Initial Assessment of the Rainbow Trout Stocking Program

Long Pond (Watcode 5272)

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INTRODUCTION/BACKGROUND

History

Long Pond is a 2,714 acre pond located in the towns of Belgrade, Rome, and Mount Vernon. Long Pond is part of what is known as the Belgrade Chain of Lakes that includes seven lakes and ponds totaling over 20,000 acres of surface area. Long Pond lies near the bottom of the chain of lakes, situated between Great Pond (upstream) and Messalonskee Lake (downstream).

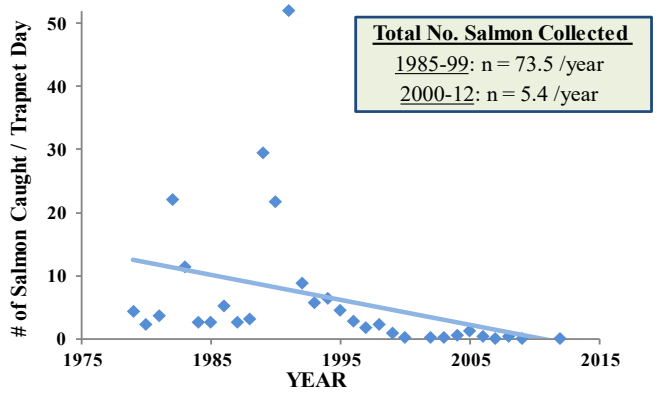
Long Pond was historically managed as a successful landlocked salmon (*Salmo salar*) program, with stocking efforts beginning in the late 1930's. Long Pond was arguably the best landlocked salmon fishery in central Maine; providing anglers with an opportunity to catch quality to trophy-size landlocked salmon within a 30-minute drive of Augusta. This track record continued until the mid-1990's, when significant changes occurred to the pond's species assemblage. Northern pike (*Esox lucious*) were illegally introduced into the upstream waters in the Belgrade Lakes in the late 1970's, and their presence was confirmed in Long Pond in 1983. It took from the early 1980's to the mid-1990's for pike to colonize Long Pond and begin making trophic-level impacts to the fish community and the historic sport fishery. Anglers began reporting lower landlocked salmon catch rates and reduced individual fish condition. Follow-up surveys conducted by Region B staff revealed a high prevalence of tooth scarring on landlocked salmon, presumably from attempted pike predation. In addition to predation-related impacts, pike necropsy results indicated significant pike predation on rainbow smelt (*Osmerus mordax*). This caused increased strain on Long Pond's forage base, in turn causing negative impacts to landlocked salmon condition and survival.

In addition to the introduction of northern pike, the Belgrade Lakes were subject to an introduction of landlocked alewives (*Alosa psuedoharengus*). Landlocked alewives were confirmed in Long Pond in the late 1990's, causing a potential "perfect storm" when it came to impacts on the lake's forage base. Landlocked alewives are planktivores, causing direct forage competition with rainbow smelt. Landlocked alewives are reproductively prolific and tend to out-compete rainbow smelt when co-habitation occurs. The combined presence of northern pike and landlocked alewives likely caused a precipitous collapse in the rainbow smelt population, which caused a subsequent similar impact to the landlocked salmon fishery.

Adaptive Management

The trophic changes that took place in Long Pond caused fisheries managers to attempt mitigative measures to save the landlocked salmon fishery. The salmon stocking program changed from spring yearling stocked to fall yearling stocked. This was an attempt to stock a slightly larger fish that might be more adept at avoiding predation and surviving with a dwindling forage base. This had little positive impact on the landlocked salmon fishery in Long Pond as angler reports continued indicating a collapse, which was corroborated by IFW trapnet survey results.

Figure 1. Historical Landlocked Salmon Trapnet Survey Results



By 2015 it was clear that the landlocked salmon fishery had essentially become a put-and-take opportunity rather than a fishery comprised of multiple age classes and larger individuals. Fisheries managers began researching available alternatives to landlocked salmon and determined that rainbow trout could be suitable. Previous studies in Maine had shown rainbow trout to be resilient to competition from warm water fishes, and they were far less dependent upon smelt forage for growth and survival. Long Pond has a robust forage base in the form of landlocked alewife, and perhaps rainbow trout would capitalize on those calories where landlocked salmon did not. Other waters within the Belgrade Lakes supported brown trout stocking programs, with varied degrees of success in terms of angler returns and overall performance. Rainbow trout would provide an alternative fishery, one that managers hoped could spark interest in cold water angling in Long Pond. The Long Pond rainbow trout program represents IFW's first attempt to manage rainbow trout in cohabitation with northern pike.

Stocking rates have thus far been a bit inconsistent. More recent stocking numbers have settled near 4,000 fall yearling rainbow trout annually. In addition to the annual allocation of fall yearling rainbow trout, surplus spring yearling and adult rainbow trout were stocked, when available. In the interest of long-term consistency and potential success of the rainbow trout program, fall yearling fish will be the primary age group stocked annually.

In addition to rainbow trout, a small number of spring yearling brook trout were stocked annually in Long Pond. The brook trout were stocked near the confluence of Great Pond Outlet and Long Pond and they were intended to provide a put-and-take trout fishing opportunity. This stocking program remains in place moving forward, but was not part of this rainbow trout assessment.

Figure 2. Recent Stocking History

YEAR	SPP/AGE	# STOCKED	#/ACRE
2021	SY BKT	150	0.1
	FY RBT	4025	1.6
	AD RBT	220	0.1
2020	SY BKT	300	0.1
	SY RBT	1000	0.4
	FY RBT	4300	1.7
	AD RBT	250	0.1
2019	SY BKT	300	0.1
	FY RBT	2850	1.1
	AD RBT	45	0.0
2018	SY BKT	300	0.1
	FY RBT	3300	1.3
2017	SY BKT	300	0.1
	FY RBT	1806	0.7

METHODOLOGY

Assessment of the Long Pond rainbow trout program involved multiple methods of survey and fish collection. We set out to determine if rainbow trout were surviving beyond one year at large; creating a fishery comprised of multiple size classes with some larger fish available. Additionally, we sought to determine if we had suitable angler returns. A stocking program of this magnitude represents

significant Department resources so there needs to be some level of demonstrable angler success in catching these fish, irrespective of harvest. A limited creel survey was conducted during the spring of 2021, with two areas of focus: the confluence of Great Pond Outlet and Long Pond, and the area near Long Pond's outlet dam known as Wings Mills. The intent of this survey was not to derive an estimate of use or harvest, thus it was not executed in a random stratified method. The creel survey was conducted opportunistically to ascertain if anglers were simply catching rainbow trout and with what frequency.

The assessment efforts spanned multiple years, from 2018 to 2022. Fish collection methods evolved until we found a successful means of collecting rainbow trout and associated catch information.

Figure 3. Rainbow Trout Collection Methods by Year

Year	Collection Method			
	Trapnet	**Gillnet**	**Experimental Angling**	**Creel Survey**
2018	✓			
2019		✓		
2021			✓	✓
2022			✓	

SUMMARY OF RELEVANT FINDINGS

Netting and Angling Surveys

The initial 2018 trapnet survey revealed very little in terms of rainbow trout data. One trapnet was fished from 4/17/18 to 5/3/18 at the confluence of Great Pond Outlet and Long Pond. Only one rainbow trout was collected during this time, though it was an impressive specimen at 495mm and 1,750g. The lack of trapnetting success prompted a change in methods, so a gillnet survey was utilized

in 2019. While more rainbow trout were collected using the gillnets (N=4), the sample size remained too small to make informed decisions regarding the success of the program.

Figure 4. One of the Rainbow Trout Collected in 2022.

In 2021, a combined trapnetting and experimental angling survey resulted in a more robust sample of rainbow trout (N=29). The experimental angling survey provided an opportunity for biologists to observe rainbow trout congregating at the confluence of Great Pond Outlet and Long Pond. Biologists observed numerous rainbow trout exhibiting spawning behavior and noted several size classes of fish. It became clear that experimental angling was the most successful method of fish collection. Of the 29 rainbow trout collected in 2021, 19 of them were collected by rod and reel. This was a side-by-side comparison of collection methods because the angling location was immediately adjacent to the trapnet location. Based upon those results, the 2022 collection effort focused solely on experimental angling. That effort resulted in the collection of 36 rainbow trout.

Figure 5. Rainbow Trout Collection Results

Year	Number Caught	Mean Length (mm)	Mean Weight (g)	Condition (K)
2018	1	495	1750	1.44
2019	4	417	688	0.95
2021	29	405	802	1.14
2022	36	409	766	1.07

Creel Survey

The 2022 creel survey resulted in a total of 67 angler interviews. Those 67 anglers fished a total of 116 hours and caught 70 rainbow trout. This represents a catch rate of 0.6 fish per hour. None of the anglers that participated in the survey reported harvesting any rainbow trout. Biologists observed evidence of some level of angler harvest while on-site (fish scales, viscera, etc.), likely harvested while a clerk was absent from the site.

DISCUSSION/CONCLUSIONS/RECOMENDATIONS

The Long Pond rainbow trout program is currently achieving our management goals. The fishery is comprised of multiple size classes, fish are surviving more than one year at-large, and anglers are successfully catching rainbow trout with some level of frequency.

In addition to our formal survey work, we receive numerous angler reports from interested individuals that regularly fish Long Pond. Some of these reports include qualitative food habits information that indicate many rainbow trout utilize insects and zooplankton forage, while others appear to utilize abundant landlocked alewife forage. Both food sources or preferences represent the likely reason for rainbow trout success in Long Pond: forage adaptability and an opportunistic nature. Historic food habits work on Long Pond revealed that few landlocked salmon utilized landlocked alewife forage, and they certainly exhibited poor condition when relying upon insects and zooplankton. Additionally, fall yearling rainbow trout appear to withstand significant interspecific competition and potential predation. This might not be the case if management relied upon a spring yearling-based stocking program. Spring yearlings would be advantageous in terms of overall cost, but returns would likely suffer due to pike predation on a much smaller stocked fish.

We will closely monitor the Long Pond rainbow trout program moving forward due to the significant annual investment. Our next effort will likely entail a winter creel survey to assess use and potential winter utilization of rainbow trout. Long Pond's regulations were recently liberalized to allow the harvest of trout, which may cause an increase in winter angler effort.

COOPERATIVE

STATE FEDERAL

PROJECT

This report has been funded in part by the Federal Aid in Sport Fish Restoration Program. This is a cooperative effort involving federal and state government agencies. The program is designed to increase sport fishing and boating opportunities through the wise investment of angler's and boater's tax dollars in state sport fishery projects. This program which was founded in 1950 was named the Dingell-Johnson Act in recognition of the congressmen who spearheaded this effort. In 1984 this act was amended through the Wallop Breaux Amendment (also named for the congressional sponsors) and provided a threefold increase in Federal monies for sportfish restoration, aquatic education and motorboat access.

The program is an outstanding example of a "user pays-user benefits" or "user fee" program. In this case, anglers and boaters are the users. Briefly, anglers and boaters are responsible for payment of fishing tackle, excise taxes, motorboat fuel taxes, and import duties on tackle and boats. These monies are collected by the sport fishing industry, deposited in the Department of Treasury, and are allocated the year following collection to state fishery agencies for sport fisheries and boating access projects. Generally, each project must be evaluated and approved by the U.S. Fish and Wildlife Service (USFWS). The benefits provided by these projects to users complete the cycle between "user pays – user benefits."

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