# Connecticut's Warmwater Fisheries Action Plan (2026-2030)

The purpose of this plan is to maintain and improve recreational fishing for warm- and coolwater fish species found in Connecticut lakes, ponds, and rivers over the next five years.

## **Connecticut's Warmwater Fisheries Action Plan** May 2025

## **Connecticut Department of Energy and Environmental Protection**

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**The Purpose** of this action plan is to maintain and improve recreational fishing for warm- and coolwater fish species found in Connecticut lakes, ponds, and rivers over the next five years. The plan focuses on three major themes:

- 1. Provide Diverse Fishing Opportunities
- 2. Provide Equitable Access and Promote Fisheries
- 3. Monitor Fish Communities, Angler Use, and Habitat

This plan is a living document and will be updated periodically as stakeholders' needs, management needs, and environmental conditions change. Evaluation of the plan's goals, objectives, and actions will occur in 5-year segments and be adjusted accordingly.



Community members stopped by to watch Fisheries Division staff stock Channel Catfish in Lake Wintergreen, Hamden.

#### Introduction

Connecticut is the third smallest state in the United States at 5,543 mi<sup>2</sup>; however, the state boasts a diverse array of freshwater sportfish. Specifically, Connecticut's warm- and coolwater fisheries encompass over twenty different species which support exceptional fishing opportunities and are an important component of the State's overall recreational angling activity. Each year approximately 170,000 individuals acquire a fishing license for Connecticut waters. Overall, 3.3 million trips per year are spent fishing in Connecticut for all warmwater species combined (U.S. Department of the Interior, 2011). While approximately 2.1 million of those trips are spent fishing for Largemouth and Smallmouth Bass (see the 2022 Bass Action Plan), this document focuses instead on the other 1.2 million trips that are spent fishing for warm- and coolwater fish such as Northern Pike, Walleye, catfish and panfish.

Connecticut's public lakes and ponds differ considerably in size (2 to 5,420 acres), depth (3 to over 100 feet.), shoreline development, and productivity (oligotrophic to eutrophic, i.e., nutrient poor to nutrient rich). The wide range in physical and chemical parameters means fish species composition varies widely among locations; from small waters consisting of a handful of fish species to large impounded riverine systems containing almost every freshwater species known to exist in the State. These factors cause fish population parameters (e.g., growth, mortality, and population structure) to also vary among waterbodies.

State run fisheries management in Connecticut began with the formation of the Connecticut Fish Commission in 1866. This Commission was formed as human impacts on the native fish communities increased from rapid population growth along waterways, widespread deforestation, and damming of rivers and streams. State leaders recognized action was needed to restore, manage, and conserve the State's natural resources. As key native fish species were in peril (e.g., Atlantic Salmon, American Shad, and

"Early state fisheries workers were fish culturists, and these men had an insatiable urge to experiment with new species. They introduced Largemouth and Smallmouth Bass, Calico Bass (aka Black Crappie), Bluegill, Walleye, Sockeye Salmon, Brown Trout, Rainbow Trout, and spread Atlantic Salmon, White Perch, Lake Trout, and Rainbow Smelt all over Connecticut" – 1959 Wildlife News

Brook Trout), the introduction of non-native species became a top priority. There was little fisheries science at that time concerning the potential impacts of non-native introductions.

Introductions were done simply to see "what would

Recreational Fish Species in Connecticut

# Native to Connecticut

American Eel
American Shad
Brook Trout
Brown Bullhead
Chain Pickerel
Fallfish
Pumpkinseed
White Sucker
Yellow Perch
White Perch

# Introduced to Connecticut

Bluegill Bowfin Brown Trout Calico Bass (aka Black Crappie) Channel Catfish Common Carp Kokanee Largemouth Bass Northern Pike Rainbow Trout Rock Bass Smallmouth Bass Tiger Muskie Tiger Trout Walleye White Catfish Yellow Bullhead

take". Some introductions were considered successful and beneficial (e.g., Largemouth Bass). Others, in hindsight, were bound to fail due to habitat limitations (e.g., landlocked Atlantic Salmon). All introductions, however, modified Connecticut's fish community.

To ensure the sustainability of fisheries, rules and regulations including size and creel limits, seasonal closures, and habitat protections were implemented. The earliest management strategies in Connecticut were regulations (e.g., minimum length limits, creel limits, and closed spawning seasons) to protect newly introduced fish species. This was done to prevent overharvest (creel limits), protect fish during the spawn (closed seasons), and to allow fish to grow large enough to spawn at least once (minimum length limits). Later (1960's - early 1980's), minimum length limits were tailored to achieve the maximum sustainable harvest in weight (maximizing the total pounds of fish a waterbody could produce). Despite rules and regulations, supplemental stocking of some species was also required.



Staff holding a very large Walleye caught from Beach Pond, Voluntown during a mark-recapture population analysis.

Similar management strategies did not necessarily have the same effect everywhere. For example, changes in length limit regulations usually resulted in improved bass fishing. However, in other locations, the same management strategy caused bass growth rates to slow and subsequently the quality of fishing to decline. It became apparent that different inherent characteristics of each waterbody, such as productivity or fish species composition, were affecting the outcome of attempts to improve fishing. It was also apparent that optimum angling quality could be best addressed on a location-by-location basis. Moreover, a single species approach to management was too simplistic for warm- and coolwater lake and pond systems because of the complex interactions that exist among resident fish species. Informed management strategies could only be formulated through an understanding of these interactions in the context of lake and pond ecosystems. To that end, State fisheries biologists began gathering fish community data on all State-owned lakes and ponds and some privately owned waters in the mid-1980s. This effort continues to this day.

Currently, traditional management tools focused on controlling and modifying harvest are becoming less effective due to a cultural shift towards catch and release fishing. Looking forward, fisheries managers will need to consider the impacts of mortality and learned avoidance from catch and release as well as changes to lake habitat and ecology to effectively manage warm- and coolwater fisheries.

In Connecticut, one hundred percent of fishing license sales are used to support programs that directly support fishing. Examples include trout rearing and stocking, purchase of Northern Pike,

Walleye, and Channel Catfish, land acquisition for conservation and fishing access, maintenance of boat ramps, restoration of migratory fish species, monitoring of resident fish populations (marine and freshwater), fish habitat enhancement, and education and outreach efforts. Thus, fishing fuels conservation. Preserving and growing the relevancy of fishing is critical to the long-term sustainability of Connecticut's warm- and coolwater fisheries. With only about 4% of Connecticut's population purchasing licenses, there is a large pool of potential participants that could help sustain healthy fisheries in Connecticut. Future actions related to warm- and coolwater fisheries management could entice people to take up fishing for the first time; keep those currently fishing enthusiastic and supportive; and re-ignite the passion for those who have stopped fishing.



A similar structure and process was used to create <u>Connecticut's</u> <u>Statewide Salmonid Action Plan.</u>

To help develop this action plan, the Connecticut Department of <u>Statewide Salmonid Action Plan</u>. Energy and Environmental Protection Fisheries Division conducted an electronic survey in 2020 seeking angler preferences for warm- and coolwater fishing. Additionally, the Fisheries Division (FD) hosted two in-person forums and one webinar (September to November of 2019). The purpose of reaching out to Connecticut anglers was to gain input from those who specifically target warm- and coolwater species, as well as to have face-to-face discussions focused on four key questions related specifically to warm- and coolwater fishes:

- 1. What makes a good fishing trip (related to warmwater species) in CT?
- 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 Fisheries Division research and public input, this plan will identify specific objectives and actions related to the following three themes:

## **Theme 1: Provide Diverse Fishing Opportunities**

- **1A.** Support fisheries for popular sportfish species where self-sustaining populations are not adequate or possible.
- **1B.** Evaluate options for enhancing/developing fisheries for species with adequate self-sustaining populations.

## Theme 2: Provide Equitable Access and Promote Fisheries

- **2A.** Improve/increase physical access.
- **2B.** Disseminate information about fisheries.
- **2C:** Promote fisheries.

#### Theme 3: Monitor Fish Communities, Angler Use, and Habitat

**3A.** Collect, evaluate, and disseminate data related to fish communities, angler use, and habitat.

**3B.** Increase understanding of the magnitude and frequency of permitted activities which may have an impact on fish populations.

## **Theme 1: Provide Diverse Fishing Opportunities**

Fish managed under this theme fall into two distinct categories: 1) sportfish lacking self-sustaining populations in Connecticut that are stocked and 2) fish that are self-sustaining (these can be native or introduced).

Long- and short-term management needs and goals are largely dependent on how a fishery is categorized (i.e., natural or stocked). From a long-term perspective, habitat protection, conservation, and enhancement are priorities for sustaining naturally reproducing populations. A focus on habitat improvement can increase the resilience of all lake fish populations. Many strategies such as riparian buffers and hypolimnetic aeration also have broader benefits for those living or recreating on a waterbody by improving water quality and reducing algae blooms.

Stocking certain fish species is also a way to create and sustain fisheries that are struggling for various reasons (i.e., they cannot successfully reproduce sufficiently to maintain a fishery, or they may not exist in a location at all but there is angler desire to have them there). These projects are widely supported by the public, whether they fish or not.

Short-term goals will be directed toward monitoring habitat and fish populations (see Theme 2), developing warmwater lake categorizations for Connecticut lakes, setting population parameter goals, and obtaining a better understanding of angler preferences, usage, and motivations for fishing.

## **Category 1: Stocked sportfish fisheries**

Channel Catfish are an extremely popular sportfish and are widely regarded as the most important catfish species in North America for both food and sport. In Connecticut, populations of naturalized Channel Catfish occur in the Connecticut River, Thames River, Housatonic River, and some lakes and ponds. These naturalized populations were viewed as holding considerable untapped angling potential. The Connecticut State Board of Fish and Game collected and relocated warmwater species, including nearly 10,000 catfish (exact species not always specified), from Hamburg Cove off the Connecticut River as detailed in interdepartmental memos dated 1965 and 1968. The Connecticut State Board of Fish and Game newsletters indicated these fish were transported and stocked into designated "Children's Only Fishing Waters" to provide



The self-sustaining fishery in the Connecticut River regularly produces trophy Channel Catfish.

quality fishing for children (as a note, management of "Children's Only Fishing Waters" has changed over the years).

Channel Catfish are tolerant of a wide range of temperature and water quality parameters. Accordingly, stocking Channel Catfish can create fishing opportunities in small urban ponds where other sportfish species may struggle to persist. Recognizing this potential, the Fisheries Division began stocking Channel Catfish in 2007 in seven Catfish Management Lakes (CMLs) and four urban ponds (Beardsley Park Pond, Keney Park Pond, Spaulding Pond, and Lake Wintergreen). The program stocked yearling and/or adult Channel Catfish into various waters across the state. Then beginning in 2014, the number of waters stocked with adult Channel Catfish increased with the intent to provide quality summer fishing in highly developed, urban neighborhoods as part of the Community Fishing Waters program (CFWs). In addition to those fisheries created by FD stocking efforts, naturally reproducing populations of Channel Catfish persist and have directed fisheries in Connecticut's major river systems and some lakes.

However, angler interest and the overall impact of the Channel Catfish stocking program in Connecticut waters are still not fully understood. By gauging angler interest, and overall success rate for capture, the FD could begin to better manage CML's and CFW's stocking numbers to improve angler success. If paired with fish community sampling, balancing angler desires with the protection of other fish species can be prioritized to keep healthy fish assemblages in Channel Catfish managed waterbodies.

Northern Pike were stocked into Connecticut waters, beginning in 1970 at Bantam Lake, for a



Northern Pike are a popular target through the ice in each of Connecticut's four Pike Management Lakes.

variety of reasons: 1) they grow to large size (Connecticut record = 29lbs.) and therefore provide additional opportunities for anglers to catch trophysized fish, 2) their fighting ability on rod and reel, 3) their ability to control stunted panfish populations, and 4) they provide an additional angling opportunity during the ice fishing season. Today, Northern Pike can be found in multiple waterbodies throughout the state, including the FD's four Northern Pike Management Lakes and

self-sustaining populations in the Connecticut and Housatonic rivers. The FD also permitted the Lake Lillinonah Authority to stock 200 to 400 yearling Northern Pike (12-14 inches) from 2006

through 2019 into Lake Lillinonah. After 2019, the Lake Lillinonah Authority started stocking tiger muskie.



A bucket of fingerling Northern Pike donated by the Charles O. Hayford State Fish Hatchery in Hackettstown, New Jersey enroute to Pachaug Pond, Voluntown.

The FD currently maintains four Northern Pike Management Lakes (PMLs) through annual stockings of fingerling Northern Pike which are produced through a combination of DEEP rearing marshes, purchases from commercial vendors, and donations of surplus production from the Charles O. Hayford State Fish Hatchery in Hackettstown, New Jersey. Unfortunately, meeting stocking targets on a consistent annual basis can be difficult due to the complexities of rearing Northern Pike outside of a controlled hatchery setting.

Although juvenile Northern Pike production has proven successful in maintaining viable fisheries in our PMLs, it has a history of being highly variable. As such, the FD should maintain a portfolio of procurement methods and further explore alternative methods of obtaining Northern Pike, such as rearing fish within state-run hatcheries or developing formal trade agreements with neighboring states rather than relying on donations of surplus production.

The FD primarily uses springtime trap netting to estimate the abundance, age, and growth of Northern Pike. These data help us measure stocking success, understand the effects of length and creel limit regulations, assess other fish community impacts, and identify areas for improvement.

Walleye were initially introduced to Connecticut waterbodies during the early 20<sup>th</sup> century, with the goal of creating naturally reproducing and self-sustaining populations. However, Walleye did not become self-sustaining and, although fishable populations developed, stocking was discontinued in 1959. Walleye stocking was restarted in 1993 at three



Walleye, native to the north-central US and most of Canada, reach large sizes and are excellent table fare.

waterbodies for three main reasons: 1). to diversify fishing opportunities throughout the state, 2). for their ability to obtain large sizes, and 3). an angler preference for harvest and consumption. Furthermore, Walleye are both a popular sportfish and, like Northern Pike, an efficient predator that can help maintain balanced population structures and quality fisheries of other fish species.

Based on the success of the new waterbodies, the FD began stocking more lakes and currently the Walleye management program consists of 10 public lakes, two water company lakes and one private lake. The FD, the two water company authorities and the private lake association currently maintain these fisheries through an annual stocking of juvenile Walleye purchased from a commercial vendor. Initial creel limits for Walleye were liberal, and the FD recognized that anglers were able to target fish with high success rates while ice fishing and were harvesting between 40-80% of their catch. Now, a more conservative creel limit of 2 fish/day with a minimum legal length of 18-inches is in place to help protect from overharvest and allow for a greater sustained yield in all lakes.

The FD often receives requests to expand the Walleye program to additional waters. However, Connecticut has limited waterbodies with suitable habitat and forage to develop quality Walleye fisheries and focuses instead on maintaining and improving the existing fisheries. Like Northern Pike management, data are collected to estimate abundance, age, growth, and fishing outcomes and these data are used to measure stocking success, understand the effects of length and creel limit regulations and assess the impacts on other fish species.



Stockings by the Lake Lillinonah Authority have created a popular trophy fishery for tiger muskie.

**Tiger muskie**, a fish highly prized by anglers, are currently not stocked by the FD. However, two lake associations (the Lake Lillinonah Authority and the Woodridge Lake Association) have been issued permits by the FD to stock this fish. Tiger muskie are a sterile (i.e., cannot reproduce) hybrid between Northern Pike and Muskellunge. Like Northern Pike and Walleye, tiger muskie are seen as an attractive management tool for use in maintaining fish population balance because of their piscivorous nature, rapid growth to large size, and sterility. The FD is looking into utilizing tiger muskie in other waters in Connecticut.

# <u>Goal 1A.</u> Support fisheries for popular sportfish species where self-sustaining populations are not adequate or possible.

Stock fish that are purchased or raised internally to support long-term fisheries (i.e., Channel Catfish, Walleye, and Northern Pike). Assess the success and interest of these created fisheries through rotational population sampling and angler surveys. Evaluate the potential of expanding or creating new fisheries.

Stock Channel Catfish, Walleye, and Northern Pike where natural reproduction t support recreational fishing pressure.
t support recreational fishing pressure.
Purchase catchable adult (14-18 inch) Channel Catfish annually for stocking into specific state-managed lakes and Community Fishing Waters (CFWs).  Purchase fingerling (5-8 inch) Walleye for stocking into state-managed Walleye Management Lakes (WMLs).  Raise 15,000 (4-6 inch) Northern Pike fingerlings annually from managed spawning marshes and/or Connecticut FD fish hatcheries for stocking into four Pike Management Lakes and the Connecticut River.  Purchase an appropriate number of Northern Pike "frylings" (2-3 inch) from a Minnesota vendor for stocking into 2 PMLs (Bantam Lake and Winchester Lake) to create between 120-150 age-2  Northern Pike adults within each lake annually.  Continue to obtain Northern Pike fry annually from the State of New Jersey.
M Staff; and hatchery staff.



A fingerling Walleye purchased from West Central Bait & Fisheries in Minnesota. This Walleye was stocked in Lake Zoar, one of 12 lakes stocked with Walleye in 2024.

Objective	e 1.A.2: Evaluate stocking strategies (e.g. size, density, and timing).
Actions	<ul> <li>Evaluate Channel Catfish management in CMLs and CFWs</li> <li>Conduct population estimates and evaluate survival and growth of catfish in CMLs using specialized netting gear on a rotational schedule.</li> <li>Conduct angler surveys on CMLs on an as-needed basis to determine angler usage, catch rates, and satisfaction based off the population estimate work mentioned above.</li> <li>Conduct cost/benefit analysis of re-stocking CMLs and adjust stocking as needed based on angler usage and opinion.</li> <li>Conduct nighttime boat electrofishing sampling to determine impacts of Channel Catfish stocking on resident fish assemblages.</li> <li>Conduct angler surveys on all CFWs on an as-needed basis to determine angler usage, catch rates, and satisfaction.</li> <li>Conduct cost/benefit analysis of continuing stocking of each CFW and adjust stocking as needed based on angler usage and opinion.</li> <li>Perform electrofishing relative abundance estimates on a rotational basis for each CFW to determine holdover populations of Channel Catfish and their impacts on resident fish assemblages.</li> <li>Evaluate Walleye management in WMLs.</li> <li>Monitor success and growth of stocked fingerling Walleye using 2-3 early spring nighttime boat electrofishing samples in all WMLs on a rotational schedule.</li> <li>Conduct population estimates in WMLs should relative abundance indices suggest a declining population.</li> <li>Conduct angler surveys on an as-needed basis on WMLs to collect angler usage, catch and harvest rates, and angler opinion data on Walleye stocking</li> <li>Assess fish community impacts using all-species electrofishing.</li> <li>Evaluate Northern Pike management in PMLs.</li> <li>Conduct population estimates on a rotational basis every 3-4 years on PMLs.</li> <li>Assess newly imposed length limit for Northern Pike in Lake Lillinonah and determine effectiveness as a statewide regulation.</li> <li>Restore the use of the two spawning marshe</li></ul>
People	IFM Staff; hatchery staff, and CARE staff.

Actions	<ul> <li>Identify potential waters for stocking.</li> <li>Develop stocking plan including stocking density, frequency, and timing.</li> <li>Assemble a list of various sources for yearling tiger muskie (commercial vendors or other state hatcheries).</li> <li>Secure funding for purchase.</li> <li>Make determination for action.</li> </ul>
People	IFM staff.

## **Category 2: Self-sustaining fisheries**

"Panfish" species, which in Connecticut include Black Crappie, Bluegill, Pumpkinseed, Green Sunfish, Redbreast Sunfish, Yellow Perch, White Perch, and Rock Bass are important components of Connecticut's warmwater fisheries. Panfish are the most abundant members of the fish community in most lakes and ponds and play an important role in the lake and pond ecosystem. They are often prey for larger predatory species (such as Largemouth Bass, Walleye, and Northern Pike). While these fish do not reach the size of other recreational species, they are prolific and low on the food chain, making them ideal for harvest as they are sustainable and have relatively low concentrations of bioaccumulated contaminants (e.g., mercury).



The Pumpkinseed is one of Connecticut's most colorful fishes. This native species is present in almost all our lakes, ponds, and larger streams.

Multiple years of angler surveys conducted across the State indicate that many anglers are fishing for "anything". Panfish fit this designation as they are often abundant, easy to catch year-round, and good to eat. Their availability and willingness to bite make them ideal for any angler regardless of experience level or gear. Though this collective group of fish species could be considered the most sought after and caught in Connecticut, directed management and a complete statewide assessment is lacking, while daily creel limits are liberal (no minimum length or daily creel limit).

While numerous studies have shown that length and creel regulations can be effective at improving size structure of multiple panfish species, informed regulations require waterbody specific information on abundance, age and growth, and harvest. For example, where Bluegill populations have numerous small (<6") but fast-growing fish that experience heavy fishing pressure, they will often respond well to a reduced bag limit. Similarly, improving population structure in Black Crappie populations is often achieved with length limit restrictions.

Chain Pickerel are Connecticut's only native, freshwater apex predatory sportfish. They have a long contentious history with Connecticut anglers, as well as previous fisheries managers, who viewed them as a nuisance species. Many anglers to this day still view Chain Pickerel as an unwanted and harmful predator on more preferred species like trout and bass. However, Chain Pickerel



Chain Pickerel feed actively throughout the winter and are popular with ice anglers.

offer year-round fishing opportunities – they are one of a few lake-dwelling species that remain active during winter months – and over a third of anglers (39% according to an electronic survey of over 300 Connecticut anglers) target them. Angler survey data in Connecticut have shown that most harvest of Chain Pickerel occurs during the ice fishing season.

Although Chain Pickerel have the potential to grow to more than 24 inches and four pounds in unfished water supply reservoirs, these sizes are rarely attained in Connecticut waters where fishing occurs, likely due to several factors including winter drawdowns, low minimum size limits (15-inches), high daily creel limits (6 fish), and catch and release mortality. Chain Pickerel are an understudied species in Connecticut and beyond, leading to much uncertainty in determining appropriate management strategies. The FD needs to establish baseline population structure for lakes with established Chain Pickerel populations and determine if current regulations provide adequate protection.



Chain Pickerel occasionally hybridize with Connecticut's smallest esocid species, the native Redfin Pickerel. Redfin Pickerel are typically mistaken for small Chain Pickerel. The hybrid cross between a Redfin Pickerel and a Chain Pickerel pictured above displays characteristics intermediate between the two parent species.

**Common Carp** fishing has recently gained popularity among anglers in Connecticut. As a result of this increased interest, avid carp anglers requested the FD develop statewide regulations for Common Carp and create four Trophy Carp Waters, which was done in 2018. These new regulations were developed to maintain high quality carp fisheries while concurrently addressing concerns of overharvest/wanton waste of a species that some label as "invasive" or "trash". Due to their large size and habit of frequenting shallow waters along shorelines, Common Carp are one of the few species in Connecticut that support a bow and arrow fishery (other such fisheries include American Eel.



Connecticut is globally recognized among Common Carp enthusiasts. The CT Carp Open, hosted annually on the Connecticut River by Fishin' Factory 3 in Middletown, attracts international competitors.

Bowfin, Tench, White Sucker, and lampreys).



Bowfin coloration varies by age and sex. Males have a distinct tail eye-spot and green fins. This 11-inch subadult male Bowfin has bold markings that will fade with adulthood.

Bowfin were introduced to Connecticut relatively recently (after 1960). They are locally abundant in preferred habitat in the Connecticut River and Scoville Reservoir (Wolcott). They were also found in the Podunk River in 2024. The Connecticut River population is the most robust and in Connecticut occurs from the Massachusetts border downstream at least through Haddam. While not specifically managed, the population in the

Connecticut River appears to be expanding and as such, a directed fishery may result. Additionally, education of the angling public is necessary as this species is commonly confused with the invasive Snakehead, which are not known to occur in Connecticut. As such, educating the angling public about the difference between Bowfin and Snakehead could help reduce unwanted waste when anglers might think they are helping remove an invasive species. Monitoring efforts for Bowfin have shown increasing abundance, but little is known about food preferences, growth, or the effects on other resident fish populations in Connecticut.

Tench are currently found in two Connecticut lakes; Lake Winnemaug and Bantam Lake. Recent sampling of Lake Winnemaug suggests the Tench population is small and not impacting other resident lake fish species. Data from the FD's Lake and Pond sampling program show a steady increase in the number of Tench captured at Bantam Lake since they were first detected in 1998 at a catch per unit effort of 2.5 fish per hour to a high of 52.6 fish per hour in 2016. As of 2022, Tench were



Tench are native to Eurasia where they are highly esteemed for food and sport.

captured at a rate of 22.0 fish per hour, indicating a possible leveling off of the population. The impacts of this introduced fish species to the other lake fish species are currently unknown. No known directed fishery currently exists for Tench in either location. However, there is a directed fishery for Tench in the United Kingdom where they are actively sought by anglers using methods like those used for carp.



Banded Sunfish (left), Swamp Darter (top), and Bridle Shiner (right) are native warmwater fish that are listed as species of greatest conservation need in Connecticut's State Wildlife Action Plan. One of the central challenges in fisheries management is balancing the angling and economic benefits of introduced sportfish with the conservation of native species.

# <u>Goal 1B.</u> Evaluate options for enhancing/developing fisheries for species with adequate self-sustaining populations.

Some self-sustaining sportfish populations (e.g., Bluegill, Common Carp, and Chain Pickerel) can benefit from special management through length and daily bag limit regulations or stocking of larger sized individuals (e.g., Bluegill) to maximize angler satisfaction. Before undertaking such enhancement measures, proper evaluation of existing populations must be carried out.

Actions		Identify new opportunities to diversify fishing opportunities.  Identify new urban waterbodies suitable for CFW designation.
Actions	_	·
	•	Compile a list of waters where new management strategies could create trophy
		fisheries, high catch rate fisheries, or harvest-based fisheries.
	•	Panfish
		<ul> <li>Assess angler interest in intensive panfish management.</li> </ul>
		<ul> <li>Review management plans for panfish from other northeast states.</li> </ul>
		<ul> <li>Develop lake categories based on criteria such as growth rates,</li> </ul>
		abundance, and mortality.
		<ul> <li>Use lake classification system to determine which lakes may benefit</li> </ul>
		from adaptive management.
		<ul> <li>Set experimental regulations based on groupings for a set of trial lakes.</li> </ul>
		o Assess FD hatchery capacity to raise large (i.e., $\geq 8$ -inch) panfish for
		stocking into Community Fishing Waters.
	•	Chain Pickerel
		<ul> <li>Assess age and growth for Chain Pickerel statewide (see Goal 2.A.)</li> </ul>
		<ul> <li>Use electrofishing catch-effort data to assess Chain Pickerel abundance</li> </ul>
		<ul> <li>Supplement with trap netting data where appropriate.</li> </ul>
		<ul> <li>Determine if current regulations maintain quality size Chain Pickerel.</li> </ul>
		o Determine if permitted activities (e.g., drawdowns and herbicide
		treatments) have caused declines in Chain Pickerel abundance.
		o Consider funding a graduate project through a state university to
		improve understanding of Chain Pickerel fisheries dynamics.
	•	Common Carp
		o Determine angler satisfaction and regulation effectiveness to maintain
		or improve population structure in Trophy Carp Waters.
		Use data from the lake and pond database to determine other lakes with
		potential for Common Carp management.
		<ul> <li>Consider funding a graduate project through a state university to assess</li> </ul>
		abundance, age, and growth of Common Carp in Connecticut.
	•	Tench
		<ul> <li>Create awareness among anglers through signage and informational</li> </ul>
		videos on how to target and catch Tench.
		<ul> <li>Prevent the further spread of Tench through angler education.</li> </ul>
		<ul> <li>Use the Lake and Pond database to assess the impacts of Tench on fish</li> </ul>

assemblages in the two lakes where they occur.

IFM staff, CARE staff, hatchery staff, licensed anglers of Connecticut,

northeast states fish chiefs, licensing system staff.

People

Actions	<ul> <li>Identify lakes where habitat is lacking and determine the best course of action to improve habitat.</li> </ul>
	<ul> <li>Collaborate with Habitat Conservation and Enhancement (HCE) staff to support activities that promote native aquatic vegetation growth and limit or eliminate non-native/invasive aquatic vegetation.</li> </ul>
	<ul> <li>Increase outreach demonstrating the need for riparian and littoral zone habitat protection and enhancement for Chain Pickerel and panfish (educate landowners on herbicide treatments and drawdowns).</li> </ul>
	<ul> <li>Collaborate with HCE staff to develop best management practices for ensuring lake aquatic plant treatments and shoreline modifications do not impact panfish and Chain Pickerel recruitment.</li> </ul>
	<ul> <li>Create an information sheet to distribute to stakeholders that outlines best management practices for panfish and Chain Pickerel.</li> </ul>
People	IFM Staff, CARE staff, R3 staff, and HCE staff.

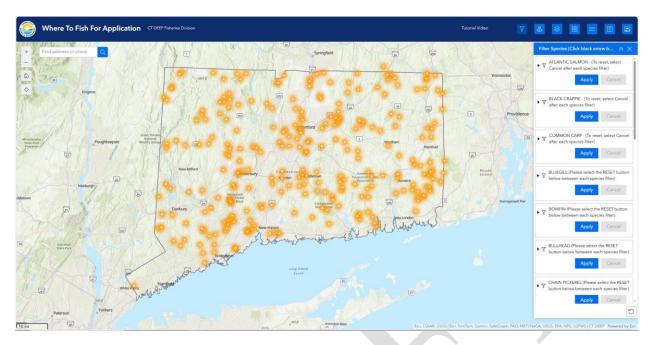
## Theme 2: Provide Equitable Access and Promote Fisheries

The FD understands that fishing can mean many things to different anglers and that the benefits of fishing are as diverse as the anglers themselves. Fishing is a beneficial social activity. Depending on your preference, fishing offers the opportunity to relax, enjoy time with friends and family, be surrounded by nature, experience peace and tranquility, compete with others, or bring home a delicious meal. Funds generated through the purchase of licenses, tackle, and boat motor fuels are key to funding the North American Model of Fisheries Management, which means fishing fuels conservation and is a benefit extended to every resident of Connecticut.



The fishing pier at Center Springs Park Pond (Manchester) improves access to a variety of fish including stocked trout, Channel Catfish, Largemouth Bass, and Bluegill.

Ideally, the FD desires that all anglers have practical and legal access to all the fisheries resources Connecticut has to offer. However, obstacles exist. The condition and use of access areas to many Connecticut lakes and ponds has changed as more people move toward outdoor activities for personal enjoyment. Connecticut waters support a diverse array of recreational activities, such as fishing, swimming, kayaking, boating, and other watersports. Conflicts can arise between different user groups in high-frequency use areas, especially when capacity limits are exceeded during popular weekends or holidays.



The "Where to Fish For" application (pictured above), Interactive Trout Stocking Map, Connecticut State Boat Launches Map, georeferenced regulations available for free in FishBrain, and recently launched Fish Community Data App, are all examples of tools designed to help provide anglers and other stakeholders the information they need to effectively engage with our fisheries resources.

Furthermore, boat launches or shoreline access points are not available at many waterbodies, impeding an angler's ability to fish there. The undesired introduction of invasive aquatic vegetation that goes unmanaged also limits access, making fishing in highly vegetated areas nearly impossible. One facet of this plan is to increase the awareness of lesser-known fishing opportunities outside of the most popular waters and fisheries. Many of these "off the beaten path" waters can provide high-quality fishing opportunities for a variety of self-sustaining species (e.g., panfish, Chain Pickerel, bass, and bullhead) as well as fisheries augmented by the

FD (e.g., trout and Channel Catfish).

The absence of waterbody-specific fishery information also inhibits angler access to new locations. Anglers targeting specific fisheries like to know when they can expect to catch the target species and in which waters. However, those anglers that are more generalist often ask what fish are available in a waterbody, where they can find them, and how to fish for them. Convenient access to this information can increase the success of an angling trip, and lead to recurring trips in the future.



Excessive aquatic vegetation or algae limits summertime fishing access, especially in shallow, nutrient-rich ponds.

# **Goal 2A.** – Improve/Increase Physical Access

Continue to collaborate with the DEEP Boating Division, Parks Division, Land Acquisition and Management Division, municipalities, lake associations, and landowners to acquire and/or enhance access via boat launches and/or the shoreline, especially for people with disabilities.

Objective 2.	A.1: Maintain, improve, and create boat launches.
Actions	<ul> <li>Survey anglers to help inform DEEP prioritization of state boat launches in need of renovation.</li> <li>Support the acquisition of property or easements when appropriate.</li> <li>Improve visibility of signage, especially to indicate legal public access.</li> <li>Create a boat launch categorization scheme that further refines the current cartop vs trailered categories so anglers can know what size and type of boat can be accommodated at a given launch.</li> </ul>
People	Inland Fisheries Management (IFM) Staff, Land Acquisition and Management staff, Boating Division staff, Bureau of Outdoor Recreation staff, Bureau of Support Services staff, Connecticut Aquatic Resources Education (CARE) staff, land trusts, lake associations, water supply companies, and municipalities.

Objective 2	.A.2: Maintain/increase shoreline fishing opportunities.
Actions	<ul> <li>Improve existing shoreline access through multiple means (vegetation management, dredging, installation of fish attracting structures, etc.)</li> <li>Evaluate and prioritize opportunities to develop or expand shoreline access at state-owned waters.</li> <li>Disseminate information on statewide shoreline fishing access opportunities.</li> <li>Support the acquisition of property or easements when appropriate.</li> <li>Continue to expand fishing access opportunities with water supply companies.</li> <li>Improve visibility of signage, especially to indicate legal public access.</li> </ul>
People	IFM Staff, Land Acquisition and Management staff, Boating Division staff, Bureau of Outdoor Recreation staff, Bureau of Support Services staff, CARE staff, land trusts, lake associations, water supply companies, and municipalities.



Beaver Pond is an oasis for the people and local wildlife of urban New Haven. However, maintaining fishable shoreline access at Beaver Pond is a challenge that requires dedicated, ongoing effort.

Objective 2	2.A.3: Maintain/increase access for people with disabilities.
Actions	<ul> <li>Identify all facilities on state-owned lakes that currently have access for people with disabilities and rank their condition.</li> <li>Improve and/or enhance existing access and actively develop new access locations for people with disabilities.</li> <li>Modify current boat ramps to improve/establish access for people with disabilities where possible.</li> <li>Influence future boating access projects to improve access for people with disabilities.</li> <li>Develop new shoreline access for people with disabilities on properties and lakes owned and/or operated by the State.</li> <li>Identify facilities that do not reach ADA criteria for handicapped access but have even terrain, short walking distances, and/or other features that make them suitable for those with mobility limitations.</li> </ul>
People	IFM Staff, Land Acquisition and Management staff, Boating Division staff, ADA staff, Bureau of Outdoor Recreation staff, Bureau of Support Services staff, CARE staff, land trusts, lake associations, water supply companies, and municipalities.

# **Goal 2B.** – Disseminate Information About Fisheries.

Work collaboratively with the Connecticut Aquatic Resources Education (CARE) program to provide accurate and timely information about where, when, and how to fish, and stocking updates to motivate people to fish.

Objective 2.B.	1: Enhance awareness of fishing opportunities.
Actions	<ul> <li>Collect data in support of the Where to Fish For application and aid in refining the user experience and promoting its use.</li> <li>Collaborate with CARE program staff to enhance the relevancy of urban fishing opportunities, especially Community Fishing Waters.</li> <li>Maintain a strong presence on social media, the DEEP website, and through email.         <ul> <li>Continue to create and distribute relevant fishing related videos.</li> <li>Continue to post warm- and coolwater stocking reports on social media as they occur.</li> <li>Continue to inform anglers through the Fishin' Tips newsletter, emails to license holders, and regular website updates.</li> </ul> </li> </ul>
People	IFM Staff, DEEP R3 staff, CARE Urban Fishing Coordinator, DEEP communications staff, and DEEP DEI Team.

**Objective 2.B.2:** Increase awareness of fishing among youth and people in underserved communities.

#### Actions

- Collaborate with the CARE Urban Fishing Coordinator to:
  - o Identify segments of underserved populations where focused efforts would be beneficial.
  - Establish collaborative connections with community-based organizations.
- Work with the CARE Urban Fishing Coordinator and the Recreational Boating and Fishing Foundation (RBFF) to seek funding opportunities to reach underserved communities.
  - Evaluate Connecticut's demographics and implement targeted marketing campaigns.
  - Develop an understanding of preferences and behaviors of nontraditional audiences as related to warm- and coolwater fishing.
- Continue to collaborate with the Fisheries Division's CARE program to increase participation in free fishing classes.
  - o Improve awareness of the Community Fishing Waters program and expand as practical.
- Support fishing clubs/organizations who have youth programs (e.g., Connecticut Bass Nation).

## People

IFM Staff, CARE staff, DEEP R3 staff, DEEP Office of Environmental Justice staff, DEEP DEI Committee, community-based groups, faith-based groups, municipalities, school districts, RBFF programs, and tournament organizations.



The CARE Program's suite of educational offerings gives students of all backgrounds the skills, knowledge, and encouragement needed to become successful anglers. Fishing fosters a unique connection with nature, leading CARE students to appreciate and advocate for Connecticut's natural resources.

## **Goal 2C.** – Promote Fisheries

People are often unaware of opportunities in their backyard, so this goal is designed to educate people about the fishing opportunities across Connecticut, especially those nearest to them. The actions listed below will be most effectively achieved through collaboration with the Fisheries Division's CARE program, which shares a common vision and approach to increase the awareness of the quality fishing opportunities in Connecticut.

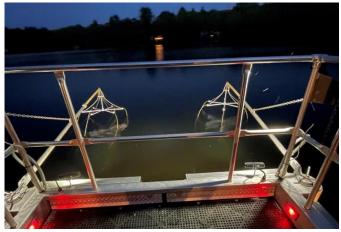
Objective 2.	C.1: Promote fisheries.
Actions	<ul> <li>Collaborate with the CARE program to develop and implement a campaign to promote:         <ul> <li>The Community Fishing Waters Program.</li> <li>The Connecticut River fisheries (catfish, Common Carp, bass, Bowfin, Walleye and Northern Pike).</li> <li>Create a Connecticut River fishing and access map.</li> <li>Trophy Common Carp locations.</li> <li>Panfish (Bluegill, Black Crappie, Yellow Perch).</li> <li>Utilization of data compiled from Objective 1.B.1 and 1.B.2 to market new specialty fisheries.</li> </ul> </li> </ul>
People	IFM Staff, CARE staff, and DEEP R3 staff.

•	: Communicate how fish and fisheries managed by the Fisheries Division relates daily life for all.
Actions	<ul> <li>Collaborate with DEEP's CARE program to develop messaging and methods to communicate the benefits of fishing to non-anglers which includes:         <ul> <li>Fishing fuels conservation.</li> <li>Ecological integrity; water quality; ecosystem services.</li> <li>Local-based consumption of healthy food options.</li> <li>Health benefits.</li> <li>Family memories and togetherness.</li> </ul> </li> </ul>
People	IFM Staff, CARE staff, DEEP R3 staff, DEEP Office of Environmental Justice staff, community-based groups, faith-based groups, municipalities, school districts, and RBFF programs.

## Theme 3: Monitor Fish Communities, Angler Use, and Habitat

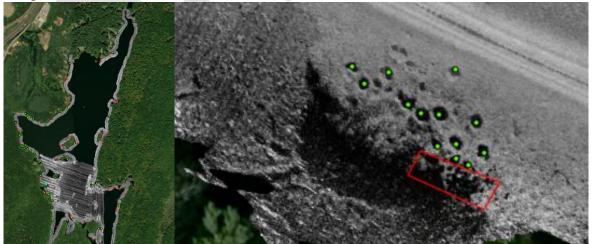
Understanding the fish community, fish habitat, fish pathogens, and the general condition of a lake or pond is critical for developing an effective management strategy. A series of statewide surveys were conducted in 1877, 1937, and 1959, and efforts continue to this day through our lake, pond, and large river monitoring program that began in its current form in the 1980s. Regular sampling of the State's fisheries is a prerequisite to effective management. Up-to-date

information about fish populations and angler use (catch, effort, catch rates, angler opinions, etc.) is required to make informed management decisions for warmand coolwater fisheries over time. Utilizing the traditional methods of electrofishing along with specialized netting gear, angler surveys, and the latest advances in technology (e.g., side scan sonar), FD staff will be able to keep current and expand the knowledge of the State's warm- and coolwater fisheries resources. In addition to the internal use of fish community data, the FD intends to make this information publicly accessible.



The netter's point of view during a night boat electrofishing sample. Night boat electrofishing is the primary way the FD learns about fish communities in Connecticut's lakes and ponds.

The evaluation of fish community data can help determine changes in fish community structure resulting from the management of nuisance aquatic vegetation (chemical, biological, or mechanical harvest), lake drawdowns, stocking of fish, or changes to sport fishing regulations. Angler surveys can help the FD better understand angler preferences towards specific species and opinions on management strategies used on specific waterbodies. Through better understanding of the effects of environmental/habitat changes and angler behavior (e.g., shifts towards a preference for catch-and-release fishing) on fish populations, the FD can optimize these fisheries. This information will enable the FD to identify waterbodies that may need alternative management practices or are subject to environmental stressors. The FD's Habitat Conservation and Enhancement (HCE) program, along with the DEEP Pesticide Management Program, will also find these evaluations useful to inform actions required for a variety of habitat related permits.



Side scan sonar units, donated to the FD by Connecticut B.A.S.S. Nation, allow us to identify high priority habitats. Above is a side scan sonar mosaic of Mashapaug Lake's nearshore habitat, with bass nest depressions marked with green and sunfish nesting colonies marked with red polygons. The image to the right is a closeup of several identified nests.

# <u>Goal 3A.</u> – Collect, Evaluate, and Disseminate Data Related to Fish Community, Angler Use, and Habitat.

The FD will continue to collect relevant data on fish communities, angler use and opinions, and aquatic habitat diversity. These data are fundamental to adaptive management and where appropriate will be included in a public facing tool to improve angler knowledge and access to fisheries specific information for improved fishing success.

# **Objective 3.A.1:** Collect Data. Actions Develop a prioritized list of waters to be sampled via nighttime electrofishing across the following categories on a rotational basis: o Long-term monitoring sites. o Special management lakes (e.g. Walleye, bass, Northern Pike, Channel Catfish, and Chain Pickerel). o Community Fishing Waters. o Lakes with no special management. o Lakes and ponds without fish population data. o Large river systems. o Privately owned waters with little or no fishing access. Sample all species to gather waterbody-specific length frequency data. Take scales to determine age and growth on a case-by-case basis. Continue to conduct angler surveys in managed waters using standardized questionnaires. o Supplement standard surveys to collect waterbody-specific angler opinion data. o Develop a prioritized list of waters to survey on a rotational basis. Identify habitat data gaps to prioritize habitat assessments. o Collect side scan sonar data where appropriate. o Maintain an up-to-date inventory of historical and current drawdowns, herbicide treatments, and triploid Grass Carp stockings. o Develop a database of lake and pond habitat enhancement work consulted on and/or performed by Fisheries Division staff. Submit wild samples for fish pathology testing annually to the USFWS. IFM Staff, HCE staff, community-based groups, municipalities, People school districts, USFWS, and anglers.



A crew preparing to night sample a Community Fishing Water. The new FD electrofishing raft allows us to adaptively manage many waterbodies that were previously inaccessible to our sampling gear.

# Objective 3.A.2: Manage and evaluate data.

#### Actions

- Develop a centralized data management system to seamlessly join historic fish community and angler use data with ongoing data collection efforts.
- Develop capacity to automate the calculation of statistics (see below) useful for comparing samples across space and time.
  - o Calculate catch per unit effort for specific species for specific gears.
  - Calculate proportional stock density (PSD) (i.e., the percent of stock sized fish that are quality size) for sportfish species.
  - Perform statistical analyses to compare catch effort over time, lengthfrequency distributions over time, and species density over time.
  - Calculate population estimates and/or density estimates (i.e., fish/acre) for managed sport species and/or forage fish species utilized by sport fish species.
  - o Calculate overall and directed angler effort for specific species.
  - o Calculate angler harvest for specific species.
  - Summarize angler opinions regarding specific fisheries management questions.
- Evaluate data to identify if species metrics are changing or stable (e.g., catch per hour, PSD, changes in length frequency structure and age structure over time, habitat changes, etc.).
- Evaluate impact of stocking practices on native and nongame fishes.
  - Determine catch per unit effort (CPUE), length-frequency, and age and growth data from electrofishing for native and nongame species before and after stocking.
  - Recommend changes to stocking practices based on fish sampling data and angler surveys. Utilize these data to inform future stocking decisions into other waterbodies.
- Develop a wild fish pathology surveillance database for Connecticut.

#### People

## IFM Staff.



From angler surveys to hoop netting, the FD collects a lot of data. Effectively managing and evaluating these data is critical to understand and improve our fisheries.

Objective 3	3.A.3: Disseminate Data.
Actions	• Continue collecting and sharing fish community data through the new Fish
	Community Data App.
	<ul> <li>Utilize data and analyses from Objective 2.A.2 to support angler expectation-</li> </ul>
	setting and decision-making through tools like CARE's Where To Fish For
	Application (arcgis.com).
	<ul> <li>Create and share side scan sonar mosaics from surveyed waterbodies.</li> </ul>
	Share aquatic habitat enhancement maps.
People	IFM and HCE staff.

# <u>Goal 3B.</u> Increase understanding of the magnitude and frequency of permitted activities, which may have an impact on fish populations.

Coordinate with program staff responsible for fishing tournaments, lake drawdowns, aquatic herbicide treatments, in-lake structure permits, warmwater fish stocking, and Grass Carp stockings in all public lakes in Connecticut.

•	L: Improve or develop systems to track fishing tournaments, lake drawdowns, le treatments, Grass Carp stockings, and other permitted activities in bublic lakes.
Actions	<ul> <li>Identify key staff and initiate discussions.</li> <li>Identify existing information, data gaps, and data needs.</li> <li>Build and maintain data management system(s).</li> <li>Analyze resulting data to better understand fisheries impacts and refine best management practices.</li> </ul>
1	IFM Staff, HCE staff, aquatic herbicide and pesticide permitting staff, and DEEP GIS staff.

#### Conclusion

Connecticut's warm- and coolwater fish species play a vital role ecologically, recreationally, and economically. While trout species and black bass receive the most targeted angling effort, numerous other stocked and self-sustaining warmwater species are vital to maintaining functional ecosystems and offering diverse fishing opportunities throughout Connecticut. With responsible conservation management plans and an engaged citizenry, we can ensure Connecticut's warm- and coolwater fisheries are maintained and improved into the future.



Triploid Grass Carp effectively control aquatic vegetation, but finding balance can be a challenge.

## Appendix A: List of Themes, Goals, and Objectives

## **Theme 1: Provide Diverse Fishing Opportunities**

# Goal 1A. Support fisheries for popular sportfish species where self-sustaining populations are not adequate or possible.

Stock fish that are purchased or raised internally to support long-term fisheries (i.e., Channel Catfish, Walleye, and Northern Pike). Assess the success and interest of these created fisheries through rotational population sampling and angler surveys. Evaluate the potential of expanding or creating new fisheries.

**Objective 1.A.1:** Stock Channel Catfish, Walleye, and Northern Pike where natural reproduction is absent or cannot support recreational fishing pressure.

Objective 1.A.2: Evaluate stocking strategies (e.g. size, density, and timing).

**Objective 1.A.3:** Evaluate feasibility for stocking tiger muskie.

# Goal 1B. Evaluate options for enhancing/developing fisheries for species with adequate self-sustaining populations.

Some self-sustaining sportfish populations (e.g., Bluegill, Common Carp, and Chain Pickerel) can benefit from special management through length and daily bag limit regulations or stocking of larger sized individuals (e.g., Bluegill) to maximize angler satisfaction. Before undertaking such enhancement measures, proper evaluation of existing populations must be carried out.

**Objective 1.B.1:** Identify new opportunities to diversify fishing opportunities.

**Objective 1.B.2:** Protect and enhance Chain Pickerel and panfish habitat in Connecticut waters.

## **Theme 2: Provide Equitable Access and Promote Fisheries**

## Goal 2A. Improve/Increase Physical Access.

Continue to collaborate with the DEEP Boating Division, Parks Division, Land Acquisition and Management Division, municipalities, lake associations, and landowners to acquire and/or enhance access via boat launches and/or the shoreline, especially for people with disabilities.

**Objective 2.A.1:** Maintain, improve, and create boat launches.

**Objective 2.A.2:** Maintain/increase shoreline fishing opportunities.

**Objective 2.A.3:** Maintain/increase access for people with disabilities.

## Goal 2B. Disseminate Information About Fisheries.

Work collaboratively with the Connecticut Aquatic Resources Education (CARE) program to provide accurate and timely information about where to fish, when to fish, how to fish, and stocking updates to motivate people to fish.

**Objective 2.B.1:** Enhance awareness of fishing opportunities.

**Objective 2.B.2:** Increase awareness of fisheries to people in underserved communities, people who have never fished, or people who have not fished in a very long time (recruitment and reactivation).

## Goal 2C. Promote Fisheries.

People are often unaware of opportunities in their backyard, so this goal is designed to educate people about the fishing opportunities across Connecticut, especially those nearest to them. The actions listed below will be most effectively achieved through collaboration with the Fisheries Division's CARE program, which shares a common vision and approach to increase the awareness of the quality fishing opportunities in Connecticut.

**Objective 2.C.1:** Promote fisheries.

**Objective 2.C.2:** Communicate how fish and fisheries managed by the Fisheries Division relates to and improves daily life for all.

#### **Theme 3: Monitor Fisheries**

# Goal 3A. Collect, Evaluate, and Disseminate Data Related to Fish Community, Angler Use, and Habitat.

The FD will continue to collect relevant data on fish communities, angler use and opinions, and aquatic habitat diversity. These data are fundamental to adaptive management and where appropriate will be included in a public facing tool to improve angler knowledge and access to fisheries specific information for improved fishing success.

Objective 3.A.1: Collect Data.

**Objective 3.A.2:** Manage and evaluate data.

Objective 3.A.3: Disseminate Data.

# Goal 3B. Increase understanding of the magnitude and frequency of permitted activities, which may have an impact on fish populations.

Coordinate with program staff responsible for fishing tournaments, lake drawdowns, aquatic herbicide treatments, in-lake structure permits, warmwater fish stocking, and Grass Carp stockings in all public lakes in Connecticut.

**Objective 3.B.1:** Improve or develop systems to track fishing tournaments, lake drawdowns, aquatic herbicide treatments, Grass Carp stockings, and other permitted activities in Connecticut's public lakes.