



Department of
Environmental
Conservation

Lake Champlain River Creel Survey Plan

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Overview

Problem Statement

Salmonid angling information of the tributaries on the New York side of Lake Champlain is outdated. Pilot surveys were conducted in spring (Balk 2024a) and fall of 2023 (Balk 2024b) to assess the salmonid fishery on the Saranac and Boquet rivers. Prior to that, the last river creel survey conducted by New York State Department of Environmental Conservation (NYSDEC) was in 1997. That survey predated significant changes to species composition, fisheries management practices and environmental disturbances in Lake Champlain and its tributaries, including the introduction of aquatic invasive species, increased sediment and phosphorus inputs, and habitat degradation (Marsden, 2012; Dudgeon, Arthington, Gessner, Kawabata, Knowler, Lévêque, and Sullivan 2006). Current data on Atlantic salmon in the open-water salmon fishery is now available in the 2021 and 2022 angler surveys (Balk 2022, Balk 2023), but the data is limited as few anglers interviewed were targeting Atlantic salmon. The collected data indicated that, catch rates for Atlantic salmon was very low. The rivers provide another component of the Lake Champlain Atlantic salmon fishery. There is a need for information on the fall spawning run fishery in the rivers to better understand angler use and expectations and to guide management actions. The river creel survey will fill this information gap. This survey will complement the open-water angler survey to provide a more complete picture of the Atlantic salmon fishery of Lake Champlain.

Need

Current catch rates, harvest rates, preferred target species and angler opinion information about the salmonid fishery in the rivers is needed to inform management decisions and provide an information base to measure management actions against. The river creel survey will provide a foundation for the development of fishery management plan for these important salmonid rivers.

Goals and Objectives

The goal of the river creel survey is to characterize the present-day angler use and exploitation of salmonids in the New York tributaries of Lake Champlain, namely, the Saranac River and the Boquet River. Specific objectives include determining:

- Preferred angler target species,
- Angler catch and harvest rates for salmonids,
- Size structure and species composition of creel,
- Angler opinions on the quality of the fishery.

Timeframe and Geographic Scope

The river creel survey covers the two most popular salmonid tributaries at the northern end of Lake Champlain, the Saranac and Boquet rivers. These rivers provide the best opportunities for NYSDEC to collect information on the Atlantic salmon in tributaries. While salmonids inhabit other tributaries on the New York side of the lake, the size of those tributaries and the low estimated numbers of anglers fishing in each, renders them unsuitable for a creel survey.

The river creel survey will run in the fall, beginning in 2024. Surveys will be conducted from 15-September to 30-November. The survey range is from the mouth of each tributary upstream to the first impassable barrier to fish. On the Saranac River the first barrier is Imperial Mills Dam. On the Boquet River, the first barrier to fish passage is the cascade section in the closed fishing area in the town of Willsboro, during low flow years.

Survey Design – Methods

Tributary creel surveys

In 2024, a roving river creel survey will begin on the Saranac River and the Boquet River in September and will be conducted annually. Multiple angler access sites on both rivers will be covered in the same survey day; a clerk will survey each river for the season. If no anglers are present at a site, the clerk will move to the next site.

The primary sampling unit is the day, which is stratified by month and by weekend/holiday and weekday day type strata within each month. A clerk will conduct surveys five days per week, for an eight-hour shift. The work week is characterized as Thursday to Wednesday, following the DEC workweek.

The count time will be randomly chosen for each survey day. Surveys will begin at least 30 minutes after sunrise and will conclude at sunset.

Vehicles will be stored at Ray Brook and Peru Dock. The clerk will report to the vehicle and then drive to their survey site.

Modifications to the survey methodology may be made in future as needed. All changes to the creel schedule or design will be documented.

Saranac River

On the Saranac River, the clerk will count anglers by driving from the Green St. fishing access site to the fishing pool at Imperial Dam (1.9 miles), counting anglers at each site along the way ([Figure 1](#)). The clerk will record counts of anglers and cars parked at the survey sites on the combined schedule and count form ([Appendix 1](#)). The count should take less than 15 minutes and will be considered an

instantaneous count. The clerk will then conduct interviews at each site along the river, for a maximum of 5 hours and 45 minutes on this river.

Boquet River

On the Boquet River, the clerk will do an instantaneous count by driving along the route from the West bank parking lot to East bank parking lots surrounding the fishing pool below the cascades in Willsboro (0.4 miles), stopping at each lot to conduct angler counts ([Figure 2](#)). This should take less than 10 minutes. The clerk will then conduct interviews at each site along the river, for a maximum of 5 hours and 45 minutes on this river.

Interviews

Clerks will intercept anglers wading in the river and in the parking lots and interview willing participants. If an angler declines to be interviewed, the clerk will move on to the next angler. Interviews will be conducted for incomplete trips using the River Creel Survey Questionnaire ([Appendix 2](#)). Anglers who have fished for less than half an hour will not be interviewed. Clerks will interview as many anglers as possible in the time block. If it appears there are too many anglers at a location to interview in the time block, the clerk will interview every second or every third angler as they survey, using their judgement. Clerks will record the angler's total hours fished up to the time of the interview as well as catch and harvest information. Clerks will examine any fish harvested, if the angler allows, recording total length, fin clips or tags, and sea lamprey wounds. They will also document angler recorded lengths of released fish. If more than 30 minutes have passed since the clerk interviewed an angler and the clerk has time remaining, the clerk may return to that angler to update their catch information before leaving for the day.

The clerk will conduct interviews at each site following the schedule; some sites will receive more time than others. When finished interviewing, the clerk will return the vehicle to the storage site and their shift ends.

Angler opinions

Anglers will be asked for their opinions about their overall satisfaction with the river fishery for the location they are fishing. They will also be asked how often they fish the river for salmon and to rate the size of the salmon run in terms of the number of fish. They will further be asked if they practice catch and release. The clerk will also ask anglers if they have any comments or concerns about the fishery. These questions can vary from year to year, depending on the information needs of the Department.

Safety

Clerks will report to the Lake Champlain Biologist at the end of each workday (safety check-in). The clerk will communicate any problems they had during their shift and ask any questions that came up.

Clerks will be responsible for monitoring the river flows throughout the survey. If the flow on a survey day is too high for the clerk or an angler to safely wade, the survey will be cancelled. The maximum safe wadable flow for the Saranac River or the Boquet River is 600 cfs.

In cases of extreme weather, a survey day may be cancelled or rescheduled if there is another available day.

Data organization

Data entry and storage

All creel data collected will be recorded on paper survey forms. The clerk will enter creel data into an Excel spreadsheet on a computer assigned to them at the end of the survey period or on any office day should a creel day be cancelled. The clerk will routinely back up the data to the laptop and email a copy to the Biologist weekly. The Biologist will maintain a master file on a DEC computer and on the Fisheries Shared (K:) drive in Ray Brook.

Quality Assurance / Quality Control (QAQC)

The senior creel clerk will ride along with the less experienced clerk on the first survey to introduce them to the locations, provide instruction on interviewing, and show them how to properly fill out the data forms.

Clerks will meet with the Biologist in-person (or have a phone call) no more than 1 day after completing their first solo survey to check understanding, resolve any issues, and answer questions. Clerks are expected to alert the Biologist to any problems as they arise so they can be addressed in a timely manner.

A Biologist will conduct unannounced site visits over the course of the creel to ensure that clerks are performing their duties.

The Biologist will monitor data entered throughout the creel season to check for any recording or typing errors. It is important that clerks send a copy of the data to the Biologist every week. Catching errors early can save time and headache later. Two staff will QAQC the data set before analysis begins.

Data Analysis

Characterize the present-day angler use and exploitation of all species in the Lake Champlain salmonid fishery by analyzing the following:

- Angler's preferred target species,
- Catch and harvest rates for each species per hour for each river by month,
- Ratings of the Atlantic salmon fishery for each river,

- The number of lamprey wounds per one hundred fish for each of the salmon species.

All angler comments and concerns will be recorded and used to develop opinion questions for the next survey.

Clerks will record the angler-provided start time for each interview and the interview time or the end time if the angler is done fishing for the day. Hours fished will be calculated later.

Angler effort will be obtained from instantaneous counts. Counts will be used to estimate angler days. Angler days are multiplied by the average length of completed trips to get angler hours.

Catch rates:

For complete trips, the ratio of means catch rate estimator will be used (Figure 3). Vehicle and angler counts provide an index to N.

For incomplete trips, the mean of the ratios catch rate estimator will be used. This technique calculates individual catch rates for each interview. The mean of individual ratios of catch is divided by effort for each angler.

Reporting

Once the first year of data has been collected, a report will be written summarizing the current creel data and documenting any changes for the next survey. The report will be submitted to Central Office for record keeping and will be posted to the NYSDEC website. The Report will also be presented at the next available Lake Champlain Fisheries Technical Committee meeting.

Literature Cited

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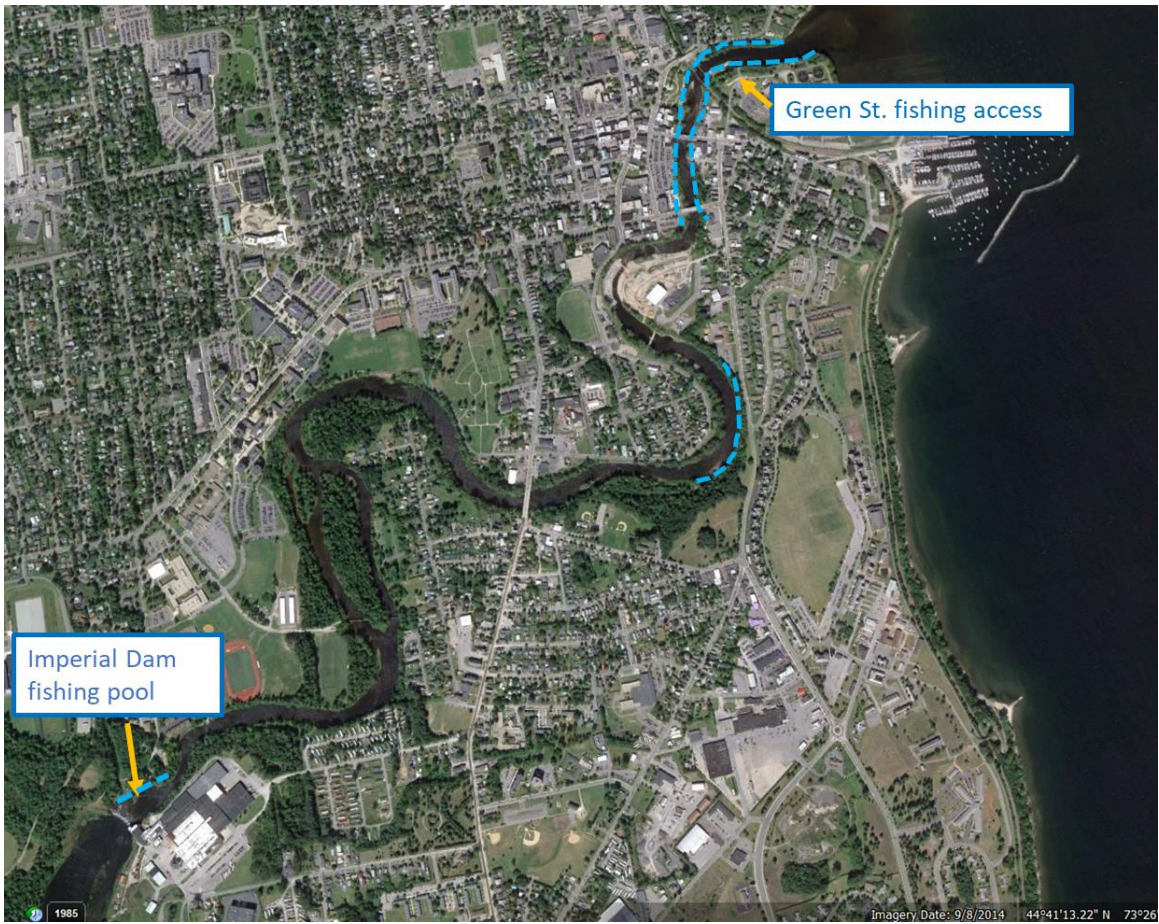


Figure 1. Map showing the fall river creel survey sites on the Saranac River. Blue dotted lines show public fishing access.

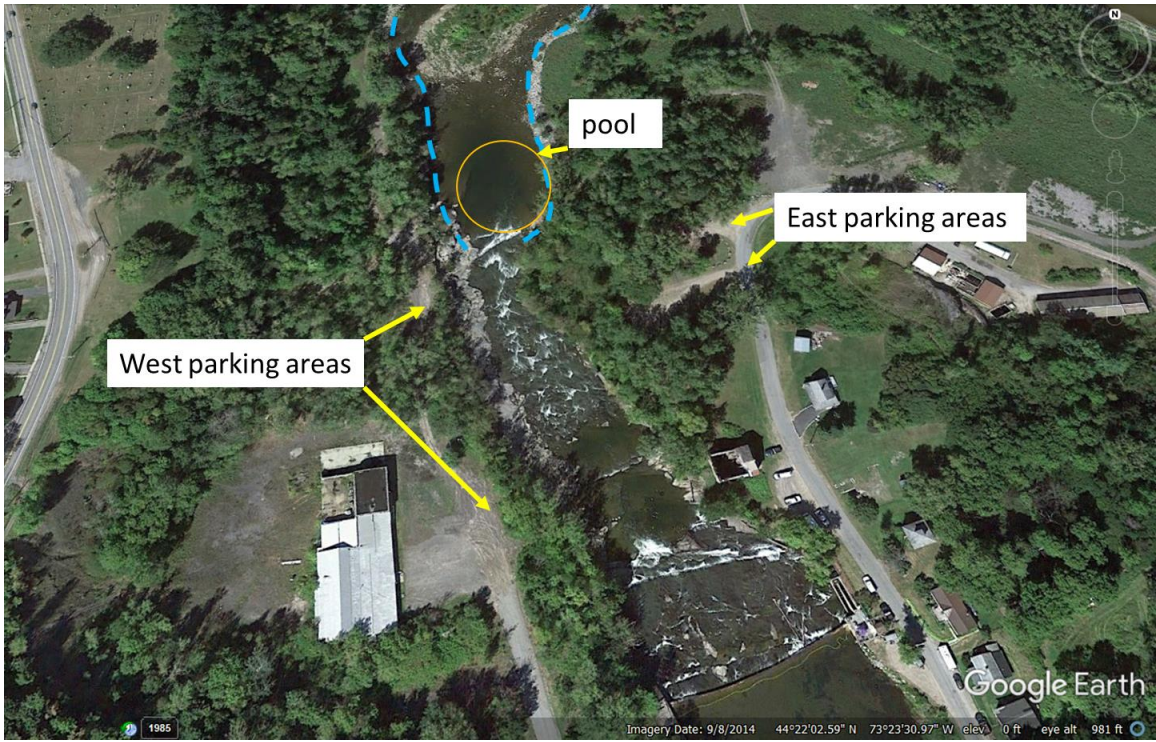


Figure 2. Map showing the fall river creel survey sites on the Boquet River. Blue dotted lines show public fishing access.

Ratio of Means Stratified Catch Rate Estimator for Complete Trip Interviews

y = fish caught or harvested, x = hours fished by angler i in stratum h and L is the total number of strata. N is the estimate of overall effort.

$\hat{R}_h = \frac{\bar{y}_h}{\bar{x}_h}$ is the rate in stratum h and $\hat{R} = \frac{\bar{y}_{st}}{\bar{x}_{st}}$ is the overall rate

estimator

where:

$$\bar{y}_{st} = \frac{\sum_{h=1}^L N_h \bar{y}_h}{N} \quad \text{And} \quad \bar{x}_{st} = \frac{\sum_{h=1}^L N_h \bar{x}_h}{N}$$

and the variance of \hat{R}_h is:

$$V(\hat{R}_h) = \left(\frac{N_h - n_h}{N_h} \right) \frac{\sum_{i=1}^{n_h} (y_{i,h} - \hat{R}_h x_{i,h})^2}{n_h (n_h - 1) \bar{x}_h^2}$$

(We will ignore the finite population correction factor with the Champlain data since we do not have an actual effort estimate)

Figure 3. Formulas for calculating the ration of means catch rate estimator.

Appendix 1. 2024 Fall river creel schedule and count form, September

Boquet River			Count form						Flow (cfs):
Date	AM/PM	Count time	West bank lot		East bank lot		fishing pool		Comments
			Cars	Anglers	Cars	Anglers	Cars	Anglers	
9/15/2024	AM	800							
9/16/2024	AM	1000							
9/18/2024	PM	1400							
9/19/2024	PM	1400							
9/20/2024	AM	1100							
9/21/2024	PM	1800							
9/22/2024	PM	1900							
9/23/2024	PM	1700							
9/26/2024	PM	1500							
9/27/2024	AM	800							
9/28/2024	PM	1900							
9/29/2024	AM	800							
9/30/2024	PM	1900							

Appendix 2. 2024 Fall River creel survey questionnaire

Clerk: _____ Access Point: _____ Interview #: _____ Boat / Wading / Shore

Date: ____/____/2024 Time of interview: ____:____ Weekday / Weekend

1. What time did you START fishing today? ____:____ AM / PM Trip Complete / In-complete
2. What time did you STOP fishing? ____:____ AM / PM Did you take any breaks? _____ total minutes
3. What species were you fishing for today? [record any lengths they tell you for fish that they released]

Atlantic salmon Caught: _____ Kept: _____ Lengths: _____

Brown trout Caught: _____ Kept: _____ Lengths: _____

Rainbow trout Caught: _____ Kept: _____ Lengths: _____

Brook trout Caught: _____ Kept: _____ Lengths: _____

_____ Caught: _____ Kept: _____ Lengths: _____

_____ Caught: _____ Kept: _____ Lengths: _____

4. May I measure your fish and take a fin clip? Y / N [length to the nearest half inch]

Fish #	Species	Length (inches)	Fin Clip	# lamprey wounds	Genetic sample ID
1					
2					
3					
4					
5					

5. On a scale of 1 to 5, with 1 being the worst and 5 being the best, how would you rate your fishing experience today?
1 2 3 4 5
6. Do you fish any other Lake Champlain tributaries for salmon and trout? Y / N If YES, where: _____
7. Have you already been interviewed this season? Y / N If Yes, skip to 12. Comments
8. If NO, How many days do you typically fish the rivers between March and June? _____
9. If NO, What state and county do you live in? State: _____ County / Province: _____
10. If NO & targeting salmon: How would you rate the number of fish in the salmon run this year?
below average / average / above average
11. If NO & targeting salmon: How often do you release salmon that you could legally harvest while fishing Lake Champlain tributaries? All of the time / most of time / some of time / never
12. Do you have any comments or concerns about the fishery?