# Central Queens Branch of the PEI Wildlife Federation 2022 Electrofishing Summary on the West and Clyde River

**Prepared by**
**Jordan Condon** ***(Project Coordinator)***
**Mark Campbell** ***(Restoration Technician)***
**Knowlton Parkman (*Restoration Technician)***
**Central Queens Branch of the PEI Wildlife Federation**
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## Introduction

The Central Queens Branch of the PEI Wildlife Federation (CQWF) carried out its annual electrofishing surveys in 2022 to assess juvenile salmonid abundance throughout the West River and Clyde River. The surveys target native juvenile species such as Atlantic salmon *(Salmo salar*) and brook trout (*Salvelinus fontinalis*) but also rainbow trout (*Oncorhynchus mykiss*), which are considered non-native to PEI.

Surveys targeted juvenile habitats in order to determine spawning success and recruitment from year to year at long-term index sites. These index sites were established in order to help monitor long-term population trends in salmonid communities and are assessed on an annual basis. Index sites are located on major tributaries (2nd and 3rd order streams) and also include sites along the main river (3rd and 4th order streams). Sites were strategically chosen to be representative of stream habitat and cover areas where there have been historic records of salmon or brook trout spawning efforts. In some instances, sites were established to monitor the survival success from hatchery-stocked fry. Typically juvenile habitat contains shallow waters (<60cm) with a lack of deep pools (>60cm) and coarse stream bottom substrate.

The main objectives for 2022 electrofishing surveys were to determine local juvenile abundances for salmonid species and to determine which sections of river habitat are currently being utilized by Atlantic salmon.

## Methods

A battery-powered Smith-Root LR-24 electrofisher was used to conduct surveys. An electrical current is produced to immobilize fish and a crew is nearby to capture the stunned fish using dip nets. Captured fish are placed in a bucket and held until processed.

In order to measure density, a site is enclosed with barrier nets to prevent any immigration or emigration of fish during the survey. Normally 3 sweeps (sometimes 4) are carried out through the entire site to establish a diminishing return of captured fish. Captured fish are identified by species and then measured to fork length to determine age class. Once all the captured fish are processed they are released back to the stream. Measurements are taken at the site to determine the total area of stream surveys which will be used with the Zippin Three Sample method to determine a population estimate within the site surveyed. The population estimate is then used to determine the number of fish per $100m^2$ and will be presented in that

format for the purpose of this report. Other measurements also taken at each site include water temperature and GPS location.

**Results**

In 2022 a total of 14 sites were assessed by the CQWF field crew between August 22th - 26th on the West River and Clyde River. Of the 14 sites, 12 were on the West River and 2 were on the Clyde River (Figures 2 and 3).

During our 2022 electrofishing surveys, brook trout were present at all 14 sites surveyed. Brook trout spawning occurs more frequently on tributaries rather than along the main river and extends into the headwater regions. Abundances ranged from 17.2 to 99.8 fish per 100 $m^2$ and averaged 45.5 fish per 100 $m^2$ (Table 1). There did not appear to be a significant relationship between the number of brook trout and other salmonids at any site.

Atlantic salmon were present at 11 of the 14 sites surveyed while abundances ranged from 0 to 107.3 per 100 $m^2$ and averaged 10.1 fish per 100 $m^2$ during 2021 electrofishing surveys (Table 1). Preliminary results indicate many sites have moderate populations of salmon, 9 sites had 0.1-25 fish/100 $m^2$, 1 site had 25.1-50 fish/100 $m^2$, 1 site had >70 fish/100 $m^2$ (the site may be overestimated), and 3 sites had 0 fish/100 $m^2$. The upper sites on Howell's Brook (Quinn and Wynn Rd) do not have a history of salmon spawning but low densities of salmon were found at the Quinn Rd site. This could be relative of the quality of habtiat and the parrs ability to seek out ideal habitats. Also, the Clyde River recently lost its salmon population (last detected in 2012) and it is expected not to have any salmon present at the sites. In 2022 no juvenile Atlantic salmon were detected on the Clyde River (Figure 2). Stocking of salmon fry occurred in 2022 (started in 2015) along several reaches of the West River and influenced electrofishing results at 6 sites (W-Bvale 1, W-Bvale 2, W-Bvale 4, W-Quinn 1, W-Howells2 and 3) . It is difficult to distinguish if the second age class of parr is native spawned or stocked fish due to their tendencies to move around. However, it is still important to monitor sites that may have been influenced by stocking efforts in order to determine the survival success of stocked fish. Sites along the West River main branch are representative of native-spawned fish. Inaccuracies in the salmon population estimation may have occurred at Curley's site in Brookvale (Bvale-1) due to a disproportion in fish captured during the three passes. A similar amount of fish was captured in the second and third pass resulting in an overestimation of the population within this site.

Rainbow trout were present at 14 of the 14 sites surveyed. Abundances ranged from 14.5 to 95.3 per 100$m^2$ and averaged 38.2 fish per 100$m^2$ during 2022 electrofishing surveys (Table 1). Rainbow trout are a nonnative species and are considered to be invasive and may compete with Atlantic salmon for habitat usage in tributary areas since both species prefer swift riffle habitats. Rainbow trout were the dominant fish at the Carragher's site on Quinn's Brook. This may be related to water temperature as this tributary is the warmest on the West River and may allow for faster growth rates and better-growing conditions for the spring-spawned fishes. This, however, is just an observation with no scientific evidence to support this assumption.

**Recommendations**

Moving forward, additional index sites along the main branch may be considered to be monitored in future endeavors to better represent the spawning population due to the bulk of spawning efforts being located along the main branch of the West River. It would be beneficial to have these index sites away from areas that are influenced by stocking efforts to have an adequate representation of population trends on the main West River. CQWF will strongly consider using some of the electrofishing sites surveyed in UPEI's study on the West River as long-term index sites.

Table 1. Juvenile salmonid abundance calculations as fish per 100m$^2$ for 14 sites electrofished in 2022 by CQWF.

| Site Location | Site Category | Brook Trout | Rainbow Trout | Atlantic Salmon |
|---|---|---|---|---|
| Brookvale (Main branch) | W-Main1 | **29.6** | **21.7** | **5.2** |
| Cudmores (Main River) | W-Main2 | **73.3** | **42.3** | **2.4** |
| Bolger Park Rd (Main River) | W-Main3 | **23.5** | **31.4** | **23.6** |
| Curley's (Brookvale) | W-Bvale1 | **99.8** | **14.5** | **107.3** |
| Patsy Arsenault's (Brookvale) | W-Bvale2 | **36.4** | **19.9** | **12.4** |
| Skye Bk (Brookvale) | W-Bvale3 | **35.8** | **36.9** | **0** |
| Below Hatchery (Brookvale) | W-Bvale4 | **17.2** | **14.8** | **15.9** |
| Carraghers (Quinn's Brook) | W-Quinns1 | **29.3** | **95.3** | **0.7** |
| Riverdale Rd (Howell's Brook) | W-Howells1 | **42.5** | **28.5** | **5.7** |
| MacDonald's (Howell's Brook) | W-Howells2 | **46.8** | **54.2** | **3.8** |
| Wynn Road (Howell's Brook) | W-Howells3 | **77.8** | **46.2** | **31.4** |
| Quinn Road (Howell's Brook) | W-Howells4 | **57.9** | **61.2** | **1.1** |
| Dixon's Dam (Clyde River) | C-Main | **35.3** | **27.1** | **0** |
| Alex Dixon's (Clyde River) | C-North | **32.1** | **41.2** | **0** |

Table 2. Range densities for salmonids captured during electrofishing surveys.

| | |
|---|---|
| 0 | |
| 0.1 - 25 | |
| 25.1-50 | |
| 50.1-70 | |
| >70 | |

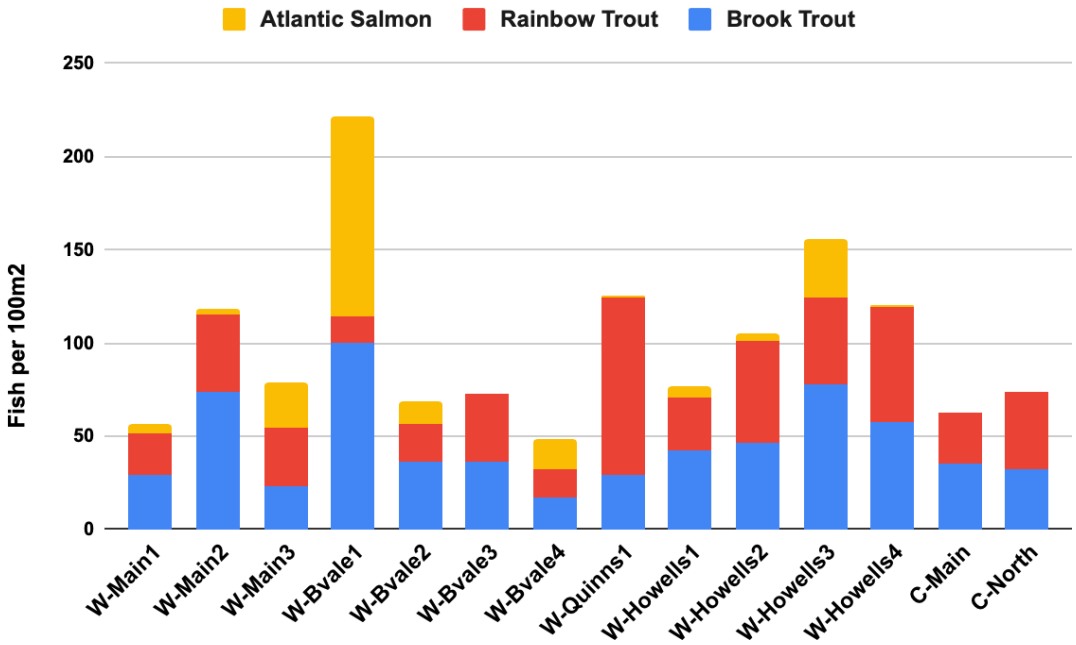


Figure 1. Electrofishing results from 2022 West River and Clyde River sites with fish captured calculated fish/100 $m^2$.

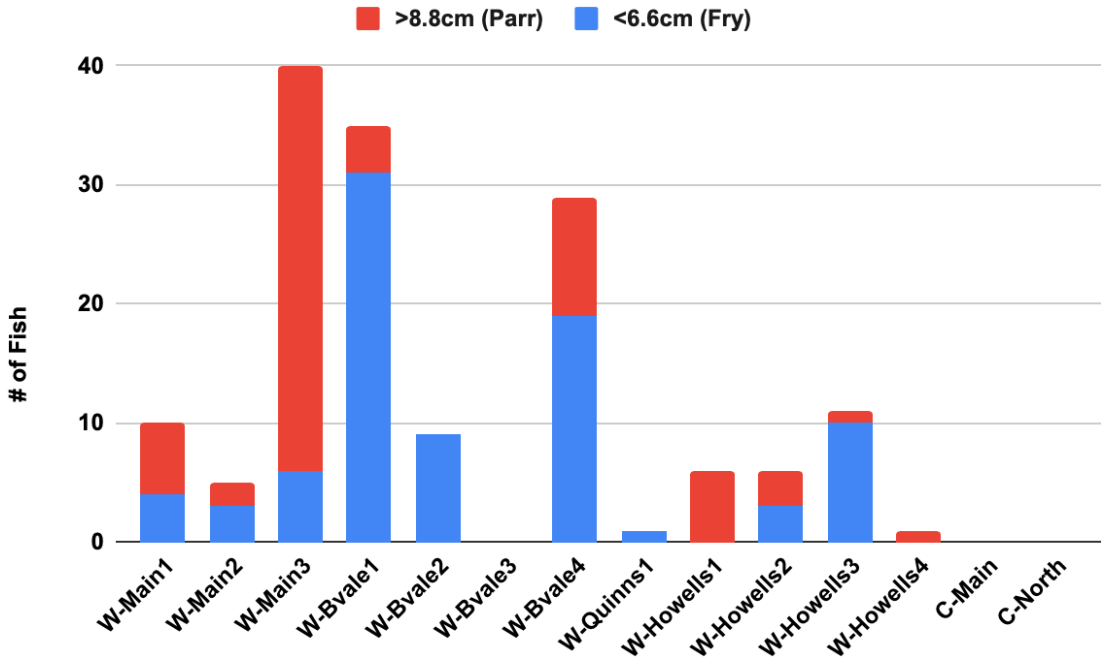


Figure 2. Age class distribution of Atlantic salmon for sites during electrofishing surveys in order, 2022.

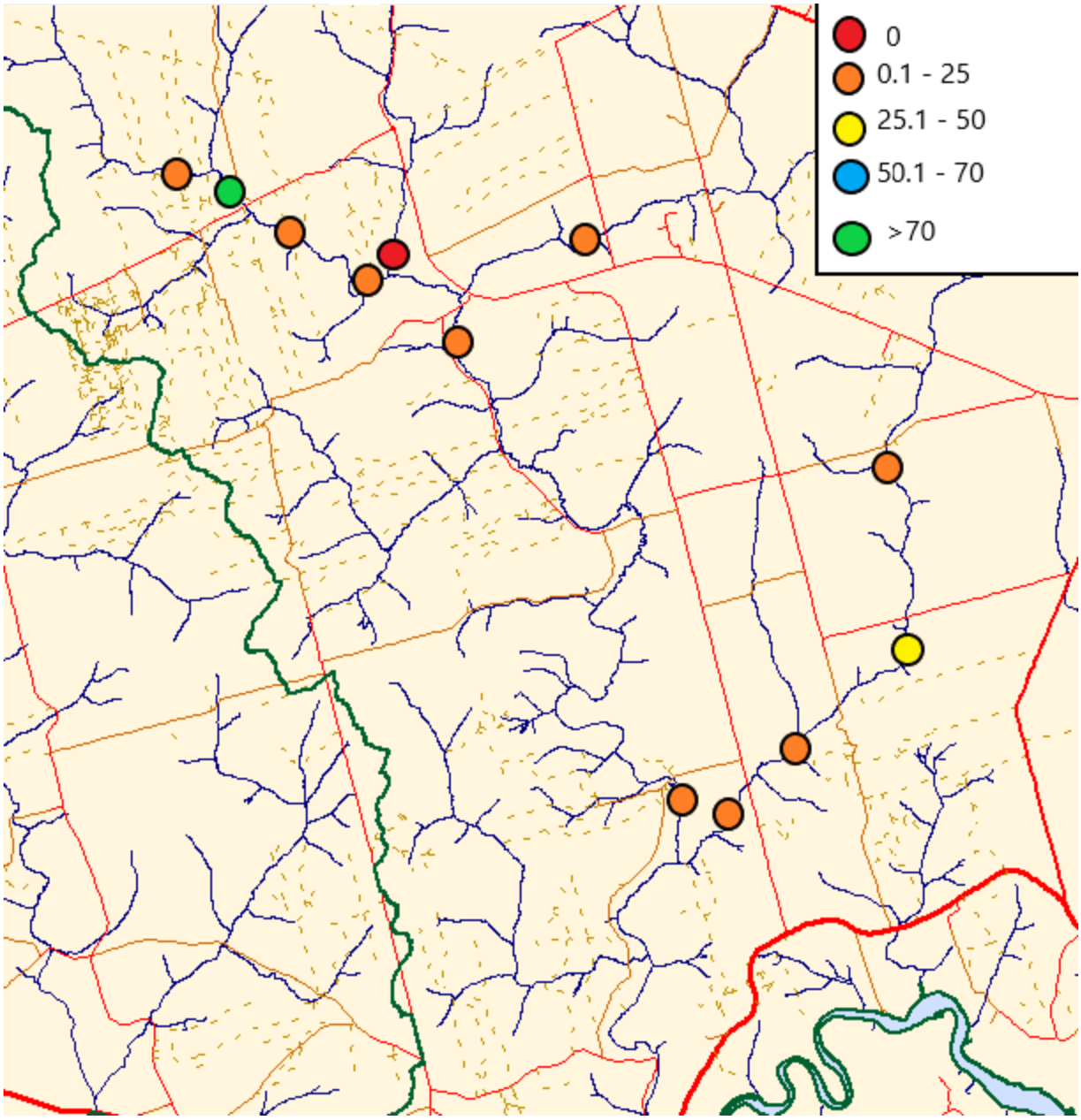

Figure 3. West River 2022 electrofishing survey sites with Atlantic salmon densities

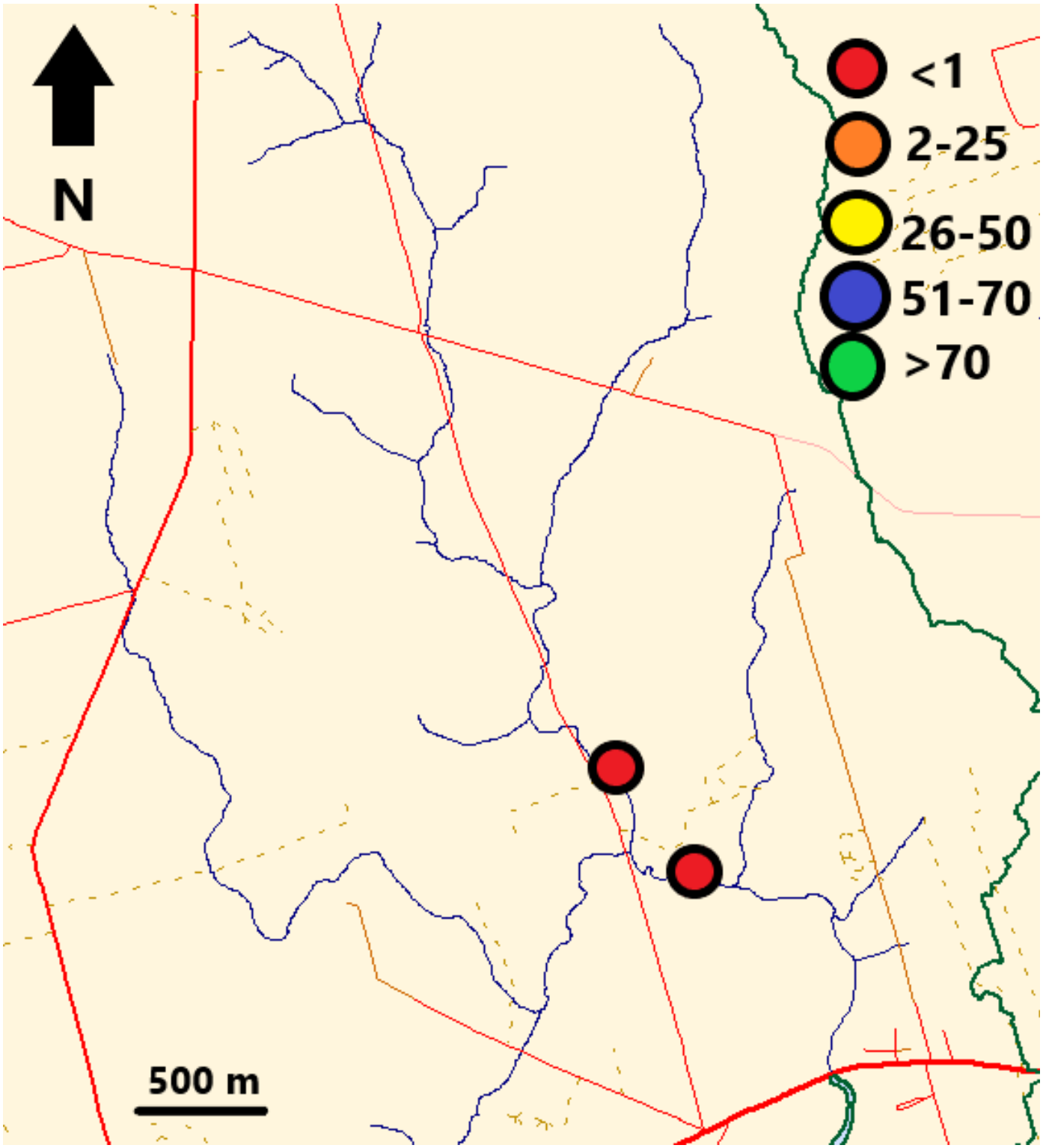


Figure 4. Clyde River 2022 electrofishing survey sites with Atlantic salmon densities