



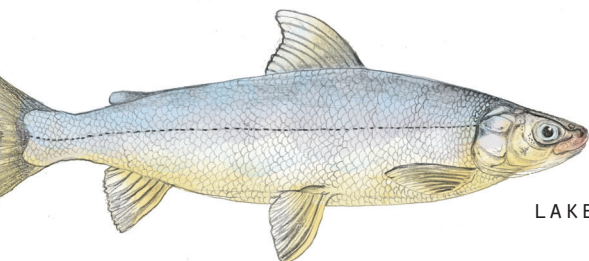
Volume I

Managing Maine's Inland Fisheries into the Future



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LAKE WHITEFISH

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A MESSAGE FROM THE DIRECTOR

Francis Brautigam
Fisheries and Hatcheries Division Director

Freshwater angling has been a part of Maine’s identity for centuries. Most of the state’s lakes and ponds were naturally formed by glacial retreat over 10,000 years ago, with Native Americans, early settlers, and loggers all known to rely heavily on brook trout and chain pickerel for food, even relocating some species so they would be closer to their settlements.

Around the turn of the last century, improved railways made it easier for out-of-state travelers to explore our fisheries; and as word spread, Maine became one of the country’s top fishing destinations. Around that same time, Maine’s waterways began to feel the effects of the Industrial Revolution. Rivers were widened to transport wood from timber harvests, mill dams were built along waterways to process wood products, lakes and ponds were overfished, and pollutants were carelessly dumped throughout Maine’s freshwater habitats.

Thanks to post-industrial age interventions including state and federal land and water conservation laws and associated management actions, many of our state’s aquatic resources have partially if not fully recovered; and to the untrained eye, these systems show little to no scars of the past. The Maine Department of Inland Fisheries and Wildlife’s Division of Fisheries and Hatcheries is passionate about keeping Maine’s wealth of fishery resources protected while also providing for their wise use. To manage this, we rely on well-informed planning within the Department, as well as cooperation from numerous partners including other state and federal agencies, advocacy groups, law-abiding anglers, and all those who appreciate Maine’s outdoors.

The 2021–2035 MDIFW Fisheries and Hatcheries Division Strategic Management Plan is the culmination of several years of planning, coordination, and public engagement. Having done this work, we are confident this 15-year plan accurately reflects existing and anticipated future management challenges and puts forth a meaningful approach to the stewardship of Maine’s inland fisheries.

While the Division of Fisheries and Hatcheries previously developed several long-range strategic plans to support operations, our goal this time was to take a new, even more comprehensive and public-centric approach that delivered on three key objectives:

1

To raise public awareness of the organization, operation, and future management goals of the Fisheries and Hatcheries Division

2

To convene members of the public and special interest groups on Technical Subcommittees to outline specific management actions for the state’s most important sport fish

3

To increase public participation through vehicles like public stakeholder-supported and water-specific management plans

All work completed in this planning process was reviewed by a steering committee that included members of the public and representatives from conservation-related organizations. We will be adding the actions listed herein to Division work plans, and we will track progress and accomplishments throughout implementation. Not only will this approach create consistency and direction for statewide Division work programs; it will also help us identify work program needs and corresponding partnerships.

This plan is divided into three volumes:

Volume I: Managing Maine’s Inland Fisheries into the Future

Volume II: Fisheries and Hatcheries Division Structure, Responsibilities, and Operations

Volume III: Species Assessments

This structure allows us to highlight future goals, provide supplemental background information, better understand how each goal may be implemented, and explain some of the general history and current considerations in the management of Maine’s most prominent freshwater fish.

I have had the pleasure of leading the Maine Department of Inland Fisheries and Wildlife’s Fisheries and Hatcheries Division since 2016. My passion for the state’s fisheries resources extends beyond my formal position, as I spend much of my off time on the water with a rod in hand, or more recently helping my young granddaughter develop a similar appreciation for the sport. My leadership vision for the Division includes a commitment to operate in a manner that is open, transparent, and accountable, allowing for meaningful public engagement and participation. I believe the process and the work that went into building this plan exemplifies that commitment, and I would like to sincerely thank the many people whose input and collaboration brought this plan to life – making it not just my plan, or the Division’s plan, but Maine’s plan for 15 more years of thriving fisheries and unmatched angling opportunities.

—Francis Brautigam

Fisheries and Hatcheries Division Director



ARCTIC CHARR

Managing Maine's Inland Fisheries

The Division of Fisheries and Hatcheries was established in the 1950s and is responsible for the preservation, protection, enhancement, and wise use of the state's freshwater fishery resources. Maine's 6,000+ lakes and ponds and 32,000+ miles of rivers and streams support a wide range of native cold water fisheries, including brook trout, landlocked Atlantic salmon, and Arctic charr. Maine has more than 700 lakes and ponds that support the most robust eastern brook trout populations in the species' range. Maine is at the southern extent of the Arctic charr's range, and is the only state in the contiguous U.S. to support endemic Arctic charr populations. Maine is also home to several endemic landlocked Atlantic Salmon populations; in fact, the taxonomic designation for landlocked Atlantic salmon "Salmo salar Sebago" refers to Maine's second-largest lake, Sebago.

In addition to the recreational angling opportunities that Maine's wild fisheries provide, over 800,000 hatchery trout and salmon are stocked annually in over 800 locations statewide. Together, the state's wild and stocked cold water fisheries make Maine a nationally recognized and distinguished fishing destination. Although smallmouth and largemouth bass are not native to the state, well-established bass fisheries in the coastal and southern regions offer exceptional fishing experiences, particularly when combined with Maine's natural landscape and rural character.

Every year, roughly 345,000 licensed recreational anglers fish Maine's inland waters, contributing \$319 million a year to the state's economy and supporting over 3,300 jobs. The commercial harvest of live baitfish and smelt for sale as bait used by anglers, particularly during the ice fishing season, not only supports traditional fishing practices, but also contributes to Maine's fishing economy. Maintaining a local source of wild baitfish also reduces demand for illegally imported baitfish, limiting threats of non-native species infiltrating Maine's waters. The freshwater fishing economy is particularly important in Maine's rural regions, where economic wellbeing is more intimately tied to the state's natural resources.

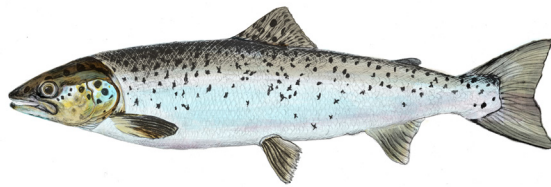
Even though Maine has always supported an abundance of native and wild fisheries, the state also has a long history of fish introductions, dating back as far as the 1800s when early settlers transferred fish to raise in ponds for food. In the later 1800s, federal hatcheries transported and stocked warm and cold water fish here. Most existing Department fish culture facilities were established in the early to mid-1900s, although other now-defunct facilities existed earlier. The Department's Division of Fisheries and Hatcheries was formed in the 1950s, following a long history of unregulated stocking with little awareness and understanding of potential negative interactions with native fish.

The Division's current stocking approaches are built on experience, public input, and investments in research.

In its early days, the Division based stocking decisions on limited available research and awareness around potential interactions between introduced fish and native fish. This understanding has evolved over time and has shaped the Division's modern stocking and management programs. The Division's current stocking approaches are built on experience, public input, and investments in research. All of this brings accountability to our stocking decisions as we strive to expand and enhance angling opportunities in waters not well-suited for native coldwater fish, while also considering potential interactions with the wild native fisheries we want to conserve.



BROOK TROUT



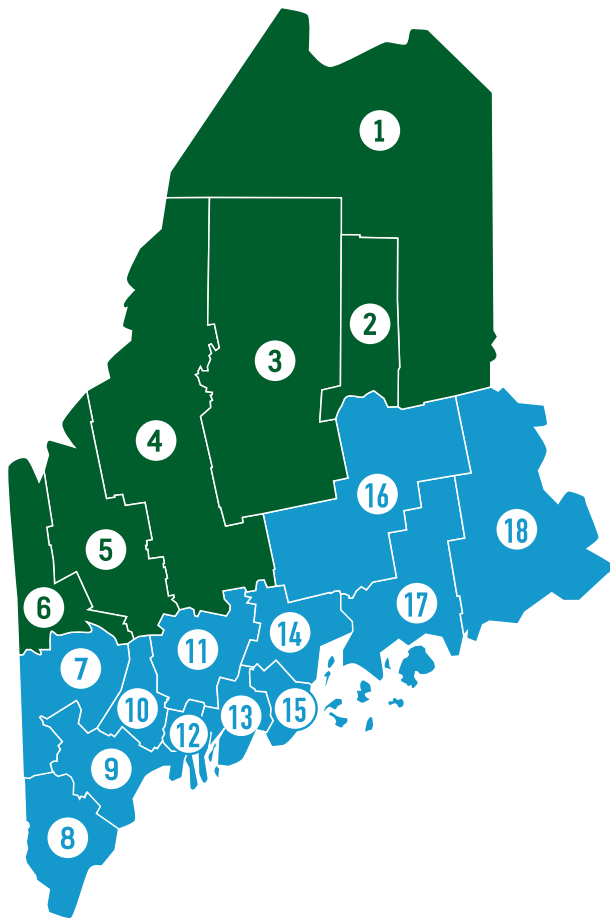
LANDLOCKED ATLANTIC SALMON

Maine's native trout and salmon evolved in the absence of competing warmwater fish and continue to be threatened by newly introduced nonnative fish, as well as some native species. When new, unauthorized species are introduced, we are challenged to consider available resources, costs, and potential benefits of any corresponding management action. With each invasion, the Division assesses the risks to the affected ecosystem, the conservation values of the native inhabitants, the values to the local community, and logistical considerations including the Division's capacity and the cost to monitor, suppress and/or eradicate the threat. Prevention is always the first line of defense, and Maine has made significant investments in regulatory, outreach, and surveillance strategies; but unlike most states, we also manage an active reclamation program to, when feasible, eradicate invasive species.

It is illegal to import live baitfish into Maine, dump baitfish in any water, or use live baitfish in the majority of North Zone waters. Deliberate illegal fish stocking carries a stiff penalty, and "Trouble by the Bucketful" signs have been posted around the state at angler access points. Unfortunately, introductions still occur, and early detection of new occurrences provides the best opportunity for early response and potential eradication. To collect information on new occurrences, we have integrated surveillance into a variety of field sampling, survey, and monitoring efforts. These efforts include winter retail baitfish inspections; routine population status monitoring; development, with the University of Maine, of new environmental DNA detection methods; and stream electrofishing. The Division's efforts to reduce new species invasions include the issuance of licenses and permits, adoption of restrictive fishing regulations, and development of public outreach and education materials. The state also regulates the use, transport, and possession of live fish through a network of existing laws, rules, and policies. Since unauthorized introductions represent one of the greatest threats facing the conservation of Maine's native coldwater fisheries, additional dedicated capacity to coordinate and manage related Division operations would be beneficial.

Anglers' growing affinity for nonnative fisheries, and their desire for the Department to actively manage and enhance these new opportunities, can conflict with the Division's responsibility to conserve what is native and unique to Maine. These new social pressures, which will undoubtedly increase with time, have complicated efforts to conserve Maine's native coldwater fisheries.

This management challenge has resulted in a more complex statewide management system, which is somewhat reflected in the demarcation of North and South Fisheries Regulation Zones. For example, smallmouth and largemouth bass are well established in the densely populated South Zone, and represent the second and third most popular sport fish in Maine (brook trout are #1), with the Division actively managing the species as a recreational fishery in this region of the state.



NORTH ZONE COUNTIES

- 1 Aroostook
- 2 Penobscot north of Route 11 & 157
- 3 Piscataquis
- 4 Somerset
- 5 Franklin
- 6 Oxford north of the Androscoggin River

SOUTH ZONE COUNTIES

- 7 Oxford south of the Androscoggin River
- 8 York
- 9 Cumberland
- 10 Androscoggin
- 11 Kennebec
- 12 Sagadahoc
- 13 Lincoln
- 14 Waldo
- 15 Knox
- 16 Penobscot south of Route 11 & 157
- 17 Hancock
- 18 Washington

In the South Zone, fish communities have changed considerably over time, with much of the change influenced by human habitation and changing public interests. Conversely, the North Zone remains sparsely developed with large areas of commercial forest land. This area supports the majority of Maine’s native and wild fisheries, and these remain a priority management and conservation focus.

In addition to the threats posed by introduced species, climate change is also impacting Maine’s freshwater ecosystems: Since 1895, the average annual temperature in the state has increased 3.2°F (Fernandez et al. 2020). Annual snowfall has decreased, rainfall has increased, years with extreme high and low snowfall amounts are becoming more common, and annual ice-out dates for lakes and ponds are earlier than they were historically.

Droughts like those Maine experienced in 2016 and 2020 may become more common, though there is still uncertainty around the predicted magnitude and scope. Regardless, most predictions anticipate negative impacts on Maine’s native coldwater fishes, particularly

those in less suitable habitats. This may increase demand for hatchery-propagated trout to satisfy angling interests, but it also may encourage unauthorized introductions of competing warmwater fish, further increasing the threat to native fishes.

Furthermore, changes in ice conditions, including reduced thickness and duration of cover, may limit winter fishing opportunities (and harvest). Earlier ice-out dates are changing thermal regimes of the state’s waters, providing a longer growing season that some speculate may diminish late-season water quality for fish. And as water temperatures increase, so will new biosecurity risks including invasive flora and fauna and new diseases and pathogens favored by warming conditions. Finally, while we don’t typically associate terrestrial species with threats to aquatic communities, anecdotal reports suggest climate-based changes in tick distribution may be suppressing shore angler participation, as the risks posed by ticks outweigh the enjoyment some anglers get from shore fishing.



MDIFW is currently working with the Governor’s Climate Council to identify threats, compile needed information, and develop predictive tools and actions that will guide decision-making and help us to prioritize focus areas. To keep our highest-priority wild and native fisheries resilient in the face of climate change, it’s clear that we will need to take management actions that conserve cold, clean waters and reduce the potential for those waters to warm.

To that end, we have been monitoring water temperatures and species status and distribution, helping landowners proactively protect and enhance habitats (including stream connectivity and enhanced riparian areas), and working with partners to identify habitats most susceptible and most resilient to climate change and strategically plan for future climate scenarios (for an example, see ecosheds.org).

For most of Maine’s anglers, recreational fishing is a mode of relaxation, a chance to bond with family and friends, a sporting challenge, and for some, a way to bring locally-sourced fish to the table. It’s good for the fish, too. Unbeknownst to most, angler harvest helps to maintain healthy and desirable fisheries, particularly wild ones where populations cannot be manipulated just by changing stocking levels. When overabundance threatens the health of managed sport fish populations, the Department’s primary strategy for reaching a sustainable balance is to encourage angler activity, often with more liberal size and harvest limits. Anglers who take advantage of these opportunities help the Department sustainably manage the state’s freshwater fisheries and meet publicly supported size-quality goals.

Members of the public have many opportunities to help guide future fisheries management. This can be as simple as phoning Division staff to relay concerns with certain fish populations or as formal as serving on a committee that identifies management challenges and helps to develop long-term solutions. The public can also comment on rulemaking and stocking proposals and give testimony on proposed legislation.

The Division has also identified a need for priority waters statewide to have publicly-supported management plans. The public will not only have opportunities to comment on these plans, but also to directly participate in planning workgroups. These plans will help the Division align management actions with established goals, and they will help the public better understand the rationale for such management actions.

Maine’s nationally recognized fisheries reflect the dedication and commitment of Division staff and Maine’s supportive, passionate angling community. Our state’s economy and quality of life both benefit from our wild and stocked fisheries and the diverse angling opportunities they provide.

As the Division works through existing challenges outlined in this plan, and new ones that arise over the next 15 years, we will continue to rely on sound science, data, and public input to guide Maine’s fisheries into the future.

Planning Process

GOALS

Goals of the management planning process include outlining the Division’s long-term vision, increasing public knowledge of our programs, and showing our public partners how to make the best, most meaningful use of resources and investments.

HISTORY

Since 1968, the Division has developed and refined a series of fisheries species assessments and implemented cost-effective comprehensive programs to support those assessments’ goals and objectives. Since 1989, we have included members of the public in the planning process. All past plans shared a similar format: a general Division overview, a detailed assessment of each sport fish species, and a set of specific goals and objectives for each species. While these plans contained an abundance of useful data, tables, and charts, they were also rather long and complex. Furthermore, their organization and applicability to disparate resources throughout the state created implementation challenges. For example, statewide brook trout goals and objectives with specific catch rate and size goals were not attainable in many waters due to local factors such as angler use, harvest rates, productivity, and habitat.

A NEW APPROACH

We entered this most recent planning process with three main objectives:

1. To create a relevant, approachable document that increases public awareness of Division programs, organization, and operations
2. To create broader species goals supported by multi-stakeholder Technical Subcommittees
3. To increase levels of transparency and public involvement

To get an updated (and crucial) understanding of Maine resident and non-resident angler preferences and attitudes towards fisheries management, the Division contracted with Responsive Management, a nationally recognized natural resource survey firm. Results from their survey informed many of this plan’s species- and program-specific goals.



Next, the Commissioner invited individuals, mostly affiliated with natural resource-related organizations, to participate on a steering committee that would provide the Division with input throughout plan development. This committee was tasked with:

- Serving as MDIFW’s sounding board on the overall process and the initial plan components and drafts
- Reviewing and giving input on draft goals, objectives, and strategies developed by the Division and the subcommittees
- Providing MDIFW with feedback on time-sensitive plan development issues
- Ensuring that the process always honored the plan’s statement of purpose and guiding principles

From there, technical subcommittees were formed to work on species-specific fisheries management issues. Each subcommittee was chaired by the Division’s applicable species specialist and included several individuals with a vested interest in the species. Members included representatives of natural-resource related organizations and nongovernmental organizations, as well as members of the public. These subcommittees worked collaboratively to:

- Identify management issues for the plan to address
- Solicit additional input and expertise on management issues
- Draft species-specific management goals, objectives, and strategies
- Review and address the steering committee’s recommended updates

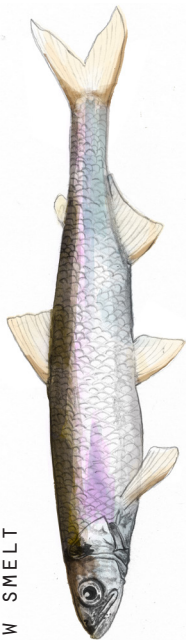
This plan will be effective for 15 years (2021–2035) and will be integrated into work plans that the state’s seven Fisheries Management Regions and Statewide Fisheries Support Team will develop. The plan may be revised and updated within the 15-year planning period in response to unanticipated changes or threats; but before making any significant revisions to the plan, the Division will reconvene a steering committee and/or technical subcommittee(s) for advice and recommendations.

Goals for the Division of Fisheries & Hatcheries 2021–2035 planning period are outlined below, separated into three core focus areas:

- Statewide Fisheries Management Goals
- Hatchery Goals
- Featured Sport Fish Goals

Statewide Fisheries Management Goals

Five core goals will guide the Division of Fisheries and Hatcheries’ general programmatic direction over the next 15 years. More specifics on conservation and management of hatchery operations and key fish species are outlined in the Hatchery Goals and Featured Sport Fish Goals sections.



RAINBOW SMELT

GENERAL DIVISION GOALS

GOAL

1

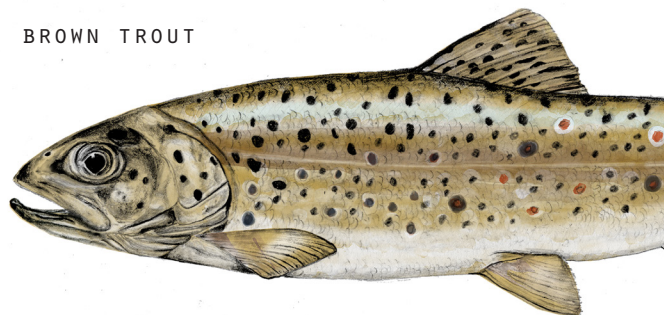
Maintain healthy fish populations and their habitat

Ensure freshwater fish populations remain healthy and are sustainably managed into the future.

Some actions to help reach this goal include:

- Conserve native fish species, particularly those exhibiting population decline, including state listed freshwater fish, as well as fish of greatest conservation need
- Use cost-effective modern scientific approaches to monitor, assess, and respond to changes in key sport fish, forage fish, and species of greatest conservation need
- Limit the spread and distribution of all aquatic invasive species, including fish pathogens, through surveillance, permitting, interagency coordination, research, remediation, and public outreach
- Implement actions identified in Maine's state Wildlife Action Plan to conserve Species of Greatest Conservation Need
- Provide timely consultation recommendations to regulatory agencies (MDEP, LUPC, FERC, ACF, etc.) to limit potential impacts to fish and aquatic communities from proposed actions
- Provide technical support and collaborate with private landowners to develop research and implement appropriate solutions to address management and conservation challenges
- Coordinate and collaborate with state, federal, tribal, and non-governmental organization partners to manage state fishery interests
- Promote and direct conservation actions, including conservation of riparian habitat, habitat restoration, and habitat connectivity targeting the state's highest priority wild native fisheries
- Manage for sustainable harvest of sport fish
- Manage harvest and recreational use of live fish as bait to support the popular practice of fishing with live fish as bait, where such practices do not threaten native coldwater fish populations
- Manage stocking and management programs considerate of potential negative interactions to native and wild fish through adherence to stocking guidelines, post stocking monitoring, research, interagency coordination, and consideration of hatchery fish sterilization techniques

BROWN TROUT



GOAL

2

Consider broad public interests in the development of stocking and management programs

Fisheries management is the science of blending biological needs of fish with public and social desires. Aside from actions that are entirely conservation-focused, a spectrum of management actions such as stocking and regulations can be implemented based on public interests and biological considerations. Effective management considers public opinions and preferences in the development of management objectives.

Some actions to help reach this goal include:

- Provide cost-effective diverse fishing opportunities throughout the state for both ice and open water anglers, focused on different social use opportunities such as fall fishing, remote fishing, urban fishing, family fishing, and fast action fishing (sunfish, chubs, etc.)
- Periodically survey anglers to assess public support for and direction of Division programs, and continue efforts by regional staff to engage with the public in various venues to increase awareness of public and Division management concerns
- Develop stakeholder-supported, water-specific fisheries management plans for the state's most popular and important waters to increase transparency and public support for management direction and associated rulemaking and stocking actions
- Develop written management goals for waters not supported by formal plans to support management actions and review of public input regarding those actions
- Explore stocking initiatives and practices that not only enhance angling opportunities, but also are expected to provide meaningful public use benefits, considerate of investment costs
- Continue to explore additional opportunities for lawbook simplification and enhanced digital tools to make fishing laws easier for anglers to understand

GOAL

3

Keep the public, stakeholders, and partners informed and encourage meaningful collaboration to build support for Division programs

As public values, attitudes, and communication technologies change, program relevancy, collaboration, and understanding become increasingly important. Because the way people communicate and access information has changed in recent decades, the strategies to reach currently engaged anglers and new audiences must also evolve.

Some actions to help reach this goal include:

- Increase angler recruitment, retention, and reactivation (“R3”) consistent with engagement and participation strategies developed in the Department’s R3 Plan
- Continue meaningful collaboration with other state agencies, federal agencies, and tribes to co-manage inland and migratory fisheries in a manner considerate of respective organization missions
- Recognize and acknowledge interests and available resources unique to special interest groups and collaborate where there is alignment with Division priorities, and shared interest in protection and enhancement of Maine’s freshwater fisheries
- Identify conservation priorities, create public awareness, and encourage potential partner investments to conserve wild native fishes, particularly considerate of the need to manage for resiliency in the face of a changing climate
- Continue collaboration with the Department’s Information and Education Division to develop and broadly disseminate information using current communication technologies, including information regarding freshwater fisheries management, angling opportunities, and the importance of native fish conservation

GOAL

4

Encourage, and where possible provide, fair, equitable, safe, and permanent access to Maine’s public waters for fishing and boating

Population demographics and associated attitudes regarding public use are changing, and waterfront real estate costs are increasing as supply decreases. Continuing to make investments that secure public access will remain an urgent priority to ensure future generations will have adequate fishing and boating access to waters throughout the state.

Some actions to help reach this goal include:

- Identify and update land and water access priorities for boating, shore fishing, and walk-in access to remote ponds and develop and implement appropriate strategies to retain or secure these priorities
- Create a range of water access opportunities and improvements that are focused on ADA accessibility
- Develop a broad-based maintenance regime to address maintenance and improvements at access sites owned by the Department
- Implement strategies to ensure access sites are visible and easy to locate by the public
- Engage and support private landowners that provide traditional access to ensure those sites remain open to public access
- Refine engineering designs to create low maintenance access with long-term site durability



CUSK

GOAL

5

Operate the Division under an organizational framework that creates efficiencies, consistency, and accountability in meeting existing and future management challenges

A forward-looking and progressive approach to staffing and infrastructure needs will best support future Division operations. Division of Fisheries and Hatcheries staff are passionate about preserving, protecting, and enhancing Maine's inland fisheries. While their commitment is nationally recognized, continued investments in operational efficiency, staff development, consistency, and transparency will help maintain credibility in decision making and program management, as well as provide support for budget planning.

Some actions to help reach this goal include:

- Support professional development of staff to facilitate the growth of skilled managers and leaders
- Model a welcoming and diverse culture that fosters teamwork and inclusivity
- Consider high-level priorities of state and federal plans in the development of program work plans in support of partner agency missions
- Update Fisheries Policies and, where appropriate, develop Standard Operating Procedures
- Systematically review fishing regulations, chapter rules, and statutes to ensure they're up to date
- Develop an updated system of data collection, reporting, entry, and analysis
- Identify and prioritize facility and infrastructure needs within the Fisheries Management Section and Hatcheries Section
- Maintain Division offices to ensure adequate workspace, technology, sampling equipment, and storage facilities exist to successfully operate
- Review Division staffing needs and if necessary, advocate for changes considerate of core priority work programs, new and emerging priorities, increased administrative and coordination responsibilities of Fisheries Resource Supervisors, seasonal and temporary staffing opportunities, and current and future operational needs
- Explore staffing opportunities to increase investments in outreach, tracking, interagency coordination, and research related to the spread and distribution of aquatic invasive species, as well as provide for improved oversight of Division programs to prevent and remediate threats to native fish

HATCHERY GOALS

MDIFW hatcheries currently produce brook trout, brown trout, togue, landlocked Atlantic salmon, rainbow trout, and splake.

Stocking a variety of species of different size and age classes across Maine’s diverse landscape provides cost effective and desirable recreational fisheries which in turn provide many social and economic benefits. We stock native species statewide, whereas we only stock nonnative brown trout, rainbow trout, and splake in select waters where they are unlikely to significantly impact native fishes.

The production and stocking program run by Maine’s state hatcheries integrates attributes and staff from different locations at different times. Each facility is strategically located near appropriate water sources to support fish production and receive discharge water. A recent examination of potential alternative hatchery sites found that opportunities to create new facilities to consolidate operations, increase production, and meet wastewater discharge licensing requirements appear to be extremely limited, particularly when considering available treatment technologies and costs (HDR 2016). Therefore, we will likely continue to make significant investments to ensure existing facility locations remain productive and support the fishery management program’s needs well into the future.

Aging hatchery infrastructure, increasing biosecurity threats, and ongoing commitments to manage hatchery effluent have created financial challenges that we expect will continue, with long-term solutions likely requiring capital investments and operating costs beyond normal operating budgets. One area of noted deficiency is insufficient production of larger fall yearling brook trout, which we stock for the popular fall/winter recreational angling season. Hatchery program priorities will be influenced by agency recruitment, retention, and reactivation efforts, shifts in angling use patterns, increased importance of conservation stocking, hatchery production capacity, and a desire to balance enhanced recreational angling with conservation of native fish.

Fish culture, production, and pathogen surveillance conducted by the Department’s Fish Health Lab will remain important to future Division management programs and will adapt in response to those programs’ shifting priorities. Stocking programs throughout the state provide exceptional recreational angling opportunities that wouldn’t otherwise be available. Maintaining these programs is consistent with programmatic direction and need, and critical to sustain the quality of Maine’s inland cold water fisheries and the high levels of angler satisfaction that they bring. Future investments in Maine’s hatchery program are certainly in the best interest of anglers, conservation, and Maine’s tourism-based economy.



SPLAKE

Goal: Produce high quality disease-free fish to meet future stocking program needs and priorities

1

Provide a level of fish production consistent with identified work program needs

- Modernize fish culture infrastructure for more efficient operations to meet increased future fish production needs and manage wastewater discharge
- Manage egg sources from both wild and domestic broodstock programs
- Spawn fish and strategically distribute fry to maximize their success among receiving facilities
- Manage warmer winter water supplies and other unique attributes within the hatchery system to improve growth most beneficial for program success
- Make needed capital and operational investments to maintain and where possible modernize hatchery infrastructure using existing and potential new funding opportunities

2

Protect facilities and stocked waters from biosecurity threats

- Strive to maintain a Class A Certification for fish culture facilities according to guidelines established by the Northeast Fish Health Committee
- Complete comprehensive fish health inspections at all state fish culture facilities annually
- Adequately staff and maintain necessary supplies at the Fish Health Laboratory and stay up to date with disease surveillance technology
- Adhere to proper disinfection protocols for fish eggs, staff, and equipment while also limiting transfers between facilities
- Protect facility water sources from external pathogens and potential vectors
- Review and restrict aquatic imports to reduce the risk of pathogen introduction into the state
- Make needed capital and operational investments to manage biosecurity threats supported by existing and new funding sources

3

Optimize fish health, quality, and condition to maximize survival after stocking

- Maintain a proper balance between fish densities and production needs to achieve acceptable fish health and quality standards
- Reduce stressors to fish such as handling, over-loading (low oxygen), high rearing densities (over-crowding), low water velocities, temperature extremes, silt loads, gas supersaturation, and limit disturbances such as tank cleaning, human interaction, predation, and excessive light levels
- Monitor growth rates, feed conversions, and changes in fish behavior
- Conduct annual health inspections and biannual fish quality surveys of all lots of fish prior to stocking
- Maintain the genetic integrity of both domestic and feral broodstock sources

4

Stock waters throughout the state using various transport methods, including truck, boat, plane, ATV, and backpack

- Coordinate with the Department's fisheries biologists regarding the number, size, species, strain, and destination of fish needed for fisheries management programs
- Coordinate with Warden Service pilots to stock fish where other forms of transport are logistically challenging
- Coordinate with various sporting clubs, groups, and private landowners for special stocking events and to access optimal release sites for stocked fish
- Maintain an operational fleet of stocking trucks specially modified for fish transport and transfer

5

Strive to improve the quality of our hatchery discharge consistent with state water quality standards

- Monitor water quality on a routine basis
- Operate wastewater treatment structures and equipment effectively
- Coordinate with the Maine Department of Environmental Protection to develop a plan that will identify cost effective treatment strategies, as well as an approach to fund planned investments (the Division recently received \$20 million from the American Rescue Plan that will be used to help address this strategy)

6

Explore opportunities to use sterilization techniques to prevent hatchery fish from establishing wild populations and/or breeding with wild fish

- Review the cost effectiveness and overall success rate of various sterilization techniques and associated equipment
- Identify and develop solutions to production challenges related to maintaining domestic broodstock while producing sterilized offspring
- Identify the primary species that should be the focus of sterilization efforts

7

Develop an isolation facility for research and special propagation of wild fish to support conservation efforts

- Explore opportunities to develop isolation capability within the hatchery system or by working with an outside partner
- Develop conceptual plans and cost estimates for the operation of an existing or prospective facility
- Explore management needs regarding capacity and species of interest

FEATURED SPORT FISH GOALS



Species included in this goal section are highly desired by anglers and/or are the focus of ongoing conservation efforts. [Maine’s State Wildlife Action Plan](#) includes conservation actions for additional species not covered here.

All goals, objectives, and strategies identified here are valuable and will help the Division best manage these species into the future. However, some are more urgent and/or likelier to drive significant progress toward achieving the goals in this plan. Therefore, all objectives have been strategically prioritized. Priority values (Low, Moderate, High) were developed based on a survey completed by Fisheries Division staff, who weighed in on the urgency, conservation value, recreational value, and feasibility of each objective, with urgency carrying the most weight. This isn’t to say that all high priority objectives will be completed before lower-ranked objectives; instead, these priorities will set an overall direction and give our work focus during this 15-year planning period. Funding opportunities, collaborations, unplanned resource changes, public desires, and staff availability will also influence the sequence with which we pursue identified action items.

ARCTIC CHARR




Salvelinus alpinus oquassa

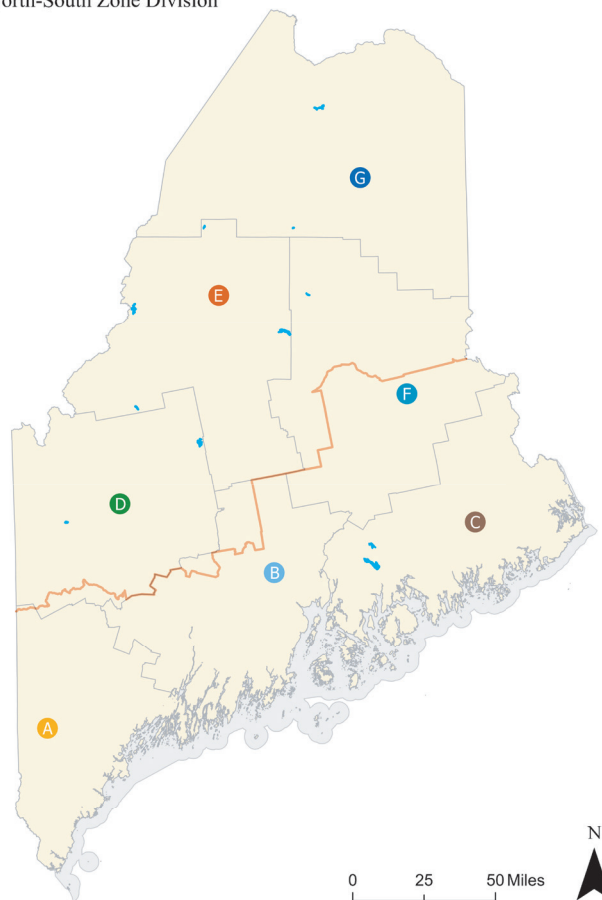


Maine’s Arctic charr (hereafter, charr) are largely represented by several endemic populations scattered across a large geographic area at the southern end of the species’ range. Maine is the only state in the contiguous U.S. that still supports endemic charr populations. Despite being highly adaptable, charr in Maine do not coexist well with many other species of fish; their limited in-state distribution is the result of glaciation, narrow habitat requirements, and intolerance to habitat changes and new species introductions.

Charr management in Maine has always emphasized conservation of the existing distribution with a recognition that each of the 12 endemic populations are genetically isolated and locally adapted and should be managed individually. Recent restoration projects at Big Reed and Wadleigh Ponds exemplify this commitment; neither location supported large fisheries, but losing either population to invasive fish would have been a significant loss for the species in Maine. Arctic charr are identified in Maine’s State Wildlife Action Plan as a Species of Greatest Conservation Need.

Charr are generally found at deeper depths where they are not easily caught. The angling public generally does not seek them out; but because the species is uncommon, it has a small following among U.S. anglers who pursue it as a “bucket list” fish.

-  Arctic Charr (*Salvelinus alpinus oquassa*)
-  Fisheries Management Regions
-  North-South Zone Division



Lakes and ponds containing Arctic charr (14 waterbodies)

Several initiatives to conserve this species in Maine are identified in the objectives below, including the establishment of new refuge waters through translocation of individuals from the most at-risk populations. Replicating select populations and associated genetics will support their continued conservation in the event endemic populations are compromised. Secondly, these new populations may provide new angling opportunities that in turn could enhance stewardship and advocacy from the general angling public as more people are able to experience the mystique surrounding this notable species.

Goals, Objectives, & Conservation/Management Strategies

GOAL **Conserve endemic and translocated populations of Arctic charr**

Monitor for and reduce threats to charr populations (*High Priority*)

- Develop a monitoring program to detect introductions of new species
- Improve agency rapid response capacity to implement chemical reclamation procedures to eradicate invasive threats and restore endemic charr populations
- Review existing regulations in effect on charr waters in light of angler access opportunities, abundance, and risk for new introductions

Monitor the status and health of charr populations (*High Priority*)

- Develop a monitoring program to sample populations at a frequency that will allow for remediation, if necessary; such a program should include protocols that will detect changes in population size, age/size structure, and genetic diversity

Monitor, review, and implement strategies to protect charr habitat (*High Priority*)

- Advocate for in-watershed land and water management practices that maintain or enhance habitat for charr
- Develop a monitoring program to assess factors that influence habitat suitability and population performance

Increase public awareness and stewardship (*Moderate Priority*)

- Develop outreach regarding the influences of land-based activities on charr habitat suitability
- Engage angler and conservation groups to help monitor and conserve populations
- Explore opportunities to provide separate size/bag listing for charr in the fishing law book
- Explore the use of additional special lake-side signage (e.g., sign at Green Lake) where/when appropriate
- Strive to provide angling opportunity secondary to conservation interests in refuge waters, recognizing that potential waters may be highly restricted by remote location, physical characteristics, and existing fish assemblages
- Use various outreach tools to educate the public about one of Maine's least known endemic sportfish, including their rich history in the western part of the state

Maintain distinct population genetics associated with each endemic population (*Moderate Priority*)

- Develop a process to identify potential waters for refuge populations considerate of life history requirements, existing laws, and management implications
- Develop fish hatchery capacity that is isolated from production stocking to support translocation and restoration projects for charr and other native fish
- Examine in-watershed Department stocking practices to reduce the potential for meaningful adverse impacts to charr, particularly from salmon and togue
- Prioritize most at-risk populations to focus threat reduction efforts, as well as the creation of refuge populations in new waters

Increase our understanding of critical habitat preference (*Moderate Priority*)

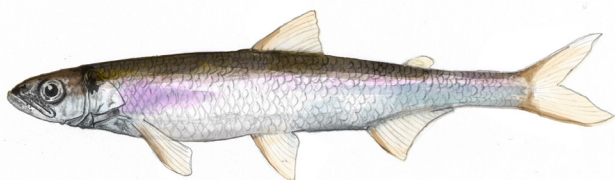
- Collaborate with Quebec and New Brunswick, and conducting research in Maine to increase our knowledge and understanding of habitat use and population impacts
- Develop a method to locate, identify, and characterize spawning habitat and other potentially critical habitat

Identify any remaining undiscovered populations of charr (*Low Priority*)

- Where strong anecdotal information conveys promise of occurrence, apply efficient exploratory sampling methods, and utilize public partnership where possible

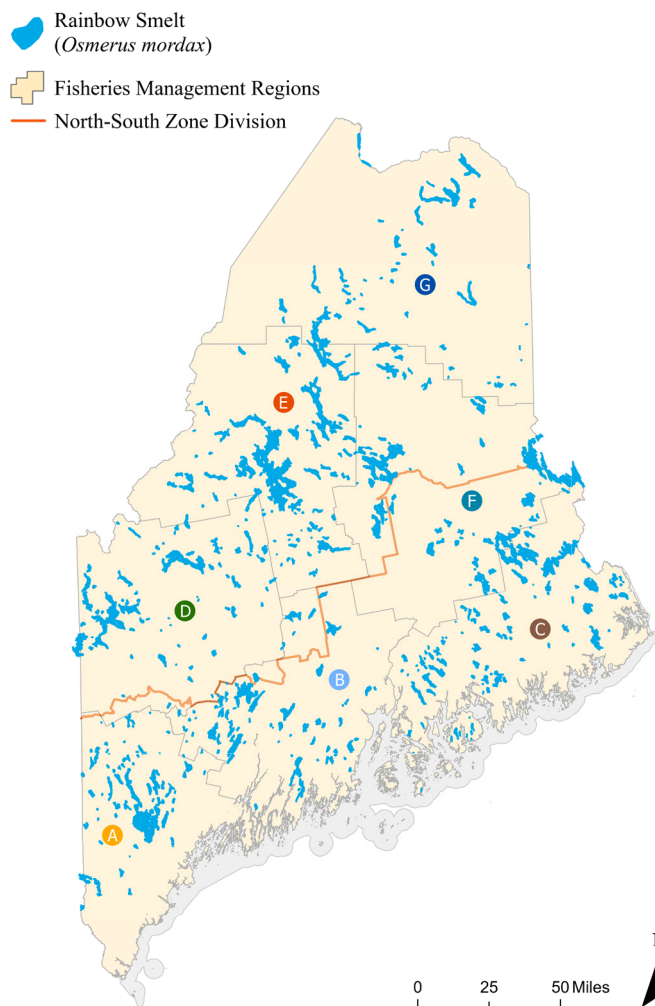
BAITFISH AND RAINBOW SMELT

Osmerus mordax



Maine’s recreational anglers have a longstanding tradition of using live fish as bait, particularly for ice fishing. In 1959, Maine prohibited the importation of baitfish in an effort to lower the risk of non-native species introductions and foreign pathogens. The term “baitfish” is defined in law ([12 MRS §10001-6](#)) and currently includes 16 species. The popularity and tradition of using live fish as bait and the prohibition on importation has created an economy around the commercial harvest and sale of legal native baitfish. By ensuring local sources of baitfish and smelt remain healthy and sustainable, we reduce potential incentives for illegal importation while still meeting angler needs and contributing to Maine’s economy. Even legal baitfish species can compete with native fish (e.g., Arctic charr, brook trout, and lake whitefish) if introduced into new waters, heightening the need for anglers to know the laws and use bait responsibly.

There is a more complexity associated with management of rainbow smelt than there is for baitfish. While smelt are a favored legal bait, they also support recreational hook and line and dip net fisheries and are the primary forage in many waterbodies that grow high quality coldwater and warmwater sport fishes. Thus, smelt are arguably one of the most important fishery resources in the state and are subject to strong public demands. These demands from various user groups are often in direct conflict with one another, particularly in geographic areas where user opportunities are limited.



Lakes and ponds containing rainbow smelt (569 waterbodies)

Unpredictable and extreme annual fluctuations in smelt abundance further complicate management of this fish. Available information indicates smelt population abundance and availability have declined in many southern and central Maine waters, likely due to unauthorized introductions of competing and predatory fish, unfavorable changes in water quality, and harvest pressure from various user groups. All of these factors can be the source of conflict among the various user groups, and a source of public consternation and concern.

Goals, Objectives & Conservation/Management Strategies

GOAL **Maintain opportunities to harvest baitfish and rainbow smelt for the retail market**

Explore regulatory and licensing options to regulate harvest on individual waters, create incentives for resource conservation, and strive to manage participation and harvest for increased sustainability (*Moderate Priority*)

- Assess the impact of prohibiting out of state export of smelt to ensure in-state retail demands are met and reduce incentives for commercial over-exploitation
- Review and refine criteria to identify waters closed to the commercial harvest of baitfish and update the list of waters routinely
- Review commercial harvest reporting requirements to ensure data needs are being met to support sustainable management

Explore opportunities to establish new self-sustaining smelt populations designated for commercial harvest (*Low Priority*)

- Adhere to established stocking policy and guidelines for all new introductions
- Review existing data to identify waters that have suitable water quality, few competing species, are currently lacking smelt, and where smelt introductions would not negatively impact native fishes

Support partnership opportunities for the development of cost-effective smelt and baitfish culture techniques for the private aquaculture industry to provide a reliable source of bait for the retail market (*Low Priority*)

GOAL **Maintain or enhance existing rainbow smelt populations**

Develop methods to better assess and monitor smelt condition, abundance, and population trends (*High Priority*)

- Conduct a feasibility analysis to assess current options in hydroacoustic technology, and if appropriate, explore opportunities to incorporate this method as an assessment procedure
- Develop a standardized protocol to assess smelt spawning runs
- Investigate additional approaches to quantify relative abundance

Explore opportunities to enhance and protect smelt spawning habitat (*Moderate Priority*)

Develop a better understanding of the effects of inter- and intra-specific competition on smelt abundance (*Moderate Priority*)

Evaluate the effectiveness, feasibility, and risks associated with smelt egg and live smelt transfers to better understand how these methods could be used to temporarily augment depressed populations (*Moderate Priority*)

GOAL **Manage social and biological concerns associated with the use of live fish as bait to minimize risks to native fish species**

Increase education and outreach efforts related to proper identification, responsible use, and risks associated with the use of live fish as bait (High Priority)

- Continue to message the North Zone general law (no live fish as bait) to anglers
- Develop print and digital fish identification products
- Utilize Department blogs and social media platforms to increase public understanding

Explore opportunities/strategies for targeted removal of unauthorized introductions of baitfish and smelt in waters containing native fishery resources, while not creating incentives for unauthorized introductions (High Priority)

Continue to conduct compliance inspections of licensed bait and smelt dealers (Moderate Priority)

GOAL **Manage user conflicts related to rainbow smelt**

Gain a better understanding of the impacts of recreational and commercial harvest on smelt population structure and health (Moderate Priority)

- Develop estimates of recreational and commercial smelt harvest for waters open to smelt harvest
- Review existing data to evaluate changes in participation and catch rates over time

Manage public use opportunities consistently (Low Priority)

- Adhere to a prioritized framework where: Priority 1 is to manage smelt as forage for cold-water sportfish; Priority 2 is to manage smelt for recreational harvest where it will not adversely impact Priority 1; and Priority 3 is to provide an opportunity for commercial harvest of smelt where it will not conflict with Priorities 1 or 2
- Routinely update smelt management goals and priority assignments for all waters supporting populations of smelt consistent with above priorities

Work to reconcile social and enforcement challenges surrounding overlap between recreational and commercial smelt harvest activities (Low Priority)

GOAL **Review and update current laws and rules related to commercial and recreational harvest of baitfish and rainbow smelt**

Implement a comprehensive review of baitfish and smelt rules and laws to address deficiencies, improve compliance, and reduce risks to native fish associated with the collection, transport, distribution, and storage of fish that may or may not be legal bait (*High Priority*)

Improve efficiency and consistency in the structure and administration of commercial licenses and permits for commercial species (*Low Priority*)

Improve efficiency, compliance, accuracy, and utility of the commercial harvest reporting system (*Low Priority*)

Review current legal baitfish species and update as needed (*Low Priority*)

Utilize stakeholders to contribute to the development of revised inland commercial and recreational regulations (*Low Priority*)

- Review existing baitfish holding restrictions (i.e., restricted areas, holding box specifications) and update as appropriate
- Review existing gear restrictions (i.e., definitions, size restrictions, use of graders, etc.) and update as appropriate

GOAL **Sustainably manage baitfish populations**

Gain a better understanding of the amount of baitfish being recreationally harvested and the number of recreational harvesters (*Low Priority*)

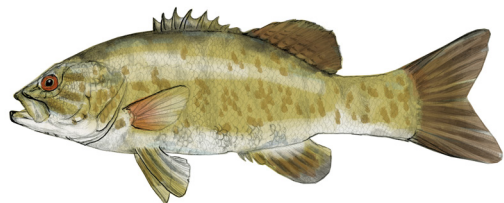
- Conduct an angler survey with questions focused on recreational baitfish harvest

Periodically monitor the status of baitfish populations (*Low Priority*)




- Collect and analyze harvest reports from commercial harvesters
- Sample baitfish via minnow traps (in conjunction with monitoring and assessment efforts of other species) to document continued existence of known baitfish species and detect new introductions

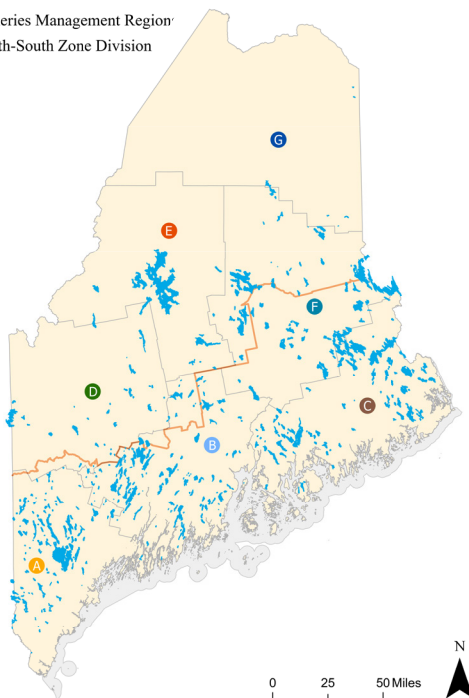
Reconcile social and enforcement challenges surrounding overlap between recreational and commercial baitfish harvest activities (*Low Priority*)

BLACK BASS



Micropterus dolomieu

-  Smallmouth Bass (*Micropterus dolomieu*)
-  Fisheries Management Region
-  North-South Zone Division



Lakes and ponds containing smallmouth bass (517 waterbodies)




The term “black bass” is a common name applied to several species of sunfishes which include Maine’s smallmouth and largemouth bass. This plan deals only with smallmouth and largemouth bass, which will be collectively referred to as black bass or, simply, bass.

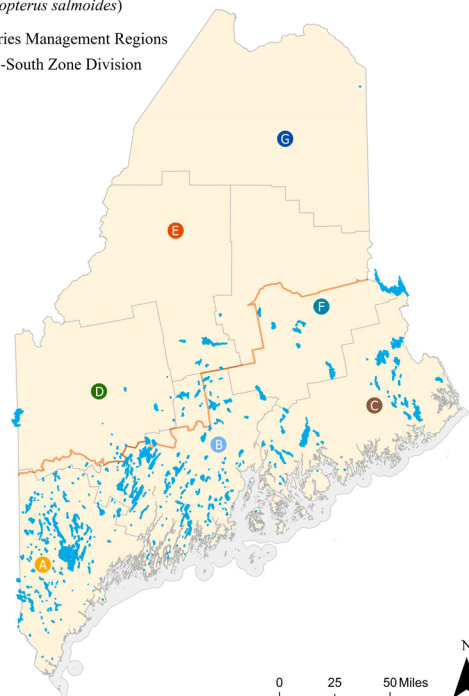
Bass occur throughout Maine but are most abundant in the South Zone where they are mostly managed as a sportfish. In the North Zone, where the majority of Maine’s native brook trout resources occur, bass are far less abundant and are generally managed as an invasive species.

Bass are not native to Maine and were first introduced to the state in the late 1800s. Shortly thereafter, they were afforded protective fishing regulations, and they have been managed as a sportfish ever since. In those early years, bass distribution was expanded in Maine with little understanding of potential interactions with native fish.



Micropterus salmoides

-  Largemouth Bass (*Micropterus salmoides*)
-  Fisheries Management Region
-  North-South Zone Division



Lakes and ponds containing largemouth bass (475 waterbodies)

Bass size quality and abundance vary among waters, largely driven by the availability of spawning and rearing habitat. All of Maine’s bass populations are now self-sustaining and MDIFW does not stock either species.

Currently, bass rank as the second and third (smallmouth #2, largemouth #3) most sought-after sport fish in Maine and are the top sportfish targeted by non-resident anglers. Bass tournaments continue to grow in popularity in Maine, and preferred tournament waters are managed through a permit lottery system, with permit conditions that address social and biological concerns.

Due to the popularity of bass, numerous unauthorized, illegal bass introductions have occurred in recent decades, altering fish populations and ecosystems in some Maine waters and watersheds. Unauthorized bass introductions may negatively impact more vulnerable native fisheries; and like many introduced fish, bass are nearly impossible to eradicate once they’ve established new populations. The challenge of managing this extremely popular, but also non-native, sport fish is one that requires balance and an appreciation for both perspectives.

Goals, Objectives & Conservation/Management Strategies

GOAL **Manage bass populations in the North Zone as invasive to protect native fish**

Clearly message the reason that bass are managed as an invasive in the North Zone (*High Priority*)

- Utilize MDIFW blogs and social media platforms to educate the public on the differences between North and South Zone bass management practices

Regulate bass waters in the North Zone to discourage illegal introductions (*High Priority*)

- Maintain a focus of unlimited bass harvest opportunity in the North Zone consistent with the general law of “no size or bag limit” on bass

Reconcile current inconsistencies with North Zone bass management (*Moderate Priority*)

- Develop guidelines that characterize how bass tournaments will be managed in the North Zone
- Review waters that currently have regulations intended to improve bass fisheries to determine if those regulations are warranted and ensure they do not favor bass over the health of native fish populations

GOAL **Manage social and biological concerns associated with the active management of a non-native species (bass) in the South Zone**

Enhance the public’s awareness and understanding of the threats and risks associated with the unauthorized introductions of bass, the transfer of aquatic invasive plants and other introduced organisms, and the proper use and disposal of soft plastic fishing lures (*High Priority*)

- Continue to coordinate with the Maine Department of Environmental Protection’s Invasive Aquatic Species Program and promote aquatic plant inspections and “Clean, drain, dry” practices whenever boats are launched or retrieved
- Promote the use of soft plastic lure retention devices and the proper disposal of soft plastic lures
- Utilize MDIFW blogs and social media platforms to educate the public on the negative impacts of unauthorized bass introductions

Manage social, biological, and administrative concerns as they arise (*Moderate Priority*)

- Continue routine coordination with leaders of the bass tournament community
- Develop “Best Management Practices” for tournament anglers and organizers

GOAL **Review and update current laws and rules related to tournament bass angling**

Review and update existing bass tournament permit conditions (*Moderate Priority*)

- Evaluate the need for additional permit conditions
- Incorporate kayak tournaments into the permit structure

Streamline the process of administering bass tournaments and reporting requirements (*Low Priority*)

- Explore opportunities for electronic permit applications and reporting of aquatic plant and live well inspections

GOAL **Sustainably manage bass populations in the South Zone where they do not adversely impact native fish or existing management programs for other sport fish**

Provide adequate public access for the most noteworthy bass fisheries (*Moderate Priority*)

- Explore opportunities to expand parking at current and newly constructed MDIFW boat launches considerate of tournament angling
- Explore opportunities to work with partners to accommodate facility infrastructure to prevent the spread of invasive aquatic organisms

Address management and tournament related questions and concerns (*Low Priority*)

- Maintain an active internal MDIFW Bass Committee to work through management issues as they arise and facilitate research when necessary to resolve more complex issues

Explore opportunities to improve bass size quality in some waters (*Low Priority*)

- Develop a routine monitoring program to evaluate status of populations with high size quality and the success of any regulatory strategies implemented to further improve size quality
- Identify alternative techniques to reduce bass abundance
- Provide information to the public regarding the benefits of harvesting smaller bass
- Review existing data to identify populations with high size quality potential that may be worthy of special management consideration

BROOK TROUT




Salvelinus fontinalis

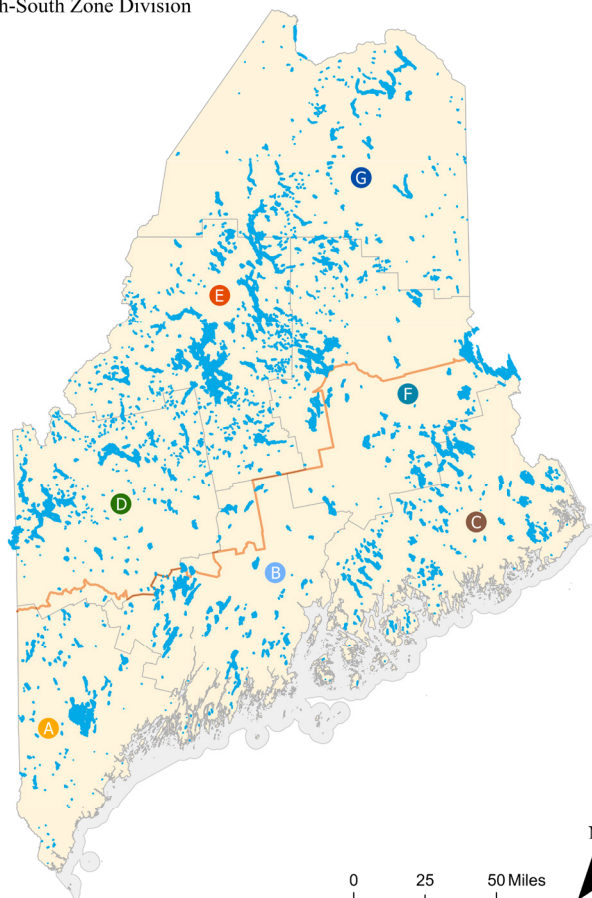


Maine supports the nation’s most extensive distribution and abundance of wild eastern brook trout in the species’ native range. More than 1,200 Maine lakes and ponds are managed for brook trout, about 60% of which are sustained by natural reproduction. Brook trout also occur in roughly 22,000 miles of streams, most of which are wild. Wild brook trout waters exist throughout the state, but they are most prevalent on privately owned commercial forest lands in the North Zone. The cooler climate in this region provides more optimal conditions with fewer competing, non-native fish species than the southern or coastal parts of the state. In addition, the habitat quality, quantity, and connectivity are generally better than the more developed South Zone.

Brook trout are declining across their historic range nationwide; and while they are faring much better in Maine, there are still declines and threats. The Eastern Brook Trout Joint Venture identified Maine as the only state with extensive intact populations of wild, self-reproducing brook trout in lakes and ponds, including some lakes over 5,000 acres in size. Maine is also the last true U.S. stronghold for stream-dwelling wild brook trout populations. Maine’s State Wildlife Action Plan identifies brook trout as a Species of Greatest Conservation Need, and more public awareness regarding threats to the species would support its future conservation.

Maine’s native and wild brook trout lakes, ponds, and flowing waters represent a unique and abundant resource not available elsewhere in the United States. There is a strong desire to sustain a ubiquitous distribution throughout the state’s cold water habitats including large rivers and lakes, streams/brooks, smaller ponds, and estuaries. MDIFW places a high priority on the management of this important resource, with a focus on protection, conservation, and restoration of self-sustaining populations, as well as enhancing recreational sport value.

-  Brook Trout (*Salvelinus fontinalis*)
-  Fisheries Management Regions
-  North-South Zone Division



Lakes and ponds containing brook trout (1,681 waterbodies)

A recent angler survey revealed that brook trout are Maine’s most preferred sportfish. Since wild brook trout are ubiquitous statewide, but recruitment and abundance are geographically highly variable, we stock hatchery fish in some waters to enhance recreational fishing opportunities. We increasingly have been stocking them at legal size to provide high-catch put-and-take fishing opportunities close to cities and towns, and we also stock them in more remote settings that lack spawning and nursery habitat to develop quality multiage-class fisheries. Stocking near or within watersheds that support wild brook trout poses some concerns regarding potential interactions. To minimize those interactions, the Department puts all new stocking programs through a peer and public review process. We are also gathering information through an ongoing genetics study which will help us to better understand these interaction concerns and refine stocking policies accordingly.

Goals, Objectives & Conservation/Management Strategies

GOAL **Maintain healthy self-sustaining brook trout populations**

Conserve brook trout habitat (*High Priority*)

- Establish collaborative partnerships with State, Federal, Tribal and private entities for the permanent conservation of important habitat, including “Heritage Fish Conservation Areas”
- Explore opportunities to formally identify important populations and habitat that will be afforded special regulatory consideration in the Environmental Review process
- Identify and prioritize areas of state owned and private lands to focus agency habitat restoration and enhancement initiatives
- Identify and prioritize geographic areas supporting high concentrations and a diversity of Brook trout habitats, considerate of other coexisting native fish assemblages, to direct agency and partner land/watershed protection initiatives
- Identify and prioritize populations and habitats most resilient to climate change and develop strategies to mitigate potential increases in water temperatures
- Improve habitat connectivity (road crossings, dams, etc.) considerate of downstream invasive threats, biosecurity threats to state fish culture facilities, and other fish and wildlife management concerns
- Support research and investigations to assess and understand the influence of land-based management practices on Brook trout and their habitat, and support appropriate advocacy

Monitor for and reduce threats from invasive species (*High Priority*)

- Continue to populate the inventory of natural barriers to fish passage
- Develop a monitoring program to sample high priority, most at risk waters for unauthorized introductions of new species
- Encourage the development of new and refined methods to improve monitoring and surveillance
- Maintain rapid response capabilities to support chemical reclamation and other methods to remediate threats

Complete the Department’s inventory and mapping of statewide occurrence for stream and pond/lake populations (*Moderate Priority*)

- Continue to identify eligible waters to review for consideration as a State Heritage Fish Waters
- Explore opportunities to apply efficient exploratory sampling methods, particularly in more remote low order streams
- Identify where brook trout use coastal waters and the relative importance of this behavior in maintaining healthy coastal stream populations

Increase public awareness and stewardship of Maine’s brook trout resource (*Moderate Priority*)

- Explore opportunities to provide separate size/bag listing for brook trout in the fishing law book
- Improve collaboration/coordination with the Maine Department of Environmental Protection and other natural resource agencies on coordinated messaging regarding all types of aquatic invasive threats
- Increase awareness of Maine’s unique and abundant wild brook trout resource, State Heritage Fish Waters, and associated sportfishing opportunities
- Increase awareness of other threats including, personal collection and use of baitfish, habitat fragmentation, and land management practices
- Increase outreach focus on invasive and unauthorized introductions, and broaden the scope to include aquarium fish, live baitfish, aquaponics, and sportfish

Examine hatchery stocking practices to reduce potential negative interactions with wild brook trout (*Moderate Priority*)

- Explore stocking of hatchery products (e.g., sterilized hatchery trout) that minimize identified risks from hatchery stocking
- Review, refine, and develop hatchery stocking guidelines, policy, and administrative procedures for waters supporting wild brook trout, considering the following management needs: stocking for recreational sport fisheries, restoration stocking, and stocking for restoration of other native fish (e.g., Arctic charr)
- Support research to improve understanding of direct and indirect effects of agency stocking on native fish
- Support research to understand the effect of direct and indirect hatchery stocking of brook trout on the integrity of wild brook trout genetics (introgression)

GOAL **Monitor, enhance, and create desirable brook trout fisheries**

Monitor Maine’s wild and stocked brook trout waters to enhance angling opportunities (*High Priority*)

- Continue ongoing evaluations of brook trout populations across the state
- Develop stocking, performance, and evaluation guidelines

Secure permanent public access over private lands (and perhaps some restricted state lands) to flowing waters and smaller ponds by purchase, negotiation, easement, or gift (*High Priority*)

- Coordinate with land trusts, state agencies, and potential non-governmental organization partners
- Identify priorities for walk-in access to rivers, brooks, streams, and small ponds (Priorities for trailer-boat access already exist)
- Support and facilitate efforts to address landowner and legal concerns regarding use of logging roads, particularly larger landowners in the North Zone

Manage wild self-sustaining and multiage class stocked fisheries considerate of public use and harvest practices (*High Priority*)

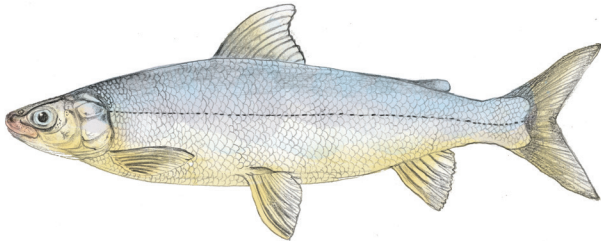
- Continue ongoing efforts to explore replacement of more complicated narrow harvest slot limit regulations with simpler alternatives that offer similar performance
- Develop a brood management plan that addresses the long-term genetic viability of a single “wild” hatchery strain to support post-stocking growth and survival to older age
- Evaluate angler use to ensure stocked fisheries are being well-used by the public to justify continued stocking and restrictive regulations
- Manage some waters for trophy potential where growth and survival to older age are favored over catch rate considerations
- Selectively utilize chemical reclamation and other methods to remediate invasive threats to improve performance of stocked fisheries
- Strive to balance growth, condition, and catch rates consistent with physical, biological, and water quality constraints

Develop additional catchable stocked fisheries to increase opportunity for the public to catch legal size brook trout (*Moderate Priority*)

- Develop hatchery capacity to support expanded stocking
- Expand and develop new fisheries close to human population centers
- Maintain a domestic brood (currently Maine Hatchery Strain) that performs well in the hatchery, grows to sizes that support legal harvest upon stocking, and are easily caught by anglers

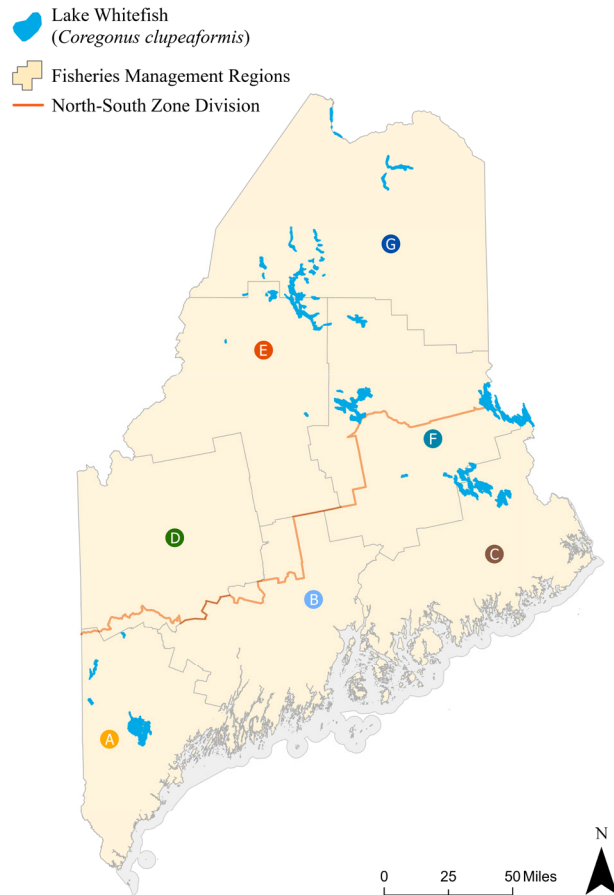
LAKE WHITEFISH

Coregonus clupeaformis



Significant declines in the range and abundance of native lake whitefish have impacted locally popular winter sport fisheries and are threatening the species' long-term sustainability. Viable populations are concentrated in headwater lakes and ponds of the Allagash and Penobscot River drainages in north-central Maine. Waters in the St. Croix drainage in Washington County are also noted for whitefish populations. Distribution in southern and western Maine is limited to only a few lakes where limited available information indicates little to no recruitment. Lake whitefish are identified in Maine's State Wildlife Action Plan as a Species of Greatest Conservation Need.

One unusual trait that is rarely found in other species but frequently seen among whitefish is the tendency to form dwarfed populations. Though still considered the same species, the dwarf ecotype of lake whitefish grows to a much smaller size, matures earlier (at age one or two), and has a much shorter lifespan.



Lakes and ponds containing Lake Whitefish (53 waterbodies)

The modern lake whitefish sport fishery grew in popularity in the early 1970s, coinciding with a decline in whitefish populations not thought to be directly related to fishing pressure. During the last planning period, concerted efforts to reverse whitefish population declines were undertaken, including promulgation of restrictive fishing regulations and implementing a lake whitefish hatchery stocking program. Neither conservation measure proved successful. Available information suggests that negative interactions from populations of rainbow smelt introduced as prey/forage for other popular sportfish (i.e., landlocked Atlantic salmon, togue, etc.) are likely responsible for recruitment failure in most lake whitefish populations. Other factors may also influence recruitment; for example, togue introduced into Sebago Lake appear to have contributed to an observed decline in lake whitefish.

Goals, Objectives & Conservation/Management Strategies

GOAL **Conserve native populations of lake whitefish**

Assess the status and health of all known populations of lake whitefish in Maine (*High Priority*)

- Develop an assessment plan to characterize population age structure and relative abundance to establish a baseline for this planning period

Identify and implement strategies to reduce threats and protect lake whitefish (*High Priority*)

- Examine Department stocking and management programs to reduce potential impacts to lake whitefish populations, considerate of inter-specific competition, regulations, lake whitefish population abundance, angler use, and risk for new competing introductions
- Explore the merit of additional restrictive regulatory measures and other strategies to maintain existing remnant populations
- Identify populations that could be positively or negatively affected by climate change and develop strategies to mitigate effects, particularly among most at-risk populations
- Identify waters that may be candidates for chemical reclamation
- Investigate options to reduce smelt populations and their interactions with lake whitefish, including mechanical harvest, predation (sterile & nonsterile), and liberalized smelt harvest opportunities
- Monitor key environmental and land management practices that can influence habitat suitability

Increase public awareness and stewardship (*High Priority*)

- Develop outreach regarding threats (e.g., influence of illegal introductions of smelt)
- Increase angling use opportunity by creating fisheries that will also serve as “gene banks”
- Use various outreach tools to highlight one of Maine’s less known native sportfish

Monitor lake whitefish populations (*High Priority*)

- Develop a long-term population monitoring program to assess changes in population size and age structure
- Identify habitats (e.g., spawning) where lake whitefish are more vulnerable to sampling
- Investigate use of alternative and nonlethal sampling methods for use on highly vulnerable populations

Support research (*High Priority*)

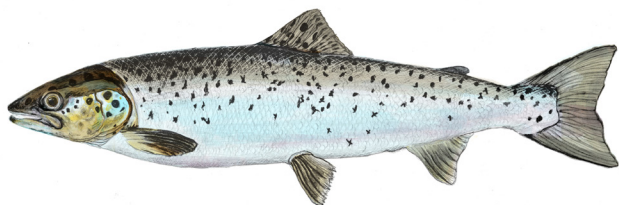
- Develop a method to locate, identify, and characterize spawning habitat
- Improve our understanding of how smelt and lake whitefish coexist in some waters
- Improve our understanding of the specific factors contributing to lake whitefish declines, focusing on recruitment failure. Develop strategies to minimize threats and interactions.
- Investigate factors that contribute to our most robust lake whitefish populations (e.g., Ross Lake, West Grand Lake, etc.)

Create new refuge populations where restoration is not viable (*Moderate Priority*)

- Develop a process to identify potential waters for refuge populations considerate of life history requirements, existing laws, and management implications
- Develop fish hatchery capacity (isolated from production stocking) to support translocation and restoration projects for wild lake whitefish and other native fish
- Explore opportunities to directly transfer lake whitefish from existing populations into new waters
- Increase our understanding of spawning and other habitat preferences
- Increase our understanding of whitefish lineage as a conservation consideration, while focusing on most at risk populations
- Prioritize most at risk populations to support the creation of refuge populations in new waters

LANDLOCKED ATLANTIC SALMON




Salmo salar sebago

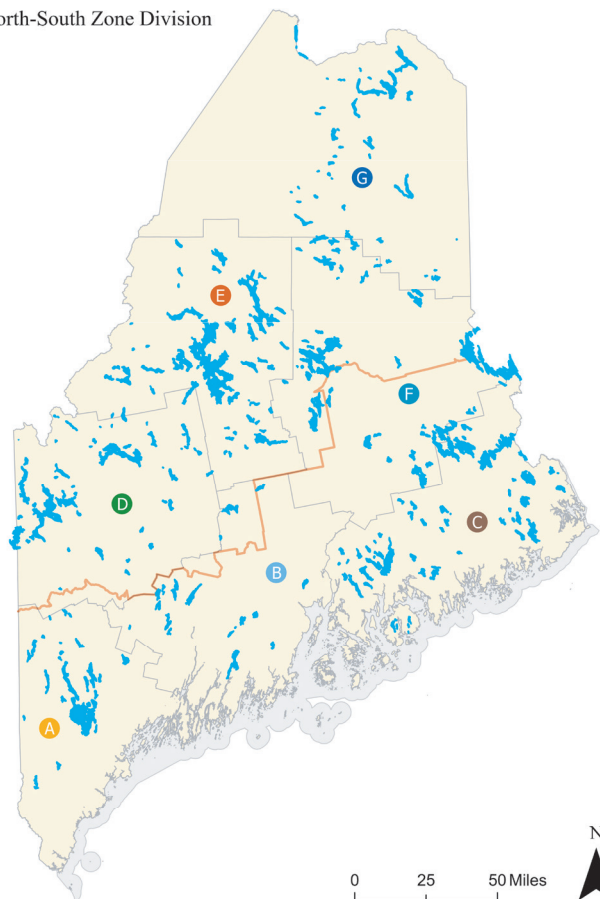


Landlocked Atlantic salmon are native to Maine and are highly desired by recreational anglers. Recent survey data revealed that they are the fourth most targeted sportfish during the open water season, and the second most targeted in the ice fishing season. In general, waters that support landlocked Atlantic salmon are relatively large, tend to support high use, and contribute to many regional economies. Rainbow smelt are their primary prey/forage fish; and accordingly, wild and stocked salmon populations thrive where rainbow smelt are most abundant.

Historically, Maine’s landlocked Atlantic salmon populations were limited to four river basins. By 1900, their range was expanded considerably through numerous introductions by state and federal agencies. In waters with suitable habitat for reproduction, stocked fish survived and established wild populations. Introductions in less suitable habitats either failed to establish wild populations and depended upon annual hatchery stocking, or failed to create persistent fisheries in the absence of abundant smelt. Landlocked Atlantic salmon are now present in at least one lake in every Maine county, and Maine now supports one of the world’s largest sport fisheries for landlocked Atlantic salmon.

Biologists develop fishing regulations with the expectation that a proportion of the angler catch will be harvested, improving growth for remaining salmon. However, harvest rates have recently declined in some wild salmon populations due to the increased prevalence of catch-and-release practices. This has led to more salmon competing for fewer smelt, and subsequent declines in salmon growth and condition.

-  Landlocked Atlantic Salmon (*Salmo salar sebago*)
-  Fisheries Management Regions
-  North-South Zone Division



Lakes and ponds containing landlocked Atlantic salmon (319 waterbodies)

Biologists have implemented new regulations aimed at increasing harvest, but these regulations will have little effect without changes in angler harvest practices.

Roughly two-thirds of Maine’s principal landlocked Atlantic salmon fisheries rely on hatchery supplementation. Two native strains of salmon (West Grand and Sebago) support statewide hatchery propagation and stocking programs. Recent infrastructure investments at the Grand Lake Stream and Casco hatcheries have enabled hatchery staff to provide more suitable year-round salmon rearing conditions, allowing for better health and growth of hatchery-reared salmon.

Goals, Objectives & Conservation/Management Strategies

GOAL **Maintain healthy and sustainable landlocked Atlantic salmon fisheries**

Improve fish condition in overabundant wild salmon populations *(High Priority)*

- Evaluate public access opportunities to ensure access is not limiting angler participation
- Identify potential strategies—including regulation, partnerships, habitat modification, and alternative population reduction techniques—aimed at increasing use and harvest and reducing spawning and recruitment success

Maintain or enhance existing populations *(High Priority)*

- Advocate for in-watershed land and water management practices that maintain or enhance spawning and rearing habitats for wild populations, where populations are not overabundant
- Continue current monitoring and assessment to be responsive to changes in abundance and condition over time
- Develop stakeholder-supported water-specific management plans
- Develop statewide field performance standards to allow managers to assess population status. Standards should be developed to account for differences in production potential among waters and water-specific management priorities (water-specific planning)
- Implement appropriate changes in regulations and stocking in response to changes in salmon condition and angler use and harvest
- Maintain viable populations of rainbow smelt to provide an adequate forage base (refer to rainbow smelt goals for additional details)
- Monitor wild escapement and spawning success

GOAL **Conserve and protect the West Grand and Sebago strains of landlocked Atlantic salmon**

Maintain a pathogen free captive brood (*High Priority*)

- Create isolation capabilities at the Grand Lake Stream hatchery and evaluate the need to do so at the Casco hatchery
- Develop infrastructure that creates opportunities and space for hatchery staff to rear multiple age classes of wild-sourced fish

Maintain the genetic integrity of our West Grand strain brood (*High Priority*)

- Develop and implement a biosecurity plan that defines the contribution and role of adult feral fish captured in West Grand Lake and secure a disease-free captive brood that meets production needs
- Maintain existing production capabilities

Reduce pathogen risks from wild-sourced gametes (*High Priority*)

- Conduct a comprehensive fish health testing regime
- Implement biosecurity protocols during spawning operations

Improve captive brood production and resulting egg quality (*Moderate Priority*)

- Utilize recent cold-water intake improvements at the Grand Lake Stream and Casco hatcheries

Evaluate the necessity and biosecurity concerns with continued collection of stocked feral fish at the Casco Hatchery (via Panther Run) (*Moderate Priority*)

- Assess the benefits associated with collecting wild fish vs the biosecurity risks of such actions
- Monitor the wild vs hatchery contribution of salmon to Sebago Lake to determine if demand necessitates continued stocking

Evaluate new brood lines from egg sources (*Low Priority*)

- Conduct disease testing on potential alternative sources to assess biosecurity risks
- Identify potential alternative wild populations that were established from historical stockings of West Grand and Sebago strains

GOAL **Increase the public’s awareness of and ability to utilize Maine’s landlocked Atlantic salmon resources**

Maintain and secure long-term access to waters that support landlocked Atlantic salmon fisheries (*High Priority*)

- Review existing access sites to determine if improvements are needed to ensure suitable access for trailered motor boats rigged for trolling
- Secure new sites for public access

Create increased public awareness of Maine’s status as one of the world’s top landlocked Atlantic salmon fishing destinations (*Low Priority*)

- Increase public outreach to inform resident and non-resident anglers of this unique resource

Explore opportunities to expand the use of legal size fall yearling salmon and retired brood to create fisheries where water quality and smelt abundance are marginal (*Low Priority*)

- Identify geographic areas of the state that currently contain limited–no opportunities for salmon fishing and review water-specific data within these areas to identify suitable candidates for establishing new salmon fisheries
- Refine hatchery production methods to create a more consistent fall yearling product
- Review existing fall yearling salmon stocking programs to better understand how to maximize their success

Explore opportunities to simplify fishing laws (*Low Priority*)

- Query existing databases for waters with similar/identical special regulations and review associated current and historical data to assess effectiveness
- Reevaluate salmon waters that haven’t been recently assessed to ensure existing regulations reflect current management goals and angler behavior

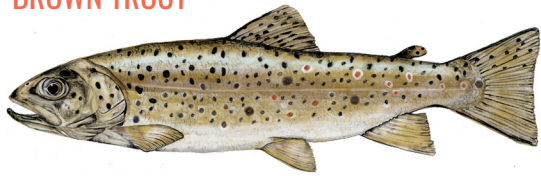
NONNATIVE TROUT

RAINBOW TROUT



Oncorhynchus mykiss

BROWN TROUT



Salmo trutta

SPLAKE

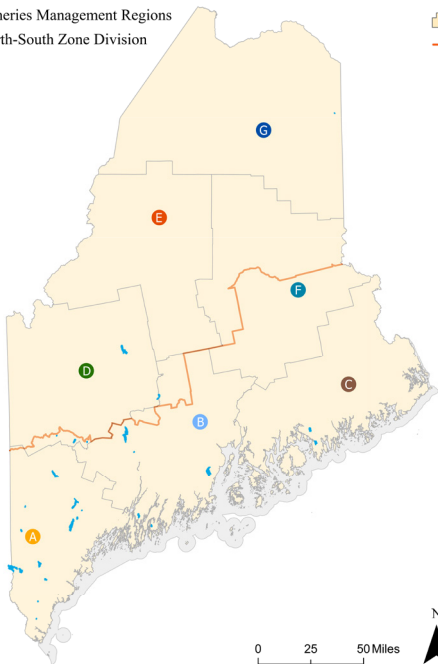


Salvelinus namaycush
x *Salvelinus fontinalis*

Non-native trout (rainbow trout, brown trout, and splake) are stocked and managed to provide recreational trout fishing opportunities in areas where native trout and salmon typically do not thrive, including those with marginal water quality and heavy competition from other fish. While none of these species are native to Maine, they have been cultured in Maine’s hatchery system for decades and most of these fisheries are maintained by annual stocking programs. Today, populations are mostly found in southern and central Maine, with a handful of brown trout and splake fisheries in parts of northern Maine. Recent statewide angler surveys suggest that individually, these species are not highly preferred, but angler preferences are likely influenced by a more limited distribution compared to the more “popular” fish. Collectively, they do have a noteworthy following, are very popular on many waters where they occur, and create trout fishing opportunities where they otherwise wouldn’t occur. New stocking programs are carefully reviewed to minimize potential interactions with native fish and prevent potential establishment of wild populations of rainbow and brown trout (not common in Maine).

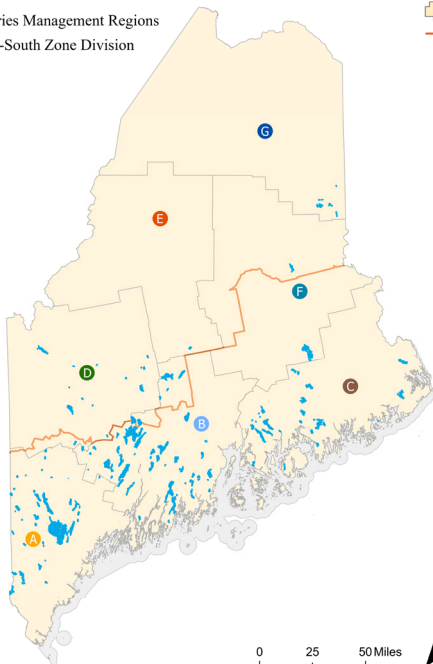
Rainbow Trout
(*Oncorhynchus mykiss*)

Fisheries Management Regions
North-South Zone Division



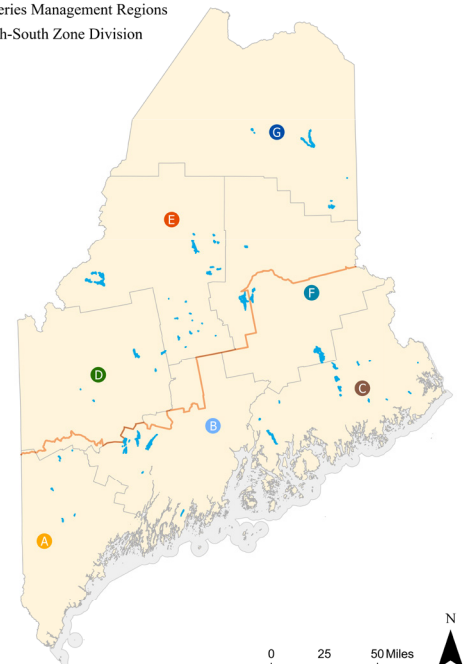
Brown Trout
(*Salmo trutta*)

Fisheries Management Regions
North-South Zone Division



Splake
(*Salvelinus namaycush* X
Salvelinus fontinalis)

Fisheries Management Regions
North-South Zone Division



Lakes and ponds containing rainbow trout (31 waterbodies), brown trout (173 waterbodies), and splake (73 waterbodies)

Goals, Objectives & Conservation/Management Strategies

GOAL **Expand the rainbow trout stocking program to provide popular and productive fishing in waters not well suited for successful management of native sportfish**

Identify opportunities for expansion of the program that minimize the potential for interactions with wild native salmonids (*High Priority*)

- Review and modify existing rainbow trout stocking guidelines
- Review existing data to identify waters that fit these criteria

Improve rearing capabilities (*Moderate Priority*)

- Develop brood that are more sustainable and reliable to meet hatchery and field performance needs
- Identify hatchery modifications, improvements, or expansion requirements that may be needed to expand the rainbow trout program

Improve our understanding of factors that lead to the establishment of wild populations (*Moderate Priority*)

- Evaluate new and existing stocking programs to identify occurrences and the extent of natural reproduction to ensure threats to native fish are minimized and to inform future management decisions

Develop strategies to enhance post-stocking performance (*Low Priority*)

- Continue to explore growth, survival, and angler returns using various age classes and stocking rates
- Explore opportunities to utilize a different rainbow trout strain to address any deficiencies in performance within the current strain
- Review and update hatchery size quality goals to meet field performance needs and production capabilities

Manage existing wild populations of rainbow trout in the Bingham area of the Kennebec River drainage and the Upper Androscoggin River drainage

Ensure the sustainability of these populations (*Moderate Priority*)

- Continue to periodically monitor and assess these populations to allow managers to appropriately respond to population changes over time
- Maintain a regulatory framework that allows for enough natural reproduction to maintain the quality of these fisheries without the need for hatchery supplementation

GOAL Provide quality fishing opportunities for splake in waters not well suited for brook trout or non-native trout

Monitor and assess post-stocking performance and angler returns
(Moderate Priority)

- Continue to monitor splake performance in lakes and ponds
- Establish splake stocking guidelines to better define their management need and role
- Review and update hatchery size quality goals to meet field performance needs and production capabilities

GOAL Restructure the brown trout stocking program to more successfully meet management objectives

Clearly define the management need and role of brown trout
(Moderate Priority)

- Identify the conditions where brown trout are most successful
- Review and update hatchery size quality goals to meet field performance needs and production capabilities
- Review data associated with waters that are currently stocked with brown trout

Increase the overall success of the brown trout stocking program
(Moderate Priority)

- Continue to actively manage popular and productive brown trout fisheries
- Develop a brood program to maintain the genetic integrity of the Seeforellen strain to support ongoing stocking and management
- Eliminate brown trout stocking programs on waters that are consistently underperforming and not meeting management objectives

Monitor and assess post-stocking performance and angler returns
(Moderate Priority)

- Continue to monitor Seeforellen brown trout strain performance in lakes and ponds
- Develop strategies to monitor Seeforellen brown trout strain performance in rivers and streams

GOAL Provide angling opportunities for non-native trout in waters where native salmonids do not thrive and where potential interactions with native fishes are minimized

Reduce competition with native salmonids (*High Priority*)

- Explore opportunities to stock sterile rainbow and brown trout
- Adhere to established stocking policy/guidelines for all new stocking programs
- Develop guidelines clarifying the role and purpose for stocking each nonnative trout species and develop hatchery products and regulations consistent with that purpose

Identify waters where native salmonids do not thrive and where potential interactions with native fishes are minimized (*Moderate Priority*)

- Develop a review process that incorporates species assemblage, barriers to dispersal, water chemistry and other variables to evaluate a water's potential for supporting a non-native salmonid fishery

Evaluate the success of existing non-native trout fisheries (*Moderate Priority*)

- Develop statewide field performance standards to allow managers to assess population status. Standards should be developed to account for differences in production potential among waters and water-specific management priorities

TOGUE




Salvelinus namaycush

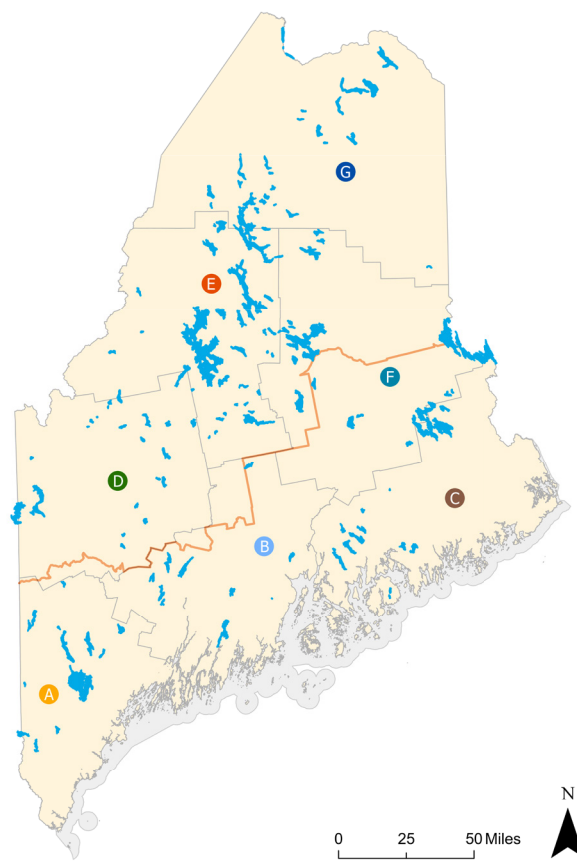


Togue are native to Maine and are among the top five sport fish targeted by recreational anglers statewide. Historically, waters throughout the state were routinely stocked with togue, and many of these populations have since become self-sustaining. Successful establishment of self-sustaining populations has led to a nearly 10-fold reduction in the number of waters stocked since the 1970s (19 waters stocked statewide 2016–20). Because of their extensive stocking history, the number of remaining native populations isn't well documented, and it is for this reason that togue are identified as a Species of Greatest Conservation Need in Maine's Wildlife Action Plan.

Several naturalized togue populations have experienced increases in abundance over time, negatively affecting the condition and health of togue and other sport fishes via reduced prey availability. Increased abundance and associated angler catch rates have produced high angler use and participation on some waters near larger population centers, particularly during the ice fishing season. However, maintaining these overabundant populations exceeding their carrying capacity results in declines in togue size quality and overall health, and increasing susceptibility to disease and pathogens. This out-of-balance situation also impacts other comanaged important sportfish including landlocked Atlantic salmon and brook trout.

Togue are a long-lived species that can attain sizes greater than any of Maine's other native freshwater sportfish and their size quality is a draw for many anglers. Togue in most Maine waters must live for 10 to 30 years to reach a trophy size of 26+ inches. Maintaining a proportion of individuals in that size class is a challenge that often carries consequences such as stockpiles of smaller individuals. Regardless

-  Togue (Lake Trout) (*Salvelinus namaycush*)
-  Fisheries Management Regions
-  North-South Zone Division



Lakes and ponds containing togue (154 waterbodies)

of the difficulties involved in managing for such large fish, the desire among anglers for trophy-sized togue remains.

Waters supporting togue can be found throughout the state, though many populations aren't well utilized by anglers. Reviewing existing fishing laws and increasing awareness regarding recreational opportunities may help to increase participation. The general law minimum length and bag limits currently in effect were established at a time when a high percentage of anglers were harvesting their catch. As catch-and-release practices have become more widespread, there's a need to reexamine our general laws to ensure they're not overly protective and contributing to population increases. The perception among some anglers that togue are less palatable may further limit harvest rates. Improving that perception may increase angler participation and harvest, which would alleviate some management challenges.

Goals, Objectives & Conservation/Management Strategies

GOAL **Increase the public’s awareness of and opportunity to utilize Maine’s togue resource**

Maintain and increase access opportunities (*Moderate Priority*)

- Ensure existing sites adequately accommodate trailered motor boats rigged for trolling in the open water season and snowmobile trailers in the ice fishing season
- Identify waters where access may be limiting participation and exploring opportunities to provide new points of access at those locations

Explore opportunities to open waters currently closed to ice fishing (*Low Priority*)

- Review data from togue waters currently closed to ice fishing to evaluate the potential effects that extended angling opportunity would have on the togue population and other sportfish within the same waterbody

Create digital media products that help to increase participation, catch rates, and harvest opportunities (*Low Priority*)

- Highlight waters with high catch rates (particularly those with overabundant populations) where targeted removal supports MDIFW management
- Provide information on how to properly care for and prepare harvested fish

Review and simplify existing laws and rules (*Low Priority*)

- Explore liberalizing General Law length and bag limits

GOAL **Manage for healthy and sustainable togue fisheries**

Identify effective approaches (regulatory/nonregulatory) to reduce overabundant wild populations, particularly in multi-species sport fisheries (High Priority)

- Develop messaging that allows anglers to better understand the benefits of harvest to population health and meeting management goals
- Identify potential incentives to offer anglers who harvest togue
- Identify potential strategies—including regulation changes, partnerships, habitat modification, and alternative population reduction techniques— aimed at increasing use and harvest and reducing spawning and recruitment success
- Investigate the factors that allow togue populations to become overabundant to understand how to best manage these populations
- Support fishing derbies that encourage harvest of small togue

Identify and monitor the status and health of the state’s native togue populations and manage these populations considerate of their conservation status (High Priority)

- Emphasize the conservation of togue in waters supporting native populations
- Explore methods to determine origin (native or established via socking) of existing populations
- Monitor existing native populations to assess population status over time
- Review historical datasets and other relevant information to better document the historical distribution of native populations

Maintain broodstock and reduce annual production shortfalls (Moderate Priority)

- Investigate the factors that have caused deficiencies in the past and develop strategies to create a more reliable and sustainable hatchery product

Maintain or enhance existing populations (Moderate Priority)

- Continue current monitoring and assessment to identify changes in abundance and condition over time
- Develop stakeholder-supported water-specific management plans to ensure public support of management goals and objectives for togue and other comanged fish
- Develop statewide field performance standards to provide a consistent basis for managers to assess population status. Standards should be developed to account for differences in production potential among waters and water-specific management priorities
- Implement appropriate rule and stocking changes in response to changes in togue condition, angler use, and harvest

GOAL Provide opportunities for anglers to catch trophy-sized (i.e., ≥ 26 ") togue

Explore regulatory options that would encourage the production of trophy-sized togue, and maintain a healthy population of sub-trophy sized togue where such management does not compromise other co-managed species that are a higher management priority (Moderate Priority)

- Review fishing regulations and associated water-specific data (e.g., population structure, competing species, etc.) for togue populations in Maine and other states/provinces that produce trophy-sized togue

Identify factors that lead to the production of trophy-sized togue (Low Priority)

- Compile existing information to better understand how trophy togue fisheries outside of Maine are managed
- Review existing datasets to identify where we currently produce trophy-sized togue and determine what biotic and abiotic factors may be driving the production of those fish

Monitor populations capable of producing trophy-sized togue (Low Priority)

- Conducting periodic creel surveys
- Periodically sample the togue population to evaluate size structure and responses to management actions

Reduce post-release mortality of togue (Low Priority)

- Develop educational products describing methods anglers could follow to minimize post-release mortality
- Investigate safe release methods for anglers to use to increase survivability of regulatory protected (i.e., within protective slot limits) and trophy-sized individuals

See Acknowledgments on page 52 of Volume III