with No Special Regulations. Specific objectives and actions related to [Kokanee](#), and [Wild](#)

<sup>9</sup> [A Summary of Public Input Related to Trout and Salmon in Connecticut](#)

[Trout Management Areas](#) (Class 2 and Class 3), which are not covered in previous goals and objectives, are included here.

**Kokanee:** [Kokanee](#) were introduced into [East Twin Lake](#) during the 1930's from populations native to the west coast of the United States. A recreational fishery developed for Kokanee during the 1940's and became so popular that the salmon population was overfished and collapsed, but was reintroduced by the CT Board of Fish and Game in the late 1950's. This program has created unique fishing opportunities within Connecticut.

To ensure a consistent fishery, the State began stocking Kokanee fry in the 1960's. Following the successful effort at East Twin, Kokanee fry were stocked into 17 other lakes. Successful fisheries were created within Lake Wonoskopomuc and West Hill Pond, and marginal fisheries were created within Bashan Lake, Highland Lake, and Beach Pond. Fry stocking was discontinued in the later set of lakes after fisheries failed to establish.

Kokanee compete with landlocked [Alewife](#) and [Rainbow Trout](#) for food. Alewives were discovered in East Twin Lake in 1989, and by the early 1990's the once popular salmon fishery had collapsed. In addition, the presence of Alewives in Lake Wonoskopomuc caused reduced survival and growth for Kokanee to the point that the lake has lost the ability to support a Kokanee fishery. Subsequently, alewife populations disappeared from East Twin Lake and Lake Wonoskopomuc. Fry stocking resumed in East Twin Lake after it was determined the Alewife population had crashed (2008) and within Beach Pond to try establishing a Kokanee fishery (2016).

Current Kokanee management efforts include evaluating fry survival from several years of stocking in Beach Pond (fall 2020) and monitoring the discovery of at least two age classes of alewife within East Twin Lake (August 2020). The Fisheries Division will monitor the situation and may need to re-develop a trophy Brown Trout fishery within East Twin Lake should the reestablished Alewife population negatively impact the number of Kokanee present.



*Kokanee fisheries have been established in several Connecticut lakes since the early 1960's (top photo). To sustain the fishery adult salmon, ready to spawn, are collected each fall (middle photo) and spawned by hand at the Burlington Hatchery (bottom photo). The resulting young fish are stocked the following spring at a size of 2-3 inches*



Connecticut’s Kokanee Fishery is a unique opportunity for anglers within the state and regionally. To protect the existing populations, periodic monitoring for illegally stocked Alewife and other competitor species will be conducted as time permits. The failure of similar Kokanee fisheries across the east may make Connecticut’s fisheries highly marketable to anglers from other areas.

**Goal 4.1: Maintain the Kokanee fishery in select lakes**

<b>Objective 4.1.A: Maintain Kokanee fisheries in select lakes</b>	
Actions	<ul style="list-style-type: none"> <li>• Continue to implement the annual work plan for Kokanee management               <ul style="list-style-type: none"> <li>○ Collect a minimum of 225 male/female pairs for spawning each fall</li> <li>○ Produce 170,000 three-inch fingerlings for annual stocking each spring</li> <li>○ Modify stocking density as needed to optimize adult growth</li> <li>○ Obtain angler effort, attitude and preference data as needed for each management lake on a rotational basis</li> <li>○ Monitor Alewife/Kokanee dynamics within East Twin Lake (starting fall 2020)</li> <li>○ Evaluate survival of fry within Beach Pond (fall 2020)</li> </ul> </li> </ul>
People	Hatchery Staff; Coldwater Fish Management Staff
By Year 1	Continue to follow and revise the annual work plan for Kokanee management
By Year 5	Continue to follow and revise the annual work plan for Kokanee management
Evaluation	Kokanee fishery is supported; angler catch; angler satisfaction; alewife presence



*Stocked as fry (2-3 inch) the Kokanee take 3-4 years to grow to 14-20 inches. The adult fish (right) are silver until the fall when they transform both physiologically and morphologically*

**Wild Trout Management Areas (WTMA):** These are sections of streams or rivers, which have some level of natural trout reproduction and support recreational fishing pressure. [WTMAs](#) are categorized into three classes, each with different regulations:

- **Class 1:** Catch and release only, open year-round, single-hook, barbless artificial lure or fly only (no bait). These waters are not stocked. Recreational fishing in Class 1 Wild Trout Management Areas is covered under goal 6.
- **Class 2:** Two fish per day limit, minimum size of 12 inches, no gear restrictions, and open for fishing from Opening Day until the last day of February. These waters are stocked with juvenile (fry/fingerlings) and adult-sized trout.
- **Class 3:** Five fish per day limit, minimum size of 9 inches, no gear restrictions, and open for fishing from Opening Day until the last day of February. These waters are stocked with juvenile (fry/fingerlings) and adult-sized trout.

**Brown Trout Fry Stocking in WTMA Class 2 and Class 3:**

Analysis of the [Statewide Stream Survey data](#) indicated many trout streams have a great deal of unused habitat that would be suitable for juvenile and adult trout. As such, some waters were stocked with fry and/or fingerling [Brown Trout](#) to by-pass the limitations on natural reproduction. The fish used for this stocking effort are “surplus,” meaning fish that are no longer needed to meet future production goals of larger-sized trout in the hatchery system (nor is space available to do so). Throughout 2000 -2017, approximately 300,000-400,000 surplus fry were produced annually to support this effort. Current hatchery operations, primarily due to a reduction in staff and space, have resulted in approximately 100 thousand fry being produced annually since 2018. Effects of this reduction on fisheries in various waters have not yet been fully evaluated.

Evaluation of growth and survival over the past decade has indicated that in many cases the juvenile or fry Brown Trout grow to be brightly colored, wild-looking fish. It has also been documented that these stockings can produce fishable densities of catchable-size trout, while some fish also migrate out from their “nursery” stream to become part of the Housatonic River TMA fishery.



*Many of CT's small waters contain wild trout. Those where there is good public access and enough fish to support angling are part of the Wild Trout Management program*



*Brown Trout fry have been stocked into WTMA class 2 and 3 for close to two decades. These fish have the potential to survive for several years and become part of the fishery*

**Goal 4.2: Maintain Brown Trout Fry stocking into WTMA's (Class 2 and Class 3).**

<b>Objective 4.2.A: Maintain stocking Brown Trout Fry into WTMA's (Class 2 and Class 3).</b>	
Actions	<ul style="list-style-type: none"> <li>• Produce up to 250,000 fry annually</li> <li>• Implement the stocking plan that prioritizes allocations to Class 2 and Class 3 WTMA's</li> <li>• Develop methodology and perform assessment of production of catchable sized fish (1+ and 2+ years old)</li> <li>• Perform angler counts/surveys to obtain angler effort, attitude, and preference data on a regular basis</li> <li>• Review opportunities and solicit input from anglers               <ul style="list-style-type: none"> <li>○ expand to other appropriate waters (waters where WTMA goals could be met)</li> <li>○ modify the "class designation" as appropriate (places where WTMA goals are or are not being met)</li> </ul> </li> </ul>
People	Hatchery Staff; Coldwater Fish Management Staff
By Year 1	Review and modify existing list of WTMA 2-3; continue to implement stocking priority plan; develop fry stocking evaluation protocol as necessary
By Year 5	Make necessary adjustments within Fishing Regulations; adjust fry stocking plan as necessary;
Evaluation	Angler use and satisfaction; number of waters added or dropped; success at fulfilling fry stocking plan

**Sea Run Trout** – After multiple years of importing eggs from Finland, the Fisheries Division has decided to suspend the annual importation of [sea-run trout](#) eggs, and therefore will no longer be importing these eggs for incubation and grow out at Burlington Hatchery. This decision was recommended by the project leaders based on poor results to date (i.e. no evidence of returning fish in the fall of 2018 or 2019 based on angler reports or our own monitoring program). We will continue to rear and stock out the 2019 year class in the spring of 2021 and look for angler reports of any returning adults.



*The Fisheries Division has made multiple attempts since the 1950's and 1960's to create a robust sea-run Brown Trout fishery. While there have been some occasional returning fish, there has never been enough to support significant fishing pressure*

## THEME 3: CONSERVE FISH

### 5. Maintain a legacy population of Connecticut River strain Atlantic Salmon



*One of the first captured “returning” Atlantic Salmon*

To maintain a legacy population of Atlantic Salmon in Connecticut, the Fisheries Division plans on annually stocking approximately 250,000 newly-hatched salmon fry into selected streams within the Farmington and Salmon River watersheds. Atlantic Salmon fry will be stocked to ensure all life stages of the species are represented in the Connecticut River watershed. The intent for this level of stocking is to have limited runs of returning Atlantic salmon.

**Atlantic Salmon - Legacy Program:** From 1992 to 2013, the Fisheries Division annually stocked over one million juvenile salmon (fry, parr, and smolts) as part of a multi-state and Federal effort to restore Atlantic Salmon to the Connecticut River watershed<sup>10</sup>. The Federal effort concluded in 2013; however, at that time DEEP began the “Legacy Program<sup>11</sup>.” The intent of the legacy program is to maintain enough Atlantic Salmon at our Kensington State Fish Hatchery to preserve the genetic integrity of the reintroduced Connecticut River strain.

For over 45 years, biologists have been breeding adult salmon that have returned to the Connecticut River as part of the restoration program. Fish that were originally stocked to support restoration came from Maine, but over time the genetic identity of the strain shifted as fish adapted to their new river. The current strain is the southernmost population of Atlantic Salmon and it is important to maintain this strain, not only to support CT’s Atlantic Salmon Legacy program but also to preserve this unique genetic resource, the importance of which may go beyond the boundaries of Connecticut.



*A returning adult Atlantic Salmon as seen moving through the Rainbow Fishway in 2017. The Fisheries Division no longer captures these upstream migrants, but instead, allows free passage through the fishway*

<sup>10</sup> Gephard, S. [CT DEEP’s Origin Linked to Efforts to Restore Salmon](#)

<sup>11</sup> Gephard, S. [Update on Atlantic Salmon](#)

Most of the salmon fry are produced at Kensington State Fish Hatchery, but any surplus eggs, which cannot be incubated at the hatchery, are shipped to the Tripp Streamside Incubation Facility at the Tributary Mill Conservancy in Old Lyme, a registered non-profit organization that hatches fry for the program on a volunteer basis. It is important to note that any juvenile or adult salmon caught within the Farmington River, Salmon River, or anywhere else in the Connecticut River watershed are a result of these stockings. All salmon caught in these waters must be released immediately without avoidable injury.

An important component related to the captive broodline is the [Connecticut River Salmon Association’s Salmon-In-Schools program](#), a collaborative effort to promote education about Atlantic Salmon and aquatic resources. Eyed salmon eggs from the Kensington State Fish Hatchery are provided to participating schools so that students can incubate and hatch the eggs, and stock the resultant fry, as part of a formal curriculum at each school.

Connecticut River strain Atlantic Salmon from the Kensington State Fish Hatchery are also used for research by many partners. All other Atlantic Salmon produced at hatcheries in New England are either aquaculture stock or part of the Gulf of Maine Distinct Population Segment, which is listed as federally endangered and therefore are generally not available for distribution and use.



*The Salmon-in-Schools program has introduced thousands of students to the life history and restoration efforts of the Atlantic Salmon within the Connecticut River Watershed. Eggs to support the classroom rearing of Atlantic Salmon fry are provided by the Kensington Fish Hatchery*

**Goal 5.1: Maintain the genetic integrity of the Connecticut River strain of Atlantic Salmon at the Kensington State Fish Hatchery**

<b>Objective 5.1.A: Maintain the genetic integrity of the Connecticut River strain (Atlantic Salmon)</b>	
Actions	<ul style="list-style-type: none"> <li>• Continue to maintain 200-250 breeding pairs</li> <li>• Continue to stock 250,000 fry annually into optimal fry habitat within the Farmington River and Salmon River Watersheds</li> <li>• Continue to support the Salmon-In-Schools program through supplying fertilized eggs</li> <li>• Continue to support external salmon rearing operations such as the Tributary Mill Conservancy</li> <li>• Continue to support research partners as necessary</li> </ul>
People	Hatchery Staff; Diadromous Fisheries Staff
By Year 1	Continue with the production of broodstock and resultant fry; continue annual stocking; supporting external partners
By Year 5	Continue with the production of broodstock and resultant fry; continue annual stocking; continue supporting external partners
Evaluation	Number of breeding pairs is met; fry production and stocking meets plan; support Salmon-in-Schools program



*The Fisheries Division began releasing surplus Atlantic Salmon adults into the Naugatuck River and Shetucket River in 1991. This quickly became a popular fishery, which continues to draw anglers from around the region to take part in this unique fishery*

## **6. Facilitate conservation and preservation of wild trout populations**

The sixth goal of this five-year plan focuses on wild trout (naturally produced within the environment). Participants at the 2019 trout and salmon public discussions placed a high value on wild trout populations and were supportive of the Fisheries Division investing additional resources to protect and improve habitat, restore populations where practical, and identify additional catch and release fishing opportunities<sup>12</sup>.

Due to the changing landscape and environmental conditions, a comprehensive management strategy will be required to protect and sustain Connecticut's wild trout populations. This will include identifying



*Brook Trout were on the brink of extirpation in the mid-1800's according to reports of the CT Fish Commission. With Connecticut's landscape changing from agriculture to forest, the Brook Trout remains a fixture in many of our small and cold waters*

<sup>12</sup> [A Summary of Public Input Related to Trout and Salmon in Connecticut](#)



cold water resources, education and outreach to promote protection of wild trout habitat, evaluation of DEEP's trout stocking practices, and restoration of degraded trout habitats through physical and chemical improvements.

Brook Trout and Atlantic Salmon are the only salmonid species native to Connecticut. During early colonial settlement in the 1700's, populations of both species experienced significant declines due to landscape modifications that included deforestation of mature forests and installation of dams for milling grain, irrigation, drinking water supply, and power. In the late 1800's, attempts were made to restore the species through large scale restocking efforts. Of these two native salmonids, only the Brook Trout has self-sustaining populations. The Brown Trout is the only other salmonid that has established self-sustaining populations within Connecticut's rivers and streams. Reproduction from stocked Rainbow Trout (feral) has been documented in several locations and waters over time, however, to date, documentation of a self-

**Displacement** - Occurs when an introduced species of fish outcompetes (displaces) a native fish species from suitable habitat for that native species. This can happen through competition or disease transfer, which can lead to extirpation (when a species ceases to exist in a certain geographic area; localized extinction) or extinction.

**Replacement** - Occurs when the habitat for a native species no longer supports that native fish species through natural (or unnatural; human influence) processes and that species is replaced by a non-native (introduced) fish species.

**Population** - The number of organisms of the same species that live in a particular geographic area at the same time, with the capability of breeding.

**Transplant** – A fish, of wild origin (not cultivated or domesticated), that was moved by humans, from one natural environment to another natural environment. This technique is often used when attempting to restore a population where it has become extirpated.

sustaining population has been elusive, and currently none is known to exist.

Brown Trout tend to tolerate slightly warmer water temperatures, live longer, grow more quickly, and reach larger sizes than Brook Trout. These characteristics can be a benefit to anglers as self-sustaining populations can develop in many places, which no longer can support wild Brook Trout (**replacement**) and would otherwise require stocking to maintain a Brook Trout fishery. However, the same characteristics can result in **displacement** of native, wild Brook Trout.

The [Statewide Stream Survey](#) estimated wild trout were present in 4,000 miles of stream. Most of the waters were single branch headwaters (first [order streams](#) (2,800 miles)), with the remainder being very small brooks (second to third order<sup>13</sup>). Only 300 miles of stream covering 286 waters contained enough wild fish to support catch and release fishing. Within this subset, Brook Trout were found in 221 streams, Brown Trout in 22 streams, and a combination of the species in 43 streams. When it comes to supporting harvest-based angling, the number of streams with wild trout were 44 with Brook Trout, 5 with Brown Trout, and 9 streams with both Brook and Brown Trout. Based on these data, the Fisheries Division developed Wild Trout Management Areas (Classes 1, 2, and 3) to support recreational fishing for wild trout on lands with public access (Hyatt et al. 1999).

A re-sample of the randomly selected stream survey project sites (probabilistic design) was conducted during the summers of 2018-2019. From this work it was determined that there has been a 36%<sup>14</sup> reduction in the number of locations where Brook Trout were present from the initial project (1988-1994). A second finding was that in locations where wild Brook Trout were present, the average densities significantly decreased from prior sampling.

The Fisheries Division's [Habitat Conservation and Enhancement Program](#) (HCE) has focused some efforts on projects to increase connectivity of wild trout populations through the modification of migration barriers, restoration of riparian and instream habitat, and requiring appropriate fish passage modifications as conditions of construction permits sought from the DEEP. In situations where a population of wild Brook Trout have been extirpated from a watershed and the habitat remains suitable for their life history, the Fisheries Division may seek to transplant wild fish from a donor population to re-establish the population lost to natural or human causes.

Regionally, the identification and management of wild trout populations by state, federal, and non-governmental organizations is increasing as cumulative changes to the environment create conditions that are not favorable for native salmonids. In addition, there is an increasing interest in the fishing



*A network of streams is similar to that of a tree. The "order" assigned to a particular waterbody starts with "1", a single unbranched water. When two waters of the same "order" merge, the number is increased by one. Two first order streams join to make a second order stream. In Connecticut, the majority of self-sustaining wild Brook Trout waters are classified as first or second order. Many of these being located on privately owned land*

<sup>13</sup> [https://www.epa.gov/sites/production/files/2016-01/documents/whatzzzzup\\_article.pdf](https://www.epa.gov/sites/production/files/2016-01/documents/whatzzzzup_article.pdf)

<sup>14</sup> [Eltz 2020, A Random Revisit of the Statewide Stream Survey Project: A Focus on Wild Brook Trout](#)



community to have wild trout resources available. Work accomplished within this goal will expand upon previous work within the Coldwater Program<sup>15</sup>.

**Goal 6.1: Develop and publish a Wild Trout Management Plan**

<b>Objective 6.1.A: Publish a plan for management of wild trout</b>	
Actions	<ul style="list-style-type: none"> <li>• Author a specific plan to manage wild trout that addresses conservation, preservation, restoration, and education               <ul style="list-style-type: none"> <li>○ Assimilate the unpublished draft “Connecticut Brook Trout Conservation Strategy” (Barry 2017) into the new plan</li> </ul> </li> <li>• Conservation/Preservation of wild trout habitat               <ul style="list-style-type: none"> <li>○ Develop a map that identifies wild trout “Conservation Opportunity Areas” (COAs) per the model used to develop COAs in the Connecticut Wildlife Action Plan. This can be used to guide protection of habitats on the ground through the local, state, and private owner levels</li> <li>○ Continue to collaborate with the Fisheries Division’s Habitat Conservation and Enhancement group to prioritize areas for habitat work</li> <li>○ Continue to engage with diversion permitting staff, especially groundwater withdrawal</li> <li>○ Implement a “lock box” donation account or voluntary “aquatic habitat stamp” to provide a mechanism for non-anglers to contribute to aquatic habitat and connectivity work</li> <li>○ Acquire property or permanent easements to preserve high quality watershed area and <a href="#">coldwater habitat</a></li> <li>○ Develop a Standard Operating Procedure for restoring Brook Trout habitat and connectivity where water quality is suitable and populations have declined or remain suppressed</li> <li>○ Revisit suggested riparian buffer zones to improve vegetative strip</li> </ul> </li> <li>• Preservation of existing populations               <ul style="list-style-type: none"> <li>○ Evaluate the potential impact of the current statewide fishing regulation on wild populations</li> <li>○ Evaluate stocking practices and potential impact on wild Brook Trout populations (displacement)</li> <li>○ Stock sterile, triploid salmonids to use in locations where stocked trout and wild trout interact to reduce the potential for hybridization of hatchery reared fish and wild fish</li> <li>○ Increase the proportion of Rainbow Trout stocked to reduce introgression and displacement</li> </ul> </li> </ul>

<sup>15</sup> Connecticut Brook Trout Conservation Strategy – unpublished draft (Barry 2017).

	<ul style="list-style-type: none"> <li>○ Acquire property or permanent easements to preserve high quality watershed area and <a href="#">coldwater habitat</a></li> <li>● Restoration of extirpated populations <ul style="list-style-type: none"> <li>○ Develop a Standard Operating Procedure for restoring Brook Trout to waters with suitable habitat where they have been extirpated (transplants)</li> <li>○ Develop a Standard Operating Procedure for introducing Brown Trout to waters where the habitat is no longer suitable for Brook Trout, but remains suitable for Brown Trout (replacement)</li> </ul> </li> <li>● Educate and disseminate information <ul style="list-style-type: none"> <li>○ Implement a landowner stewardship program to educate on best practices to sustain wild trout on their property</li> </ul> </li> </ul>
People	Coldwater Program Staff; Habitat Conservation and Enhancement Staff; Fishing Groups; Municipal agents and commissions
By Year 1	Report on evaluation of data; begin to compile plan; seek stakeholder input;
By Year 5	Publish and implement plan
Evaluation	Annual report on tasks completed; annual stakeholder meeting; actions underway for habitat conservation

**Goal 6.2: Continue to monitor and assess the status of wild trout populations**

<b>Objective 6.2.A: Acquire, evaluate, and disseminate wild trout population data/status</b>	
Actions	<ul style="list-style-type: none"> <li>● Continue to collect statewide data on status of wild trout populations, especially at locations with long periods of record</li> <li>● Perform robust statistical analyses of wild trout population numbers for sites with long-term data sets</li> <li>● Continue to share fish population and water temperature data with partner organizations focused on wild trout</li> <li>● Publish and distribute a map of drainage basins known or modeled (predicted) to be <a href="#">coldwater habitat</a> in conjunction with the Water Quality Monitoring Program within the Bureau of Water Protection and Land Reuse</li> <li>● Validate the <a href="#">Eastern Brook Trout Joint Venture</a> patch model map by sampling at least 10 locations annually</li> </ul>
People	Coldwater Program Staff; Habitat Program Staff; Fishing Groups; Municipal agents and commissions
By Year 1	Compile all data into a single centralized database; develop annual monitoring plans; monitor water temperature
By Year 5	Continued reporting on the status of wild trout populations; continued robust statistical analyses; identification of new populations; identification of populations extirpated or in danger

Evaluation	Annual report of tasks complete; updated maps of wild trout population status; contribution to regional efforts
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**Goal 6.3: Increase opportunity for recreational fishing of wild trout**

<b>Objective 6.3.A: Increase opportunity to fish for wild trout</b>	
Actions	<ul style="list-style-type: none"> <li>• Designate additional waters as Class 1 WTMA's, especially those within state-owned property. Seek permission for waters on non-state owned property with public access (land trust, municipalities, etc.)</li> <li>• Restore wild Brook Trout and wild Brown Trout to waters with suitable habitat where they have been extirpated (transplant)</li> <li>• Develop plan to establish wild Brown Trout populations where conditions are no longer suitable for wild Brook Trout (replacement)</li> </ul>
People	Coldwater Program Staff; Land Trust; Municipalities; Private land owners
By Year 1	Identify state-owned lands to add to WTMA 1 listing; identify waters for restoration of wild trout
By Year 5	Seek external partners to expand WTMA 1 waters
Evaluation	Annual report of tasks completed; Addition of waters; addition of external partners to assist in WTMA1 creation



## THEME 4: PUBLIC ENGAGEMENT

### 7. Increase awareness and relevancy of salmonid fisheries

The final theme of this plan is to increase awareness and relevancy of salmonid fisheries. Fishing means many things to many people. The benefits of fishing can include relaxation, excitement, time outside, being with family and/or friends, and gaining potential health benefits through bringing home a delicious meal. Participants at the public discussions would like the Fisheries Division to increase the focus on youth and families, especially as it relates to developing a passion for salmonid fishing.

Since 2011, the Fisheries Division has been investing resources to develop and implement programs to **Recruit** new anglers, **Reactivate** lapsed anglers, and **Retain** existing anglers (**R3**). The Fisheries Division R3 coordinator will continue to work in conjunction with fisheries biologists and staff with DEEP's office of Environmental Justice in order to implement campaigns, programs, and policies that will increase equitable access to, awareness of and participation in salmonid fishing opportunities.



*Annual events where the public are invited to “stock with DEEP” are very popular and help to increase awareness of Connecticut’s trout fisheries*

#### Goal 7.1 Increase awareness and relevancy of salmonid fisheries

<b>Objective 7.1.A: Invest in retention and reactivation efforts among existing anglers (lapsed or avid)</b>	
Actions	<ul style="list-style-type: none"> <li>• Collaborate with Agency and Division based R3 strategies</li> <li>• Engage with constituents on a regular basis               <ul style="list-style-type: none"> <li>○ Maintain a strong presence on a variety of social media and the DEEP web site</li> <li>○ Continue to create and distribute relevant fishing related videos on the web page and via social media (especially YouTube)</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>○ Conduct Facebook Live sessions during stocking events, opening day, and at each of the hatcheries</li> <li>○ Continue to post daily stocking reports on social media</li> <li>○ Continue to publish weekly stocking report on the web page and weekly fishing reports via email</li> <li>○ Augment the current interactive trout stocking map with public fishing access points and easements</li> <li>○ Continue to conduct “stock with us” events at popular fishing locations on Opening Day and throughout the stocking season</li> <li>○ Conduct presentations and talks at stakeholder meetings, banquets, and conferences</li> <li>○ Conduct town hall style meetings at several locations across the state to gather input and feedback</li> <li>○ Maintain and enhance educational materials and displays at the Burlington and Quinebaug Hatcheries</li> <li>○ Install graphic wraps on hatchery stocking vehicles to act as a “rolling billboard” to draw awareness to fish and fishing</li> </ul>
People	Coldwater Program Staff; DEEP R3 staff; DEEP Communications Staff
By Year 1	Develop plan on how salmonid fishing information is disseminated
By Year 5	Implement plan
Evaluation	Annual report on tasks completed; annual stakeholder meeting; number of public members reached
<b>Objective 7.1.B: To increase awareness and relevancy of salmonid fisheries to people in underserved communities, people who have not fished, or people who have not fished in a very long time (Recruitment and Reactivation)</b>	
Actions	<ul style="list-style-type: none"> <li>● Collaborate with Agency and Division based R3 strategies</li> <li>● Collaborate with DEEP’s Office of Environmental Equity</li> <li>● Collaborate with the Recreational Boating and Fishing Foundation (RBFF) and seek funding opportunities to reach underserved communities</li> <li>● Identify segments of underserved populations where focused efforts would be beneficial</li> <li>● Develop understanding of preferences and behaviors of non-traditional audiences as related to salmonid fishing</li> <li>● Evaluate Connecticut’s demographics and implement targeted marketing campaigns</li> <li>● Develop collaborative connections with community-based organizations</li> <li>● Continue to collaborate with the Fisheries Division’s Connecticut Aquatic Resource Education (CARE) Program to increase participation in free fishing classes</li> </ul>

	<ul style="list-style-type: none"> <li>• Continue to conduct “stock with us” events at popular fishing locations on Opening Day and throughout the stocking season</li> <li>• Support recommended action items as described within “Casting to the Future<sup>16</sup>” (CT’s draft plan to increase the number of people participating in fishing)</li> <li>• Install additional graphic wraps on hatchery stocking vehicles to act as a “rolling billboard” to draw awareness to fish and fishing</li> <li>• Purchase billboard space seasonally and target specific geographic locations</li> <li>• Continue to promote health benefits of eating stocked salmonids</li> <li>• Support organizations who run fish in the classroom programs</li> <li>• Improve awareness of the Community Fishing Waters program and expand as practical</li> </ul>
People	Coldwater Program Staff; DEEP R3 program staff; DEEP Office of Environmental Justice staff; Community-based groups; Faith-based groups; Municipalities; School Districts; RBFF; CARE
By Year 1	Develop plan to retain and recruit salmonid anglers
By Year 5	Implement plan
Evaluation	Annual report on tasks completed; number of anglers recruited or reactivated
<b>Objective 7.1.C: Communicate how fish and fishing managed by the Fisheries Division relate to and improve daily life for all</b>	
Actions	<ul style="list-style-type: none"> <li>• Develop messaging and methods to communicate the benefits of fishing to non-anglers <ul style="list-style-type: none"> <li>○ Ecological integrity; water quality; ecosystem services</li> <li>○ Local-based consumption of a healthy food option</li> <li>○ Health benefits</li> <li>○ Family memories and togetherness</li> <li>○ Fishing fuels conservation</li> </ul> </li> </ul>
People	Coldwater Program Staff; DEEP R3 program staff; DEEP Office of Environmental Justice staff; Community-based groups; Faith-based groups; Municipalities; School Districts; RBFF; CARE
By Year 1	Develop plan to disseminate how salmonid management and fishing can improve daily life, awareness, and connection to the environment
By Year 5	Implement plan
Evaluation	Plan completed and information disseminated

<sup>16</sup> Casting to the Future: CT Plan to Increase Participation in Fishing 2017

## **Appendix 1: A List of Goals for Each Theme**

### ***GROW FISH***

1. Maximize efficient production and distribution of salmonids at State Fish Hatcheries
  - Goal 1.1: Create a stable and predictable funding allocation for hatchery operation
  - Goal 1.2: Continue to focus on improving & maintaining hatchery infrastructure
  - Goal 1.3: Reduce losses of fish to predation
  - Goal 1.4: Distribute trout and salmon effectively and efficiently
  - Goal 1.5: Continue to maintain the highest level of professional development
2. Increase the size of fish produced at State Hatcheries
  - Goal 2.1: Increase “standard-size” 9-11 inch (2.0 fish per pound) trout to 10-12 inches (1.8 fish per pound).
  - Goal 2.2: Increase the number of “specialty trout”
  - Goal 2.3: Continue to manage waters where “hold-over” production is practical

### ***CATCH FISH***

3. Improve access to stocked salmonids
  - Goal 3.1: To maximize catch of stocked fish
  - Goal 3.2: Maintain and acquire access to waters
4. Provide a diversity of fish and fishing opportunities that appeal to a wide range of preferences and desires
  - Goal 4.1: Maintain the Kokanee Salmon fishery in select lakes
  - Goal 4.2: Maintain Brown Trout Fry stocking into WTMA's (Class 2 and Class 3)

### ***CONSERVE FISH***

5. Maintain a legacy population of Connecticut River strain Atlantic Salmon
  - Goal 5.1: Maintain the genetic integrity of the Connecticut River strain of Atlantic salmon at the Kensington State Fish Hatchery
6. Conserve wild trout populations
  - Goal 6.1: Develop and Publish a Wild Trout Management Plan
  - Goal 6.2: Continue to monitor and assess the status of wild trout populations
  - Goal 6.3: Increase opportunity for recreational fishing

### ***PUBLIC ENGAGEMENT***

7. Increase awareness and relevancy of salmonid fisheries
  - Goal 7.1 Increase awareness and relevancy of salmonid fisheries

## About the Authors:

Mike Beauchene: As a lifelong resident of Barkhamsted, CT, I was very fortunate to grow up with a wild brook trout stream in my back yard. I can't even imagine the number of hours I spent in and around that stream chasing, catching, and observing these trout (nicknamed Aphrodite of the Hemlock). My hero at the time was Jacques Cousteau and I thought for sure marine biology was in my future. Thanks to my late high school Environmental Science teacher, Walter Landgraf, I was connected with the Fisheries Division and became a volunteer on the Atlantic Salmon restoration project on Sandy Brook.

Working side by side with actual 'fisheries biologists' sealed my fate. After many years as a seasonal employee, graduating from UConn with a B.S. in Ecology and Evolutionary Biology and a M.S. in Natural Resource Management, I was fortunate to land employment at CT DEEP. I consider myself extremely fortunate to be in a position to engage my life's passion on a daily basis. I take my responsibility to focus on Connecticut's fish and fisheries very seriously. While I feel that I have been able to make some meaningful contributions regarding CT's fish communities, my aspiration is to do everything possible to make sure that all future generations have the opportunity to be mystified and inspired by Connecticut's natural resources, as was I.

Brian Eltz: Growing up in northeastern Pennsylvania provided me with the opportunity to observe and play in nature. I grew up a hunter and fisher and was able to truly enjoy natural wonders, at least to me, such as the springtime American Shad run and the fall time American Eel seaward migration (boy did those eel weirs intrigue the heck out of me) on the upper Delaware River. I can credit my interest in science to my 7<sup>th</sup> grade teacher, Mr. Decker. I can still remember putting a predacious diving beetle into a tank in his classroom and watching it devour an unsuspecting fish – man was that cool! I also watched a show called Wild America with Marty Stouffer, which even furthered my interest in observing wildlife. Boy was I hooked! But, what sealed the deal for me was interning with fisheries and wildlife biologists in CT on separate projects where I got to work with downstream migrant Atlantic Salmon smolts and use radio-telemetry to track White-tailed deer.

After graduating from UConn with a B.S. in Ecology & Evolutionary Biology, a M.S. from UMass, Amherst, in Fisheries Conservation, where I got to work with and study those downstream migrant eels (migrant shad too), and working seasonally for what seemed to be an eternity, I was luckily hired full-time by the CT Fisheries Division. I now take great pride in helping protect and enhance our natural resources. To me, there is nothing more gratifying than hearing about or seeing someone's catch of the day or discovering a stream that holds wild Brook Trout. And, I hope at the end of the day, that in some small way, I am helpful in helping others find their own natural wonders.



