



MANAGEMENT PLAN FOR LAKE ERIE STEELHEAD 2016 – 2025



Photo by: Tom Pritchard

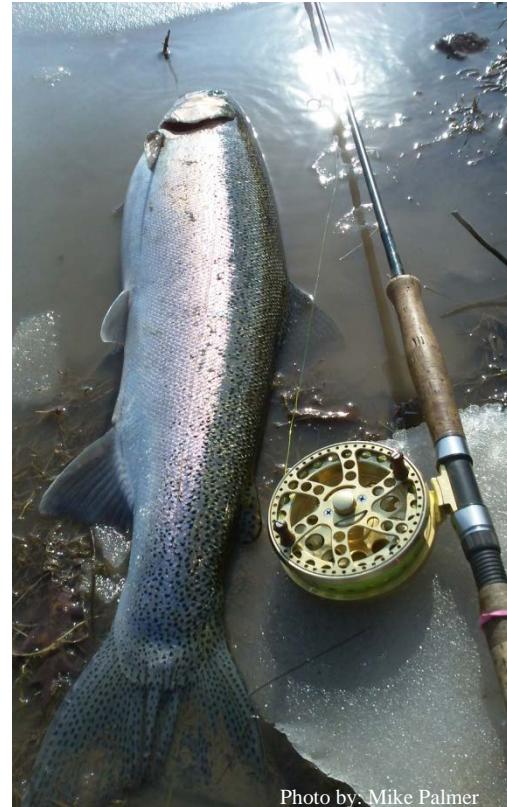


Photo by: Mike Palmer



Photo by: NYSDEC



Photo by: NYSDEC

MANAGEMENT PLAN FOR LAKE ERIE STEELHEAD 2016 – 2025



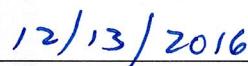
Edward Woltmann

Acting Chief, Bureau of Fisheries



Douglas Stang

Acting Director, Division of Fish and Wildlife



Date

MANAGEMENT PLAN FOR LAKE ERIE STEELHEAD

MISSION OF THE BUREAU OF FISHERIES

Conserve and enhance New York State's abundant and diverse populations of freshwater fishes while providing the public with quality recreational angling opportunities.

MANAGEMENT PLAN FOR LAKE ERIE STEELHEAD

TABLE OF CONTENTS

Acknowledgments	5
Executive Summary.....	6
Introduction.....	6
Background.....	7
Angling Regulations.....	9
Status of the Resource.....	9
Guiding Principles, Goal and Objectives.....	12
Management Strategies.....	13
Evaluation.....	19
Research Needs.....	21
Literature Cited.....	22
Appendix: Responses to Public Comments.....	25

ACKNOWLEDGMENTS

Prepared by:

Lake Erie Fisheries Research Unit and Region 9 Fisheries
Bureau of Fisheries
Division of Fish and Wildlife
New York State Department of Environmental Conservation

James Markham
Scott Cornett
Donald Einhouse
Mike Clancy
Michael Todd

New York State Department of Environmental Conservation

Basil Seggos, Commissioner, NYSDEC
Kathy Moser, Deputy Commissioner, Office of Natural Resources
Douglas Stang, Acting Director, Division of Fish and Wildlife
Edward Woltmann, Acting Chief, Bureau of Fisheries
Steve LaPan, Great Lakes Section Head, Bureau of Fisheries

The authors would like to thank Patricia Rixinger and Phil Hulbert, who both retired before this document was completed, for their edits, comments, and thoughtful advice that greatly improved this plan.



STUDIES REPORTED IN THIS
DOCUMENT ARE SUPPORTED BY
THE FEDERAL AID IN SPORT FISH RESTORATION PROGRAM
AND THE NEW YORK STATE CONSERVATION FUND

EXECUTIVE SUMMARY

Rainbow trout and/or steelhead have been stocked in Lake Erie since the late 1800s and are now considered a naturalized species. The population is sustained primarily through stocking and supports high-quality tributary fisheries that generate millions of dollars annually to local economies. In recent years the tributary fishery has declined compared to the mid-2000s period, but compared with other significant Great Lakes and West Coast steelhead fisheries, our current catch rates remain among the highest in the country. Information describing characteristics of New York's Lake Erie tributary steelhead fishery were limited until consistent angler surveys began in 2003/04. These ongoing surveys effectively characterize the fishery and provide insights into angler views on management topics. This information provided the foundation for development of this management plan for steelhead fisheries in New York's Lake Erie tributaries through 2025.

This steelhead plan outlines New York's goals, objectives, and management strategies for the Lake Erie tributary fishery while remaining consistent with broader fish community goals and objectives shared by all Lake Erie jurisdictions. New York's overall goal is to maintain a high quality fishery that provides diverse angling experiences and broad angler satisfaction. Six objectives are listed in the plan to accomplish this goal: 1) maintain average catch rates of 0.33 fish/hour, 2) foster production of wild steelhead in areas with suitable water quality and habitat, 3) increase stream access, 4) protect and enhance stream habitat, 5) maintain simple and effective regulations, and 6) promote responsible stewardship of the resource. Some of the prominent strategies to achieve these objectives include: developing more effective stocking strategies, simplify angling regulations, improve steelhead access to high quality spawning areas, protect and improve habitat, expand angler access, and increase public outreach. Various surveys will be employed to evaluate the progress towards achieving plan objectives, and knowledge gained from ongoing scientific investigations will guide future management strategies.

INTRODUCTION

Rainbow trout and/or steelhead (*Oncorhynchus mykiss* - referred to as steelhead hereafter) have long supported important sport fisheries in Lake Erie, especially in the tributaries of Ohio, Pennsylvania, and New York. Over 180,000 angler-hours were spent in New York tributaries alone during the 2011-12 steelhead season (Markham 2012). While the tributary fishery is substantial, New York's portion of Lake Erie supports an insignificant open lake steelhead fishery. Hence, this plan focuses on the larger tributary component. The tributary fishery has a large economic impact to the Western New York area; anglers pursuing tributary steelhead in 2007-08 spent an estimated \$3.2 million within the three local counties (Reinelt et al. 2013). Fishing quality over the past 15 years has been very good, with occasional exceptions. Because steelhead roam widely and become a shared resource throughout the lake, they are managed under the governance structure of the Great Lakes Fishery Commission's (GLFC) *Joint Strategic Plan for the Management of Great Lakes Fisheries (Joint Plan)*. New York State is signatory to

the *Joint Plan* and is responsible for participating in inter-agency management initiatives for highly valued and broadly shared Great Lakes fisheries resources. The GLFC's Lake Erie Committee (LEC) is comprised of representatives from Lake Erie's five fisheries management agencies (Ohio, Michigan, Ontario, New York, and Pennsylvania), and the LEC utilizes the consensus-based decision making process outlined in the *Joint Plan*, guided by the LEC's Lake Erie Fish Community Goals and Objectives (FCGOs) (Ryan et al. 2003). The FCGO lists nine guiding principles as being important for determining fish-community objectives for Lake Erie. Steelhead, although not native to Lake Erie, are considered a naturalized component of the fish community with objectives of providing sustainable harvests in the central and eastern basins. This management plan formalizes New York's goals and objectives for this fishery, identifies standard metrics to evaluate fishing quality, and specifies management strategies to maintain acceptable fishing quality while being responsive to the needs of the angling community.

BACKGROUND

Steelhead have been stocked in the Lake Erie system since the late 1800s, mainly to support recreational fisheries (Crawford 2001). Populations became established in the tributaries during the early decades of the 1900s (MacCrimmon 1977), and then declined in the 1940s and 1950s due to lack of stocking, sea lamprey (*Petromyzon marinus*) predation, and degradation of water quality (Berst and Wainio 1967; Kustich and Kustich 1999). Populations rebounded in the 1970s, mainly due to a renewed stocking effort that began in 1975 (Crawford 2001). By 1989, 1.1 million yearling steelhead were being stocked lakewide (Figure 1) (Coldwater Task Group 2012). While the 1990s brought significant ecosystem changes to Lake Erie primarily due to the invasion of the zebra mussel (*Dreissena polymorpha*), steelhead fisheries continued to thrive while Pacific salmon fisheries declined. Eventually Pacific salmon stocking was phased out and many stocking programs were redirected to steelhead. By the early 1990s, annual steelhead stocking had increased to over 1.7 million yearlings. Lakewide stocking levels of steelhead have since stabilized and range from 1.75 to 2.0 million yearlings annually.

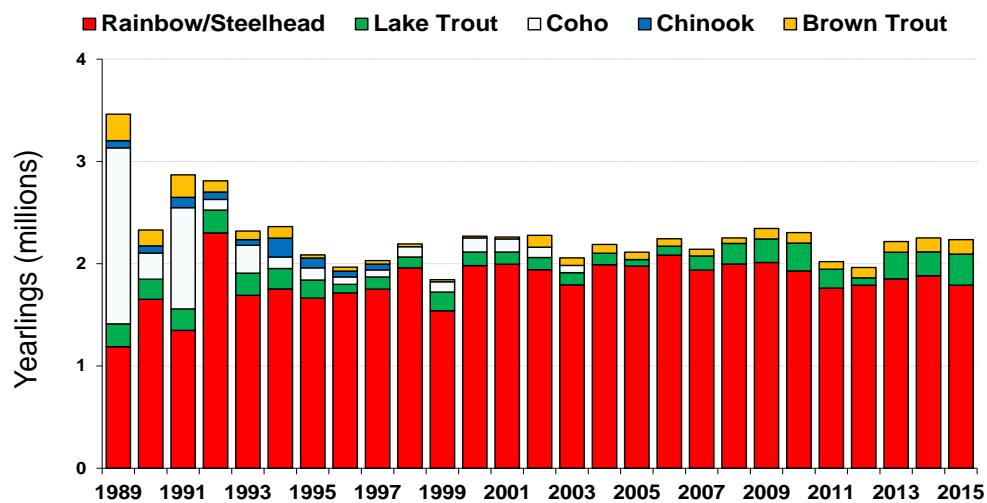


FIGURE 1. Annual salmonid stockings (millions of yearlings) in Lake Erie by all jurisdictions, 1989-2015. In the New York waters of Lake Erie, steelhead stocking was intermittent until the mid-1980s with the majority of the salmonid stocking directed at domestic rainbow trout and brown trout (*Salmo trutta*) along with Chinook (*Oncorhynchus tshawytscha*) and coho (*Oncorhynchus kisutch*) salmon (Figure 2). However, in 1985 steelhead stocking increased to 100,000 yearlings upon completion of the New York State Department of Environmental Conservation's (Department) Salmon River Fish Hatchery, and continued to increase to 214,000 fish by 1993 as Chinook and coho salmon stockings were phased out. The current stocking target is 255,000 Washington strain steelhead yearlings which are distributed to nine tributaries. Steelhead stocked in other jurisdictions, especially Pennsylvania, are known to contribute to New York's fisheries as well.

In addition to stocking, the steelhead population is augmented by natural reproduction in New York's tributaries (Einhause et al. 2007, Roth 2002). Studies of Cattaraugus Creek by Mikol (1976) and Goehle (1998) using scale analysis concluded that approximately 22% and 25%, respectively, of the spring spawning steelhead were naturally produced in that system. However, more recent investigations using otolith microchemistry indicate that only 5% of the steelhead runs in both Cattaraugus Creek and Chautauqua Creek are naturally produced (Dr. Jeffrey Miner, Bowling Green State University, unpublished data). Although these studies found modest contributions of naturally produced fish in some of Lake Erie's highest quality tributaries, it is important to note naturally produced steelhead do not comprise a significant portion of the overall lake wide population.

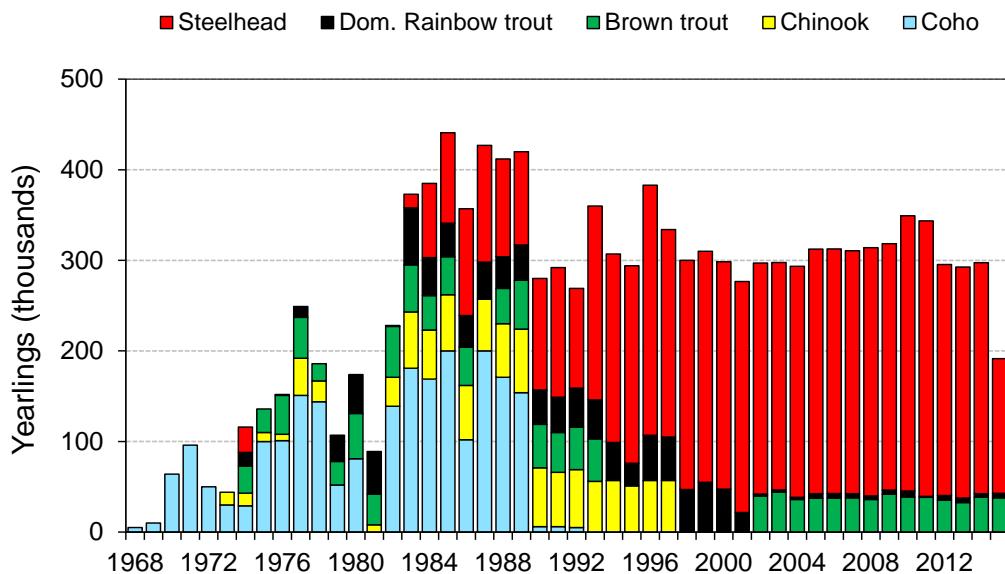


FIGURE 2. Annual salmonid stockings (thousands of yearlings) in the New York waters of Lake Erie, 1968-2015.

ANGLING REGULATIONS

Current steelhead angling regulations for Lake Erie tributaries in 2016 are as follows:

- Daily limit – 3 in any combination of brown or rainbow trout/steelhead or salmon species
- Minimum length – 12 inches
- Multiple hook points are permitted, including on tandem flies
- Year-round catch & release, artificial lure only fishing sections
 - Eighteen Mile Creek Main Branch (1.7 miles)
 - Chautauqua Creek (1.3 miles)
- Additional seasonal regulations (September 1 to March 31) address fishing hours, hook, leader and weight restrictions

STATUS OF THE RESOURCE

Direct assessments of Lake Erie's adult steelhead population have not been possible as this species is not typically encountered in any of the Department's open lake monitoring programs (such as gill net and trawl surveys). Instead, we rely on fishery-dependent measures such as an annual angler diary program, and more recently a periodic (every 3rd year), comprehensive tributary angler survey to provide information about the sport fishery and the status of the steelhead population. In the future, a weir may be installed on Cattaraugus Creek at the Springville Dam as an element of a fish passage project that may provide an opportunity for direct assessment of the adult population. Juvenile trout surveys have also been conducted to provide an understanding of the extent of natural reproduction in New York's Lake Erie tributaries.

Assessment of the Fishery

The Lake Erie Salmonid Angler Diary Program began in 1983 to acquire data to describe the open water and tributary salmonid fishery. The diary program has provided an efficient long term and low cost means of monitoring some general characteristics of the salmonid fishery such as angling preferences, length frequency of the catch, catch-and-release practices, and performance of various species and stockings. The program also serves an outreach function, connecting anglers to resource managers. However, due to inherent biases of angler diary programs representing only a relatively small and select group of anglers, the program is unable to objectively assess trends in overall fishing effort and fishing quality experienced by the broader angling population - information that is needed for effective fisheries management.

To better inform fisheries management decisions, a comprehensive direct contact tributary angler survey began in 2003-04 to obtain estimates of effort, catch and harvest, and information on

angler demographics and angler opinions on management issues. Angler surveys have been conducted from fall through spring in 2003/04, 2004/05, 2007/08, 2011/12 and 2014/15 in New York's stocked tributaries (Markham 2006; Markham 2008; Markham 2012; Markham 2015). Prior to these re-occurring surveys, the only previous survey was a benchmark comprehensive Great Lakes angler survey conducted in 1984 (NYS DEC 1989). The 1984 survey found spring tributary effort was mainly directed at steelhead while fall fishing targeted a variety of salmonid species. Recent angler surveys revealed this tributary fishery has essentially become solely dominated by steelhead angling from fall through spring. Angler catch rates from surveys conducted between 2003/04 and 2007/08 remained consistent around 0.60 fish/hour, but declined 42% in the 2011/12 survey to 0.34 fish/hour (Figure 3). Total catch declined 47% over this same time period. Catch rates similar to 2011/12 were also observed in the most recent, 2014/2015 survey. This decline was not unique to New York's portion of Lake Erie as Ohio and Pennsylvania biologists also reported similar declines in tributary steelhead fishing quality during this period. The reasons for the recent decline in steelhead fishing quality remain unclear, but biologists speculate it may be related to predation on juveniles from a large walleye population, predation on adult steelhead from an increasing sea lamprey population, or perhaps a combination of these and other unknown factors.

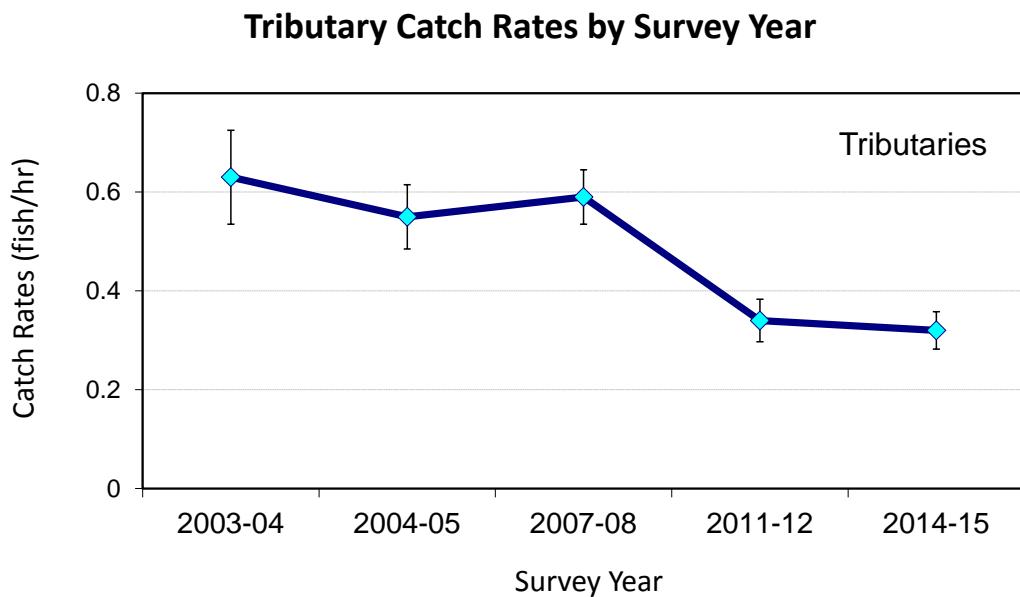


FIGURE 3. Targeted catch rates (fish/hr) of steelhead from New York's Lake Erie tributaries estimated from angler surveys in 2003/04, 2004/05, 2007/08, 2011/12, and 2014/15. Error bars are 2 standard errors of the catch rate.

Assessment of Natural Reproduction

Juvenile steelhead surveys have been conducted since 1995 to assess natural reproduction in some of the higher quality tributaries. Initial surveys began on Spooner Creek, the uppermost tributary of Cattaraugus Creek downstream of the impassable dam in Springville (Culligan et al.

1996). Surveys on Spooner Creek continued each fall through 2001 with population estimates ranging between 3,918 age-0 (young-of-the-year or YOY) steelhead in 1999 to 14,853 YOY in 2001. Sampling also documented natural reproduction in other Cattaraugus Creek tributaries such as Derby Brook, Coon Brook, Clear Creek, North Branch Clear Creek, and Connoisarauley Creek, although to a lesser degree than Spooner Creek (Culligan et al. 1999).

A comprehensive, multi-year electrofishing survey of Lake Erie tributaries for steelhead reproduction potential began in fall 2002 which included all streams suspected to support adult steelhead spawning runs. By 2006, an additional 30 Lake Erie tributaries were evaluated, bringing the total number of streams inventoried to 38 (Markham 2007). While the majority of the streams sampled were judged to have a low potential for producing wild steelhead, thirteen streams did show a higher potential. Five streams (Spooner Creek, Chautauqua Creek, Derby Brook, Little Chautauqua Creek, North Branch Clear Creek) were judged to have a high potential for producing wild fish while three other streams (Clear Creek, Connoisarauley Creek, Coon Brook) had moderate potential. Despite the findings that there is varying potential for natural reproduction in many tributaries, together it is not thought to be sufficient for sustaining viable tributary steelhead fisheries without supplemental annual stocking.

GUIDING PRINCIPLES

This plan embraces the following principles as a foundation for steelhead management in New York's Lake Erie tributaries that are consistent with the *Joint Plan* and Lake Erie's fish community goals and objectives. Management efforts will:

- remain consistent with broader fisheries management efforts by DEC and member agencies of the Lake Erie Committee (LEC)
- be science based, recognizing biological limits of the ecosystem, the fishery, and agency resources
- be responsive to the needs of the angling community

GOAL

The goal for the Lake Erie tributary steelhead fishery is to maintain a high quality fishery that provides diverse angling experiences and broad angler satisfaction.

OBJECTIVES

To achieve this goal, six primary objectives are identified:

1. Maintain average steelhead catch rates at or above 0.33 fish/hour (equal to 1 fish every 3 fishing hours) as measured in Lake Erie tributary angler surveys.
2. Maintain, and increase where practical, wild steelhead production.
3. Maintain existing access, add five angler parking areas, and increase Public Fishing Rights (PFR) easements by at least 0.5 miles by 2025.
4. Protect existing habitat and support five habitat projects that improve quality trout habitat in the Lake Erie tributaries by 2025.
5. Maintain regulations that are science based, easily understandable, and enforceable.
6. Promote responsible stewardship of the resource through public outreach.

MANAGEMENT STRATEGIES

OBJECTIVE 1: Maintain average steelhead catch rates at or above 0.33 fish/hour (equal to 1 fish every 3 fishing hours) as measured in Lake Erie tributary angler surveys

Catch rates in tributary angler surveys during 2003/04, 2004/05, and 2007/08 were at levels (0.60 fish/hr) far exceeding our objective but declined in surveys conducted in 2011/12 and 2014/15 to near objective levels. As previously discussed, reasons for this decline are unclear, but stocking numbers and strategies have remained generally stable throughout this period. While we realize that the catch rates experienced in the mid-2000's were achieved for a period of time, we also believe that those high rates were well above what might be considered as a long term, sustainable target for a fishery of this nature. Compared with other significant Great Lakes and West Coast tributary steelhead fisheries, the most recent measures of steelhead catch rates in Lake Erie tributaries (0.32 fish/hr) remain among the highest measured in the entire country. Ongoing research is exploring whether changes in New York's stocking strategies may improve post-stocking survival and returns of adult steelhead, and this knowledge will be used to guide future stocking efforts. The following strategies will be employed to fulfill the steelhead catch rate objective.

Strategy 1.1. Maintain current stocking targets in individual tributaries

The current annual stocking policy for Lake Erie tributaries is 255,000 yearling steelhead (Table 1). Our recommendation is to maintain the current stocking targets in each tributary until new information becomes available indicating the need for change. We also recognize that many other factors can potentially influence catch rates independent of New York's stocking levels; examples include steelhead mortality due to varying sea lamprey abundance, variability in post-stocking survival, and changes to stocking strategies or post-stocking survival in other Lake Erie jurisdictions.

Steelhead stocking targets for individual streams were originally determined with consideration of stream size and availability of public access. Only a few changes to these long standing targets have occurred in recent years (i.e. moving 10,000 yearlings from Chautauqua Creek to Cazenovia Creek; moving 10,000 Dunkirk Harbor pen-reared fish to Silver and Walnut Creeks (5,000 each)). More recently the decision was made to halt stocking Cazenovia Creek due to poor performance, and instead redirect the former Cazenovia Creek allocation (10,000 yearlings) equally between Buffalo Creek and Chautauqua Creek. Tributary angler surveys have shown that angler success varies both between streams within the same year and between years on a single stream, most likely due to fluctuating environmental factors including stream flow and temperature. Historic angler survey data also suggest that current stocking targets in all monitored tributaries are capable of achieving catch rates that meet or exceed this Plan's catch rate objective. As such, we recommend maintaining the current allocation of steelhead among individual streams until new evidence emerges to prompt a modification of this strategy. Future consideration of other streams for steelhead stocking will continue to be founded upon our

original considerations of stream size, availability of public access, and hatchery production capacity.

TABLE 1. Steelhead stocking targets in the New York waters of Lake Erie.

<u>Tributary</u>	<u>Stocking Target</u>
Chautauqua Creek	45,000
Canadaway Creek	20,000
Walnut Creek	10,000
Silver Creek	10,000
Cattaraugus Creek	90,000
Eighteen Mile Creek	40,000
Cayuga Creek	15,000
Buffalo Creek	15,000
<u>Buffalo River net pens</u>	<u>10,000</u>
TOTAL	255,000

Strategy 1.2. Determine and implement a realistic stocking size target and stocking strategy to maximize adult returns

New York's Lake Erie long standing tributary stocking strategy has been to stock steelhead as far upstream in the watershed as practical. This stocking strategy is based on the theory that survival of small, juvenile steelhead (average stocking size = 4.5-5.0 inches) is better in upstream areas, and upstream stocking allows fish additional time to grow prior to smolting. Smolting is a physiological process whereby migratory trout and salmon imprint on the tributaries they inhabit, leave to migrate downstream to the ocean (or in this instance Lake Erie), then return to spawn in their "natal" tributary (McCormick et al. 1998). Smolting is related to fish size, and various studies (Wallis 1968; Chrisp and Bjornn 1978; Bjornn et al. 1978; Bjornn et al. 1979; Seelbach 1987) indicate that steelhead should average a minimum of 6.3 inches at stocking to maximize post-stocking survival. Ideally, steelhead should be stocked as smolts that are physiologically ready to imprint and then migrate quickly from the river (Wagner 1968). Stocking steelhead downstream near the mouths of Lake Ontario tributaries has been effective, however, fish habitat and predators in the Lake Ontario system may differ. Ongoing research to assess different stocking strategies (stocked high upstream or downstream near mouth) and stocking size (small vs large) will determine which stocking strategy produces the highest returns of adult steelhead. These findings will be used to develop a recommendation for the optimal stocking location and a recommended stocking size, attainment of which will be subject to hatchery limitations.

Strategy 1.3. Pursue a sustainable, science-based harvest strategy

The current angling regulations for trout and salmon in Lake Erie and its tributaries are a daily limit of three fish/day (any salmonids in combination) with a minimum length limit of 12 inches and no closed season. These regulations have remained static while the fishery has mostly

flourished and expanded through the last 30+years, and while anglers can potentially harvest 3 steelhead/day, creel survey results consistently indicate angler release rates exceeding 85%. However, a reduced steelhead creel limit and/or increased size limit could be implemented in the future if angler catch rates are consistently below the objective.

OBJECTIVE 2. Maintain, and increase where practical, wild steelhead production

Although it is difficult to distinguish between stocked and wild steelhead as adults, having the opportunity to catch wild steelhead is important to many Lake Erie tributary steelhead anglers. During the 2003-04 tributary angler survey, 68% of anglers interviewed indicated that catching wild steelhead was important to their fishing experience; less than 17% felt it was unimportant (Markham 2006). We surmise that catching a wild steelhead is indicative of desirable conditions which include excellent water quality, ideal stream habitat, and healthy trout populations - general qualities that also reflect a healthy ecosystem, and that wild fish are more highly valued than stocked fish. However, exclusively managing for wild populations on a lake wide scale is inconsistent with achieving the catch rate goal given the limited availability of quality spawning and juvenile habitat. Moreover, projected long term increases in water temperature and frequency of severe storms as a result of climate change may have negative impacts on natural reproduction in the future. Therefore, a robust stocking effort remains essential for maintaining our overall tributary steelhead fishery while continuing to foster natural reproduction where possible and practical. The following strategies will be employed to maintain a wild steelhead component in this fishery.

Strategy 2.1. Improve fish access to high quality spawning areas

The most direct method to increase wild steelhead production is to create access to high quality spawning and juvenile habitat. However, removal of dams or other barriers must take into consideration and balance issues such as impacts to upstream fish communities and fisheries, increasing access to invasive species (especially sea lamprey), evaluation of available habitat, and availability of public access. Dam removals are usually protracted, costly endeavors with many accompanying issues such as dam ownership, changes to stream hydraulics, and sediment management (see Council of Lake Committees position statement: http://www.glfco.org/boardcomm/cglfa/CGLFA_dams_barriers_decision_support_protocol_FEB2013.pdf).

Some fish passage initiatives have already been completed or are currently underway. A fish passage project (a notch on a lower dam and a rock ramp on an adjacent upper dam) was completed in July 2012 on Chautauqua Creek through the Great Lakes Fishery and Ecosystem Restoration (GLFER) program. Although this project suffered significant damage during Superstorm Sandy, necessary repairs and improvements to this project have now been completed through an effort led by the Chautauqua County Soil and Water Conservation District and funded through the Great Lakes Basin Fish Habitat Partnership. Another fish passage project is being investigated at the Springville Dam on Cattaraugus Creek through the GLFER program. Fish passage on Cattaraugus Creek has the potential to significantly increase wild production of

steelhead due to an abundance of high quality spawning and rearing habitat above this dam. Some other potential fish passage projects include Silver Creek, Buffalo Creek, and Thatcher Brook.

Strategy 2.2. Explore whether special fishing regulations can foster natural reproduction

Where appropriate, special fishing regulation zones can limit harvest in some areas particularly suitable for wild steelhead production. Seasonal closures (Jan-1 to March-31) were established on two small headwater tributaries (Spooner Creek and N. Branch Clear Creek) because of their value as steelhead spawning and nursery streams, and an accompanying perception that removal of spawning-phase steelhead in these streams would negatively affect wild steelhead production. These two streams are New York's only Great Lakes tributaries with seasonal closures addressing the objective of benefitting wild steelhead production. In addition, current special fishing areas on Lake Erie tributaries, such as the "Catch and Release – Artificials Only" area on Chautauqua Creek, were developed with these objectives, as well as to provide a unique fishing experience desired by some anglers.

In principle, limiting harvest of spawning-phase steelhead in selected areas particularly suitable for natural reproduction is consistent with the objective of increasing wild steelhead production. However, whether these seasonal closures and catch-and-release regulations produced the intended benefits has never been evaluated. Wild steelhead production is usually more limited by the availability of suitable spawning and rearing habitat than by insufficient numbers of adult steelhead. In this regard, all candidate special fishing regulation areas will be assessed to determine their potential for achieving desired objectives. Examination of tributary angler survey results, surveys of wild steelhead production, and available scientific literature should provide an effective, science-based evaluation of the effectiveness of these special regulations.

OBJECTIVE 3. Maintain existing access, add an additional five angler parking areas, and increase Public Fishing Rights (PFR) easements by at least 0.5 miles by 2025.

A major impediment to Lake Erie steelhead fisheries is limited angler access. Many privately owned areas once available for fishing are now posted. In a few instances, landowners are charging fees for access to their properties. Due to a number of factors, including increasing land values, leases to guides, and poor angler/landowner interactions, DEC has only acquired five new parking areas and 0.5 miles of PFR on Lake Erie tributaries over the last ten years, and this situation is unlikely to improve in the near future. Our objective is to obtain at least the same number of parking areas and additional stream access over the next decade. While it remains worthwhile to continue to search for and obtain PFR on our larger stocked streams when opportunities arise, there may be unexplored opportunities to acquire access on other smaller, non-stocked Lake Erie tributaries that support healthy steelhead runs and have the potential to provide additional angling opportunities. Some possible candidate streams include Delaware Creek, Big Sister Creek, and Smokes Creek.

OBJECTIVE 4. Protect existing habitat and support five habitat projects that improve quality trout habitat in the Lake Erie tributaries by 2025.

Protecting and improving the existing habitat is essential for the future of the fishery. Poor water quality due to increased temperatures, excessive siltation, or lack of in-stream habitat results in reduced survival of stocked fish, lower adult returns, and limited natural reproduction. The possibility of increased water temperatures and frequency of strong storms and runoff events due to climate change will make habitat improvement projects, such as bank and stream stabilization, increasingly important. Over the past decade there have been at least five completed projects that improved or maintained the existing stream habitats in Lake Erie tributaries, and our objective is to complete at least this same number of new projects over the next decade.

Strategy 4.1. Increase habitat for age-1 and older steelhead

Both stocked and naturally produced steelhead would benefit from habitat improvement projects in many of New York's Lake Erie tributaries. Studies by the Lake Erie Unit have found good production of age-0 wild steelhead in many tributaries, but fewer numbers of wild age-1 fish. These results are consistent with other studies (Seelbach 1993; Mitro and Zale 2002; Mitro et al. 2003; Roth 2002) that found that over-winter stream discharge and lack of habitat reduced the number of age-0 steelhead that remained in the stream to age-1. Other studies by Stauffer (1972), Kwain (1983), and Roth (2002) found that large numbers of wild steelhead in the Great Lakes emigrate as age-1 pre-smolts, presumably due to limitations in the quantity of available suitable habitat. Based on this knowledge of important factors limiting juvenile survival and emigration behavior, we recommend that future stream projects incorporate features that increase habitat for age-1 and older steelhead. Potential habitat improvements include riparian tree and shrub plantings, bank stabilization, in-stream improvements such as the creation of pools or lunkers, and the addition of woody debris and large rocks. These types of habitat improvements provide shade and improved water temperatures, increase habitat diversity, and decrease turbidity, thereby increasing available steelhead spawning, rearing, and holding habitat for age-1 and older juvenile steelhead. A few habitat improvement projects have already been implemented, including bank stabilization and stream channel improvement projects on Chautauqua and Canadaway Creeks, and riparian plantings for bank stabilization and shading on Spooner Creek. Some additional candidate streams for similar habitat improvement work could include Clear Creek, Connoisarauley Creek, Coon Brook, and Derby Brook.

Strategy 4.2. Protect current stream habitat through DEC Protection of Waters Program (Article 15 Environmental Conservation Law)

In addition to improving existing habitat in Lake Erie tributaries, it is critical that existing high quality habitat be protected. Many tributaries containing runs of steelhead currently require permits under Article 15 of NYS Environmental Conservation Law for projects potentially disturbing stream beds and banks. Projects requiring Article 15 permits will be issued only when the plans will not result in a decrease of available spawning, rearing and adult trout habitat in the

stream. Biologists and permit analysts will work with applicants to modify application plans to improve habitat conditions for trout in the proposed projects. Conditions in issued permits will include in-water work restriction dates during spawning and rearing periods for trout.

A number of Lake Erie tributary streams are not currently classified as trout spawning waters under the DEC Division of Water's water quality classification system, thus these streams are not protected under Article 15. Water quality classifications for these waters should be upgraded at the earliest possible opportunity.

OBJECTIVE 5. Maintain regulations that are science based, easily understandable, and enforceable.

Simple and consistent regulations allow anglers to enjoy the fishery with a clear understanding of the rules as they employ their favored angling technique (fly fishing, artificial lures, bait, etc.). We assert that complex and confusing regulations discourage participation by some ethical anglers who become wary of breaking a rule they may not fully understand. Complicated regulations can also be problematic for effective enforcement. Although efforts have been made in recent years to simplify Lake Erie tributary regulations, we will continue to explore opportunities to improve regulations to provide clear guidance, maintain/enhance legitimate angling opportunities, and address enforcement issues.

OBJECTIVE 6. Promote responsible stewardship of the resource through public outreach.

Landowners are understandably sensitive to irresponsible actions by anglers such as leaving behind trash, exhibiting unethical or illegal fishing techniques, gutting fish in or near the stream, walking through yards, etc. Eventually some landowners decide that prohibiting access to the stream is the best option to solve these issues. In order to maintain or expand public access to the tributaries, it will be important to continually promote respectful use of private property, adherence to angling regulations, and proper stewardship of fishery and stream resources. Promotion of these ideas is best accomplished through public outreach.

Strategy 6.1. Increase use and improve access to existing outreach information

A variety of public information on the Lake Erie tributary steelhead fishery has been developed over the past decade and is now available on the DEC website (www.dec.ny.gov). This information includes maps (public fishing rights or public fishing access) of the four major Lake Erie tributaries (Cattaraugus, Eighteenmile, Canadaway, Chautauqua Creeks) and fishing hotlines that are updated weekly. DEC also recently revised its "Guide to Great Lakes Fishing" brochure with up-to-date information on fishing destinations, and links to additional resources (http://www.dec.ny.gov/docs/fish_marine_pdf/glfishing.pdf). In addition, New York's fishing regulations guide is also posted on the website and is available as a web-based application for smart phones. Anglers increasingly access these resources as evidenced by tracking use of weekly hotlines (Todd 2016) and visits to fishing maps on the DEC website.

The recent advances in technology and information sharing affords us an opportunity to improve public education on the resource and its associated issues. This may be accomplished through added language in brochures and fishing maps, an educational handout that can be distributed to anglers during tributary angler surveys or at kiosks, through verbiage added to the weekly fishing hotline, and through messages on Facebook and Twitter.

Strategy 6.2. Install kiosks at major fishing access sites

Kiosks are frequently used at inland stream parking areas and other state facilities such as state forests and parks, but have not been utilized at our Lake Erie tributary access sites. They provide an additional avenue to directly deliver information to anglers such as stream maps, educational material on responsible fishing ethics and stewardship of the resources, and fishing regulations. While it is not practical to place information kiosks at every steelhead access area, there are some popular access spots identified through the tributary angler survey that can be initially targeted.

Strategy 6.3. Support local stream revitalization events

Some angler groups devote considerable energy toward stewardship of trout streams, mainly in the form of stream habitat improvement projects. However, additional projects occur that include maintaining aesthetics of the stream, and these projects not only provide environmental protection but also help prevent loss of access from posting. An example of an ongoing effort is an angler-sponsored annual clean-up program on Canadaway Creek. This event, which started in 2006, enlists volunteers to collect trash, plants trees and shrubs to protect stream habitat, and remove invasive species in order to nurture and protect this local stream. Such programs are currently rare on Lake Erie tributaries but vital in maintaining angler access to our steelhead streams and should be supported and expanded as opportunities arise. Encouraging local fish and sporting clubs to start an “Adopt a Stream” program may be one way to get more community involvement in their local streams while improving aesthetics, landowner relationships, and stewardship of the resource.

EVALUATION

Evaluation of progress toward achieving plan objectives will be accomplished through a variety of programs and surveys.

- **The Angler Diary Program** (Objective 1) provides a long-term view of fishery performance, including diary angler catch rates in both the tributaries and open waters of Lake Erie. However, perhaps the most valuable information this program provides is a length-frequency distribution from angler catches. These data are required for anglers participating in the program and currently not available through any other survey. Diary anglers typically catch and record information from over 900 steelhead annually, and these data provide insights into steelhead recruitment and longevity. This survey addresses

Objective 1 through evaluation of the trends of the fishery and size distribution of the population. We recommend this long standing program continue and maintain at least 35 active tributary participants.

- **Tributary and Harbor Angler Surveys** (Objectives 1, 3, 5) began in the 2003-04 fishing season and have proved invaluable for providing statistically rigorous estimates of fishing effort, catch and harvest rates, and overall catch and harvest for each of the stocked tributaries and the overall tributary fishery. In addition, the survey has provided an improved understanding of angler demographics and opinions on management issues and proposed regulations. This survey provides the direct measure of catch rates utilized in Objective 1 and will determine if the management strategies are achieving the desired goal of the objective. This survey also utilizes the main points of access for the steelhead fishery and provides an ongoing count of prominent access sites for evaluation of Objective 3. Additionally, this survey collects angler opinion data which will be used to determine prevailing fishing regulations remain easily understandable (Objective 5). We recommend that this survey be conducted every third year.
- **Wild Steelhead Production Surveys** (Objective 2) have identified streams and habitats with measurable production of wild steelhead. In some locations, such as Chautauqua Creek, these surveys also assess the success of an upstream fish passage management action. We recommend that these surveys continue as needed to evaluate the success of management actions fostering production of wild steelhead addressed in Objective 2.
- **Post-Stocking Steelhead Surveys** (Objective 1) have improved our understanding of stocked steelhead emigration patterns and sources of post-stocking mortality. In spring 2013 the Lake Erie Fisheries Research Unit performed a pilot study to examine various aspects of post-stocking emigration and whether predation by predator fishes is a significant source of mortality. The results of that pilot study lead to a more comprehensive investigation to reveal whether alternative stocking strategies might maximize survival of stocked steelhead and ultimately adult returns. Adult returns will be evaluated in tributary angler surveys and address Objective 1.
- **Trap and Sort Assessments** (Objectives 1, 2) at fish passage weirs, while currently not available, would provide an opportunity to obtain important information on the status of the adult population including migration patterns, age and size structure, growth, condition, mortality, and sea lamprey wounding rates. Such an assessment could provide an opportunity to evaluate emigration and population characteristics of wild and stocked juvenile steelhead. A trap and sort weir is in the project design for the proposed Springville Dam fish passage project on Cattaraugus Creek.
- **Adult Spawning Surveys** (Objective 1) would provide an annual sample to assess age and size distribution, growth, condition, and sea lamprey wounding. Adult surveys also provide a means to gather a sample of fish to evaluate tagging efforts. These surveys should be

conducted in a standard fashion throughout the fall and spring and in representative streams in order to characterize the adult steelhead population.

RESEARCH NEEDS

We recommend research through 2025 be pursued as lake wide in scale and focus on the following research questions to inform Lake Erie steelhead management efforts:

- What is the contribution of wild steelhead to the overall Lake Erie adult population and to specific tributaries (Objective 2)?
- What is the contribution to the overall Lake Erie adult population by steelhead stocking programs of each Lake Erie jurisdiction and to specific tributaries (Objective 1)?
- What are the relative survival rates experienced by the different stocked steelhead strains in Lake Erie (Objective 1)?
- Do sea lamprey wounding rates differ by steelhead strain (Objective 1)?
- What are the maturity schedules, growth trajectories, and longevity of the different steelhead strains stocked in Lake Erie (Objective 1)?
- What are the thermal regimes and associated in-stream and riparian habitat characteristics of Lake Erie tributaries (Objective 4)?
- Which Lake Erie tributaries would benefit most from habitat improvements aimed at restoring or expanding trout habitat (Objectives 2, 4)?

LITERATURE CITED

- Berst, A.H., and A.A. Wainio. 1967. Lamprey parasitism of rainbow trout in southern Georgian Bay. *Journal of the Fisheries Research Board of Canada* 24:2539-2548.
- Bjornn, T.C., J. King, and J. Lukens. 1979. Evaluation of pilot rearing program for Steelhead trout at Hagarman and Dworshak national fish hatcheries. Completion report to the U.S. Army Corps of Engineers, North Pacific Division, Portland, Oregon.
- Bjornn, T.C., R.R. Ringe, and P. Hiebert. 1978. Seaward migration of Dworshak Hatchery Steelhead trout in 1976. University of Idaho, Idaho Cooperative Fisheries Research Unit, Technical Report 6, Moscow.
- Chrisp, E.Y. and T.C. Bjornn. 1978. Parr-smolt transformation and seaward migration of wild and hatchery Steelhead trout in Idaho. University of Idaho, Idaho Cooperative Fisheries Research Unit, Federal Project F-49-12, Final Report, Moscow.
- Council of Lake Committees. 2013. Decision support for barrier/dam modification and removal: Great Lakes basin protocol for information sharing, review and input. Great Lakes Fishery Commission, Ann Arbor, Michigan, USA. Online at: http://www.glfcc.org/boardcomm/cglfa/CGLFA_dams_barriers_decision_support_protocol_FEB2013.pdf
- Coldwater Task Group. 2012. Report of the Lake Erie Coldwater Task Group, March 2012. Presented to the Standing Technical Committee, Lake Erie Committee of the Great Lakes Fishery Commission, Ann Arbor, Michigan, USA.
- Crawford, S.S. 2001. Salmonine introductions to the Laurentian Great Lakes: an historical review and evaluation of ecological effects. *Can. Spec. Publ. Fish. Aquat. Sci.* 132. 205 pp.
- Culligan, W. J., F. C. Cornelius, D. W. Einhouse, D. L. Zeller, R. C. Zimar, B. J. Beckwith, and M. Wilkinson. 1996. 1996 Annual Report to the Lake Erie Committee. New York Department of Environmental Conservation, Albany.
- Culligan, W. J., F. C. Cornelius, D. W. Einhouse, D. L. Zeller, R. C. Zimar, and B. J. Beckwith. 1999. 1999 Annual Report to the Lake Erie Committee. New York Department of Environmental Conservation, Albany.
- Einhouse, D.W., J.L. Markham, D.L. Zeller, R.C. Zimar, and B.J. Beckwith. 2007. Lake Erie 2006 Annual Report. New York State Department of Environmental Conservation, Albany.
- Goehle, M. A. 1998. Assessment of natural recruitment in the mixed rainbow/Steelhead fishery of Cattaraugus Creek and tributaries. MS Thesis, State University of New York - Buffalo. 45 pp.

Kustich, R., and J. Kustich. 1999. Fly fishing for Great Lakes steelhead: an advanced look at an emerging fishery. West River Publishing, Grand Island, NY, USA. 280 pp.

Kwain, W. 1983. Downstream migration, population size, and feeding of juvenile rainbow trout. *Journal of Great Lakes Research* 9:52-59.

MacCrimmon, H.R. 1977. Animal, man, and change: alien and exotic wildlife of Ontario. McClelland and Stewart, Toronto, ON. 160 pp.

Markham, J.L. 2006. Lake Erie tributary creel survey: fall 2003-spring 2004; fall 2004-spring 2005. New York State Department of Environmental Conservation. Lake Erie Fisheries Unit, Dunkirk, New York, USA.

Markham, J.L. 2007. Wild Steelhead assessment program. Section J in Einhouse, D.W., J.L. Markham, D.L. Zeller, R.C. Zimar, and B.J. Beckwith. DEC Lake Erie Unit 2006 Annual Report to the Lake Erie Committee. New York State Department of Environmental Conservation, Albany.

Markham, J.L. 2008. Lake Erie tributary creel survey: fall 2007-spring 2008. New York State Department of Environmental Conservation. Lake Erie Fisheries Unit, Dunkirk, New York, USA.

Markham, J.L. 2012. Lake Erie tributary creel survey: fall 2011-spring 2012. New York State Department of Environmental Conservation. Lake Erie Fisheries Unit, Dunkirk, New York, USA.

Markham, J.L. 2015. Lake Erie tributary creel survey: fall 2014-spring 2015. In Preparation. New York State Department of Environmental Conservation. Lake Erie Fisheries Unit, Dunkirk, New York, USA.

McCormick, S.D., L.P. Hansen, T.P. Quinn, and R.L. Saunders. 1998. Movement, migration, and smolting of Atlantic salmon (*Salmo salar*). *Canadian Journal of Fisheries and Aquatic Science* 55(1):77-92.

Mikol, G. F. 1976. Investigation of population dynamics of the lake-run rainbow trout (*Salmo gairdneri*) of the upper Niagara River and tributaries of eastern Lake Erie. MS Thesis, State University of New York - Buffalo. 157 pp.

Mitro, M.G., and A.V. Zale. 2002. Seasonal survival, movement, and habitat use of age-0 rainbow trout in the Henrys Fork of the Snake River, Idaho. *Transactions of the American Fisheries Society* 131:271-286.

Mitro, M.G., A.V. Zale, and B.A. Rich. 2003. The relation between age-0 rainbow trout (*Oncorhynchus mykiss*) abundance and winter discharge in a regulated river. Canadian Journal of Fisheries and Aquatic Science 60:135-139.

NYS DEC. 1989. 1984 New York State Great Lakes Angler Survey. New York State Department of Environmental Conservation, Bureau of Fisheries Report. 42 pp.

Reinelt, P., J. Markham, and M. Lesinski. 2013. Economic impact analysis of Lake Erie Steelhead fishery in New York State. State University of New York, College at Fredonia. 11 pp.

Roth, R.N., Jr. 2002. Steelhead (*Oncorhynchus mykiss*) smolt production in the lower Cattaraugus Creek watershed. MS Thesis, State University of New York, College at Fredonia. 69 pp.

Ryan, P. A., R. Knight, R. MacGregor, G. Towns, R. Hoopes, and W. Culligan. 2003. Fish-community goals and objectives for Lake Erie. Great Lakes Fishery Commission Special Publication 03-02, Ann Arbor, Michigan.

Seelbach, P.W. 1987. Smolting success of hatchery-raised Steelhead planted in a Michigan tributary of Lake Michigan. North American Journal of Fisheries Management 7:223-231.

Seelbach, P.W. 1993. Population biology of Steelhead in a stable-flow, low-gradient tributary of Lake Michigan. Transactions of the American Fisheries Society 122:179-198.

Stauffer, T.M. 1972. Age, growth, and downstream migration of juvenile rainbow trout in a Lake Michigan tributary. Transactions of the American Fisheries Society 101:18-28.

Todd, M.T. 2016. Public information and extension. Section N in NYSDEC 2016, Lake Erie 2015 Annual Report. New York State Department of Environmental Conservation, Albany, New York, USA.

Wagner, H.H. 1968. Effect of stocking time on survival of Steelhead Trout, *Salmo gairdnerii*, in Oregon. Transactions of the American Fisheries Society 97:374-379.

Wallis, J. 1968. Recommended time, size, and age for release of hatchery-reared salmon and steelhead trout. Fish Commission of Oregon, Clackamas.

APPENDIX: RESPONSES TO PUBLIC COMMENTS

A draft of the Management Plan for Lake Erie Steelhead (Plan), 2016-2025 was released for public review on July 19, 2016 with the comment period extending through August 18, 2016. Public comment on the Plan was solicited through a variety of avenues including: 1) a “GovDelivery” mass email to 44,812 subscribers of this service from the New York State Department of Environmental Conservation, 2) an announcement in the Buffalo News, 3) presentations at seminars and sportsmen’s clubs, 4) special notice to the leadership of western New York sportsman groups, 5) a mass email to the Great Lakes Action Agenda list serve, and 6) announcement to the Lake Erie Committee (LEC). There were 10,765 (24%) unique “opens” of the GovDelivery mass email and 270 unique “opens” of the Plan.

A total of 18 comments were received, all through email. Eleven of these comments conveyed specific concerns or recommendations; the other seven comments were simply endorsements or general statements. In addition, the Plan was endorsed by the three LEC agencies that responded. Responses to the eleven comments are included below.

COMMENTER 1.

Comment 1.1. Maintain catch rates of 0.33/hr

This goal should be attainable. To all of us that lived the banner years, the current state seems subpar, but compared nationally, it's very good. A significant factor in catch rate is the return rate. Related to this is the size of the stocked fish. The smaller the fish, the more apt it is to become a meal for another predator, especially the exploding comorant population. I believe these birds are also an exotic species. It probably would not be difficult to prove via stomach contents if these birds are doing great harm to the stocked steelhead population. If so, I think there should be a management plan to reduce their numbers.

Also playing in to return rates is the lamprey situation. I think this is even more of a factor for the more lethargic brown trout and lake trout. Just through observation, I see more evidence of lamprey wounds and even lampreys attached on browns and lakers.

I think the current poor return of adult brown trout puts their future in question. A few years ago, I remember looking at the stocking numbers, and it was something like 250,000 steelhead and 40,000 brown trout. Therefore, doing the math, I expected a few years later, to be catching a brown trout for every 5 to 7 steelhead. That has surely not been the case for me, more like 25:1 or higher. I think the brown trout should be replaced with Atlantic Salmon. They have done well in Lake Huron and the St' Mary's River system. Like steelhead, they are a highly sought after fish that people would eagerly pursue and drive many mile to vacation and catch. Like steelhead, their more energetic nature may make them less prone to lamprey predation. Also, like steelhead and unlike brown trout, landlocks would migrate far upstream, bolstering fish

numbers in the headwaters, offering more opportunity to anglers, and hopefully a potential increased CPE.

A few observations and hypotheses why the summer and fall boat CPE for steelhead is poor. From our observations over the years, my brother and I have come to the conclusion that the window for catching fall steelhead from the boat near shore either trolling or casting is very narrow, and the weather is usually not cooperative at that time as well. This is not because they are finicky or difficult to catch, but because they don't seem to stage off the creek mouth to same extent as the Pacific salmon did. It seems after spawning or stocking, the steelhead disappear into the abyss of Lake Erie, probably the deep hole off Long Point Ontario or wherever. Then when the steelhead come in to run the creeks, they come right from the deep water, and with minimal staging time, run the creeks as soon as flow allows. This probably coincides with heavy rains and stormy conditions on the lake, further minimizing boat angler opportunities. The steelhead management plan cites that it is a management plan mainly for managing the steelhead in the streams, and this makes sense since their location during the summer is a mystery. I would suggest implanting some transmitters in some dropback steelhead and track their location throughout the summer, and also to verify if our "minimal staging" hypothesis is correct. Tracking information could have a dramatic impact on summer fishing CPE. Knowing where to go is key.

I think when there were still domestic rainbows being stocked in Lake Erie, they tended to hang around the creek mouths and harbors a little longer. I believe their termination has played into our poor fall open lake production. One good thing about when Pacific salmon were stocked in Lake Erie, when they staged off creek mouths like the Catt, they would occasionally porpoise at the surface reaffirming their presence to the fisherman. You can still see this behavior during the runs up in Lake Ontario.

About a decade ago, the decision was made to cease the stocking of cohos and kings in to Lake Erie, because of poor returns. Surprisingly, a few kings still show up every year around the Catt. We really did not experience these poor returns of the 80s. We were actually fairly successful, limiting out on coho salmon in August off Dunkirk on downriggers on dodgers and squids, and then later in September and October off the mouth of the Catt sideplaning with J-plugs and jointed Rebel stickbaits, for chinooks and coho salmon. I would love to see some of these fish stocked again, even as a control group, as there was a diehard group of trollers and charters that actively pursued them out of Dunkirk and Barcelona.

Response 1.1: While the Plan's catch rate objective is less than overall catch rates that have previously been achieved for this fishery, the Plan's objective remains very high compared to other tributary steelhead fisheries in the Great Lakes and the Pacific coast. This target was established as a catch rate that we believe is a realistic long term objective and corresponds to good quality tributary fishing opportunities and averaging one steelhead caught per 3 hours of fishing effort. An effective stocking program is perhaps the most important strategy for achieving this catch rate objective and we are committed to pursuing a rainbow/steelhead stocking strategy that is guided and enhanced by ongoing research. There are no current plans

to stock salmon, either Atlantic or Pacific, in Lake Erie. At this writing, Lake Erie's domestic rainbow trout stocking component is planned to expand at the expense of suspending brown trout stocking. Our most recent trial with brown trout has failed to demonstrate measurable contributions to Lake Erie or tributary fisheries in recent years.

Comment 1.2. Foster production of wild steelhead

Perhaps the production of steelhead would be further enhanced if the steelhead could get higher than Springville on the Catt. From Arcade and up, the water quality, shade, cooler temperatures would seem like an asset to natural reproduction. Many other small streams have small waterfalls and dams, and perhaps some projects could improve upstream access as well. Also, I would strongly encourage fishermen to not fish for spawning fish on redds. If the fishermen could just leave them alone to spawn, the natural production component fishery might increase.

Response 1.2: *We expect fish passage on Cattaraugus Creek upstream of Springville Dam has the potential to significantly increase natural reproduction of steelhead. Regarding anglers targeting steelhead on redds, research on some Lake Erie tributary streams indicates that availability of suitable spawning habitat is the principal limiting factor for wild steelhead production rather than lack of spawning adults. It is doubtful that wild steelhead production is significantly compromised by some anglers choosing to target steelhead on redds.*

Comment 1.3. Increase stream access

This is interesting, as I have heard of some landowners around 18 Mile Creek going bonkers at the thought of more fisherman parking near their land, and the associated increase in noise, litter, and other issues. In a way, I can't blame them. But most seasoned steelhead fisherman seem pretty responsible, it's just a few irresponsible fishermen that wreck it for the rest of us. There are a few locations where the creeks, and the waterfalls are totally owned by landowners; Matulke's Falls on 18 Mile for example. This is an area with all the potential of Burt's Dam on Lake Ontario. The DEC should attempt to buy this property and others like this. And likewise, if a fish ladder allowed the steelhead to swim further, they might make it to better spawning habitat in Boston. So many of the small streams become low and clear easily, and the fishery can be fragile on these streams. The shining star is of course, the Catt. But it's clarity at the low section below the Rez is usually poor. Then it's the Rez all the way to Gowanda. The only hope for the New York fishermen is that the steelhead make it to Gowanda and above or buy a Seneca Nations license. Also, some guides and outfitters have bought up and posted many of the old fishing spots in the Zoar Valley region further reducing angler access to Catt steelhead. I think this makes it all the more desirable to open up fish ladder access above Scoby Hill Dam.

It would be great if some agreement with the Seneca Nations could be made for some section of the Catt to be a shared area, but this would likely be politically difficult. Also, on the topic of access, I would like to note that many of the NYSDEC fishing access sites are becoming kayaker parking lots. Obviously, they have the right to enjoy the outdoors as much as fishermen, but these sites were originally chosen as fishing access sites and they were not

designed for the launching legions of kayaks. Likewise, in the Finger Lakes, Hemlock, Canadice, etc, these sites are limited and fisherman who used to fish these lakes are finding it harder to gain access on busy weekends. Perhaps a first step would be to increase the number of parking spots at these sites.

Response 1.3: *New opportunities to increase access on many streams remain limited for a variety of reasons. We hope to focus additional effort exploring access opportunities on some of the smaller streams that have perhaps been overlooked in the past.*

Comment 1.4. Protect and enhance stream habitat

Fish ladders or other projects to enhance the ability of the fish to migrate above small waterfalls and dams.

Comment 1.5. Maintain simple and effective regulations

I think the regulations are pretty good. Easy and logical.

Comment 1.6. Promote responsible stewardship of the resource

Most steelheaders I meet seem to have a decent sense of stewardship. Most steelhead anglers practice catch and release. I would encourage fishermen to not fish for spawning fish on redds. Also, one year, for that beach cleanup effort, my brother and I did a section of 18 Mile instead of the Lake Erie shore. Perhaps there could be a special stream cleanup day.

Response 1.6: *We encourage sportsmen's groups to organize clean-up projects as described above. These projects are admirable endeavors that promote resource stewardship and foster improved landowner relations.*

COMMENTER 2.

Comment 2.1. Page 9 Angling Regs - I would like to give consideration to increasing the Catch and Release areas, specifically at 18 Mile & Cattaraugus Creeks. I believe that this would help increase the catch rates at these two creeks.

Response 2.1: *Designating areas as "Catch and Release" will not likely improve catch rates as the great majority of steelhead anglers currently practice catch and release already. In our 2014/15 angler survey, release rates on Eighteen Mile and Cattaraugus Creeks were 89% and 84%, respectively. Previous surveys documented even higher release rates. There are currently two Catch and Release areas in Lake Erie tributaries (Eighteen Mile and Chautauqua Creeks). In the future, a pending fish passage project upstream of Springville Dam would significantly expand Catch and Release areas while maintaining existing trout fishing regulations in the*

Cattaraugus system, and also be consistent with promoting natural reproduction (see Plan Strategy 2.2).

Comment 2.2. Declining Catch Rates - I started steelhead fishing in 2005 and remember the following few years as very productive. Over the last 3-5 years, however, it seems to have declined significantly, and the lamprey eel is often given as a major reason for the predation. Can anything additional be done by the DEC to eliminate the lamprey from the equation?

Response 2.2: *The Great Lakes Fishery Commission (GLFC) contracts with the U.S. Fish and Wildlife Service and the Dept. of Fisheries and Oceans Canada to implement a multi-million dollar Great Lakes-wide sea lamprey control program. Lake Erie has received special attention in recent years because the sea lamprey abundance indicators have remained above acceptable thresholds. GLFC and partners continue to be fully committed to mitigating sea lamprey issues on Lake Erie. However, as an established invasive species in the Great Lakes, sea lamprey will continue to be a component of Lake Erie's ecosystem.*

Comment 2.3. Page 16 Objective 3 - I agree increasing access is needed at the smaller streams mentioned. In addition, I have always wanted to fish Chautauqua & Walnut Creeks more often, as a change of pace to my usual 18 mile & Catt favorite spots, but have been frustrated by the lack of access to these smaller streams. There are some bridge crossings that may be good candidates at these two streams that the DEC could consider.

Response 2.3: *Please see Response 1.3. Limited access on Walnut Creek and Silver Creek is at least partly due to upstream reaches of these streams traversing through gorges providing limited access to stream banks. There is a great deal of public access on Chautauqua Creek from the mouth to the dams (roughly 5 miles) in the form of PFR and public property. There is a public fishing map available for Chautauqua Creek on the DEC website (http://www.dec.ny.gov/docs/fish_marine_pdf/chautauquacreek.pdf) that lists all of the parking locations and public fishing areas that are available on this stream.*

Comment 2.4. Page 18 Enforcing Regs - Last spring there were two young men fishing in the 18 Mile junction pool using live minnows & bragging about all the steelhead they were catching. They were informed by other fishermen in the same pool that the area was Catch and Release, but paid no attention to them. I had spoken to Mike Todd on the phone & he advised that additional signage was going up. I believe this was done; however, it would have been better to have access to a DEC enforcement person nearby. Perhaps more frequent DEC personnel at these busier spots to check licenses, etc. can weed out these violators.

Response 2.4: *Anglers that wish to report a violation can call the DEC Tip Line at 1-877-457-5680. In addition, phone numbers for all NYSDEC Conservation Officers can be found in the fishing regulations guide.*

Comment 2.5. Page 19 Strategy 6.2 - **PLEASE ABSOLUTELY NO KIOSKS** in the popular places identified through angler surveys. On a weekday last Fall, I counted a total of **41 vehicles**

at the North Creek, Route 20/Cemetery & Hobuck Flats access areas to 18 Mile Creek. With the advent of Facebook ("WNY Fishing & Hunting," etc.) and other internet sites, there has been a proliferation of steelhead anglers flooding these popular areas - many lacking in fishing etiquette (pool crowding/takeover), compliance to regulations, littering, etc. We don't need another I Love NY - type campaign at these areas (e.g. passing out of maps, more advertising of popular spots, etc.). There is already too much information available to the serious steelhead angler via the DEC sites (e.g. Public Fishing Rights, Lake Erie Hotline, etc.) as well as the nemesis Facebook account mentioned above.

Response 2.5: *A variety of information sources, including the internet and social media, has expanded the availability of up-to-date material for anglers. However, the installation of some kiosks at strategic locations would provide stream maps of public fishing areas in that location, deliver information on responsible angler ethics and resource stewardship, and inform anglers of any special fishing regulations. We believe that, as you stated, improving fishing etiquette is important to the sustainability of this resource, and this is an efficient way of delivering that type of information, especially to the anglers that do not use social media.*

COMMENTER 3.

Please!!! Please!! REDUCE THE DAILY LIMIT ON STEELHEAD FROM 3 FISH PER DAY TO 2 FISH PER DAY !!!!!

Response 3: *One of the Plan's guiding principles is a science based approach to guide management decisions, and the information gathered to-date does not indicate that a reduced creel limit will measurably improve fishery performance. The 3 fish creel limit for steelhead has remained static while the steelhead fishery has mostly flourished and expanded over the past 30+ years. Release rates measured from angler surveys consistently exceed 85%, and survey results in two different years (2003/04, 2011/12) have shown that many anglers continue to support the three fish daily creel limit even though a majority do not harvest their limit when they could have. Data from angler surveys support these results.*

As an example, of 181 anglers interviewed upon completing a trip who caught steelhead in the 2014/15 angler survey, only 6.0% (11 anglers) kept 3 fish and 6.6% (12 anglers) kept 2 fish; 65.2% kept none (118 anglers). Applying these survey results, a reduction from 3 fish to 2 fish would have reduced the harvest by 6.0%, which equates to only 388 steelhead in 2014/15 (total harvest = 6,462 steelhead). As stated in Strategy 1.3, we will re-evaluate a reduced creel limit and/or size limit if angler catch rates are consistently below the objectives in this plan in the future.

COMMENTER 4.

I am an avid steelhead fisherman. I am glad to read in the DEC Steelhead management plan of the research being done and future plan to increase accessibility to streams. Although this may not be a very popular idea because many anglers view the steelhead population as a put (stocking) and take fishery I think there should be an increased policy of catch and release; either by day of the week or stream section. As you know steelhead do not die after they run into the stream as salmon do and with more fish available to spawn there may be more natural reproduction of the species. I also believe the sections of stream designated for artificial only is unjustified. That regulation discriminates against those fisherman that may not want to or know how to fly fish. I know that artificials are not just the fly fisherman but that is who the regulation caters to. Most young people do not fly fish and are not very good with lures and they should be allowed to fish with bait any part of the stream they choose. After all the license they purchase is the same license the fly fisherman does. What better way to hook (no pun intended) a young angler on fishing then to catch a big steelie and release it to fight another day? This is the next generation of outdoorsmen that we want to grow up with a sense of ecological responsibility.

Response 4: Please see Responses 2.1 and 3. Lake Erie steelhead anglers do exhibit a strong catch and release ethic in the tributary fishery, and we agree that voluntary catch and release practices have been a major contributor to the success of the fishery over the past 15+ years. We also believe availability of suitable spawning habitat has been the principal limiting factor for natural reproduction, not a lack of spawning adults.

The Artificial Lure Only stipulation is typically a companion restriction with Catch and Release regulations in New York State and elsewhere. A review of the scientific literature across a wide variety of fisheries suggests an increased potential for hooking mortality exists when anglers are allowed to use bait.

COMMENTER 5.

As a lifelong western NY resident since 1960s, a steelhead fisherman since late 1970s and a diary program respondent for many years, I read with great interest, the new plan for steelhead management in Lake Erie. My comments are:

Comment 5.1. Please drive the Scoby hill dam removal project on the Cattauragus to completion. This will likely be the most significant project on your slate that can improve wild steelhead reproduction here. I would love to see it in my lifetime.

Response 5.1: At this writing, the Feasibility Study for the Springville Dam (Scoby Hill dam) has been completed and our expectation is that this project will move forward to design and engineering phase with possible construction during 2019. For clarification, this project is not a dam removal effort but a dam lowering with associated fish passage through a by-pass channel. Dam removal at that location is not recommended due to the potential for sea lamprey infestation in the high quality tributaries upstream of the dam, and maintaining a lower barrier

and installing fish passage ensures dam safety and provides capability to pass desirable fish species upstream while stopping undesirable species such as sea lampreys.

Comment 5.2. Consider predation by cormorants when stocking steelhead in tributaries. My friends and I have seen numerous cases of flocks of cormorants waiting for steelhead to be stocked on the Catt, Canadaway and other tributaries. These birds have successfully adapted to DEC spring stocking. Perhaps stocking could be tied to high water events to minimize this predation.

Response 5.2: While we agree that it might be beneficial to stock fish during high water events to minimize impacts by avian predators, it is not possible to plan stocking from short term weather forecasts as NYS's complex spring stocking program is planned weeks in advance.

Comment 5.3. Stock larger steelhead smolts. 4 to 4.5" is too small and numerous studies prove this.

Response 5.3: The results of current steelhead research on Chautauqua Creek should provide a better understanding of the preferred size of stocked fish and stocking location to maximize adult returns in the Lake Erie tributaries. Ultimately, size of stocked fish is also constrained by characteristics of the hatchery rearing environment, and ongoing infrastructure improvements at the Salmon River Hatchery are expected to improve steelhead size at stocking.

Comment 5.4. Make decision to allow fish passage at Blossom road dam on Buffalo creek. This could likely be done on the "cheap". There is cooler water and tributaries upstream that will allow for steelhead reproduction. I have been told that some steelhead have passed this barrier in the past and have personally caught what I believe are steelhead smolts at confluence with Beaver Meadow creek. Also obtain DEC public fishing rights areas proactively before runs set up. This could open up 20 miles or more of fishing. Same could be said for dam at 18 mile creek in Hamburg.

Response 5.4: We have done a cursory evaluation of the benefits of fish passage on Buffalo Creek and observed an additional low head dam further upstream of Blossom road that is impassable in its current condition. If some steelhead can migrate this far, it remains unclear whether they would be able to pass this next barrier during a high water event. Moreover, fisheries surveys have not found much suitable trout habitat above these dams. A more detailed investigation of both of these issues would be necessary before fish passage is considered.

As stated in Strategy 2.1 in the Plan, fish passage opportunities will continue to be explored on streams that create access to high quality spawning and juvenile steelhead habitat, do not increase access for invasive species, and have available public access for fishing opportunities.

COMMENTER 6.

Great plan!!! Thank you. More stocking off older steelhead and more catch release only areas as well as fly fishing only areas.

Response 6: Please see Responses 2.1, 3, and 5.3. As stated in Strategy 2.2 in the Plan, the purpose of establishing any special regulation areas is to limit harvest to foster production of wild steelhead in areas with appropriate habitat. This can be accomplished through Catch and Release – Artificials Only regulations that essentially eliminate harvest but still allow broader use of fishing gears. Moreover, anglers interviewed during the 2003/04 angler survey did not show strong support for establishing a special fly fishing only section on Lake Erie tributaries (45% in favor; 55% opposed or no opinion).

COMMENTER 7.

I think that the report is very comprehensive, thoughtful, proactive and the goals are exciting. My only concern is that the goal to keep the catch rates at .3 fish per hour is too low. Jim mentions that the mid 2000's rate of .6 was an exception to the catch rate of 0.3 and that it can could not be maintained. I have been fishing since 1990's and there have have always been many more fish in the streams than there have been in the past few years. While there might not have been surveys done during the 1990's, I am confident that the catch rates were closer to .6 than .3. I think that the .6 is closer to the what the norm was. While the increase and lampreys and walleye populations have dramatically changed the number of steelhead in the streams and, consequently, the catch rates, these now factors warrant changes in regulations (lowering catch limits), increasing stocking numbers to be financed from a modest raise in licenses, increase special regulation areas and policy changes that would be enable the fishery to rebound back to previous rates.

The most controversy might be from the 17% who keep the steelhead but I think that they would value catching more fish even if it means taking home one less fish that day.

Response 7: Please see response 3. There are no comparable surveys conducted during the 1990's to determine the status of the steelhead fishery during that time period relative to the fishery that existed in the mid-2000's. However, increasing stocking numbers is not feasible as the Salmon River Hatchery is currently operating at peak capacity. Moreover, Lake Erie's long standing steelhead stocking target produced the fishery that existed during the 2000's, and should be capable of producing that fishery once again if ecosystem conditions change to a more favorable state. Meanwhile, we believe results from current research on stocked steelhead emigration, size, and stocking location should reveal a more optimal stocking strategy that will result in improved returns of adult steelhead in the future.

Please see Response 1.1. The catch rates of 0.60 fish experienced in the mid-2000's were extraordinarily high for a sportfish that averages nearly two feet in length. For comparison, the catch rate objective for inland stocked trout in New York has been 0.50 fish/hour, and current steelhead catch rates on the Salmon River are 0.09 fish/hr, roughly 1/4 of Lake Erie's objective. Walleye catch rates in New York's portion of Lake Erie are generally considered exceptional when above 0.25 fish/hr.

COMMENTER 8.

I wish to place the following comment on the Draft Steelhead Management Plan:
Whereas OBJECTIVE 5 of the draft plan is to "Maintain regulations that are science based, easily understandable, and enforceable." and objective 5 further states "we will continue to explore opportunities to improve regulations to provide clear guidance, maintain/enhance legitimate angling opportunities, and address enforcement issues."

The DEC should consider eliminating the artificial only, catch and release zones which have been established on the Lake Erie tributaries. There is no scientific or wildlife management based reason for the existence of these zones. These zones only serve to limit angling opportunities for all fisherman in areas where all fisherman have contributed to obtain Public Fishing Rights, as well as for the stocking and management of the resource.

Response 8: As stated in Strategy 2.2 in the Plan, we plan to assess all candidate special fishing regulation areas to determine their potential for achieving desired objectives. Moreover, establishing additional special regulation areas will only be considered in areas particularly suited for natural reproduction with the objective of increasing wild steelhead production.

COMMENTER 9.

Thank you for the opportunity to comment on the draft Lake Erie Steelhead Management Plan. Having fished for steelhead and other salmonids in New York's Lake Erie tributaries for more than 20 years, I am strongly interested in the future direction for this fishery and appreciate the opportunity to provide input.

The observed decline in steelhead catch rates is almost certainly linked to two clear factors - lower stocking density and increased angler effort.

While total stocking numbers for Lake Erie tributaries may be somewhat consistent year over year, the current stocking level of 45,000 fish for Cattaraugus Creek is approximately half the 90,000 to 100,000+ fish that were formerly stocked into this watershed each year. At the same time, angling effort on Cattaraugus Creek has increased exponentially. Either of these situations cannot help but depress overall catch rates. In combination, the effect is crushing. When I started fishing for steelhead in western New York in the 1990s, a typical day on Cattaraugus would result in landing 10 to 12 steelhead per rod, while two or three times a month one could expect an exceptional day or landing 20 or more fish per person. Today, a typical outing results in landing two or three steelhead per person, and an exceptional day might bring five or six. This is a success rate of 25% or less than what it used to be.

With due respect to comments in the draft that these results are still among the best steelhead catch rates in the country, they remain far from what they once were. We should not be content

to offer fishing that is as poor as it is in other areas. We should focus on getting it back to what it can be.

The increase in angling effort is particularly evident on Cattaraugus Creek. Dry summer and fall weather often leaves the Catt as the only stream with sufficient water volumes to entice steelhead upstream, or provide enough stream flow for successful fishing. While steelhead may enter other streams like Canadaway Creek or Silver Creek in early fall, extremely low clear water can make successful angling in these tiny creeks virtually impossible. This inevitably results in substantial, additional angling pressure being applied to Cattaraugus Creek, lowering catch rates there even further. I am quite certain that anglers outnumber the fish more often than not.

In view of the substantial concentration of angling pressure on the Cattaraugus (and perhaps 18 Mile Creek), my feel is that stocking should be concentrated in these larger rivers in order to simply sustain angling catch rates. Right now, stocking is “a mile wide and an inch deep,” which is inconsistent with providing a sustainable sport fishery. The Ontario Ministry of Natural Resources is currently revising its Lake Ontario brown trout stocking strategy after having followed a similar shotgun approach since the 1990s, and finding it simply does not yield acceptable results.

My advocacy for concentrating stocking to a small number of areas in order to develop put-and-take fisheries with higher yields is not to say that attempts to develop naturally sustaining populations in suitable streams should be abandoned. But I do believe that managing two or three locations to provide high yield, put-and-take fisheries will take angling pressure off these smaller, more fragile streams while providing a viable sport fishery that will bring significant economic benefits to the region.

Finally, I applaud the suggestion of monitoring returning steelhead numbers through a weir installed at the Springville Dam. With due respect to the diary program, I suspect that its results are skewed since the only anglers who are likely to participate in such a program are more serious fishermen who typically enjoy higher catch rates than average. By personal observation, I also believe that anglers tend to exaggerate - often substantially - in terms of both fish numbers and size. I believe a weir at the dam would provide a far more objective and accurate assessment of fish population trends.

In summary:

If the goal is to provide some level of recreational fishery, my belief is that concentrating stocking at two or three key sites will produce far better results than spreading low numbers of fish across the entire lake shore. Increasing stocking levels at these sites, or stocking larger smolts, should produce greater return rates and lead to higher catch rates in return.

If the goal is to develop naturally-sustaining wild steelhead populations in localized areas, then stock these areas and protect the fish with seasonal closures during the spring spawning period.

Again, thank you for the opportunity to contribute my thoughts.

Response 9: Steelhead stocking targets in the New York Lake Erie tributaries have remained unchanged for the past 20 years, including Cattaraugus Creek. Aside from 2015, when overall steelhead stocking decreased due to shortages in the hatchery system, long term stocking targets for steelhead have been uniformly achieved or exceeded. The current stocking target for Cattaraugus Creek is 72,000 yearlings/year, but actual stocking is typically 90,000 yearlings. Cattaraugus Creek also received surplus steelhead in 2016 that more than doubled its stocking rate in that particular year.

Stocking targets for individual streams were initially allotted based on stream size and the amount of public access available. Recent angler surveys have found that over 90% of the angler effort and catch occurs in four tributaries – Cattaraugus, Eighteen Mile, Chautauqua, and Canadaway Creeks. These streams receive at least 75% of stocked fish in any given year. As such, we believe that stocking is already allocated among the most important streams available to anglers.

Contrary to your observations, angler surveys conducted since 2003/04 indicate a decline in angler effort. Estimated tributary angler effort peaked in 2004/05 at 263,545 angler-hours, but has declined to 112,564 angler-hours during the 2014/15 survey (57% decrease). Angler effort on Cattaraugus Creek has similarly declined during this same time period (114,878 angler-hours in 2004/05; 46,094 angler-hours in 2014/15 (60% decrease)).

COMMENTER 10.

Thank you for the opportunity to review the proposed NYDEC Steelhead plan. I am glad to see data is being collected to monitor the status of the steelhead population and return to the streams. It is nice to see an action plan being formulated and put in place to sustain the fishery.

For each the past 25 years, my two brothers and I have spent an entire week of vacation fishing the NY streams along Lake Erie in late October. Needless to say, we are steelhead "junkies." We have experienced many exciting days on the streams. But, as indicated in the data shown in the report, we have seen a significant reduction in our catch rate, especially over the past 5 years.

I wanted to comment on the catch rate objective in the proposed plan:

- "Maintain average catch rates of 0.33 fish/hour"

The report indicates the "Angler catch rates from surveys conducted between 2003/04 and 2007/08 remained consistent around 0.60 fish/hour, but declined 42% in the 2011/12 survey to 0.34 fish/hour (Figure 3). Total catch declined 47% over this same time period." Given this data, why is the objective being set at the lowest catch rate for this time period? The catch rate in the report ranged from 0.6 to 0.34.

I suggest the catch rate objective should be set between 0.4 and 0.475 fish/hour. The current rate of 0.34 is not high enough to attract fishermen from outside the local area and could lead to a decline in fishing license sales, room rentals, and restaurant/sport store sales. For us personally, if catch rates remain at this level, it is not worth our while to use a week of vacation and spend associated dollars on room rentals, meals, and tackle/equipment. If we are catching a reasonable amount of fish during our hours spent on the stream, without a doubt, we will continue to return to the Western NY area as long as we are physically capable to do so.

I believe the agency should not set objectives at the lowest catch rate levels when higher catch rates have been attained in past. It is similar to a student setting his/her grade objective at a "D" because it is not failing but has been able to attain "A's" and "B's" in the past school years.

Thank you for your consideration and the opportunity to comment.

Response 10: Please see Responses 1.1 and 7. The catch rate objective should be viewed as a threshold rate that we believe creates satisfactory tributary fishing quality. Catch rates in the 2014/15 angler survey were near this rate, and angler opinion questions indicated that the majority (62%) of interviewed anglers were satisfied with the current steelhead fishery. With that said, we obviously will continue to strive to implement strategies to obtain the highest fishing quality possible.

Non-resident anglers have consistently comprised around 15% of Lake Erie tributary anglers interviewed in angler surveys with the highest proportion of non-resident anglers measured in the most recent survey conducted in 2014/15 (28 states and 2 countries).

COMMENTER 11.

To whom it may concern:

I'm in general agreement with the draft Lake Erie Steelhead Management Plan, but I do not accept the argument on p. 15 that dam removal is not a viable strategy. On the contrary, I believe the State has a scientific and ethical duty to remove, for instance, the Springville Dam on the Catt.

Thank you for your good work!

Response 11: Please see Response 5.1. There are many issues associated with complete dam removals that need to be considered, and the Springville Dam is an excellent example. One of the major issues on Lake Erie is sea lamprey control. Cattaraugus Creek is one of the major producers of sea lamprey in Lake Erie, and the Springville Dam is currently the barrier that prevents them from accessing over 70 miles of high quality spawning and rearing habitat located above the dam. While a complete dam removal at this location would create unimpeded passage of all species and restore full stream connectivity, it would also allow sea lampreys unimpeded

access upstream with the potential for a high degree of impact to the Lake Erie fish community. Treatment of these waters would be extremely expensive and may not be feasible given the size of the watershed. With this knowledge, it would irresponsible for the Department to support complete dam removal at the Springville Dam, and a partial dam removal and fish passage with an associated fish trap is being pursued as an alternative solution.