NEW YORK STATE | Department of Environmental Conservation

New York State Trout Stream Management Plan

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Andrew M. Cuomo, Governor | Basil Seggos, Commissioner

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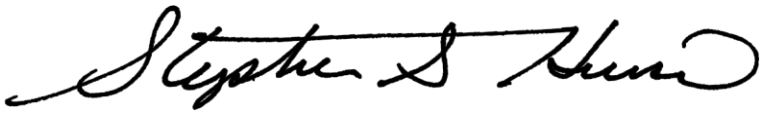

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Vision

The vision of the Trout Stream Management Plan (Plan) is that New York trout streams are managed according to their ecological and recreational potential and that resources are strategically focused on actions that effectively contribute to the most prevalent desired outcomes of trout stream anglers.

Purpose

The purpose of this Plan is to guide the efforts and resources of the Department of Environmental Conservation (DEC) toward managing New York's trout stream fisheries according to their ecological and recreational potential. To that end, this Plan was written to clearly communicate the outcomes DEC will strive to achieve, why those outcomes were selected, what actions will be taken, and how the results will be evaluated to create a learning environment for adaptive management. It builds on prior experience, reexamined in response to new information, and serves as a model for responding to future management needs.

PLAN SCOPE OF ACTIONS

Habitat Enhancement and Protection

Fish Culture

Angling Regulations

Public Access

Information and Outreach

Plan Scope

The approach outlined in this Plan is limited to the following scope:

- publicly accessible inland trout streams that contain wild or stocked brook, brown, and rainbow trout (*Salvelinus fontinalis*, *Salmo trutta*, and *Oncorhynchus mykiss*).

The following areas of fisheries management are outside the scope of this Plan:

- trout or salmon other than the three species identified above;
- lakes and ponds;
- tidal stream reaches; and
- stream reaches in which the recreational fishery is primarily dependent on migratory trout rather than resident trout (tributary streams to the Great Lakes, Finger Lakes, and Lake Champlain from their mouths to the first impassable barriers).

The scope of actions includes habitat enhancement and protection, fish culture, angling regulations, public access, and information and outreach. As a function of narrative flow, habitat enhancement and protection are discussed near the end of the document. However, the fundamental importance of trout stream habitat to every aspect of this Plan cannot be overstated.

For this Plan, a stream reach is a segment of stream that shares, at a basic level, a common set of physical and biological characteristics that influence its ability to support trout and trout angling opportunity for the public. While precisely defined reach boundaries that are readily recognizable to anglers are necessary for management purposes, it should be acknowledged that trout can move across reach boundaries.

Need

A Trout Stream Management Plan (Plan) was needed for several reasons:

- the existing guidance is 30 years old;
- angler preferences, expectations, and behaviors have changed during this time;
- the current management approach was unnecessarily complex, and
- adapting to change is a basic requirement of responsible government.

Since 1990, DEC has managed inland trout streams using an approach (CROTS: Catch Rate Oriented Trout Stocking) that considers the capacity of a stream reach to support trout, the availability of unused carrying capacity after accounting for the needs of existing wild trout, and the fishing pressure it receives (Engstrom-Heg 1990). Through this approach, hatchery trout are used as a stand-in for wild trout to fill the void in unused carrying capacity to achieve a desired catch rate. Catch rate, meaning the average number of trout caught per hour of fishing, is an intuitive and readily calculated component of angler satisfaction (Arlinghaus 2006). This management approach did not recognize any value difference between stocked trout and wild trout.

While CROTS rests on sound ecological principles, and its catch rate objective is relatively easy to explain, it was largely developed using angler survey and biological information collected in the late 1970s. Concerns over the continued practical applicability of the old system and feedback from trout stream anglers motivated a three-year evaluation study conducted in partnership with Cornell University.

The Cornell study focused on stocked brown trout and revealed that post-stocking trout density in stocked reaches declined far more rapidly than what was observed in the 1970s, even though the proportion of the catch that was released had increased and fishing pressure had generally decreased (Alexiades, et al. 2014). Of further concern was the inability of the study to validate the central tenet of CROTS: a clear, dependable relationship between the density of trout stocked and the average catch rate. This concern was exacerbated by the subsequent publication of similar findings from investigations by researchers in other states (Hyman, McMullin and DiCenzo 2016) (Kirn 2018).

Given the results of the study and the fact that our current approach to trout stream management is more than 30 years old, DEC advanced development of a new Plan. As the first step in a reexamination of trout stream management in New York State, 16 public meetings were conducted during the fall of 2017 for the purpose of understanding the range of outcomes desired by trout stream anglers and the relative importance of those outcomes to angler satisfaction (Henson 2018).

The top five desired outcomes were:

- High-quality stream habitat as a means to better fishing and as a desired outcome in its own right;
- the opportunity to catch wild trout and to a lesser extent stocked trout that have been in the stream longer than freshly stocked trout;
- extended availability of trout stocked in streams;
- a diversity of distinct stream fishing experiences (stocked trout, wild trout, easy vs. challenging, etc.) and the information necessary to find them should be made available;
- management success should be based on more than just catch of trout per hour.

These findings (Henson 2018) demonstrated the need for a new approach and formed the foundation of this Plan.

Management Environment: Risks and Challenges

The following summarizes issues that represent challenges or impediments to meeting several fisheries management objectives, some of which cannot be overcome. These issues are not presented in priority order.

Habitat Challenges

Collapsing banks such as this one increase sedimentation, alter physical habitat, and can result in increased water temperatures.

With respect to habitat-related risks, Kirn (2018) catalogued and described the following concerns for trout stream habitat in Vermont:

- increased water temperature;
- sedimentation;
- physical habitat alteration;
- flow alteration; and
- habitat fragmentation.

This list captures the most important ecological risks for trout stream habitat in New York State as well, and is nearly identical to the habitat concerns listed and discussed in the Management Plan for Inland Trout in Michigan (Zorn, et al. 2018). Because these risks are not unique to New York State and are common knowledge to both anglers and fisheries professionals, an extended discussion is not warranted in this Plan.

Climate Change

When summer water temperatures in a stream routinely exceed the thermal tolerances of trout or when trout reproduction is compromised by frequent floods, there is little opportunity for effective management. These constraints are likely to increase broadly based on current climate trends and climate model projections. The prospects for particular stream reaches will greatly depend on influences like groundwater inflows, riparian shade, and land use in the watershed. While constructive engagement with landowners and other agencies can be beneficial, it must be recognized that, in most situations, many factors fall outside the purview of Fisheries Managers.

Limitations of Cultured Trout

The ability to satisfy the desired outcome of extended fishing opportunities for stocked trout is limited by the reduced ability of domesticated trout to evade predators, survive the other challenges of life in a natural stream, and persist in a stocked reach (Alexiades, et al. 2014) (Stiller 2011) (Flowers, et al. 2019). Furthermore, the capacity of DEC's fish culture program is limited with respect to the total biomass (pounds) of trout that can be safely reared as well as the total number of stocking trips that can be completed per season.

Declining Recruitment of New Trout Anglers

Compared to other angler types, trout anglers tend to be older, suggesting a decline in the recruitment of new trout anglers (Maillett and Aiken 2015). With a few notable exceptions, creel surveys conducted by DEC show a long-term trend of declining angling effort on most trout streams around the state. While decreased fishing pressure would seem to make management easier in the short run, it suggests a troubling loss of connection between the public and the resource.

Over the last 30 years, informal stream access has declined due to posting by landowners.

Angler Access

Maintaining public access to trout streams becomes more difficult in a society with declining levels of interpersonal trust (Smith, et al. 2018). Although DEC continues to acquire additional public fishing rights (PFR), over the last 30 years, informal stream access has declined due to posting by landowners. DEC capability to acquire new PFR easements is increasingly constrained by unrealistic and outdated property valuations and the time it takes to identify and pursue additional opportunities.

Limitations of Managing Harvest

Angling regulations that restrict harvest (including mandatory catch-and-release) are most effective when they prevent harvest that would have otherwise occurred. Where natural factors such as predation or adverse stream conditions account for a larger share of total annual mortality than angler harvest, it is extremely difficult for fishing regulations to influence the trout population. To further confound the ability of regulations to influence trout populations, in recent years, the prevalence of voluntary catch-and-release angling practice has generally increased while fishing pressure has generally declined on many New York trout streams (Alexiades, et al. 2014).

Plan Development Process

The Plan was developed iteratively in a series of committee meetings held between May 2018 and December 2019. DEC staff who participated in these meetings are listed in the acknowledgements. The process began with the assessment and summary of public input received in the fall of 2017 (Henson 2018). We heard from anglers that trout stream fishing is not a standardized experience that can be adequately represented with a universal metric like catch rate. Instead, anglers characterized trout stream angling as a composite of distinct angling experiences and typically wanted access to more than one kind. Anglers drew a sharp distinction between wild and stocked trout fisheries and affirmed that self-sustaining trout have special value. In stocked reaches, anglers wanted to see the fishing opportunities provided by hatchery trout extended in terms of the season length and the spatial distribution within the reaches. Finally, anglers emphasized that, apart from its expected contribution to good fishing, healthy, unimpaired, high-quality stream habitat was important to their fishing experiences of its own accord.

After reaching agreement on these top desired outcomes, the committee used this information, and its collective professional experience in fisheries management and public service, to establish the management philosophy and guiding principles presented below. In particular, the committee emphasized the values of simplicity, clarity, and pragmatism in the guiding principles. Having an explicit management philosophy and guiding principles supported the committee's momentum and forward direction as ideas for management objectives and strategies were presented, revised, and critiqued. These statements were posted prominently during the proceedings to help the committee maintain focus on whether specific proposals adhered to the agreed principles and philosophy. Frequently, ideas that seemed promising at one meeting were rejected at the following meeting after further reflection, discussion with additional DEC staff, and reference to the guiding principles.

> *…anglers characterized trout stream angling as a composite of distinct angling experiences and typically wanted access to more than one kind.*

When the new management framework was fully developed, a Focus Group of trout stream anglers was convened to hear a presentation of the Plan tenets and provide feedback to the committee. This group comprised participants in the 2017 public meetings selected to represent, as fully as possible, the diversity of perspectives expressed during those meetings. The reaction of the Focus Group was positive, affirming that both the development process and resulting product were sound.

The next step was to engage the broader public. Ten public meetings around New York State were conducted between October 1 and November 12, 2019 to present the Plan tenets, answer questions, and receive informal comments. The meetings were announced through multiple outreach channels, including a statewide news release, DEC's website, targeted emails to participants in the 2017 public meetings, and subscribers to the *DEC Delivers* fishing list. Regional Fisheries Managers also reached out with invitations to sportsman's federations and other angling-oriented organizations in their regions with emails or phone calls. Feedback was overwhelmingly positive, but some of areas of concern were identified that prompted some additional research and reflection, including the Catch-and-Release Season and delayed harvest. After a final committee conference call to resolve these remaining questions, the draft Plan was completed and released for formal public comment. DEC received nearly 500 comments during the public review period. Similar to the public meetings, most of the comments received were favorable. An assessment of public comments received and changes made to the draft Plan based on the comments can be found in "Appendix 2." Plan changes based on the assessment of public comments included providing additional details for habitat enhancement and Plan evaluation. In addition, Esopus Creek was re-evaluated, and the management category changed from *Stocked-Extended* to *Wild-Quality*.

Focus Group Participants and DEC Trout Stream Plan Committee – Plan approach presentation and review meeting July 2, 2019, Cortland, NY; committee member Webster Pearsall not pictured; photo credit: Chuck Godfrey.

Management Philosophy

Trout stream reaches will be managed based on a combination of their ecological and recreational potential, with a clear distinction between wild trout and stocked trout management. Wild trout can be present in a stocked reach, but hatchery trout will not be stocked in a reach managed for wild trout.

Wild trout can be present in a stocked reach, but hatchery trout will not be stocked in a reach managed for wild trout.

Guiding Principles for Management

Wild Trout

- DEC will always strive for self-sustaining populations, with an emphasis toward native trout (brook trout).
- Trout stream reaches will be managed according to their ecological potential.
- A stocked reach may have wild trout, but a wild reach will not have stocked trout (i.e., DEC will not stock in a reach managed for wild trout).

Habitat

- Habitat protection is a fundamental component of trout stream management.
- Trout habitat enhancement will be used where appropriate and feasible.

Stocked Trout

- Stocked fish will be used judiciously to achieve specific management outcomes.
- Domestic trout strains will be stocked to support a fishery, not to establish new self-sustaining populations.
- The numbers and sizes of hatchery trout stocked under this Plan will not exceed what can be reared using existing hatchery capacity.

Angling Opportunity

- Management decisions will consider a stream reach's recreational potential.
- DEC will manage for a diversity of fishing opportunities across the state, but individual stream reaches will have a specific management focus.
- Management will be directed toward stream reaches that are publicly accessible. Any management actions taken on private land must yield clear recreational benefits for the public.
- Expanding and maintaining public access is a key component of trout stream management.
- Management decisions affecting angling and harvest opportunities will be made from a population level rather than an individual-fish perspective.

Management Approach

- Management decisions will be based on best available information and professional judgement.
- Management will be transparent to the public.
- Management will be simple and understandable.
- Management actions will be undertaken to achieve desired outcomes.
- Management actions will consider impacts to stream ecological health.

Management Categories

To manage within the potential of a broad array of trout stream reaches, provide a diversity of fishing experiences, and provide anglers with simple, understandable information to establish expectations, it quickly became apparent to the committee that a handful of management categories must compose the core of the Plan. In developing the categories, another consideration was that they should also be useful as benchmarks for habitat improvement actions: Did the project elevate the reach to a category consistent with a more productive fishery? Reaching agreement on the number and precise nature of the categories needed for these purposes required extensive debate and discussion. The dynamic tension between striving for simplicity and doing justice to the diversity of trout stream fisheries was ever-present.

> *Five independent categories of trout stream management are included in this Plan to address trout anglers' expressed desires to be able to find and access a diverse array of distinct trout stream fishing experiences, while also striving for clarity and simplicity.*

Five independent categories of trout stream management are included in this Plan to address trout anglers' expressed desires to be able to find and access a diverse array of distinct trout stream fishing experiences, while also striving for clarity and simplicity. Consistent with the views expressed by anglers in 2017 (Henson 2018), the categories make a sharp distinction between **wild trout management** (three categories) and **stocked trout management** (two categories) (Figure 1). Wild trout have unique value to many anglers and as part of an ecologically healthy coldwater stream. The three wild trout categories differ in fishery and habitat characteristics, but none are managed with the use of DEC hatchery trout.

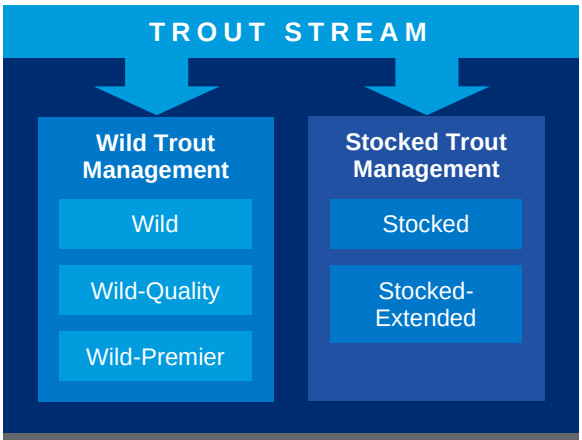


Figure 1. Management categories for wild and stocked trout management

The chief value of hatchery trout, on the other hand, is to provide additional fishing opportunities that would not be otherwise realized due to habitat limitations (Dietsch and Parker 1964). Recognizing that domesticated hatchery trout provide an immediate recreational benefit and seldom persist or reproduce, one stocked category provides a short-term spring fishery from a single stocking while the other relies on multiple stockings to address the desire for a longer period to catch stocked trout. While some reproduction may take place, the intended purpose of stocking domestic trout is not for improving or establishing self-sustaining wild populations.

The criteria for assigning stream reaches to categories are listed in Table 1a for wild trout management categories and Table 1b for stocked trout management categories. Management category-specific objectives and strategies are discussed below. Objectives and strategies that apply across categories are discussed in the following sections of the Plan. Angling regulations are summarized in Table 2.

Table 1a. Criteria for Wild Trout Management Categories			
	Wild	**Wild-Quality**	**Wild-Premier**
Access	Public access	Public access	Significant access – at least 3 cumulative miles of reach length in one or more of the following: • Public fishing rights • Public land • Public fishing permitted by landowner • Adequate angler parking
Size	Not applicable	Mean width >10 feet	Mean width >20 feet
Stream Reach Quality (Trout Carrying Capacity)	Meets C(T)[1] or higher water quality standard or data exists to support C(T) classification	• wild trout biomass >40 lbs/acre or • ≥ 300 yearling or older trout/mile	• wild trout biomass >60 lbs/acre or ≥ 500 yearling or older trout/mile • abundance of wild trout ≥9 in • potential to catch memorable fish (12″ ST, 15″ RT or BT)[2]
Angler Use	Not applicable	Not applicable	Reach can physically and biologically accommodate moderate to high angler use (>150 hr/acre)

Table 1b. Criteria for Stocked Trout Management Categories		
	Stocked	**Stocked-Extended**
Access	Access by one or more of the following: • Public fishing rights easements • Public land • Public fishing permitted by landowner	Significant access – at least 3 cumulative miles of reach length in one or more of the following: • Public fishing rights • Public land • Public fishing permitted by landowner • Adequate angler parking
Size	Mean width >10 feet	Mean width >20 feet
Stream Reach Quality (Trout Carrying Capacity)	• Survival to end of May • Does not already support adequate fisheries for black bass or walleye, even though technically a trout stream • Must meet Bp[3] standard	• Reach conditions offer potential for spring-stocked trout to survive into summer • Temperatures generally suitable for regular stocking through mid-June or for two consecutive months • Must meet Bs[4] standard
Angler Use	>75 hours/acre	>150 hours/acre

[1] The C(T) classification applies to waters that support trout and requires evidence of trout presence.
[2] ST=brook trout, RT= rainbow trout, and BT=brown trout
[3] Marginal put and take trout streams with relatively little potential for wild or holdover contribution (Engstrom-Heg 1990).
[4] Trout streams capable of supporting a spring fishery and some holdover trout, but with habitat deficiencies limiting wild trout (Engstrom-Heg 1990).

Many Wild category reaches offer the opportunity to catch brook trout in relative solitude.

Wild Category

The reaches in this category make up the largest quantity and greatest diversity of wild trout stream fishing opportunities in New York State. This category includes a wide array of reach types, from small headwaters sustaining native brook trout at carrying capacity to larger unproductive stretches that contain trout but are habitat limited and/or access limited.

Small headwater stream reaches for which trout populations are at their ecological potential but the recreational potential is limited by their small size, low chemical fertility, or remote location nonetheless constitute an important coldwater aquatic resource. Such reaches, especially in the Catskill and Adirondack regions, are also of interest to anglers motivated by the chance to encounter native brook trout while fishing in relative solitude. Stocking is an inappropriate management strategy for these reaches because, in addition to their inability to yield an adequate public benefit relative to the cost of stocking them (Engstrom-Heg 1990) (Kirn 2018), they also constitute a valuable reservoir of native trout biodiversity (Bruce, et al. 2019) (Beer, et al. 2019). This biodiversity is not only valuable from a conservation perspective but is also increasingly valued by many trout anglers as a unique opportunity and an important part of their fishing experience (Henson 2018).

The *Wild* category also includes larger streams with very limited public access or very limited trout habitat such that stocking is not an appropriate management strategy. These reaches do not meet the trout biomass criteria for *Wild-Quality*, yet the sparse trout populations they support still offer pockets of angling opportunity.

In general, stream reaches in the *Wild* category do not require intensive management. Collectively, however, the reaches in this category provide extensive fishing opportunities for anglers willing to explore, and because overall fishing pressure is generally light, they can be sustainably managed without imposing restrictive regulations (Detar, et al. 2014). Stream reaches in the *Wild* category are best managed by protecting resident wild trout and their habitat using the regulatory tools available to DEC while providing the angling public with the information to find publicly accessible stream reaches that support wild trout.

Objectives

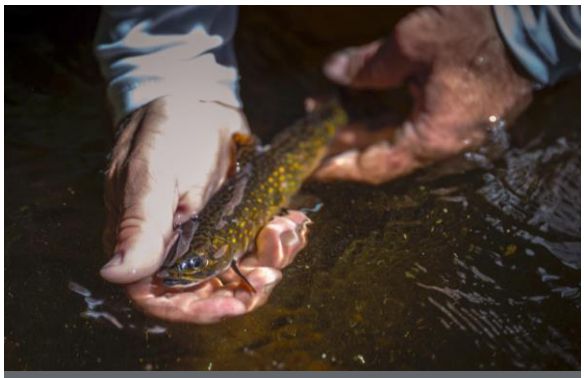
- Provide wild trout fishing opportunities in stream reaches incompatible with stocked trout management.
- Identify streams in this category with the greatest potential to be upgraded to *Wild-Quality* if specific habitat deficiencies can be corrected.

Strategies

- Limit harvest to 5 trout/day with no more than 2 over 12 inches in length.

Brook Trout Management

Brook trout, as New York State's only native stream resident salmonid, are of particular interest to trout stream anglers and are of particular conservation concern due to their stringent habitat requirements and a wide array of environmental threats, including global climate change (Hudy, et al. 2008). Recognizing that the headwater streams in this category constitute much of New York State's prime brook trout habitat, a more restrictive harvest regulation was carefully considered. While the imposition of a more restrictive limit may seem intuitive to protect the native brook trout populations included in this category, literature suggests that even catch-and-release regulations have little biological impact at the low levels of fishing pressure that these reaches typically experience (Detar, et al. 2014). Meanwhile, wild brook trout in Vermont have demonstrated long-term resilience under a much more liberal daily limit of 12 per day (Kirn 2017). These findings are consistent with the observation that natural mortality rates exert a much greater influence on these populations than harvest rates. Consequently, there is little opportunity to achieve a conservation or fishery benefit from more stringent regulations. A daily limit of 5 trout/day with no more than 2 over 12 inches provides a curb on excessive individual harvest and aligns with the same regulation in the *Stocked* category to minimize the complexity of regulations for anglers and law enforcement.



Brook trout are New York State's only native stream resident trout.

Brook trout represent the highest quality of habitat and serve as a symbol of the self-sustaining fisheries we should strive for.

Photo credit: Trout Power

The fisheries management and conservation needs of stream-dwelling brook trout were considered extensively in the development of the Plan and influenced several of its features, including: an emphasis on habitat protection, no stocking in reaches 10 feet wide or less, no stocking if fishing pressure is less than 75 hours/acre, investigating the production of sterile hatchery trout, and retention of a special catch-and-release only regulation for brook trout in the suburban counties of Nassau and Suffolk.

Wild-Quality Category

Stream reaches in this category are more productive than those in the *Wild* category and support an abundance of wild trout to provide a quality wild trout fishing experience. These reaches tend to be well-known to anglers, at least locally, and are unlikely to offer the degree of solitude available on reaches in the *Wild* category. These reaches are best managed to maintain abundant wild trout within the ecological potential of the reach and to provide a quality wild trout fishing experience.

Objectives

- Maintain a long-term average wild trout abundance greater than 40 pounds/acre or 300 yearling and older trout/mile.
- Where feasible, identify significant habitat deficiencies and implement durable (long-term) improvements.

Strategies

- Limit harvest to 3 trout/day with no more than 1 over 12 inches in length.
- Complete trout population assessment surveys within a 10-year recurrence interval.

The rationale for the more restrictive harvest regulation in this category is to help maintain the trout population above the abundance objective under higher levels of fishing pressure than typically seen in the *Wild* category.

Determining a trout population benchmark to define a *Wild-Quality* reach was a challenging task for the committee. Initial discussions considered carrying capacity estimates as well as measures of abundance. Regardless of the approach, the inherent year-to-year variability of streams requires that data are informed by context (recent floods, droughts, etc.). Abundance measures are used to identify high-quality wild trout streams for management in several neighboring states, and the 40 pounds/acre agreed upon by the committee falls within the range of benchmarks used by those states.[5]

Wild-Premier Category

This category constitutes the very short list of New York State's most productive large wild trout streams. These reaches are established angling destinations and offer exceptionally abundant wild trout populations and the opportunity to catch trophy-sized wild trout. To be classified as *Wild-Premier*, a reach must support an exceptional wild trout population and have the level of public access necessary to handle the high fishing pressure associated with this level of quality. These reaches are managed to provide an exceptional wild trout fishing experience with greater potential to catch larger trout than in either the *Wild-Quality* or *Wild* categories.

Anglers fishing in Wild-Premier reaches have the opportunity to catch trophy-sized wild trout.

Objectives

- Maintain an average wild trout abundance greater than 60 pounds/acre or 500 yearling and older trout/mile.
- Maintain a trout population size structure that offers anglers a high probability of catching wild trout larger than 9″ and the potential to catch a memorable wild trout (12″ or larger brook trout, 15″ or larger rainbow or brown trout).
- Where feasible, identify significant habitat deficiencies and implement durable (long-term) improvements.

Strategies

- Limit harvest to 1 trout/day of any size.
- Develop individual fishery management plans for *Wild-Premier* reaches that identify the biological and fishery information needed for long-term management.

The harvest regulation for this category severely restricts harvest to sustain the exceptional trophy potential of these heavily used destination fisheries while still allowing an angler to make the decision to harvest a single trout whether it is the trout of a lifetime or an injured trout that seems unlikely to survive release.

[5] Vermont – 30 pounds/acre considered "excellent"; Pennsylvania – 36 pounds/acre considered "Class A"; Connecticut – 49 pounds/acre considered high quality.

Stocked Category

Stocked reaches provide short-term opportunities to catch and harvest trout.

Stream reaches in this category generally have significant habitat limitations, usually including summer water temperatures that are marginal for trout survival. However, springtime conditions are suitable for trout stocking and the level of public access (via public property, easement, or willing landowners) and angler use justifies the investment in a single stocking to provide an early season trout fishing opportunity that would not otherwise exist. Some reaches in the *Stocked* category with better habitat lack the extensive public access needed to justify more intensive management under the *Stocked-Extended* category. Reaches in the *Stocked* category are best managed to provide short-term opportunities to catch and harvest trout. While they are ill-suited to extend good fishing opportunities into the summer, they are well-suited to geographically expand springtime trout stream fishing opportunities to reaches with minimal wild trout. Fish culture objectives, detailed in the "Fish Culture and Stocking Strategies" section of the Plan, include stocking yearlings at 9 inches and that 10% of the total number stocked in each stocking will be trout 12 inches or longer. To be classified as Stocked, the calculated stocking rate for the reach must be 300 yearling-equivalent[6] fish or more. Stocking rates less than 300 fish present a high opportunity cost for management and provide little value in regard to recreational opportunity. A reach will not be stocked with less than 300 yearling-equivalent fish.

Objectives

- Generate and maintain an amount of angler use equivalent to at least 75 hours/acre/year.
- Provide angling and harvest opportunities for stocked trout that typically does not persist through summer.

Strategies

- Stock once a year with the stocking rate calculated from Table 5 of the CROTS manual (Engstrom-Heg 1990) where 100 hours/acre/year is the assumed angler use unless a valid pressure estimate specific to the reach supports use of a higher value.
- Publish the date of stocking on DEC's website as soon as possible after stocking.
- Limit harvest to 5 trout/day with no more than 2 over 12 inches in length.

[6] One trout 12″ or longer counts as the equivalent of four yearling trout on the basis of weight.

Stocked-Extended reaches can handle higher fishing pressure due to their larger size and extensive public access. Photo credit: Ed Ostapczuk

Stocked-Extended Category

Stream reaches in this category lack the habitat needed to consistently support an abundant wild trout population. They typically support some wild trout, but the abundance falls short of the benchmark for management as a *Wild-Quality* reach.

Compared to reaches in the *Stocked* category, however, *Stocked-Extended* reaches can support stocked trout later in the season. These reaches can also handle higher fishing pressure as a function of their size and more extensive public access. In combination, the habitat, angler use, and access characteristics of these reaches make them the most promising candidates in which to provide an extended fishing opportunity to catch stocked trout using a strategy of frequent stockings and a reduced daily limit. Of the top desired outcomes expressed by trout stream anglers, prolonging the fishing opportunities for stream-stocked trout is one of the most difficult to achieve because hatchery trout are an inherent compromise between the traits needed to thrive in fish culture and the traits needed to survive in a stream. The purpose of this management category is to match up additional stocking and regulatory strategies with the stream reaches where they have the greatest potential to prolong the fishing opportunities for stream-stocked trout. As in the *Stocked* category, fish culture objectives, detailed in the “Fish Culture and Stocking Strategies” section of the Plan, include stocking yearlings at 9 inches and that 10% of the total number stocked in each stocking will be trout 12 inches or longer.

Frequent stocking is the most reliable means of satisfying the desire expressed by trout anglers for a longer period of good fishing for stocked trout. However, this cannot be applied everywhere based on availability of hatchery trout. More stockings on these reaches are balanced by a reduction to a single stocking for reaches in the *Stocked* category that formerly received multiple stockings.

Objectives

- Maintain a density of stocked trout capable of sustaining an average catch rate greater than 0.5 trout/hour for at least 2 consecutive months.[7]
- Generate and maintain an amount of angler use equivalent to at least 150 hours/acre/year, including at least 75 hours/acre during the second month of stocking.

Strategies

- Stock every 2 weeks, 4 times over a 2-month period in spring and early summer to extend the duration of quality fishing.
- Stock at rates that account for wild trout as part of the overall carrying capacity (Engstrom-Heg 1990).
- Complete early summer trout density surveys within a 10-year recurrence interval.
- Limit harvest to 3 trout/day with no more than 1 over 12 inches in length to extend the duration of quality fishing.

In the last decade, special regulations on inland trout streams in New York State reached a peak of 26 different combinations of possession limit, length regulation, and season length.

Assigning Management Categories to Reaches

Management categories were assigned to publicly accessible stream reaches using the criteria listed in Tables 1a and 1b. Initial assignments were made by DEC regional biologists using the best information available. These assignments are listed by DEC Region in *Categorization of New York State Trout Stream Reaches* (NYSDEC 2020), which should be considered a dynamic component of this Plan that will be updated accordingly as new information becomes available. As part of this process, biologists prioritized reaches for resurvey (High, Medium, Low) based on the date of the last biological survey, the potential for subsequent changes to trout abundance and carrying capacity, the need to update angler use information, and assessing public access. As reaches are resurveyed and the current status is reevaluated, reach category assignments and boundaries may change in accordance with the category criteria and reach boundary guidance (NYSDEC 2020).

Angling Regulations

In the last decade, special regulations on inland trout streams in New York State reached a peak of 26 different combinations of possession limit, length regulation, and season length. In many cases, only slight differences distinguish these regulations. Four regulations apply to the Plan's management categories. These regulations and the waters to which they would apply are listed in *Categorization of New York State Trout Stream Reaches* (NYSDEC 2020).

The guiding principle of simple, understandable management demands that management categories and their associated angling regulations be simple and understandable. DEC acknowledges the general tendency of fisheries management agencies to establish large portfolios of complex but well-intentioned special regulations that cannot be effectively evaluated

[7] While recent research shows that the ability to predict catch rate from trout density is unreliable at best (Alexiades et. al. 2014 and Kirn 2017), this metric is included as a benchmark for the persistence of stocked trout in the reach.

(Radomski, et al. 2001). Such complexity is accepted and sometimes actively sought by avid trout anglers with the assumption that trout population characteristics can be reliably fine-tuned by imposing water-specific measures. However, it can discourage participation and recruitment of new anglers to the sport (Knoche and Lupi 2016) (Radomski, et al. 2001). Moreover, because trout populations are simultaneously influenced by the unregulated mortality associated with natural predators and environmental stressors, water-specific angling regulations seldom achieve the desired outcome in a consistent or precise manner. This is particularly true when non-harvest mortality varies greatly from year to year, and in many years, exerts a greater influence on the population than harvest.

Seasonal Framework

Under this Plan, the same angling seasons are proposed for all five management categories.

- April 1–October 15: Harvest Season
- October 16–March 31: Catch-and-Release Season (artificial lures only)

The single biggest change proposed for the trout stream angling regulations is the addition of a catch-and-release, artificial-lures-only season from October 16 through March 31 to provide year-round trout fishing opportunities statewide. While New York State has traditionally closed trout stream fishing during the winter period as a precaution against the disruption of wild trout reproduction, many states, including neighboring Pennsylvania, have sustainably managed wild trout populations without a closed season. In New York, we have monitored trout populations in inland trout streams that have been open to year-round angling by special regulation for over a decade. Through this experience, DEC has gained confidence and found that it is feasible to sustainably manage wild trout with a winter Catch-and-Release Season. Applying this regulation statewide expands fishing opportunities for avid anglers who are motivated to fish on a catch-and-release basis outside of the regular season.

This change was included in the Plan based on the current science and DEC's objective to provide for increased fishing opportunities whenever possible. "Appendix 1" summarizes the information considered in developing the proposal and in response to concerns expressed by the public during the fall 2019 public meetings. While the argument for prohibiting angling during the spawning and egg incubation seasons is intuitive and long-established in angling tradition, the science shows no evidence of harm at the population level where catch-and-release angling is permitted (Kelly 1993) (Roth, et al. 2019).

The Catch-and-Release Season expands fishing opportunities outside of the regular harvest season.

Category Harvest Regulations

Daily harvest limits under this Plan are tied to the management category objectives as described earlier and summarized below (Table 2). Except for the *Wild-Premier* category, where only 1 trout per day may be harvested, the daily limit is lower for trout over 12 inches in length than for smaller trout. This approach serves two purposes: to provide more anglers a chance to catch a large hatchery trout and to provide a greater degree of protection for mature wild trout. The daily limit of 5 trout with no more than 2 longer than 12 inches is the new statewide trout stream regulation applicable to:

- *Stocked* reaches,
- *Wild* reaches, and
- Uncategorized reaches.

Anglers planning to harvest trout during a day of fishing different reaches must understand that the daily possession limit of the reach being fished includes trout placed or stored in a vehicle. These fish count even if they were previously caught in a water with a greater possession limit than the reach the angler is currently fishing (Revenaugh 2020).

Table 2. Harvest Regulations for Trout Stream Management Categories Apply from April 1 through October 15

Category	Daily Limit
Wild	5 trout, no more than 2 trout over 12″
Wild-Quality	3 trout, no more than 1 trout over 12″
Wild-Premier	1 trout, any size
Stocked	5 trout, no more than 2 trout over 12″
Stocked-Extended	3 trout, no more than 1 trout over 12″
Uncategorized[1]	5 trout, no more than 2 trout over 12″

[1] Uncategorized includes any reach not specifically categorized, including reaches without public access, and is the default statewide trout stream regulation.

Anglers planning to harvest trout during a day of fishing different reaches must understand that the daily possession limit of the reach being fished includes trout placed or stored in a vehicle. These fish count even if they were previously caught in a water with a greater possession limit than the reach the angler is currently fishing.

Use of Catch-and-Release Regulations

Nearly all reaches already managed under a catch-and-release regulation will be grandfathered into this Plan under a year-round catch-and-release, artificial-lures-only regulation with no further evaluation required (NYSDEC 2020). Over the life of the Plan, a catch-and-release regulation on a specific reach may be reevaluated if its value comes into question. New year-round catch-and-release regulations in *Stocked* or *Stocked-Extended* reaches will not be considered. However, a temporary catch-and-release regulation may be considered on a formerly stocked reach or a *Wild* reach that has been converted to a *Wild-Quality* as a strategy to reach the trout biomass objective if there is evidence that harvest pressure is a significant obstacle. In this case, an evaluation will be required.

The Plan retains the special catch-and-release regulation specific to brook trout in Nassau and Suffolk counties. The handful of reaches that support brook trout in these counties are very small in extent, isolated from each other, and are surrounded by densely populated suburban neighborhoods. Given the scarcity of similar trout stream fishing opportunities to diffuse angling pressure in a region with a human population exceeding 2.86 million, these populations were considered uniquely vulnerable.

Consideration for Delayed-Harvest Strategies

Statewide delayed-harvest regulations for stocked trout were considered but not included in this Plan. A delayed-harvest regulation providing for several weeks of catch-and-release fishing for stocked trout prior to the opening of the regular harvest season could extend fishing opportunity if the combination of natural mortality, hooking mortality, and outmigration from stocked reaches was low compared to harvest losses during the regular season. However, this combination of non-harvest losses is known to be relatively high in New York (Alexiades, et al. 2014) (Stiller 2011) and other states (Flowers, et al. 2019). This offers little opportunity for a delayed harvest regulation to extend the angling opportunity provided by a stocking of hatchery trout. From the perspective of anglers who wish to harvest stocked trout, delaying harvest for an extended period would waste fish, without achieving the desired outcome of extending the fishing opportunity provided by a stocking of hatchery trout. It is worth noting that the April 1st opening day of the regular trout season does result in a brief delayed-harvest scenario for March-stocked trout in the southern portion of the state that are immediately available for anglers to enjoy under the new catch-and-release regulations.

At almost every one of the fall 2019 public meetings, one or more participants asked DEC to consider a special case of the delayed-harvest regulation: a temporary harvest closure imposed on a water-by-water basis for the first 24 to 48 hours after that waterbody receives a stocking of hatchery trout. This strategy would allow time for vulnerable freshly stocked trout to acclimate and disperse prior to harvest, but the brevity of the closure would curtail the losses to non-human predators before harvest can begin. The obstacle to implementing this approach lies in the communication and law enforcement requirements. These would include:

- shortening daily stocking schedules to account for the time required to post signs at each stocking location;
- communicating the freshly stocked reaches to law enforcement in real-time (communicating the schedule in advance would result in wasted law enforcement effort whenever the stocking schedule changed due to a weather delay or a truck breakdown);
- scheduling trips to remove expired signs; and
- communicating to anglers when the stocked reach will be closed before they make the trip to the stream only to find out it is closed to fishing.

Based on the public interest expressed in this strategy, these issues were reexamined after the fall 2019 public meetings, but workable solutions were not identified. Stocking multiple increments in *Stocked-Extended* reaches was determined to be the most practical approach to extending the opportunity to catch stocked trout later in the season.

Stocking multiple increments in Stock-Extended reaches will extend the opportunity to catch stocked trout.

Fish Culture and Stocking Strategies

Trout raised at hatcheries provide additional trout stream fishing opportunities that otherwise would not exist.

Stocking is a valuable tool to provide additional trout stream fishing opportunities to the angling public. DEC recognizes that hatchery trout and wild trout are not ecological equivalents, that their relative value to anglers cannot be measured on the same scale, and that wild trout are held in high esteem. These premises were enthusiastically affirmed by trout anglers during the 2017 public meetings. However, many anglers who expressed a strong preference to fish for wild trout also noted the importance of fishing opportunities provided by stocked trout, particularly as a means of introducing young people to the sport. The following strategies and associated trade-offs were developed to better align our fish culture capacity with the angler priorities expressed during the 2017 public meetings.

Hatchery capacity places an upper limit on the quantity of healthy trout (total pounds of fish) that can be safely produced. To mitigate risk and maintain quality, stocking policy numbers will not exceed the capacity of the system. A new stocked or stocked-extended reach may only be added if enough hatchery trout are made available by the removal of another stocked reach.

Strain Development

DEC will not rear and stock domestic hatchery trout for the purpose of establishing new reproducing populations. However, it is important that the fish we raise possess a balance of characteristics that enable them to be efficiently cultured in the hatchery environment and to survive well enough in the wild to provide a reasonable duration of angling opportunity. DEC has initiated the following steps to improve the hatchery product and will continue to implement them under this Plan:

Rainbow Trout

DEC investigated alternative rainbow trout strains in 2017 and is currently replacing the Wytheville strain with the Arlee strain to address the declining reproductive performance of the Wytheville strain in the hatchery system. The first Arlee eggs were obtained from Erwin National Fish Hatchery in 2017. Full DEC production of Arlee rainbow trout eggs will begin in 2021. Preliminary results suggest that adopting the Arlee strain will result in more reliable and consistent production.

Brown Trout

The Rome strain brown trout reared by DEC is strongly resistant to furunculosis (*Aeromonas salmonicida)*, a pathogen that can cause devasting disease in trout hatcheries. However, recent evidence shows that post-stocking survival has declined since the late 1970s. To restore the benefits of natural selection to our Rome strain broodstock while conserving their important disease resistance traits, we are experimentally refreshing the genetics of our Rome strain broodstock by breeding domestic females with males from a wild population founded by Rome strain brown trout. The half-wild offspring are being evaluated for performance in the hatchery, and the evaluation in the natural environment will be concluded in 2023.

Brook Trout

The domestic brook trout reared by DEC are also propagated from a Rome strain broodstock that is resistant to *Aeromonas salmonicida*. As with the Rome strain brown trout, there are increasing concerns with the performance of this strain (e.g., poor post-stocking survival in streams, unreliable reproduction in the hatchery). A practical strategy for improving or replacing this strain without creating an unacceptable disease risk is currently lacking but is identified as a need. If this problem cannot be solved and the Rome strain continues to deteriorate, then DEC may suspend production of domestic brook trout for stream stocking.

> *DEC will not rear and stock domestic hatchery trout for the purpose of establishing new reproducing populations.*

Species Composition

In addition to steps to improve the performance of trout strains reared and stocked by DEC, the relative mix of the three trout species raised for stream stocking is open to revision under this Plan. Currently, hatchery production is dominated by brown trout. However, the performance characteristics of the improved strains observed in the hatchery and in the stream may suggest that a different mix could better meet the management objectives for the two reach categories managed with hatchery trout.

Sterile Domestic Trout

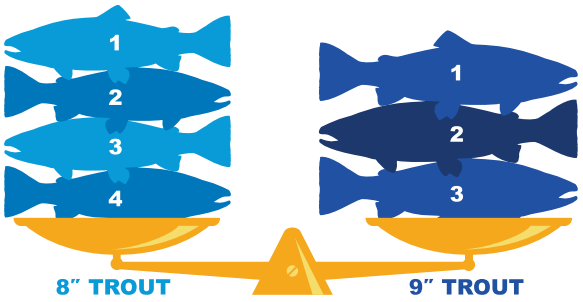
DEC will investigate the feasibility of large-scale production of sterile (triploid) domestic trout. Other states, notably Idaho and Vermont, make extensive use of sterile domestic rainbow trout to mitigate the risk of unwanted natural reproduction. The poor long-term survival of domestic trout strains currently stocked in New York State limits this risk and, in the case of Rome strain domestic brook trout, two recent studies found minimal genetic evidence for interbreeding with wild brook trout in historically stocked waters (Bruce, et al. 2019) (Beer, et al. 2019). Nonetheless, a sterile hatchery product could have management value for stocked reaches with adjacent wild reaches of particular sensitivity. If strain-improvement strategies are successful in prolonging the survival of stocked domestic trout, then sterility would become an even more desirable feature in such circumstances.

Size Objectives for Spring-Stocked Trout

To increase angler satisfaction, DEC will raise larger trout for stocking in streams. The production capacity of hatchery system is limited in terms of the total weight of trout that can be raised. Larger yearling trout weigh more; therefore, fewer yearlings will be able to be raised. The obvious trade-off required to implement this strategy is a reduction in the total number of yearlings stocked. Two factors were considered in the decision to accept this trade-off:

- There is mounting evidence that the number of trout stocked into a reach does not reliably predict the average catch rate (Alexiades, et al. 2014) (Hyman, McMullin and DiCenzo 2016) (Kirn 2018). Meanwhile, DEC's CROTS stocking methodology depended on the ability to accurately and consistently relate the number of trout stocked to the average number of trout caught per hour by anglers.
- During the public meetings held in 2017, the inadequacy of catch per hour as the measure of satisfaction for trout stream angling was a recurrent theme in public comments while the opportunity to catch large trout was a commonly expressed desire.[8]

Thus, stocking fewer but larger trout can reasonably be expected to enhance the fishing experience for anglers fishing stocked trout streams with minimal impact on satisfaction associated with catch rate.



The trade-off for stocking larger yearling trout is that fewer yearlings can be raised.

Spring Yearlings

The Plan establishes a minimum length objective of nine inches at stocking for spring stocked yearling trout. Currently, yearlings typically range from six to eight inches. While this outcome was not specifically identified by anglers at public meetings, DEC understands this to be obtainable and a benefit worth adding to improve angler satisfaction.

As stated previously, current hatchery production must be curtailed to meet the increased size at stocking. Since the early 2000s, DEC's hatchery system has been stressed to produce the number of fish needed to satisfy stocking policies. For the past two decades, stocking has been prorated at approximately 83% of statewide policy targets as the hatchery system could not meet demands, even at levels of over-production. The stocking strategies in this Plan will both solve the proration issue and alleviate stress on the hatchery system, as production will now be more aligned with twenty-first century angling pressure. Current stocking numbers are based on generic fishing pressure estimates from the early 1990s that are no longer realistic given the general decline in fishing pressure observed in trout stream creel surveys since that time. When updated pressure estimates are used to recalculate stocking rates and the trout formerly stocked in reaches categorized as *Wild* or *Wild-Quality* are subtracted, the demand for spring yearling production decreases to approximately 70% of the 2019 yearling target; a reduction from 2.23 million to 1.56 million yearlings. Given the above, DEC is confident that a higher-quality fish can be produced in the appropriate numbers to satisfy stocking needs for management.

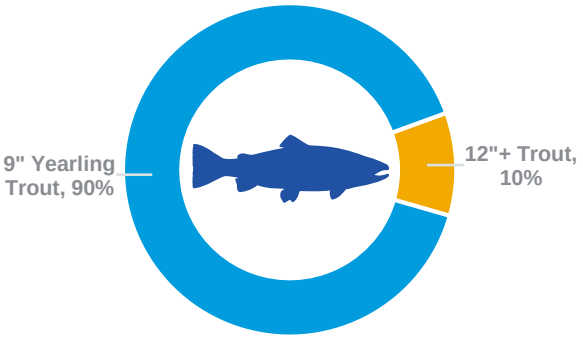
> *The Plan establishes a minimum length objective of nine inches at stocking for spring stocked yearling trout.*

[8] The opportunity to catch large trout was not among the top five recurring themes but would rank among the top ten (Henson 2018).

12-inch or Longer Trout

Building on the success of the two-year-old brown trout program, the Plan establishes an objective that each stocking of hatchery trout will include trout 12 inches or longer as 10% of the total number stocked.

All stocked reaches will provide anglers with the opportunity to catch a large stocked trout. The production of trout that are at least 12 inches long will continue at the level of the current two-year-old brown trout program. Currently, many stockings receive no two-year-old brown trout, while some receive two-year-olds and yearlings (i.e., simultaneously or as an entirely separate stocking). In the future, trout that are at least 12 inches long will constitute 10% of every stocking. This strategy results in a wider distribution of these valuable fish across the landscape and establishes consistent angler expectations that he or she has the chance to catch a larger hatchery fish in stocked reaches. For the *Stocked-Extended* category, the distribution of these fish over the spring stocking period will be broader. The opportunity for anglers to target large concentrations of freshly stocked trout 12″ or longer will be diminished by this strategy. It will, however, extend the opportunity for anglers to fish for two size classes of stocked trout in reaches managed with stocking. In the future, this size class of stocked trout may include rainbow trout and brown trout. It should be noted that while most stockings will include 12″ or longer fish in the immediate future, implementation may be delayed for some waters while the hatchery system re-tools operations.



10% of each stocking will comprise trout 12 inches or longer.

Stocking by Entities Other Than DEC

A stocking permit must be obtained from the Regional Fisheries Manager of the DEC region where the stocking is proposed to stock trout into the waters of the State[9]. This requirement applies to private individuals and organizations as well as public fish hatcheries operated by the counties of Essex, Monroe, Onondaga, and Warren.

Stocking permits will not be approved under any circumstances for publicly accessible stream reaches categorized as *Wild-Premier* or *Wild-Quality*. A stocking permit may be issued at the manager's discretion for publicly accessible stream reaches categorized as *Wild* or uncategorized private waters if the following circumstances apply:

- The reach characteristics make it unlikely to support an abundance of wild trout that meets the standard for *Wild-Quality* management (wild trout biomass of 40 pounds/acre or 300 yearling and older trout/mile); and
- the reach was disqualified for management in the *Stocked* category due to insufficient public access, insufficient angling pressure, or insufficient coldwater habitat.

In all circumstances where a stocking permit may be considered, Regional Fisheries Managers will give priority to protecting wild and native trout populations. Managers may require applicants to provide information on the existing trout population. If warranted, managers may impose permit conditions appropriate to the circumstances. For example, the permit may stipulate the species to be stocked or limit stocking to sterile trout. Permits to stock trout in a reach being stocked by DEC will limit the number of additional trout to 10% of DEC's stocking rate.

[9] Any lake, river, pond, stream or any other distinct mass of water existing in the state of New York, whether publicly or privately owned.

County Hatcheries

The Plan recognizes the capacity of the county-operated hatcheries to add value to the trout fishing experience on reaches managed under the two stocked categories. For example, county hatchery capacity supports more *Stocked-Extended* reaches than could be stocked by DEC hatcheries alone. The following guidance applies to stockings conducted under DEC permit by county hatcheries:

- The total number of trout stocked into a reach annually by county-operated hatcheries will not exceed the DEC-calculated stocking rate for that reach by more than 10%;
- For a given stocked reach, spring-stocked catchable size trout will be stocked by either the county or DEC, not both;
- DEC will include county-stocked reaches that meet the criteria for the *Stocked* or *Stocked-Extended* categories on the statewide trout stream map (see the "Information and Outreach" section of this Plan); and
- County-stocked reaches that qualify for a stocking permit but do not meet criteria for the *Stocked* or *Stocked-Extended* categories will not be shown on the statewide trout stream map—for example, a reach that does not meet DEC Bureau of Fisheries standards for public access or which is stocked with less than 300 trout.

Habitat Enhancement and Protection

The guiding principle of striving for self-sustaining trout populations demands an emphasis on habitat enhancement and a continuing commitment to stream habitat protection. The habitat goals of this Plan are threefold:

- prioritize resources on habitat enhancement projects that offer the greatest enduring public benefit for the cost;
- in collaboration with committed partners, create a learning environment to expand expertise and capacity to complete habitat projects with meaningful fishery benefits; and
- effectively apply DEC regulatory authority to protect stream reaches from habitat disturbances detrimental to trout.

Prioritizing Habitat Enhancement

Under the Plan, DEC will evaluate and prioritize possible habitat enhancement projects based on their potential to achieve a management category shift from

- *Stocked* or *Stocked-Extended* to *Wild-Quality*
- *Wild* to *Wild-Quality* and
- *Wild-Quality* to *Wild-Premier*

by correcting a specific, well-defined habitat problem or deficiency. Where a developing habitat problem is responsible for a *Wild-Quality* or *Wild-Premier* reach failing to meet category objectives, the resolution of that problem would be valued as equivalent to one of the listed positive category shifts. Streams in the *Wild* category that are already functioning at their ecological and recreational potential, such as low-fertility headwater streams in wilderness areas, may not be appropriate candidates for habitat enhancement projects.

Developing a Habitat Enhancement Subplan

DEC will develop a habitat enhancement subplan that will provide detailed criteria for prioritizing stream reaches for habitat enhancement projects. Criteria will be developed with input from experts and partners. Over the life of the Plan, those criteria will likely require modifications to reflect advances in the field. Additional considerations include:

- risk that the short-term benefits of the project will be negated by hydrological influences beyond the riparian corridor;
- vulnerability of the project site to disturbance by future landowners or other parties;
- potential to benefit trout populations beyond the immediate reach;
- thermal vulnerability of the reach to climate change (influence of groundwater, stormwater, and riparian vegetation considered); and
- technical feasibility of proposed technique.

The subplan will include an initial list of high priority reaches for habitat enhancement to focus the resources and collaborative efforts of DEC and partners on implementing projects with high conservation and recreational value.

The objectives for habitat enhancement under this to be developed subplan can be divided into a large-scale/high-complexity level and a small-scale/lower-complexity level.

At the large-scale level, there are two objectives:

- assess New York State's watersheds with extensive coldwater habitat to identify 2–3 stream/tributary systems where the trout fishery can be improved by a targeted comprehensive set of habitat enhancement actions; and
- develop and begin implementation of an incremental habitat enhancement plan in the 2–3 systems identified by the watershed assessment.

At the small-scale level, the objectives are to:

- provide technical assistance to partners seeking to mitigate specific well-defined habitat problems with significant trout fishery implications; and
- provide material support to partners with well-defined, technically sound plans to mitigate specific, well-defined habitat problems and achieve trout fishery benefits.

Partnerships

DEC assisted the Seth Green Chapter of Trout Unlimited to complete this habitat enhancement project on Oatka Creek. Photo credit: Cal Curtice

To bring together the knowledge, expertise, and resources necessary to achieve meaningful trout stream fishery improvements through strategically focused habitat enhancement work, DEC will continue to emphasize partnerships with committed stakeholders. Working with partners, DEC will strive to identify and develop projects that can be confidently implemented with respect to the technical approach and beneficial fishery outcome. DEC will also be attentive to the needs of partners priorities for advancing improvements in trout stream habitat.

Building Capacity in Habitat Expertise

Recognizing the importance of expertise in successfully accomplishing effective stream habitat enhancement, DEC will seek to secure the services of a research scientist with applied fluvial geomorphology qualifications and experience. These skills are needed to identify potential projects that can yield the types of trout fishery improvements described above and ensure that prioritization considers the potential resiliency of resources in the face of climate change. This expertise will also be crucial to ensure that projects contribute to the knowledge base of the discipline and inform subsequent decisions and strategies. To achieve maximum benefits from habitat enhancement projects, advancing the applied science on the interactions between in-channel features, riparian features, and groundwater is particularly important.

Addressing Climate Change

Climate change will undoubtedly be the greatest challenge we face to maintain our wild trout streams. Distinguishing reaches that can support self-sustaining populations of wild fish, as we have done in this Plan, is an important first step in taking a deliberative science-based approach to preserve these coldwater resources. The ability of a reach to withstand the effects of a warming planet will be considered carefully when prioritizing projects in the future. DEC will use the most relevant predictive models and analytical tools to make informed decisions for selecting stream reaches that stand the best chance of being resilient in the face of climate change.

Complimenting direct fish habitat improvement efforts, new tools like New York State's Flood Risk Management Guidance and model local laws developed by DEC and the State Department of State will provide essential guidance to state and local agencies and land managers to advance projects that help improve stream habitat while also promoting flood resilience. Better siting, right-sized flood-resistant culverts and bridges, and other measures will help reduce flood risk to people and infrastructure while also providing for fish and wildlife passage, improved water quality and natural riverine processes that support the long-term viability of aquatic habitats and will augment and leverage the efforts identified in this Plan.

Habitat Protection

The application of fisheries expertise and DEC regulatory authority to infrastructure projects affecting New York State's trout streams is critical to maintaining the quality of trout habitat, preventing persistent habitat degradation, and avoiding the need for costly habitat restoration. Examples include:

- the review of permit applications and establishment of appropriate permit conditions under Article 15 of the Environmental Conservation Law for projects affecting the bed and banks of trout streams;
- participation in the evaluation of energy project applications, including those for relicensing under the Federal Energy Regulatory Commission with respect to stream flow, water quality, and fish-passage needs;
- participation in the review of State Pollutant Discharge Elimination System (SPDES) permits to regulate a broad range of effluents, including stormwater and other thermal discharges to trout waters;
- participation in the review of water withdrawal permits, evaluation of reservoir release regulations and requirements;
- providing biological data to support regulatory stream classification updates;
- participation in the review of proposed actions subject to the State Environmental Quality Review Act (SEQRA).

Public Access

New York has over 1,300 miles of Public Fishing Rights.

To gain access to trout streams in New York, anglers rely on a mix of properties: those under public ownership, those with permanent public fishing rights (PFR) (easements purchased by DEC from private landowners for the purpose of fishing access), and privately held properties whose owners freely permit fishing. Since 1935, over 1,300 miles of PFR have been acquired by DEC. The acquisition, development, and maintenance of these easements will continue as an important public access strategy under this Plan.

A considerable portion of currently accessible trout streams are on privately held properties whose owners permit fishing. In almost all instances, no formal (legal) agreement exists between DEC and the landowner for allowing the public to fish. While historically acceptable, these "handshake" agreements need to be formalized to ensure that fish are being stocked in waters that remain accessible and that these waters are labeled as open to fishing and available for all anglers to enjoy. Going forward, DEC will seek to formalize agreements with landowners and label privately held waters that are accessible to the public. For all types of public access, the goal is to provide the angling public with safe, legal, and readily recognizable access to a diversity of trout stream angling opportunities for wild and stocked trout. Implementation will focus on the following strategies:

- continue working to obtain access to landlocked PFR;
- develop angler parking areas on parcels that have already been purchased for this purpose;
- obtain and develop angler parking areas where a lack of safe and convenient parking limits recreational potential;
- give priority to PFR acquisitions that fill significant gaps on reaches with good existing access and to acquiring additional formal access on stream reaches where recreational potential is constrained by inadequate access;
- review the PFR scoring strategy to determine whether any adjustments are needed to better address current circumstances;
- revisit the PFR payment schedule to determine whether landowner incentives provide sufficient motivation to complete PFR agreements;
- validate and enforce landowner compliance with the terms of existing PFR easements;
- partner with outdoor recreation organizations to address the above priority tasks and to assist in verifying public access on private lands;
- develop "you are here" type kiosk maps for parking areas to help anglers orient themselves to the adjacent PFR, understand PFR rules, and locate additional trout stream angling opportunities on nearby reaches;
- develop new sign standards to allow anglers to better identify the type of access available and the management category associated with that stream reach;
- pursue acquisition of suitable boat launch sites on larger trout stream reaches where this form of public access is a recognized need and appropriate to the fishery; and
- maintain and replace signage needed for anglers to recognize public access points.

Information and Outreach

Providing user-friendly access to information necessary for anglers to find their preferred trout stream angling experiences is the primary outreach goal of this Plan because of the importance placed on it by anglers during the 2017 public meetings.

Developing an Interactive Trout Stream Fishing Map

The first priority in keeping anglers informed is the development of an interactive online map that identifies management categories of publicly accessible trout stream reaches. The map may be used to find the type of fishing experience they desire. Specific features include:

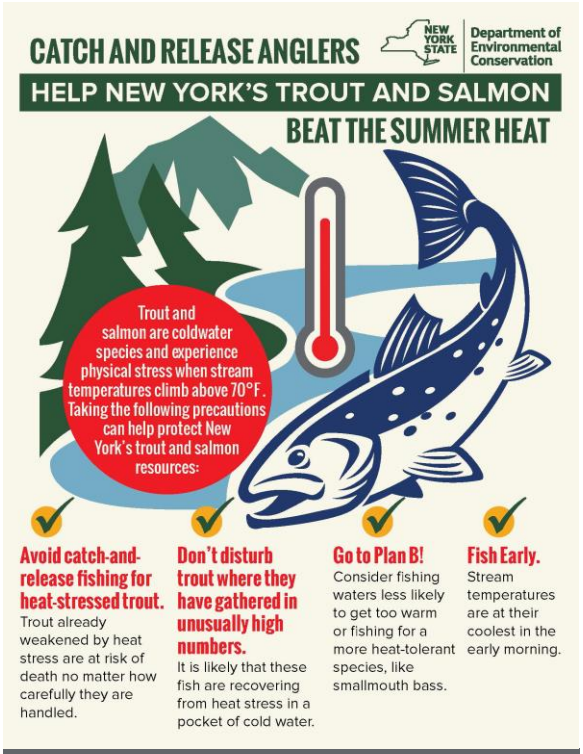
- stream reaches color-coded by management category for easy identification;
- angler parking areas;
- PFR and non-PFR stream reaches where fishing is permitted by landowners;
- public lands where fishing is allowed; and
- associated angling regulations; stocking information, including anticipated date of stocking(s), numbers, species, and sizes of trout stocked.

The primary purpose of the map will be to help anglers find and access various trout stream fishing opportunities based on management category. It will not show uncategorized trout stream reaches that are inaccessible to the general public. *Stocked*, *Stocked-Extended*, *Wild-Quality*, *and Wild-Premier* reaches will be shown in their entirety, so anglers can expect to encounter some private properties posted against trespassing within the mapped reach. The map coverage of *Wild* reaches will be limited to reaches on publicly owned properties, easements, or those with landowner permission.

Promoting Responsible Angling

A second outreach priority is to encourage responsible angler behavior by providing anglers with sound information and advice to sustain both trout populations and access to those resources. Topics include:

- respect for landowners (PFR and informal access);
- respect for fellow anglers;
- trout-handling tips for successful catch-and-release;
- recognizing and avoiding trout redds;
- fair chase ethics (freshly stocked trout, spawning wild trout, thermally stressed trout)



Anglers will be provided with sound information and advice on a variety of trout fishing related topics.

- preventing the spread of invasive species; and
- the role of stocked trout in trout stream management.

To develop and disseminate effective messages on these and other topics, DEC will engage with interested partners with insights and access to target audiences. New and upgraded outreach products will include signage, infographics, web content, social media, and other forms of online messaging.

Educating the Public on the Value of Brook Trout

Brook trout are New York's only native non-migratory stream-dwelling trout. They represent the highest quality of habitat and serve as a symbol of the self-sustaining fisheries we should strive for. These fish are an important component of New York's biodiversity and our fishing heritage.

People cannot advocate for what they don't understand, therefore it is imperative that we provide the necessary outreach and education on this high-value species, especially as the atmosphere warms and our environment changes. Brook trout are undeniably beautiful and are emblematic of beautiful places. DEC will capitalize on these attributes to promote the protection of our official State fish and the places it resides. Like other aspects of implementing this Plan, we will work with partners to develop an approach to outreach that includes the following actions:

- Developing signage recognizing brook trout waters;
- Writing brief articles in *The Conservationist*;
- Developing a *Conservationist For Kids* issue (for school children);
- Increasing awareness via DEC's website and social media;
- Highlighting DEC Bureau of Fisheries Technical Briefs associated with brook trout investigations and habitat improvement efforts; and
- Spotlighting brook trout via the DEC habitat stamp in 2023.

Implementation and Evaluation

Evaluation of Plan Strategies

The strategies set forth in this Plan are subject to ongoing evaluation over the life of the Plan. Strategies will be evaluated based on their contribution to the stated goals and objectives that they were developed to fulfill. Strategies that prove ineffective will be modified, replaced, or deleted. Evaluation is essential to ensure that the Plan serves its purpose in creating a learning environment for adaptive management. Specific areas of evaluation and the instruments proposed for tracking progress include:

- **Habitat Enhancement** – Annually report the length of stream improved by habitat enhancement projects completed through DEC-supported partnerships and the number of reach category upgrades implemented due to project outcomes. Because habitat enhancement as a statewide management priority is a new emphasis under this Plan, a target number is not proposed. However, the trend of management category shifts over time will provide feedback on the effectiveness of the approach and help to identify necessary strategy adjustments;

- **Public Access** – Annually report the quantity of public access available, including PFR acquired, on stream reaches within the Plan scope, and summarize improvements completed on existing stream access sites. Evaluate PFR and informal public access on stream reaches for consistency with category criteria;
- **Outreach** – Annually report on new and upgraded outreach products including signage, infographics, webpages, social media, and other forms of online messaging. Use periodic online angler surveys to assess the public impact of messaging on the Plan focus areas;
- **Catch-and-Release Season** – A multi-year study to assess angling pressure and trends in wild trout reproduction will be designed and implemented with angler input and assistance on a statewide sample of 10–12 stream reaches;
- **Brown trout strain improvement** – The persistence of experimental half-wild brown trout in stocked reaches will be compared to that of domestic brown trout in a study planned for 2022 and 2023;
- **9″ yearling objective** – Production lots of brook, brown, and rainbow trout yearlings will be sampled at each hatchery prior to the first spring stocking to determine whether the trout meet the minimum size objective of 9 inches. The results will be used to inform adjustments to rearing strategies to better achieve the objective. The evaluation will be considered successfully completed when all facilities have met the 9″ minimum size objective for three consecutive years, but DEC will track yearling size at stocking on an annual basis;
- **12″ trout objective** – Annually report whether overall production of 12″ or longer trout was enough to stock all *Stocked* and *Stocked-Extended* stream reaches at 10% of the total number stocked. Annually report the percentage of *Stocked* and *Stocked-Extended* stream reaches which were stocked with 12″ or longer trout at 10% of the total number stocked;
- ***Stocked-Extended*** **Reaches** – Annually report the percentage of *Stocked-Extended* reaches stocked four times, consistent with the stocking strategy for this category. Assess abundance of wild and stocked trout and angler use within 10 years of the previous assessment to evaluate performance relative to category objectives;
- ***Wild-Premier*** **Reaches** – Assess wild trout abundance and population size structure according to the fisheries management plans developed for these reaches (at an interval of 10 years or less) to evaluate performance relative to category objectives;
- ***Wild-Quality*** **Reaches** – Assess wild trout abundance at an interval of 10 years or less;
- ***Stocked*** **Reaches** – Estimate angler use and check public access to verify that the criteria for stocking are met and to update reach boundaries and stocking calculations when significant change is observed; and
- ***Wild*** **Reaches** – Assessments limited to the evaluation of potential category changes on the basis of trout abundance. Specific problems or opportunities will be considered but reaches in this category will not be routinely surveyed.

Evaluation of Categorized Reaches and Category-Specific Strategies

Reach management category assignments will be reevaluated as biological surveys and fishing pressure estimates are conducted.

The initial management category assignments of stream reaches are subject to change as new biological surveys and fishing pressure estimates are conducted. Based on their level of confidence in the initial assignment, regional biologists ranked the priority for resurvey as LOW, MEDIUM, or HIGH to better focus survey efforts during the Plan implementation. The information gained will result in reassignment of some reaches. Additional reach reassignments are expected as an outcome of Plan strategies, particularly with respect to habitat enhancement.

When fully implemented, strategies will be evaluated against reach category management objectives described in this Plan. If category management objectives are not attained on a systematic basis for a given category, then the strategies for that category will be reassessed. In scheduling and conducting survey work on trout stream reaches, priority will be given to the reach categories that experience more intensive angler use. Trout population assessments on *Wild-Quality* and *Stocked-Extended* reaches will be conducted within 10 years of the last population assessment as a minimum requirement, and more frequently if needed to address reach specific information needs. For *Wild* and *Stocked* reaches, surveys will be conducted when required to investigate specific concerns or to evaluate opportunities to manage in a different category. The survey schedule for *Wild-Premier* reaches will be determined in the fisheries management plans required for these waters.

A listing of trout stream reach assignments will be updated annually and available via DEC's website.

Evaluation of the Catch-and-Release Season

DEC does not anticipate that the new catch-and-release season will have an adverse impact on wild trout populations. However, a 3-year study comprising a sample of at least 10 wild trout stream spawning reaches will be conducted to estimate fishing pressure during the formerly closed season and detect any negative trend in wild trout reproduction. While there are many factors that influence young-of-the-year recruitment, the study will consist of angler counts conducted during October and November and summer electrofishing surveys to monitor juvenile and adult trout abundance. DEC will solicit input and assistance from angler organizations to identify suitable study locations and conduct angler counts.

Reporting on Progress

Progress towards Plan objectives and a summary of reach evaluation outcomes will be reported annually in a concise "report card" format. In addition to reporting the quantitative metrics discussed in this section, the report card will include a quick visual representation of whether specific Plan objectives have been attained, partially attained, or no progress has been made. This report card will help DEC measure progress, provide a platform for adaptive management and most importantly, serve as an instrument for transparency and accountability.

A cumulative evaluation will be conducted every five years to document what we have learned and where adjustments to our approach are needed. The Plan will be revised every five years based on this evaluation.

Implementing the Plan[10]

The timeline below represents major actions that will be taken in the next five years to meet immediate implementation needs identified in this Plan. Many actions identified in the Plan will be repeated annually, given the continual nature of our management.

Continuing Actions

- Conducting biological and angler use surveys to evaluate stream reach characteristics relative to management category objectives;
- Updating the interactive trout stream map to reflect changes in management category, stocking, and public access;
- Identifying and prioritizing opportunities for stream habitat enhancement; and
- Issuing annual report cards.

Major Actions

2020

- Conduct resurveys of stream reaches ranked as HIGH priority for resurvey;
- begin rulemaking process to adopt trout stream regulations proposed in Plan;
- update 2021 stocking policies to reflect Plan adjustments;
- begin adjustments to fish culture operations needed to meet objectives for *Stocked* and *Stocked-Extended* reaches;
- develop interactive map of publicly accessible trout stream reaches identified by management category;
- develop new sign standard for management categories;

[10] Actions in this timeline will be evaluated in the context of the fiscal impacts of the COVID-19 pandemic.

2021

- implement new angling regulations to take effect April 1;
- put new stocking policies into effect;
- ensure interactive trout stream reach map is available online;
- fully replace Wytheville strain rainbow trout by Arlee strain rainbow trout in hatchery system;
- secure fluvial geomorphology expertise;
- complete resurveys of stream reaches ranked as HIGH priority for resurvey;
- finalize and implement plan to evaluate Catch-and-Release Season;
- finalize individual fisheries management plans for *Wild-Premier* reaches;

2022

- complete subplan for assessment and prioritization of stream reaches for habitat enhancement work, including an initial list of high-priority stream reaches;
- add last-date-stocked feature to interactive map of publicly accessible trout stream reaches;
- conduct surveys for Catch-and-Release Season evaluation;

2023

- complete brown trout strain evaluation;
- conduct surveys for Catch–and-Release Season evaluation;
- implement work on initial list of high-priority stream reaches for habitat enhancement;

2024

- complete transition to full production of new brown trout strain (assuming satisfactory evaluation results in 2023); and
- submit final report for Catch-and-Release Season evaluation.

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Appendix 1: Year-Round Trout Fishing: Risk Assessment and Considerations

The importance of successful natural reproduction to sustaining wild trout populations is self-evident and was the primary focus of the deliberations on the pros and cons of the proposed October 16–March 31 Catch-and-Release, artificial-lures-only Season. The Bureau of Fisheries recognizes that the expansion of fishing opportunities is only worthwhile if the quality of the fishery can be sustained.

The closed season is the strictest regulatory approach to avoid two specific fishery-dependent risks: mortality to potential spawners from hooking and handling, and the loss of eggs and pre-emergent fry from inadvertent disturbance of redds by wading anglers. However, in considering the extent to which the fishery can be enhanced by avoiding these risks, it is important to put them in perspective by recognizing that they compete with other causes of natural mortality that co-occur during the same period. These include adverse flow conditions, non-human predation, extreme cold, and the well-documented tendency of late spawning trout to destroy previously deposited eggs by digging new redds over existing redds. The importance of these fishery-independent factors to the population dynamics of stream-resident trout is well supported by the published literature (Carline 2006) (Lobon-Cervia 2009). On an annual basis, the natural mortality rate of wild brown trout averages 31% in good quality New York trout streams (Engstrom-Heg 1990). The critical management question then is whether the fishery-dependent risks associated with the proposed Catch–and-Release season are likely to result in long-term harm to the wild trout population that is evident amid the above described fishery-independent influences.

While experiments focused on this question are absent from the published literature, our risk assessment benefitted from long-term trout population monitoring data from inland trout streams managed without a closed season in Pennsylvania and in New York under special regulations. In a study of 23 headwater brook trout streams in Pennsylvania, population indices from 1990 to 2011 (based on electrofishing catch per 100 square meters) strongly suggest that brook trout populations are sustainable with a catch-and-release season (Detar, et al. 2014). The persistent high quality of the popular brown trout fishery of Spring Creek, Pennsylvania, managed under a year-round catch-and-release regulation since 1982, provides further evidence that fall and winter angling is not incompatible with quality trout fishing (Carline, Beard and Hollender 1991). Meanwhile, in New York, we have seen that resident wild brown and rainbow trout populations on inland trout streams where angling is permitted during the spawning season by special regulation have maintained their quality over the long term. Examples include McKinistry Creek (since 2004), Hosmer Brook (since 2004), and Clear Creek Ellington (since 2015). The wild trout population of the Cohocton River has thrived under a year-round season (with harvest permitted) since the late 1980s. These examples provide additional evidence that allowing angling during the current closed season will not be detrimental at the population level. Perhaps the most compelling evidence that allowing catch-and-release angling during spawning season will not negatively impact wild trout populations comes from a carefully controlled experiment designed to quantify any such effects on spawning Yellowstone cutthroat trout in Idaho (Roth, et al. 2019). The authors found no negative effect of angling and air exposure up to 60 seconds on short-term survival, long-term survival, or reproductive success.

The available evidence supports the conclusion that, under actual stream conditions, egg and fry mortality associated with wading anglers is too low to affect the trout population. Reduced fry production was demonstrated for redds exposed to simulated wading in a laboratory experiment

(Roberts and White 1992). However, detrimental effects were not observed in the cutthroat trout population of the Yellowstone River despite the exposure of spawning habitat to a popular wading fishery during the incubation period (Kelly 1993). It should also be acknowledged, that in New York, the current opening day of trout season does not protect incubating rainbow trout eggs and fry from wading anglers. Indeed, rainbow trout spawning activity may be ongoing on April 1. Given the lack of evidence that wading anglers are harming trout at the population level, outreach to help anglers identify and avoid redds is preferable to retaining the closed season as a means of further reducing accidental redd disturbance. While no effect on trout populations is anticipated, an increased appreciation and understanding of wild trout reproduction by anglers is a desirable outcome.

The sustainability of wild trout populations managed without the traditional closed season may seem counterintuitive given the obvious importance of successful natural reproduction. The low impact is probably a function of low cold-weather angling pressure combined with low handling stress associated with cold water temperatures (Mitro 2015). Under these circumstances and, given the powerful fishery-independent factors at work, it is not surprising that fishery-dependent impacts are not evident. While year-round angling will hold the greatest appeal for the most committed catch-and-release anglers, there will be circumstances that may tempt some anglers to exercise poor ethics. Similar temptations currently exist now to fish for thermally stressed trout during summer. Rather than impose broad summer-season closures at the expense of reduced fishing opportunities and angler judgement, DEC has emphasized outreach and education to mitigate potential for harm. A similar outreach and education strategy is warranted for the proposed Catch-and-Release Season. Despite the long tradition of a closed season on New York trout streams, there is ample evidence to suggest that the hardy subset of anglers motivated to pursue the sport over the winter on a catch-and-release basis can do so with the confidence that they are not harming the fishery.

Appendix 2: Summary of Assessment of Public Comment

A draft of the Fisheries Management Plan for Inland Trout Streams in New York State (Plan) was released for public review on May 26, 2020, with the comment period extending through June 25, 2020. Public comment was solicited through a variety of avenues, including:

- a posting of the statewide public comment period in the Environmental Notice Bulletin (ENB);
- a DEC news release distributed statewide;
- an announcement distributed to all email addresses provided by participants at the 2017 and 2019 public meetings on trout stream management described on page 11 of the Plan [353 recipients, 181 unique opens (58%)]; and
- an announcement distributed to all subscribers to the *DEC Delivers* Freshwater Fishing and Boating Group [138,122 recipients, 34,944 unique opens (26%)].

A total of 489 public comments were received through email or letters. Four hundred seventy-one of these comments conveyed specific concerns, recommendations or endorsements; the other 18 comments were general statements or pertained to issues outside the scope of the Plan. General themes to recurring comments were identified (22 total themes), and responses to these are included below. These themes only embrace recommendations or comments of concern. Comments that represent favorable and supportive views are not included in this assessment.

The full Assessment of Public Comments, including all received comments, is documented in Henson, *Assessment of Public Comments on Draft New York State Trout Stream Management Plan* 2020.

Theme #1

The statewide Catch-and-Release (artificial lures only) Season proposed to run from October 16 through March 31 poses a risk to the sustainability of wild trout populations and the quality of the fisheries they support that is either wholly unacceptable or of great concern, particularly in some areas of the state; notably Delaware/Catskill waters. The principle biological concerns were injuries and losses of spawning trout and losses of incubating eggs due to disturbance of redds (trout nests) by wading anglers. Some comments acknowledged that these potential impacts were miniscule in comparison to natural limitations such as flow conditions, natural predators, and redd disturbance by other spawning trout, but felt that the additional fishing opportunities provided by the proposal did not justify accepting any risk whatsoever.

In addition, concerns were expressed about the potential for increased trespassing, conflict between anglers and hunters, and inadequate law enforcement during this portion of year. Some comments asserted that the presence of large spawning trout in small streams would encourage angling practices contrary to the principle of fair chase. Several comments suggested that such practices would be further encouraged by the desire to post photographs on social media. Many comments reflected the view that the proposal was simply an unnecessary change to a long-accepted and satisfactory regulation. Finally, some comments stated that the closed season provided trout with a well-deserved seasonal respite from angling during which to complete their reproductive cycle.

Response

This concern was considered extensively during Plan development and again based on comments received during at one of the fall 2019 public meetings. An extensive review of the available published research and the experience of DEC (special regulations) and other jurisdictions was completed to assess the potential risk associated with proposal. This assessment is included in the "Appendix 1" of the Plan.

Negative impacts to reproductive success are not evident in resident or migratory populations of trout and salmon in New York that have long been managed under an open season by special regulation. This is consistent with research findings and management experience from other states, including Pennsylvania and Idaho. Cold ambient temperatures are a key protective influence in terms of the resiliency of trout to handling and limiting the extent of angler participation. It is noteworthy, however, that natural reproduction has increased over time in Great Lakes tributaries despite intense fishing pressure concurrent with spawning and egg incubation.

From a biological perspective, summertime thermal stresses on trout combined with high angling pressure have a higher potential to impact wild trout populations and individual trout that are sexually mature. Arguably, an analogously conservative response to unethical summertime anglers would be a statewide season closure in July and August.

In response to the public concern and opposition expressed, DEC will work with stakeholders to develop and implement a study to evaluate the Catch-and-Release Season to determine if it produces negative population-level impacts.

Theme #2

Angling regulation violations are a serious problem because they are detrimental to trout populations and/or detract from a positive angling experience. More law enforcement effort is needed.

Response

Because the Division of Fish and Wildlife (DFW) does not control the relative priorities or resources available to the Division of Law Enforcement (DLE), law enforcement efforts cannot be directly addressed in the Plan. However, DLE was consulted in the development of the regulations proposed in the Plan to confirm their clarity and practical enforceability. By reporting observed patterns of illegal behavior, anglers and DFW staff can help to maximize the impact of DLE efforts.

Theme #3

There were errors, omissions, or deficiencies in the information provided in "Appendix 2: Initial Stream Reach Category Assignments."

Response

Stream reach category assignments have been revised to correct several specific errors or omissions identified by reviewers and updated to include management category changes based on reassessment. Appendix 2 and 3 of the draft Plan are now part of a stand-alone document entitled *Categorization of New York State Trout Stream Reaches* (NYSDEC 2020). Going forward, this document will be updated to reflect changes in categorization that will take place over time.

With respect to the difficulty of identifying reach boundaries from numbered tributaries, this issue will be resolved by the interactive map proposed in the "Information and Outreach" section of the Plan. Angler-friendly boundary descriptions were developed wherever adjoining reaches fall under different regulations. For *Stocked* and *Stocked-Extended* reaches, the species stocked will be included in the map. Several errors or omissions with respect to specific waters have been corrected.

Theme #4

Stocking trout during the harvest season is pointless because they are rapidly fished out. Catch-and-release regulations or some period of harvest prohibition post-stocking should be imposed.

Response

This issue is addressed in the Plan under "Other Angling Regulations That Were Considered." Substantial losses of stocked trout from stocked reaches due to natural predators and outmigration are typical in New York State and elsewhere. Therefore, a harvest prohibition has very limited potential to extend the "shelf life" of a batch of stocked trout and comes at the cost of disadvantaging licensed anglers in favor of natural predators. Very short-term harvest prohibitions associated with specific stocking events minimize this cost but are impractical to coordinate and implement. Plan strategies aimed at this problem include more frequent stockings within *Stocked-Extended* reaches and strain improvement to produce trout that exhibit more natural dispersal behavior after stocking.

Theme #5

The daily trout possession limits proposed under this Plan are too liberal to effectively sustain wild trout populations or extend the fishing opportunities provided by stocked trout; more restrictive harvest regulations are needed.

Response

Creel surveys conducted over the decades in New York and elsewhere demonstrate that the harvest of a full possession limit as the outcome of a trout angler's trip is relatively uncommon. Meanwhile, the profound influence exerted by habitat constraints and natural predators on trout abundance tends to be underappreciated. As discussed under the "Wild Category" section in the Plan, evidence from brook trout studies in Pennsylvania and Vermont confirms the limited potential for restrictive harvest regulations to shape trout populations.

The daily possession limits proposed in this Plan are actually more restrictive than what currently exists. The proposed harvest limits are meant to spread the resource out more equitably amongst the angling public and restrain excessive harvest by harvest-oriented individuals when the combination of circumstance and skill create such an opportunity. In addition, the possession limits proposed in this Plan communicate the higher value of mature wild trout and stocked trout longer than 12 inches.

Theme #6

The reach-level management proposed in the Plan does not consider the role of tributary streams or the larger watershed; wild trout are not adequately protected because the Plan does not eliminate stocking in reaches with wild trout populations at low abundance or in reaches adjacent to robust wild trout populations.

Response

The criteria for the wild and stocked categories under the Plan preclude supplemental stocking over wild trout populations exceeding 40 pounds of trout/acre (or 300 yearling or older trout/mile). This is a dramatic shift from our current management, which is relatively blind to the difference between stocked trout and wild trout. The Plan allows for stocking to expand fishing opportunities in reaches with a lower abundance of wild trout if they are greater than 10 feet wide, have adequate public access, and at least 75 hours/acre of fishing pressure. Smaller streams with low fishing pressure that contain wild trout are not stocked. The Plan strives to balance the protection of wild trout with the ability to provide fishing opportunities that would not otherwise exist while providing anglers with a clear expectation of how a reach is managed. Finally, the Plan is adaptive such that reach classifications and boundaries may be adjusted in response to new information and management actions, such as habitat improvement.

Theme #7

The Plan should manage more trout stream reaches under permanent catch-and-release regulations that apply to the entire season.

Response

The benefits of catch-and-release regulations depend heavily on both the quality of the stream habitat and the impact of harvest rate relative to the mortality rates associated with other causes. Broadly imposing catch-and-release or other highly restrictive regulations that do not produce substantial improvements in the quality of the fishery runs the risk of discouraging many anglers and creating the perception that DEC is managing solely to accommodate the preferences of a subset of trout anglers. The practice would also result in a substantial waste of fish in reaches managed for stocked fish.

Theme #8

The Plan should broadly restrict tackle (single hook, barbless hooks, no live bait), particularly on reaches managed for wild trout.

Response

While advantages of certain types of terminal tackle are intuitive with respect to the survival of released trout, the published research on the benefits of tackle restrictions is ambiguous at best. Several studies have shown that outcomes depend less on the type of terminal tackle than on other aspects of angling technique or water temperature. As with other highly restrictive regulatory strategies, tackle restrictions run the risk of discouraging many anglers and creating the perception that DEC is managing solely to accommodate the preferences of a subset of trout anglers. Therefore, the Plan proposes to address the issue of appropriate tackle selection and ethical angling practices for catch-and-release fishing through outreach and education.

Theme #9

More effort should be made, with the assistance of partners, to distribute stocked trout beyond typical bridge pools.

Response

Some DEC stockings are already conducted in this fashion. While some published research suggests that the benefits of this strategy are limited, and the capacity of volunteers and DEC staff to effectively coordinate and implement this strategy is finite, DEC is open to working with partners to implement this approach where feasible.

Theme #10

Stock trout in the fall to provide additional fishing opportunities and to allow them more time to acclimate to the stream before exposure to harvest.

Response

Fall is a harsh season for freshly stocked trout to adapt to a stream. DEC has not found this strategy to be successful, and this finding is consistent with published research on the subject.

Theme #11

Private landowners are concerned that long-standing stocking permits for non-publicly accessible stream reaches will not be renewed under the Plan.

Response

The fish and wildlife resources in New York are property of the people of the state. Regional Fisheries Managers are responsible for protecting these resources and determining the risks any action may have on wild populations of fish. They will continue to have the discretion to issue or deny permits for stocking non-publicly accessible stream reaches and ensure that wild populations are not negatively impacted through the introduction of stocked fish.

Theme #12

The Plan does not adequately protect wild and native trout because too much discretion is given to manage for either wild or stocked trout in reaches that do not meet the trout abundance criteria for *Wild-Quality* classification.

Response

The wild trout abundance criteria in the Plan are designed to strike a balance between protecting wild trout populations and providing for the use of stocked trout in marginally productive stream reaches with high enough angling pressure to provide fishing opportunities that would not otherwise exist.

Theme #13

Watershed-level factors should exert a strong influence in the prioritization of habitat enhancement work.

Response

DEC is committed to focusing resources on projects with the best chance to achieve an enduring benefit. The importance of considerations beyond the immediate reach is recognized and DEC will prioritize projects that yield broader benefits while avoiding projects that are likely to be compromised by broader instabilities in the watershed. We hope to leverage work at the reach level to encourage conservation organizations and partners to help expand upon our efforts and repair entire systems.

Theme #14

The Plan must enhance the quantity and quality of outreach and education on the new approach to trout stream management, the value of wild trout, and a variety of important trout conservation topics. This concern includes promotion of angling ethics and familiarizing anglers with new regulations through multiple media, including streamside signage.

Response

Outreach is recognized as a vital component of this Plan. DEC is committed to improving the efficacy of its efforts and leveraging its impact through creative collaboration with partners. DEC is eager to communicate the value of wild trout and what they represent from an ecosystem perspective. We are hopeful that the labeling of waters as Wild will garner greater appreciation and protection of this resource, especially in the face of climate change.

Theme #15

The Plan should include strategies for the reduction or control of trout-eating predators, particularly Common Mergansers.

Response

The ability of the DEC to directly control migratory waterfowl is constrained by an international treaty. Moreover, fish-eating waterfowl hold very limited appeal for hunters. The Plan focuses on habitat improvement and improvement to hatchery strains to enhance predator avoidance.

Theme #16

The Plan must include additional detail on how progress towards its goals will be evaluated and how changes to the Plan would be considered and implemented.

Response

DEC will revise the document to address these concerns, and develop a report card that will be used to track progress.

Theme #17

The Plan should focus additional effort on mitigating the intra- and inter-agency hurdles that impede progress on habitat protection and habitat enhancement projects. Issues of concern pertain to: historic preservation, water use classifications, dam safety, and water quality, among others.

Response

This comment is largely outside the scope of this document. The Bureau of Fisheries has and will continue to collaborate with peers inside and outside of the agency to advance matters that are in the best interest of our fisheries resources.

Theme #18

The Delaware Tailwaters are unique and require their own fisheries management strategy.

Response

In collaboration with its partners, DEC is currently conducting an extensive fisheries investigation on the Delaware Tailwaters to inform a fisheries management Plan for this system. Based on the information currently available, we believe that the categorization of reaches associated with the Tailwaters is correctly applied. Fisheries management extends beyond season and harvest limit setting. The Tailwater Fisheries Management Plan will be comprehensive and include specific strategies such as habitat improvement and monitoring of the fishery.

Theme #19

The Plan should directly address reservoir release and flow management in the Delaware Tailwaters.

Response

The Plan was developed to focus resources under the control of the Bureau of Fisheries. The Bureau will continue to participate actively in the evaluation of flow management strategies as they relate to the welfare of the wild trout populations in the Delaware Tailwaters.

Theme #20

As a stocked tributary to the *Wild-Premier* Delaware Tailwaters, Oquaga Creek should receive a high priority for habitat enhancements to support management as a *Wild-Quality* reach. Management with stocked trout is undesirable in this system.

Response

DEC will work with the relevant partners to assess the improvements needed and the likelihood of a long-term successful outcome.

Theme #21

The Delaware River mainstem reach from Lordville downstream to Callicoon should be categorized as *Wild-Premier*.

Response

This reach lacks the ecological characteristics and temperature regime for a year-round trout fishery and does not meet the *Wild-Premier* criteria. However, DEC agrees with the comments asserting that, outside of the warmest summer months, fish from within Wild Premier sections of the tailwater system use this reach and that the same angling regulations should apply. With the concurrence of Pennsylvania Fish and Boat Commission, DEC will apply the same angling regulations as proposed for the *Wild-Premier* category for this border water, but it will not be categorized as such.

Theme #22

Esopus Creek should be managed without stocking as a *Wild-Quality* reach rather than *Stocked-Extended*, as proposed in the draft Plan.

Response

In response to the extensive comment on this reach, DEC reviewed the available data and changed the category to *Wild-Quality* as suggested. Follow-up evaluations will be conducted to monitor the impact on the fishery and wild trout population. The Plan is intended to be a dynamic document, with the expectation that the management categories of particular stream reaches will change in response to new information or successful management strategies.

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