

**Central Queens Branch of the PEI Wildlife Federation 2025
Thermal and Brook Trout Redd Survey Summary**



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Introduction

The Central Queens Branch of the PEI Wildlife Federation (CQWF) employed a new method to help gather further information on how we visualise our river systems through a different lens than our crew can observe with the naked eye. The value of being able to understand the further intricacies of thermal input through coldwater plumes coming from tributaries and springs in the West and Clyde Rivers can help to guide management decisions in the future through the implementation of this technology our crew was able to map out thermal input on our rivers to a higher degree of accuracy by cataloguing the various springs and tributaries that showed a contrast to the river temperatures in the main vein of the areas being surveyed.

The management implications that CQWF can gather through these surveys hold a multitude of positive implications for the rivers we manage. Brook trout (*Salvelinus fontinalis*) shares a close affinity to the upwellings that instream spring seepages provide; their Latin name loosely translates to “Dweller of springs”. By identifying these areas, improvements to the habitat utilised by these salmonids can be planned, which remains an activity that largely remains in its infancy on PEI. Through identifying these thermal inputs, work can be carried out in the future to hopefully make strategic plans moving forward to improve or create new viable spawning habitats on the rivers we manage.

Another facet of this study was to do comprehensive spawning surveys for brook trout in our rivers and cataloguing all of the spawning hotspots we observed. This is something that our crew has performed in previous years but not to the extent that we performed these surveys to this year. This will also help us to make further management decisions on our river by knowing areas that show high productivity can be prioritized for protection, as they already show high productivity within these sections, whereas sections with lower productivity can have strategic actions implemented to hopefully improve the productivity of these areas to increase spawning efforts and productivity.

Methods

During CQWF’s redd surveys our field crew brought a thermal camera (FLIR TG 165-X), and a HOBO temperature logger (Onset HOBO MX2201 pendant). When walking sections of stream for our redd surveys we located major brook trout spawning areas that had more than 5 redds in a small area. Prominent brook trout spawning spots were recorded on a

Garmin GPS, and temperature readings were conducted to determine any temperature change. We would first use the handheld thermal camera to try to identify any areas where surface water temperatures were drastically different. If we could not get a proper temperature reading with the handheld thermal camera, we would deploy our temperature logger for more accurate results. The temperature logger was attached to a stick and was slowly moved around the spawning area along the stream substrate and into the stream substrate out of the spawning area to see if any noticeable differences could be observed. This ensured the most accurate temperature readings. The temperature data would then be displayed on a phone showing the difference in temperatures throughout the large spawning area. These steps would then be followed for any major brook trout spawning areas that were encountered on our redd walks.

Results

This year marked the first year where extensive brook trout spawning surveys were undertaken on the West and Clyde Rivers. An additional facet to this included the use of a thermal imaging device and bluetooth hobo temperature logger to help to understand whether spring seepages influenced any spawning areas in either of these watersheds. Areas surveyed were broken into sections where distinguishing borders could be established. These included: Lower West River (Crosbies pond to Green Bay culvert), Mid West River (Green Bay culvert to Cudmores), and the upper West River (Cudmores to the forks above Rt 13). Additional Tributaries were surveyed, including Howells Brook and Quinns Brook. Gass' Brook and Black Brook were also planned to be surveyed for spawning efforts.

A total of 26 prominent brook trout spawning areas were identified throughout the 2025 spawning survey season. Additional counts of individual redds were obtained and separated into each section, which were surveyed during the 2025 season (Table 1). In total, five spring seepages were identified and catalogued during the 2025 survey season; an additional eight coldwater inputs from first-order tributaries were catalogued for future restoration actions to be implemented. While the numbers obtained for 2025 were lower than our crew was anticipating, this represents one of the first years where a fully fleshed-out redd survey was undertaken for the Clyde and West Rivers. Conditions for redd surveys were manageable through the redd survey season; however, weather constraints in December led to limited access for our crew to complete

final counts, and this resulted in missing some areas for redd surveys to be completed during the 2025 field season (Gass' Brook and Black Brook).

These areas are planned to be surveyed in 2026, and a better framework for the areas of prominent brook trout spawning areas will be established when surveying from the canoe (Lower and Mid West River).

Clyde River

Clyde River was surveyed from the highway overpass up to the first laneway crossing above Dixons Dam. In total, 42 brook trout redds were observed, and six prominent spawning areas were catalogued during the 2025 field season, along with one spring seepage marked and catalogued.

West River

The West River had twenty total prominent brook trout spawning areas identified. A total of four springs were identified, and 4 coldwater inputs were catalogued. A total of 334 brook trout redds were counted on the West River for the 2025 survey season. A further area breakdown is provided below (Table 1).

	Lower West River	Mid West River	Upper West River	Howells Brook	Quinns Brook	Black Brook	Gass' Brook	Clyde River
Total Redds	0*	0*	55	48	231	N/A	N/A	42
Total Prominent Spawning areas	0*	1	5	4	10	N/A	N/A	6
Total springs	1	0	1	0	2	N/A	N/A	1
Total Coldwater Inputs	0	0	4	0	0	N/A	N/A	1

Table 1. Table with further breakdowns into each section of river surveyed during the 2025 redd surveys. A * indicates that no accurate brook trout counts were taken

Discussion

2025 marked the first year extensive redd surveys were conducted for brook trout in the West and Clyde Rivers. While the numbers were lower than our group had expected, invaluable insights were gathered by conducting these surveys. This included the large role instream cover played in prominent spawning areas. A large amount of the prominent spawning areas included cover logs or above-stream cover in close proximity to these spawning areas. Another valuable insight was the time of year in which we utilised the handheld thermal imaging device and the temperature logger. No significant contrast was observed from the regular stream temperatures on the rivers we surveyed, as the water temperature was $\sim 4^{\circ}\text{C}$, which made it hard to pick up any significant contrast from the stream temperature compared to any spring seepages, which may be nearby. While the crew tried to implement several methods to help with identifying these spring seepages in the surveyed rivers, both the thermal imaging camera and temperature logger had trouble picking up any noticeable temperature changes in these spawning areas whether the seepage was diffusing into the river water too quickly or whether the contrast of temperatures coming from the areas was too close to the river temperature remains an unknown. To rectify this, next year our group plans to take the thermal imaging device and water temperature logger during the summer field season, when water levels should be lower, and water temperatures should show a higher contrast. We hope that this will help us to catalog a larger number of spring seepages within the stream bed.

Other considerations to take into next year are the difficulty in marking some of these prominent spawning areas from a canoe may provide and the time constraints of counting large volume spawning areas during our redd survey season. The lower and mid river sections of the West River reflect this as obtaining accurate counts from a canoe had certain difficulties to it however prominent areas were still noted for future restoration work, such as throughout the Green Bay section, leading into the Riverdale Horseshoe and Sweenies section.

It should be noted that five of the prominent brook trout spawning areas on the Clyde River were within the tidal section. This should mean that these spawning areas have spring seepages within these spawning areas, which makes it attractive for brook trout to spawn in. However, no significant contrast in temperatures was able to be identified at any of these locations.

Future Management Implications

Cataloguing the springs and cold water inputs from first-order tributaries provides countless opportunities to pursue in the future. Brook trout spawning enhancement remains a relatively new concept within our province. However, the results gathered in this first year of study will provide a leap forward and tangible information that our crew can utilise in a targeted approach to improve upon existing spawning sites and enhance areas that are not utilised by brook trout. By identifying these prominent brook trout spawning areas, spawning gravel can be loosened heading into the spawning season to help enhance spawning success and help to create more prominent upwellings that make attractive spawning habitat for brook trout. This can also help in areas of spring seepages that were identified without any nearby spawning efforts noted. Other methods can be implemented to increase spawning success, such as the targeted addition of Coarse Woody Materials (CWM) to improve cover habitat nearby to ensure spawning brook trout have confidence to spawn in this area, as a large number of redds were observed in direct adjacency to cover logs and above stream cover that was installed by CQWF in the past years.

Areas lacking certain factors that make for successful brook trout spawning can be enhanced through prescribed tactics that CQWF will be trialing for the upcoming field season to improve or create new spawning habitat. These methods will include more strategic woody material addition to the stream bed and researching potential methods to create artificial upwellings in the streambed to make artificial spawning beds for trout to utilise.

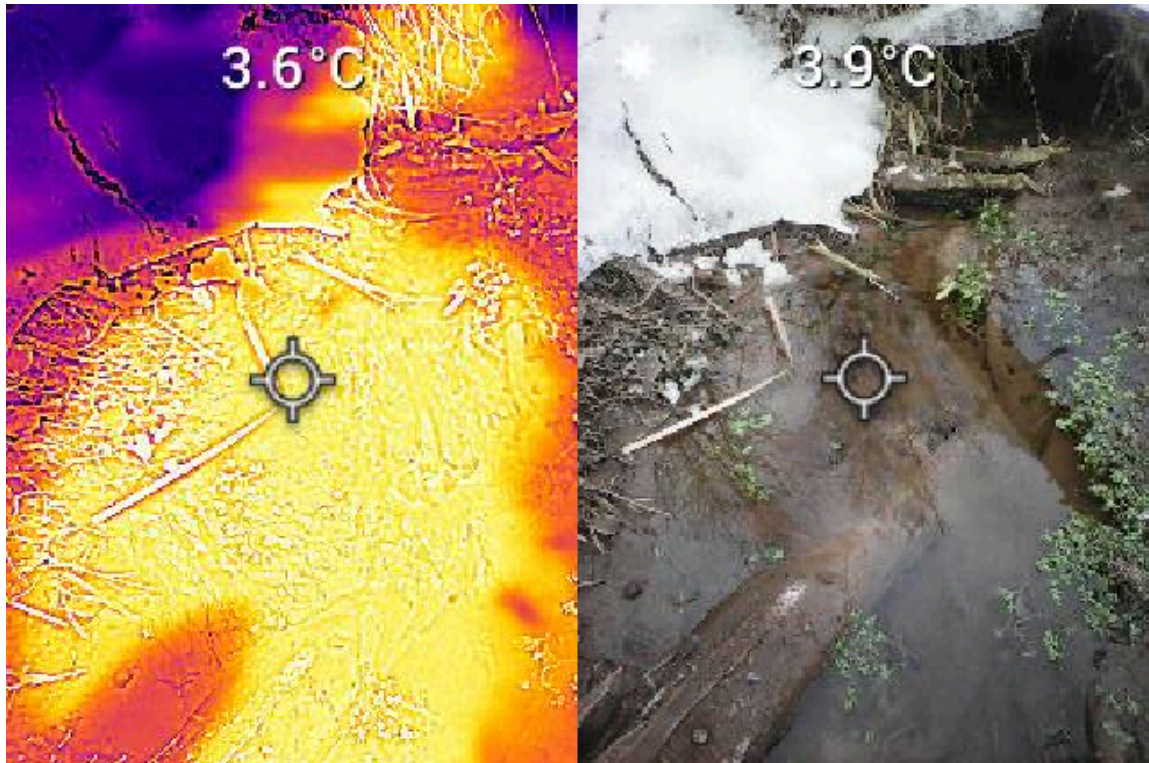


Image 1. An identified spring during the 2025 survey season through the thermal lens and the normal lens options on the TG 165-X

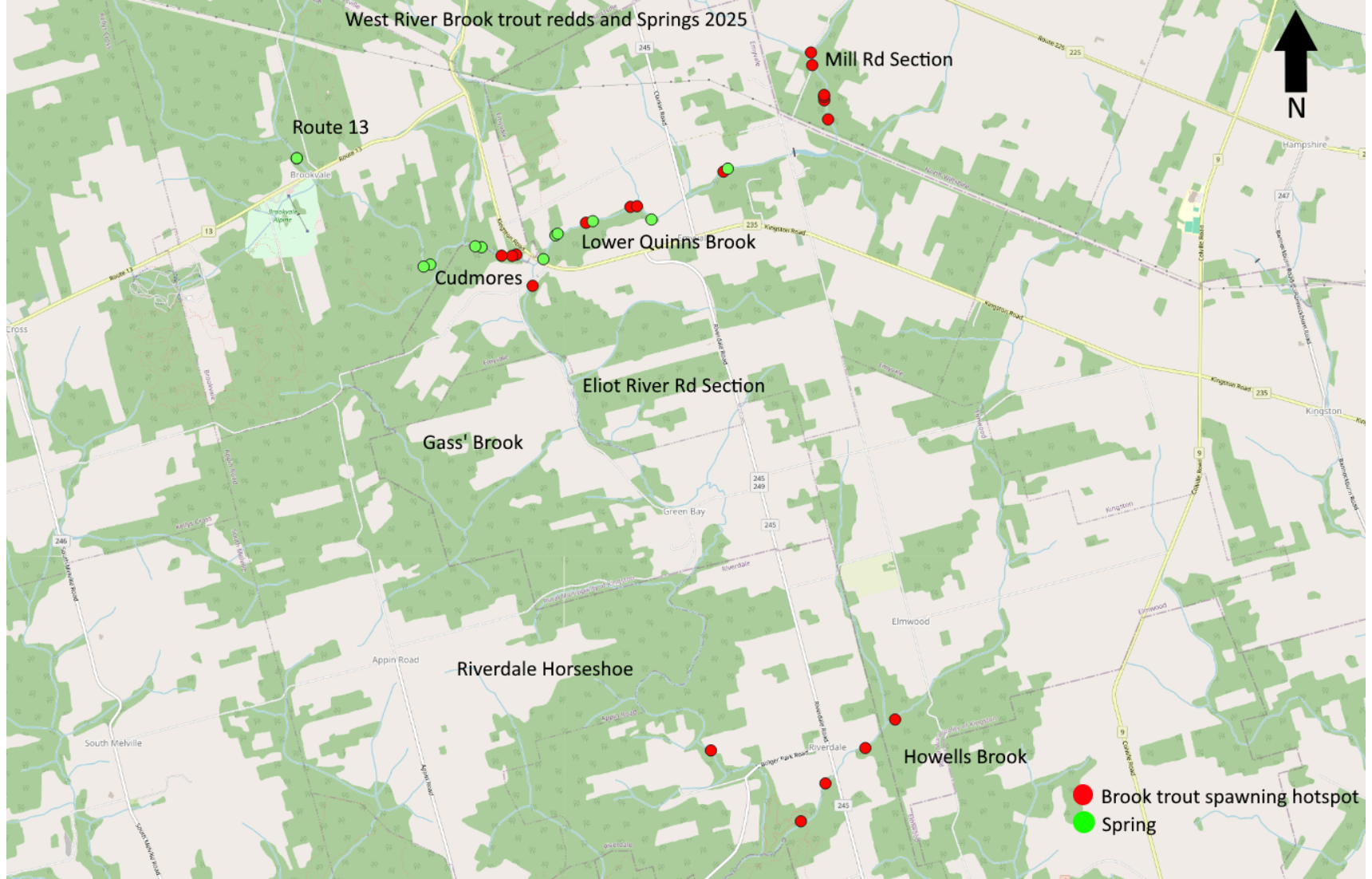


Figure 1. Brook trout spawning hotspots and springs catalogued on the West River in 2025.



Figure 2. Brook Trout spawning hotspots and springs catalogued on the Clyde River in 2025.