

Watershed Planning: AERF

Cornwall and Area Watershed Group Inc.

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Section 1: Scope & Purpose

Watershed Group Mission & Structure

The Cornwall & Area Watershed Group (CAWG) is a community-based group whose goal is to enhance the water quality and health of our local waterways, to restore and protect wildlife habitats, and to improve active living through increased recreational opportunities. To accomplish this, we focus on four main objectives:

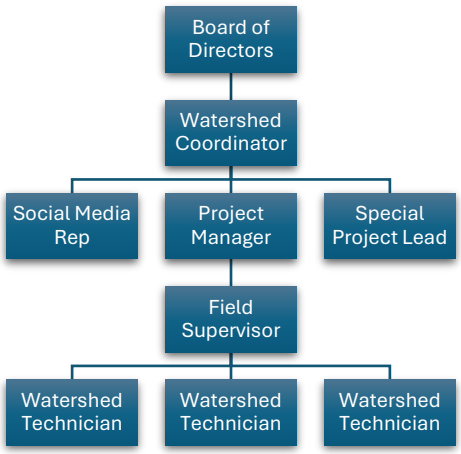
- Evaluate our Watershed – Develop and implement science-based programs to research, assess, monitor, and evaluate.
- Advocate for our Watershed – Advocate for sound air, land, and water use planning, as well as management practices and policies.
- Communicate and Educate – Develop and implement public information and education programs that promote sustainability and an understanding of the impact of human actions on the watersheds.
- Preserve and Revitalize – Promote buffer zone regulations and best practices that support an environmentally sustainable community structure. Invest in the revitalization of areas of the watershed that have been damaged by human actions.

CAWG has been active since February 2009. It was founded by a group of Cornwall residents that wanted to play an active role in the preservation and revitalization of our watershed. Our group includes community residents, farmers, landowners, and government in collaborative watershed planning and active support for environmental stewardship.

In addition to the efforts of our staff and board members, CAWG partners and collaborates with the following groups and organizations:

- Prince Edward Island Watershed Alliance
- The Forests, Fish and Wildlife division of the Dept. of Environment and Climate Change
- The Atlantic Salmon Federation
- The Foundation for Conservation of Atlantic Salmon
- PEI Department of Agriculture
- PEI AgriWatershed Partnership Program
- Town of Cornwall
- Miltonvale Park
- PEI Invasive Species Council
- PEI Department of Transportation
- Various other PEI watershed organizations
- Landowners within the North River and Hyde Creek watersheds

CAWG operates on a policy board governance model, with a volunteer board of directors that makes policy and governance decisions. The board employs a Watershed Coordinator and staff to carry out the daily work of the organization. The Watershed Coordinator holds authority over the day-to-day administration and operations of the organization and reports directly to the board, acting as a liaison between the board and the staff. The Project Manager reports to the Watershed Coordinator and manages the logistics of routine crew activities and project implementation. Reporting to the Project Manager is the Field Supervisor, who leads the field crew on the job site. The field crew is made up of technicians who carry out survey and data collection, event staffing, and habitat rehabilitation activities. The number of field crew members fluctuates from year to year based on project needs and funding access. Crew members are occasionally contracted for additional roles in which they report directly to the Watershed Coordinator, such as social media representative, data technician, or special project lead.



Watershed Management Area

CAWG performs habitat rehabilitation and environmental stewardship activities within the North River and Hyde Creek watershed areas, excluding a small eastern portion of the North River watershed which is managed by the Ellen's Creek watershed group (**Fig. 1**). These watersheds lie to the west of Charlottetown, encompassing the communities of Cornwall, Miltonvale Park, Warren Grove, Winsloe, North River, and Charlottetown.

Land use in both watersheds is heavily agricultural, punctuated by a swath of urban land use surrounding the North River Causeway, Town of Cornwall, Beach Grove, and the Upton Rd area (**Fig. 2**).

Figure 1

The North River and Hyde Creek Watershed Areas

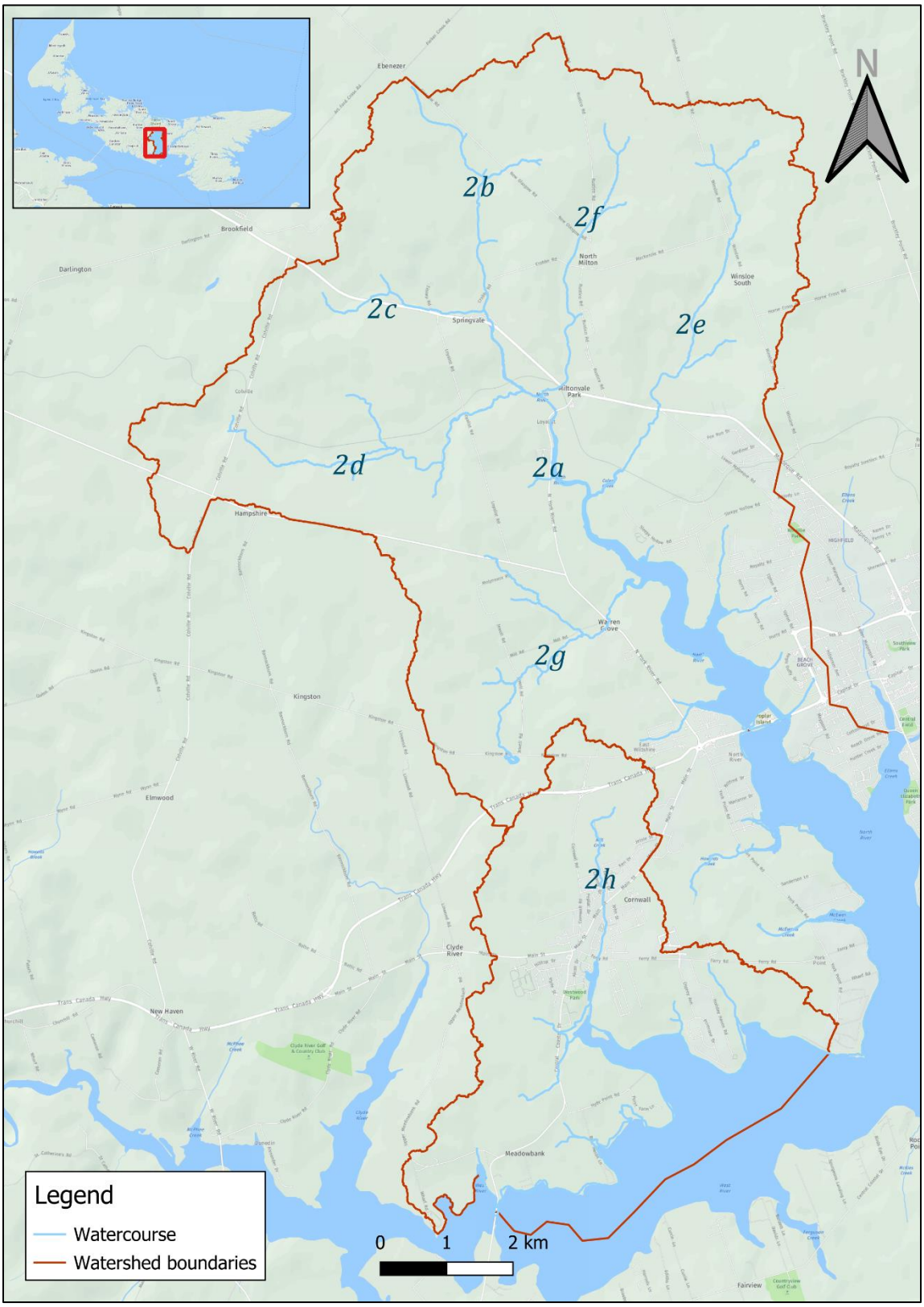
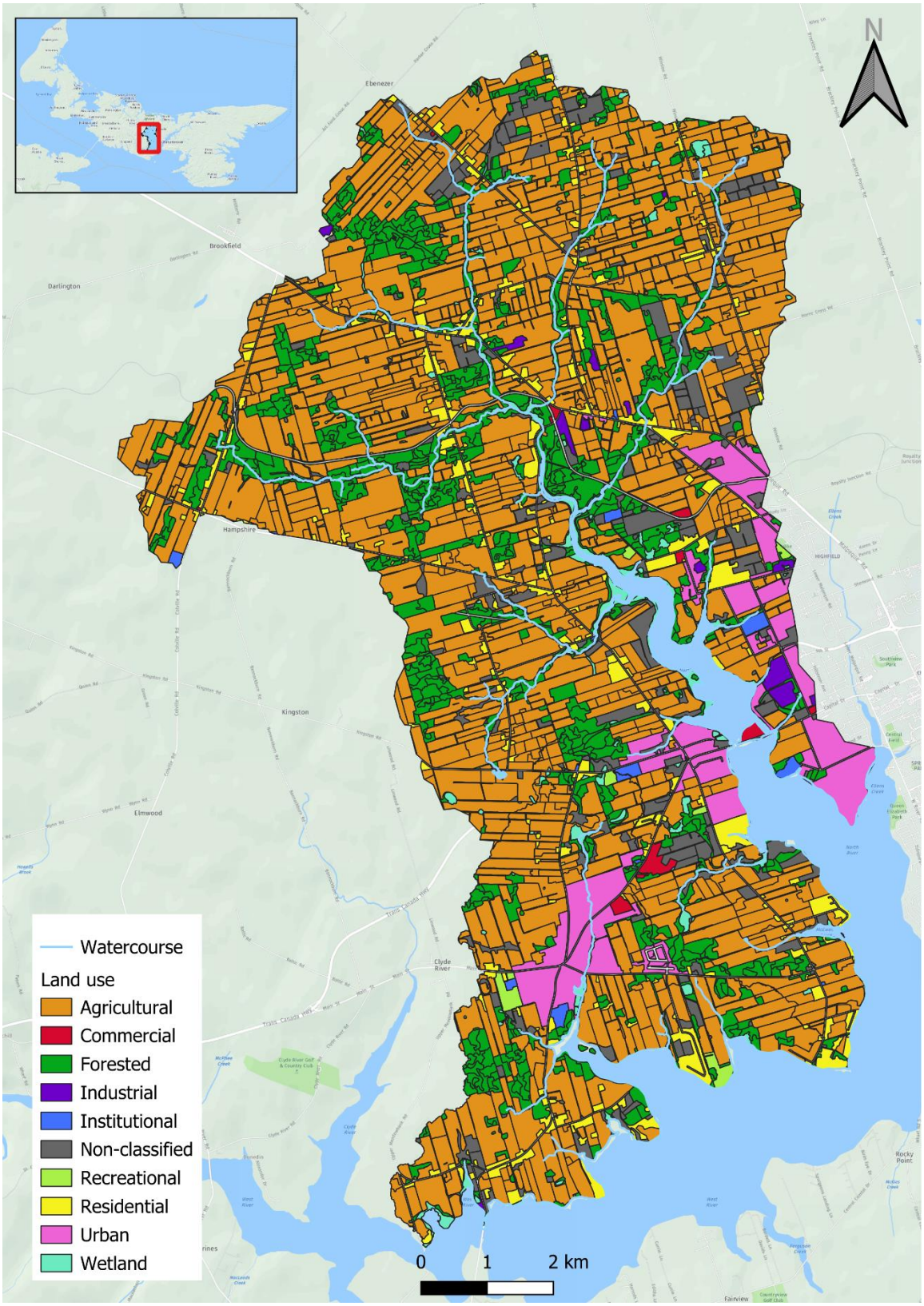


Figure 2

2020 Land Use Inventory of the North River and Hyde Creek Watersheds



High Level Goals

- Have aquatic habitat connectivity from head of tide to headwaters in The North River and Hyde Creek watersheds by 2030.
- Manage at least 15 acres of mature Acadian Forest that is biodiverse to provide for wildlife and the community.
- Become an established force for environmental conservation in all communities within watershed boundaries by 2035.
- Have sustainable populations of native salmonids across various life stages in the North River and Hyde Creek watersheds.
- Have at least 2 layers of biodiverse vegetation (ground layer and shrub layer) across 200 hectares of the buffer zones in North River and Hyde Creek watersheds by 2035 (increase by 4 hectares annually).

Purpose

This document will provide an overview of CAWG's organization and management areas for the benefit of partners, funders, stakeholders, and staff. It will combine various sources of information that are critical to decision making into a single, easy to understand, document, and will function as guidance for restoration activities.

Section 2: Sub-watershed Characterization

To avoid redundancies, all assessment and survey methods used by CAWG throughout our watersheds are fully described here. The methods applicable to each sub-watershed will be listed in brief under the relevant sub-watershed sections.

- **Damage and Vulnerability Assessments (DVA)**: This survey is based on the Canadian Wildlife Federation's Riparian Health Assessment Protocol, with several additions made to assess erosion issues, hurricane damage, tree stand resiliency, and invasive species. The survey upon which the DVA is based is a whole watershed assessment used to guide and assess restoration activities. CAWG plans to perform DVAs every 5 years to maintain an up-to-date picture of conditions throughout the watershed. **In March of 2025, a Fish Habitat Management Plan was completed for CAWG, which used fish habitat scores from the Damage and Vulnerability Assessment to quantify habitat quality by reach. Fish habitat scores are focused on the requirements of salmonids and are calculated based on the quality of spawning substrate, variety of fish cover types, barriers to fish passage, presence of springs and pools, and shade over the channel. These scores are referenced in Section 2 of this document to help describe the characteristics of the various sub-watersheds.** Parameters addressed in the assessment pertain primarily to freshwater habitats and therefore the assessment has not been applied to the lowest reaches where water in the channel is consistently brackish. There are also some scattered freshwater reaches that have yet to be assessed due to difficulties with crew access.

- **Stream crossing inventory**: In 2024, CAWG began updating their stream crossing inventory following the "Field Assessment for Determining Fish Passage Status of Closed Bottom Structures" protocol from the BC Ministry of Environment, 2011. This assessment will be completed every 5 years with annual monitoring as required.
- **Electrofishing:** These direct count surveys are performed by CAWG annually since 2021, in areas where Atlantic salmon spawning activity has previously been observed, with the primary goal of identifying and quantifying Atlantic salmon presence. The data collected from these surveys is also used to calculate population densities of brook trout and rainbow trout; however, since electrofishing surveys select for specific habitat types and CAWG does not randomize locations, these density calculations should only be considered informative and not definitive.
- **Rapid Geomorphic Assessments (RGA's)**: This survey consists of a group of 4 assessments that are typically performed together:
    - Rapid Geomorphic Assessment (RGA) uses a scoring system to determine if the channel is stressed, in transition, or stable.
    - Bank Data collects information about the bank and riparian zone.
    - Cross-Sections involve a series of measurements that can be used to graph a cross-section of the channel.
    - Rapid Stream Assessment (RSAT) uses a scoring system to assess the overall health of the reach.

  These assessments were introduced together in 2019 prior to the installation of a sediment trap on Watts Creek and additional survey locations were added with the installation of a rock deflector on North River. These surveys are performed yearly to monitor how these installations affect the geomorphology of the river.
- **Redd surveys:** these are performed yearly on the lower ends of tributaries with a history of Atlantic salmon presence. Prior to 2024 these surveys were performed once each fall and the data collected consisted of a count of redds and scrapes found. Species attribution was subjective. In 2024 CAWG began performing multiple passes of redd surveys throughout the spawning season to more accurately capture redd numbers. With assistance from the Government of PEI's Forests, Fish and Wildlife Division and the Central Queens Branch of the PEI Wildlife Federation, CAWG intends to expand the data collected during redd surveys to include measurements that will facilitate objective species attribution.
- **Bird surveys:** these are transect-based auditory surveys that were introduced in 2022 to capture information about bird species present in the two largest forest stands of late succession in the North River watershed. Over the years, transects have been added in other habitat types and as of 2025 CAWG will be uploading all bird survey data to the eBird platform.
- **Temperature logging:** CAWG introduced the use of temperature loggers in 2019 following concerns that our spring-fed streams may be too cold for emerging salmon fry. The data collected revealed water temperatures at the time of fry emergence to be within an acceptable range. Monitoring has continued, but several temperature loggers were lost following hurricane Fiona. CAWG plans to introduce temperature loggers in each tributary in 2025 to monitor temperatures for salmonid health, as well as above and below Hyde Pond.

- **Headwater surveys:** These were last completed in 2019. CAWG plans to re-introduce headwater surveys in 2026 using protocols provided by the government of PEI's Forests, Fish and Wildlife Division.
- **Water Quality Data:** CAWG has collected water quality data and uploaded that data to DataSteam for various projects, but there is no ongoing monitoring of water quality.

2a: North River (main branch)

Historic & Current Surrounding Land Use

Much of North River's main branch has tidal influence, with the head-of-tide reaching up to the mouth of Watts Creek where it empties into North River. This point is locally known as "The Forks." Above this point the banks are mostly forested, though the width of the buffer varies greatly. Beyond the buffer, land use is primarily agricultural.

From The Forks downstream to the Milton Bridge (which spans North York River Rd near the highway) the banks are surrounded by grassy floodplain and alders, with forest beyond. This stretch used to include a mill pond, and the habitat surrounding the river resembles the many old pond basins scattered throughout the province.

From the Milton Bridge flowing downstream to the North River estuary, there is a wide variety of land use. Below the bridge for about 1.5km the channel is surrounded by treed land. The east bank has quite a wide forest buffer, but the buffer is thin on the west bank with North York River Rd running adjacent to the channel. Downstream from this, the banks become steeper surrounding the estuary, and much of the land is cleared all the way down to the channel with mostly agriculture, commercial, and residential land use. There are ongoing suburban developments on both sides of the river.

In the past there have been three recorded fish kills on North River, in 1967, 2022, and 2014. The 2014 North River fish kill was estimated to have killed between 4,560-10,973 salmonids, most of which were brook trout although rainbow trout and Atlantic salmon were also recovered in high numbers relative to their populations. Though fish mortality originated on the north branch near the headwaters, fish populations were affected throughout the main branch as far downstream as the mouth of Warren's Creek.

Methods

- Damage and Vulnerability Assessments
- Stream crossing inventory
- Electrofishing
- RGAs**:** To monitor changes following the installation of the rock deflector.
- Redd surveys
- Water Temperature Monitoring

Habitat Components

The main branch of North River is considered to begin where the north branch and the west branch meet north of the Malpeque Rd and flows southward to the estuary west of Charlottetown. Though hurricane damage did create some log jams in this branch, those have since been addressed and connectivity is high throughout the main branch, as evidenced by data from CAWG's stream crossing inventory. The upper portion of this is shown in **Fig. 3**, which portrays fish habitat scores from the DVA. Scores are generally good from Malpeque Rd downstream to North York River Rd. Habitat characteristics of the main branch are best described in four sections that vary in stream bed and buffer zone composition.

The first is a small section that flows from the top of the main branch to the culvert on Malpeque Rd. This area has a mostly grass buffer with high levels of in-stream sediment and a deeply incised channel. Hydraulic roughness is very low here, so although there is no suitable spawning habitat, many trout tend to hold in the area, especially under the bridge on the Old Route 2 Rd.

The second section flows from below the Malpeque Rd. culvert to the Forks, which is the location of the head-of-tide. This section has much more habitat diversity, a mature, forested buffer, and less in-stream silt and fines. Both salmon redds and trout redds have been repeatedly found in this section in past years, and prior to 2023 CAWG has found Atlantic salmon during electrofishing surveys in this section. Because the entire North River system is almost entirely spring-fed, temperatures in this area have been monitored to confirm that they are not too low for fry survival at the time of emergence. Though loggers in other parts of the system were lost in the aftermath of hurricane Fiona, a temperature logger remains deployed in this section.

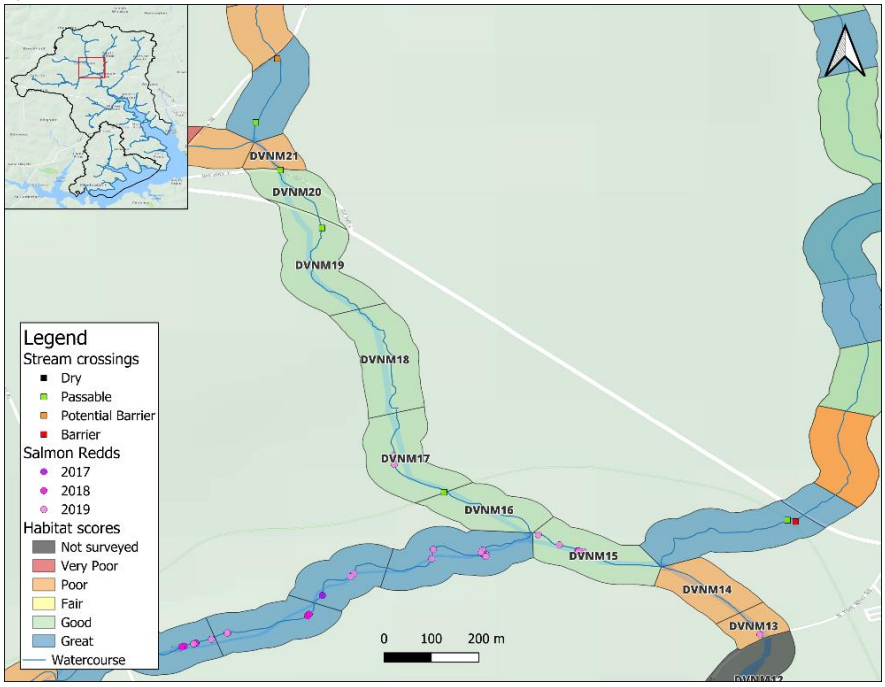
The third section, flowing from The Forks to Milton Bridge, is mostly tidal, acting as a buffer for sea-run fish where they acclimate to fresh water. While the reaches below the head of tide are primarily a migration corridor, some spawning does occur just below the Forks. In 2024, a potential salmon redd and multiple brook trout redds were observed at the tail of the forks pool during redd surveys. Buffer zone composition in this section is primarily grasses and shrubs (alder, choke cherry), with the river following a mostly straight path. A rock deflector was installed to help improve meander and pool formation above Milton Bridge, but additional work is still needed to create flow diversity in this section.

The fourth section flows from Milton Bridge to the estuary. The area is well below the head-of-tide, and water in the channel is largely brackish. The river increases in size throughout this section and fine sediment is consistent throughout, gradually encompassing extensive mussel shoals in the estuary.

In addition to the presence of brook trout, rainbow trout, and Atlantic salmon in the main branch, there are also yearly migrations of gaspereau, striped bass, and rainbow smelt. Sticklebacks and red-bellied dace have also been observed. Although CAWG has no data record of animal species for this branch, CAWG crews have seen mink below the culvert on Malpeque Rd.

Figure 3

Fish Habitat Scoring, Assessed Stream Crossings, and Salmon Redds on the Main Branch of North River



Threats/Pressures on the System

Threat	Description
Overexploitation of Resources	Unknown
Pollution	The degree of pesticide and nutrient input is unknown. Fish kills have occurred on North River in the past, and it is unknown to what degree the current fish populations may still be recovering. A lack of algae blooms and recent fish kills suggests that pesticide and nutrient input is not currently a concern.
Invasive Species	Rainbow trout are present throughout the system. A small Japanese knotweed site is being managed successfully by CAWG at the canoe launch on North York River Rd. At the mouth of the estuary there is a significant problem with Himalayan balsam which is under ongoing management by the PEI Invasive Species Council. In the expanding development area extending north of the J. Frank Gaudet Provincial Tree Nursery on the east bank of the estuary, invasive plant species are rampant and CAWG has observed upwards of ten different invasive species in this area. The extent of invasives in this development area is beyond the scope of CAWG's abilities to manage.

Habitat Degradation and Modification	The area surrounding The Forks shows characteristics of an old mill pond basin with poor tree cover. Just upstream from Milton Bridge there is excessive straightening of the channel.
Climate Change Impacts	Tree blowdown from hurricane damage is high in some parts of this branch, which has caused log jams impacting stream connectivity and crew access (though those have been addressed in this section). There has also been an increase in heavy rainfall events, which increase sediment inputs to the stream. We can expect the frequency of these extreme weather events to continue increasing with climate change. Although it is not possible to anticipate all the impacts of climate change, increased water temperatures and reductions to recharge rates are potential issues of concern in the future.
Erosion	Erosion inputs in this branch are primarily carried down from other tributaries.

2b: North River (north branch)

Historic & Current Surrounding Land Use

Land use around the north branch is heavily dominated by agriculture and development. Most of the branch does have a healthy treed buffer, but the headwaters run through several lawns where the land has been cleared all the way to the channel. 1935 arial photos from the Government of PEI's Arial Photo Index show that land use and tree coverage have remained consistent in this area for the better part of a century.

Methods

- Damage and Vulnerability Assessments
- Stream crossing inventory
- Electrofishing

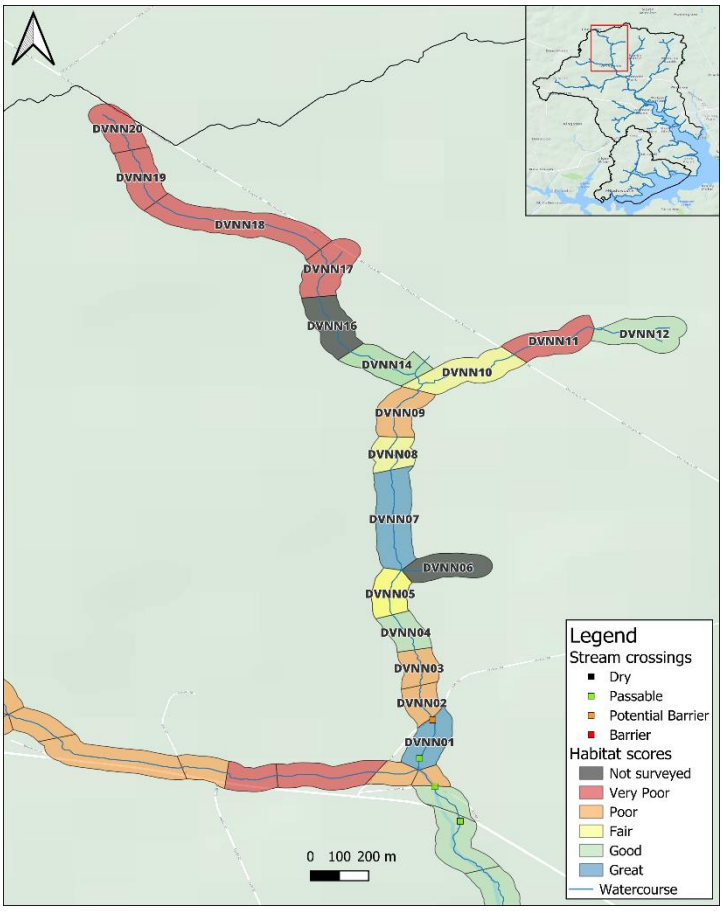
Habitat Components

The north branch of the North River has its headwaters to the west of the New Glasgow Road, running adjacent to the road. It transitions to the main branch where it is joined by the west branch just below Crabbe Road. Fish habitat scores in this branch vary significantly (**Fig. 4**). Data from CAWG's stream crossing inventory shows that the bridge on Crabbe Rd, near the bottom of the branch, is a potential barrier to fish passage.

A significant weakness of the north branch is the lack of a forested buffer at the headwaters. The headwaters also have several areas where fields extend into the buffer zone giving soil erosion a quick and easy path into the stream. As a result of unmaintained buffer zones, a lack of trees, and the presence of gullies, the North Branch's headwaters are heavily silted.

Figure 4

Fish Habitat Scores and Assessed Stream Crossings in the North Branch of the North River



A small tributary to the north branch, which originates on the east side of the New Glasgow Rd, is subject to point source erosion coming from an adjacent field, but upstream from this where the tributary originates from two springs, is a small late-succession tree stand that protects the springs. In this area the small channel is healthy with a completely gravel substrate.

Continuing downstream from the point where the aforementioned tributary joins the north branch, the habitat generally improves as the channel is protected by a treed buffer. There are a couple of areas where the treed buffer is thinner and some silt enters the stream, but these are short. Overall, there is an abundance of shade over the stream, there is a higher prevalence of gravel and cobble in the stream bed, and there is good variability in both the vertical and horizontal profiles of the stream.

CAWG has conducted electrofishing surveys at two locations on this branch in the past and has caught Atlantic salmon parr during some of these surveys. However, redd surveys are restricted to the lower tributaries so there is no record of Atlantic salmon redds in this branch. Other fish species observed in the north branch are brook trout, rainbow trout, and sticklebacks.

Threats/Pressures on the System

Threat	Description
Overexploitation of Resources	Unknown
Pollution	Unknown
Invasive Species	Rainbow trout are present. Bittersweet nightshade is common throughout the middle part of the branch and is beyond the scope of CAWG's abilities to manage.
Habitat Degradation and Modification	Land clearing and agriculture have significantly degraded the headwater area.
Climate Change Impacts	Tree blowdown from hurricane damage is extensive in this branch, with log jams impacting stream connectivity and crew access. There has also been an increase in heavy rainfall events, which increase sediment inputs to the stream. We can expect the frequency of these extreme weather events to increase with climate change. Although it is not possible to anticipate all the impacts of climate change, increased water temperatures and reductions to recharge rates are potential issues of concern in the future.
Barriers	A culvert on the Crabbe Rd constitutes a barrier to fish passage. There are numerous culverts upstream that have yet to be assessed, but chances are strong that some of those will also be identified as barriers.
Erosion	Run-off from agriculture causes a high degree of siltation in the headwaters.

2c: North River (west branch)

Historic & Current Surrounding Land Use

Land use around the West Branch is heavily dominated by agriculture and development, with Malpeque Rd. running adjacent to the tributary. 1935 arial photos from the Government of PEI's Arial Photo Index show that land use and tree coverage have remained consistent in this area for the better part of a century.

Treed buffers are heavily degraded at the headwaters where they pass through commercial farm properties. Further downstream on a smaller farm property there is a complete lack of trees in the buffer zone. CAWG has planted trees in this area, but it will still be many years before those trees are big enough to reduce run-off into the stream.

Methods

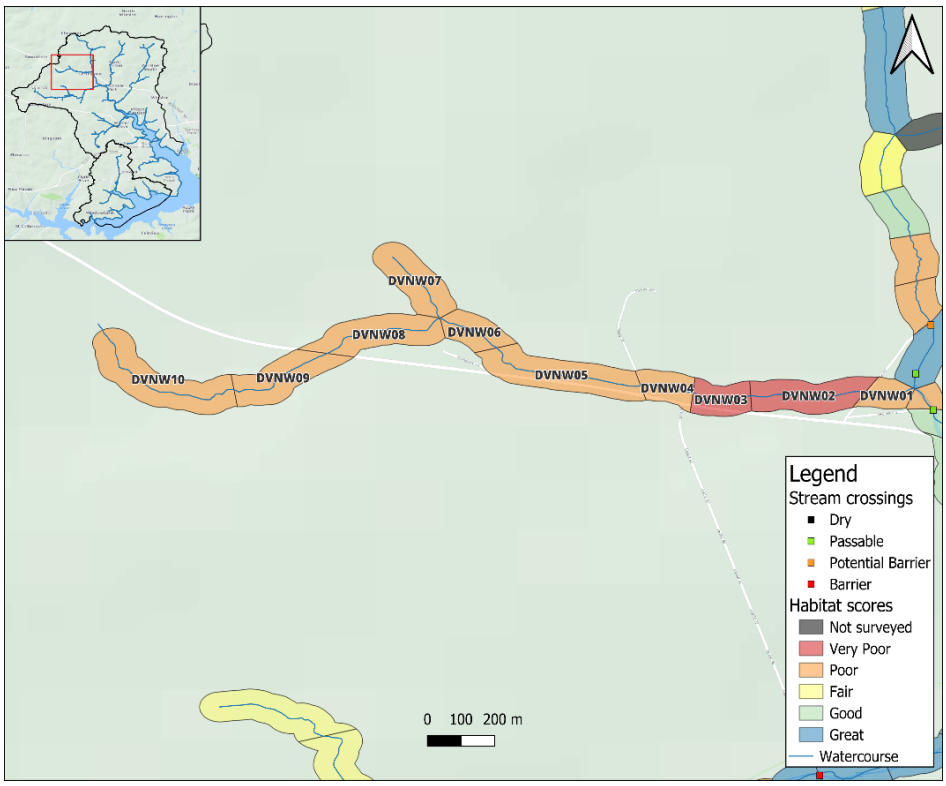
- Damage and Vulnerability Assessments

Habitat Components

The west branch of the North River has headwaters near Malpeque Rd., and it joins the main branch just above the Old Rte.2 Rd. Fish habitat scores are consistently poor in this branch (**Fig. 5**). The west branch is one of the most silted tributaries in the entire North River watershed thus siltation is a major limiting factor for salmonids in this tributary. Two of the primary sources of this silt are soil erosion from fields, and bank erosion. Much like the headwaters of the north branch, there are several areas where the 15m regulated buffer zone is not maintained, and treed buffers are severely lacking. In terms of bank erosion, there are several areas where banks are migrating into adjacent farm fields as the channel begins to oxbow, and intervention may be needed to prevent the banks from collapsing.

Figure 5

Fish Habitat Scores and Assessed Stream Crossings in the West Branch of the North River



The West Branch also scored poorly in terms of connectivity. Although culvert assessments have yet to be completed on this tributary, there are numerous log jams that may impact connectivity; however, these instances of large wood in the stream may help to improve sediment storage in the tributary. When managing woody material in the stream, CAWG strives to strike a balance that both improves habitat variability within the stream by retaining large wood, while also ensuring fish passage.

Although no electrofishing or redd surveys are performed on this branch, CAWG crews have observed brook trout, rainbow trout, and sticklebacks.

Threats/Pressures on the System

Threat	Description
Overexploitation of Resources	Unknown
Pollution	Unknown
Invasive Species	Rainbow trout are present. Occasional occurrences of bittersweet nightshade, little-leaf linden, and rosa multiflora.
Habitat Degradation and Modification	Where the tree buffer is lacking, the channel is heavily silted and deeply incised.
Climate Change Impacts	Tree blowdown from hurricane damage in this branch is sporadic but intense, with log jams impacting stream connectivity and crew access. There has also been an increase in heavy rainfall events, which increase sediment inputs to the stream. We can expect the frequency of these extreme weather events to increase with climate change. Although it is not possible to anticipate all the impacts of climate change, increased water temperatures and reductions to recharge rates are potential issues of concern in the future.
Barriers	Though culverts have yet to be assessed, we know anecdotally that some of them are barriers to fish passage. Log jams may also create barriers.
Erosion	By far the biggest threat in this branch. Run-off from agriculture causes a high degree of siltation in the headwaters and lack of trees in the buffer zone leads to bank erosion.

2d: Watts Creek

Historic & Current Surrounding Land Use

Watts Creek stands out in the North River Watershed for the high degree of forested buffer it retains throughout the entire branch, which is quite wide in some of the upper sections. The Watts Creek drainage area also contains the two largest late succession forest stands in the North River Watershed, which were the first locations for CAWG's annual bird surveys. Beyond the buffer, most of the land use is agricultural. Despite the robust buffer, there is a large amount of run-off entering the river from non-point source erosion near the headwaters. Two projects were undertaken to combat this: a sediment trap was installed on this branch in 2021 just upstream from the Loyalist Rd culvert, and in 2022 CAWG partnered with the PEI Agri-Watershed Partnership Program to install jute mats in the agricultural field that is the primary source of the run-off. It is unclear whether the siltation in the branch can be attributed entirely to this source; from here the river passes through a significant forested stand before it reaches the sediment trap, and there has been beaver activity in this section as well. These two factors should help filter sediment significantly, but there is still a large amount of sediment entering the trap. Access to this forested section has been limited in the past, and since hurricane Fiona access has been additionally challenging. CAWG has plans to cut trails along this section beginning in 2025 so that we can increase monitoring in the area.

Methods

- Damage and Vulnerability Assessments
- Redd surveys
- Electrofishing surveys
- RGAs (to monitor changes following installation of the sediment trap)
- Stream Crossing Inventory
- Bird surveys

Habitat Components

Watts Creek is a westward branch of the North River Drainage Basin. It originates at its headwaters near Colville Road and flows to its mouth, where it joins the North River at the forks. It has a major tributary with headwaters near Kinkora Road. Watts creek is a third order river and has the most forested area of all tributaries in the North River watershed. Currently it contains the best spawning and rearing habitat in the entire watershed, particularly downstream from Loyalist Rd (**Figs. 6 and 7**). This is attributed to the high degree of forested buffer, the sediment trap above Loyalist Rd that prevents silt from reaching the valuable spawning habitat in the lower section, and the strategic management activities that have been undertaken since 2019, such as woody material management and raking of spawning areas. RGAs are performed yearly on this branch to assess changes in stream morphology above and below the sediment trap. Riparian buffer zones in lower Watts Creek are typically three layers of vegetation spanning greater than the mandated 15m.

Figure 6

Fish Habitat Scores and Assessed Stream Crossings in the Upper Half of Watts Creek

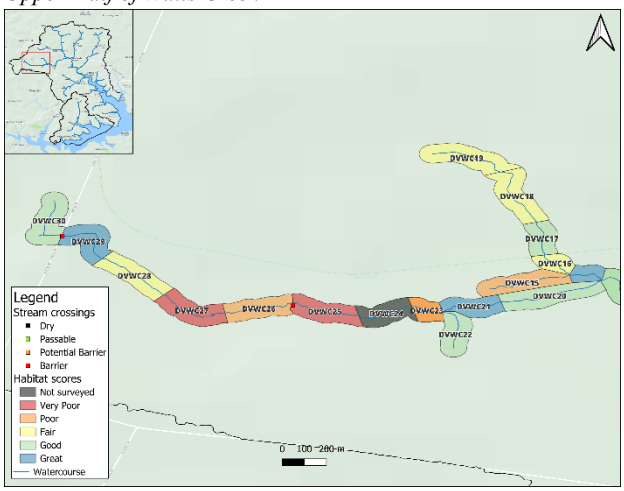
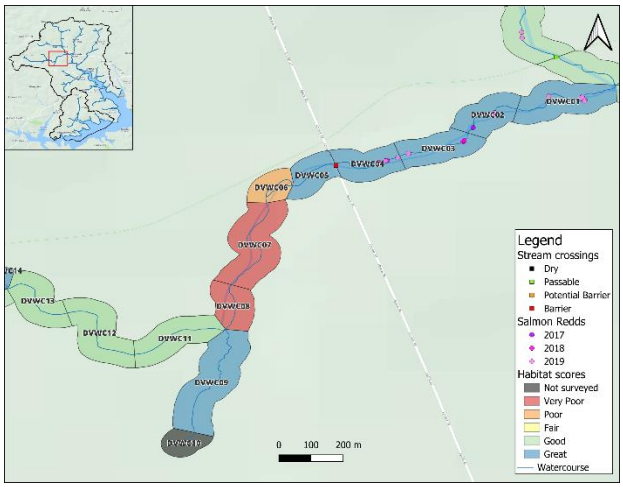


Figure 6

Fish Habitat Scores, Assessed Stream Crossings, and Salmon Redds in the Lower Half of Watts Creek



Stream crossing inventory shows that Loyalist Rd is a barrier to fish passage. This is evident by direct observation, as the box culvert hangs very high above the outlet pool (1.87 ft drop). This blocks migratory fish access to over 10km of stream above the culvert.

CAWG's redd survey data shows that Watts Creek consistently has the highest count of Atlantic salmon redds compared to other tributaries in the system. Electrofishing surveys on this branch have caught Atlantic salmon parr on multiple occasions. Other fish species present in Watts Creek are brook trout, rainbow trout, rainbow smelt (seasonal migrations), and sticklebacks.

Trail cam footage on this branch has shown an abundance of snowshoe hare, as well as raccoons and coyotes. Ruffed grouse are often observed in the area in the spring, and crews have occasionally observed American kestrels and barred owls.

CAWG has a record of bird species present on this branch from our yearly bird surveys. Some highlights of these records include Eastern wood peewee and Northern cardinals. During unrelated work, CAWG crews have reported an increase in Eastern wood peewee songs heard throughout the watershed since hurricane Fiona, and we will be sharing these observations to the eBird platform as of 2025.

Threats/Pressures on the System

Threat	**Description**
Overexploitation of Resources	Unknown
Pollution	Unknown
Invasive Species	Rainbow trout present throughout the tributary. Wild angelica is extensive in the lower section.
Habitat Degradation and Modification	Above the sediment trap the channel is lacking natural meander for at least 200m. This section is also heavily silted.
Climate Change Impacts	Tree blowdown from hurricane damage is extensive in this branch, especially upstream from Loyalist Rd, with log jams impacting stream connectivity and crew access. There has also been an increase in heavy rainfall events, which increase sediment inputs to the stream. We can expect the frequency of these extreme weather events to increase with climate change. Although it is not possible to anticipate all the impacts of climate change, increased water temperatures and reductions to recharge rates are potential issues of concern in the future.
Barriers	Loyalist Road culvert acts as a barrier to fish passage, blocking access to over 10km of upstream habitat. There has historically been beaver activity in the upper reaches of Watts Creek, which may also impact connectivity.
Erosion	There is significant erosion from agriculture that carries run-off into the stream just below the headwaters. Other significant sources of sediment input are yet unidentified.

2e: Coles Creek

Historic & Current Surrounding Land Use

Land use in the upper half of Coles Creek is heavily agricultural. The lower half benefits from an extensive forest buffer.

In previous years, Coles Creek was a considerable focus of restoration activities like brush matting and woody material management. However, visitation and restoration work on Coles Creek since 2017 has not been as frequent. In 2017 the City of Charlottetown began operating a well-field on Coles Creek upstream of Malpeque Rd. With the establishment of the well field, gaining access to those stretches of the stream has become more difficult. In 2024, CAWG was able to gain access to these reaches and conduct DVAs thanks to communication with the well field operators at the City of Charlottetown. The need to check in and have operators grant access for every visit to these stretches has been a challenge to monitoring and restoration work. An additional challenge comes from the research being conducted on Coles Creek. Since the establishment of the wellfield, researchers from the Canadian Rivers Institute and the Department of Biology at UPEI have been monitoring the impacts of wellfield water extraction on water temperatures, stream flows, and fish populations. Culvert replacements, woody material management, and brush matting can all have varying impacts on these variables, so CAWG's ability to perform these common rehabilitation activities on Coles Creek have been limited.

At the headwater, a pond was installed in 2009 by Ducks Unlimited as a wetland restoration. CAWG planted trees surrounding the pond in 2022, but monitoring remains in the hands of Ducks Unlimited. The landowner owns several other agricultural properties in the upper reaches of Coles Creek. Although these properties are deforested, the landowner has shown considerable willingness and initiative to correct this and has collaborated with CAWG on several projects to that end.

A shale pit operates near the upper reaches of Cole's Creek, creating point-source erosion that washes into the stream. A lack of a treed buffer in this area compounds the problem. Just downstream of this is a pond which helps to trap the sediment. CAWG has planted trees extensively in this area in 2022 and 2024 to help combat the problem, but more preventions are needed.

Methods

- Damage and Vulnerability Assessments
- Stream crossing inventory
- Electrofishing
- Redd surveys

Habitat Components

Coles Creek can be described as a major tributary of the North River. The headwaters originate east of the Winsloe Rd, and the creek joins the main branch of North River near the top of the estuary. Fish habitat quality varies widely throughout the branch (**Figs. 8 and 9**). The upper reaches are

heavily deforested with considerable sediment inputs. A pond with a significant tree buffer belonging to a non-farming resident is the sole forested oasis amid these agricultural fields. About halfway down the branch, however, the riparian zone transitions to mature forest, and further downstream to a wide forested area that appears to be young clearcut regeneration.

Figure 8

Fish Habitat Scores, Assessed Stream Crossings, and Salmon Redds in the Upper Reaches of Coles Creek

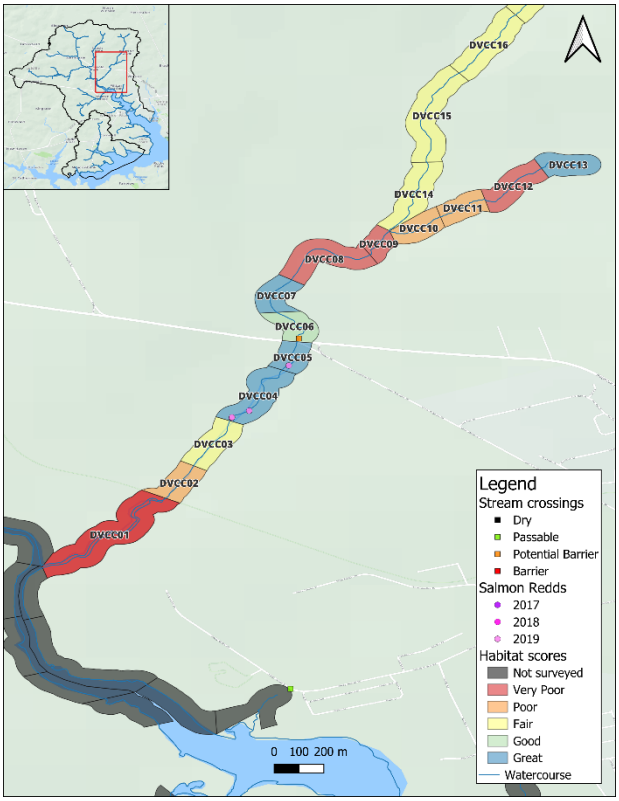
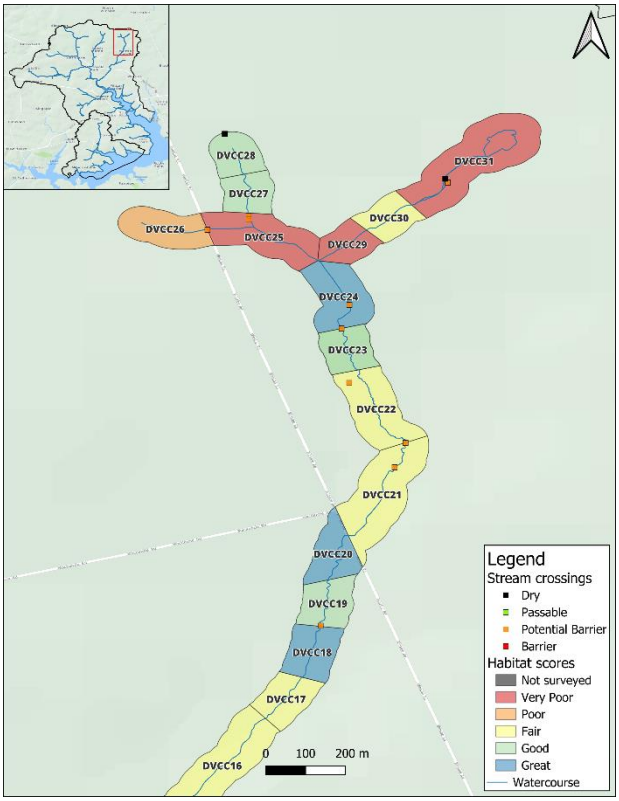


Figure 7

Fish Habitat Scores and Assessed Stream Crossings in the Upper Reaches of Coles Creek



The entire branch appears to have low flows in general, compared to other tributaries in the system.

There are brook trout and rainbow trout present throughout the branch, and CAWG has records of Atlantic salmon redds found on Coles Creek downstream of Malpeque Rd. in 2016, 2019, and 2020. Electrofishing surveys here are limited, with one index survey performed in 2021 and one spot-check survey performed in 2024. Atlantic salmon were not found in either of these instances.

There is little information available about other animal species in the branch. There is a history of beaver activity on Coles Creek just above Malpeque Rd., but no beaver activity has been observed since 2022. Canada geese have been observed at Coles Pond next to the Rustico Rd, and at the Ducks Unlimited Pond at the headwaters. Tree swallows are also present at the Ducks Unlimited site.

Threats/Pressures on the System

Threat	Description
Overexploitation of Resources	The City of Charlottetown wellfield has been shown to impact water flows and temperature downstream.
Pollution	Unknown
Invasive Species	Extensive bittersweet nightshade above Malpeque Rd. Rainbow trout present in the stream.
Habitat Degradation and Modification	River flows have been shown to be reduced downstream from the wellfield. Siltation in the channel has reduced habitat quality in the upper reaches.
Climate Change Impacts	Tree blowdown from hurricane damage is extensive in the forested buffer near the wellfield, with log jams impacting stream connectivity and crew access. There has also been an increase in heavy rainfall events, which increase sediment inputs to the stream. We can expect the frequency of these extreme weather events to increase with climate change. Although it is not possible to anticipate all the impacts of climate change, increased water temperatures and reductions to recharge rates are potential issues of concern in the future.
Barriers	Many of the culverts on the upper reaches of Coles Creek are barriers to fish passage, and the culvert on Malpeque Rd is a potential barrier. Culverts between the two points are yet to be assessed.
Erosion	Erosion from agricultural fields and from a shale pit brings a large volume of run-off to the channel in the upper reaches.

2f: Milton Creek

Historic & Current Surrounding Land Use

Land use surrounding Milton Creek is heavily agricultural, but legally mandated buffer zone is continuously treed throughout most of the branch. In summer 2024, an agricultural landowner with significant acreage bordering Milton Creek terraced their field and installed a settlement pond to stop silt before it enters the stream.

Methods

- Damage and Vulnerability Assessments
- Stream Crossing Inventory
- Electrofishing

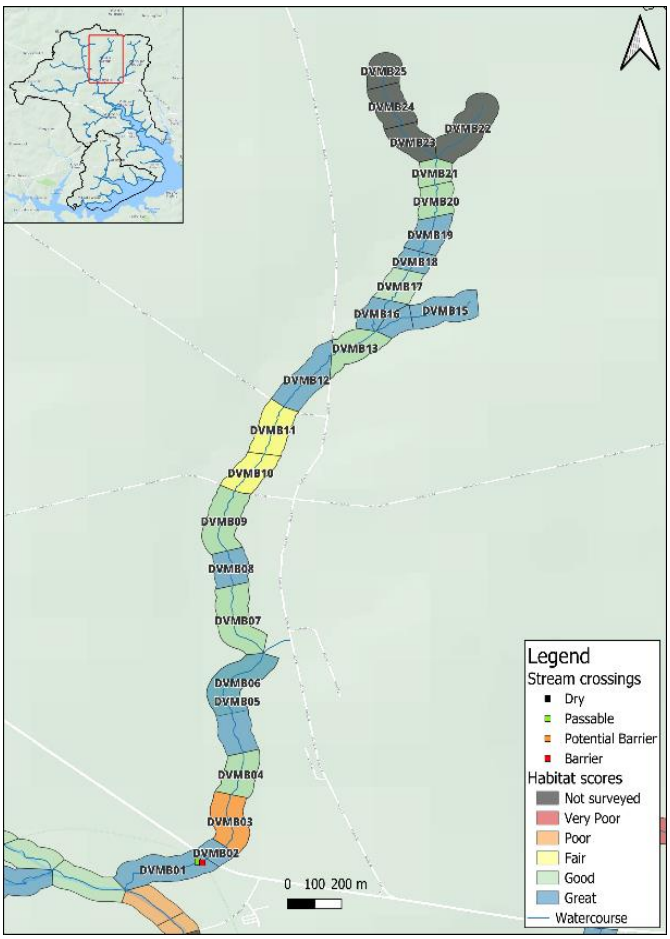
Habitat Components

Milton Creek is a major tributary of the North River. It has its headwaters near the Rustico Rd and joins North River just south of Malpeque Rd. It has many areas of high-quality habitat (**Fig. 10**), its

greatest strengths being shade and the availability of large substrate in the majority of reaches. Despite this, siltation is still a problem for Milton Creek as a whole. There is also a general lack of habitat diversity.

Figure 8

Fish Habitat Scores and Assessed Stream Crossings in Milton Creek



Considering the amount of high-quality habitat in this branch, it is a great misfortune that the lowest culvert on the branch, where it crosses Malpeque Rd, is a barrier to migratory fish passage. This is recorded in CAWG's stream crossing inventory and is visibly evident due to the significantly perched box culvert. Other culverts on Milton Creek are yet to be assessed.

There is some anecdotal evidence of Atlantic salmon in Milton Creek. Juvenile salmon were caught in 2019 during an electrofishing course, but no official data has been found that supports Milton Creek as a historic salmon river. There is an abundance of brook trout in the branch. Electrofishing surveys have revealed the presence of rainbow trout below Malpeque Rd, but their presence upstream is unknown. There are also sticklebacks in the branch.

Threats/Pressures on the System

Threat	Description
Overexploitation of Resources	Unknown
Pollution	Unknown
Invasive Species	Bittersweet nightshade is a problem throughout the branch. There are rainbow trout present in this tributary.
Habitat Degradation and Modification	Unknown
Climate Change Impacts	Tree blowdown from hurricane damage is heavy in some places with log jams impacting stream connectivity and crew access. There has also been an increase in heavy rainfall events, which increase sediment inputs to the stream. We can expect the frequency of these extreme weather events to increase with climate change. Although it is not possible to anticipate all the impacts of climate change, increased water temperatures and reductions to recharge rates are potential issues of concern in the future.
Barriers	The culvert at Malpeque Rd is a barrier to fish passage. This culvert is close to the mouth, so anadromous fish are denied access to an abundance of potential spawning habitat.
Erosion	Though the tree buffer is mostly continuous, the abundance of agricultural fields still contributes a large volume of run-off into the channel.

2g: Warren's Creek

Historic & Current Surrounding Land Use

As is typical throughout the watershed, land use surrounding Warren's Creek is primarily agricultural. There is an old pond basin about 1km upstream from the mouth of the creek. A sediment pond in an agricultural field west of Jewell Rd helps to prevent some of the sediment in that area from entering the stream.

Methods

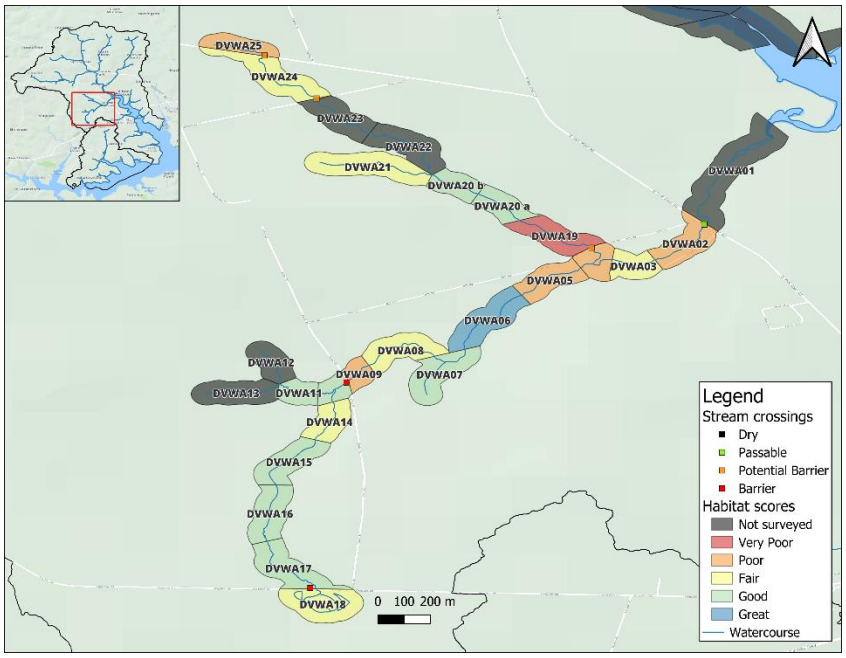
- Damage and Vulnerability Assessments
- Stream crossing inventory
- Bird surveys

Habitat Components

Warren's Creek is a major tributary of the North River (**Fig. 11**). The creek itself has two branches, one which flows roughly southeast with headwaters near Route 225, and the other which flows roughly northwest with its headwaters near Kingston Road. The branches combine near Mill Road and Warren's creek joins North River just southeast of Rte.225.

Figure 9

Fish Habitat Scores and Assessed Stream Crossings in Warren's Creek



Upstream of the old pond basin, Warren's creek has multiple areas of high-quality fish habitat. An old growth hemlock stand exists on the north branch and there is a section deeply shaded by mature forest on the south branch. However, barriers throughout Warren's Creek act to limit movement between habitats. CAWG's stream crossing inventory has identified culverts on Jewell Rd and Kingston Rd as barriers to fish passage, and the culvert on Mill Rd as a potential barrier. Crews have observed a fully collapsed culvert on the north branch where the stream has circumvented the collapse by flowing underground. Many of the other culverts on Warren's Creek are yet to be assessed. Severe blowdown from hurricane Fiona has also created potential barriers.

On top of connectivity issues, landowner activities in the buffer zone are a significant concern. Problems persist with cattle being allowed access to the stream, temporary stream crossings being built and collapsing, and garbage accumulating in riparian areas.

Warren's Creek has no history of Atlantic salmon; therefore redd surveys and electrofishing are not conducted on this branch. Crews have observed a plentiful population of brook trout, but rainbow trout and stickleback populations are unknown.

A bird survey was conducted in a meadow area adjacent to the north branch of Warren's creek in 2024, and all species recorded were common in the province.

Threats/Pressures on the System

Threat	Description
Overexploitation of Resources	Unknown
Pollution	Collapsed bridges and garbage accumulating in riparian areas.
Invasive Species	Bittersweet nightshade is a known problem on this reach, especially upstream of Jewell Rd. Glossy buckthorn and small balsam are present on the north branch of Warren's Creek. Although rainbow trout presence is unknown, it is likely given its presence in other tributaries.
Habitat Degradation and Modification	In the old pond basin, the stream's meander is excessive, and the channel is deeply incised. Cattle access to the river has severely damaged the banks and channel in at least 2 locations. Several poorly constructed bridges have also caused damage to the banks and altered the natural meander.
Climate Change Impacts	Tree blowdown from hurricane damage is heavy in some places with log jams impacting stream connectivity and crew access. There has also been an increase in heavy rainfall events, which increase sediment inputs to the stream. We can expect the frequency of these extreme weather events to increase with climate change. Although it is not possible to anticipate all the impacts of climate change, increased water temperatures and reductions to recharge rates are potential issues of concern in the future.
Barriers	There are several culverts that are barriers to fish passage.

2h: Hyde Creek

Historic & Current Surrounding Land Use

Hyde Creek is a sub-watershed of the West River with a drainage area of approximately 2,009 hectares and 5.9 km of streams. Just above the mouth of Hyde Creek is Hyde Pond, which used to be a mill pond. The Town of Cornwall developed around the mill, and though the mill has long since been removed, Hyde Creek remains the core of the town. Land use around Hyde Creek is urban and residential throughout the lower half, with some agricultural land surrounding the upper reaches. Next to the pond are two water treatment lagoons owned by the Town of Cornwall. The banks contain trees throughout most of the creek, but these buffer zones are very narrow in some places. The western side of the pond and estuary are surrounded by Hyde Park, which is primarily a treed area with walking trails. The pond has historically been a popular spot for recreational anglers, though in recent years there have been fewer, and fewer fish caught. The reasons for this apparent lack of fish could be related to several factors, including a fish kill in Hyde Creek in 2017, excessive eutrophication of the pond (making it less hospitable to cold water species such as brook trout), and restriction to fish passage caused by the old pond spillway and beaver activity. In 2024, the Hyde Pond spillway was redesigned with the installation of a bypass channel to improve fish passage.

Methods

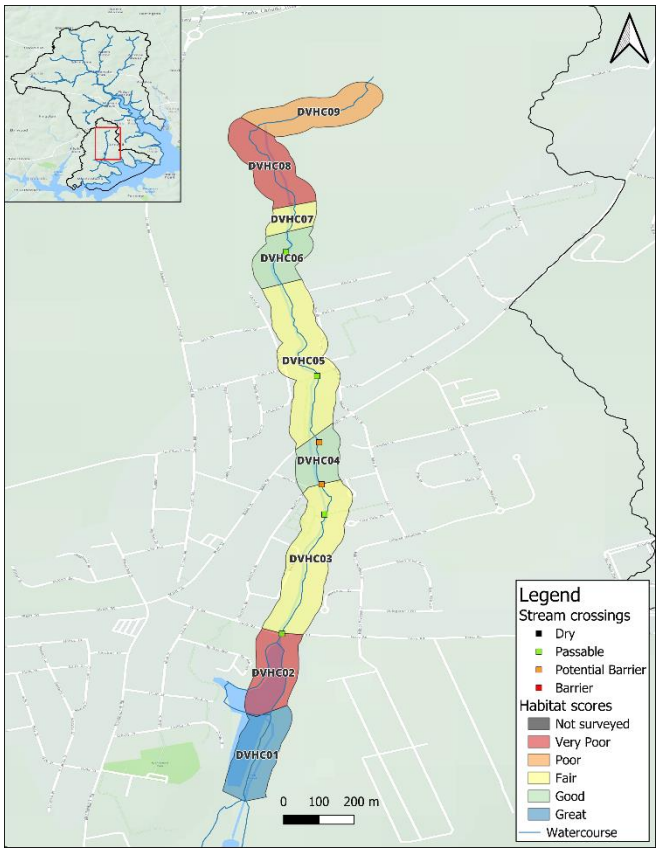
- Damage and Vulnerability Assessments
- Stream crossing inventory
- Electrofishing
- Bird surveys
- Temperature logging

Habitat Components

Hyde Creek runs roughly north to south through the heart of the Town of Cornwall. The mouth of the creek spills into the West River estuary east of Meadowbank Rd. Fish habitat quality is mostly poor, with some isolated pockets of higher quality habitat (**Fig. 12**). There are two ponds on the creek: Hyde Pond, near the mouth, and a smaller, un-named pond in the agricultural area north of Cornwall.

Figure 10

Fish Habitat Scores and Assessed Stream Crossings in Hyde Creek



The un-named pond is isolated among farm fields and is not well-known. This pond has evidence of past beaver activity, but there does not appear to be any beavers active in the area as of fall 2024. Above the inlet of the pond the stream banks are less defined, and the channel is surrounded by forested swamp and alder swales. Fish species present in the pond are currently unknown.

Hyde Pond was originally a mill pond and situated at the heart of Cornwall. Bordering Hyde Pond to the south are two water treatment lagoons. A series of walking trails surround the pond and wind through a mature forested area bordering the estuary, making up Hyde Park.

Although there are currently no structured bird surveys being conducted at Hyde Pond, CAWG is considering establishing surveys here. The pond and lagoons are frequented by many species of waterfowl, making Hyde Park a popular birdwatching location. CAWG crews occasionally make records of birds observed while working at Hyde Pond and will be sharing these observations to the eBird platform as of 2025. Hooded mergansers, barrow's goldeneye, lesser scaups, green-winged teals, red-winged blackbirds, and belted kingfishers are all commonly spotted at Hyde Pond, in addition to the many Canada geese and mallards that are common at waterbodies across PEI.

In the past, beaver activity created some problems with the pond. Continuous damming of the spillway further restricted fish passage (which was already at least partly restricted by the spillway itself) and caused the water level to rise and partially flood walking trails. In the year prior to the installation of the new bypass channel, beavers appeared to have moved on from the area on their own. Though beavers are a healthy part of river systems in PEI, their presence at Hyde Pond creates a threat to surrounding property and infrastructure, so CAWG crews continue to watch for any indications of their return.

Muskrats are a common resident throughout Hyde Creek, especially in Hyde Pond and the reaches below Main St. Though they cause no issues in the creek, in Hyde Pond they have created some problems for the municipality by causing damages to the treatment lagoons. Consequently, the Town of Cornwall is pursuing trapping the muskrats in Hyde Pond.

The spillway had constituted a barrier to fish passage for a long time and crews had observed that seasonal rainbow smelt migrations did not appear able to access the pond or creek upstream. In 2024 CAWG spearheaded the redesign of the spillway into a water control structure, and the addition of a natural bypass channel. With this redesign, it is hoped that smelt migrations will return to Hyde Creek. Pond temperatures were logged in preparation of the installation of the new bypass channel, and CAWG will be placing temperature loggers above and below the pond in 2025 to monitor water temperatures in the pond.

Fish passage is potentially further blocked on Hyde Creek by two culverts, one on Main Street and the other on James Street. The Main Street culvert is particularly concerning, with no outlet pool, a large inlet drop, and significant amounts of debris scattered throughout the culvert.

Recreational angling has always been popular at Hyde Pond, and the primary fish species observed here are brook trout, rainbow trout and sticklebacks.

CAWG has performed electrofishing spot checks in two locations on Hyde Creek in 2023. At the first location, which is situated about 100m downstream of the pond, fish species observed have been primarily mummichogs, with a lower number of sticklebacks and two rainbow trout. The

second location, which was also spot-checked in 2024, is upstream of the pond in a residential zone and is bordered by walking trails. Species found at this location were brook trout, rainbow trout, and sticklebacks.

Threats/Pressures on the System

Threat	**Description**
Overexploitation of Resources	Unknown
Pollution	Fish populations in Hyde Creek were reduced as a result of a fish kill in 2017 and have not yet returned to their previous abundance. The difference in species found above and below the pond also suggests that effluent entering Hyde Creek from the water treatment lagoons may be a limiting factor for both anadromous and resident salmonids. Trash is a common issue along the lower half of the creek and surrounding Hyde Pond.
Invasive Species	Invasive species are common throughout Hyde Creek (as is typical in urban developmental areas). Multiflora rose is common along the banks, and there are several patches of both Japanese knotweed and small balsam throughout the Hyde Creek watershed. Rainbow trout are also present in the stream.
Habitat Degradation and Modification	Because Hyde Creek runs directly through the center of Cornwall, urban development has shaped the habitat in several ways. Both ponds on the creek are man-made. Most habitat degradation in Hyde Creek is directly tied to human activity along the banks, such as make-shift stream crossings and repeated damming with river rocks.
Climate Change Impacts	Because Hyde Creek is surrounded mainly by urban land use, windthrow from hurricane damage has mostly been restricted to the highest reaches. There has also been an increase in heavy rainfall events, which increase sediment inputs to the stream. We can expect the frequency of these extreme weather events to increase with climate change. Although it is not possible to anticipate all the impacts of climate change, increased water temperatures and reductions to recharge rates are potential issues of concern in the future.
Barriers	There are several culverts on Hyde Creek that create barriers to fish passage.

Section 3: Identification of Priorities & Future Actions

Summary & Data Gaps

Salmonid species, which are the most prominent fish species in PEI's freshwater streams, require gravel and cobble substrates for spawning. Erosion is high in the North River watershed; land use throughout the area is largely agricultural, and the geology of Prince Edward Island also happens to consist largely of easily erodible materials such as sandstone and clay. Consequently, the most significant limiting factor to salmonid populations in this watershed is the consistent input of fine sediments into the streams. The bulk of CAWG's conservation activities in the North River Watershed focus on preventing and mitigating the effects of siltation in freshwater streams.

While fine sediments are also an issue in Hyde Creek, pollution, barriers to fish passage, and habitat degradation from other human activities are of larger concern in this more urban watershed. CAWG's activities in the Hyde Creek watershed lean more toward invasive species management, stream connectivity, and fostering public awareness and involvement in conservation.

CAWG lacks data about the following:

- **Water quality**: CAWG has not seen any environmental signs suggesting a need for water quality monitoring and so has not yet introduced it. CAWG may introduce macro-invertebrate EPT ratio surveys as a means of identifying areas that may warrant routine water quality monitoring.
- **Non-aquatic species populations**: CAWG has some information about bird species present in some locations, and animal species of PEI are well-known within the local conservation industry, but CAWG has no data about population sizes or
- **Smelt migrations:** Smelt surveys will be completed annually, beginning in 2025 to identify the timing of smelt runs, water temperature associated with smelt migration, tributaries that support smelt runs and any barriers to smelt passage.
- **Gaspereau migrations:** CAWG has never conducted gaspereau surveys, but monitoring may be considered in the future if it becomes a priority.
- **Impact of invasive rainbow trout on native salmonid species:** Given the status of Atlantic salmon populations in the North River system, redd superimposition may be worth investigating. Rainbow trout are known to superimpose redds over Atlantic salmon spawning areas, this has been observed on the West River. When superimposition happens, survival to emergence can be heavily impacted. This potential occurrence may be monitored in the future through rainbow trout redd surveys and compared with brook trout and Atlantic salmon redd locations from the previous fall.
- **Erosion input sites:** Excessive siltation poses a significant threat to salmonids in our management area. To address this, we plan to identify erosion input sites and collaborate with landowners and experts to implement effective solutions.
- **Current water temperatures**: We plan to expand our water temperature monitoring to consistently track temperatures in each tributary, ensuring they remain within a safe range for salmonids.

- **Stream recharge and discharge:** CAWG has never measured the discharge of North River or Hyde Creek, though lower flows have been observed while in the field. Future investigations into watershed discharge may be pursued if it becomes a monitoring priority.

Identified Priorities, Goals & Actions

This section outlines the priority threats identified above and the actions we are taking or hope to pursue to address them. For consistency, it follows the tributary breakdown from section 2. All actions outlined in this section are driven by the high-level goals established in section 1.

3a: North River (main branch)

Threat & Description	Actions
Habitat Degradation and Modification The area surrounding The Forks shows characteristics of an old mill pond basin with poor tree cover. Just upstream from Milton Bridge there is excessive straightening of the channel.	Tree plant from The Forks to Milton Bridge to improve the riparian zone. Create a stream bed profile on the North River between The Forks and Milton Bridge to guide deflector placement. Based on these findings, install tree deflector(s) to restore meander of this section.
Climate Change Impacts Tree blowdown from hurricane damage is high in some parts of this branch, and we can expect the frequency of these extreme weather events to increase with climate change.	Plant a diversity of native species in the riparian zone to increase ecosystem resiliency to extreme weather events.

3b: North River (north branch)

Threat & Description	Actions
Habitat Degradation and Modification Land clearing and agriculture have significantly degraded the headwater area.	Reach out to landowners near the headwaters, fostering collaboration through tree plantings and soil conservation projects to improve the headwaters.
Climate Change Impacts Tree blowdown from hurricane damage is extensive in this branch, with log jams impacting stream connectivity.	Complete woody material management to improve passage and salmonid habitat diversity.
Barriers A culvert on the Crabbe Rd constitutes a barrier to fish passage. There are numerous culverts upstream that have yet to be assessed, but chances are strong that some of those will also be identified as barriers.	Complete stream crossing assessments that were not completed in 2024. Collaborate with landowners and the PEI Department of Transportation to address crossings impacting fish passage. Complete smelt surveys to identify connectivity issues.

Erosion Run-off from agriculture causes a high degree of siltation in the headwaters.	Identify erosion input sites and monitor them during rain events for runoff. If issues are identified, follow the appropriate steps to address and resolve them.

3c: North River (west branch)

Threat & Description	Actions
Habitat Degradation and Modification Where the tree buffer is lacking, the channel is heavily silted and deeply incised.	Develop collaborative relationships with landowners to gain permission to plant trees to improve the riparian zone and floodplain connection.
Climate Change Impacts Tree blowdown from hurricane damage in this branch is sporadic but intense, with log jams impacting stream connectivity.	Complete woody material management to improve passage and salmonid habitat diversity.
Barriers Though culverts have yet to be assessed, we know anecdotally that some of them are barriers to fish passage. Log jams may also create barriers.	Complete stream crossing assessments that were not completed in 2024. Collaborate with landowners and the PEI Department of Transportation to address crossings impacting fish passage.
Erosion By far the biggest threat in this branch. Run-off from agriculture causes a high degree of siltation in the headwaters and lack of trees in the buffer zone leads to bank erosion.	Identify erosion input sites and monitor them during rain events for runoff. Collaborate with landowners and experts to address and resolve erosion inputs. Use willow stakes to reinforce banks that are susceptible to failure.

3d: Watts Creek

Threat & Description	Actions
Habitat Degradation and Modification Above the sediment trap the channel is lacking natural meander for at least 200m. This section is also heavily silted.	Monitor sediment trap infilling and empty as deemed necessary. Once flows are restored to the natural channel, monitor the meander upstream and complete necessary restoration techniques if required.
Climate Change Impacts Tree blowdown from hurricane damage is extensive in this branch, especially upstream from Loyalist Rd, with log jams impacting stream connectivity.	Complete woody material management to improve passage and salmonid habitat diversity.
Barriers Loyalist Road culvert acts as a barrier to fish passage, blocking access to over 10km of upstream habitat. There has historically been beaver activity in the upper reaches of Watts Creek, which may also impact connectivity.	Construct step pools below the Loyalist Road culvert on Watt's Creek to improve passage, in partnership with the Department of Transportation. Complete smelt surveys to identify any additional connectivity issues.

Erosion There is significant erosion from agriculture that carries run-off into the stream just below the headwaters. Other significant sources of sediment input are yet unidentified.	Monitor previous Agri-Watershed partnership site on upper Watt's and follow up if deemed necessary. Identify erosion input sites and monitor them during rain events for runoff. If issues are identified, follow the appropriate steps to address and resolve them.

3e: Coles Creek

Threat & Description	**Actions**
Overexploitation of Resources The City of Charlottetown wellfield has been shown to impact water flows and temperature downstream.	Support UPEI with their research projects on Cole's Creek.
Climate Change Impacts Tree blowdown from hurricane damage is extensive in the forested buffer near the wellfield, with log jams impacting stream connectivity.	We aim to manage woody material to enhance passage and salmonid habitat diversity; however, restoration activities are on hold to avoid impacting UPEI's ongoing study.
Barriers Many of the culverts on the upper reaches of Coles Creek are barriers to fish passage, and the culvert on Malpeque Rd is a potential barrier. Culverts between the two points are yet to be assessed.	Complete stream crossing assessments that were not completed in 2024. Collaborate with landowners and the PEI Department of Transportation to address crossings impacting fish passage. Complete smelt surveys to identify connectivity issues.
Erosion Erosion from agricultural fields and from a shale pit brings a large volume of run-off to the channel in the upper reaches.	Work with a farmer and the Agri-Watershed Partnership to install a sediment pond, reducing sediment entering upper Cole's. Identify erosion input sites and monitor them during rain events for runoff. Collaborate with landowners and experts to address and resolve erosion inputs.

3f: Milton Creek

Threat & Description	Actions
Climate Change Impacts Tree blowdown from hurricane damage is heavy in some places with log jams impacting stream connectivity.	Complete woody material management to improve passage and salmonid habitat diversity.
Barriers The culvert at Malpeque Rd is a barrier to fish passage. This culvert is close to the mouth, so anadromous fish are denied access to an abundance of potential spawning habitat.	Improving fish passage through the Malpeque Rd culvert is a priority, although additional data is needed to assess connectivity upstream. Complete stream crossing assessments that were not completed in 2024. Complete smelt surveys to identify connectivity issues.
Erosion Though the tree buffer is mostly continuous, the abundance of agricultural fields still contributes a large volume of run-off into the channel.	Continue collaborating with landowners on projects to mitigate soil erosion.

3g: Warrens Creek

Threat & Description	Actions
Pollution Collapsed bridges and garbage accumulating in riparian areas.	Clean up garbage in riparian areas. Identify problematic areas and contact landowners to resolve issues.
Habitat Degradation and Modification In the old pond basin, the stream's meander is excessive, and the channel is deeply incised. Cattle access to the river has severely damaged the banks and channel in at least 2 locations. Several poorly constructed bridges have also caused damage to the banks and altered the natural meander.	Tree-plant the old pond basin to improve the riparian zone. Work with landowners to fence cattle out of the stream through the ALUS program.
Climate Change Impacts Tree blowdown from hurricane damage is heavy in some places with log jams impacting stream connectivity.	Complete woody material management to improve passage and salmonid habitat diversity.
Barriers There are several culverts that are barriers to fish passage.	Complete stream crossing assessments that were not completed in 2024. Collaborate with landowners and the PEI Department of Transportation to address crossings impacting fish passage.

3h: Hyde Creek

Threat & Description	Actions
Pollution Fish populations in Hyde Creek were reduced as a result of a fish kill in 2017 and have not yet returned to their previous abundance. The difference in species found above and below the pond also suggests that effluent entering Hyde Creek from the water treatment lagoons may be a limiting factor for both anadromous and resident salmonids. Trash is also a common issue along the lower half of the creek and surrounding Hyde Pond.	Stock the pond with Brook Trout in partnership with the province. Complete macroinvertebrate surveys to attain a general understanding of water quality above Hyde Pond, below the pond and below the lagoon effluent outlet. Continue community stream cleanup annually. Complete garbage clean ups in the areas residents missed.
Invasive Species Invasive species are common throughout Hyde Creek (as is typical in urban developmental areas).	Manage select invasive species sites deemed attainable. Educate residents about invasive species transport and management in partnership with the PEI Invasive Species Counsil.
Habitat Degradation and Modification Because Hyde Creek runs directly through the center of Cornwall, urban development has shaped the habitat in several ways. Both ponds on the creek are man-made. Most habitat degradation in Hyde Creek is directly tied to human activity along the banks, such as make-shift stream crossings and repeated damming with river rocks.	Install educational signage throughout Hyde Creek in areas where consistent habitat modification has been identified. Educate community members about best practices around watercourses.
Barriers There are several culverts on Hyde Creek that create barriers to fish passage.	Manage riprap at the Main Street culvert in Cornwall to enhance fish passage. Complete stream crossing assessments that were not completed in 2024. Collaborate with landowners and the PEI Department of Transportation to address crossings impacting fish passage. Complete smelt surveys to identify connectivity issues.

Resources Required

Additional core funding is needed to strategically plan activities, analyze data, strengthen community relationships, secure funding, and build organizational capacity. Our current core funding is insufficient to meet staffing needs, and wage subsidies are not always a viable option.

As a result of core funding not meeting our staffing needs, there is a high turnover rate of employees. To maintain consistent restoration work regardless of staff changes, a certification training program is essential.

Establishing contact and developing relationships with landowners in our watershed can be challenging. Not everyone values environmental conservation which can be difficult to navigate. More resources to get farmers and other landowners familiar with watershed groups and aquatic ecosystem health is needed.

CAWG has identified a need for technical support regarding data storage and mapping, as small organizations often lack the capacity to manage complex GIS and data systems. This makes tracking habitat changes and restoration progress challenging and time consuming. Access to technical experts for troubleshooting, training, and an effective data storage platform would greatly improve data management.

CAWG's limited access to the Watershed Alliance electrofishing unit, restricted to just one week per year, has limited our ability to effectively survey the watershed. As electrofishing is our primary method for detecting Atlantic salmon presence in the North River watershed, expanding our sampling capacity is a priority. Additionally, CAWG is exploring alternative methods for detecting salmon, as we have not had a confirmed sighting since 2022.

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