Assessment of rivers in the Outer Bay of Fundy, Inner Bay of Fundy, and Nova Scotia Southern Upland Atlantic Salmon Designatable Units: suitability for monitoring escaped aquaculture salmon in the Bay of Fundy

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Assessment of rivers in the Outer Bay of Fundy, Inner Bay of Fundy, and Nova Scotia Southern Upland Atlantic Salmon Designatable Units: suitability for monitoring escaped aquaculture salmon in the Bay of Fundy

by

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ABSTRACT

Van Wyngaarden, M., Tellier, G.E., Colton, K.J., Mossman, D.C., Yaroshewski, V., Hardie, D., Hogan, J.D., Notte, D., Beaumaster, R., McWilliam, S., McBride, M.C., Jeffery, N.W., de Mestral, L., Trudel, M., Steeves, R., Wringe, B.F. 2026. Assessment of rivers in the Outer Bay of Fundy, Inner Bay of Fundy, and Nova Scotia Southern Upland Atlantic Salmon Designatable Units: suitability for monitoring escaped aquaculture salmon in the Bay of Fundy. Can. Tech. Rep. Fish. Aquat. Sci. 3783: xiv + 312 p. https://doi.org/10.60825/ax5v-8x12

Atlantic Salmon (*Salmo salar*) in the Bay of Fundy are split into three genetically and ecologically distinct Designatable Units – Outer Bay of Fundy (OBoF), Inner Bay of Fundy (IBoF), and Nova Scotia Southern Upland (SU). All three groups have been designated as Endangered by the Committee on the Status of Endangered Wildlife in Canada and abundances are at or below 5% of the conservation requirement for the species. Interactions with escaped domestic salmon from aquaculture operations has been identified as a significant risk to Bay of Fundy Atlantic Salmon populations through genetic (i.e. interbreeding) and non-genetic interactions. Atlantic Salmon aquaculture is a dominant industry in the Bay of Fundy in both New Brunswick and Nova Scotia, and even with improvements to technology and standards in the industry, escape events continue to occur. Escaped aquaculture salmon have been detected in Bay of Fundy since shortly after the introduction of the industry to the region, however monitoring for escaped aquaculture fish is opportunistic and relies on documentation from monitoring and research activities with other objectives. To accurately understand the scale and scope of interactions with escaped aquaculture fish in Bay of Fundy rivers, targeted, spatially-informed monitoring is required. We investigated 159 sites in 110 rivers around the Bay of Fundy in Nova Scotia and New Brunswick to identify candidates for dedicated aquaculture escapee monitoring using fish fences. We identify four sites in OBoF, seven sites in IBoF, and seven sites in SU as suitable locations for escapee monitoring; these sites have characteristics that allow for relatively easy and inexpensive fish fence installation and are in rivers predicted to have escaped aquaculture salmon. We present a further five sites in OBoF, 16 sites in IBoF, and one site in SU that are not suitable for aquaculture escapee monitoring but may be useful for other research or monitoring activities that require river access. All remaining sites are presented in an appendix as the data and photographs collected represent a useful resource for future work in rivers around the Bay of Fundy.

RÉSUMÉ

Van Wyngaarden, M., Tellier, G.E., Colton, K.J., Mossman, D.C., Yaroshewski, V., Hardie, D., Hogan, J.D., Notte, D., Beaumaster, R., McWilliam, S., McBride, M.C., Jeffery, N.W., de Mestral, L., Trudel, M., Steeves, R., Wringe, B.F. 2026. Assessment of rivers in the Outer Bay of Fundy, Inner Bay of Fundy, and Nova Scotia Southern Upland Atlantic Salmon Designatable Units: suitability for monitoring escaped aquaculture salmon in the Bay of Fundy. Can. Tech. Rep. Fish. Aquat. Sci. 3783: xiv + 312 p. https://doi.org/10.60825/ax5v-8x12

Le saumon atlantique (*Salmo salar*) de la baie de Fundy est divisé en trois unités désignables génétiquement et écologiquement distinctes : la baie extérieure de Fundy (OBoF), la baie intérieure de Fundy (IBoF), et les hautes terres du sud de la Nouvelle-Écosse (SU). Ces trois groupes sont désignés comme espèces en voie de disparition par le Comité sur la situation des espèces en péril au Canada et leur abondance est égale ou inférieure à 5 % du seuil de conservation requis pour l'espèce. Les interactions avec des saumons domestiques échappés des exploitations aquacoles représentent un risque important pour les populations de saumon atlantique de la baie de Fundy, en raison d'interactions génétiques (p. ex. croisements) et non-génétiques. L'aquaculture du saumon atlantique est une industrie dominante dans la baie de Fundy, tant au Nouveau-Brunswick qu'en Nouvelle-Écosse, et malgré les améliorations aux technologies et aux normes de l'industrie, des événements d'évasion continuent de se produire. Des saumons d'aquaculture échappés ont été détectés dans la baie de Fundy peu après l'introduction de cette industrie dans la région. Toutefois, la surveillance des poissons échappés demeure opportuniste et repose principalement sur des données recueillies de la surveillance et de la recherche menées à d'autres fins. Afin de quantifier adéquatement l'ampleur et la distribution spatiale des interactions entre les saumons sauvages et les poissons d'aquaculture échappés dans les rivières de la baie de Fundy, une surveillance ciblée et spatialement structurée est nécessaire. Nous avons évalué 159 sites répartis dans 110 rivières autour de la baie de Fundy, en Nouvelle-Écosse et au Nouveau-Brunswick, afin d'identifier des sites potentiels pour la surveillance des poissons d'aquaculture échappés à l'aide de barrières à poissons. Nous avons identifié quatre sites dans l'OBoF, sept dans l'IBoF, et sept dans la SU comme étant appropriés à cette fin ; ces sites présentent des caractéristiques permettant l'installation relativement simple et peu coûteuse de barrières à poissons et se situent dans des rivières où la présence de saumons d'aquaculture échappés est prévue. Nous présentons également cinq autres sites dans l'OBoF, seize dans l'IBoF, et un dans la SU qui ne conviennent pas à la surveillance des poissons d'aquaculture échappés, mais qui pourraient être utiles pour d'autres activités de recherche ou de surveillance nécessitant un accès à la rivière. Tous les autres sites sont présentés en annexe, puisque les données et les photographies recueillies constituent une ressource précieuse pour les travaux futurs menés dans les rivières autour de la baie de Fundy.

INTRODUCTION

Atlantic Salmon (*Salmo salar*) populations in the Bay of Fundy are divided into three genetically and ecologically distinct Designatable Units (DU): Outer Bay of Fundy (OBoF, DU 16), Inner Bay of Fundy (IBoF, DU 15), and Nova Scotia Southern Upland (SU, DU 14; COSEWIC 2010; Lehnert et al. 2023). These units were last assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in 2010, at which time all OBoF and SU were designated as Endangered (COSEWIC 2010). The IBoF population was first designated as Endangered by COSEWIC in 2001 and has been listed as Endangered on Schedule 1 of the Species at Risk Act since 2003 (COSEWIC 2001). Population status information provided to COSEWIC for each DU in 2024 has indicated that these populations continue to decline (Raab et al. 2024; Reader et al. 2024a; Reader et al. 2024b). In OBoF, adult abundance on the Saint John River upriver of the Mactaquac Dam is estimated at 4% of the conservation requirement and on the Nashwaak River it is estimated at 5% of the conservation requirement (Reader et al. 2024a). IBoF population abundance is also critically low; adult abundance on the Big Salmon River in New Brunswick (New Brunswick) is estimated below 4% of the conservation requirement, despite being the recipient of a Live Gene Bank (LGB) intervention program. Persistence of IBoF populations elsewhere in the DU is primarily maintained through the LGB breeding and release program (Clarke et al. 2025; Reader et al. 2024a). In 2018, Fisheries and Oceans Canada (DFO) concluded that “IBoF Salmon would likely be extirpated without the LGB program” (DFO 2018), however recent management decisions connected to a government-wide comprehensive expenditure review will see the end of the LGB program and closure of DFO Biodiversity Facilities in 2026 (Grillo de Lambarri 2026). Similarly, annual adult abundance data from four rivers in SU show population declines of 95% to 100% from maximum abundance and returns to index rivers in SU have been below conservation requirements for the past three generations of available data (Raab et al. 2024). Threats to Atlantic Salmon population persistence are complex, affecting both the freshwater and marine life stages of Atlantic Salmon, however interactions with escaped aquaculture salmon are listed as a threat to wild salmon populations in all three Bay of Fundy DUs (COSEWIC 2010; Raab et al. 2024; Reader et al. 2024a; Reader et al. 2024b).

Salmon aquaculture production in the Bay of Fundy began in the late 1970s (Carr et al. 1997) and has grown into a dominant industry in areas of New Brunswick and Nova Scotia, with production sites concentrated in Passamaquoddy Bay and around Grand Manan in New Brunswick and in the Annapolis Basin, St. Mary’s Bay near Shelburne, and St. Margarets Bay in Nova Scotia (Figure 1). In 1991, New Brunswick and Nova Scotia produced 9000 and 600 tonnes of salmon, respectively. By 2023, the New Brunswick aquaculture industry produced more than 22000 tonnes of salmon, while Nova Scotia produced more than 9000 tonnes (Statistics Canada 2026). Although aquaculture salmon are highly domesticated and genetically different from wild fish populations (Glover et al. 2017), salmon that escape marine aquaculture pens (due to weather events, predator activity, regular operations, etc.) may still follow instinctive behaviour to enter rivers for spawning, and escaped aquaculture salmon have been regularly detected in rivers in Atlantic Canada since 1983 (Figure 2; Keyser et al. 2018). The genetic and non-genetic effects on wild populations due to interactions with escaped aquaculture salmon have been well documented in North America and Europe (DFO 2023; Gilbey et al. 2021; Jóhannsson et al. 2017; Karlsson et al. 2016). Direct genetic interactions between wild and domestic salmon can reduce population viability (Fraser et al. 2008; Glover et al. 2017; McGinnity et al. 2003) and even non-reproductive interactions can lead to genetic effects on wild populations due to competition, predation, and disease exposure (Bradbury et al. 2020a). Escaped aquaculture salmon disperse quickly following escape events (Dempster et al. 2018) and are known to generally enter rivers near their escape site (up to 300 km), although in

rarer cases individuals have been tracked more than 1000 km from the where they escaped (Hansen and Youngson 2010; Keyser et al. 2018; Morris et al. 2008). Because of the potential scale of escapee dispersal, effective, spatially-informed monitoring is crucial for an accurate assessment of the effects of escaped aquaculture salmon on endangered Bay of Fundy salmon populations.

Salmon population monitoring around the Bay of Fundy relies on both opportunistic and targeted sampling. Opportunistic monitoring (where salmon may be observed at facilities targeting different species) by DFO, First Nations, Parks Canada, and other groups, occurs on the Big Salmon River, the Pointe Wolfe River, the Upper Salmon River, and the Petitcodiac River in New Brunswick and the Gaspereau River and Stewiacke River in Nova Scotia (Burtt 2025; Clarke et al. 2025; Reader et al. 2024b). Targeted population monitoring for salmon around the Bay of Fundy focuses on several index populations that are tracked through existing infrastructure, including the St. George Fishway on the Magaguadavic River, the Mactaquac Dam on the Saint John River, and a semi-permanent fish counting fence on the Nashwaak River, all in New Brunswick (Figure 3). In Nova Scotia, targeted monitoring takes place at the White Rock Dam on the Gaspereau River and Morgan's Falls on the LaHave River (see Figures 1, 2, 5, 17, and 41). Apart from the semi-permanent counting fence on the Nashwaak River, the existing targeted salmon monitoring in facilities in Maritimes Region relies on purpose-designed elements or modifications of in-stream infrastructure, such as fishways on dams originally constructed and maintained for other purposes, including power generation. Although these facilities are critical for long-term monitoring and assessment of salmon populations, they were neither designed nor sited to assess the number and distribution of escaped farmed salmon in the DFO Maritimes Region.

In contrast to permanent facilities primarily maintained for other purposes, fish counting fences can be installed temporarily at specific sites selected to prioritize the detection of escaped aquaculture salmon. While deployed, they can be used to assess all fish travelling upstream or downstream past a site, allowing for the collection of quantitative data and samples which can be useful in determining whether migrating salmon are wild or domestic (Clay 1995). Because they can be installed and removed relatively quickly (especially compared to more permanent infrastructure), they can be especially effective for monitoring an anadromous species like Atlantic Salmon, which must enter rivers at specific times of the year to complete their life cycle. This can help limit the impact of sampling on a river since alterations and activity will only be present at a site during a specific window of time. Fences can also be designed to accommodate a variety of river features, although costs can increase significantly if conditions are not optimal. However, the cost and complexity of installing temporary fish fences will always be less than installing larger, permanent infrastructure. Factors such as the likelihood of flooding, river size and substrate, and the ability to access a river safely and easily should all be considered when selecting a fence installation site.

To provide recommendations on the most suitable rivers for the installation of a fish counting fence to monitor aquaculture escapees around the Bay of Fundy, we first utilized the output of an aquaculture escapee dispersal model previously employed in aquaculture siting evaluations in Nova Scotia and New Brunswick (Bradbury et al. 2020b; DFO 2023; Jóhannsson et al. 2017). From the rivers predicted by the model to receive escapees from the existing New Brunswick and Nova Scotia aquaculture industries, we next identified those located within approximately 200 km of the nearest aquaculture site. Prospective monitoring sites within each river were then identified using available data along with topographic maps and aerial imagery from Google Maps to select locations that were near the mouth of the rivers (where possible), downstream of major tributaries, and located near areas that appeared to provide relatively easy access (e.g. bridges, Crown land, and parking areas). We surveyed this shortlist of rivers in the OBoF, IBoF,

and SU DUs in the summer of 2024 and the summer and autumn of 2025. We also consolidated existing data on river geography, extant salmon populations, the presence of hatcheries or other salmon-producing facilities, and prior detections of escapees, then collected new data on river characteristics to systematically rank rivers using a decision tree adapted from Andrews and Coffey (2009; Figure 4). We collected environmental DNA (eDNA) samples at many of the selected rivers to detect the presence of Atlantic Salmon DNA and identify other potentially impacted species of conservation and economic concern present near the assessment sites. We also sampled several sites using electrofishing to capture, document, and collect tissue samples from any juvenile salmon present in the river.

A major factor that likely influenced some of the data collected during our survey is the extreme drought conditions present in the Maritime provinces around the Bay of Fundy during the summer of 2025, which affected water levels in almost all rivers surveyed (Environment and Climate Change Canada 2025). To account for this, where possible we present both wet and bankfull river widths and identify evidence of lower-than-average water levels that were present throughout the region during our survey. We also take care to note and report evidence of river size during high water events because this is an important consideration for the installation of counting fences and for the safety of operation personnel. In the main text of this report, we identify rivers and sites in OBoF, IBoF, and SU that are suitable candidates for fence installation and rivers that are not suitable candidates for escapee monitoring but possess features of potential interest for other research or monitoring work that requires river access. All rivers and sites visited that are not appropriate for fence installation and escapee monitoring are presented in the Appendix.

MATERIALS AND METHODS

SITE VISITS

Between August 2024 and October 2025, we visited 159 river sites in 110 rivers in the OBoF, IBoF, and SU Atlantic Salmon DUs (Table 1). At each site, we measured river widths (wetted and bankfull), depth, water temperature, and noted substrate, evidence of flooding, available adult and juvenile salmon habitat, and several other characteristics detailed in our sample site rubrics (Table 2, Table S1). We calculated site rating scores using a decision tree modified from Andrews and Coffey (2009; Figure 4). We first identified whether the escapees were predicted to enter the river based on a dispersal model (Bradbury et al. 2020b; DFO 2023; Jóhannsson et al. 2017), whether the river mouth was within 200 km of active sea pen salmon aquaculture sites, and whether the site was above tidal influence (either saltwater intrusion or freshwater levels rising due to tidal pressure). Next, we scored sites based on 5 criteria: fish passage, flooding, river size, river substrate, and accessibility. Sites scored one point if they had no barrier to fish passage downstream in the system, limited evidence of regular flooding at the site, appropriate width (between 5 m and 80 m wide although wide rivers increase fence cost), depth (less than 1 m or waist-deep), flow (most passive, in-river fish capture requires some current to function properly but the current must not be too strong to wade in safely), suitable substrate for fence installation (cobble is ideal for securing fence supports but substrates like bedrock or mud can be used with modifications), and a safe access point for fence installation and maintenance (a wide road shoulder or parking area close to the site; stable bank with a shallow slope for river access). Sites with a decision tree score of four or five are suitable as possible locations for fence installations and are presented in the main report; details for all other sites are included in the Appendix.

We collected eDNA samples in triplicate with a field negative at 84 sites. We used new single-use large, resealable plastic bags to collect water from the left bank, middle, and right bank of

each site. Bags were rinsed in the river several times before being filled, then sealed and brought to a filtering station beside the river. Bags were not reused between sites or samples. For each triplicate sample, we filtered 1 L of water through a 47 mm diameter glass microfibre filter with 1.5 µm pore size using a Gast suction pump, measuring the volume in the post-filter vacuum flask to avoid contamination. After the triplicate samples were filtered at each site, we ran a field negative by filtering 1 L of distilled water. Water for the field negatives was stored in cleaned and sterilized 1 L sealable bottles until filtering. After filtering, we used sterile tools to transfer the filters to 1.5 mL tubes containing 1 mL of 95% ethanol and stored the tubes with ice packs in coolers to prevent UV damage. Where possible during field trips, samples were stored at -20°C or 4°C overnight. Upon return to the lab, the tubes containing the filters were transferred to -80°C freezers and stored until eDNA extraction and processing.

In addition to the data collected at the site visit, we also consolidated existing data for each site and river into the rubric (Table 2, Table S1). We included information on existing salmon populations in rivers, the previous detection of escapees, geography surrounding the river, and existing work on the river. Although in many cases specific groups engaged in conservation work on rivers can be identified, only a summary of that information is presented to avoid biasing any future work. We also included the size of the available productive salmon habitat for each river where available [in 100 m^2 units per Marshall et al. (1997) and O'Connell et al. (1997)]. To estimate the available salmon habitat area for rivers without published values, we used linear regression following Bowlby et al. (2018b), however we used available river axial length (in km) rather than total drainage area of the watershed as the predictive variable. We used the rivers with published data to determine the relationship between productive salmon habitat area (in 100 m^2 units) and the axial length (in km) of the river (assuming a zero intercept) for each DU separately, then used the relationship to calculate the predicted amount of salmon habitat available based on axial length in data deficient rivers.

ELECTROFISHING

In 2024 and 2025, we sampled 21 sites for the presence of juvenile Atlantic Salmon using one-pass electrofishing (Table 3). Before beginning each site, we assessed weather, hazards, and safety considerations and measured river water temperature to ensure conditions were safe for both operators and captured fish. The sites were sampled as an open system with no nets preventing the movement of fish up- or downstream so results are not a fully quantitative mark/recapture metric but still provide accurate presence/absence and biodiversity data. We fished the sites in teams of three with one person operating a Smith-Root LR-24 backpack electrofisher at a frequency of 60 Hz and a 36% Duty Cycle and two people catching stunned fish – one with a dip net and one with a lip seine. Stunned fish were placed in a large bin filled with river water and kept in the shade with an aerator to ensure fish safety. Once fishing was complete, we anesthetized captured fish with clove oil (approximately 1:9 oil: ethanol ratio) in sufficient river water, then measured fork length, photographed and weighed the fish, and took a fin clip from any captured Atlantic Salmon and placed it in 95% ethanol for future DNA analysis. Once sampled, we placed the fish in a recovery bucket until equilibrium was achieved, then returned them to the river near the collection point.

EDNA EXTRACTION, PROCESSING, AND ANALYSIS

We processed eDNA filters from 60 out of 84 sampling sites selected to maximize the spatial coverage of the results and prioritize sites with high likelihoods of wild populations and aquaculture escapees. Filters from the remaining 24 sites were stored in ethanol at -80°C for future processing. DNA was extracted from the eDNA filters at the Aquatic Biotechnology Lab (ABL) at the Bedford Institute of Oceanography (BIO) in a designated eDNA clean laboratory,

following strict cleaning procedures and established laboratory protocols. We cut each sample filter in half and extracted DNA from one half using a modified automated version of the Qiagen DNeasy Extraction Kit on a QIACube Connect (Qiagen), including an extraction negative with every batch of 11 samples. We quantified all samples and extraction negatives using the Qubit v4 Fluorometer (ThermoFisher) with the dsDNA High Sensitivity Picogreen assay kit (ThermoFisher). We returned the remaining unprocessed half of each filter to the original tube with ethanol and archived it at -80°C.

We analyzed all extracted DNA samples including extraction negatives using quantitative PCR (qPCR). We identified the presence of *S. salar* in each sample with a species-specific assay targeting the mitochondrial *cytochrome c oxidase subunit 1* (COI) gene region using the COI_82F_Ss (TGGCGCCCTTCTGGGA) and COI_276R_Ss (AAGGAGGGAGGGAGAAGTCAAAAA) primers and the COI_194P_Ss probe (ATTAATTCCTCTTATAATCGGG; NFQ-MGB; Wood et al. 2021). We prepared all the qPCR assays in a clean lab using an epMotion 5073 robot (Eppendorf). Reactions were performed in a 384-well format with three technical replicates for all sample types, including eDNA samples, field negatives, extraction negatives, PCR negative control samples (water), a positive control of DNA from *S. salar* tissue, and a 6-point, 10-fold serial dilution ($1.0x10^5$ to $1.0x10^0$ copies DNA/µL) of a synthesized *S. salar* COI gBlock gene fragment (IDT). The serial dilution was used to generate a standard curve for assessing assay efficiency. Each 20 µL reaction contained 10 µL of 2X TaqPath ProAmp Master Mix (Applied Biosystems), 0.4 µL each of 10 µM COI_82F_Ss and COI_276R_Ss primers, 0.25 µL of 10 µM COI_194P_Ss probe, 0.8 µL of 1% BSA, and 3 µL of eDNA, controls, or standards. Assays were amplified on a Quantstudio 7 Flex instrument (Applied Biosystems) with an initial denaturation at 95°C for 10 minutes followed by 50 cycles of 95°C for 15 seconds and 60°C for 1 minute. All samples were also analyzed in duplex with an internal positive control (e.g., T4 DNA) to assess potential PCR inhibitors; no samples showed evidence of inhibition.

We evaluated qPCR results for both the individual sample (using three technical replicates) and collection site (using three samples per site) following the decision framework of Shaw-McDonald et al. (2025) to determine if *S. salar* DNA was present (either “detected”, “inconclusive”, or “not detected”). At the individual sample level, if *S. salar* DNA amplification occurred in all three technical replicates per sample, we classified the sample as “detected”, if *S. salar* DNA amplification occurred in one or two technical replicates, we classified the sample as “inconclusive”, and if *S. salar* DNA did not amplify in any of the technical replicates, we classified the sample as “not detected”. Next, we used the individual sample results to classify collection sites. We classified a site as “detected” if at least one sample from the site was classified as “detected” or if two or more samples from the site were classified as “inconclusive”. If all three of the samples from a site were classified as “not detected”, the site was also classified as “not detected”. If only one of three samples from a site was classified as “inconclusive” (and the other samples from the site were “not detected”), the site was classified as “inconclusive” and the samples were re-assayed to increase the confidence in site-level classification.

We used a subset of extracted eDNA (including extraction negatives) to detect a broad range of fish species using eDNA metabarcoding. We amplified samples using the MiFish universal primer set [Mifish_UR_Miya (CATAGTGGGGTATCTAATCCCAGTTTG; Miya et al. 2015) and 12S_248F_RADS_For (CGTGCCAGCCACCGCGGTT; He et al. 2022)], targeting the mitochondrial gene 12S. We prepared the 12S metabarcoding libraries using a one-step dual-indexed PCR protocol with customized forward and reverse fusion primers, each containing a uniquely barcoded Nextera adapter (Illumina). Each 25 µL PCR was reaction performed in triplicate with a PCR negative for each sample and contained of 12.5 µL of 2X Qiagen Multiplex

Master Mix, 1 µL each fusion primer (10 µM), 8.5 µL PCR-grade water, and 3 µL DNA template. The PCR thermocycling started with an initial denature at 95°C for 15 minutes, followed by 35 cycles of 95°C for 30 s, 58°C for 90 s and 72°C for 60 s, with a final extension of 72°C for 10 minutes. We screened the PCR reactions on a TapeStation 4200 (Agilent Technologies) to confirm amplification and the absence of bands for PCR negative controls. Following screening, we pooled PCR replicates by sample, then purified and quantified each sample. We pooled all samples in equimolar concentrations to maximize sequencing depth and promote uniform coverage across the library. We quantified the final library pool using the NEBNext Library Quant Kit for Illumina (New England BioLabs) on a QuantStudio 7 Flex (ThermoFisher) and sequenced it on an Illumina MiSeq platform using a 500-cycle reagent kit.

Once sequenced, we verified data quality, completed sample processing, and identified fish species in each eDNA sample using the QIIME2 pipeline (Bolyen et al. 2019) and NCBI nucleotide database following (He et al. 2022). After filtering and initial species identification for each ASV (amplicon sequence variant), we checked our list of identified fish species against a white-list of expected native and aquatic invasive species created using expert knowledge and corroborated with Scott and Crossman (1973), FishBase (Froese and Pauly 2025), and iNaturalist (iNaturalistCommunity 2025) records. For final species identification, we retained five BLAST hits per each ASV and used a custom R script to assign reportable species identities. When all five BLAST hits identified the same species, the assignment was considered unambiguous and that species name was recorded. If the top five hits included multiple species or any non-native species, these cases were flagged for further review. ASVs flagged for ambiguous or non-native identifications were subjected to an additional BLAST search. These secondary results were manually evaluated: if the top BLAST hit for an ASV showed a lower E-value and higher percent identity than subsequent hits, and the species was native, that species identity was retained. If multiple top hits shared identical E-values and percent identities, the taxonomic assignment was collapsed to the lowest common taxonomic level shared by those hits. If no native species were present among the top BLAST hits, the assignment was collapsed to the lowest common taxonomic level observed among the native species within the reference database. Once all ASVs were identified to the lowest possible taxonomic level, we visualized species presence and abundance at each sample site using heat maps and used the *vegdist* function in the R package *vegan* to calculate Bray-Curtis dissimilarity indices in species composition among sites.

RESULTS

OUTER BAY OF FUNDY

The OBoF DU extends from the New Brunswick border with the United States of America (USA) to just east of the Saint John River Estuary (approximately 45°12’ N, 65°57’W). We completed 38 site visits at 33 sites across 19 rivers in OBoF and collected eDNA at 20 of these sites across 13 rivers (Figure 5). Calculated using data from 14 OBoF rivers, our linear regression of productive salmon habitat area by river axial length was significant ($p < 0.001$, adjusted $R^2 = 0.67$, Table S2a). We multiplied the slope estimate from the OBoF regression by river axial length to estimate the salmon habitat area for four OBoF rivers that did not have published values available.

eDNA qPCR

qPCR analysis detected the presence of Atlantic Salmon DNA in nine of the 20 sites sampled in OBoF: Digdeguash River, two sites in Pocologan River, New River, two sites in Nashwaaksis Stream, Salmon Creek/Middle Brook in the Canaan River system, Kennebecasis River, and

Hammond River. Three sites were inconclusive for the presence of salmon DNA (Forks Stream in the Canaan River system, Belleisle Creek, and Keswick River). Atlantic Salmon DNA was not detected in the remaining eight sites: two sites in Dennis Stream, Waweig River, Digdeguash River, Mill Brook, Grants Brook, Kennebecasis River, and Hammond River (Table 4).

eDNA Metabarcoding

After quality control and rigorous curation of species identifications, we detected DNA from 37 fish species across all sites (Figure 6). Four ASVs could not be confidently resolved to species level and were instead assigned to the genera Alosa, Anguilla, Cottus, and Pungitius. In total, these identifications represented 32 genera and 16 families. The most frequently detected species were Blacknose Dace (*Rhinichthys atratulus*), American Eel (*Anguilla rostrata*), Creek Chub (*Semotilus atromaculatus*), White Sucker (*Catostomus commersonii*), Common Shiner (*Luxilus cornutus*), and Sea Lamprey (*Petromyzon marinus*), with Blacknose Dace and American Eel DNA detected at all sites. Atlantic Salmon DNA was detected at eight sites (CAN1, DIG1, HD11, KSL, NKS, NRB1, PN1, and PN2). The spatial pattern of Atlantic Salmon detections using metabarcoding was highly concordant with positive Atlantic Salmon detections obtained through qPCR analysis (Table 4).

Notably, DNA from five invasive species was detected at eight sites (Figure 6). Smallmouth Bass (*Micropterus dolomieu*) DNA was found at four sites, Chain Pickerel (*Esox niger*) at three sites, Brown Trout (*Salmo trutta*) at two sites, and Largemouth Bass (*Micropterus nigricans*) at one site. Although detected at low abundance, Stone Loach (*Barbatula barbatula*) DNA exceeded established filtering thresholds at site KSL, classifying as a detection. Review of pre-quality-controlled ASV counts in field, extraction, and PCR blanks confirmed that Stone Loach DNA was absent from all negative controls, supporting the conclusion that this detection reflected true presence in water samples rather than contamination. Stone Loach was the only invasive species detected at the same site as Atlantic Salmon using eDNA (Figure 6). Comparison of species composition across sample sites using the Bray-Curtis similarity of species index revealed three general groupings: the lower reaches of major tributaries (KSL, HDL, CAN2, KSW1), cold-water brooks (GRB, KS5), and all other sites (NRB1, PN1, PN2, WGNEW, DES2, DIG1, DIG2, NKS, BEL, DES1, HD11, CAN1, HAR; Figure 7).

Electrofishing

In 2024, we electrofished for juvenile Atlantic Salmon in Dennis Stream, Mill Brook, Canaan River, Grant Brook/Spragg Brook, Kennebecasis River, and Hammond River. Thirty seven juvenile salmon were caught: 13 in Canaan River at site CAN1 and 24 in Hammond River at site HD11. In all cases, fin clip tissue samples were taken and fish were measured before being released.

Rivers Suitable for Aquaculture Escapee Monitoring

Thirteen sites in OBoF had decision tree scores of 4 or 5, indicating they would be suitable for fence installation (Table 5). Four of these sites were excluded from recommendations due to features that made them unsuitable that weren't captured in the scoring, although they were identified in the rubric. Of the remaining nine sites, four are suitable candidates for the installation of a counting fence for monitoring escaped aquaculture salmon and five are highlighted as suitable for other monitoring or assessment work. Rivers are presented in order moving northeast from the New Brunswick border with Maine, USA to the northeastern edge of the OBoF DU. Full details for suitable sites are presented in the rubric (Table 2); details for OBoF sites not suitable for escapee monitoring are in the Appendix.

Dennis Stream

Dennis Stream is in Charlotte County, New Brunswick, near the border with the United States of America (Figure 5A). The mouth of the stream is in St. Stephen, where it empties into the St. Croix River which flows into Passamaquoddy Bay. The mouth of Dennis Stream is approximately 26 km away from the nearest active salmon sea pen aquaculture lease. The dispersal model predicts that most of the salmon that return to the stream are escaped aquaculture salmon and escapees have previously been detected in the St. Croix River, New Brunswick, which Dennis Stream drains into (DFO 2014; Keyser et al. 2018). The closest dedicated salmon monitoring facility to Dennis Stream is the St. George Fishway on the Magaguadavic River in St. George, New Brunswick, also in Charlotte County (under review for closure in 2026). Dennis Stream has a small amount of salmon habitat [527 productive salmon habitat units (100 m^2; Jones et al. 2014)] and there is likely a wild salmon population in Dennis Stream (Jones et al. 2023). Salmon DNA was not detected in eDNA samples taken at DES1 and DES2 in 2024 (Table 4) although the Atlantic Salmon Federation caught fry and parr on recurring electrofishing surveys in Dennis Stream in 2025 (pers. comm. G. Chafe). Neither stocking of landlocked Atlantic Salmon by the government of New Brunswick nor DFO intervention through the LGB occur in the watershed. At least one organization is actively engaged in conservation and fisheries-related work in the river and surrounding system. Several other anadromous species can be found in the stream.

Site Dennis001/DES2

Decision Tree score: 4

Benefits:

- Suitable substrate for fence installation
- Known to have sea-run salmon in very low abundance

Caveats:

- Close to existing monitoring in OBoF
- Some evidence for flooding at the site

Site Dennis001 (2025 assessment), also called DES2 (2024 assessment), is along New Brunswick Route 170 between two bridges (Figure 8). The site is appropriate for fence installation and scores high on the decision tree and rubric. Installation of a counting fence would be relatively easy and relatively inexpensive given the substrate, water flow, and river width. One bridge is on private property (the older bridge), but the main Rte. 170 bridge is on Crown land. There is a moderately steep bank from the road to the stream, and although it would require brush clearing to bring equipment down, the stream can be safely accessed from the road. Several areas of suitable adult and juvenile salmon habitat were observed near the site. The water temperature was 16.8°C during the site assessment, suitable for adult and juvenile salmon, and there was sufficient depth in areas that could be used as habitat or holding areas for adult salmon during migration or juvenile salmon living in the river. At the time of our site visit, the stream was approximately 12 m wide under the bridge (18-20 m wide at its widest point) and 1 m deep – suitable for both adult and juvenile capture via fence, although too deep for electrofishing. The substrate was mostly gravel with some silt, which is appropriate for fence installation. The existing bridge structures may provide some infrastructure that could be modified to support a fence with permission. There was some evidence for flooding (debris on riverbank), but the system did not seem at risk for significant flash flooding.

Site DES1

Decision Tree score: 4

Benefits:
- Suitable substrate for fence installation
- Known to have sea-run salmon in very low abundance

Caveats:
- Close to existing monitoring at St. George Fishway on Magaguadavic River
- High up in system, would only capture fish that migrate far up the stream

Site DES1 is an alternate site on Dennis Stream located five kilometers upstream of Dennis001/DES2 off New Brunswick Highway 750 (Figure 9). Although a site higher up in the system reflects less of the total habitat, DES1 would likely also be feasible for a fence installation as it has similar features to Dennis001/DES2. This site was assessed before the project's full protocols were developed so detailed measurements are unavailable, but with the information available the site scores high on the decision tree and rubric and is appropriate for fence installation.

Pocologan River

Pocologan River is in Charlotte County, New Brunswick, halfway between Saint John and the border with the USA (Figure 5A). The mouth of the river is in Pocologan where it empties into the Bay of Fundy and is about 2 km away from the nearest active salmon sea pen aquaculture lease. The dispersal model suggests that most of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility is the St. George Fishway on the Magaguadavic River in St. George, New Brunswick, also in Charlotte County. Pocologan River has a small amount of salmon habitat [226 productive salmon habitat units (100 m^2; Jones et al. 2014)]. There is likely a wild salmon population in the river (Jones et al. 2023) and salmon DNA was detected in eDNA samples taken at PN1 and PN2 in 2024 (Table 4). Stocking of landlocked Atlantic Salmon by the government of New Brunswick occurs in the watershed but DFO intervention programs are not present in Pocologan River. At least one organization is actively engaged in conservation and fisheries-related work in the river and surrounding system. Several other anadromous species can be found in the river. Pocologan River has evidence of moderate human activity, including ATV trails.

Site PN1

Decision Tree score: 5

Benefits:
- Suitable substrate for fence installation
- River empties directly in to the Bay of Fundy

Caveats:
- Close to existing monitoring at St. George Fishway on Magaguadavic River

Site PN1 is located down a dirt logging road off of New Brunswick Highway 780 between New River and Utopia (Figure 10). This site was assessed before the project's full protocols were developed so detailed measurements are unavailable, but with the information available the site scores high on the decision tree and rubric and is appropriate for fence installation.

Hammond River (Saint John River system)

Hammond River is in Kings County, New Brunswick, and drains into Kennebecasis Bay in the Saint John River system (Figure 5B). The closest active salmon sea pen aquaculture lease is 38 km from the mouth of the Saint John River system; the mouth of Hammond River is approximately 30 km farther upstream. The dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon; escaped farmed salmon have been detected in the Saint John River system (DFO 2014), but Keyser et al. (2018) do not specify if they were detected in the Hammond River. The closest dedicated salmon monitoring facilities to Hammond River are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system upstream of Hammond River (both under review for closure in 2026). Hammond River has a large amount of salmon habitat [16620 productive salmon habitat units (100 m^2) and 3.3% of all OBoF productive salmon habitat (Marshall et al. 1997)] and there is likely a wild salmon population in the river (DFO 2014); salmon were caught via electrofishing and salmon DNA was detected in the eDNA sample at site HD11 in 2024 but it was not detected in the sample from site HDL further downstream in the system (Table 4). DFO intervention programs do not target the Hammond River. Stocking of landlocked Atlantic Salmon by the government of New Brunswick does occur in Grand Lake in the Saint John system, although fish from Grand Lake are very unlikely to enter Hammond River. Several other anadromous species can be found in the river, including smelt. Many organizations, including conservation groups, Indigenous communities, and other environmental non-governmental organizations are actively engaged in conservation and fisheries-related work in the river and surrounding system. The Hammond River has evidence of high human activity, including a recreational fishery.

Site Hammond001/HDL

Decision Tree score: 4

Benefits:

- Easy access with room for staging
- Good substrate for fence installation

Caveats:

- Large, wide river with potential for deep water at certain times of the year
- Easily visible and publicly accessible

Site Hammond001/HDL is located at the French Village Road bridge over the Hammond River near New Brunswick Highway 1 (Figure 11). The site scores highly on the decision tree and rubric, and would be an appropriate site for aquaculture escape monitoring. Based on the river's size and depth, as well as the predominant substrate, installation of a fence would be relatively easy and inexpensive. The site is surrounded by private land, but some of the area along the riverbank between Highway 1 and French Village Road is Crown land. Site access is easy, with a gentle slope down to the river and substantial parking and equipment staging areas. No detailed depth measurements were taken during the site visit, but the river was estimated at 20 m wide and 50 cm deep, a suitable width and depth for juvenile and adult capture via fence. Many areas of suitable juvenile habitat were observed from the assessment site, however low water levels meant limited deeper habitat holding areas were available for adult salmon at the time of the site visit. The water was very warm (24.2°C), but the high temperatures may have been partly caused by the limited rain and low water levels throughout the region during 2025. Although the water was fairly shallow during the site visit, a large cobble bank indicated that the river is likely approximately 50 cm deeper and 20 m wider during periods of more

significant rainfall (approximately 20 m wide during the site visit). The substrate of the river was primarily gravel and cobble, an ideal substrate for fence installation. The existing bridge structures (French Village Road and Hwy 1) provided some infrastructure that could be modified with permission. There was some evidence for flooding (debris on riverbank), but the system did not seem at risk for significant flash flooding.

Rivers Suitable for Other Research Activities

In addition to the four sites suitable for aquaculture escapee monitoring, five sites on four other OBoF rivers met the physical and logistical requirements for a monitoring site, however some of these rivers are close to existing monitoring facilities and others are far from existing aquaculture leases with a model-predicted low likelihood of escapees entering the river, making them unsuitable for escapee monitoring (Table 5). While not suitable for monitoring escaped salmon, these rivers would be amenable to the installation of a fish counting fence which could be used for monitoring and assessment of wild salmon or other anadromous fish, so we present and describe these rivers here rather than in the Appendix (Table 2). These rivers are presented in order from the New Brunswick border with Maine, USA eastward to the northeastern edge of the OBoF DU.

Digdeguash River

Digdeguash River is in Charlotte County, New Brunswick, near the border with the United States of America (Figure 5A). The mouth of the river is in Digdeguash, where it empties into Passamaquoddy Bay. Digdeguash River is located about 16 km away from the nearest active salmon sea pen aquaculture lease and there is a rearing facility located in the watershed. The dispersal model predicts that most of the salmon that return to the river are escaped aquaculture salmon and escapees have previously been detected in the river (Morris et al. 2008). The closest dedicated salmon monitoring facility to Digdeguash River is the St. George Fishway on the Magaguadavic River in St. George, New Brunswick, also in Charlotte County. Digdeguash River has a moderate amount of salmon habitat [4220 productive salmon habitat units (100 m^2; O'Connell et al. 1997)] and there is likely a wild salmon population in the river (DFO 2014); salmon DNA was not detected in the eDNA sample from site DIG2 in 2024 either by qPCR or metabarcoding, however both methods detected salmon DNA at site DIG1 downstream (Table 4). DFO intervention programs do not target Digdeguash River, but landlocked salmon stocking is undertaken by the government of New Brunswick in Lake Digdeguash (upstream of DIG2 in the watershed) and there are also Atlantic Salmon hatcheries located on the river, but they are downstream of DIG1 and unlikely to influence our results. At least one organization is actively engaged in conservation and fisheries-related work in the river and surrounding system. Several other anadromous species can be found in the river. The river has limited evidence of human activity, including fishing.

Site DIG2

Decision Tree score: 4

Benefits:

- Suitable substrate for fence installation
- River drains directly into the Bay of Fundy

Caveats:

- Close to existing monitoring at St. George Fishway on Magaguadavic River
- High up in system, would only capture fish that migrate far up the river

Site DIG2 is along a dirt road off of New Brunswick Highway 3 near Lawrence Station (Figure 12). This site was assessed before the project's full protocols were developed so detailed measurements are unavailable, but with the information available the site scores high on the decision tree and rubric and is appropriate for fence installation.

Canaan River (Salmon Creek and Forks Stream, Saint John River system)

Canaan River is in Queens County, New Brunswick, near Cambridge-Narrows, and drains into Washademoak Lake in the Saint John River system (Figure 5B). The closest active salmon sea pen aquaculture lease is approximately 38 km from the mouth of the Saint John River, while the mouth of Canaan River is approximately 80 km further upstream within the system. The dispersal model predicts that most of the salmon that return to the river are escaped aquaculture salmon and escapees have previously been detected in the Saint John River system (DFO 2014; Keyser et al. 2018). The closest dedicated salmon monitoring facilities to Canaan River are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system upstream of Canaan River (both under review for closure in 2026). Canaan River has a large amount of salmon habitat [23870 productive salmon habitat units (100 m^2; Marshall et al. 1997)] and there is likely a wild salmon population in the river (DFO 2014); salmon DNA was detected by both qPCR and metabarcoding in eDNA samples taken at CAN1 in 2024 although it was not detected by metabarcoding for CAN2 further upstream and qPCR for CAN2 was inconclusive (Table 4). DFO intervention programs do not target Canaan River. Stocking of landlocked Atlantic Salmon by the government of New Brunswick does occur in Grand Lake in the Saint John system although fish from Grand Lake are very unlikely to enter Canaan River. Several other anadromous species can be found in the river. Many organizations, including conservation groups, Indigenous communities, and other environmental non-governmental organizations are actively engaged in conservation and fisheries-related work in the river and surrounding system. Canaan River has limited evidence human activity, although it is likely used for recreational fishing.

Site CAN1

Decision Tree score: 5

Benefits:

- Relatively easy access with space for staging off Old Codys Road

Caveats:

- In the well-studied Saint John River system and close to existing monitoring
- In a tributary of Canaan River and would only detect fish entering Salmon Creek

Site CAN1 is located on Salmon Creek in Queens County, New Brunswick, near the communities of Thornetown and Codys and just upstream of Washademoak Lake (Figure 13). Salmon Creek flows into Canaan River approximately 30 km upstream of the mouth of Canaan River, where Canaan River flows into Saint John River. This site was assessed before the project's full protocols were developed so detailed measurements are unavailable, but with the information available the site scores high on the decision tree and rubric and is appropriate for fence installation.

Site CAN2

Decision Tree score: 5

Benefits:

- Straightforward access from Keirstead Road

Caveats:

- In the well-studied Saint John River system and close to existing monitoring
- Far upstream in Canaan River system

Site CAN2 is located on Forks Stream in Queens County, New Brunswick, near the communities of Forks and Canaan Forks (Figure 14). Salmon Creek flows into Canaan River approximately 60 km upstream of the mouth of Canaan River, where Canaan River flows into Saint John River. This site was assessed before the project's full protocols were developed so detailed measurements are unavailable, but with the information available the site scores high on the decision tree and rubric and is appropriate for fence installation.

Grants Brook (Belleisle Bay, Saint John River system)

Grants Brook is in Kings County, New Brunswick, near Hatfield Point, and drains into Spragg Brook which flows into Belleisle Bay in the Saint John River system (Figure 5B). The closest active salmon sea pen aquaculture lease is 38 km from the mouth of the Saint John system; the mouth of Spragg Brook is approximately 60 km further into the system. The dispersal model predicts that few of the salmon that return to the brook are escaped aquaculture salmon although escapees have been detected in the Saint John River system (DFO 2014; Keyser et al. 2018). The closest dedicated salmon monitoring facilities to Grants Brook are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system upstream of Grants Brook (both under review for closure in 2026). Although there is likely a wild salmon population in Belleisle Creek off Belleisle Bay, no data is available for Grants Brook (Jones et al. 2023). The presence of salmon DNA was inconclusive in eDNA samples taken at BEL in Belleisle Creek (upstream of Grants Brook along Belleisle Bay) in 2024 (Table 4). DFO intervention programs do not target Grants Brook or Belleisle Bay. Stocking of landlocked Atlantic Salmon by the government of New Brunswick does occur in Grand Lake in the Saint John system although fish from Grand Lake are very unlikely to enter Grants Brook. Several other anadromous species can be found in the brook. Many organizations, including conservation groups, Indigenous communities, and other environmental non-governmental organizations are actively engaged in conservation and fisheries-related work in the surrounding system. Grants Brook has limited evidence human activity, although it is likely used for recreational fishing.

Site GRB

Decision Tree score: 5

Benefits:

- Lower in the Saint John River system than other sites
- Captures both Grants Brook and Spragg Brook

Caveats:

- In the well-studied Saint John River system and close to existing monitoring

Site GRB is off New Brunswick Highway 710 below the confluence of Spragg Brook and Grant Brook near Hatfield Point (Figure 15). Spragg Brook flows into Belleisle Bay approximately 17 km upstream of the Saint John River. This site was assessed before the project's full protocols were developed so detailed measurements are unavailable, but with the information available the site scores high on the decision tree and rubric and is appropriate for fence installation.

Belleisle Creek (Belleisle Bay, Saint John River system)

Belleisle Creek is in Kings County, New Brunswick, near Springfield, and drains into Belleisle Bay in the Saint John River system (Figure 5B). The closest active salmon sea pen aquaculture lease is 38 km from the mouth of the Saint John system; the mouth of Belleisle Creek is approximately 65 km further into the system. The dispersal model predicts that few of the salmon that return to the creek are escaped aquaculture salmon although escapees have been detected in the Saint John River system (DFO 2014; Keyser et al. 2018). The closest dedicated salmon monitoring facilities to Belleisle Creek are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system upstream of Belleisle Creek (both under review for closure in 2026). Belleisle Creek has a moderate amount of salmon habitat [3990 productive salmon habitat units (100 m^2) and 0.8% of all OBoF productive salmon habitat (Marshall et al. 1997)] and there is likely a wild salmon population in the creek (Jones et al. 2023); the presence of salmon DNA was inconclusive in eDNA samples taken at BEL in 2024 (Table 4). DFO intervention programs do not target Belleisle Creek or Belleisle Bay. Stocking of landlocked Atlantic Salmon by the government of New Brunswick does occur in Grand Lake in the Saint John system although fish from Grand Lake are very unlikely to enter Belleisle Creek. Several other anadromous species can be found in the creek. Many organizations, including conservation groups, Indigenous communities, and other environmental non-governmental organizations are actively engaged in conservation and fisheries-related work in the surrounding system. Belleisle Creek has limited evidence human activity, although it is likely used for recreational fishing.

Site BEL

Decision Tree score: 5

Benefits:

- Easy access from New Brunswick Route 124

Caveats:

- In the well-studied Saint John River system and close to existing monitoring

Site BEL is off New Brunswick Route 124 near Springfield (Figure 16). Belleisle Creek flows into Belleisle Bay approximately 17 km upstream of the Saint John River. This site was assessed before the project's full protocols were developed so detailed measurements are unavailable, but with the information available the site scores high on the decision tree and rubric and is appropriate for fence installation.

INNER BAY OF FUNDY

The IBoF DU extends from just east of the Saint John River estuary where OBoF ends to Cape Split in Nova Scotia. We assessed 76 sites across 53 rivers in IBoF, collected eDNA at 38 sites across 36 rivers (26 processed at time of report preparation), and electrofished six rivers (Figure 17). Calculated using data from 24 IBoF rivers, our linear regression of productive salmon habitat area by river axial length was significant ($p < 0.001$, adjusted $R^2 = 0.66$, Table S2b). We multiplied the slope estimate from the IBoF regression by river axial length to estimate the salmon habitat area for 32 IBoF rivers that did not have published values available.

eDNA qPCR

qPCR analysis detected the presence of Atlantic Salmon DNA in seven of the 26 sites sampled and processed in IBoF: Big Salmon River (two sites), Black River (New Brunswick), Mispec River, Economy River, Salmon River (Colchester County, Nova Scotia), and Herbert River in the

Avon River system. Atlantic Salmon DNA was not detected in the remaining 19 of 26 sites sampled and processed: Gardner Creek, Bains Brook and Ten Mile Creek in the Tynemouth Creek system, Mosher River, Irish River, the Little Salmon River system, Shepody River and Crooked Creek, Demoiselle Creek, the Apple River system, Ramshead River, the Moose River system, the Economy River system, Bass River, Gays River in the Shubenacadie River system, Kennetcook River, and Cornwallis River (Table 4).

Electrofishing

In early September 2025, we electrofished for juvenile Atlantic Salmon in Mispec River, Black River (New Brunswick), Bains Brook in the Tynemouth Creek system, Mosher River, Irish River, and Little Salmon River. Five juvenile salmon were caught in the Mispec River and one was caught in Black River. In all cases, fin clip tissue samples were taken and fish were measured before being released.

Rivers Suitable for Aquaculture Escapee Monitoring

Twenty-four sites in IBoF had decision tree scores of 4 or 5, indicating they would be suitable for fence installation (Table 5). One of these sites (Bains005) was excluded from recommendations due to features that made it unsuitable which were captured in the rubric but not the scoring system. Of the remaining 23 sites, seven are suitable candidates for the installation of a counting fence for monitoring escaped aquaculture salmon and 16 are highlighted as suitable for other monitoring or assessment work. Rivers are presented in order from the border between OBoF and IBoF to the eastern edge of the IBoF DU, where it meets the SU DU. Full details for the suitable sites are presented in the rubric (Table 2); details for IBoF sites not suitable for escapee monitoring are included in the Appendix.

Mispec River

Mispec River is in Saint John County, New Brunswick, southeast of Saint John, and runs from Robertson Lake to the Bay of Fundy near Mispec Beach (Figure 17A). Mispec River is located approximately 43 km away from the nearest active salmon sea pen aquaculture lease. The dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facilities to Mispec River are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Mispec River is predicted to have a moderate amount of salmon habitat [3349 productive salmon habitat units (100 m^2)] and there is likely a wild salmon population in the river (Reader et al. 2024b); salmon DNA was detected by qPCR in eDNA samples taken at Mispec002 (Table 4) and juvenile salmon were caught during electrofishing surveys at Mispec003, both in 2025 (Table 3). Stocking of landlocked Atlantic Salmon by the government of New Brunswick occurs in Loch Lomond, which connects to Mispec River via Robertson Lake. DFO intervention through the LGB does not occur in Mispec River. Several other anadromous species can be found in the river. Several organizations are actively engaged in conservation and fisheries-related work in the river. Mispec River has evidence of moderate human activity, including a recreational trout fishery and ATV and boating use.

Site Mispec002

Decision Tree score: 4

Benefits:

- Limited evidence of flooding

- Ideal cobble-pebble substrate for installing and anchoring a fence, with many suitable areas of salmon habitat upstream

Caveats:
- High water temperature during site visit (24°C)
- Evidence of human use at the site (ATV trails, campfires)

Mispec002 is located along Old Black River Road and is accessible from a provincially owned roadway and bridge (Figure 18). At the time of the site visit, water levels were very low at Mispec002, reflected in low flow and depth (~15 cm) and high water temperature (24°C), which would be inappropriate for adult and juvenile salmon, however low water levels and high temperatures may have been due to the extreme drought in the area in 2025. At the time of our visit, the river was approximately 11 m wide with cobble and pebble substrate, suitable for fence installation, although the water depth and temperature during the site visit were unsuitable for either adult or juvenile capture by fence or electrofishing. There is an existing bridge at the site, however is it likely not useful in fence installation. The site is near an existing flood plain and there is limited evidence of flooding at the site. Although the site itself had little appropriate salmon habitat, ideal conditions further upstream would suggest salmon move through the area making it suitable for monitoring.

Site Mispec003

Decision Tree score: 4

Benefits:
- Salmon were present at the site during the site visit
- Appropriate substrate for fence installation

Caveats:
- Recreational angling popular in the area
- Likely prone to spring flooding

Site Mispec003 is located along Clover Valley Road near the Saint John Airport, upstream of Mispec002 (Figure 19). The site is appropriate for fence installation and scores high on both the decision tree and rubric. There is shoulder parking along Clover Valley Road with easy access to the river although the area is also popular for recreational angling. The land around the site is either privately owned or belongs to the airport, however there is Crown land just downstream of the site past the airport. Several areas of habitat suitable for Atlantic Salmon juvenile rearing as well as spawning were observed near the assessment site. The water temperature was 14.9°C during the site assessment which is suitable for both adult and juvenile salmon. Juvenile salmon were caught at the site during electrofishing in 2025. Although the water level was low at the time of the site visit, there was sufficient depth in areas that could be used as habitat or holding areas for adult salmon during migration and many areas of riffles and instream cover that would be appropriate juvenile habitat. At the time of our visit, the river was approximately 5-8 m wide (likely 10 m at the widest) and 15-40 cm deep, suitable for adult and juvenile capture via fence or electrofishing, with healthy riparian areas along the shore and a lot of instream cover. The substrate was mostly gravel and cobble overlaying bedrock or sandstone which is appropriate for fence installation and anchoring. There is no existing infrastructure at the site to aid in fence installation. There was limited evidence of severe flooding at the site, however some debris in alder branches suggests that the site floods during the spring.

Black River (Saint John County, New Brunswick)

Black River is in Saint John County, New Brunswick, near Garnett Settlement and Willow Grove (Figure 17A). The mouth of Black River empties into the Bay of Fundy near Powers Beach. Black River is located about 57 km away from the nearest active salmon sea pen aquaculture lease. The dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon and escaped farmed salmon have previously been detected in the river (Keyser et al. 2018; Morris et al. 2008). The closest dedicated salmon monitoring facilities to Black River are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Black River is predicted to have a moderate amount of salmon habitat [3329 productive salmon habitat units (100 m^2)] and there is likely a wild salmon population in the river (Reader et al. 2024b); salmon DNA was detected in eDNA samples taken at BlackNB003 in 2025 (Table 4) and a single salmon was caught by electrofishing at BlackNB004 in 2025 (Table 3). Neither stocking of landlocked Atlantic Salmon by the government of New Brunswick nor DFO intervention through the LGB occur in the watershed. Several other anadromous species can be found in the river, although small falls in the system may prevent some smaller species from entering the river. Several organizations are actively engaged in conservation and fisheries-related work in the river. Black River has evidence of moderate human activity, including recreational fishing and ATV and boating use in addition to white water rafting during periods with high water levels.

Site BlackNB003

Decision Tree score: 4

Benefits:

- Easy to access
- Good juvenile salmon habitat

Caveats:

- Very publicly accessible and visible
- Shallow and not very wide during site visit

Site BlackNB003 is located on the main branch of Black River in the community of Garnett Settlement, approximately 8 km upstream from the mouth of the river (Figure 20). The site is located at the New Brunswick Route 825 bridge over Black River, with parking along the road shoulder, and accessed via a small incline down from the road. The land around the site is primarily privately owned. The Water Survey of Canada real-time hydrometric data recording station number 01BV004 is located at the site. The site is appropriate for fence installation with some caveats, particularly downstream of the bridge, and scores moderately high on both the decision tree and rubric. The site has many areas of suitable juvenile habitat and salmon DNA was detected via qPCR in eDNA samples taken during the site visit, indicating the presence of salmon near the sample collection site. At the time of the site visit there was limited suitable adult habitat was observed, likely due to low water levels in the region. The river was about 3 m wet width above the bridge and 7 m wet width below the bridge with an average depth of around 30 cm, suitable for adult and juvenile capture via fence or electrofishing. There was evidence of higher water levels, particularly under the bridge where the gravel river bed extended approximately 2 m wider than the water on either side. Data from the Water Survey of Canada recorder show that the water level at the site was approximately 15 cm lower during the site visit than in September 2024, and that the water level may exceed 2.5 m during the spring (Water Survey of Canada 2025). The banks were primarily shrubs and trees with a shallow slope

and the river is easy to enter and exit. The water was 21.8°C, warm for appropriate salmon habitat. The substrate was primarily bedrock and cobble, which is not the preferred substrate for fence installation but can be used with appropriate modifications. The existing bridge structure may also be useful for fence installation.

Gardner Creek

Gardner Creek is in Saint John County, New Brunswick, near Fairfield and Coleraine (Figure 17A). The mouth of the creek empties into the Bay of Fundy at Gardner Creek Beach Cove near Forbes Beach. Gardner Creek is located 64 km away from the nearest active salmon sea pen aquaculture lease and the dispersal model predicts that some of the salmon that return to the creek are escaped aquaculture salmon. The closest dedicated salmon monitoring facilities to Gardner Creek are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Gardner Creek is predicted to have a moderate amount of salmon habitat [2968 productive salmon habitat units (100 m^2)] and there is likely a wild salmon population in the river (Reader et al. 2024b) although salmon DNA was not detected in eDNA samples taken at Gardner002 in 2025 (Table 4). Neither stocking of landlocked Atlantic Salmon by the government of New Brunswick nor DFO intervention through the LGB occur in the watershed. Several other anadromous species can be found in the river. Several organizations are actively engaged in conservation and fisheries-related work in the river. Gardner Creek has evidence of moderate human activity, including recreational fishing and ATV and boating use.

Site Gardner001

Decision Tree score: 4

Benefits:

- Appropriate substrate for fence installation
- Good adult and juvenile salmon habitat

Caveats:

- Publicly accessible and visible
- Large debris indicates possible flooding

Site Gardner001 is located approximately 2.5 km from the mouth of Gardner Creek (Figure 21). The site is accessed via Old Gardener Creek Road off of New Brunswick Route 825, is accessible by vehicle, and has good areas for equipment staging adjacent to the site. The property around the site is owned privately and by the province, but is used by the public. The site is appropriate for fence installation and scores moderately high on both the decision tree and rubric. Many areas of suitable juvenile and adult habitat were observed near the site including shallow riffles and deeper pools that could be used by both adult and juvenile salmon. Specific water temperature measurements weren't taken during the site visit on 16 October 2025, but Gardner002 (upstream of Gardner001) was 18.2°C on 4 September 2025. At the time of our visit, the creek was approximately 9 m wet width (~15 m bankfull) with some narrower portions in riffles, and was approximately 20 cm deep in riffles and runs, up to 1 m deep in pools, and around 35 cm deep in the rest of the creek. This size is suitable for both adult and juvenile capture via fence or electrofishing. As expected given generally low water levels due to the drought conditions in 2025, there was evidence of higher water levels in the creek, particularly the large uncovered areas of gravel riverbed and waterlines along rocks on the creek's edge downstream of the site. The banks were a mix of shrubs, trees, and some steeper bedrock downstream of the site. There was evidence of flooding, although there was also a large area of gravel river bed uncovered indicating the site had capacity to accommodate higher

water levels and flows. The substrate was primarily cobble, with some boulders, sand, and bedrock in isolated sections, and would be suitable for fence installation.

Bains Brook (Tynemouth Creek system)

Bains Brook is in Saint John County, New Brunswick, near Bains Corner and Tynemouth Creek (Figure 17A). The mouth of the brook empties into Tynemouth Creek which flows into the Bay of Fundy. Bains Brook is located 69 km away from the nearest active salmon sea pen aquaculture lease and the dispersal model predicts that some of the salmon that return to the creek are escaped aquaculture salmon. The closest dedicated salmon monitoring facilities to Bains Brook are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Bains Brook is predicted to have a moderate amount of salmon habitat [2391 productive salmon habitat units (100 m^2)] and there is likely a wild salmon population in the river (COSEWIC 2006) although salmon DNA was not detected in eDNA samples taken at Bains004 in 2025 (Table 4). Neither stocking of landlocked Atlantic Salmon by the government of New Brunswick nor DFO intervention through the LGB occur in the watershed. Several other anadromous species can be found in the system. Several organizations are actively engaged in conservation and fisheries-related work in the river. Bains Brook has evidence of high human activity, including recreational fishing, swimming, and ATV and boating use.

Site Bains001

Decision Tree score: 4

Benefits:

- Easy access with Crown land
- Significant appropriate juvenile habitat

Caveats:

- Just above head of tide and water levels may be influenced by tide cycles
- Some evidence of flooding

Site Bains001 is the lowest site investigated on the Tynemouth Creek system, approximately 1 km upstream of the confluence of Bains Brook with Tynemouth Creek. The confluence is approximately 2 km from the mouth of Tynemouth Creek, where it exits into the Bay of Fundy (Figure 22). Bains001 is located at the bridge where Shore Road crosses the brook. The site is appropriate for fence installation and scores moderately high on the decision tree and rubric. Bains001 only has road shoulder parking, but the shoulders are wide and a short embankment down to the brook makes for relatively easy access to the river. There is Crown land upstream of the site. Many areas of suitable juvenile habitat were observed during the site visit, including shallow riffles and runs, however low water levels at the time made it difficult to assess adult habitat suitability and no deeper pools were evident. There was evidence of higher water levels in the system, primarily exposed gravel banks and water lines on the concrete of the bridge. The water temperature was quite cold during the site assessment, however we visited the site in mid-October when high temperatures would not be expected. At the time of the site visit, the brook was 7 m wide upstream of the bridge, and upwards of 40 m wide downstream of the bridge where the brook enters a large marsh influenced by the tides. Average depth at the time of assessment was approximately 35 cm. In the narrower portion, this site is suitable for adult and juvenile capture by fence or electrofishing. The substrate around Bains001 was mostly cobble with some fine sediment and a few areas of exposed bedrock. The banks above and below the site were a mix of trees and shrubs, with mostly grasses further downstream in the tidal portion. Although there was little evidence of saltwater

intrusion at Bains001, the site is just above the head of tide for the system and freshwater may back up causing raised water levels during high tide. Because of this, a site further up the brook less prone to flooding may be more appropriate for fence installation.

Site Bains002

Decision Tree score: 4

Benefits:
- Easy access from wide road shoulder
- Many areas of suitable juvenile and adult habitats

Caveats:
- Steep bedrock upstream may influence flooding
- Ideal locations near site would require hiking through the stream

Site Bains002 is approximately 500 m upstream from Bains001 and is located at a bend in the brook adjacent to Shore Road (Figure 23). The site and the region upstream are appropriate for fence installation and score moderately high on the decision tree and rubric. Bains002 has only road shoulder parking, but the shoulder is wide at the site and it is a very short embankment down to the brook. The land around the site is a mix of private property and Crown land. Many areas of suitable juvenile and adult habitat were observed upstream of the site, including some pools deeper than 1 m, and the most suitable locations for a fence that had deeper holding pools for adult salmon were upstream of the access point. The brook was 7 m wide wetted and approximately 12 m wide bankfull. Average depth was approximately 40 cm, but some deeper runs were present upstream of the site. Exposed sections of cobble and gravel along the edge of brook suggest the water level was lower than average during the site visit, and although the site is suitable for adult and juvenile capture via fence, at higher water levels it would be too deep for electrofishing. The substrate at Bains002 was primarily cobble with some boulders and patches of bedrock. Although the brook at Bains002 had a wide cobble bed and the banks were mostly shrubs, the brook ran through a steep-sided bedrock section upstream of the site, which could increase the likelihood of rapid flooding. Access to the brook at Bains002 was straightforward, however accessing some of the sections of the brook that provide better holding for adult salmon would require hiking through the stream for a few hundred meters as road access is limited upstream of Bains002.

Site Bains004

Decision Tree score: 4

Benefits:
- Good substrate for fence installation
- Many areas of suitable adult and juvenile salmon habitat

Caveats:
- Human-made small rock wall downstream of site
- No salmon detected via eDNA or electrofishing in 2025

Site Bains004 is located on Bains Brook at the New Brunswick Route 111/St. Martins Road bridge over the brook (Figure 24). The site is approximately 5 km upstream of the mouth of the system and is upstream of several waterfalls, however salmon can pass over the falls at higher water levels. The site can be accessed down a small embankment from a parking lot off New Brunswick Route 111. The property around the site is a mix of private and Crown land. The site is appropriate for fence installation and scores

moderately high on the decision tree and rubric. Several areas of suitable adult and juvenile habitat were observed near the site, and although water levels were low at the time of the site visit a few deeper pools were located around the site. The water was 16.8°C during the site visit on 4 September 2025, which was a sunny day with an air temperature of 20.4°C. The brook was 5.5 m wide at Bains004, with uncovered gravel and cobble extending the width to 12 m. The brook was 30 cm deep in most stretches with some pools deeper than 60 cm, suitable for adult and juvenile capture via fence or electrofishing. As expected given the drought conditions in 2025, there was visible evidence of higher water levels in the brook, including water line levels on the concrete of the bridge. Debris in the shrubs along the banks indicated the potential for flooding at the site, although the gradient at Bains004 was shallower than sites further downstream in the system and certain areas of the banks seemed capable of buffering some flooding. The substrate at the site was primarily gravel and cobble with some boulders, and looked to be ideal spawning substrate for Atlantic Salmon. Although most of the characteristics of Bains004 are ideal for fence installation, there was evidence of human use at the site, including a human-created rock wall downstream of the site that created a small pool in the brook.

Rivers Suitable for Other Research Activities

In addition to the seven sites suitable for aquaculture escapee monitoring, 16 sites on 14 other IBoF rivers met the physical and logistical requirements for a monitoring site, however their distance from aquaculture leases and the dispersal model predictions indicate a low likelihood of escapees entering these rivers making them unsuitable for escapee monitoring (Table 5). While not suitable for monitoring escaped salmon, these rivers would be amenable to the installation of a fish counting fence which could be used for monitoring and assessment of wild salmon or other anadromous fish, so we present and describe these rivers here rather than in the Appendix (Table 2). Rivers are presented in order from the border between OBoF and IBoF to the eastern edge of the IBoF DU where it meets the SU DU.

East Branch (Apple River system)

The Apple River system is in Cumberland County, Nova Scotia, near Apple River and the Raven Head Wilderness Area. It contains several branches, including the East Branch, South Branch, and Morang Branch, that come together in a large salt marsh where the system empties into the Bay of Fundy (Figure 17C). The mouth of the East Branch empties into Apple River near the tidal mouth of the system, which flows into Chignecto Bay in the Bay of Fundy. Apple River is located 117 km away from the nearest active salmon sea pen aquaculture lease and the dispersal model predicts that few of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facilities to Apple River are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system, and the White Rock Dam on the Gaspereau River in Nova Scotia, but these monitoring facilities are several hundred kilometres from the Apple River. Although no specific estimates for the East Branch exist, the Apple River main stem has a moderate amount of salmon habitat [2111 productive salmon habitat units (100 m^2; O'Connell et al. 1997)] and there is likely a wild salmon population in the river (Reader et al. 2024b). No salmon stocking occurs in the Apple River system. Several other anadromous species can be found in the river. A few organizations are actively engaged in conservation and fisheries-related work in the river. East Branch has evidence of moderate human activity, primarily hiking, camping, and some recreational fishing.

Site AppleEast001

Decision Tree score: 4

Benefits:

- Easy to access with suitable parking
- Many areas of suitable adult and juvenile salmon habitat

Caveats:

- No escaped salmon predicted to enter the system
- Potential for flash flooding seasonally and during extreme weather

Site AppleEast001 is at the Nova Scotia Route 209/Fundy Shore Ecotour Road bridge over Apple River East Branch, just above the head of tide (Figure 25). Although AppleEast001 scores high on the decision tree and rubric, very few escaped aquaculture salmon are predicted to enter the Apple River system making this site unsuitable for an escapee monitoring fence, however features of this site may make it useful for other research that requires access to the waterway or equipment installation. The site is approximately 5 km upstream of the mouth of the system, and the land around the site is a mix of Crown land and provincially owned land. Many areas of suitable juvenile and adult salmon habitat were observed near the site, including deep, shaded pools, riffles, and areas with cover from shoreline vegetation. The water was 21°C during the site visit, which could lead to high temperature stress in salmon, but it was a sunny day with an air temperature of 25°C which likely contributed to the high water temperature. The river at AppleEast001 was between 4 m and 15 m wide and roughly 30 cm deep with some pools deeper than 80 cm, suitable for adult and juvenile capture via fence or electrofishing. The substrate at the side was mostly cobble and gravel on top of bedrock, and a stretch of one bank of the river was entirely bedrock. There were water lines and exposed cobble in the river bed indicating that water levels were lower than average during the site visit. There was some evidence of seasonal flooding at the site and the bedrock bank along one side of the river may lead to flash flooding in some circumstances. There was also evidence of human use at the site, both recreational fishing and swimming in the deeper pool under the bridge.

Site AppleEast002

Decision Tree score: 4

Benefits:

- Good salmon habitat with low water temperatures
- Suitable size and substrate for salmon monitoring

Caveats:

- No escaped salmon predicted to enter the system
- Significant evidence of beaver activity

Site AppleEast002 is on the Apple River East Branch approximately 10 km upstream of AppleEast001 along West Red River Road (Figure 26). Like AppleEast001, AppleEast002 scores high on the decision tree and rubric, but because few escaped aquaculture salmon are predicted to enter the river, it is not a suitable location for escapee monitoring. The land around the site is primarily provincially owned and used mostly for logging. Many areas of suitable juvenile and adult salmon habitat could be found near the site, including shallower runs and riffles, and deeper, shaded pools. The water was 14.8°C during the site visit, appropriate for salmon. The river was between 3 m and 5 m wide at the site, with some exposed river bed along the banks due to low water. On average the river was 30 cm deep near the site, with pools deeper than 80 cm and evidence of higher water on boulders along the shore. This site is suitable for fish capture via electrofishing, although it

may be too narrow for fence installation. The substrate was mostly cobble and gravel, and there is a bridge over the river at the site. However, in addition to the lack of escapees predicted to enter the river, there was a very large breached beaver dam a few hundred meters downstream of AppleEast002. Although the dam was not actively impeding flow or fish movement during the site visit, future beaver activity near the site could affect upstream migration of salmon or other anadromous fish.

South Branch (Apple River system)

The Apple River system is in Cumberland County, Nova Scotia, near Apple River and the Raven Head Wilderness Area. It contains several branches, including the East Branch, South Branch, and Morang Branch, that come together in a large salt marsh where the system empties into the Bay of Fundy (Figure 17C). The mouth of the South Branch empties into Apple River near the tidal mouth of the system, which flows into Chignecto Bay in the Bay of Fundy. Apple River is located 117 km away from the nearest active salmon sea pen aquaculture lease and the dispersal model predicts that few of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facilities to Apple River are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system, and the White Rock Dam on the Gaspereau River in Nova Scotia, each of which are several hundred kilometres from Apple River. Although no specific estimates for the East Branch exist, the Apple River main stem has a moderate amount of salmon habitat [2111 productive salmon habitat units (100 m^2; O'Connell et al. 1997)] and there is likely a wild salmon population in the river (Reader et al. 2024b), however salmon DNA was not detected in eDNA samples taken at AppleSouth001 in 2025 (Table 4). No salmon stocking occurs in the Apple River system. Several other anadromous species can be found in the river. A few organizations are actively engaged in conservation and fisheries-related work in the river. South Branch has limited evidence of human activity.

Site AppleSouth001

Decision Tree score: 4

Benefits:
- Limited evidence of human activity
- Suitable size and substrate for salmon monitoring

Caveats:
- No escaped salmon predicted to enter the system
- Depth likely underestimated due to low water levels

Site AppleSouth001 is located on Apple River South Branch along a logging road off Nova Scotia Route 209 (Figure 27). AppleSouth001 scores high on the decision tree and rubric and may be useful for research that requires access to the waterway or equipment installation, but because few escaped aquaculture salmon are predicted to enter the river it is not a suitable location for escapee monitoring. The land around the site is provincially owned, and like AppleEast002 is used mostly for logging operations. Like the other sites in the Apple River system, ample suitable habitat for adult and juvenile salmon was observed. The water was 18.2°C during the site visit, within the optimal range juvenile salmon. The river at the site was 5 m wide wetted (11 m bankfull) and approximately 20 cm deep with some 60 cm pools, suitable for capturing adults and juveniles via fence or electrofishing. A large exposed gravel bank at the site and water level lines on the bridge indicate that water levels were likely very low during the site visit. The substrate near AppleSouth001 was primarily cobble and gravel. This site had limited evidence of human activity in the river, although logging operations were occurring in the vicinity.

Morang Branch (Apple River system)

The Apple River system is in Cumberland County, Nova Scotia, near Apple River and the Raven Head Wilderness Area. It contains several branches, including the East Branch, South Branch, and Morang Branch, that come together in a large salt marsh where the system empties into the Bay of Fundy (Figure 17C). The mouth of the Morang Branch empties into the South Branch, which then flows into the main river and subsequently into Chignecto Bay in the Bay of Fundy. Apple River is located 117 km away from the nearest active salmon sea pen aquaculture lease and the dispersal model predicts that few of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facilities to Apple River are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system, and the White Rock Dam on the Gaspereau River in Nova Scotia, each of which are several hundred kilometres from Apple River. Although no specific estimates for the Morang Branch exist, the Apple River main stem has a moderate amount of salmon habitat [2111 productive salmon habitat units (100 m^2; O'Connell et al. 1997)] and there is likely a wild salmon population in the river (Reader et al. 2024b). No salmon stocking occurs in the Apple River system. Several other anadromous species can be found in the river. A few organizations are actively engaged in conservation and fisheries-related work in the river. Morang Branch has limited evidence of human activity.

Site AppleMorang001

Decision Tree score: 4

Benefits:

- Limited evidence of human activity
- Suitable size and substrate for salmon monitoring

Caveats:

- No escaped salmon predicted to enter the system
- No suitable adult habitat during site visit

Site AppleMorang001 is on the Morang Branch of the Apple River system, approximately 1 km west of AppleSouth001 (Figure 28). Similar to AppleSouth001, the site scores high on the decision tree and rubric and would be suitable for fence installation, but because few escaped aquaculture salmon are predicted to enter the river, it is not a suitable location for escapee monitoring. Many areas of suitable juvenile salmon habitat were observed near the site, but low water levels left few areas suitable for adult salmon. The water in the mainstem was 17.9°C during the site visit, however a small creek that flowed into the river near the site was markedly colder (13°C). The river was 5 m wide during the site visit (8 m bankfull) and approximately 30 cm deep with very few deeper pools although there were a few areas that would likely form deep pools with higher water levels. This site is suitable for fish capture via electrofishing, but it was too shallow for a fence during the site visit. There was moderate evidence of seasonal flooding. The river substrate near the site was cobble and gravel, with some larger boulders near the bridge. Like AppleSouth001, AppleMorang001 had limited evidence of human activity in the river apart from logging operations.

Ramshead River

Ramshead River is in Cumberland County, Nova Scotia, west of the community of Parrsboro (Figure 17C). The mouth of the river is in the town of Diligent River where it empties into the Bay of Fundy near the Minas Basin. Ramshead River is located 134 km away from the nearest active salmon sea pen aquaculture lease and the dispersal model predicts that few of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon

monitoring facility is the White Rock Dam on Gaspereau River. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Ramshead River is predicted to have a moderate amount of salmon habitat [2387 productive salmon habitat units (100 m^2)] however there is likely no wild salmon population in the river (Reader et al. 2024b); salmon DNA was not detected in eDNA samples taken at Ramshead002 in 2025 (Table 4). No salmon stocking occurs in the Ramshead River. A few other anadromous species can be found in the river. Several organizations are actively engaged in conservation and fisheries-related work in the river. Ramshead River has limited evidence of human activity, primarily recreational fishing.

Site Ramshead002

Decision Tree score: 4

Benefits:

- Suitable size and substrate for salmon monitoring
- Easy access to river

Caveats:

- Limited adult salmon habitat
- Used by local fire departments for water

Site Ramshead002 is located at the Ramshead River Road bridge over Ramshead River, near the community of Diligent River (Figure 29). Although features of the site make it appropriate for fence installation or other research that requires access to the waterway, few escaped aquaculture salmon are predicted to enter the river so it is not a suitable location for escapee monitoring. There were many areas of suitable juvenile salmon habitat observed near the site, including riffles and places with significant plant cover extending over the water, however low waters levels left few deeper areas suitable for adult salmon. The water temperate was 18.8°C during the site visit while the air temperature was 27°C. The river was between 4 m and 8 m wide and the average depth was only around 10 cm, with a few approximately 80 cm deep pools, suitable for adult and juvenile capture via fence or electrofishing. Water lines on the bridge supports and exposed gravel and cobble along the river indicate that water levels being lower than average during the site visit. There was some debris in the brush along the river banks, though it was the only evidence of flooding observed. Substrate at the site was mostly cobble, gravel, and sand. The bridge supports were constructed of small boulders and wood. Although there was little evidence of human recreation at the site, it is used as a supply by local fire departments to fill water tanks.

East Branch (Moose River system)

The East Branch of Moose River is in Cumberland Country, Nova Scotia (Figure 17C). The mouth of the East Branch flows into Moose River near Nova Scotia Highway 2, and the Moose River then empties into Minas Basin in the Bay of Fundy. Moose River is located 155 km away from the nearest active salmon sea pen aquaculture lease and the dispersal model predicts that few of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility is the White Rock Dam on the Gaspereau River. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, the East Branch of Moose River is predicted to have a moderate amount of salmon habitat [2797 productive salmon habitat units (100 m^2)] however there is likely no wild salmon population in the river (Reader et al. 2024b) and no salmon stocking occurs in the Moose River system. Several other anadromous species can be found in the river. A few organizations are actively engaged in conservation and fisheries-related work in the river. The East Branch of Moose River has moderate evidence of human activity, including campfires and swimming.

Site MooseEast002

Decision Tree score: 4

Benefits:
- Low in the system and would capture the entire East Branch watershed
- Adult and juvenile salmon habitat present at the site

Caveats:
- Directly next to a busy highway
- No escaped salmon predicted to enter the system

Site MooseEast002 is on Crown land where the Moose River East Branch runs alongside Nova Scotia Highway 2/Glooscap Trail, approximately 500 m upstream of the head of tide where the East and West Branches of Moose River join (Figure 30). As with other rivers in the region, the dispersal model predicts that few of the salmon that return to the river are escaped aquaculture salmon. Although features of the site make it appropriate for fence installation or other research that requires access to the waterway, it is not a suitable location for escapee monitoring. There were a few pools near the site suitable for adult salmon, and much of the area had suitable juvenile habitat, including some plant cover along the banks. The water was 18°C during the site visit. At the site the river was between 4 m and 7 m wide and around 30 cm deep with some shallower riffles and a few pools more than 70 cm deep, making it suitable for adult and juvenile capture via fence or electrofishing. Some debris along the banks suggest some flooding occurs, likely in the spring, and water lines along the boulders lining the road and some exposed cobble indicate water levels may be higher in a more typical year. The substrate was a mix of boulders and sandstone downstream of the site and gravel and cobble upstream, which may overlay bedrock but it was difficult to tell during the site visit. Apart from the highway directly next to the site, there was some evidence of human activity downstream, mostly campfires and swimming.

West Branch (Moose River system)

The West Branch of Moose River is in Cumberland Country, Nova Scotia (Figure 17C). The mouth of the river flows into Moose River near Nova Scotia Highway 2, and the Moose River then empties into Minas Basin in the Bay of Fundy. Moose River is located 155 km away from the nearest active salmon sea pen aquaculture lease and the dispersal model predicts that few of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility is the White Rock Dam on Gaspereau River. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, the West Branch of Moose River is predicted to have a moderate amount of salmon habitat [2046 productive salmon habitat units (100 m^2)] however there is likely no wild salmon population in the river (Reader et al. 2024b) and no salmon stocking occurs in the Moose River system. Several other anadromous species can be found in the river. A few organizations are actively engaged in conservation and fisheries-related work in the river. The West Branch of Moose River has limited evidence of human activity, primarily some recreational fishing.

Site MooseWest001

Decision Tree score: 4

Benefits:
- Limited human activity
- Cool water with ample juvenile salmon habitat

Caveats:

- Steep bank could influence flooding
- No escaped salmon predicted to enter the system

Site MooseWest001 is directly west of MooseEast002 on the West Branch of Moose River, where Nova Scotia Highway 2/Glooscap Trail crosses over Moose River West Branch (Figure 31). Few escaped aquaculture salmon are predicted to enter the river by the dispersal model and it is not a suitable location for escapee monitoring, but like MooseEast002 it has features that may make it useful for other research that requires access to the waterway or equipment installation. There is Crown land near the site, and safe parking off of the highway next to what appears to be footings for an old bridge. The site had extensive suitable juvenile habitat, but lower than average water levels meant that only a few pools were sufficiently deep enough for adult salmon. During the site visit on 31 July 2025, the water was 14.6°C after several days with air temperatures above 25°C. The river was 3 m wide at the time of the site visit (more than 5 m bankfull) and approximately 20 cm deep, suitable for fish capture via electrofishing but too small for a fence. Exposed cobble riverbed near the site indicates that water levels were likely lower than average during the visit. There was some evidence of flooding and part of the riverbank was steep and high upstream of the site, which could also contribute to flooding, although the width of exposed river bed may provide some buffering. Apart from some recreational fishing, there was little evidence of human activity at the site.

Economy River

Economy River is in Colchester County, Nova Scotia (Figure 17C). The mouth of the river is in the unincorporated community of Economy where it empties into Minas Basin in the Bay of Fundy. Economy River is located 174 km away from the nearest active salmon sea pen aquaculture lease and the dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facilities to Economy River are the White Rock Dam on Gaspereau River and facilities on the Stewiacke River. Economy River has a moderate amount of salmon habitat [2386 productive salmon habitat units (100 m^2; O'Connell et al. 1997)] and there is likely a wild salmon population in the river (Reader et al. 2024b); salmon DNA was detected by qPCR in eDNA samples taken at Economy002 in 2025 (Table 4). The river was previously intermittently supplemented by the DFO LGB program. Several other anadromous species can be found in the river. A few organizations are actively engaged in conservation and fisheries-related work in the river. Economy River has evidence of moderate human activity, primarily fishing, campfires, hunting, and groundwater retrieval.

Site Economy001

Decision Tree score: 4

Benefits:

- Large river with ample salmon habitat
- Captures the entire catchment of the watershed

Caveats:

- Large beaver dam upstream of site
- No escaped salmon predicted to enter the system

Site Economy001 is the lowest site that was investigated in the Economy River system and is located where Economy River Road runs alongside the river, approximately 5 km upstream of the river mouth (Figure 32). The land around the site is primarily provincially

owned, and the characteristics of the site would be appropriate for fence installation, but because few escaped aquaculture salmon are predicted to enter the river it is not a suitable location for escapee monitoring. There are many areas of suitable adult and juvenile salmon habitat adjacent to the site, and the water was 18.4°C during the site visit. The river was approximately 12 m wide and around 25 cm deep, with several pools deeper than 50 cm, suitable for adult and juvenile capture via fence but too wide for electrofishing. Exposed rocks and gravel indicate that the river is likely about 25 cm deeper during seasons with more rainfall. The substrate was mostly cobble and small boulders with some exposed bedrock. There was some evidence of flooding and a steep bank on one side of the river may further contribute to flooding. Human activity was apparent near the site and the river is likely used for recreational boating and fishing. Apart from the lack of escaped salmon predicted to enter the system, there was a large beaver dam upstream of the site which may make some of the areas upstream of Economy001 inaccessible to salmon and reduce the habitat suitability of the area.

Site Economy002

Decision Tree score: 4

Benefits:

- Several areas of available adult and juvenile salmon habitat
- Easy to access the river

Caveats:

- Human activity including groundwater pump near the site
- No escaped salmon predicted to enter the system

Site Economy002 is approximately 2 km upstream of Economy001 at a bridge where Economy River Road crosses Economy River (Figure 33). Economy002 is upstream of the confluence of Economy River and East Branch Economy River and therefore does not capture the eastern portion of the watershed. Like Economy001, because few escaped aquaculture salmon are predicted to enter the river by the dispersal model, it is not a suitable location for escapee monitoring, however it may be a useful site for other research that requires access to the waterway or equipment installation. This site is primarily on provincially owned land, and the river near the site had many areas of suitable adult and juvenile salmon habitat, although the river was 19.4°C during the site visit. The river was between 9 m and 12 m wide and 40 cm deep adjacent to the site, with several pools deeper than 75 cm apparent, suitable for adult and juvenile capture via fence but too wide for electrofishing. The substrate was mostly cobble and gravel overlying bedrock. One bank of the river was primarily steep bedrock, which like Economy001, could influence flooding near the site. The bridge over the site had wooden supports. There was more evidence of human activity at this site than at Economy001 – a sign from 2020 with information of past salmon research was posted near the site, and evidence of canoeing, fishing, and campfires were observed. There was also a water pump in the river downstream of the site.

Bass River

Bass River is in Colchester County, Nova Scotia (Figure 17C). The mouth of the river empties into Cobequid Bay in the Bay of Fundy. Bass River is located 186 km away from the nearest active salmon sea pen aquaculture lease and the dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility to Bass River is in the Stewiacke River. Bass River has a small amount of salmon habitat [696 productive salmon habitat units (100 m^2; O'Connell et al. 1997)] and there is

likely a wild salmon population in the river (Reader et al. 2024b), however salmon DNA was not detected in eDNA samples taken at Bass002 in 2025 (Table 4). The river was previously supplemented by the DFO LGB program. Several other anadromous species can be found in the river. A few organizations are actively engaged in conservation and fisheries-related work in the river. Bass River has limited evidence of human activity, primarily fishing.

Site Bass002

Decision Tree score: 4

Benefits:
- Appropriate size and substrate for fence installation
- Good adult and juvenile salmon habitat

Caveats:
- Runs through agricultural land up- and downstream of site
- No escaped salmon predicted to enter the system

Site Bass002 is on the main branch of Bass River where Mines Bass River Road crosses the river near the community of Hoegs Corner (Figure 34). No escaped aquaculture salmon are predicted to enter the river by the dispersal model and the mouth of Bass River is more than 200 km away from the nearest active salmon aquaculture site, so it is not a suitable location for escapee monitoring, however the site has characteristics that could make it useful for other research that requires access to the waterway or equipment installation. The land around the site is privately owned, but the site is accessible from a nearby cornfield. There were many areas of suitable juvenile and adult salmon habitat near the site, and the water was 17°C during the site visit. The river was 7 m wide with a few meters of exposed cobble bed along one bank. The water was around 20 cm deep with some pools deeper than 40 cm, suitable for adult and juvenile capture via electrofishing but too shallow for a fence with traps. Strong water marks along the wooden bridge supports indicate the river is usually 20 cm deeper than it was during the site visit and may be higher still during seasonal flooding, although there was limited debris along the banks. The substrate was primarily cobble with a few small boulders. There was limited evidence of human activity at the site apart from some recreational fishing, however the river runs adjacent to agricultural land both up- and downstream of the site.

Middle Branch (North River, Salmon River system, Colchester County, Nova Scotia)

The Middle Branch of the North River (Salmon River system) is in Colchester County, Nova Scotia, near Truro (Figure 17D). The mouth of the Middle Branch is near Upper North River, where it flows into North River which flows into Salmon River near Onslow which empties into the eastern end of Cobequid Bay in the Bay of Fundy. The Salmon River system is located 208 km away from the nearest active salmon sea pen aquaculture lease (the Middle Branch of North River is 20 km upstream of the mouth of the system). The dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon although escaped aquaculture salmon have been detected in the Salmon River (Keyser et al. 2018). The closest dedicated salmon monitoring facility to the Salmon River system River is in the Stewiacke River. Although no specific estimates for the Middle Branch exist, the North River main stem has a moderate amount of salmon habitat [4485 productive salmon habitat units (100 m^2; O'Connell et al. 1997)] and there is likely a wild salmon population in the river (Reader et al. 2024b). The river was historically supplemented by the DFO LGB program. There is a “u-fish” stocking operation along the North River near the Middle Branch, however they mainly stock trout. Several other anadromous species can be found in the river. Many organizations are actively

engaged in conservation and fisheries-related work in the river. The Middle Branch of the North River (Salmon River system) has limited evidence of human activity.

Site NorthMiddle001

Decision Tree score: 5

Benefits:
- Limited evidence of human activity near the site
- Suitable salmon habitat

Caveats:
- High in system and only captures a small portion of the watershed
- No escaped salmon predicted to enter the system

Site NorthMiddle001 is on Middle Branch North River (part of the Salmon River system) upstream of the community of Upper North River where Nova Scotia Route 311 crosses Middle Branch and where Middle Branch joins North River (Figure 35). NorthMiddle001 scores very high on the decision tree and rubric but because no escaped aquaculture salmon are predicted to enter the river by the dispersal model it is not a suitable location for escapee monitoring. The site is also quite high in the system, only capturing the Middle Branch of North River, which itself flows into Salmon River near Truro, Nova Scotia. Areas of suitable juvenile and adult salmon habitat were observed near the site, even with low water levels present during a historic drought. The water was 13.8°C in Middle Branch and 15°C in the main branch of North River, which joins Middle Branch just downstream of the bridge. Upstream of the confluence of the rivers, Middle Branch was 2 m wide, with some exposed river bank indicating the river is likely a few meters wider during years with more average rainfall and during seasonal flooding; downstream of the confluence much of the cobble riverbed was exposed. The river was approximately 40 cm deep, with some pools deeper than 80 cm evident. The site is suitable for fish capture via electrofishing but is too small for a fence. Exposed river bed and some debris along the banks highlight the potential for seasonal flooding and overall higher water during non-drought conditions. The substrate of the river near the site was cobble with exposed sandstone and bedrock.

Salmon River (Colchester County, Nova Scotia)

The Salmon River system is in Colchester County, Nova Scotia, near Truro (Figure 17D). The mouth of the river is in Truro where it empties into the eastern end of Cobequid Bay in the Bay of Fundy. Salmon River is located 208 km away from the nearest active salmon sea pen aquaculture lease. The dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon however escaped aquaculture salmon have been detected in the river (Keyser et al. 2018). The closest dedicated salmon monitoring facility to the Salmon River system is in the Stewiacke River. Salmon River has a large amount of salmon habitat [13468 productive salmon habitat units (100 m^2; O'Connell et al. 1997)] and there is likely a wild salmon population in the river (Reader et al. 2024b); salmon DNA was detected in eDNA samples taken at SalmonTruro005 in 2025 (Table 4). The river was historically supplemented by the DFO LGB program although stocking no longer occurs in the system. Several other anadromous species can be found in the river. Many organizations are actively engaged in conservation and fisheries-related work in the river. Salmon River has evidence of high human activity, including fishing and urban use.

Site SalmonTruro005

Decision Tree score: 4

Benefits:

- Easily accessible from the road
- Suitable size and substrate for salmon habitat (with higher water levels)

Caveats:
- Visible from the road with moderate human activity and high truck traffic
- No escaped salmon predicted to enter the system

Site SalmonTruro005 is along the main branch of Salmon River near the community of Valley and a water bottling plant where Valley Road runs adjacent to the river (Figure 36). The site scores high on the decision tree and rubric, but because no escaped aquaculture salmon are predicted to enter the river it is not a suitable location for escapee monitoring. The land around the site is provincially and municipally owned, and the site can be accessed from the road shoulder. Due to low water, there were few suitable areas of adult salmon habitat, but many locations would be suitable for juvenile salmon although the water was 19.5°C during the site visit while the air was only 18.5°C. The river is fairly wide at the site with a 10 m wet width, extending to approximately 20 m in some larger pools and with a wide, shallow exposed river bed and bank, and was too wide for fish capture via electrofishing, although a fence could be used. The river was roughly 25 cm deep during the site visit, with some pools around 50 cm deep. In some areas near the site the flow was patchy during the site visit, but some debris and the shape of the bank indicates that both water level and flow are higher during times with more average rainfall totals. The substrate at the site was a mix of cobble and sandstone/bedrock. The site was easy to access from the road, but also had evidence of moderate human activity including swimming and boating. The nearby bottling plant also leads to high truck traffic on Valley Road.

Kennetcook River (Avon River system)

The Kennetcook River (Avon River system) is in Hants County, Nova Scotia, along Nova Scotia Highway 236 between the communities of Upper Burlington and Kennetcook (Figure 17D). The mouth of the river flows into the tidal portion of the Avon River near Centre Burlington, and the Avon then empties into the Minas Basin. The Avon River system is located 179 km away from the nearest active salmon sea pen aquaculture lease (the mouth of Kennetcook River is a further 10 km upstream of the mouth of the system) and the dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility to the Avon River system is the White Rock Dam on Gaspereau River. The Kennetcook River has a moderate amount of salmon habitat [3976 productive salmon habitat units (100 m^2; O'Connell et al. 1997)] and there is likely a wild salmon population in the river (Reader et al. 2024b), however salmon DNA was not detected in eDNA samples taken at Kennetcook001 in 2025 (Table 4). A few hatcheries and fish facilities are located in the system, but the river is not supplemented by the DFO LGB program. Many organizations are actively engaged in conservation and fisheries-related work in the river. Kennetcook River has evidence of high human activity, primarily lower in the system, including kayaking, camping, and fishing.

Site Kennetcook001

Decision Tree score: 4

Benefits:
- Suitable substrate and size downstream of the site
- Easy to access site with room for equipment

Caveats:

- High human use
- No escaped salmon predicted to enter the system

Site Kennetcook001 is near where Birch Brook flows into Kennetcook River alongside Nova Scotia Route 236 and is accessed from a dirt road that branches off a nearby driveway (Figure 37). The site scores high on the decision tree and rubric, but because no escaped aquaculture salmon are predicted to enter the river it is not a suitable location for escapee monitoring. The land around the site is mostly privately owned. The river near the site had many areas of suitable habitat for adult salmon, but there were not many areas with juvenile salmon habitat and the water was 21°C. The river was approximately 10 m wide and 1 m deep extending to more than 20 m wide in some of the wider pools, too large for fish capture via electrofishing but suitable for a fence. There was some evidence of seasonal flooding, but the area upstream of the site extended into marsh habitat along the riverbanks, which may buffer rising water levels. The substrate upstream was muddy with marsh grasses visible in the river, but downstream the substrate was primarily cobble and gravel. The area appears to have high human activity, including boating, ATV use, and campfires, and the system supports both commercial and recreational fishing.

Herbert River (Avon River system)

The Herbert River (Avon River system) is in Hants County, Nova Scotia, near the communities of Brooklyn and Woodville (Figure 17D). The mouth of Herbert River flows into the St. Croix River, Nova Scotia, which then flows into the Avon River which then empties into Minas Basin. The Avon River system is located 179 km away from the nearest active salmon sea pen aquaculture lease (the mouth of Herbert River is a further 25 km upstream of the mouth of the system) and the dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility to the Avon River system is the White Rock Dam on Gaspereau River. Although no specific estimates for Herbert River exist, the St. Croix River main stem has a moderate amount of salmon habitat [4283 productive salmon habitat units (100 m^2; O'Connell et al. 1997)] and there is likely a wild salmon population in the river (Reader et al. 2024b); salmon DNA was detected via qPCR in eDNA samples taken at Herbert003 in 2025 (Table 4). The river is supplemented by the DFO LGB program. Many organizations are actively engaged in conservation and fisheries-related work in the river. Herbert River has evidence of high human activity, including fishing, camping, and swimming.

Site Herbert003

Decision Tree score: 4

Benefits:
- Good availability of adult and juvenile salmon habitat
- Easy, safe access to river from highway

Caveats:
- Water levels likely much higher during typical year
- No escaped salmon predicted to enter the system

Site Herbert003 is on the Herbert River east of the community of Woodville where Nova Scotia Highway 14 crosses the river (Figure 38). Several characteristics of this site and the river would be useful for research that requires access to the waterway or equipment installation, but because no escaped aquaculture salmon are predicted to enter the river it is not a suitable location for escapee monitoring. During the site visit, many areas of suitable juvenile salmon habitat were observed, and a few large pools provided suitable

adult salmon habitat. During the site assessment, the water temperature was 17.3°C. The river was 13 m wide at the site (20 m bankfull), but narrowed up- and downstream. The river was about 40 cm deep and more than 1 m deep in the larger pools, suitable for fish capture via fence and via electrofishing in narrower portions. There was limited evidence of flooding at the site, although based on exposed river bed and water lines along the bank water levels were much lower than average when the site was assessed. The substrate was primarily bedrock overlayed by cobble, which may make fence installation more difficult than at other sites. The banks were shallow and wooded except for a high, steep bedrock section upstream of the site. There was some evidence of human activity at the site, and the river is popular for boating, swimming, and fishing.

Meander River (Avon River system)

Meander River (Avon River system) is in Hants County, Nova Scotia, near McKay Section (Figure 17D). The mouth of the river flows into the St. Croix River, Nova Scotia, which then flows into the Avon River near Windsor and empties into Minas Basin. The Avon River system is located 179 km away from the nearest active salmon sea pen aquaculture lease (the mouth of Meander River is a further 25 km upstream of the mouth of the system) and the dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility to the Avon River system is the White Rock Dam on Gaspereau River. Although no specific estimates for Meander River exist, the St. Croix River main stem has a moderate amount of salmon habitat [4283 productive salmon habitat units (100 m^2; O'Connell et al. 1997)] and there is likely a wild salmon population in the river (Reader et al. 2024b). The river was previously supplemented by the DFO LGB program. Many organizations are actively engaged in conservation and fisheries-related work in the river. Meander River has evidence of high human activity, including fishing, camping, and swimming.

Site Meander001

Decision Tree score: 4

Benefits:

- Suitable adult and juvenile salmon habitat
- Appropriate size and substrate for fence installation

Caveats:

- Water levels much lower than average during site visit
- No escaped salmon predicted to enter the system

Site Meander001 is located under the Nova Scotia Highway 215 bridge over Meander River south of Newport, Nova Scotia (Figure 39). Although the site is easy to access with features that make it suitable for fence installation, no escaped aquaculture salmon are predicted to enter the river so it is not a suitable location for escapee monitoring. The water was 16.3°C and the river had many areas of suitable juvenile salmon habitat and at least one deep pool suitable for adult salmon; a school of white sucker (*Catostomus commersonii*) was seen in the pool during the site visit. The river was approximately 6 m wide upstream of the bridge, expanding to 16 m near the bridge. On average the river was 35 cm deep with a 70 cm channel along one side, with a 1.5 m deep pool under the bridge. This site was suitable for fish capture via fence or electrofishing. There was some evidence of flooding in the river, and water lines along the bank and bridge and low flow indicates the water is likely 30 cm deeper during average years. The substrate around the site was mostly cobble and gravel with mud and silt further downstream and in deeper portions or the river. There is likely a lot of human activity along the river and near the site, including boating, swimming, hiking, and fishing.

Avon River

The Avon River system is in Hants County, Nova Scotia, near Windsor (Figure 17D). The mouth of the river is a wide tidal stretch that empties into the Minas Basin. Avon River is located 179 km away from the nearest active salmon sea pen aquaculture lease and the dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility to the Avon River system is the White Rock Dam on Gaspereau River. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Avon River is predicted to have a large amount of salmon habitat [10605 productive salmon habitat units (100 m^2)]. There is likely no wild salmon population in the river (although salmon will enter the system on the way to rivers further upstream) (Reader et al. 2024b) and several hatcheries and fishing facilities are located in the system, but the river is not supplemented by the DFO LGB program. Many other anadromous species can be found in the river. Many organizations are actively engaged in conservation and fisheries-related work in the river. The Avon River has evidence of high human activity, primarily lower in the system.

Site Avon001

Decision Tree score: 4

Benefits:

- Excellent juvenile salmon habitat
- Appropriate size and substrate for fence installation

Caveats:

- Barrier downstream preventing salmon from entering the river
- No escaped salmon predicted to enter the system

Site Avon001 is located on the Avon River where it runs next to Nova Scotia Highway 14 south of Mill Section (Figure 40). Although the site is easy to access with features that make it suitable for fence installation, there is a barrier preventing salmon from entering the river and no escaped aquaculture salmon are predicted to enter the river, so it is not a suitable location for escapee monitoring. During the site visit many areas of suitable juvenile salmon habitat were observed near the site, but low water levels left few areas suitable for adult salmon. The water was 17.8°C during the site visit. The river at the site was 10 m wide (13 m bankfull) and 40 cm deep, with a slightly deeper channel in the river, suitable for fish capture via fence but potentially too large for electrofishing. Water lines on some rocks along the banks suggested the river is likely 20 cm deeper under non-drought conditions, but there was limited evidence of flooding at the site. The substrate was mostly cobble and gravel with some large boulders along the bank in one area. There was a bridge under construction during the site visit, so although the site had limited evidence of other human activities, that may change in the future.

SOUTHERN UPLAND

The SU DU extends from Cape Split in Nova Scotia to the northeastern mainland of Nova Scotia at approximately 45°39'N, 61°25' W, but we limited our assessments to rivers along the coastline between Cape Split and Broad River (just south of Mersey River near Liverpool, Nova Scotia). We visited 50 sites in 38 Rivers in SU, collected eDNA at 26 sites in 26 rivers (14 processed as of publishing), and electrofished nine rivers (Figure 41). Calculated using data from 66 SU rivers, our linear regression of productive salmon habitat area by river axial length was significant ($p < 0.001$, adjusted $R^2 = 0.68$, Table S2c). We multiplied the slope estimate from

the SU regression by river axial length to estimate the salmon habitat area for 18 SU rivers that did not have published values available.

eDNA qPCR

qPCR analysis detected the presence of Atlantic Salmon DNA in one of the 14 sites sampled and processed for eDNA in SU: South River. Three sites had inconclusive results for salmon DNA (Annis River, and Daniels Brook and Round Hill River, both in the Annapolis River system). Atlantic Salmon DNA was not detected in the remaining 10 of 14 sites sampled and processed: Bear River, Belliveau River, Broad Brook, Chebogue River, Clyde River, Jordan Rivier, Meteghan River, Rodney Brook, Roseway River, and Salmon River (Digby County, Nova Scotia; Table 4).

Electrofishing

In August and September 2025, we electrofished for juvenile Atlantic Salmon in South River (Annapolis River system), Nictaux River (Annapolis River system), Daniels Brook (Annapolis River system), Round Hill River (Annapolis River system), Salmon River (Digby County, Nova Scotia), Indian River (Salmon River system, Digby County, Nova Scotia), Clyde River, Hamilton Branch (Clyde River system), and Jordan River. Ten juvenile salmon were caught in the South River; fin clip tissue samples were taken and the fish were measured before being released. No salmon were captured at other sites.

Rivers Suitable for Aquaculture Escapee Monitoring

Nine sites in SU had decision tree scores of 4 or 5, indicating they would be suitable for fence installation (Table 5). Two of these sites were excluded from recommendations due to features that made them unsuitable that weren't captured in the scoring but were captured in the rubric. The remaining seven sites are suitable candidates for the installation a counting fence to monitor escaped aquaculture salmon. One site with a decision tree score of 3 is highlighted as a suitable candidate for future monitoring or assessment work given existing infrastructure that could be useful. Rivers are presented in order from the border between IBoF and SU following the southern cost of Nova Scotia to Broad River. Full details for the suitable sites are presented in the rubric (Table 2); details for SU sites not suitable for aquaculture escapee monitoring are in the Appendix.

South River (Annapolis River system)

South River is in Kings County, Nova Scotia, near Aylesford and Greenwood (Figure 41A). South River flows into the Annapolis River near Auburn; the Annapolis River empties into the Annapolis Basin which is connected to the Bay of Fundy through the Digby Gut. Annapolis River is 19 km away from the nearest active salmon sea pen aquaculture lease (South River is approximately 70 km upstream of the mouth of Annapolis River). The dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon and escapees have previously been detected in Annapolis River (Keyser et al. 2018; Morris et al. 2008). There is an inoperative tidal generating station on the Annapolis River near Annapolis Royal which may act as a partial barrier to fish entering the river, but escapees were detected in the Annapolis River system even while the station was operational (Keyser et al. 2018) so it likely has a limited effect on salmon migration. The closest dedicated salmon monitoring facilities to Annapolis River are the White Rock Dam on Gaspereau River in Nova Scotia and the St. George Fishway, Mactaquac Dam, and Nashwaak Fence across the Bay of Fundy in New Brunswick. Based on our linear model of salmon habitat area by river axial length for SU rivers, South River is predicted to have a large amount of salmon habitat [20886 productive salmon

habitat units (100 m^2)] and there is likely a wild salmon population in the Annapolis River system (Bowlby et al. 2013a); salmon DNA was detected in eDNA samples taken at South002 (Table 4) and juvenile salmon were caught during electrofishing surveys at South002 (Table 3), both in 2025. No salmon stocking occurs in the Annapolis River system. Many other anadromous species can be found in the river and greater system. Many organizations are actively engaged in conservation and fisheries-related work in the river. South River has evidence of moderate human activity, mostly recreation by landowners near the river.

Site South002

Decision Tree score: 4

Benefits:

- Appropriate substrate for fence installation
- Salmon detected in 2025 using eDNA and electrofishing

Caveats:

- Private property with extensive human activity
- Annapolis River system is already well studied by several groups

Site South002 is the furthest upstream site surveyed on the Annapolis River system, and can be accessed from Victoria Road near Millville and near a residential stretch of Victoria Road (Figure 42). The site is approximately 3 km upstream of the mouth of South River where it flows into the Annapolis River, and the land around the site is privately owned. South002 is appropriate for fence installation and scores high on the decision tree and rubric, and the site would likely capture the majority of salmon entering the South River watershed. Although water levels were low in the area due to drought conditions in 2025, a few areas habitat suitable for both adult and juvenile salmon were observed both up- and downstream of South002, and many areas of suitable habitat would be present with more average water levels. The river was 4 m wide upstream of the Victoria Road bridge and 7 m wide downstream, with exposed river bed extending to 9 m wide both above and below the bridge. There were several shallow riffles near the bridge that averaged about 35 cm deep and a stretch of water 1 m deep below the bridge, with some evidence of high water marks about 50 cm deeper than levels during the site visit. Although water levels were low during the site visit, the area would be suitable for fish capture via electrofishing or fence during periods with more average rainfall levels. The water was 9.8°C at the time of the site visit (air temperature was 11°C). The substrate around South002 was a mix of large cobble and gravel. The bridge supports were constructed of beams and large rock fill and could possibly be used to help anchor a fence. There was limited evidence of flooding at the site, although water levels were lower than average during the site visit.

Fales River (Annapolis River system)

Fales River is in Kings and Annapolis Counties, Nova Scotia, near Greenwood (Figure 41A). Fales River flows into the Annapolis River near Greenwood; the Annapolis River empties into the Annapolis Basin which is connected to the Bay of Fundy through the Digby Gut. Annapolis River is 19 km away from the nearest active salmon sea pen aquaculture lease (Fales River is approximately 60 km upstream of the mouth of Annapolis River). The dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon and escapees have previously been detected in Annapolis River (Keyser et al. 2018; Morris et al. 2008). There is an inoperative tidal generating station on the Annapolis River near Annapolis Royal which may act as a partial barrier to fish entering the river but escapees were detected in the Annapolis River system even while the station was operational (Keyser et al. 2018) so it likely has a limited effect on salmon migration. The closest dedicated salmon monitoring facilities to

Annapolis River are the White Rock Dam on Gaspereau River in Nova Scotia and the St. George Fishway, Mactaquac Dam, and Nashwaak Fence across the Bay of Fundy in New Brunswick. Based on our linear model of salmon habitat area by river axial length for SU rivers, Fales River is predicted to have a moderate amount of salmon habitat [7801 productive salmon habitat units (100 m^2)] and there is likely a wild salmon population in the Annapolis River system (Bowlby et al. 2013a). No salmon stocking occurs in the Annapolis River system. Many other anadromous species can be found in the river and greater system. Many organizations are actively engaged in conservation and fisheries-related work in the river. Fales River has evidence of moderate human activity, primarily recreational fishing.

Site Fales003

Decision Tree score: 4

Benefits:

- Easy access with nearby picnic area for staging
- Appropriate size and substrate for fence installation

Caveats:

- Very low water during site visit which may reoccur if drought conditions occur again in the region
- Annapolis River system is already well studied by several groups

Site Fales003 is located at the Meadowvale Road bridge over Fales River near East Tremont in Nova Scotia (Figure 43). The site is approximately 5 km upstream of where Fales River joins the Annapolis River, and the land around the site is a mix of provincially and privately owned. There is a small park adjacent to the site with sufficient parking and areas for staging equipment. Although water levels were incredibly low during the site visit, Fales003 is likely appropriate for fence installation and scored high on the decision tree and rubric. At the time of the visit, there was little water flow in the river, and the system presented as a series of interconnected pools. Although not appropriate habitat during the site visit, evidence of higher water levels and the present cobble and gravel substrate (with some deeper pools under the bridge) indicate that the site would have suitable adult and juvenile salmon habitat. The exposed river bed was 10 m wide; the water present at the site during the visit was 5 m. The water in what would appear to be shallower riffle areas were 30 cm deep and the larger pool under the bridge was 1 m deep. Although water levels were very low during the site visit, the area would be suitable for fish capture via electrofishing or fence during periods with more average rainfall levels. The water was 13.8°C and the air was 19°C during the site visit. The substrate was primarily gravel and cobble and there was little evidence of flooding beyond the exposed river bed, although water marks on the concrete bridge supports suggest water levels approximately 50 cm higher with more typical water levels.

Black River (Annapolis River system)

Black River is in Annapolis County, Nova Scotia, near Meadowvale and Torbrook (Figure 41A). Black River flows into the Annapolis River near Meadowvale; the Annapolis River empties into the Annapolis Basin which is connected to the Bay of Fundy through the Digby Gut. Annapolis River is 19 km away from the nearest active salmon sea pen aquaculture lease (Black River is approximately 55 km upstream of the mouth of Annapolis River). The dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon and escapees have previously been detected in Annapolis River (Keyser et al. 2018; Morris et al. 2008). There is an inoperative tidal generating station on the Annapolis River near Annapolis Royal which may act as a partial barrier to fish entering the river but escapees were detected in the

Annapolis River system even while the station was operational (Keyser et al. 2018) so it likely has a limited effect on salmon migration. The closest dedicated salmon monitoring facilities to Annapolis River are the White Rock Dam on Gaspereau River in Nova Scotia and the St. George Fishway, Mactaquac Dam, and Nashwaak Fence across the Bay of Fundy in New Brunswick. Based on our linear model of salmon habitat area by river axial length for SU rivers, Black River is predicted to have a moderate amount of salmon habitat [8892 productive salmon habitat units (100 m^2)] and there is likely a wild salmon population in the Annapolis River system (Bowlby et al. 2013a). No salmon stocking occurs in the Annapolis River system. Many other anadromous species can be found in the river and greater system. Many organizations are actively engaged in conservation and fisheries-related work in the river. Black River has evidence of moderate human activity, mostly fishing and boating.

Site BlackNS003

Decision Tree score: 4

Benefits:

- Large pool provides appropriate adult salmon habitat despite low water levels
- Suitable substrate for fence installation

Caveats:

- Low water levels limited flow in the system and potentially promoted algal growth
- Annapolis River system is already well studied by several groups

Site BlackNS003 is located on the Meadowvale Road bridge over Black River near Tremont and is approximately 4km west of Fales003 (Figure 44). The site is approximately 5 km upstream of where Black River joins Annapolis River. The land around the site is primarily privately owned. The site is easy to access from the road shoulder with a dirt road approximately 25 m from the site that is available for parking. Water levels were low during the site visit, but BlackNS003 is appropriate for fence installation and scored high on the decision tree and rubric. Flow was low in the river during the site visit, but several areas of suitable adult and juvenile habitat were observed near the site, including a large 15 m wide pool downstream of the bridge. Algae was evident in the pool, although low water levels and flow may have influenced algal growth. Apart from the large pool, most of the river was about 6 m wide. Upstream of the site was a shallow stretch of riffles approximately 10 cm deep, and the pool itself was more than 1 m deep. The area is suitable for fish capture via electrofishing (in shallow areas) or fence. The water was 10.8°C and the air was 15°C during the site visit. The substrate was primarily small cobble, particularly upstream of the site, with some sandy gravel. The bridge supports were constructed of beams and large rock fill and could possibly be used to help anchor a fence. There was limited evidence of flooding at the site, although some markings on the bridge suggest average water levels would likely be about 20 cm higher than they were during the site visit.

Bloody Creek Brook (Annapolis River system)

Bloody Creek Brook is in Annapolis County, Nova Scotia, near Centrelea (Figure 41A). Bloody Creek Brook flows into the Annapolis River near Upper Granville; the Annapolis River empties into the Annapolis Basin which is connected to the Bay of Fundy through the Digby Gut. Annapolis River is 19 km away from the nearest active salmon sea pen aquaculture lease (Bloody Creek Brook is approximately 30 km upstream of the mouth of Annapolis River). The dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon and escapees have previously been detected in Annapolis River (Keyser et al. 2018; Morris et al. 2008). There is an inoperative tidal generating station on the Annapolis

River near Annapolis Royal which may act as a partial barrier to fish entering the river but escapees were detected in the Annapolis River system even while the station was operational (Keyser et al. 2018) so it likely has a limited effect on salmon migration. The closest dedicated salmon monitoring facilities to Annapolis River are the White Rock Dam on Gaspereau River in Nova Scotia and the St. George Fishway, Mactaquac Dam, and Nashwaak Fence across the Bay of Fundy in New Brunswick. Based on our linear model of salmon habitat area by river axial length for SU rivers, Bloody Creek Brook is predicted to have a moderate amount of salmon habitat [5728 productive salmon habitat units (100 m^2)] and there is likely a wild salmon population in the Annapolis River system (Bowlby et al. 2013a). No salmon stocking occurs in the Annapolis River system. Many other anadromous species can be found in the brook and greater system. Many organizations are actively engaged in conservation and fisheries-related work in the river. Bloody Creek Brook has limited evidence of human activity.

Site BloodyCreek001

Decision Tree score: 5

Benefits:

- Easy access near a national historic site
- Suitable habitat for adult and juvenile salmon even with low water levels

Caveats:

- Site just above head-of-tide on Bloody Creek Brook which may influence water levels
- Annapolis River system is already well studied by several groups

Site BloodyCreek001 is located at the Nova Scotia Highway 201 bridge over Bloody Creek Brook near Centrelea and the Bloody Creek National Historic Site (Figure 45). The site is approximately 1.5 km upstream of where Bloody Creek Brook flows into Annapolis River. Land ownership around the site is primarily provincial. The site is easy to access with parking available at the nearby historic site and a path directly to the brook. Water levels were low during the site visit, but BloodyCreek001 is appropriate for fence installation and scored high on the decision tree and rubric. Several areas of suitable juvenile habitat were observed, including riffles and runs between 10 and 40 cm deep, and although water levels were low a few pools 70 cm deep could provide habitat for adult salmon. The brook was 6 m wide above the bridge and spread out below the bridge where it is likely tidally influenced and flows through agricultural land. Although water levels were low during the site visit, the area would be suitable for fish capture via electrofishing or a fence during periods with more average rainfall levels. The water was 11.9°C and the air was 13°C during the site visit. The substrate was primarily sand and cobble near the bridge with increasing amounts of cobble further upstream. There was limited evidence of flooding at the site, although some markings on the bridge suggest average water levels would likely be about 20 cm higher than they were during the site visit.

Round Hill River (Annapolis River system)

Round Hill River is in Annapolis County, Nova Scotia, near Round Hill and Granville Centre (Figure 41A). Round Hill River flows into the Annapolis River which empties into the Annapolis Basin which is connected to the Bay of Fundy through the Digby Gut. Annapolis River is 19 km away from the nearest active salmon sea pen aquaculture lease (Round Hill River is approximately 15 km upstream of the mouth of Annapolis River). The dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon and escapees have previously been detected in Annapolis River (Keyser et al. 2018; Morris et al. 2008). There is an inoperative tidal generating station on the Annapolis River near Annapolis Royal which may act as a partial barrier to fish entering the river however escapees were detected in the

Annapolis River system even while the station was operational (Keyser et al. 2018) so it likely has a limited effect on salmon migration. The closest dedicated salmon monitoring facilities to Annapolis River are the White Rock Dam on Gaspereau River in Nova Scotia and the St. George Fishway, Mactaquac Dam, and Nashwaak Fence across the Bay of Fundy in New Brunswick. Round Hill River has a low amount of salmon habitat [282 productive salmon habitat units (100 m^2) once the habitat inaccessible to salmon is removed (Bowlby et al. 2013b)] and there is likely a wild salmon population in the river (Bowlby et al. 2013a), however the presence of salmon DNA was inconclusive in eDNA samples taken at Roundhill002 in 2025 (Table 4). No salmon stocking occurs in the Annapolis River system. Many other anadromous species can be found in the river and greater system. Many organizations are actively engaged in conservation and fisheries-related work in the river. Round Hill River has limited evidence of human activity, primarily fishing.

Site Roundhill002

Decision Tree score: 4

Benefits:

- Suitable substrate for fence installation with existing human modifications that show rebar can be installed in the substrate
- Appropriate habitat for both juvenile and adult salmon even during drought conditions

Caveats:

- Evidence suggests flooding in the system
- Annapolis River system is already well studied by several groups

Site Roundhill002 is located at the Nova Scotia Highway 201 bridge over Round Hill River near the community of Round Hill (Figure 46). The site is approximately 2 km upstream of where Round Hill River flows into Annapolis River. The land around the site is a mix of provincially and privately owned. The site is fairly easy to access via a short path, although parking at the site is limited to the road shoulder. Water levels were incredibly low in the system during the site visit, but Roundhill002 is appropriate for fence installation and scored high on the decision tree and rubric. A few areas of suitable adult and juvenile salmon habitat were observed near the site, even with low water levels. Upstream of the site the river was 30 cm deep, with some 1 m deep pools located close to the bridge. The exposed river bed suggests water levels would be approximately 70 cm higher in a year with more typical rainfall. The wetted portion of the river was 7 m wide and the exposed river bed was 18 m wide. Although water levels were extremely low during the site visit, the area would be suitable for fish capture via electrofishing or a fence during periods with more average rainfall levels. The water was 13.2°C and the air was 18.5°C during the site visit. The substrate was primarily cobble and gravel. There was some evidence of flooding in the system, and evidence of human modification of the river near the site with logs secured into the substrate to aid bank restoration.

Clyde River

The Clyde River system is in Shelburne and Yarmouth Counties, Nova Scotia (Figure 41C). The mouth of the system is in Clyde River where it empties into the Atlantic Ocean. Clyde River is located 25 km away from the nearest active salmon sea pen aquaculture lease and the dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility to Clyde River is Morgan's Falls on the LaHave River in Nova Scotia. Clyde River has a large amount of salmon habitat [24256 productive salmon habitat units (100 m^2; O'Connell et al. 1997)] and there is likely no wild salmon population in the river (Bowlby et al. 2013a); salmon DNA was not detected in

eDNA samples taken at Clyde100 in 2025 (Table 4). No salmon stocking occurs in the Clyde River. Many other anadromous species can be found in the river. A few organizations are actively engaged in conservation and fisheries-related work in the river. Clyde River has evidence of moderate human activity, primarily camping, ATV use, and fishing.

Site Clyde002

Decision Tree score: 5

Benefits:

- Evidence of appropriate habitat for both juvenile and adult salmon even during drought conditions
- Suitable substrate for fence installation

Caveats:

- Very low water levels during the site visit that may reoccur if drought conditions occur again in the region
- Higher water levels may made deeper pools difficult to work in

Site Clyde002 is located at the Middle Clyde Road bridge over Clyde River off of Upper Clyde Road (Figure 47). The site is on the main branch of Clyde River approximately 30 km upstream of the river mouth. The land around the site is primarily privately owned, but the site can be easily accessed from the road with ample parking on the road shoulder. Water levels were incredibly low in the system during the site visit, but Clyde002 is appropriate for fence installation and scored high on the decision tree and rubric. During the site visit, the river filled approximately one-third of the existing river bed and there was little flow. Despite this, several areas that would likely be suitable adult and juvenile salmon habitat with higher water levels were observed, and even with low water levels deeper pools were present in the river. The river was approximately 20 cm deep in riffles with an 80 cm deep pool below the bridge. Water line evidence on the bridge structure suggests the water level can be up to 1 m higher, and the full width of the river bed was consistently 22 m up- and downstream of the site. Although water levels were extremely low during the site visit, the area would be suitable for fish capture via a fence during periods with more average rainfall levels, but is likely too wide for electrofishing. The water was 19.7°C and the air was 20°C during the site visit. The substrate was primarily cobble and medium boulders, suitable for fence installation. Although water marks and the exposed river bed suggest the Clyde River is on average wider and deeper at site Clyde002, there was little evidence of flooding.

Site Clyde100

Decision Tree score: 4

Benefits:

- Suitable substrate for fence installation
- Appropriate habitat for both adult and juvenile salmon

Caveats:

- Extensive human recreational use downstream of the site
- Water levels during non-drought conditions may be too deep for safe fence operation

Site Clyde100 is located on the main branch of the Clyde River downstream of Clyde002 and the confluence of the main branch and the Hamilton Branch (Figure 48). The site can be accessed from an ATV trail off of Upper Clyde Road, but the trail is suitable for a truck with 4-wheel drive. There is both Crown land and privately owned land around the

site. Similar to Clyde002, water levels were incredibly low in the system during the site visit, but Clyde100 is appropriate for fence installation and scored high on the decision tree and rubric. A few areas of suitable adult and juvenile salmon were observed near the site with some shallower riffles and deeper pools both up- and downstream of the site, although salmon DNA was not detected in eDNA samples collected at Clyde100 in 2025. The river was 16 m wide with exposed river bed extending to 20 m. Shallower areas of the river were approximately 30 cm and some pools were deeper than 1 m. Water marks on the ATV bridge over the river at Clyde100 indicate that water levels may be 1 m higher than what was seen during the site visit. Although water levels were extremely low during the site visit, the area would be suitable for fish capture via fence during periods with more average rainfall levels, but is likely too wide for electrofishing. The substrate was primarily coarse gravel and cobble, suitable for fence installation. Although water levels were low during the site visit, there was little evidence of flooding. In addition to the ATV bridge, there were cottages and other evidence of human use downstream of the site.

Rivers Suitable for Other Research Activities

In addition to the seven sites suitable for aquaculture escapee monitoring, one SU site met some requirements to be an appropriate monitoring site, however its distance from aquaculture leases and the dispersal model prediction indicate a low likelihood of escapees entering this river, making it unsuitable for escapee monitoring (Table 5). While not suitable for monitoring escaped salmon, it may still be useful for other monitoring and assessment work, so it is presented here following the suitable monitoring sites rather than the Appendix (Table 2).

Annis River (Tusket River system)

Annis River is part of the Tusket River system in Yarmouth County, Nova Scotia (Figure 41B). Annis River flows into Tusket River near Pleasant Lake, and Tusket River empties into the Atlantic Ocean near Wedgeport on the south coast of Nova Scotia. The Tusket River system is located 93 km away from the nearest active salmon sea pen aquaculture lease (Annis River is approximately 17 km into the system). The dispersal model predicts that few of the salmon that return to the river are escaped aquaculture salmon although escapees have previously been detected in Tusket River (Keyser et al. 2018; Morris et al. 2008). The closest dedicated salmon monitoring facilities to Annis River are Morgan's Falls on the LaHave River in Nova Scotia and the St. George Fishway across the Bay of Fundy in New Brunswick. Annis River has a moderate amount of salmon habitat [estimated at 3162 productive salmon habitat units (100 m^2) once the habitat inaccessible to salmon is removed (Bowlby et al. 2013b)] but there is likely no wild salmon population in the river (Bowlby et al. 2013a); the presence of salmon DNA was inconclusive in eDNA samples taken at Annis002 in 2025 (Table 4). No salmon stocking occurs in the Tusket River system. Several other anadromous species can be found in the river. Several organizations are actively engaged in conservation and fisheries-related work in the river. Annis River has evidence of moderate human activity, including fishing.

Site Annis002

Decision Tree score: 3

Benefits:

- Old dam/mill structure at the site could be used for equipment installation
- River is the appropriate width for monitoring, and likely the appropriate depth during non-drought conditions

Caveats:

- Inappropriate substrate for fence installation without attaching to existing infrastructure
- Evidence of human-made rock structures at the site

Site Annis002 is located on Annis River (part of the Tusket River system) between Hoopers Lake and Ellenwood Lake near Deerfield (Figure 49). The site can be accessed from the Haley Drive bridge over Annis River near an old dam structure. The site is approximately 12 km upstream from the mouth of Annis River where it flows into Tusket River. The land around the site is primarily privately owned. Although the site is not suitable for escapee monitoring, it does contain the remains of an old dam and mill which could be used to anchor equipment which may be useful for other research or monitoring activities. The water levels were extremely low during the site visit, so the river was mostly reduced to a series of interconnected pools with little suitable salmon habitat. The water was 21.6°C during the site visit. The substrate at Annis002 was primarily bedrock, however some cobble and small boulders were observed downstream of the site which could provide more appropriate salmon habitat with higher water levels. The river bed was 13 m wide below the dam structure, and water marks indicated the river is likely 50 cm deeper at times with more average rainfall in the region.

DISCUSSION

We identified four sites in OBoF, seven in IBoF, and seven in SU that would be suitable for aquaculture escapee monitoring using a fish counting fence. We also identified five sites in OBoF, 16 in IBoF, and one in SU that are not suitable for escapee monitoring but are worth noting as accessible sites on these rivers that could be useful for other research that requires access to the waterway or equipment installation. Data for the remaining 119 sites are provided in the Appendix. These sites are not suitable for fence installation and in some cases are very difficult to access, but the information collected may still be valuable in the future.

Our OBoF sites suitable for escapee monitoring are in rivers with moderate to high productive salmon habitat area and with existing or suspected wild populations (DFO 2014; Jones et al. 2023). Of the four, only the Pocologan River site has no previous escapee detections (Keyser et al. 2018). Dennis Stream, Digdeguash River, and Pocologan River empty into Passamaquoddy Bay (or just adjacent), where the majority of salmon aquaculture is concentrated in New Brunswick. The fourth site is in Hammond River (part of the Saint John River system), where escaped aquaculture salmon have been detected since the early 1990s (Keyser et al. 2018). Three other sites in the Saint John River system (near Canaan River and Belleisle Bay) are suitable as potential sites for future studies only because although they have good characteristics for fence installation, modelling predicts few escapees entering the rivers near these sites (Bradbury et al. 2020b; DFO 2023; Jóhannsson et al. 2017). Based on model predictions, rivers near Passamaquoddy Bay have the highest probability of receiving escapees, so adding more monitoring near Passamaquoddy Bay (in addition to the St. George Fishway on the Magaguadavic River) rather than in the Saint John River system may provide more effective coverage of the OBoF DU. Based on Decision Tree scores, four other sites (in the Pocologan River, Lepreau River, Hammond River, and Kennebecasis River) were also considered as possible recommendations, but they were either tidally influenced, had barriers to fish passage, were difficult to access, or had very high human activity, so details on those sites are included in the Appendix.

The suitable sites for IBoF are all in New Brunswick between Saint John and Fundy National Park in Mispec River, Black River, Gardner Creek, and Bains Brook (part of the Tynemouth Creek system). These rivers all have moderate amounts of Salmon Production Habitat Area and

existing or suspected wild populations (Reader et al. 2024b). Of these rivers, only Black River has had escapees detected (Keyser et al. 2018; Morris et al. 2008). Aside from the listed rivers, there are few other rivers suited to escapee detection in IBoF, primarily due to distance from aquaculture. Although 16 other sites in Nova Scotia have good characteristics for fence suitability, they are all more than 100 km away from the nearest active salmon aquaculture site and few escapees have been detected in the area. Per the dispersal model, few salmon returning to these rivers are predicted to be escapees (Bradbury et al. 2020b; DFO 2023; Jóhannsson et al. 2017). In New Brunswick there may also be appropriate sites within Fundy National Park, but many of the rivers in the park are difficult to access and the region is already well studied by Parks Canada staff (Parks Canada 2026). Based on Decision Tree scores, only one other site in IBoF was considered as possibly suitable (on Bains Brook), but the brook at that site was too small to be an appropriate monitoring site and so it is included in the Appendix.

All but one of the suitable sites in SU are in the Annapolis River system on Nova Scotia's west coast. These rivers all had high or moderate amounts of salmon production habitat area, but only Round Hill River has a suspected or existing wild population (apart from the suspected Annapolis River population; Bowlby et al. 2013a). Escapees have been detected in Annapolis River but not in Clyde River, the other river suitable for escapee monitoring (Keyser et al. 2018; Morris et al. 2008). Annis River in the Tusket River system, the river with a site suitable for future studies, also doesn't have a wild population (Bowlby et al. 2013a), but escapees have been detected in Tusket River (Keyser et al. 2018; Morris et al. 2008). Although many SU rivers have historically provided suitable salmon habitat, changes associated with human use have left many unsuitable for salmon. Some of the most significant changes include the installation of barriers on many rivers in SU (dams, etc.) and the acidification of many rivers (including Clyde River), which may reduce the survival of salmon offspring in the river (Lacroix and Knox 2005). These issues limit the number of appropriate rivers for escapee monitoring, particularly because many SU rivers have barriers to fish passage. Based on Decision Tree scores, two other sites (on the Bear River West Branch and the Belliveau River) were considered for recommendation, but they either had barriers to fish passage or were too small for escapee monitoring; therefore they are presented in the Appendix.

In addition to the DU-specific challenges in selecting appropriate rivers for escapee monitoring, the region around the Bay of Fundy experienced an extreme drought in 2025, with some water stations reporting the lowest rainfall since recording began (Environment and Climate Change Canada 2025), which must be taken into consideration when reviewing the suitable sites presented here. The drought had significant effects on almost every river in the area, and river water levels were low at almost every site visited. At site Salmon001 near Digby, local residents said they had never seen the river as low as it was during our site visit on 25 August 2025. At many sites, low water levels were indicated by exposed river beds along the banks of the rivers, exposed rocks near the centers of some channels, and water lines on rocks and infrastructure, such as bridges. In addition to low water levels, flow rates were also likely lower than average; some sites (like BlackNBEast001 and Kennetcook004) were reduced to a series of interconnected pools with little flow between them. Although we provide estimates of river depth and width for a year with average rainfall along with the measurements taken, any site chosen for escapee monitoring will need remeasuring during a period with more rainfall to confirm river depth and width.

The drought conditions may also have affected the eDNA present in the sampled water, which may explain discrepancies between electrofishing and eDNA results. Although eDNA and electrofishing surveys at many sites did not identify the presence of salmon, a lack of detection does not mean that salmon are never present in the watershed or near the sampled site. Atlantic Salmon have a diverse and complex life history which includes variation in the timing of

maturation, migration, and spawning. This makes the salmon life cycle somewhat resistant to challenges (the portfolio effect; Schindler et al. 2015) and can lead to yearly variation in the number of salmon returning to a river to spawn, which may not be captured when sampling in a single year. Drought conditions may also affect the longevity and distribution of eDNA in water. eDNA can be degraded by UV light and microbial action (Rees et al. 2014), and shallower water may increase UV exposure, reducing the longevity of eDNA in a drought-influenced river with low turbidity. Higher temperatures may also increase the rate of eDNA breakdown, and shallower, warmer waters can influence salmon behaviour, making them harder to detect using eDNA. During drought conditions, Atlantic Salmon parr will often move to deeper areas of a river, at least temporarily (Armstrong et al. 1998), which may concentrate eDNA in certain areas of a river and induce heterogenous distribution of eDNA throughout a sample site (Morrison et al. 2023; Wood et al. 2021). We took three samples at each eDNA collection site across the width of the river to help ensure an accurate sample of what existed in the river, but this strategy may not have detected salmon if they were present but clustered in a refuge pool that was missed by the sampling method, particularly in low flow conditions with stagnant water.

Interactions between wild and escaped aquaculture Atlantic Salmon have been detected throughout the species' range, and the genetic and non-genetic impacts on and negative consequences for wild salmon populations have been studied extensively (Bradbury et al. 2020a; Fraser et al. 2008; Gilbey et al. 2021; Glover et al. 2017; McGinnity et al. 2003; Wringe et al. 2018). Genetic analysis of aquaculture salmon from Europe and North America has shown evidence of European ancestry in North American aquaculture Salmon; this signal has also been detected in wild Salmon from the Bay of Fundy, introduced into the populations through successful breeding between wild Salmon and aquaculture escapees (Bradbury et al. 2022; Holborn et al. 2025). Evidence of escaped aquaculture Salmon entering Bay of Fundy rivers and spawning was detected as early as 1996 (Carr et al. 1997) and although improvements in technology and best practices in the aquaculture industry have led to a decline in the number of salmon escaping fish farms (Jensen et al. 2010), the problem has not been completely eliminated (Glover et al. 2017; Jensen et al. 2010; Keyser et al. 2018). Escaped aquaculture Salmon have continued to be detected throughout the Bay of Fundy (Figure 2), however most of these detections have been opportunistic through other research and monitoring activities rather than the result of targeted monitoring for escapees (Keyser et al. 2018; Morris et al. 2008). The "Assessment of the Risk Posed to Wild Atlantic Salmon Population Abundance and Genetic Character by Direct Genetic Interaction with Escapes from East Coast Atlantic Salmon Aquaculture" (DFO 2023) highlights that limited local data is available about escape rates in many regions of Atlantic Canada (including the Bay of Fundy) and that data from fish counting fences will be valuable for validating model predictions when determining the effects of escaped aquaculture Salmon on wild Salmon populations. The scale of the issue throughout the Bay of Fundy suggests that effective, targeted escapee monitoring is critical for an accurate understanding of the impact of escaped aquaculture Salmon in OBoF, IBoF, and SU. As the interaction between wild and escaped aquaculture Atlantic Salmon has been identified as a significant threat to population persistence in all three Bay of Fundy Atlantic Salmon DUs (Bowlby et al. 2013b; Clarke et al. 2014; COSEWIC 2010; DFO 2008), implementing monitoring strategies at any of the suitable rivers listed in this report will be a crucial part in the continued development of successful conservation and recovery plans for this endangered species.

DATA AVAILABILITY

Scripts for eDNA metabarcoding were modified from https://github.com/NickJeff13/eDNA-for-MPAs/blob/master/code/Bioinformatics/Metabarcoding_QIIME2_Pipeline.sh.

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TABLES

Table 1 - Site codes, coordinates, assessment details, and river names for 159 sites examined in the Outer Bay of Fundy, Inner Bay of Fundy, and Nova Scotia Southern Upland Atlantic Salmon Designatable Units in 2024 and 2025. Rivers are ordered from west to east around the coast of the Bay of Fundy.

DU	Prov.	Date	Main System	River	Site Code	Latitude	Longitude	Site Assessment	eDNA	Electro-fishing
OBoF	NB	19-Aug-24	Dennis Stream	Dennis Stream	DES1	45.25357	-67.26773	Yes	Yes	Yes
OBoF	NB	19-Aug-24	Dennis Stream	Dennis Stream	DES2	45.20934	-67.26230	Yes	Yes	
		18-Jun-25			Dennis001			Yes		
OBoF	NB	18-Jun-25	Waweig River	Waweig River	Waweig001	45.23744	-67.13428	Yes		
OBoF	NB	18-Jun-25	Waweig River	Waweig River	Waweig002	45.24987	-67.13239	Yes		
OBoF	NB	19-Aug-24	Waweig River	Waweig River	WGNEW	45.24929	-67.13240	Yes	Yes	
OBoF	NB	18-Jun-25	Bocabec River	Bocabec River	Bocabec001	45.19143	-66.99610	Yes		
OBoF	NB	18-Jun-25	Digdeguash River	Digdeguash River	Dig001	45.20836	-66.94441	Yes		
OBoF	NB	19-Aug-24	Digdeguash River	Digdeguash River	DIG1	45.25689	-67.00491	Yes	Yes	
OBoF	NB	19-Aug-24	Digdeguash River	Digdeguash River	DIG2	45.43722	-67.17528	Yes	Yes	
OBoF	NB	17-Jun-25	Cripps Stream	Cripps Stream	Cripps001	45.08630	-66.70989	Yes		
OBoF	NB	17-Jun-25	Knights Mill Brook	Knights Mill Brook	Crow001	45.11493	-66.61353	Yes		
OBoF	NB	22-Aug-24	Pocologan River	Pocologan River	PN1	45.15422	-66.60985	Yes	Yes	
OBoF	NB	17-Jun-25	Pocologan River	Pocologan River	Poc001	45.12552	-66.59871	Yes		
OBoF	NB	22-Aug-24	Pocologan River	Pocologan River	PN2	45.12245	-66.59232	Yes	Yes	
		17-Jun-25			Poc002			Yes		
OBoF	NB	17-Jun-25	New River	New River	New001	45.14312	-66.54105	Yes		
OBoF	NB	17-Jun-25	New River	New River	New002	45.17640	-66.54323	Yes		
OBoF	NB	17-Jun-25	New River	New River	New003	45.13708	-66.54116	Yes		
OBoF	NB	22-Aug-24			NRB1	45.13871	-66.54044	Yes	Yes	
OBoF	NB	17-Jun-25	Lepreau River	Lepreau River	Lepreau001	45.16960	-66.46800	Yes		
OBoF	NB	17-Jun-25	Little Lepreau River	Little Lepreau River	LittleLepreau001	45.13433	-66.46041	Yes		
OBoF	NB	8-Aug-24	Keswick River	Keswick River	KSW1	45.99479	-66.83487	Yes	Yes	
OBoF	NB	8-Aug-24	Nashwaaksis Stream	Nashwaaksis Stream	NKS	46.02967	-66.69689	Yes	Yes	
OBoF	NB	8-Aug-24			NKS_BR	46.02967	-66.69689	Yes	Yes	
OBoF	NB	13-Aug-24	Canaan River	Salmon Creek	CAN1	45.87355	-65.83273	Yes	Yes	Yes
OBoF	NB	13-Aug-24	Canaan River	Forks Stream	CAN2	46.05229	-65.55099	Yes	Yes	
OBoF	NB	13-Aug-24	Mill Brook	Mill Brook	HAR	45.79239	-65.89331	Yes	Yes	Yes
OBoF	NB	13-Aug-24	Belleisle Bay	Grants Brook	GRB	45.66512	-65.87606	Yes	Yes	Yes

DU	Prov.	Date	Main System	River	Site Code	Latitude	Longitude	Site Assessment	eDNA	Electro-fishing
OBoF	NB	13-Aug-24	Belleisle Bay	Belleisle Creek	BEL	45.67499	-65.80950	Yes	Yes	
OBoF	NB	16-Jun-25	Kennebecasis River	Kennebecasis River	Kenneb001	45.58023	-65.75832	Yes		
OBoF	NB	16-Jun-25	Kennebecasis River	Kennebecasis River	Kenneb002	45.70200	-65.59997	Yes		
OBoF	NB	15-Aug-24	Kennebecasis River	Kennebecasis River	KS5	45.82703	-65.20345	Yes	Yes	Yes
OBoF	NB	15-Aug-24	Kennebecasis River	Kennebecasis River	KSL	45.76456	-65.42145	Yes	Yes	
OBoF	NB	15-Aug-24	Hammond River	Hammond River	HDL	45.43007	-65.88583	Yes	Yes	
		16-Jun-25			Hammond001			Yes		
OBoF	NB	17-Jun-25	Hammond River	Hammond River	Hammond002	45.46390	-65.80424	Yes		
OBoF	NB	15-Aug-24	Hammond River	Hammond River	HD11	45.53066	-65.56559	Yes	Yes	Yes
IBoF	NB	17-Oct-25	Mispec River	Mispec River	Mispec001	45.23514	-65.95180	Yes		
IBoF	NB	4-Sep-25	Mispec River	Mispec River	Mispec002	45.26968	-65.89490	Yes	Yes	
IBoF	NB	17-Sep-25	Mispec River	Mispec River	Mispec003	45.30786	-65.88205			Yes
IBoF	NB	16-Oct-25	Black River	Black River	BlackNB001	45.26783	-65.81932	Yes		
IBoF	NB	4-Sep-25	Black River	Black River	BlackNB003	45.30644	-65.84865	Yes	Yes	
IBoF	NB	22-Sep-25	Black River	Black River	BlackNB004	45.32942	-65.78122			Yes
IBoF	NB	4-Sep-25	Black River	East Branch Black River	BlackNBEast001	45.28430	-65.80429	Yes		
IBoF	NB	4-Sep-25	Emerson Creek	Emerson Creek	Emerson004	45.31907	-65.74069	Yes		
IBoF	NB	16-Oct-25	Gardner Creek	Gardner Creek	Gardner001	45.29967	-65.71076	Yes		
IBoF	NB	4-Sep-25	Gardner Creek	Gardner Creek	Gardner002	45.32827	-65.69402	Yes	Yes	
IBoF	NB	16-Oct-25	Tynemouth Creek	Bains Brook	Bains001	45.31156	-65.65275	Yes		
IBoF	NB	16-Oct-25	Tynemouth Creek	Bains Brook	Bains002	45.31557	-65.65153	Yes		
IBoF	NB	4-Sep-25	Tynemouth Creek	Bains Brook	Bains004	45.33452	-65.63908	Yes	Yes	Yes
IBoF	NB	4-Sep-25	Tynemouth Creek	Ten Mile Creek	Bains005	45.33845	-65.67169	Yes	Yes	
IBoF	NB	4-Sep-25	Mosher River	Mosher River	Mosher001	45.34101	-65.55611	Yes	Yes	Yes
IBoF	NB	4-Sep-25	Mosher River	Mosher River	Mosher003	45.37848	-65.57828	Yes		
IBoF	NB	17-Sep-25	Mosher River	Mosher River	Mosher100	45.34387	-65.56664	Yes		
IBoF	NB	4-Sep-25	Irish River	Irish River	Irish001	45.36105	-65.53127	Yes	Yes	Yes
IBoF	NB	4-Sep-25	Irish River	Curry Brook	IrishCurry001	45.43361	-65.52529	Yes		
IBoF	NB	4-Sep-25	Irish River	East Branch Irish River	IrishEast002	45.42175	-65.52726	Yes		
IBoF	NB	3-Sep-25	Big Salmon River	Big Salmon River	BigSalmon001	45.42253	-65.40856	Yes	Yes	
IBoF	NB	3-Sep-25	Big Salmon River	Big Salmon River	BigSalmon002	45.51660	-65.35256	Yes	Yes	
IBoF	NB	3-Sep-25	Little Salmon River	Little Salmon River	LittleSalmon001	45.54302	-65.28322	Yes	Yes	Yes
IBoF	NB	3-Sep-25	Little Salmon River	Little Salmon River	LittleSalmon002	45.56455	-65.28243	Yes	Yes	
IBoF	NB	3-Sep-25	Little Salmon River	Northeast Branch Little Salmon River	LittleSalmonNortheast001	45.55327	-65.25972	Yes	Yes	
IBoF	NB	2-Sep-25	Quiddy River	Quiddy River	Quiddy001	45.56746	-65.23291	Yes	Yes	

DU	Prov.	Date	Main System	River	Site Code	Latitude	Longitude	Site Assessment	eDNA	Electro-fishing
IBoF	NB	2-Sep-25	Quiddy River	Quiddy River	Quiddy002	45.59923	-65.21996	Yes		
IBoF	NB	2-Sep-25	Goose Creek	Goose Creek	GooseCreek001	45.58219	-65.19944	Yes		
IBoF	NB	2-Sep-25	Goose Creek	Goose Creek	GooseCreek002	45.58740	-65.20241	Yes		
IBoF	NB	2-Sep-25	Shepody River	Shepody River	Shepody003	45.66643	-64.81075	Yes	Yes	
IBoF	NB	2-Sep-25	Shepody River	Crooked Creek	ShepodyCrooked004B	45.74516	-64.74608	Yes	Yes	
IBoF	NB	2-Sep-25	Shepody River	Crooked Creek	ShepodyCrooked100	45.78069	-64.75844	Yes		
IBoF	NB	2-Sep-25	Demoiselle Creek	Demoiselle Creek	Demoiselle002	45.83513	-64.62365	Yes	Yes	
IBoF	NS	30-Jul-25	Apple River	East Branch Apple River	AppleEast001	45.47300	-64.76895	Yes	Yes	
IBoF	NS	30-Jul-25	Apple River	East Branch Apple River	AppleEast002	45.44707	-64.65115	Yes		
IBoF	NS	30-Jul-25	Apple River	East Branch Apple River	AppleEast003	45.46692	-64.66068	Yes		
IBoF	NS	30-Jul-25	Apple River	South Branch Apple River	AppleSouth001	45.43376	-64.80202	Yes	Yes	
IBoF	NS	30-Jul-25	Apple River	Morang Branch Apple River	AppleMorang001	45.43271	-64.81658	Yes	Yes	
IBoF	NS	30-Jul-25	Ramshead River	Ramshead River	Ramshead001	45.41320	-64.46464	Yes		
IBoF	NS	30-Jul-25	Ramshead River	Ramshead River	Ramshead002	45.42187	-64.46315	Yes	Yes	
IBoF	NS	30-Jul-25	Diligent River	Diligent River	Diligent100	45.40727	-64.41994	Yes	Yes	
IBoF	NS	30-Jul-25	Diligent River	North Branch Diligent River	DNorth002	45.42270	-64.42420	Yes		
IBoF	NS	30-Jul-25	Diligent River	Wharton Brook	Wharton002	45.42245	-64.36634	Yes		
IBoF	NS	31-Jul-25	Farrells River	Farrells River	Farrells001	45.42484	-64.31931	Yes		
IBoF	NS	31-Jul-25	Farrells River	Farrells River	Farrells003	45.44919	-64.33325	Yes	Yes	
IBoF	NS	31-Jul-25	Moose River	Moose River	Moose100	45.41881	-64.19273	Yes		
IBoF	NS	31-Jul-25	Moose River	East Branch Moose River	MooseEast002	45.41920	-64.18950	Yes	Yes	
IBoF	NS	31-Jul-25	Moose River	West Branch Moose River	MooseWest001	45.41981	-64.19400	Yes		
IBoF	NS	31-Jul-25	Harrington River	Harrington River	Harrington001	45.41774	-64.10554	Yes	Yes	
IBoF	NS	31-Jul-25	North River	North River	NorthCumberland001	45.41185	-64.08304	Yes		
IBoF	NS	31-Jul-25	Economy River	Economy River	Economy001	45.39823	-63.89437	Yes		
IBoF	NS	31-Jul-25	Economy River	Economy River	Economy002	45.41355	-63.90085	Yes	Yes	
IBoF	NS	31-Jul-25	Economy River	East Branch Economy River	EconomyEast001	45.43611	-63.85128	Yes	Yes	
IBoF	NS	31-Jul-25	Bass River	Bass River	Bass001	45.41469	-63.77972	Yes		
IBoF	NS	29-Jul-25	Bass River	Bass River	Bass002	45.43847	-63.77192	Yes	Yes	
IBoF	NS	29-Jul-25	Bass River	West Bass River	BassWest002	45.44309	-63.80557	Yes	Yes	
IBoF	NS	20-Aug-25	Salmon River	North River	North002	45.42626	-63.25051	Yes	Yes	
IBoF	NS	20-Aug-25	Salmon River	Middle Branch North River	NorthMiddle001	45.49557	-63.21269	Yes		
IBoF	NS	20-Aug-25	Salmon River	West Branch North River	NorthWest002	45.45188	-63.25420	Yes		
IBoF	NS	20-Aug-25	Salmon River	Salmon River	SalmonTruro003	45.42850	-63.08071	Yes		
IBoF	NS	20-Aug-25	Salmon River	Salmon River	SalmonTruro005	45.38517	-63.18919	Yes	Yes	

DU	Prov.	Date	Main System	River	Site Code	Latitude	Longitude	Site Assessment	eDNA	Electro-fishing
IBoF	NS	20-Aug-25	Salmon River	Black River	Black001	45.42368	-63.04673	Yes		
IBoF	NS	20-Aug-25	Shubenacadie River	Gays River	McLeans004	45.03192	-63.38979	Yes	Yes	
IBoF	NS	20-Aug-25	Shubenacadie River	Shubenacadie River	Shubenacadie001	44.97931	-63.47470	Yes		
IBoF	NS	20-Aug-25	Shubenacadie River	Nine Mile River	NineMile003	45.00069	-63.52344	Yes	Yes	
IBoF	NS	21-Aug-25	Avon River	Kennetcook River	Kennetcook001	45.10337	-63.83033	Yes	Yes	
IBoF	NS	21-Aug-25	Avon River	Kennetcook River	Kennetcook004	45.20044	-63.65281	Yes		
IBoF	NS	21-Aug-25	Avon River	Herbert River	Herbert003	45.03706	-63.89996	Yes	Yes	
IBoF	NS	21-Aug-25	Avon River	Meander River	Meander001	44.99398	-64.00221	Yes	Yes	
IBoF	NS	21-Aug-25	Avon River	Avon River	Avon001	44.90232	-64.20662	Yes		
IBoF	NS	21-Aug-25	Avon River	West Branch Avon River	AvonWest002	44.92763	-64.30766	Yes		
IBoF	NS	25-Jul-25	Avon River	Halfway River	Halfway001	45.04299	-64.19037	Yes	Yes	
IBoF	NS	25-Jul-25	Cornwallis River	Cornwallis River	Cornwallis004	45.06561	-64.60140	Yes	Yes	
IBoF	NS	25-Jul-25	Cornwallis River	Mill Brook	Mill001	45.07501	-64.49166	Yes		
IBoF	NS	25-Jul-25	Cornwallis River	Mill Brook	Mill002	45.07642	-64.48803	Yes		
IBoF	NS	25-Jul-25	Habitant River	Habitant River	Habitant001	45.15091	-64.44273	Yes	Yes	
SU	NS	22-Sep-25	Annapolis River	South River	South002	45.00209	-64.82306	Yes	Yes	Yes
SU	NS	25-Sep-25	Annapolis River	Fales River	Fales003	44.95878	-64.90455	Yes	Yes	
SU	NS	22-Sep-25	Annapolis River	Black River	BlackNS003	44.94813	-64.94898	Yes	Yes	
SU	NS	25-Sep-25	Annapolis River	Nictaux River	Nictaux001	44.92995	-65.03696	Yes	Yes	Yes
SU	NS	25-Sep-25	Annapolis River	Paradise Brook	Paradise001	44.86394	-65.20580	Yes		
SU	NS	24-Sep-25	Annapolis River	Daniels Brook	Daniels001	44.84620	-65.25315	Yes	Yes	Yes
SU	NS	25-Sep-25	Annapolis River	Bloody Creek Brook	BloodyCreek001	44.82233	-65.31005	Yes	Yes	
SU	NS	22-Sep-25	Annapolis River	Round Hill River	Roundhill002	44.77298	-65.40431	Yes	Yes	Yes
SU	NS	24-Sep-25	Annapolis River	Allains River	Allains001	44.71902	-65.48851	Yes	Yes	
SU	NS	25-Aug-25	Bear River	Bear River	Bear001	44.56901	-65.63614	Yes	Yes	
SU	NS	25-Aug-25	Bear River	West Branch Bear River	BearWest002	44.56654	-65.63706	Yes		
SU	NS	25-Aug-25	Belliveau River	Belliveau River	Belliveau001	44.37418	-66.05993	Yes	Yes	
SU	NS	25-Aug-25	Belliveau River	Rivière Grosses Coques	GC001	44.37319	-66.07334	Yes		
SU	NS	25-Aug-25	Boudreau River	Leblanc Brook	Boudreau001	44.27845	-66.13462	Yes	Yes	
SU	NS	25-Aug-25	Boudreau River	Ruisseau des Boudreau	Boudreau003	44.26434	-66.11607	Yes		
SU	NS	25-Aug-25	Meteghan River	Meteghan River	Meteghan001	44.21592	-66.10763	Yes	Yes	
SU	NS	25-Aug-25	Salmon River (Digby)	Salmon River	Salmon001	44.05870	-66.13938	Yes	Yes	Yes
SU	NS	25-Aug-25	Salmon River (Digby)	Salmon River	Salmon005	44.08808	-66.08171	Yes		
SU	NS	23-Sep-25	Salmon River (Digby)	Indian River	Indian001	44.05099	-66.09536	Yes		Yes
SU	NS	26-Aug-25	Chegoggin River	Chegoggin River	Chegoggin002A	43.87512	-66.13524	Yes		

DU	Prov.	Date	Main System	River	Site Code	Latitude	Longitude	Site Assessment	eDNA	Electro-fishing
SU	NS	26-Aug-25	Chegoggin River	Chegoggin River	Chegoggin002B	43.88876	-66.13657	Yes		
SU	NS	26-Aug-25	Chegoggin River	Chegoggin River	Chegoggin002C	43.91176	-66.13985	Yes		
SU	NS	26-Aug-25	Chegoggin River	Chegoggin River	Chegoggin005	43.93409	-66.10754	Yes		
SU	NS	26-Aug-25	Broad Brook	Broad Brook	Broad001A	43.81583	-66.10983	Yes		
SU	NS	26-Aug-25	Broad Brook	Broad Brook	Broad001B	43.83627	-66.10429	Yes		
SU	NS	26-Aug-25	Chebogue River	Chebogue River	Chebogue001	43.83623	-66.05876	Yes	Yes	
SU	NS	26-Aug-25	Tusket River	Annis River	Annis002	43.95180	-65.99425	Yes	Yes	
SU	NS	26-Aug-25	Tusket River	Annis River	Annis003	43.98497	-65.96249	Yes		
SU	NS	26-Aug-25	Tusket River	Carleton River	Carleton002	44.00618	-65.92427	Yes	Yes	
SU	NS	26-Aug-25	Argyle River	Argyle River	Argyle001	43.81923	-65.86471	Yes		
SU	NS	26-Aug-25	Argyle River	Argyle River	Argyle002	43.83529	-65.86672	Yes	Yes	
SU	NS	27-Aug-25	Barrington River	Barrington River	Barrington002	43.59959	-65.57428	Yes		
SU	NS	27-Aug-25	Barrington River	Barrington River	BarringtonHwy103	43.57930	-65.58691	Yes	Yes	
SU	NS	27-Aug-25	Clyde River	Bloody Creek	Clyde001	43.70996	-65.52129	Yes		
SU	NS	27-Aug-25	Clyde River	Hamilton Branch Clyde River	ClydeHamilton001	43.78355	-65.53151	Yes		Yes
SU	NS	27-Aug-25	Clyde River	Clyde River	Clyde002	43.85325	-65.50953	Yes		Yes
SU	NS	27-Aug-25	Clyde River	Clyde River	Clyde100	43.74700	-65.51306	Yes	Yes	
SU	NS	27-Aug-25	Roseway River	Roseway River	Roseway001	43.83732	-65.36941	Yes	Yes	
SU	NS	27-Aug-25	Roseway River	Roseway River	Roseway003	43.78642	-65.34568	Yes		
SU	NS	27-Aug-25	Blacks Brook	Blacks Brook	BlacksNS001	43.78568	-65.32118	Yes		
SU	NS	27-Aug-25	Rodney Brook	Rodney Brook	Rodney001	43.76330	-65.25688	Yes	Yes	
SU	NS	27-Aug-25	Purney Brook	Purney Brook	Purney001	43.78091	-65.25723	Yes	Yes	
SU	NS	10-Sep-25	Jordan River	Jordan River	Jordan100	43.84377	-65.23605	Yes		Yes
SU	NS	28-Aug-25	Jordan River	Jordan River	JordanHwy103	43.81567	-65.23346	Yes	Yes	
SU	NS	28-Aug-25	East River	East River	East001	43.74432	-65.14383	Yes	Yes	
SU	NS	28-Aug-25	Sable River	Sable River	Sable003	43.84815	-65.07201	Yes		
SU	NS	28-Aug-25	Sable River	Tidney River	SableTidney001	43.84133	-65.05233	Yes	Yes	
SU	NS	28-Aug-25	Sable River	Tidney River	SableTidney002	43.84646	-65.04932	Yes		
SU	NS	28-Aug-25	Granite Village Brook	Granite Village Brook	Granite002	43.86820	-64.97671	Yes		
SU	NS	28-Aug-25	Broad River	Broad River	BroadRiver001	43.95710	-64.83590	Yes	Yes	

Table 2 – Data rubric for all sites suitable for escapee monitoring or other research activities. The rubric contains information on salmon habitat, proximity to aquaculture, salmon presence, and human activities for each river and detailed site measurements and characteristics for each suitable site.

| Site Information | | | | | | | | Existing Data for the River | | | | River Biology | | | | | | | | River Geography | | | | | | | | | Site Characteristics | | | | | | | | |

Table 3 – Province, DU, river, site code, and the number of salmon caught for all electrofishing site visits in the Outer Bay of Fundy, Inner Bay of Fundy, and Nova Scotia Southern Upland Atlantic Salmon Designatable Units in 2024 and 2025. Rivers are ordered from west to east around the coast of the Bay of Fundy.

DU	Prov.	Date	Main System	River	Site Code	Number of salmon detected
OBoF	NB	8-Jul-24	Dennis Stream	Dennis Stream	DES1	0
OBoF	NB	9-Jul-24	Mill Brook	Mill Brook	HAR	0
OBoF	NB	9-Jul-24	Canaan River	Salmon Creek	CAN1	13
OBoF	NB	17-Jul-24	Belleisle Creek	Grants Brook	GRB	0
OBoF	NB	25-Jul-24	Kennebecasis River	Kennebecasis River	KS5	0
OBoF	NB	16-Jul-24	Hammond River	Hammond River	HD11	24
IBoF	NB	17-Sep-25	Mispec River	Mispec River	Mispec003	5
IBoF	NB	22-Sep-25	Black River	Black River	BlackNB004	1
IBoF	NB	4-Sep-25	Tynemouth Creek	Bains Brook	Bains004	0
IBoF	NB	4-Sep-25	Mosher River	Mosher River	Mosher001	0
IBoF	NB	4-Sep-25	Irish River	Irish River	Irish001	0
IBoF	NB	3-Sep-25	Little Salmon River	Little Salmon River	LittleSalmon001	0
SU	NS	22-Sep-25	Annapolis River	South River	South002	10*
SU	NS	25-Sep-25	Annapolis River	Nictaux River	Nictaux001	0
SU	NS	24-Sep-25	Annapolis River	Daniels Brook	Daniels001	0
SU	NS	22-Sep-25	Annapolis River	Round Hill River	Roundhill002	0
SU	NS	25-Aug-25	Salmon River (Digby)	Salmon River	Salmon001	0
SU	NS	23-Sep-25	Salmon River (Digby)	Indian River	Indian001	0
SU	NS	27-Aug-25	Clyde River	Hamilton Branch Clyde River	ClydeHamilton001	0
SU	NS	27-Aug-25	Clyde River	Clyde River	Clyde002	0
SU	NS	10-Sep-25	Jordan River	Jordan River	Jordan100	0

* One fish caught at Site South002 may have been a brown trout

Table 4 – River names, site codes, and qPCR results for 83 triplicate eDNA samples taken during river visits in 2024 and 2025 across the Outer Bay of Fundy, Inner Bay of Fundy, and Nova Scotia Southern Upland Atlantic Salmon Designatable Units. Metabarcoding results are included for the samples taken in Outer Bay of Fundy. Rivers are ordered from west to east around the coast of the Bay of Fundy.

DU	Prov.	Date	Main System	River	Site Code	Salmon qPCR Results	Salmon Metabarcoding Results
OBoF	NB	19-Aug-24	Dennis Stream	Dennis Stream	DES1	Not Detected	Not Detected
OBoF	NB	19-Aug-24	Dennis Stream	Dennis Stream	DES2	Not Detected	Not Detected
OBoF	NB	19-Aug-24	Waweig River	Waweig River	WGNEW	Not Detected	Not Detected
OBoF	NB	19-Aug-24	Digdeguash River	Digdeguash River	DIG1	Detected	Detected
OBoF	NB	19-Aug-24	Digdeguash River	Digdeguash River	DIG2	Not Detected	Not Detected
OBoF	NB	22-Aug-24	Pocologan River	Pocologan River	PN1	Detected	Detected
OBoF	NB	22-Aug-24	Pocologan River	Pocologan River	PN2	Detected	Detected
OBoF	NB	22-Aug-24	New River	New River	NRB1	Detected	Detected
OBoF	NB	8-Aug-24	Keswick River	Keswick River	KSW1	Inconclusive	Not Detected
OBoF	NB	8-Aug-24	Nashwaaksis Stream	Nashwaaksis Stream	NKS	Detected	Detected
OBoF	NB	8-Aug-24	Nashwaaksis Stream	Nashwaaksis Stream	NKS_BR	Detected	N/A
OBoF	NB	13-Aug-24	Canaan River	Salmon Creek	CAN1	Detected	Detected
OBoF	NB	13-Aug-24	Canaan River	Forks Stream	CAN2	Inconclusive	Not Detected
OBoF	NB	13-Aug-24	Mill Brook	Mill Brook	HAR	Not Detected	Not Detected
OBoF	NB	13-Aug-24	Belleisle Bay	Grants Brook	GRB	Not Detected	N/A
OBoF	NB	13-Aug-24	Belleisle Bay	Belleisle Creek	BEL	Inconclusive	Not Detected
OBoF	NB	15-Aug-24	Kennebecasis River	Kennebecasis River	KS5	Not Detected	Not Detected
OBoF	NB	15-Aug-24	Kennebecasis River	Kennebecasis River	KSL	Detected	Detected
OBoF	NB	15-Aug-24	Hammond River	Hammond River	HD11	Detected	Detected
OBoF	NB	15-Aug-24	Hammond River	Hammond River	HDL	Not Detected	Not Detected
IBoF	NB	4-Sep-25	Mispec River	Mispec River	Mispec002	Detected	
IBoF	NB	4-Sep-25	Black River	Black River	BlackNB003	Detected	
IBoF	NB	4-Sep-25	Gardner Creek	Gardner Creek	Gardner002	Not Detected	
IBoF	NB	4-Sep-25	Tynemouth Creek	Bains Brook	Bains004	Not Detected	
IBoF	NB	4-Sep-25	Tynemouth Creek	Ten Mile Creek	Bains005	Not Detected	
IBoF	NB	4-Sep-25	Mosher River	Mosher River	Mosher001	Not Detected	
IBoF	NB	4-Sep-25	Irish River	Irish River	Irish001	Not Detected	
IBoF	NB	3-Sep-25	Big Salmon River	Big Salmon River	BigSalmon001	Detected	
IBoF	NB	3-Sep-25	Big Salmon River	Big Salmon River	BigSalmon002	Detected	
IBoF	NB	3-Sep-25	Little Salmon River	Little Salmon River	LittleSalmon001	Not Detected	
IBoF	NB	3-Sep-25	Little Salmon River	Little Salmon River	LittleSalmon002	Not Detected	

DU	Prov.	Date	Main System	River	Site Code	Salmon qPCR Results	Salmon Metabarcoding Results
IBoF	NB	3-Sep-25	Little Salmon River	Northeast Branch Little Salmon River	LittleSalmonNortheast001	Not Detected	
IBoF	NB	2-Sep-25	Quiddy River	Quiddy River	Quiddy001	To be processed	
IBoF	NB	2-Sep-25	Shepody River	Shepody River	Shepody003	Not Detected	
IBoF	NB	2-Sep-25	Shepody River	Crooked Creek	ShepodyCrooked004B	Not Detected	
IBoF	NB	2-Sep-25	Demoiselle Creek	Demoiselle Creek	Demoiselle002	Not Detected	
IBoF	NS	30-Jul-25	Apple River	East Branch Apple River	AppleEast001	To be processed	
IBoF	NS	30-Jul-25	Apple River	South Branch Apple River	AppleSouth001	Not Detected	
IBoF	NS	30-Jul-25	Apple River	Morang Branch Apple River	AppleMorang001	To be processed	
IBoF	NS	30-Jul-25	Ramshead River	Ramshead River	Ramshead002	Not Detected	
IBoF	NS	30-Jul-25	Diligent River	Diligent River	Diligent100	To be processed	
IBoF	NS	31-Jul-25	Farrells River	Farrells River	Farrells003	To be processed	
IBoF	NS	31-Jul-25	Moose River	East Branch Moose River	MooseEast002	Not Detected	
IBoF	NS	31-Jul-25	Harrington River	Harrington River	Harrington001	To be processed	
IBoF	NS	31-Jul-25	Economy River	Economy River	Economy002	Detected	
IBoF	NS	31-Jul-25	Economy River	East Branch Economy River	EconomyEast001	Not Detected	
IBoF	NS	29-Jul-25	Bass River	Bass River	Bass002	Not Detected	
IBoF	NS	29-Jul-25	Bass River	West Bass River	BassWest002	To be processed	
IBoF	NS	20-Aug-25	Salmon River (Colchester)	North River	North002	To be processed	
IBoF	NS	20-Aug-25	Salmon River (Colchester)	Salmon River	SalmonTruro005	Detected	
IBoF	NS	20-Aug-25	Shubenacadie River	Gays River	McLeans004	Not Detected	
IBoF	NS	20-Aug-25	Shubenacadie River	Nine Mile River	NineMile003	To be processed	
IBoF	NS	21-Aug-25	Avon River	Kennetcook River	Kennetcook001	Not Detected	
IBoF	NS	21-Aug-25	Avon River	Herbert River	Herbert003	Detected	
IBoF	NS	21-Aug-25	Avon River	Meander River	Meander001	To be processed	
IBoF	NS	25-Jul-25	Avon River	Halfway River	Halfway001	To be processed	
IBoF	NS	25-Jul-25	Cornwallis River	Cornwallis River	Cornwallis004	Not Detected	
IBoF	NS	25-Jul-25	Habitant River	Habitant River	Habitant001	To be processed	
SU	NS	22-Sep-25	Annapolis River	South River	South002	Detected	
SU	NS	25-Sep-25	Annapolis River	Fales River	Fales003	To be processed	
SU	NS	22-Sep-25	Annapolis River	Black River	BlackNS003	To be processed	
SU	NS	25-Sep-25	Annapolis River	Nictaux River	Nictaux001	To be processed	
SU	NS	24-Sep-25	Annapolis River	Daniels Brook	Daniels001	Inconclusive	
SU	NS	25-Sep-25	Annapolis River	Bloody Creek Brook	BloodyCreek001	To be processed	
SU	NS	22-Sep-25	Annapolis River	Round Hill River	Roundhill002	Inconclusive	

DU	Prov.	Date	Main System	River	Site Code	Salmon qPCR Results	Salmon Metabarcoding Results
SU	NS	24-Sep-25	Annapolis River	Allains River	Allains001	To be processed	
SU	NS	25-Aug-25	Bear River	Bear River	Bear001	Not Detected	
SU	NS	25-Aug-25	Belliveau River	Belliveau River	Belliveau001	Not Detected	
SU	NS	25-Aug-25	Boudreau River	Leblanc Brook	Boudreau001	To be processed	
SU	NS	25-Aug-25	Meteghan River	Meteghan River	Meteghan001	Not Detected	
SU	NS	25-Aug-25	Salmon River (Digby)	Salmon River	Salmon001	Not Detected	
SU	NS	26-Aug-25	Chebogue River	Chebogue River	Chebogue001	Not Detected	
SU	NS	26-Aug-25	Tusket River	Annis River	Annis002	Inconclusive	
SU	NS	26-Aug-25	Tusket River	Carleton River	Carleton002	To be processed	
SU	NS	26-Aug-25	Argyle River	Argyle River	Argyle002	To be processed	
SU	NS	27-Aug-25	Barrington River	Barrington River	BarringtonHwy103	To be processed	
SU	NS	27-Aug-25	Clyde River	Clyde River	Clyde100	Not Detected	
SU	NS	27-Aug-25	Roseway River	Roseway River	Roseway001	Not Detected	
SU	NS	27-Aug-25	Rodney Brook	Rodney Brook	Rodney001	Not Detected	
SU	NS	27-Aug-25	Purney Brook	Purney Brook	Purney001	To be processed	
SU	NS	28-Aug-25	Jordan River	Jordan River	JordanHwy103	Not Detected	
SU	NS	28-Aug-25	East River	East River	East001	To be processed	
SU	NS	28-Aug-25	Sable River	Tidney River	SableTidney001	To be processed	
SU	NS	28-Aug-25	Broad River	Broad River	BroadRiver001	Not Detected	

Table 5 – Designatable Unit, province, site code, and decision tree results for all sites visited in the Outer Bay of Fundy, Inner Bay of Fundy, and Nova Scotia Southern Upland Atlantic Salmon Designatable Units. Rivers are ordered by total score and from west to east around the coast of the Bay of Fundy.

DU	Prov.	Date	Site Code	>10% model predicted escapees	<200km to nearest AQ site	Above tide	Barrier to fish passage (Yes=0, No=1)	Evidence of flooding (Yes=0, No=1)	Appropriate size (Yes=1, No=0)	Suitable substrate (Yes=1, No=0)	Safe access point (Yes=1, No=0)	Score	Result
OBoF	NB	22-Aug-24	PN1	Yes	Yes	Yes	1	1	1	1	1	5	Suitable for escapee monitoring
OBoF	NB	13-Aug-24	CAN1		Yes	Yes	1	1	1	1	1	5	Suitable for other research
OBoF	NB	13-Aug-24	CAN2		Yes	Yes	1	1	1	1	1	5	Suitable for other research
OBoF	NB	13-Aug-24	BEL		Yes	Yes	1	1	1	1	1	5	Suitable for other research
OBoF	NB	13-Aug-24	GRB		Yes	Yes	1	1	1	1	1	5	Suitable for other research
OBoF	NB	19-Aug-24	DES1	Yes	Yes	Yes	1	0	1	1	1	4	Suitable for escapee monitoring
OBoF	NB	19-Aug-24	DIG2	Yes	Yes	Yes	1	0	1	1	1	4	Suitable for other research
OBoF	NB	17-Jun-25	Poc001	Yes	Yes		1	0	1	1	1	4	Tidal
OBoF	NB	17-Jun-25	Lepreau001	Yes	Yes	Yes	0	1	1	1	1	4	Barrier
OBoF	NB	16-Jun-25	Kenneb002	Yes	Yes	Yes	1	0	1	1	1	4	High human use
OBoF	NB	17-Jun-25	Hammond002	Yes	Yes	Yes	1	1	1	1	0	4	Limited access
OBoF	NB	18-Jun-25	Dennis001 (DES2)	Yes	Yes	Yes	1	0	1	1	1	4	Suitable for escapee monitoring
OBoF	NB	19-Aug-24	DES2 (Dennis001)	Yes	Yes	Yes	1	0	1	1	1	4	Suitable for escapee monitoring
OBoF	NB	16-Jun-25	Hammond001 (HDL)	Yes	Yes	Yes	1	0	1	1	1	4	Suitable for escapee monitoring
OBoF	NB	15-Aug-24	HDL (Hammond001)	Yes	Yes	Yes	1	0	1	1	1	4	Suitable for escapee monitoring
OBoF	NB	18-Jun-25	Bocabec001	Yes	Yes		1	0	0	1	1	3	
OBoF	NB	19-Aug-24	DIG1	Yes	Yes	Yes	1	0	1	0	1	3	
OBoF	NB	17-Jun-25	LittleLepreau001	N/A	Yes		0	1	1	0	1	3	
OBoF	NB	16-Jun-25	Kenneb001	Yes	Yes	Yes	1	1	0	0	1	3	
OBoF	NB	15-Aug-24	HD11	Yes	Yes	Yes	1	0	1	1	0	3	
OBoF	NB	22-Aug-24	PN2 (Poc002)	Yes	Yes		1	0	1	1	0	3	
OBoF	NB	17-Jun-25	Poc002 (PN2)	Yes	Yes		1	0	1	1	0	3	
OBoF	NB	18-Jun-25	Waweig001	Yes	Yes	Yes	1	1	1	0	0	3	
OBoF	NB	18-Jun-25	Waweig002	Yes	Yes	Yes	1	1	1	0	0	3	
OBoF	NB	19-Aug-24	WGNEW	Yes	Yes	Yes	1	0	1	0	0	2	
OBoF	NB	18-Jun-25	Dig001	Yes	Yes	Yes	1	0	0	0	1	2	
OBoF	NB	17-Jun-25	New001	Yes	Yes	Yes	1	0	0	1	0	2	
OBoF	NB	17-Jun-25	New002	Yes	Yes	Yes	1	0	1	0	0	2	
OBoF	NB	15-Aug-24	KS5	Yes	Yes	Yes	1	0	0	0	1	2	
OBoF	NB	15-Aug-24	KSL	Yes	Yes	Yes	1	0	0	0	1	2	

DU	Prov.	Date	Site Code	>10% model predicted escapees	<200km to nearest AQ site	Above tide	Barrier to fish passage (Yes=0, No=1)	Evidence of flooding (Yes=0, No=1)	Appropriate size (Yes=1, No=0)	Suitable substrate (Yes=1, No=0)	Safe access point (Yes=1, No=0)	Score	Result
OBoF	NB	17-Jun-25	New003 (NRB1)	Yes	Yes	Yes	1	1	0	0	0	2	
OBoF	NB	22-Aug-24	NRB1 (New003)	Yes	Yes	Yes	1	1	0	0	0	2	
OBoF	NB	17-Jun-25	Cripps001	N/A	Yes	Yes	0	0	1	0	0	1	
OBoF	NB	17-Jun-25	Crow001	N/A	Yes	Yes	0	0	1	0	0	1	Fish ladder
OBoF	NB	8-Aug-24	KSW1		Yes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No data
OBoF	NB	8-Aug-24	NKS (NKS_BR)		Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A	No data
OBoF	NB	8-Aug-24	NKS_BR (NKS)		Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A	No data
OBoF	NB	13-Aug-24	HAR		Yes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No data
IBoF	NS	20-Aug-25	NorthMiddle001			Yes	1	1	1	1	1	5	Suitable for other research
IBoF	NB	4-Sep-25	Mispec002	Yes	Yes	Yes	1	1	0	1	1	4	Suitable for escapee monitoring
IBoF	NB	17-Sep-25	Mispec003	Yes	Yes	Yes	1	1	0	1	1	4	Suitable for escapee monitoring
IBoF	NB	4-Sep-25	BlackNB003	Yes	Yes	Yes	1	1	1	0	1	4	Suitable for escapee monitoring
IBoF	NB	16-Oct-25	Gardner001	Yes	Yes	Yes	1	0	1	1	1	4	Suitable for escapee monitoring
IBoF	NB	16-Oct-25	Bains001	Yes	Yes	Yes	1	0	1	1	1	4	Suitable for escapee monitoring
IBoF	NB	16-Oct-25	Bains002	Yes	Yes	Yes	1	0	1	1	1	4	Suitable for escapee monitoring
IBoF	NB	4-Sep-25	Bains004	Yes	Yes	Yes	1	0	1	1	1	4	Suitable for escapee monitoring
IBoF	NB	4-Sep-25	Bains005	Yes	Yes	Yes	1	1	0	1	1	4	Too small
IBoF	NS	30-Jul-25	AppleEast001		Yes	Yes	1	0	1	1	1	4	Suitable for other research
IBoF	NS	30-Jul-25	AppleEast002		Yes	Yes	1	0	1	1	1	4	Suitable for other research
IBoF	NS	30-Jul-25	AppleSouth001		Yes	Yes	1	0	1	1	1	4	Suitable for other research
IBoF	NS	30-Jul-25	AppleMorang001		Yes	Yes	1	1	0	1	1	4	Suitable for other research
IBoF	NS	30-Jul-25	Ramshead002		Yes	Yes	1	0	1	1	1	4	Suitable for other research
IBoF	NS	31-Jul-25	MooseEast002		Yes	Yes	1	0	1	1	1	4	Suitable for other research
IBoF	NS	31-Jul-25	MooseWest001		Yes	Yes	1	0	1	1	1	4	Suitable for other research
IBoF	NS	31-Jul-25	Economy001		Yes	Yes	1	0	1	1	1	4	Suitable for other research
IBoF	NS	31-Jul-25	Economy002		Yes	Yes	1	0	1	1	1	4	Suitable for other research
IBoF	NS	29-Jul-25	Bass002			Yes	1	0	1	1	1	4	Suitable for other research
IBoF	NS	20-Aug-25	SalmonTruro005			Yes	1	0	1	1	1	4	Suitable for other research
IBoF	NS	21-Aug-25	Kennetcook001		Yes	Yes	1	0	1	1	1	4	Suitable for other research
IBoF	NS	21-Aug-25	Herbert003		Yes	Yes	1	1	1	0	1	4	Suitable for other research
IBoF	NS	21-Aug-25	Meander001		Yes	Yes	1	0	1	1	1	4	Suitable for other research
IBoF	NS	21-Aug-25	Avon001		Yes	Yes	0	1	1	1	1	4	Suitable for other research
IBoF	NB	16-Oct-25	BlackNB001	Yes	Yes	Yes	1	0	1	1	0	3	

DU	Prov.	Date	Site Code	>10% model predicted escapees	<200km to nearest AQ site	Above tide	Barrier to fish passage (Yes=0, No=1)	Evidence of flooding (Yes=0, No=1)	Appropriate size (Yes=1, No=0)	Suitable substrate (Yes=1, No=0)	Safe access point (Yes=1, No=0)	Score	Result
IBoF	NB	22-Sep-25	BlackNB004	Yes	Yes	Yes	1	0	0	1	1	3	
IBoF	NB	4-Sep-25	BlackNBEast001	Yes	Yes	Yes	0	1	0	1	1	3	
IBoF	NB	4-Sep-25	Mosher001	Yes	Yes		1	0	0	1	1	3	
IBoF	NB	4-Sep-25	Mosher003	Yes	Yes	Yes	0	1	0	1	1	3	
IBoF	NB	17-Sep-25	Mosher100	Yes	Yes	Yes	0	0	1	1	1	3	
IBoF	NB	4-Sep-25	Irish001	Yes	Yes		1	1	1	0	0	3	
IBoF	NB	4-Sep-25	IrishEast002	Yes	Yes	Yes	1	1	0	0	1	3	
IBoF	NB	3-Sep-25	BigSalmon001		Yes	Yes	1	0	1	0	1	3	
IBoF	NB	3-Sep-25	LittleSalmon001		Yes	Yes	1	0	1	1	0	3	
IBoF	NB	3-Sep-25	LittleSalmon002		Yes	Yes	1	0	1	0	1	3	
IBoF	NB	3-Sep-25	LittleSalmonNortheast001		Yes	Yes	1	1	0	0	1	3	
IBoF	NB	2-Sep-25	Quiddy001		Yes	Yes	0	1	1	0	1	3	
IBoF	NB	2-Sep-25	Quiddy002		Yes	Yes	1	1	0	0	1	3	
IBoF	NB	2-Sep-25	Shepody003		Yes	Yes	0	1	0	1	1	3	
IBoF	NB	2-Sep-25	ShepodyCrooked004B		Yes	Yes	0	0	1	1	1	3	
IBoF	NB	2-Sep-25	ShepodyCrooked100		Yes	Yes	0	0	1	1	1	3	
IBoF	NB	2-Sep-25	Demoiselle002		Yes	Yes	0	0	1	1	1	3	
IBoF	NS	30-Jul-25	AppleEast003		Yes	Yes	1	0	1	0	1	3	
IBoF	NS	30-Jul-25	Ramshead001		Yes	Yes	1	1	0	1	0	3	
IBoF	NS	30-Jul-25	Diligent100		Yes		1	0	1	1	0	3	
IBoF	NS	30-Jul-25	DNorth002		Yes	Yes	0	1	0	1	1	3	
IBoF	NS	31-Jul-25	Moose100		Yes		1	0	0	1	1	3	
IBoF	NS	31-Jul-25	Bass001			Yes	1	0	0	1	1	3	
IBoF	NS	29-Jul-25	BassWest002			Yes	1	0	0	1	1	3	
IBoF	NS	20-Aug-25	SalmonTruro003			Yes	1	0	1	0	1	3	
IBoF	NS	20-Aug-25	Black001			Yes	1	1	0	0	1	3	
IBoF	NS	20-Aug-25	McLeans004			Yes	1	1	0	1	0	3	
IBoF	NS	25-Jul-25	Halfway001		Yes	Yes	1	0	0	1	1	3	
IBoF	NS	25-Jul-25	Cornwallis004		Yes	Yes	1	0	1	0	1	3	
IBoF	NS	25-Jul-25	Habitant001	N/A	Yes	Yes	1	1	0	0	1	3	
IBoF	NB	17-Oct-25	Mispec001	Yes	Yes	Yes	1	0	0	0	1	2	
IBoF	NB	4-Sep-25	Emerson004	Yes	Yes	Yes	0	0	0	1	1	2	
IBoF	NB	4-Sep-25	Gardner002	Yes	Yes	Yes	0	0	0	1	1	2	

DU	Prov.	Date	Site Code	>10% model predicted escapees	<200km to nearest AQ site	Above tide	Barrier to fish passage (Yes=0, No=1)	Evidence of flooding (Yes=0, No=1)	Appropriate size (Yes=1, No=0)	Suitable substrate (Yes=1, No=0)	Safe access point (Yes=1, No=0)	Score	Result
IBoF	NB	4-Sep-25	IrishCurry001	Yes	Yes	Yes	0	0	0	1	1	2	
IBoF	NB	3-Sep-25	BigSalmon002		Yes	Yes	0	0	1	0	1	2	
IBoF	NB	2-Sep-25	GooseCreek001		Yes	Yes	0	1	0	0	1	2	
IBoF	NB	2-Sep-25	GooseCreek002		Yes	Yes	0	1	0	0	1	2	
IBoF	NS	31-Jul-25	Farrells001		Yes	Yes	0	1	0	0	1	2	
IBoF	NS	31-Jul-25	Farrells003		Yes	Yes	0	0	0	1	1	2	
IBoF	NS	31-Jul-25	EconomyEast001		Yes	Yes	1	0	0	1	0	2	
IBoF	NS	20-Aug-25	North002			Yes	1	0	0	0	1	2	
IBoF	NS	20-Aug-25	NorthWest002			Yes	1	0	1	0	0	2	
IBoF	NS	20-Aug-25	NineMile003			Yes	1	0	0	1	0	2	
IBoF	NS	21-Aug-25	Kennetcook004		Yes	Yes	0	0	0	1	1	2	
IBoF	NS	21-Aug-25	AvonWest002		Yes		1	0	0	0	1	2	
IBoF	NS	25-Jul-25	Mill001		Yes		1	0	0	0	1	2	
IBoF	NS	25-Jul-25	Mill002		Yes	Yes	1	0	0	1	0	2	
IBoF	NS	30-Jul-25	Wharton002		Yes	Yes	0	0	0	0	1	1	
IBoF	NS	31-Jul-25	Harrington001		Yes	Yes	1	0	0	0	0	1	
IBoF	NS	31-Jul-25	NorthCumberland001		Yes		1	0	0	0	0	1	
IBoF	NS	20-Aug-25	Shubenacadie001			Yes	1	0	0	0	0	1	
SU	NS	25-Sep-25	BloodyCreek001	Yes	Yes	Yes	1	1	1	1	1	5	Suitable for escapee monitoring
SU	NS	27-Aug-25	Clyde002	Yes	Yes	Yes	1	1	1	1	1	5	Suitable for escapee monitoring
SU	NS	22-Sep-25	South002	Yes	Yes	Yes	1	0	1	1	1	4	Suitable for escapee monitoring
SU	NS	25-Sep-25	Fales003	Yes	Yes	Yes	1	0	1	1	1	4	Suitable for escapee monitoring
SU	NS	22-Sep-25	BlackNS003	Yes	Yes	Yes	1	1	0	1	1	4	Suitable for escapee monitoring
SU	NS	22-Sep-25	Roundhill002	Yes	Yes	Yes	1	0	1	1	1	4	Suitable for escapee monitoring
SU	NS	25-Aug-25	BearWest002	Yes	Yes	Yes	0	1	1	1	1	4	Barrier
SU	NS	25-Aug-25	Belliveau001	Yes	Yes	Yes	1	1	0	1	1	4	Too small
SU	NS	27-Aug-25	Clyde100	Yes	Yes	Yes	1	1	0	1	1	4	Suitable for escapee monitoring
SU	NS	25-Sep-25	Nictaux001	Yes	Yes	Yes	0	0	1	1	1	3	
SU	NS	24-Sep-25	Daniels001	Yes	Yes	Yes	0	0	1	1	1	3	
SU	NS	25-Aug-25	Boudreau001	N/A	Yes	Yes	1	0	1	0	1	3	
SU	NS	25-Aug-25	Salmon001	Yes	Yes	Yes	1	0	1	0	1	3	
SU	NS	25-Aug-25	Salmon005	Yes	Yes	Yes	0	1	1	0	1	3	
SU	NS	23-Sep-25	Indian001	Yes	Yes	Yes	1	1	0	0	1	3	

DU	Prov.	Date	Site Code	>10% model predicted escapees	<200km to nearest AQ site	Above tide	Barrier to fish passage (Yes=0, No=1)	Evidence of flooding (Yes=0, No=1)	Appropriate size (Yes=1, No=0)	Suitable substrate (Yes=1, No=0)	Safe access point (Yes=1, No=0)	Score	Result
SU	NS	26-Aug-25	Chegoggin002A	N/A	Yes	Yes	1	1	0	1	0	3	
SU	NS	26-Aug-25	Broad001B	Yes	Yes	Yes	1	1	0	0	1	3	
SU	NS	26-Aug-25	Chebogue001	Yes	Yes	Yes	0	1	0	1	1	3	
SU	NS	26-Aug-25	Annis002		Yes	Yes	1	1	0	0	1	3	Suitable for other research*
SU	NS	26-Aug-25	Carleton002		Yes	Yes	1	1	1	0	0	3	
SU	NS	26-Aug-25	Argyle001	N/A	Yes		1	1	0	0	1	3	
SU	NS	26-Aug-25	Argyle002	N/A	Yes	Yes	1	1	0	0	1	3	
SU	NS	27-Aug-25	Clyde001	Yes	Yes	Yes	1	1	0	1	0	3	
SU	NS	27-Aug-25	ClydeHamilton001	Yes	Yes	Yes	1	0	0	1	1	3	
SU	NS	27-Aug-25	Roseway001	Yes	Yes	Yes	1	0	0	1	1	3	
SU	NS	27-Aug-25	Rodney001	N/A	Yes		0	0	1	1	1	3	
SU	NS	27-Aug-25	Purney001	N/A	Yes		0	1	1	0	1	3	
SU	NS	10-Sep-25	Jordan100	Yes	Yes	Yes	1	1	0	1	0	3	
SU	NS	28-Aug-25	JordanHwy103	Yes	Yes		1	1	0	1	0	3	
SU	NS	28-Aug-25	SableTidney002	Yes	Yes		1	0	1	0	0	2	
SU	NS	28-Aug-25	Granite002	N/A	Yes		1	0	0	0	1	2	
SU	NS	25-Sep-25	Paradise001	Yes	Yes	Yes	1	0	0	0	1	2	
SU	NS	24-Sep-25	Allains001	Yes	Yes	Yes	1	0	0	0	1	2	
SU	NS	25-Aug-25	Bear001	Yes	Yes	Yes	0	0	1	0	1	2	
SU	NS	25-Aug-25	GC001	Yes	Yes	Yes	0	1	0	0	1	2	
SU	NS	25-Aug-25	Meteghan001	Yes	Yes	Yes	0	1	0	0	1	2	
SU	NS	26-Aug-25	Chegoggin005	N/A	Yes	Yes	0	1	0	1	0	2	
SU	NS	26-Aug-25	Broad001A	Yes	Yes	Yes	1	1	0	0	0	2	
SU	NS	26-Aug-25	Annis003		Yes	Yes	1	1	0	0	0	2	
SU	NS	27-Aug-25	Barrington002	Yes	Yes	Yes	1	1	0	0	0	2	
SU	NS	27-Aug-25	BarringtonHwy103	Yes	Yes	Yes	1	0	1	0	0	2	
SU	NS	27-Aug-25	Roseway003	Yes	Yes	Yes	1	0	0	0	1	2	
SU	NS	28-Aug-25	Sable003	Yes	Yes		1	1	0	0	0	2	
SU	NS	28-Aug-25	BroadRiver001	Yes	Yes	Yes	1	0	0	0	1	2	
SU	NS	25-Aug-25	Boudreau003	N/A	Yes	Yes	0	1	0	0	0	1	
SU	NS	26-Aug-25	Chegoggin002B	N/A	Yes	Yes	0	1	0	0	0	1	
SU	NS	26-Aug-25	Chegoggin002C	N/A	Yes	Yes	0	1	0	0	0	1	
SU	NS	27-Aug-25	BlacksNS001	N/A	Yes	Yes	0	0	0	0	1	1	

DU	Prov.	Date	Site Code	>10% model predicted escapees	<200km to nearest AQ site	Above tide	Barrier to fish passage (Yes=0, No=1)	Evidence of flooding (Yes=0, No=1)	Appropriate size (Yes=1, No=0)	Suitable substrate (Yes=1, No=0)	Safe access point (Yes=1, No=0)	Score	Result
SU	NS	28-Aug-25	East001	Yes	Yes	Yes	1	0	0	0	0	1	
SU	NS	28-Aug-25	SableTidney001	Yes	Yes	Yes	1	0	0	0	0	1	
* Site Annis002 is presented in the main text due to existing infrastructure that could be useful for future work													

FIGURES

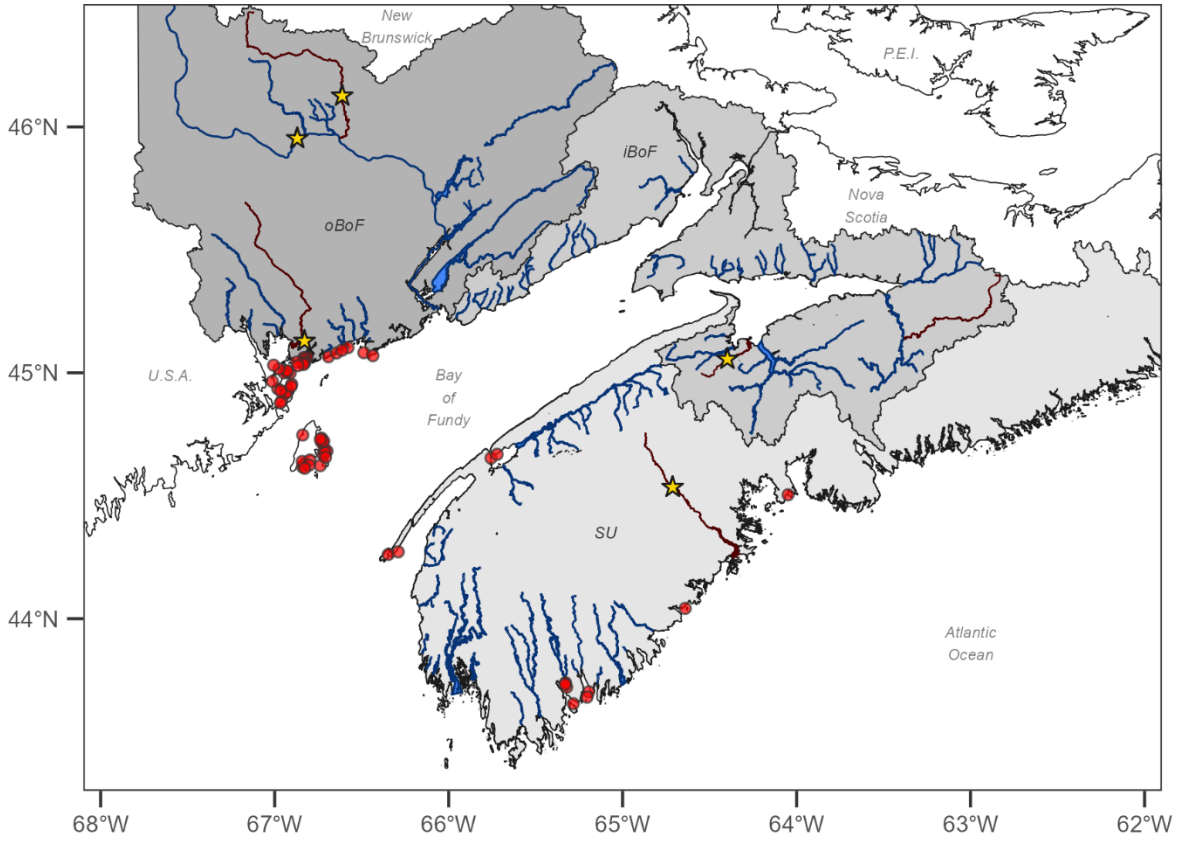


Figure 1 – Map of the rivers sampled for this project (blue) and active salmon aquaculture leases (red circles) in the Outer Bay of Fundy (OBoF), Inner Bay of Fundy (IBoF), and Nova Scotia Southern Upland (SU) Atlantic Salmon Designatable Units. Rivers in maroon were not sampled for this project, but have dedicated salmon monitoring infrastructure (yellow stars)

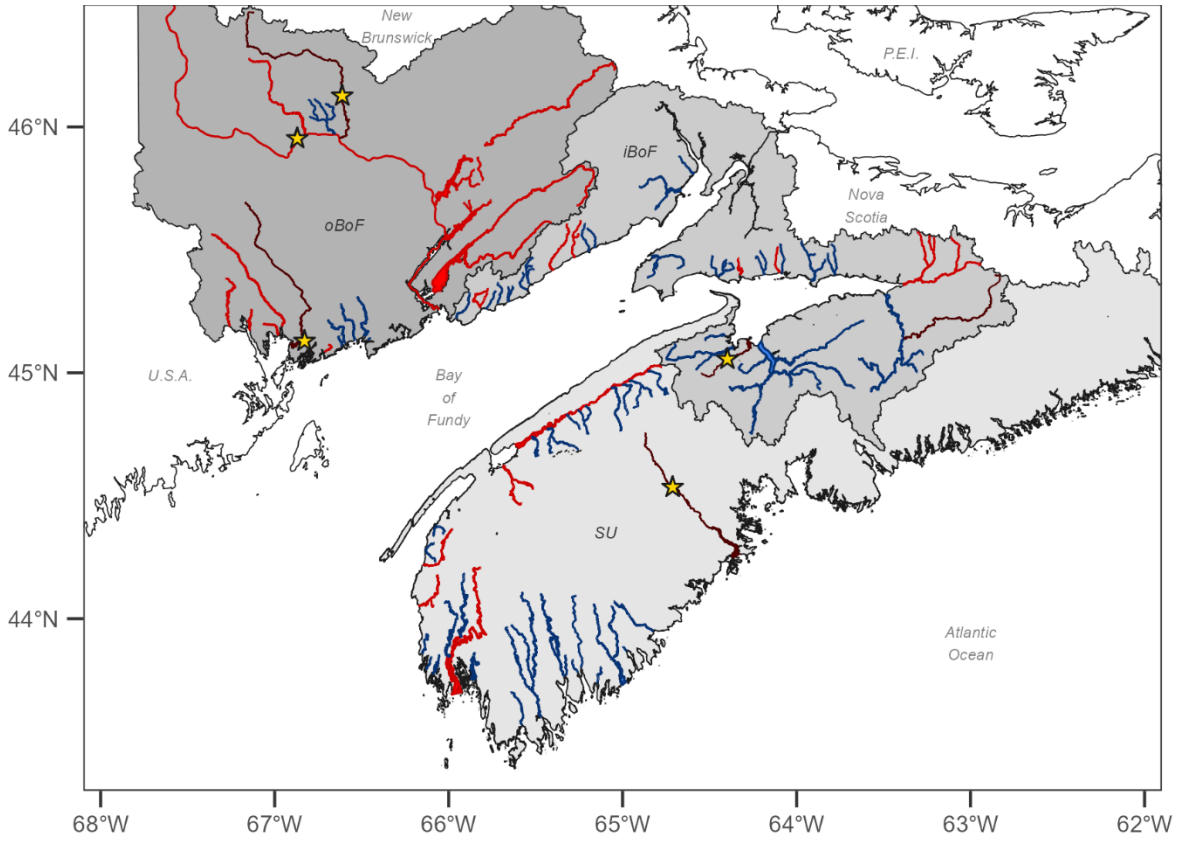


Figure 2 – Map of rivers sampled for this project showing where escaped aquaculture salmon have (red) and have not (blue) been previously detected in the OBoF, IBoF, and SU Atlantic Salmon DUs. Detection data is taken from Morris et al. (2008), DFO (2014), and Keyser et al. (2018). Rivers in maroon were not sampled for this project, but have dedicated salmon monitoring infrastructure (yellow stars) where escaped aquaculture salmon have previously been detected. These are provided for additional context of dispersal of escapees in this region.

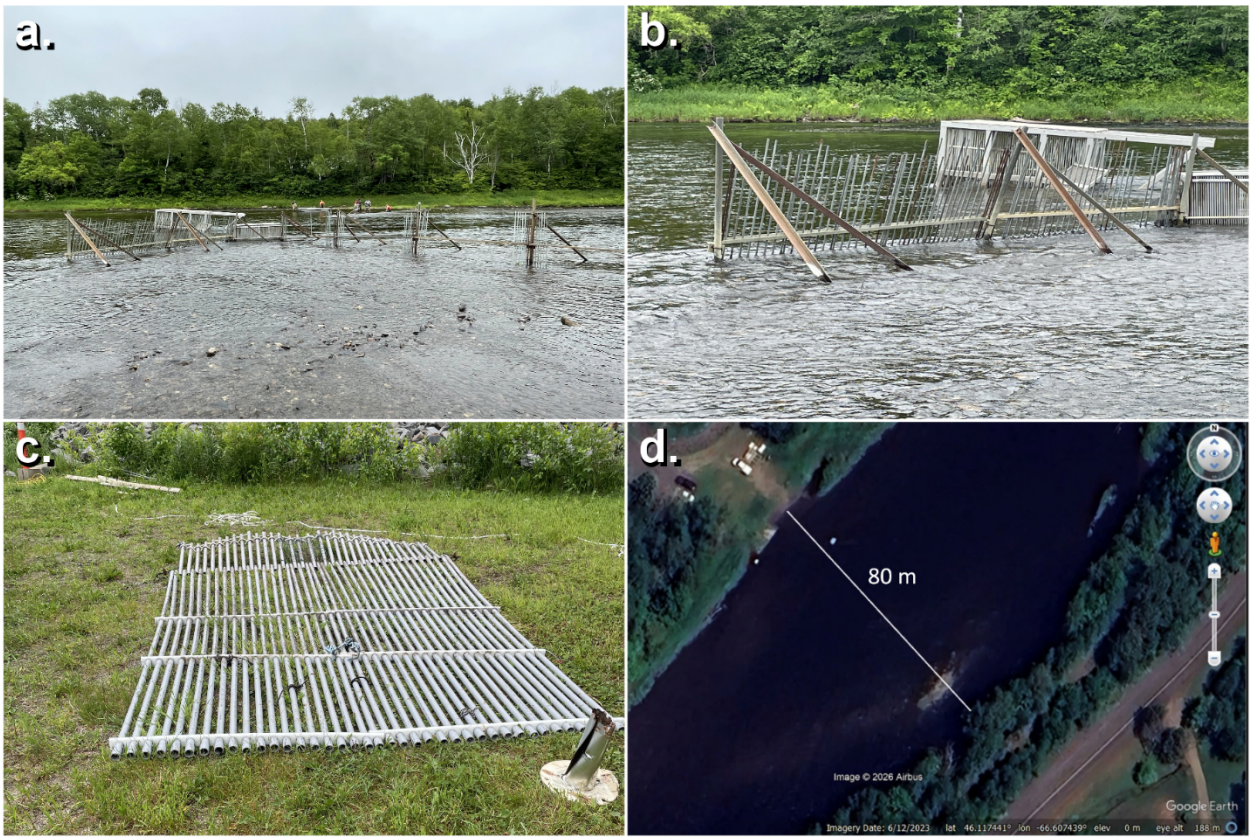


Figure 3 – Examples and detail of DFO Maritimes Region Atlantic Salmon counting fences. a. A monitoring fence for salmon being installed in the Nashwaak River in New Brunswick. b. Close-up of supports on the downstream side of the fence providing support against the flow of water. Traps for fish leaving (closer) and entering (further) the river can be seen on the right of the image. c. A "floating" fence panel made of plastic can raise and lower with water levels while being anchored on the riverbed. Debris from flooding can usually pass over this type of panel. d. A Google Maps screenshot of the location of the Nashwaak Fence. The Nashwaak River is 80 m wide at the fence site.

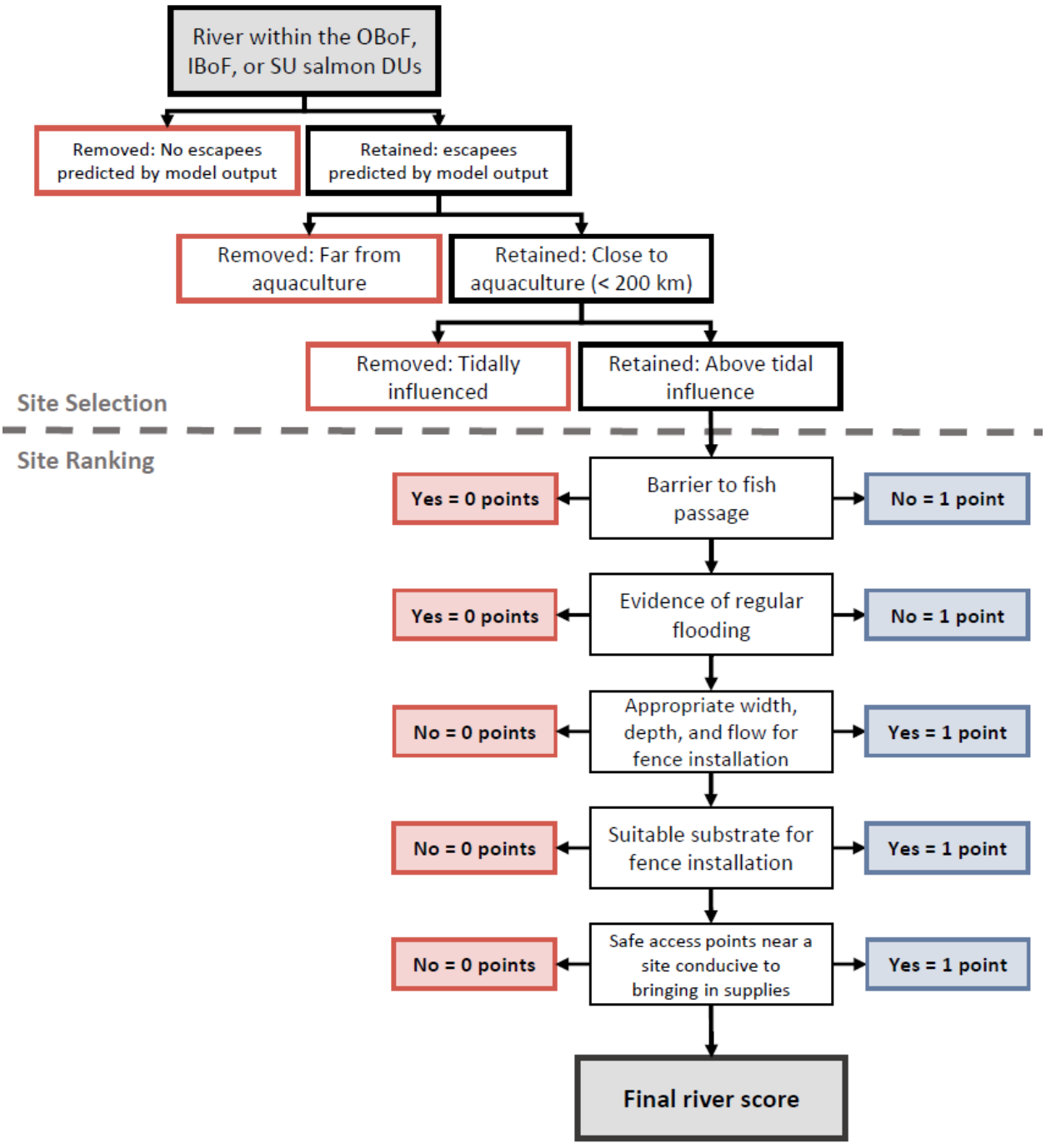


Figure 4 - Decision tree for ranking and selecting rivers suitable for aquaculture escapee monitoring, modified from Andrews and Coffey (2009).

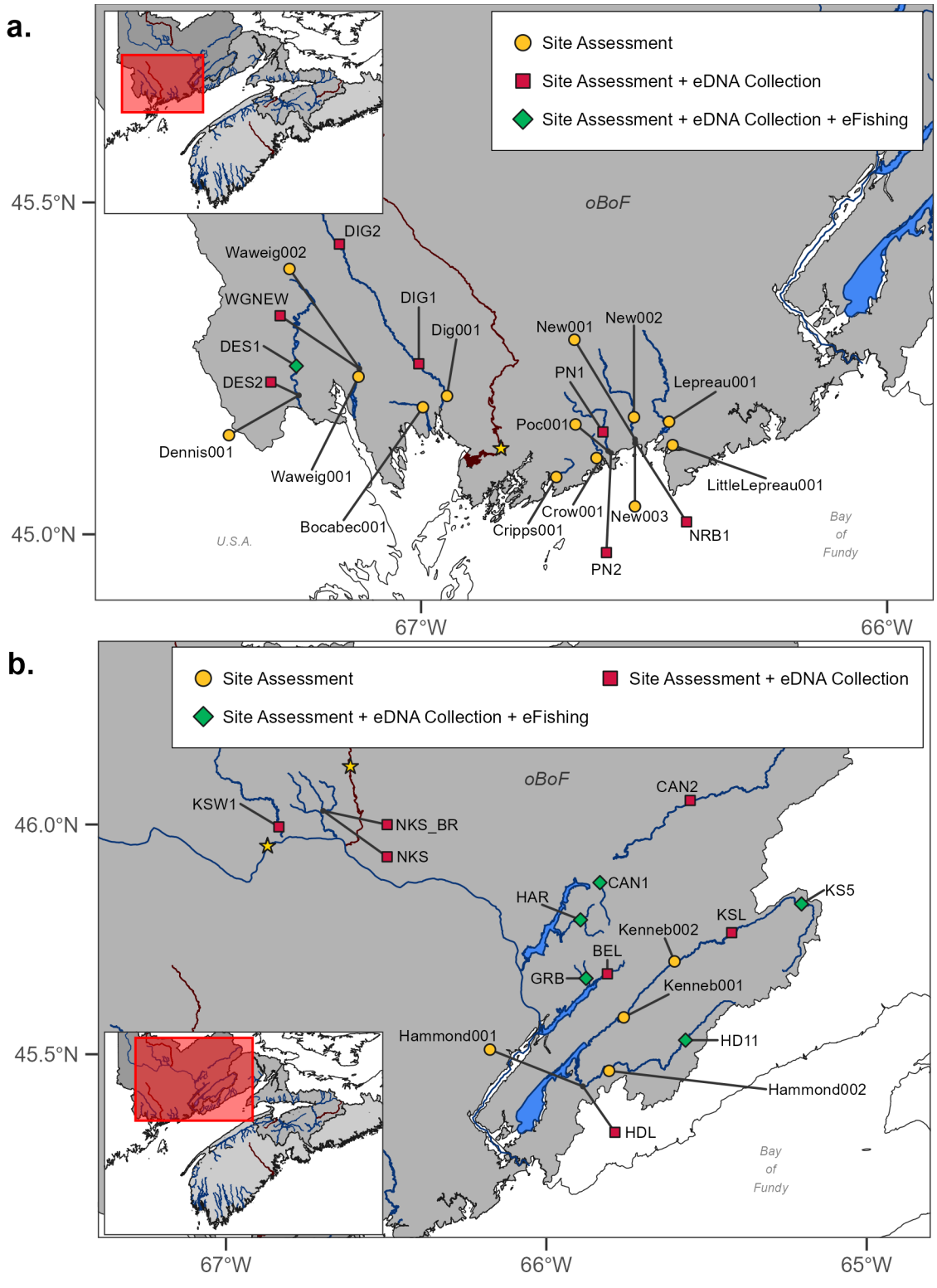

a.
Site Assessment
Site Assessment + eDNA Collection
Site Assessment + eDNA Collection + eFishing
oBoF
45.5°N
45.0°N
67°W
66°W
DIG2
Waweig002
WGNEW
DIG1
Dig001
DES1
DES2
Dennis001
Waweig001
Bocabec001
New001
New002
PN1
Lepreau001
Poc001
LittleLepreau001
Crow001
New003
NRB1
Cripps001
PN2
U.S.A.
Bay
of
Fundy
b.
Site Assessment
Site Assessment + eDNA Collection
Site Assessment + eDNA Collection + eFishing
oBoF
46.0°N
45.5°N
67°W
66°W
65°W
KSW1
NKS_BR
NKS
CAN2
CAN1
HAR
KS5
KSL
Kenneb002
BEL
GRB
Kenneb001
HD11
Hammond001
Hammond002
HDL
Bay
of
Fundy

Figure 5 – a. Map of the Outer Bay of Fundy Designatable Unit, highlighting the area from the US border to Little Lepreau River, with labelled sampling sites b. Map of Saint John River system with labelled sample sites. All panels: Rivers in maroon were not sampled for this project, but have dedicated salmon monitoring infrastructure (yellow stars). The red boxes in the inset map shows the location of each enlarged map.

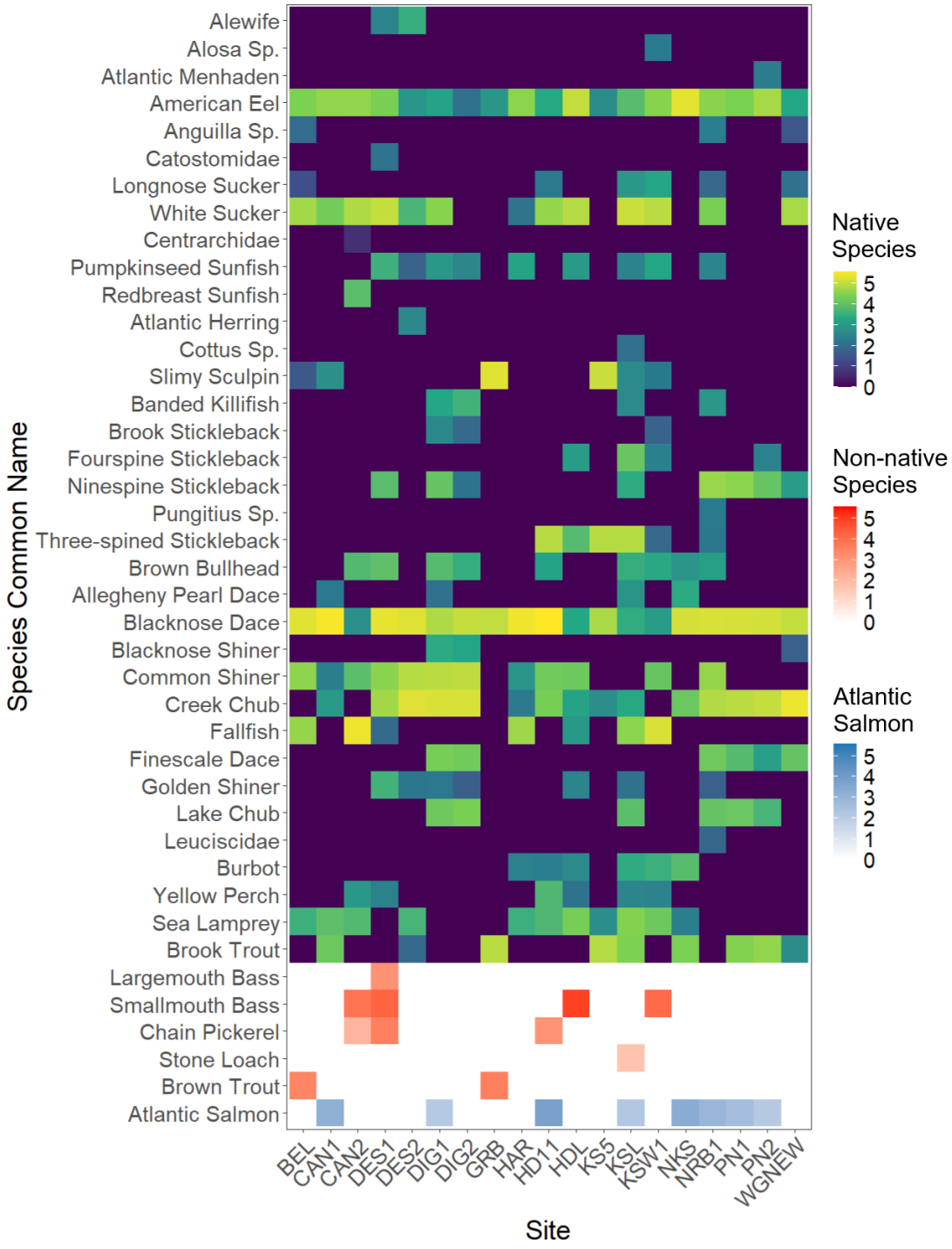


Figure 6 – eDNA metabarcoding species detections for native species (dark blue-green-yellow gradient), non-native species (red), and Atlantic Salmon (light blue) for sample sites in the Outer Bay of Fundy Designatable Unit. Colours represent log_{10}(number of sequence reads+1).

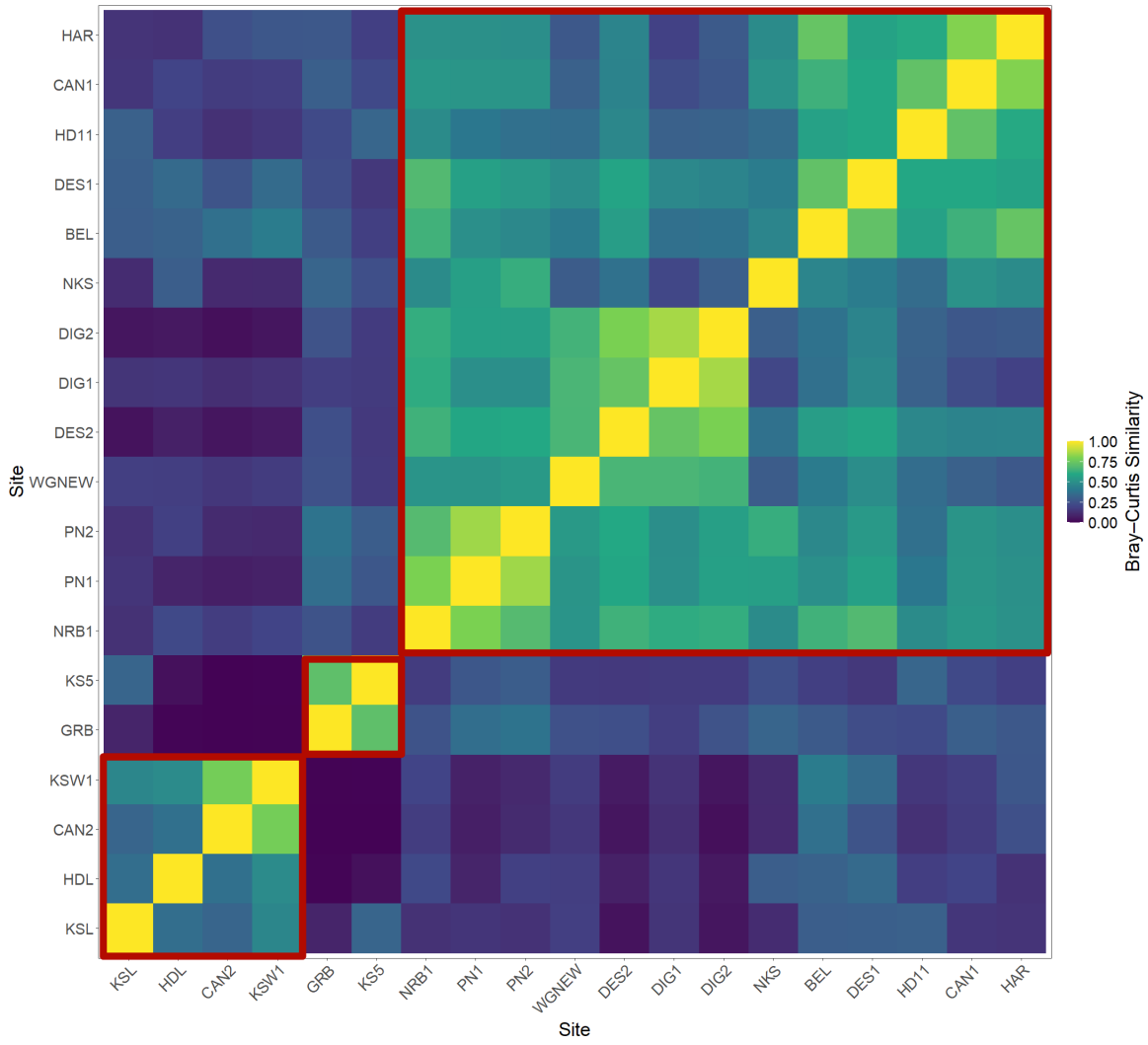


Figure 7 – Plot of Bray-Curtis similarity values calculated using species detections from the eDNA metabarcoding analysis for sites in the Outer Bay of Fundy Designatable Unit. Higher values (green and yellow) indicate greater similarity between sites. Three major sample site groupings are highlighted in red squares.

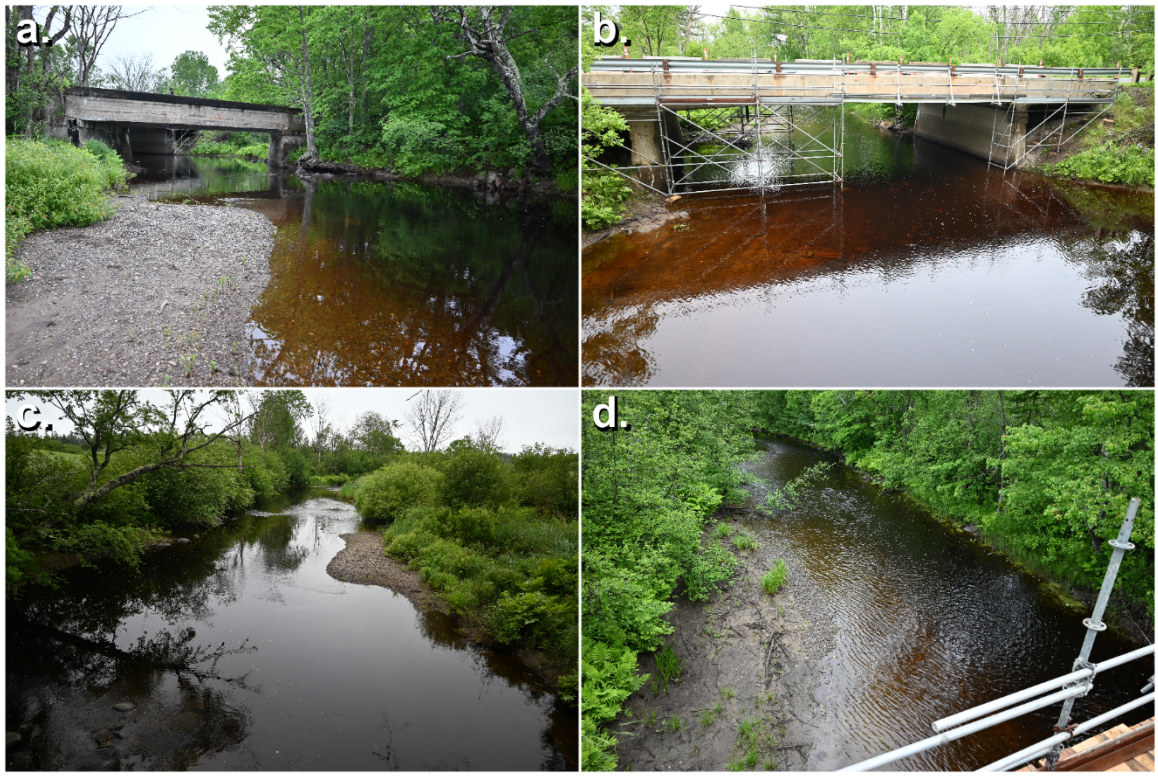


Figure 8 - Photographs of sampling site Dennis001 (from 2025, the site was sampled as DES2 in 2024), on the Dennis River, NB, in the Outer Bay of Fundy Designatable Unit. a. View from downstream of the Dennis001 site, on the Dennis River, NB, facing upstream towards two bridges. The closer, downstream bridge is the older bridge, while the further upstream bridge with scaffolding is the newer Route 170 bridge. An exposed gravel bank on the left highlights the low water levels in the area during the site visit and the primarily gravel substrate of the stream. b. View from the older bridge crossing Dennis Stream upstream towards the Route 170 bridge, which was under construction at the time of the site visit. c. View from the older bridge over Dennis Stream looking downstream showing densely vegetated riparian areas. d. View from the Route 170 bridge over Dennis Stream facing upstream, showing thick vegetation around the stream. An exposed muddy area on the left highlights the low water levels in the area during the site visit.



Figure 9 – Google Maps screenshot of site DES1, on Dennis River, NB, in the Outer Bay of Fundy Designatable Unit.



Figure 10 – Google Maps screenshot of site PN1, on the Pocologan River, NB, in the Outer Bay of Fundy Designatable Unit.

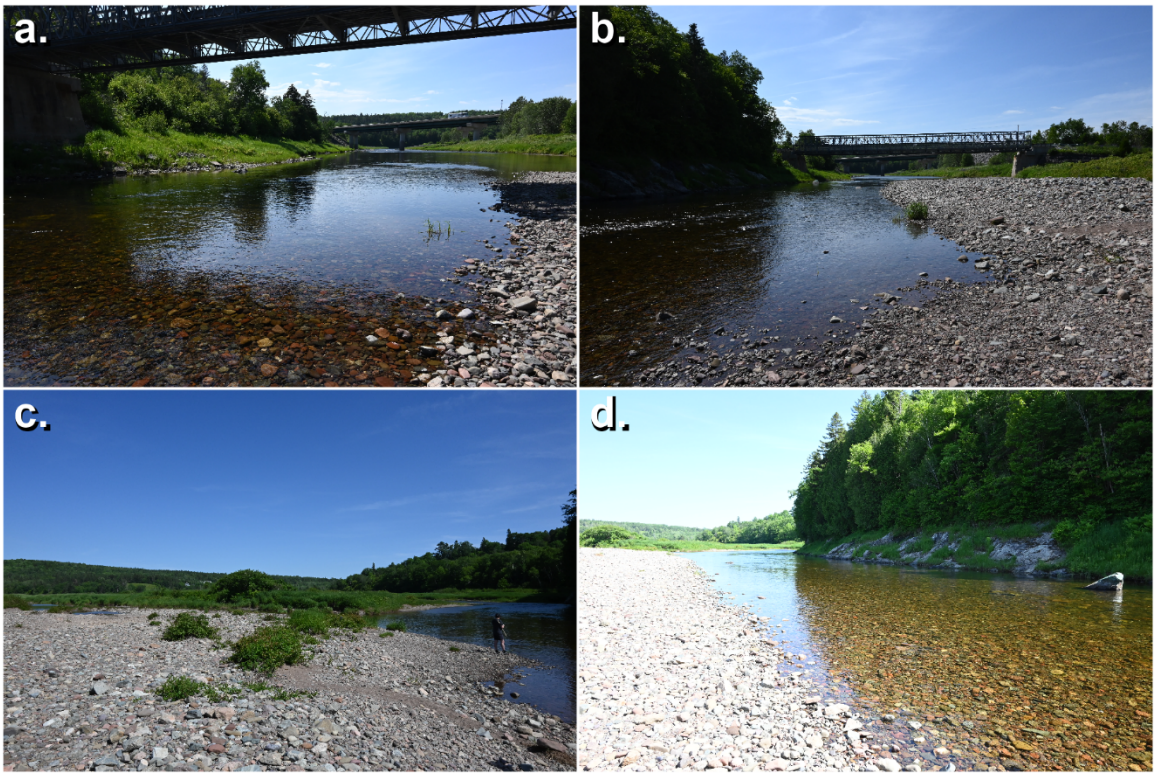


Figure 11 – Photographs of sampling site Hammond001 (from 2025, the site was sampled as HDL in 2024), on the Hammond River, NB, in the Outer Bay of Fundy Designatable Unit. A. View from Hammond001 under the Route 860 bridge looking downstream towards the New Brunswick Highway 1 bridge over the river. b. View from upstream of Hammond001 looking downstream towards the Route 860 bridge (closer) and Highway 1 bridge (further away). A gravel bank on the right highlights the low water levels in the area at the time of the site visit and the dominant substrate type -gravel and cobble - at the site. c. View looking upstream from Hammond001 from just upstream of the Route 860 bridge. The water on the left shows a braiding channel of the river, reduced to small pools at the time of the site visit due to low water levels. d. View across the river from Hammond001 showing the extent of rocky shoreline present at the site. The rest of the shoreline around the site was a grassy floodplain.

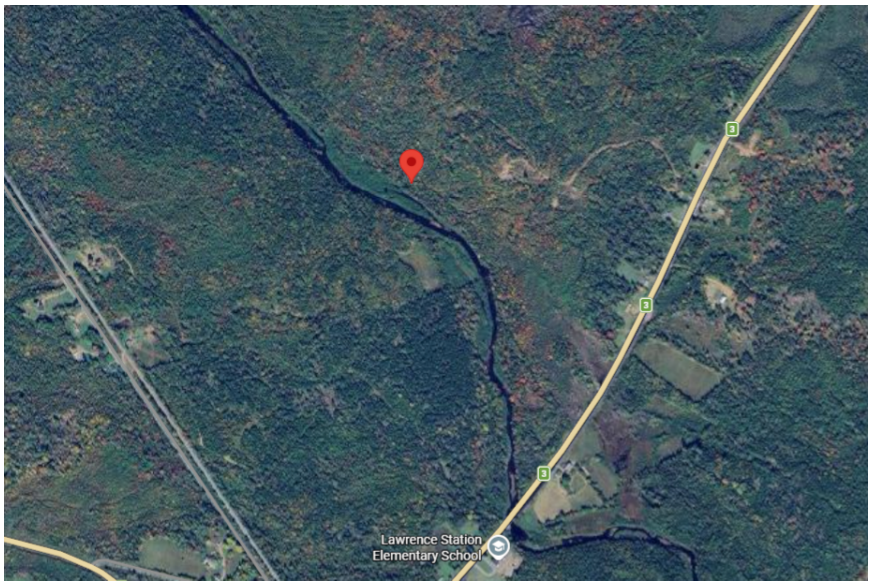


Figure 12 – Google Maps screenshot of site DIG2, on the Digdeguash River, NB, in the Outer Bay of Fundy Designatable Unit.



Figure 13 – Google Maps screenshot of site sampling site CAN1, on the Canaan River, NB, in the Outer Bay of Fundy Designatable Unit.

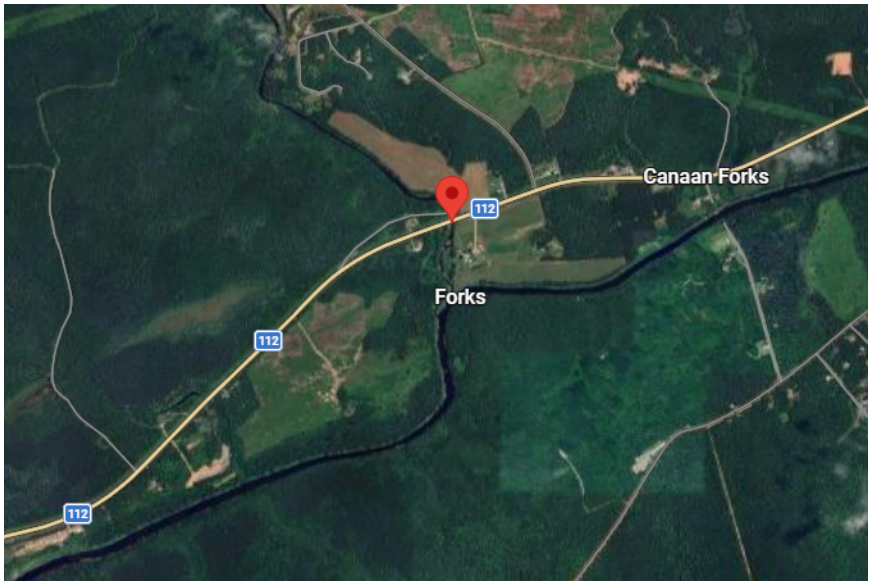


Figure 14 – Google Maps screenshot of site CAN2, on the Canaan River, NB, in the Outer Bay of Fundy Designatable Unit.



Figure 15 – Google Maps screenshot of site GRB, just below the confluence of Spragg Brook and Grant Brook, NB, in the Outer Bay of Fundy Designatable Unit.

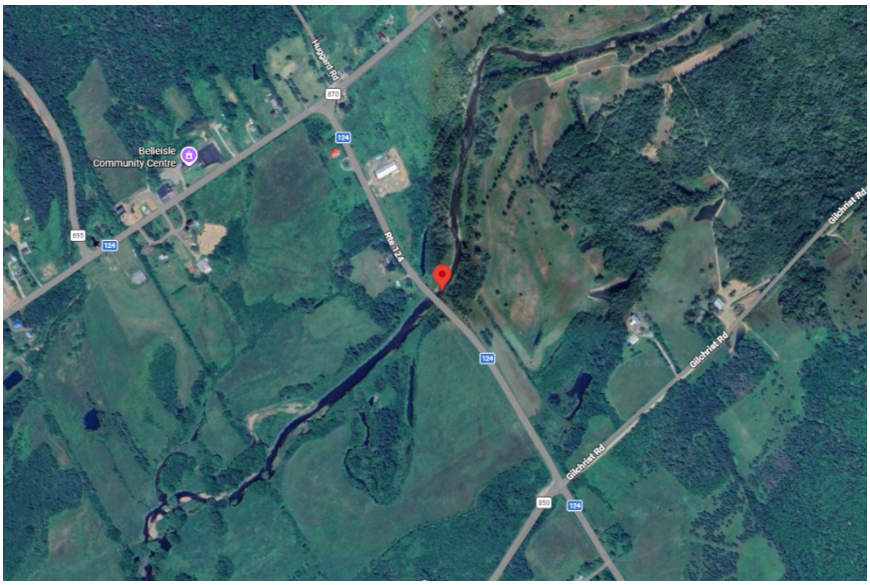
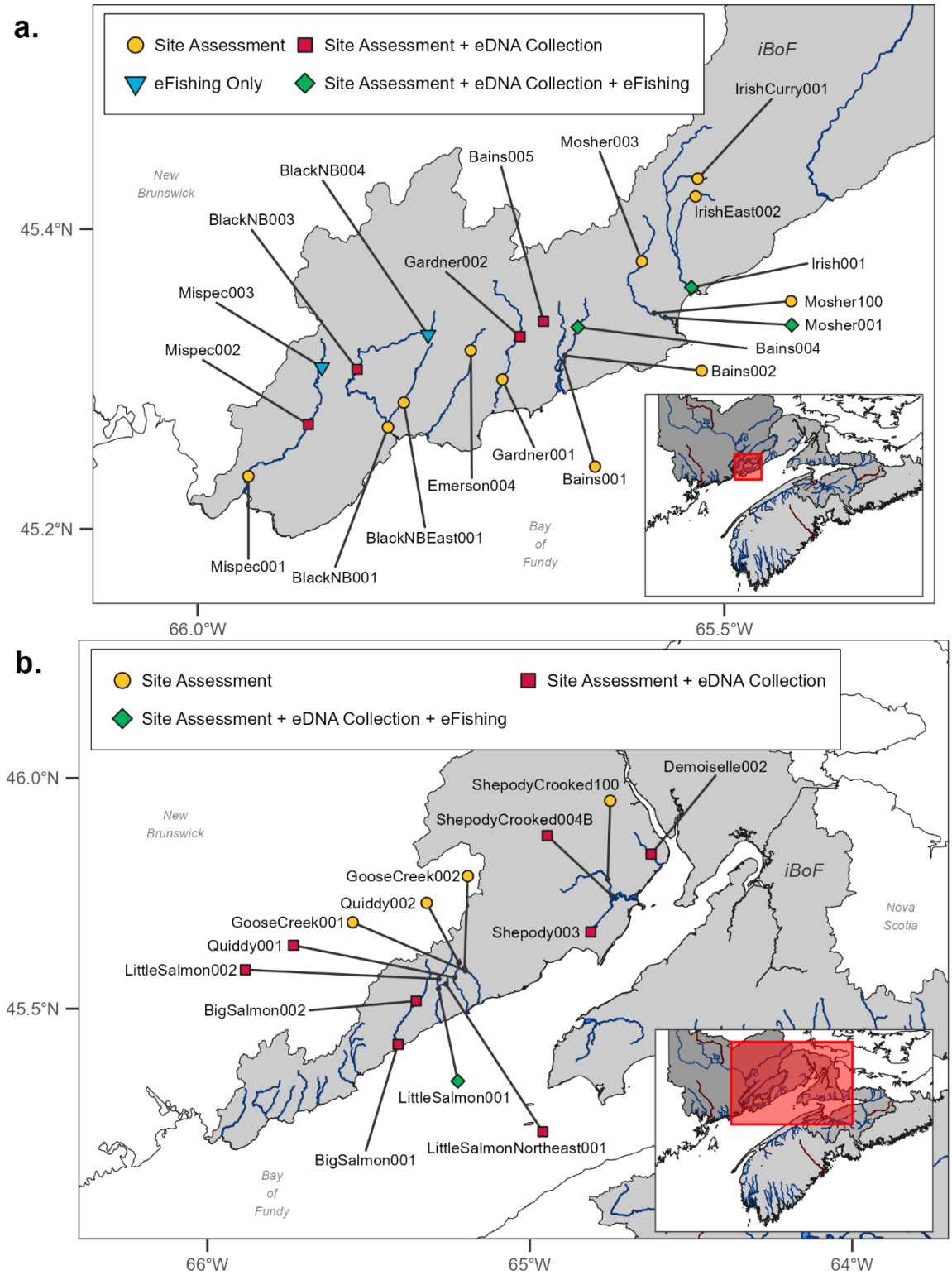


Figure 16 - Google Maps screenshot of site BEL, on Belleisle Creek, NB, in the Outer Bay of Fundy Designatable Unit.


a.
Site Assessment
Site Assessment + eDNA Collection
eFishing Only
Site Assessment + eDNA Collection + eFishing
iBoF
IrishCurry001
Mosher003
Bains005
BlackNB004
New Brunswick
IrishEast002
BlackNB003
Gardner002
Irish001
Mispec003
Mosher100
Mosher001
Mispec002
Bains004
Bains002
Gardner001
Bains001
Emerson004
BlackNBEast001
Bay of Fundy
Mispec001
BlackNB001
45.4°N
45.2°N
66.0°W
65.5°W
b.
Site Assessment
Site Assessment + eDNA Collection
Site Assessment + eDNA Collection + eFishing
Demoiselle002
ShepodyCrooked100
ShepodyCrooked004B
New Brunswick
iBoF
GooseCreek002
Quiddy002
Nova Scotia
GooseCreek001
Shepody003
Quiddy001
LittleSalmon002
BigSalmon002
LittleSalmon001
LittleSalmonNortheast001
BigSalmon001
Bay of Fundy
46.0°N
45.5°N
66°W
65°W
64°W

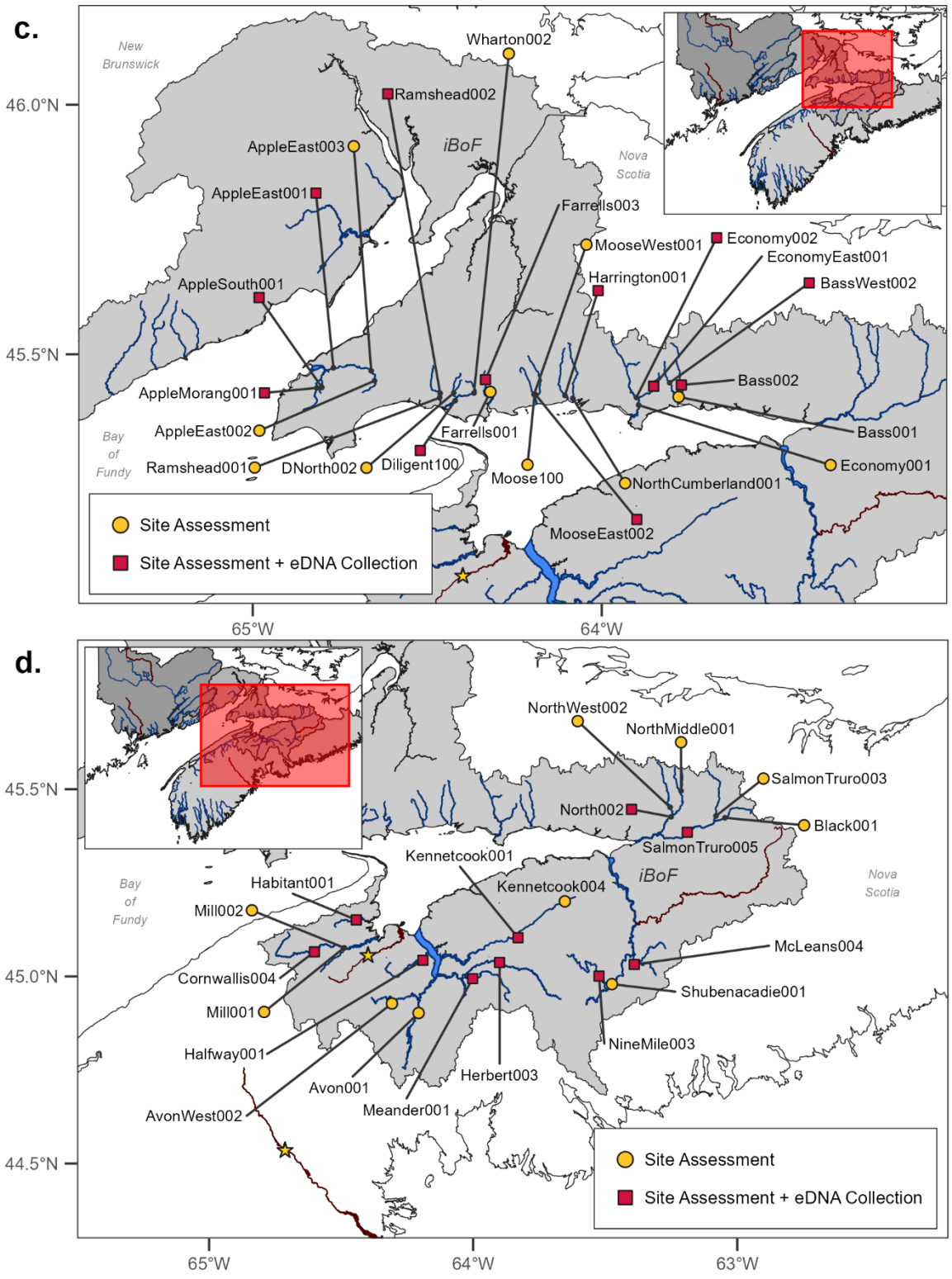

c.
New Brunswick
Nova Scotia
iBoF
Bay of Fundy
Wharton002
Ramshead002
AppleEast003
AppleEast001
AppleSouth001
AppleMorang001
AppleEast002
Ramshead001
DNorth002
Diligent100
Farrells001
Farrells003
Moose100
MooseWest001
MooseEast002
Economy002
EconomyEast001
Harrington001
BassWest002
Bass002
Bass001
Economy001
NorthCumberland001
Site Assessment
Site Assessment + eDNA Collection
46.0°N
45.5°N
65°W
64°W
d.
NorthWest002
NorthMiddle001
SalmonTruro003
North002
Black001
SalmonTruro005
Kennetcook001
Kennetcook004
Habitant001
Mill002
Cornwallis004
Mill001
Halfway001
AvonWest002
Avon001
Meander001
Herbert003
McLeans004
Shubenacadie001
NineMile003
45.5°N
45.0°N
44.5°N
65°W
64°W
63°W

Figure 17 – Maps of the Inner Bay of Fundy Designatable Unit. a. Map of IBoF Designatable Unit from its origin at St. John River eastward to Irish River b. Map of IBoF highlighting the sampled rivers and sampling locations on the Fundy Shore and the Chignecto Basin – NS and NB; c. Map of IBoF Highlighting sampled rivers and sampling locations on the north side of the Minas Basin, NS; d. Map of IBoF rivers and sample sites on the southern side of the Minas Basin, NS. All panels: Rivers in maroon were not sampled for this project, but have dedicated salmon monitoring infrastructure (yellow stars). The red boxes in the inset maps shows the location of the respective enlarged maps.

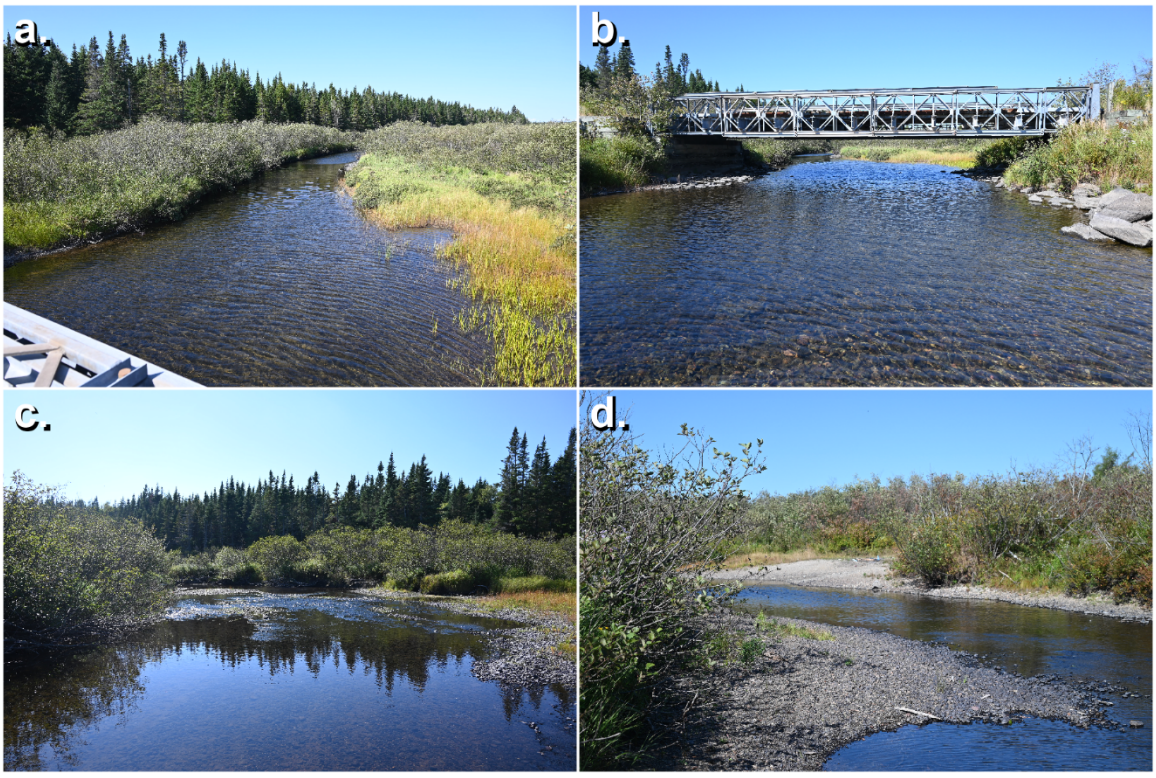


Figure 18 – Photographs of sampling site Mispec002, on the Mispec River, NB, in the Inner Bay of Fundy Designatable Unit. a. View, looking upstream from Mispec002 to the Old Black River Road bridge over the river. The banks if the river were shrubby and grassy throughout the area. b. View of Mispec002 from downstream of the Old Black River Road bridge, looking upstream. Exposed rocks on both side of the river under the bridge indicate the potential for higher water levels at the site. c. View looking downstream from below Mispec002 showing gravel substrate and banks with grasses and shrubs. d. In the back of the image, a campfire pit, garbage, and ATV tracks show evidence of human use upstream of Mispec002.



Figure 19 - Photographs of sampling site Mispec003, on the Mispec River, NB, in the Inner Bay of Fundy Designatable Unit. a. View looking upstream from Mispec003. Exposed gravel on the right highlights the low water levels in the area at the time of the site visit and the gravel substrate at the site. Thick vegetation lines both sides of the river, with some evidence of flooding (branches and debris) on the left bank. b. View looking downstream from Mispec003 showing low water levels and some debris along the woody bank of the river. Evidence of higher water levels can be seen in debris washed up the bank and into some of the shrubs and in the exposed gravel bed on the left of the image. c. View from downstream of Mispec003 looking downstream and across the river (water flows to the right of the image). Riffles and grasses can be seen in the stream, as well as significant debris across the water. d. Atlantic Salmon parr caught at Mispec003 during the 2025 electrofishing survey.



Figure 20 – Photographs of sampling site BlackNB003, on Tynemouth Creek, NB, in the Inner Bay of Fundy Designatable Unit. a. View looking downstream on Black River from BlackNB003 towards the Route 825 bridge in Garnett Settlement. b. Upstream view of Black River from BlackNB003 showing exposed bedrock and boulder substrate and shrubs and grasses along the banks of the river. c. View looking downstream on Black River from downstream of the Route 825 bridge in Garnett Settlement. d. View looking upstream towards the Route 825 bridge over Black River in Garnett Settlement. Bridge clearance over the river is approximately 2.5 m.

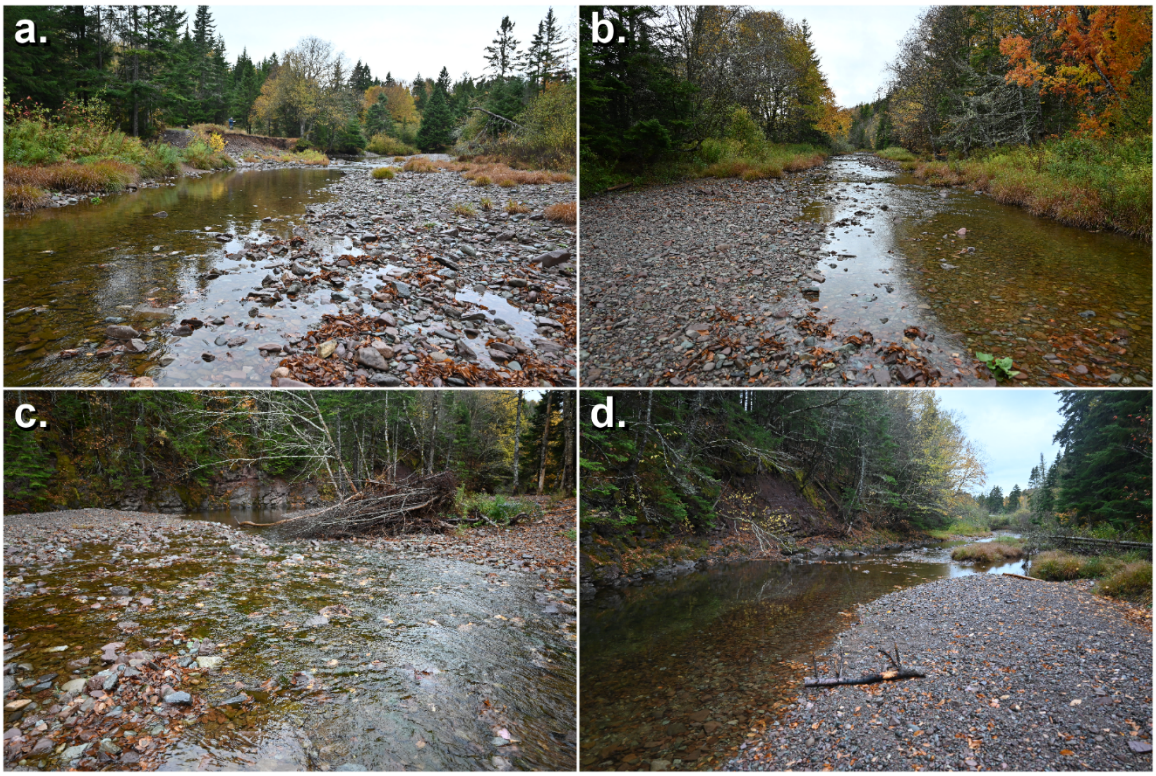


Figure 21 – Photographs of sampling site Gardner001, on Gardner Creek, NB, in the Inner Bay of Fundy Designatable Unit. a. View from Gardner001 looking upstream on Gardner Creek. This site was on a bend in the creek and the outer bank on the left had a slight cutout. Exposed cobble with grasses on the right indicates water levels may have been lower-than-average but the entire width of the riverbed may only be full during high water seasons. b. View from upstream of Gardner001 looking further upstream on Gardner Creek. Visible exposed cobble on the left indicates the creek water level may have been lower-than-average, and highlights the ideal substrate for fence installation. c. View from Gardner001 looking downstream. Visible large debris on the right is evidence for periodic flooding in the system. d. View from downstream of Gardner001 looking further downstream. On the left is a deeper pool with bedrock substrate, and the bank on the left is part of a stretch of bedrock that forms the riverbank, also visible behind the debris in panel c.



Figure 22 – Photographs of sampling site Bains001, on Bains Brook, NB, in the Inner Bay of Fundy Designatable Unit. a. Upstream of Bains Brook from the Shore Road bridge at Bains001. Upstream of the bridge, the brook has slate and cobble substrate with some riffles and runs. b. Downstream of Bains Brooks from the Shore Road Bridge at Bains001. The substrate of the brook was similar below and above the bridge, but there was more exposed cobble below the bridge as the brook flowed through more open, shallow terrain. c. Base of the Shore Road Bridge over Bains Brook with lines indicating higher water levels. d. View of downstream of Bains001 from Shore Road. Below the bridge, the brook splits into braiding channels, only one of which had water during the site visit.

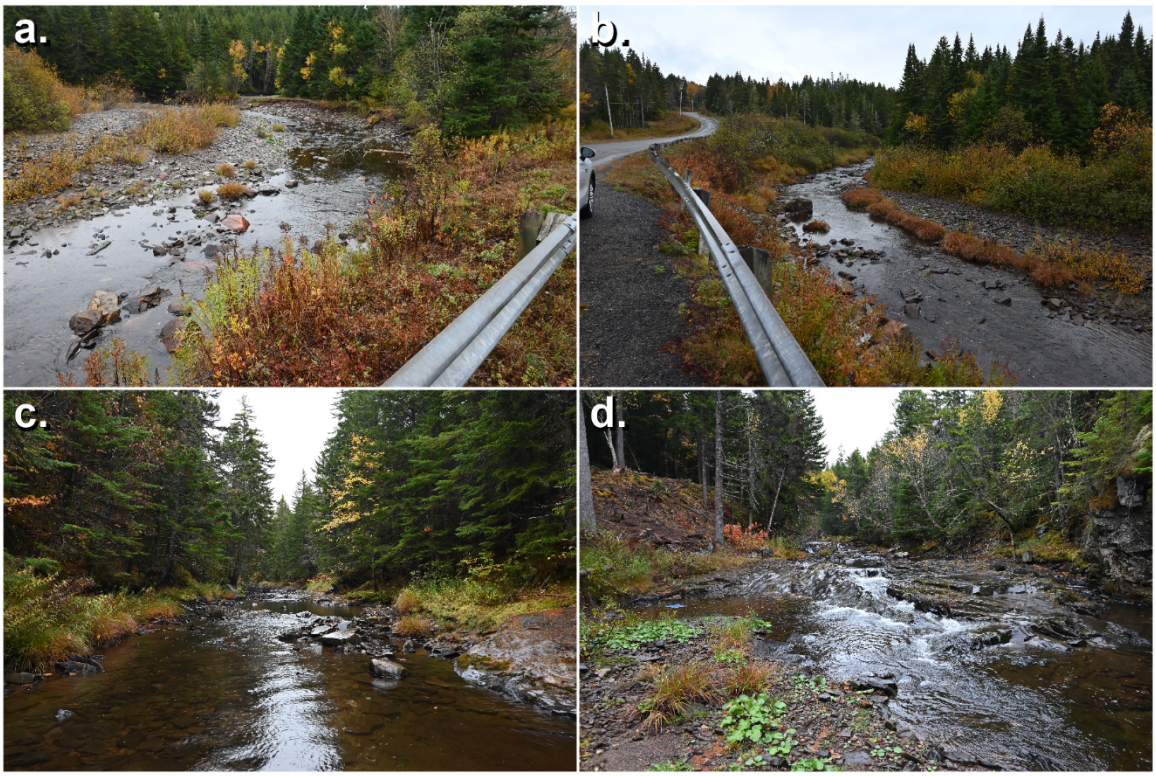


Figure 23 – Photographs of sampling site Bains002, on Bains Brook, NB, in the Inner Bay of Fundy Designatable Unit. a. View looking downstream from Bains002 from the shoulder of Shore Road. The substrate in this area was mostly gravel and slate, with some interspersed cobble, as can be seen in the exposed bank on the left. This site is along a bend in the brook. Just downstream of the site is private property with evidence of human use. b. View looking upstream from Bains002 from the shoulder of Shore Road. Grasses and exposed slate and cobble on the right of the image indicate water levels were likely consistent for some time. c. Upstream view of Bains Brook from approximately 50 m upstream of Bains002. The substrate in this area was consistent with Bains002, although the banks are shallower with more trees. d. Upstream view of Bains Brook approximately 500 m from Bains002. In this area, the brook substrate was mostly exposed bedrock and the gradient was steeper than further downstream. This area had a combination of riffles and deeper pools. A steep bedrock bank can be seen on the right of the image.

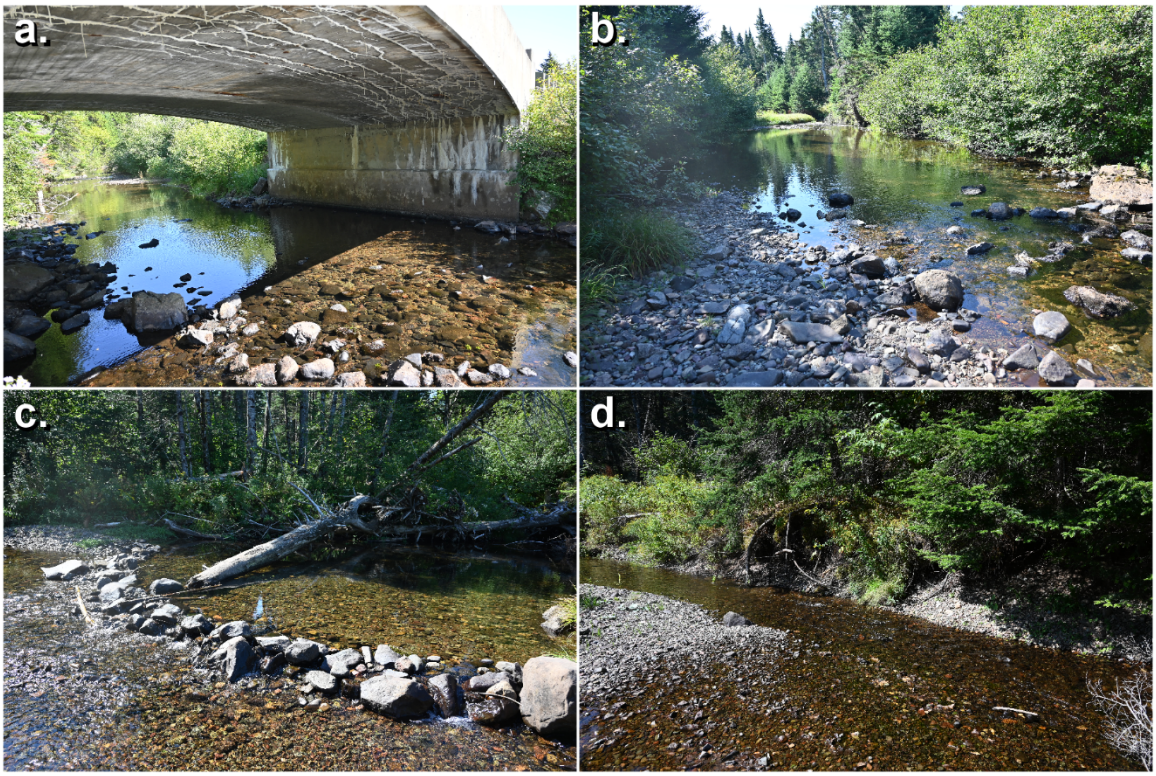


Figure 24 – Photographs of sampling site Bains004, on Tynemouth Creek, NB, in the Inner Bay of Fundy Designatable Unit. a. Looking upstream on Bains Brook at Bains004 from under the Route 111 bridge. Upstream of Bains004 was a stretch of shallow brook with shrubs and trees along the bank. There was some evidence of higher water levels along the concrete of the bridge base. b. Downstream view of Bains Brook from Bains004 below Route 111 bridge. The exposed gravel streambed on the left suggests that water levels were low at the time of the site visit. The substrate downstream of the site was primarily gravel and cobble. c. A human-made rock barrier downstream of Bains004. While evidence of human use of the brook near Bains004, this barrier would not prevent fish passage, especially during higher water. d. A small riffle downstream of Bains004 which shows the gravel and pebble substrate. Exposed gravel on both banks of this stretch of the brook suggest water levels were lower-than-average during the site visit.

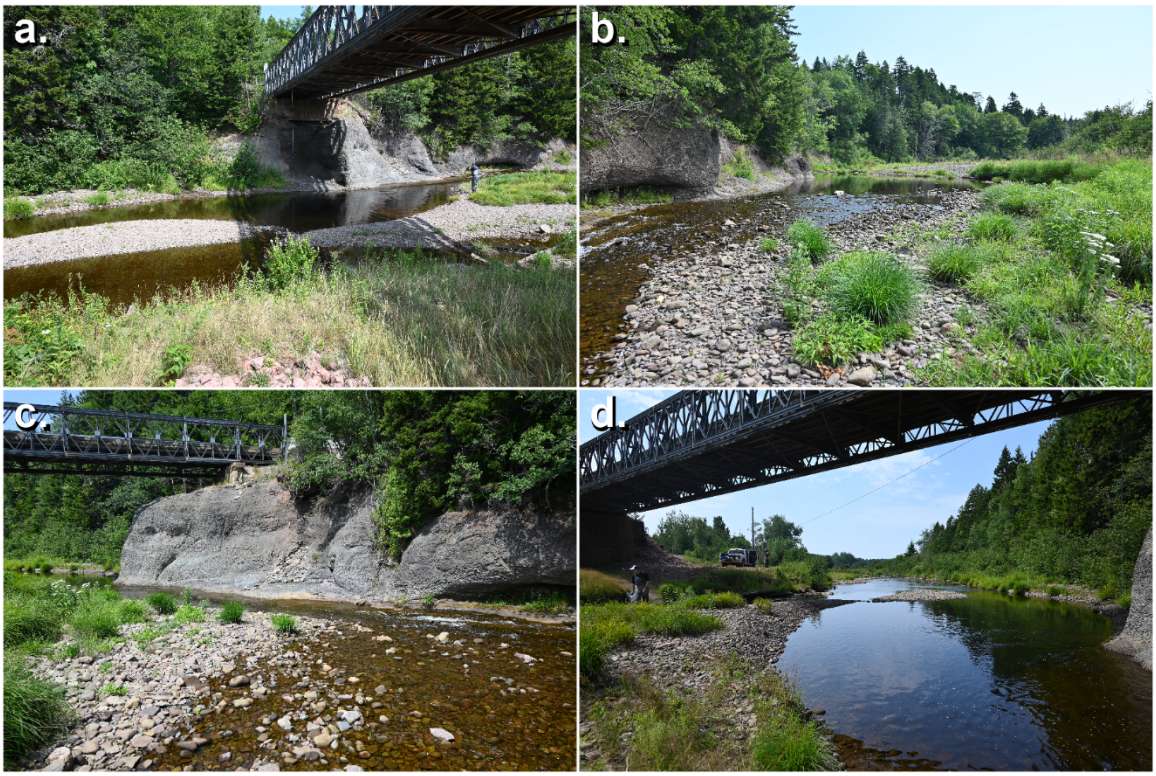


Figure 25 – Photographs of sampling site AppleEast001, on the East Branch of the Apple River, NS, in the Inner Bay of Fundy Designatable Unit. a. View looking across Apple River East Branch from available parking next to AppleEast001. The water is flowing from right to left in this view. b. View looking upstream of AppleEast001 from below the bridge visible in panel a. The substrate upstream was mostly cobble overlying bedrock, and the river banks were bedrock on one side and a shallow area with grasses and sedges on the other. c. Looking downstream at AppleEast001 from just above the bridge over the site. Here, the extent of the bedrock bank and the height of the bridge over the water can be seen. d. View looking downstream from below the bridge at AppleEast001, showing the slightly deeper channel next to the bedrock bank and the available, accessible parking at the site.

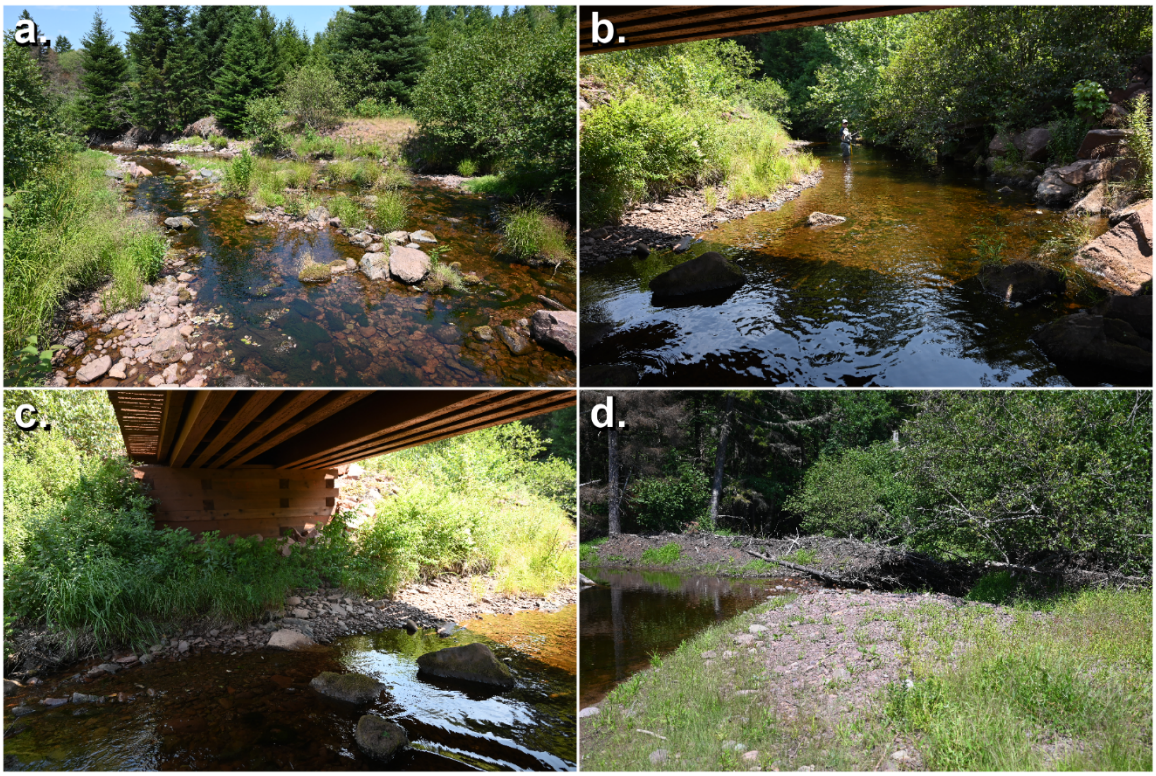


Figure 26 – Photographs of sampling site AppleEast002, on the East Branch of the Apple River, NS, in the Inner Bay of Fundy Designatable Unit. a. View looking downstream on Apple River East Branch from the bridge over site AppleEast002. Algae growth can be seen on the cobble and boulder substrate. b. View facing upstream from below the bridge at AppleEast002. A slightly deeper channel and steep boulder bank can be seen on the right, while shallower cobble, grasses, and shrubs can be seen on the left bank. c. The bridge structure at AppleEast002, showing some exposed cobble (likely covered with higher water) and grasses and shrubs along the river bank. d. A breached beaver dam downstream of AppleEast002. The dam was not preventing river flow during the site visit, however if it is reused or repaired by beavers in the area, it may affect the suitability of AppleEast002 for salmon research.

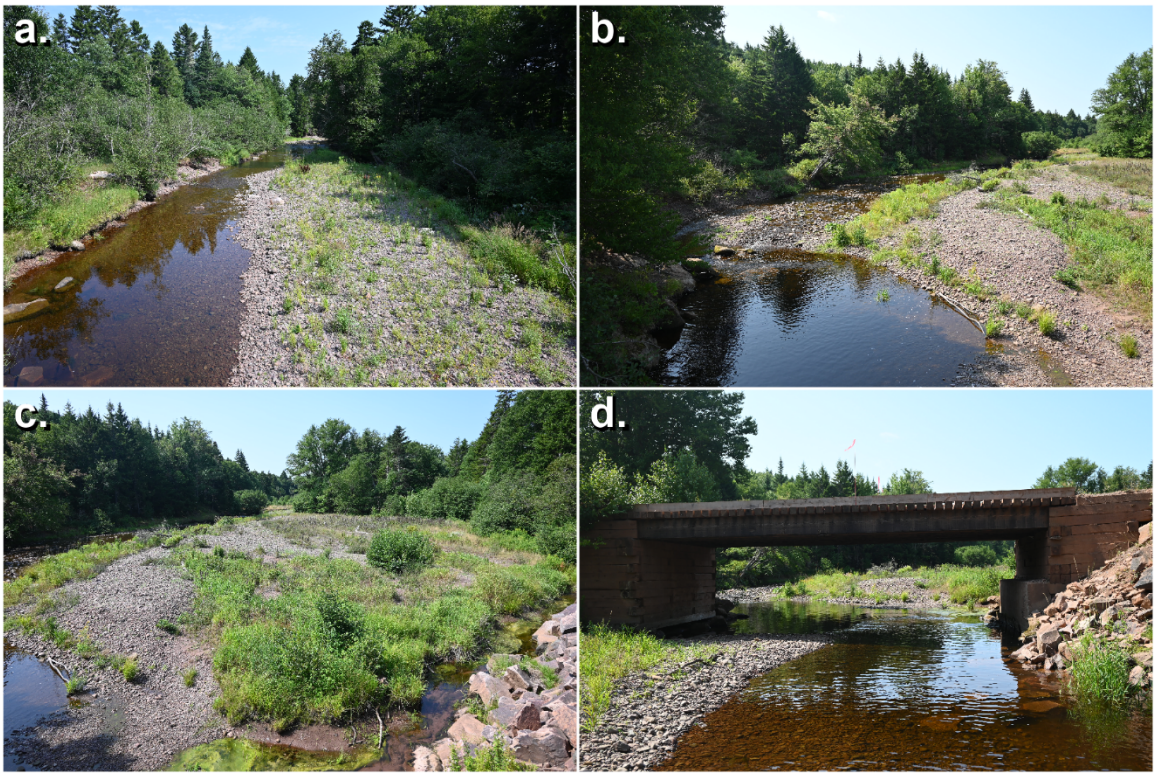


Figure 27 – Photographs of sampling site AppleSouth001, on the South Branch of the Apple River, NS, in the Inner Bay of Fundy Designatable Unit. a. Facing downstream on Apple River South Branch from the bridge at AppleSouth001. Exposed river bed due to low water levels is visible on the right of the image. b. Facing upstream on Apple River South Branch from the bridge at AppleSouth001 showing shallow riffles. c. Facing upstream from the same point as panel b. showing a large island in the river with the main channel on the left and a smaller braiding channel with algae growth on the right. d. Facing upstream from AppleSouth001 showing the bridge structure and boulder slope up to the road from the river. The exposed island and both channels of the river can be seen in the background behind the bridge.

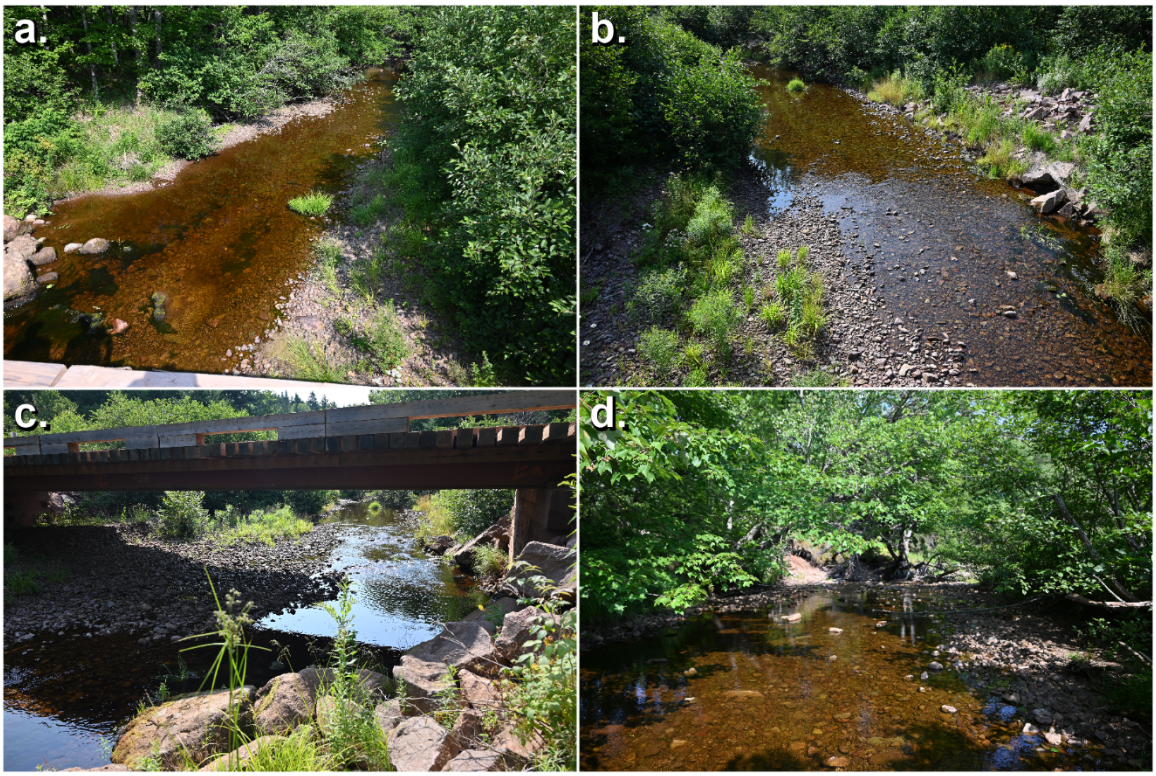


Figure 28 – Photographs of sampling site AppleMorang001, on the Morang Branch of the Apple River, NS, in the Inner Bay of Fundy Designatable Unit. a. Facing downstream on Apple River Morang Branch from the bridge over AppleMorang001. Some exposed cobble riverbed can be seen on both sides of the channel. b. Facing upstream on Apple River Morang Branch from the bridge over AppleMorang001. Some exposed cobble riverbed can be seen on the left, while a steeper boulder bank can be seen on the right. c. Facing upstream from below the bridge at AppleMorang001. Exposed cobble on the left under the bridge indicates lower water levels than average during the site visit. d. Low water levels and low flow downstream of AppleMorang001, facing downstream.

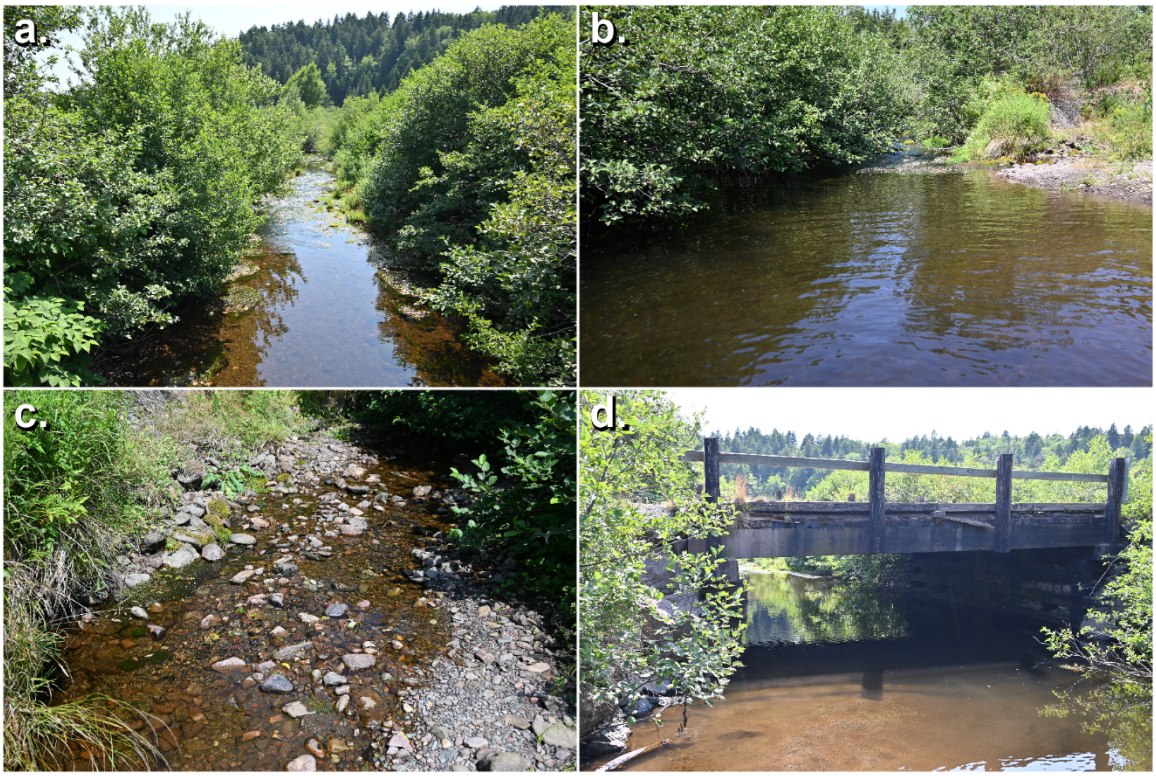


Figure 29 – Photographs of sampling site Ramshead002, on the Ramshead River, NS, in the Inner Bay of Fundy Designatable Unit. a. View of the Ramshead River facing downstream from the bridge over Ramshead002. b. Facing upstream from Ramshead002 from below the bridge at the site. A braided river channel can be seen entering the main branch in the right background of the image. c. Facing upstream on the braiding channel highlighted in panel b. The substrate in this smaller channel was primarily cobble and gravel. d. Facing downstream towards the bridge at Ramshead001.

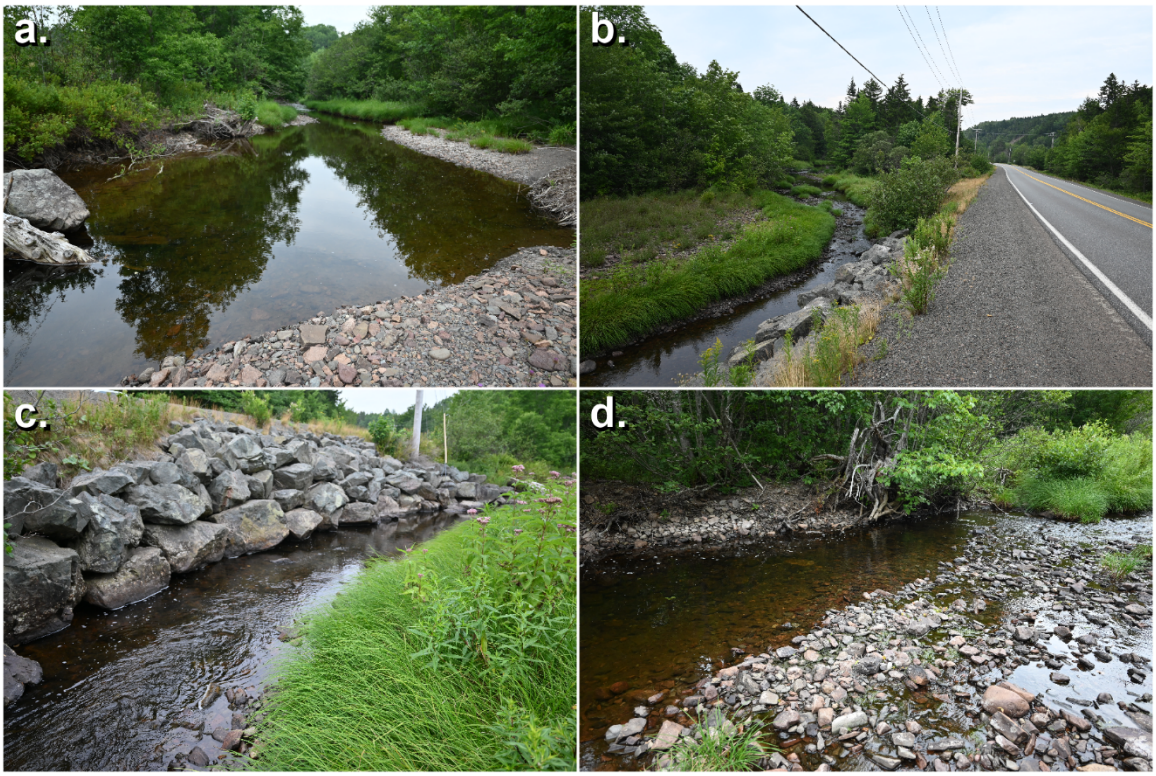


Figure 30 – Photographs of sampling site MooseEast002, on the East Branch of the Moose River, NS, in the Inner Bay of Fundy Designatable Unit. a. Facing downstream at MooseEast002 from the bank across from Highway 2/Glooscap Trail. b. Facing upstream at MooseEast002 from the Highway 2/Glooscap Trail road shoulder. c. Facing downstream at MooseEast002 on the bank directly across from panel b, showing the large boulder retaining wall that makes up the riverbank in this area. d. Upstream of MooseEast002 facing upstream, with a deeper channel on the left of the image and exposed cobble on the right.

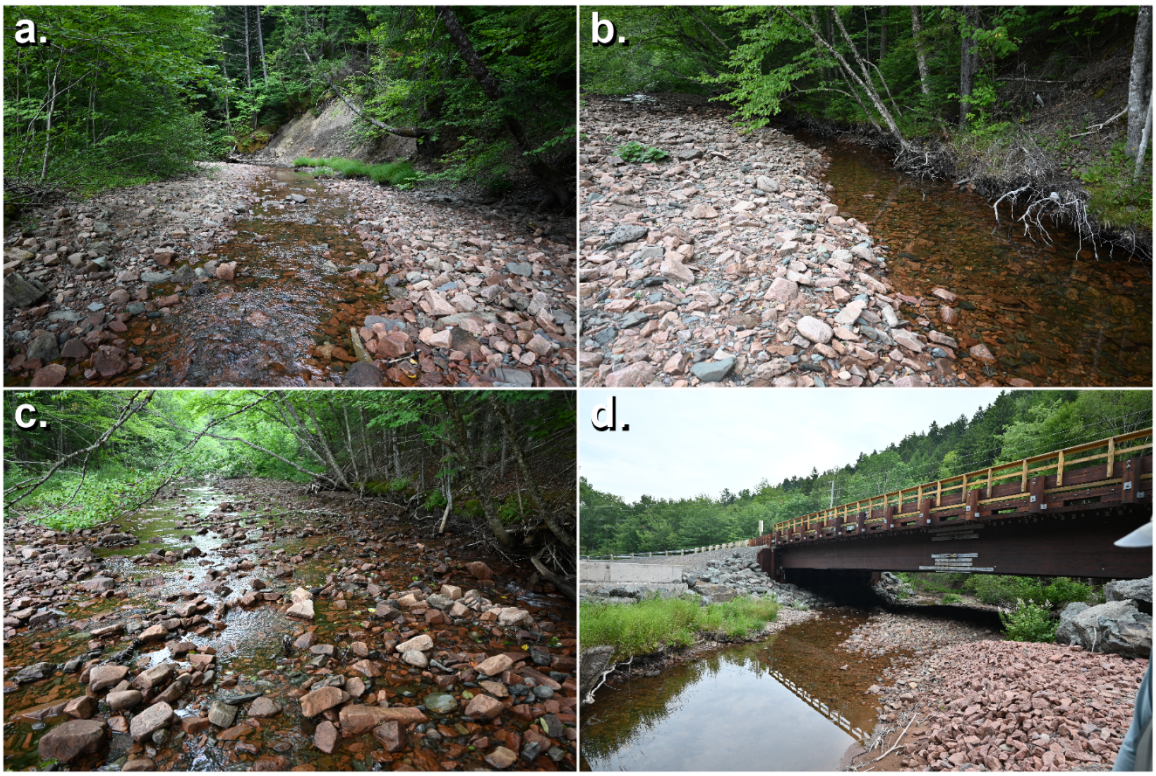


Figure 31 – Photographs of sampling site MooseWest001, on the West Branch of the Moose River, NS, in the Inner Bay of Fundy Designatable Unit. a. Facing downstream at MooseWest001 from below the Highway 2/Glooscap Trail bridge. Exposed cobble and boulders on both sides of the water channel highlight the width of the river during periods with more average rainfall, and the steep bank along one side of the river can be seen in the background. b. Facing upstream at MooseWest001 from below the Highway 2/Glooscap Trail bridge. A deeper channel with an undercut bank can be seen on the right, and exposed riverbed on the left highlights the low water levels during the site visit. c. Upstream of MooseWest001 facing upstream. Shallow riffles filled most of the exposed riverbed in this section, where the substrate was mostly large cobble. d. Facing downstream at MooseWest001 showing the bridge and low water levels. What are believed to be supports for an old bridge can be seen on the left.

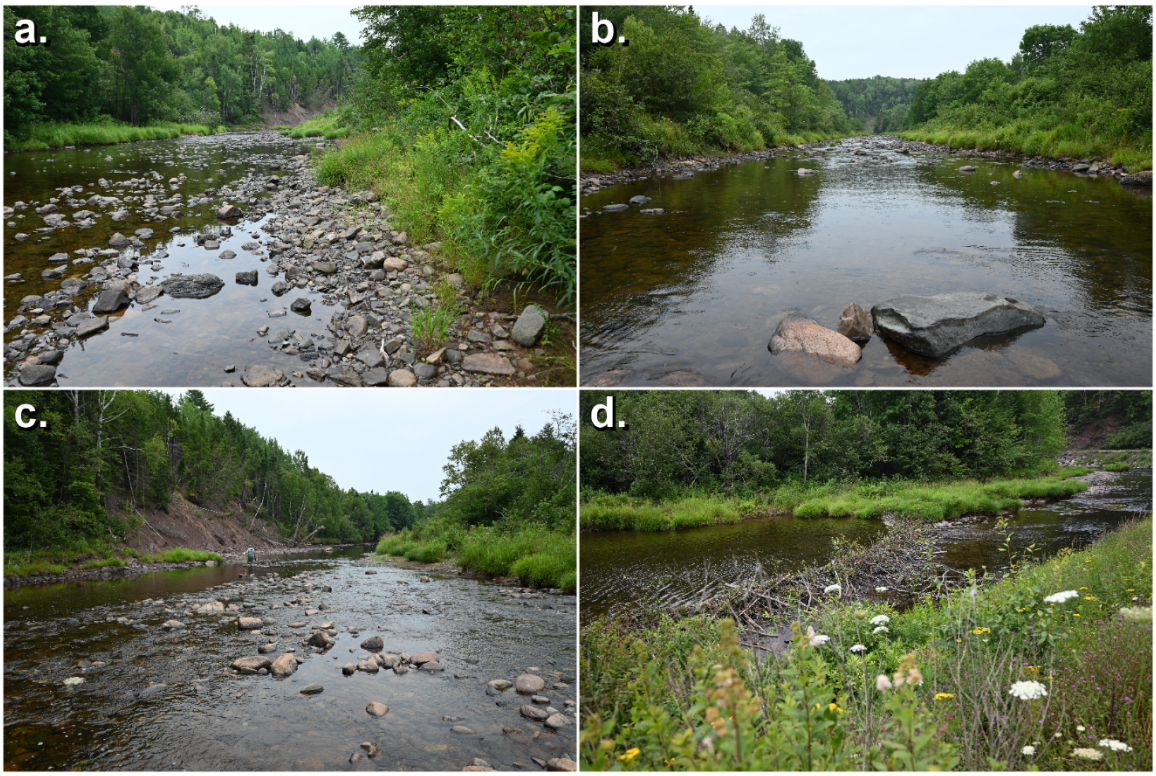


Figure 32 – Photographs of sampling site Economy001, on the Economy River, NS, in the Inner Bay of Fundy Designatable Unit. a. Downstream view of Economy River from Economy001. Exposed rocks on the bank and in the water channel suggest the water level was lower-than-average during the site visit. b. Upstream view of Economy River from Economy001. c. Downstream view from Economy001 showing the steep, tall bank along one side of the river. d. Beaver dam upstream of Economy001. While preventing some flow, the dam is likely passable by Atlantic Salmon at high water.

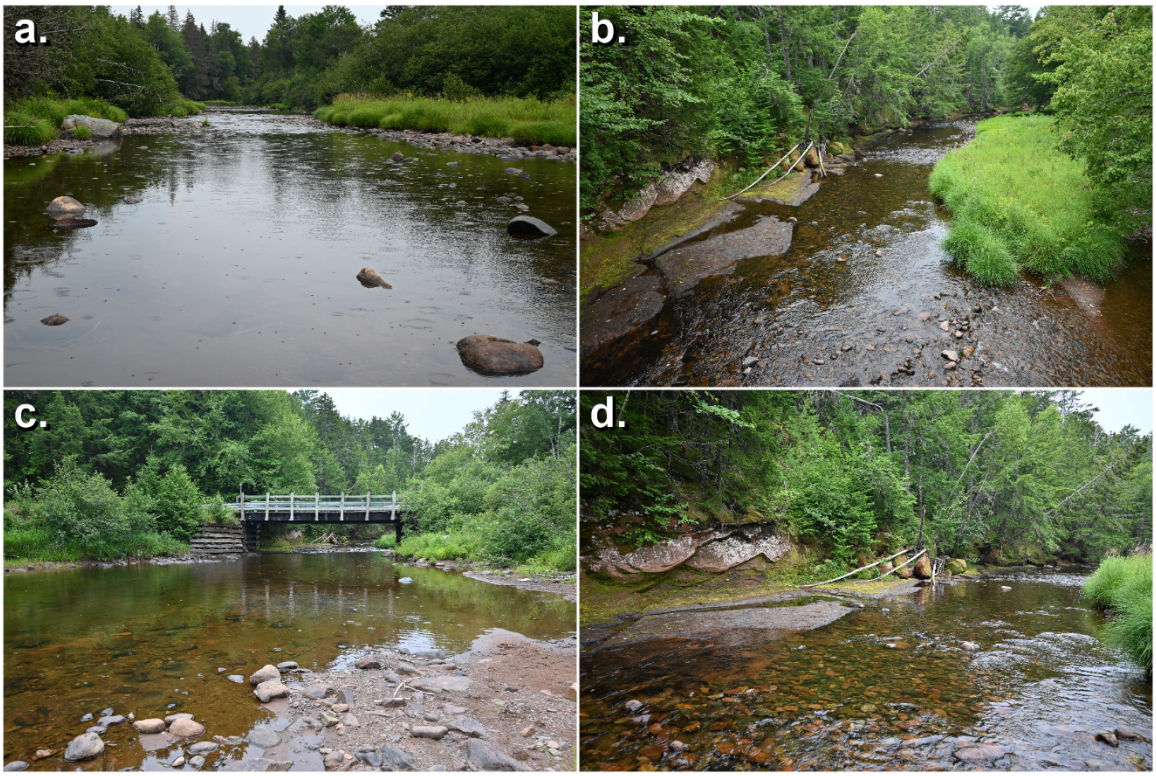


Figure 33 – Photographs of sampling site Economy002, on the Economy River, NS, in the Inner Bay of Fundy Designatable Unit. a. Downstream view of Economy River from beneath the bridge at Economy002. b. Upstream view of Economy River from the bridge at Economy002. Some solid rock substrate can be seen along the riverbank at the left. c. Facing upstream at Economy002 towards the bridge. d. Facing upstream at Economy002 from just upstream of the bridge. The solid rock substrate and riverbank visible in panel b can be seen clearly.

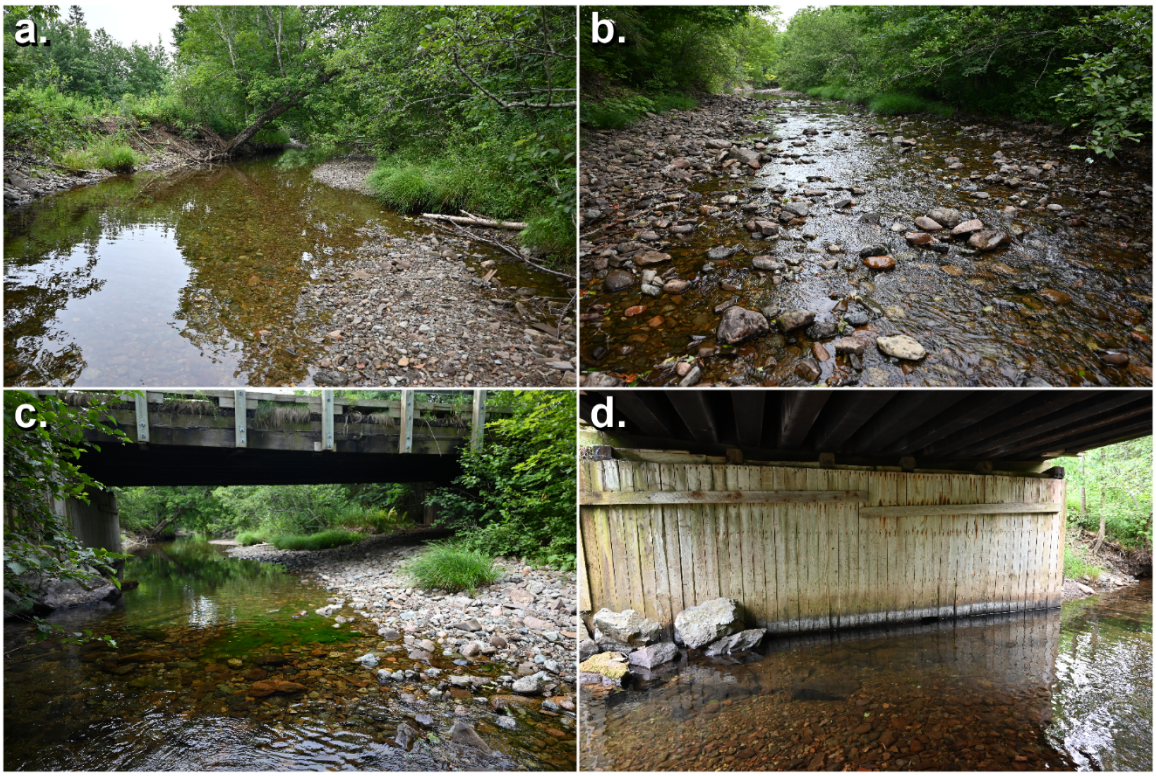


Figure 34 – Photographs of sampling site Bass002, on the Bass River, NS, in the Inner Bay of Fundy Designatable Unit. a. Downstream view of Bass River from beneath the Mines Bass River Road bridge at Bass002. This portion of the river had a shallower gradient than other areas of the river. Exposed cobble on the right indicates water levels were lower-than-average during the site visit. b. Upstream view of Bass River from beneath the bridge at Bass002. Exposed cobble along the left of the image is likely due to lower-than-average water levels during the site visit. c. Looking downstream towards the Mines Bass River Road bridge from Bass002, with exposed riverbed on the right. d. The supports of the bridge at Bass002 with clearly visible water lines showing more typical water levels (lower, stronger bands), as well as depth at high water levels (uppermost band), in the system.

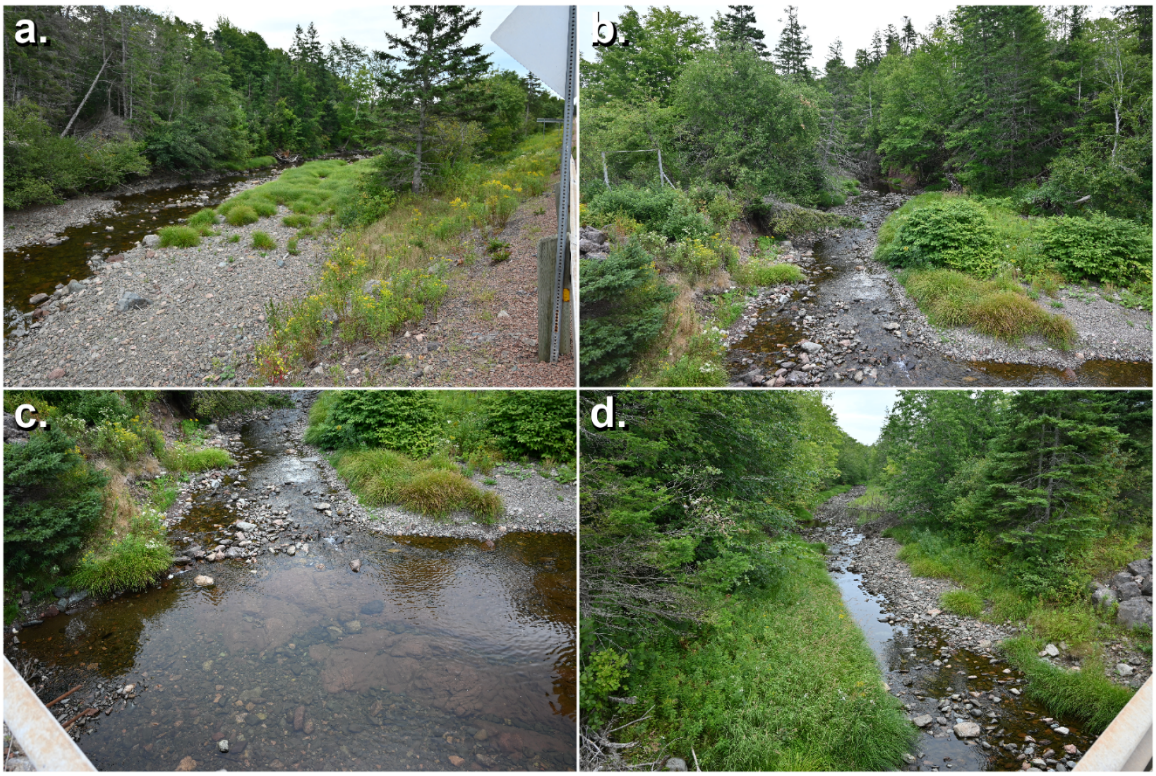


Figure 35 – Photographs of sampling site NorthMiddle001, on the Middle Brach of the North River, which is a part of the Salmon River (Truro) system, in the Inner Bay of Fundy Designatable Unit. a. Downstream North River from the bridge at NorthMiddle001. Exposed riverbed along both sides of the water channel indicate water levels were lower-than-average during the site visit, but grasses growing along the right suggest that area may only flood seasonally. b. The main stem of North River from the bridge at NorthMiddle001, looking upstream. The Main and Middle branches of North River join at this site. c. The confluence of North River and Middle Branch from the bridge at NorthMiddle001. Middle Branch flows from the left of the image (under the bridge) and the main stem of North River flows from the top of the image and continues towards the right. d. Upstream of Middle Branch North River from the bridge at NorthMiddle001.

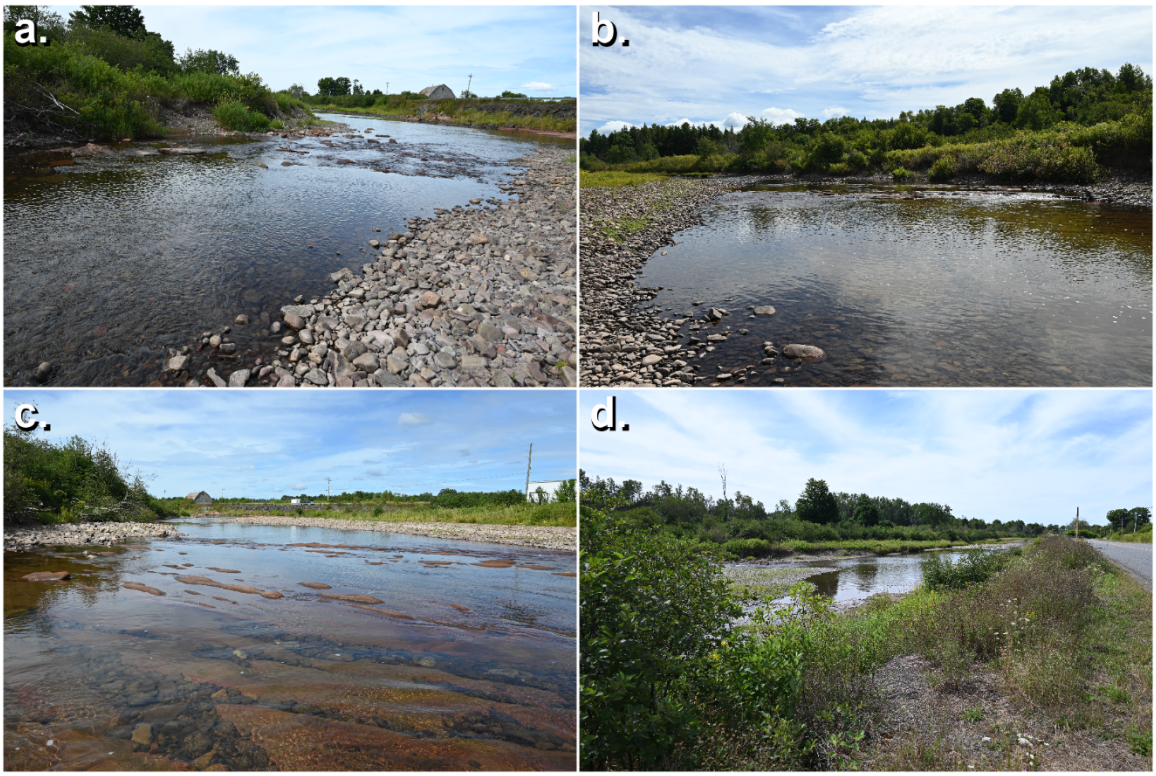


Figure 36 – Photographs of sampling site SalmonTruro005, on the Salmon River (Truro), NS, in the Inner Bay of Fundy Designatable Unit. a. Downstream view of Salmon River at SalmonTruro005 near a water bottling facility along the river. Some exposed cobble on the right suggests the river levels were lower-than-average during the site visit. b. Looking upstream at SalmonTruro005 from the same vantage point as panel a. c. Looking downstream at SalmonTruro005 with the solid rock substrate at the site clearly visible. d. The access point from the road to the river at SalmonTruro005. The site was easy to access, although the road shoulder was not very wide.



Figure 37 – Photographs of sampling site Kennetcook001, on the Kennetcook River, NS, in the Inner Bay of Fundy Designatable Unit. a. Downstream view of Kennetcook River from Kennetcook001, with a deeper channel on the right next to the far bank of the river and exposed gravel on the left suggesting water levels were low during the site visit. b. Upstream view of Kennetcook River from Kennetcook001. Directly in front of view was a deeper pool containing American Shad (Alosa sapidissima). c. Upstream view of Kennetcook River from slightly upstream of panel b. This portion of the river extends into some grassy marshland. d. The substrate at Kennetcook001, a mix of cobble and mud.

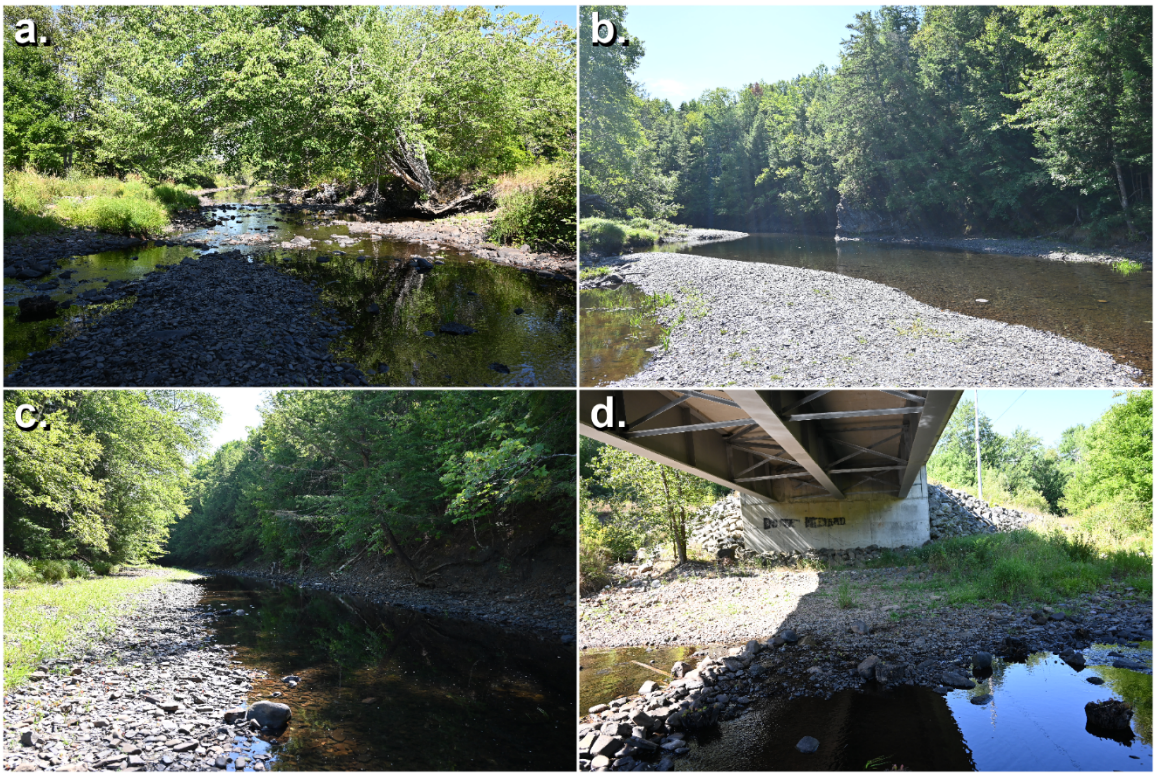


Figure 38 – Photographs of sampling site Herbert003, on the Herbert River, NS, in the Inner Bay of Fundy Designatable Unit. a. Downstream view of Herbert River at Herbert003 from beneath the Highway 14 bridge, with exposed cobble suggesting water levels were low at the time of site visit. b. Upstream view of Herbert River from Herbert003 from below the Highway 14 bridge. Although water levels were low, the river had a deeper channel along the far bank, and a steep rock bank can be seen in the background of the image. c. Upstream view of Herbert River just past the view in panel b and the steeper rock bank. Exposed cobble on the left highlights the low water levels in the river during the sample visit. d. Beneath the Highway 14 bridge at Herbert003. A small rock dam was built beneath the bridge by recreational river users, visible in the lower left hand of the picture.

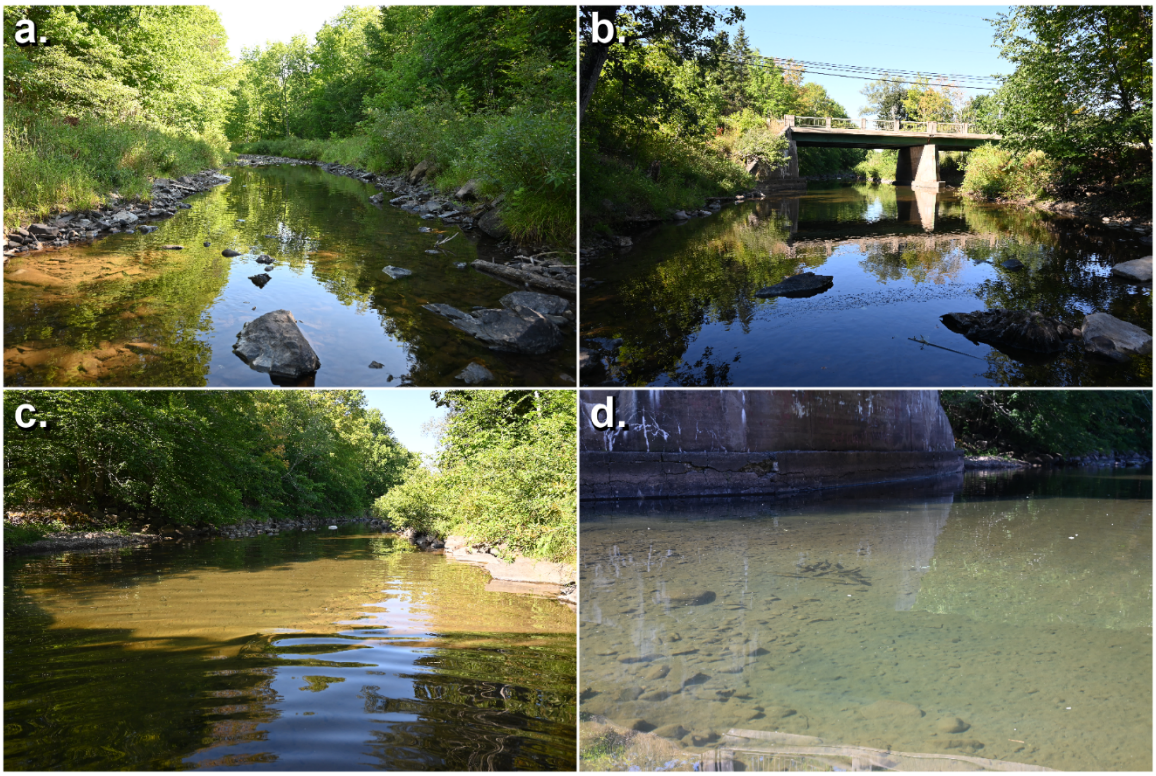


Figure 39 – Photographs of sampling site Meander001, on the Meander River, NS, which is part of the St. Croix River system, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Meander River from Meander001. Flow was very low during the site visit, and some exposed boulders on either bank of the river suggest that water levels are likely higher during a year with average rainfall. Substrate upstream of the site was mostly cobble and small boulders with some silt. b. Looking downstream on the Meander River from Meander001, just upstream of the Highway 215 bridge. c. Downstream view of Meander River from beneath the Highway 215 bridge. The substrate downstream of Meander001 was primarily silt. d. Several white sucker (Catostomus commersonii) in a deeper pool under the Highway 215 bridge at Meander001.

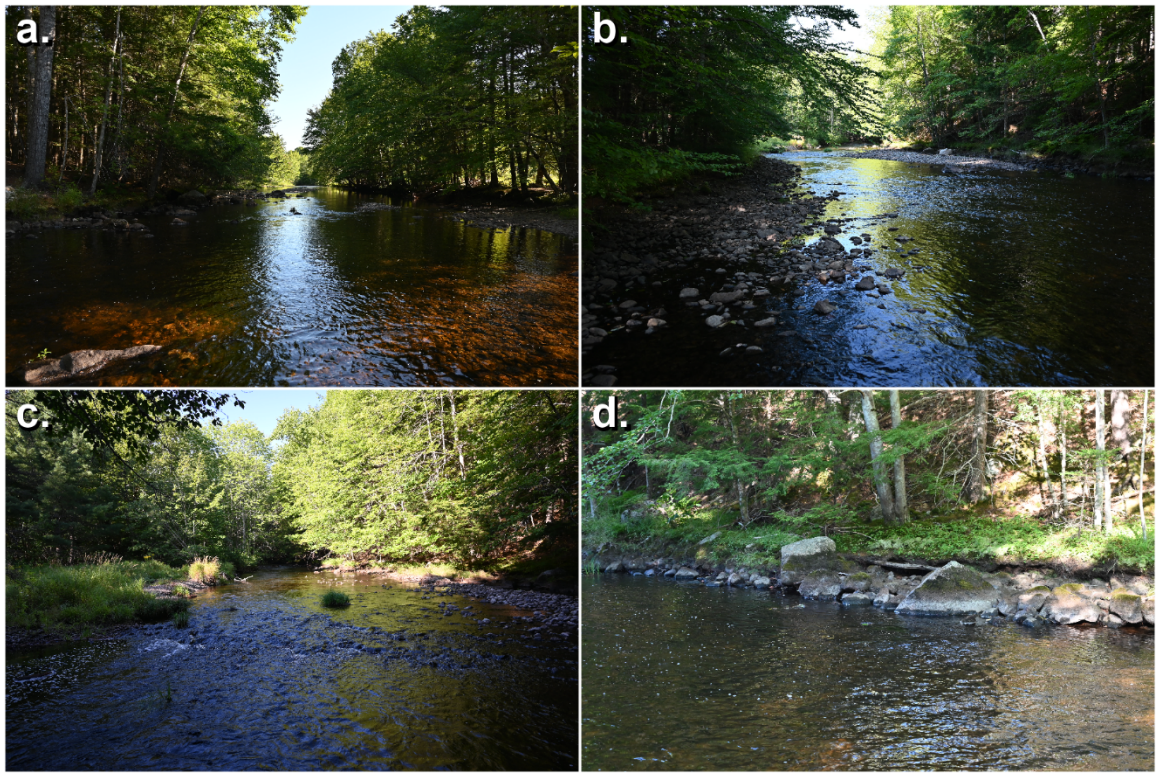
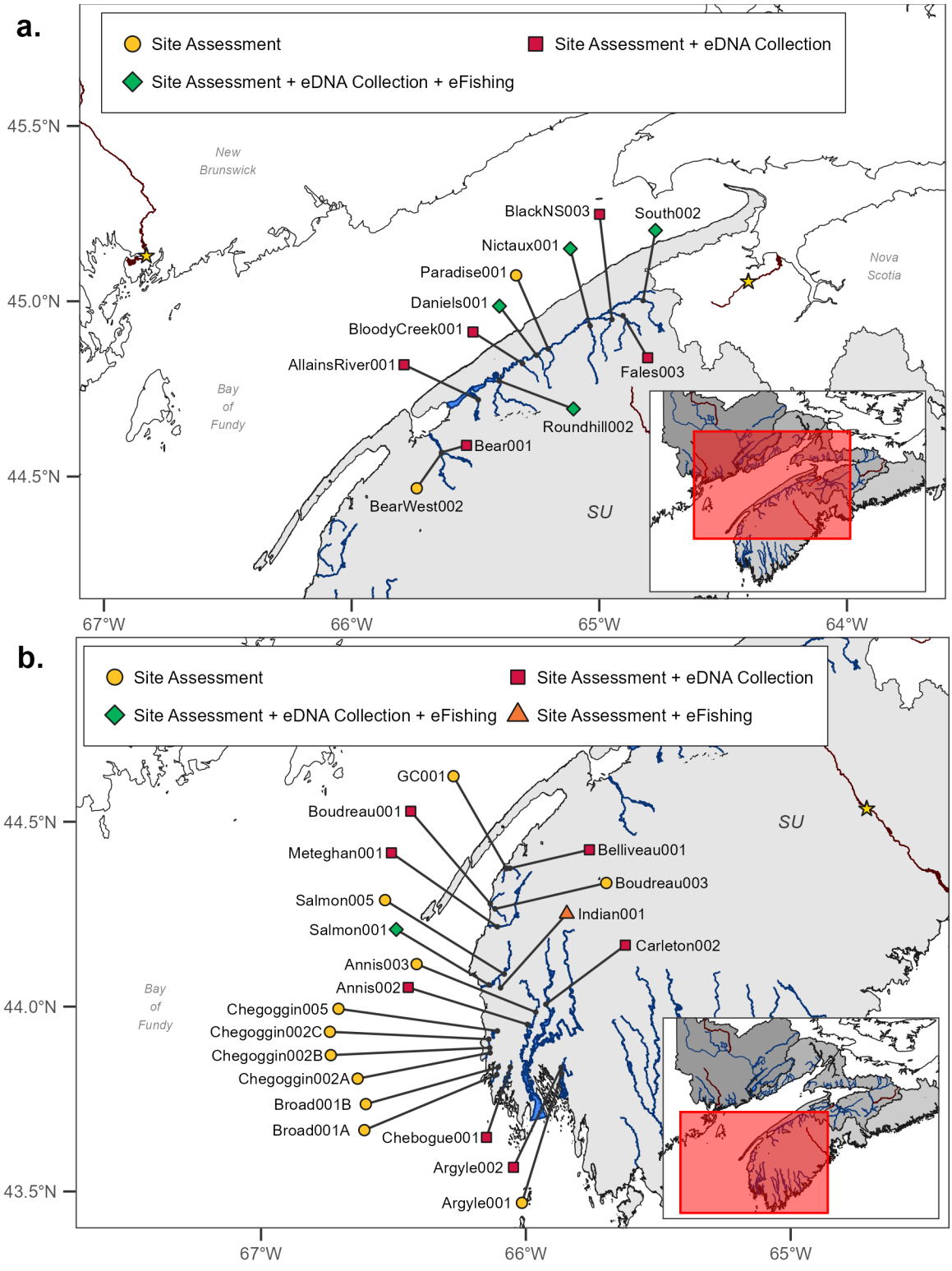


Figure 40 – Photographs of sampling site Avon001, on the Avon River, NS, in the Inner Bay of Fundy Designatable Unit. a. Downstream view of the Avon River from Avon001. b. Upstream view of the Avon River from Avon001. c. Looking upstream at a riffle from just upstream of Avon001. d. Boulders along the bank near Avon001 with noticeable waterlines, highlighting the lower-than-average water levels present during the site visit.


a.
Site Assessment
Site Assessment + eDNA Collection
Site Assessment + eDNA Collection + eFishing
45.5°N
45.0°N
44.5°N
New Brunswick
Nova Scotia
Bay of Fundy
BlackNS003
South002
Nictaux001
Paradise001
Daniels001
BloodyCreek001
AllainsRiver001
Fales003
Roundhill002
Bear001
BearWest002
SU
67°W
66°W
65°W
64°W
b.
Site Assessment
Site Assessment + eDNA Collection
Site Assessment + eDNA Collection + eFishing
Site Assessment + eFishing
44.5°N
44.0°N
43.5°N
Bay of Fundy
GC001
Boudreau001
Meteghan001
Salmon005
Salmon001
Annis003
Annis002
Chegoggin005
Chegoggin002C
Chegoggin002B
Chegoggin002A
Broad001B
Broad001A
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Argyle002
Argyle001
Belliveau001
Boudreau003
Indian001
Carleton002
SU
67°W
66°W
65°W

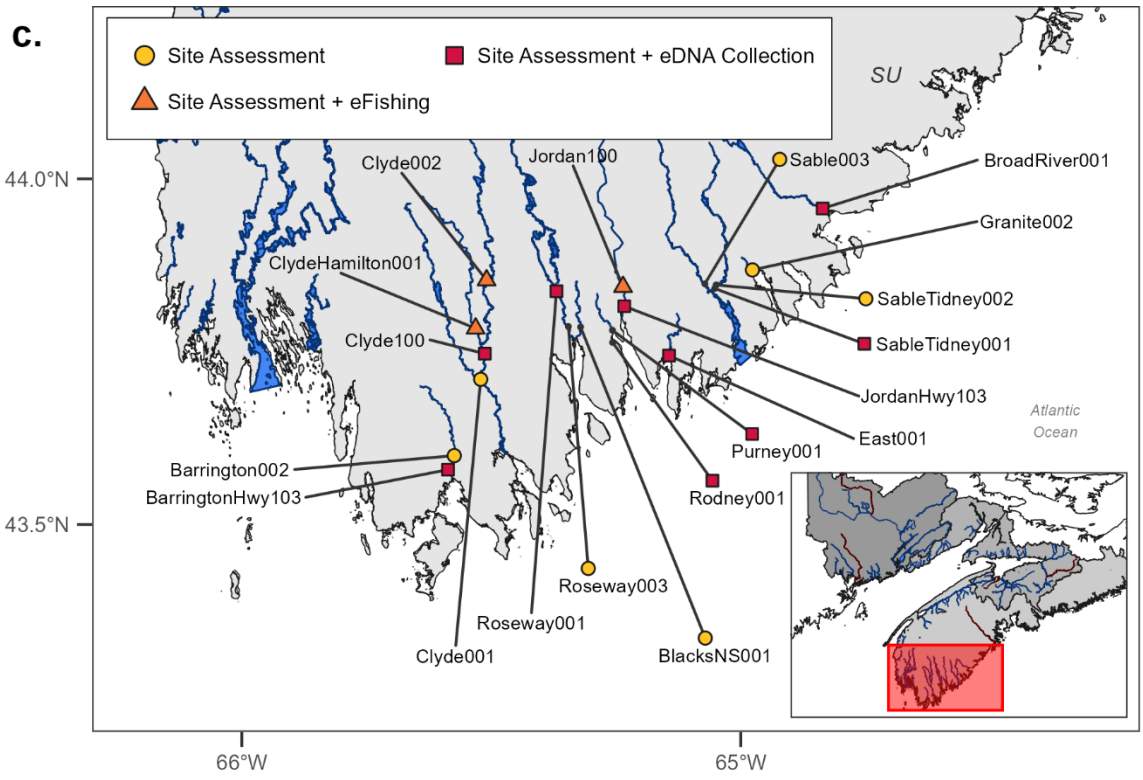


Figure 41 - Maps of the Nova Scotia Southern Upland Designatable Unit. a. Map of Southern Upland sampling sites in the Annapolis River and Bear River systems. b. Map of Southern Upland sampling sites between the Belliveau River system and Argyle River. c. Map of Southern Upland sampling sites between Barrington River and Broad River. All panels: Rivers in maroon were not sampled for this project, but have dedicated salmon monitoring infrastructure (yellow stars). The red boxes in the inset maps show the location of the enlarged maps.

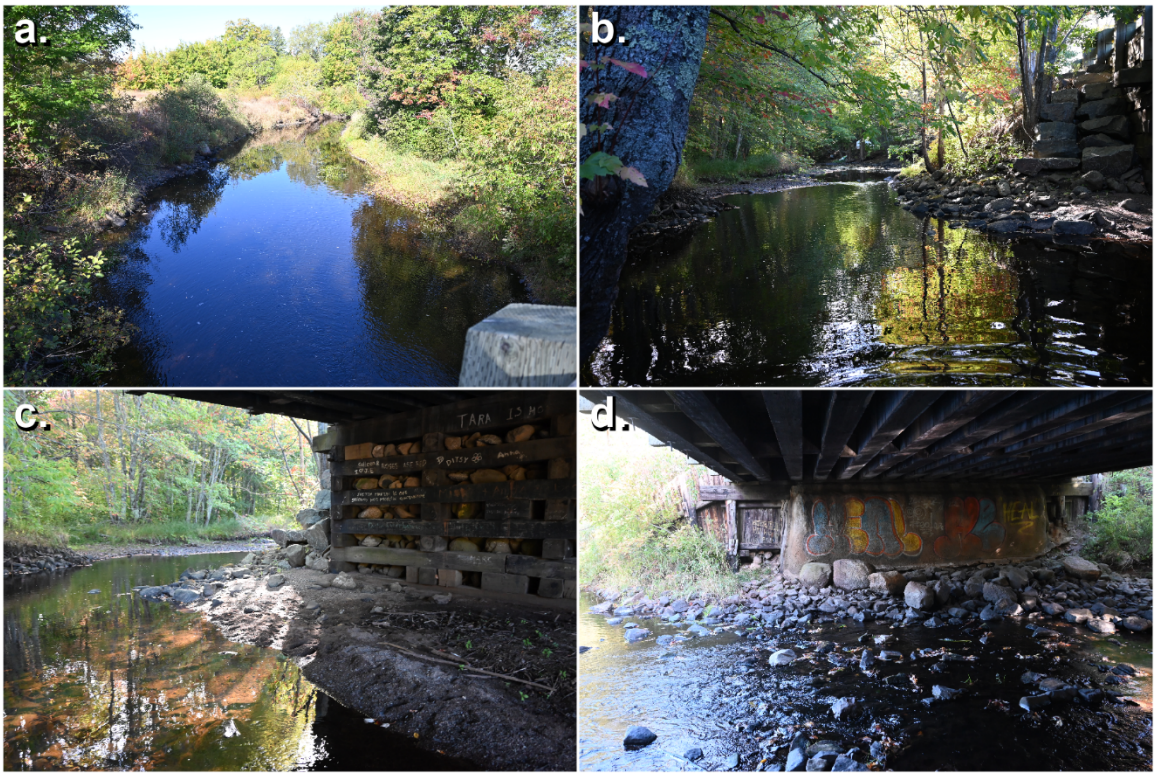


Figure 42 – Photographs of sampling site South002, on the South River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Facing downstream on South River from the bridge at South002. b. Facing upstream on South River from just upstream of the bridge at South002. c. Upstream view of South River from beneath the bridge at South002 showing the bridge supports and exposed riverbed. d. The concrete bridge supports opposite of panel c with exposed boulders and visible water lines.

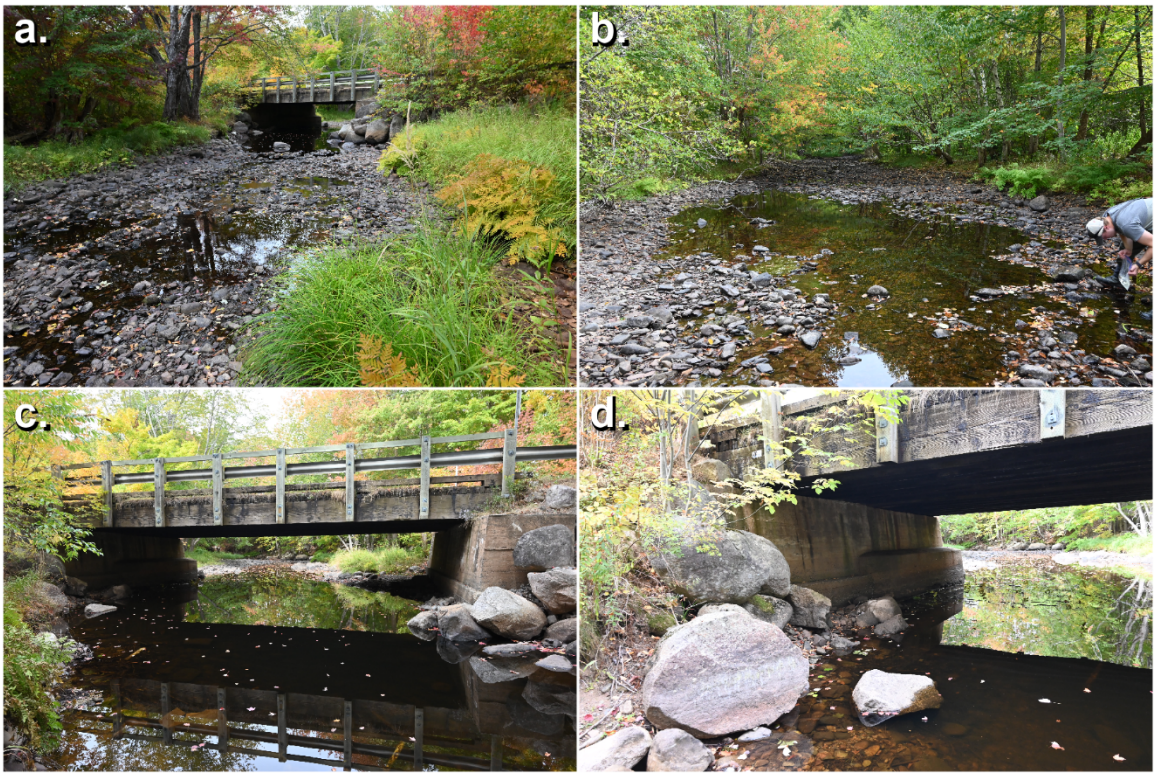


Figure 43 – Photographs of sampling site Fales003, on the Fales River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Facing downstream on Fales River from just above the bridge at Fales003. b. Facing upstream on Fales River from the same vantage point as panel a. Exposed cobble on either side of the water highlight the low water levels during the site visit. c. Downstream view of the bridge at Fales003. The pool under the bridge was approximately 1 m deep with very little flow. d. The support structure and boulders near the bridge at Fales003 with visible water lines.

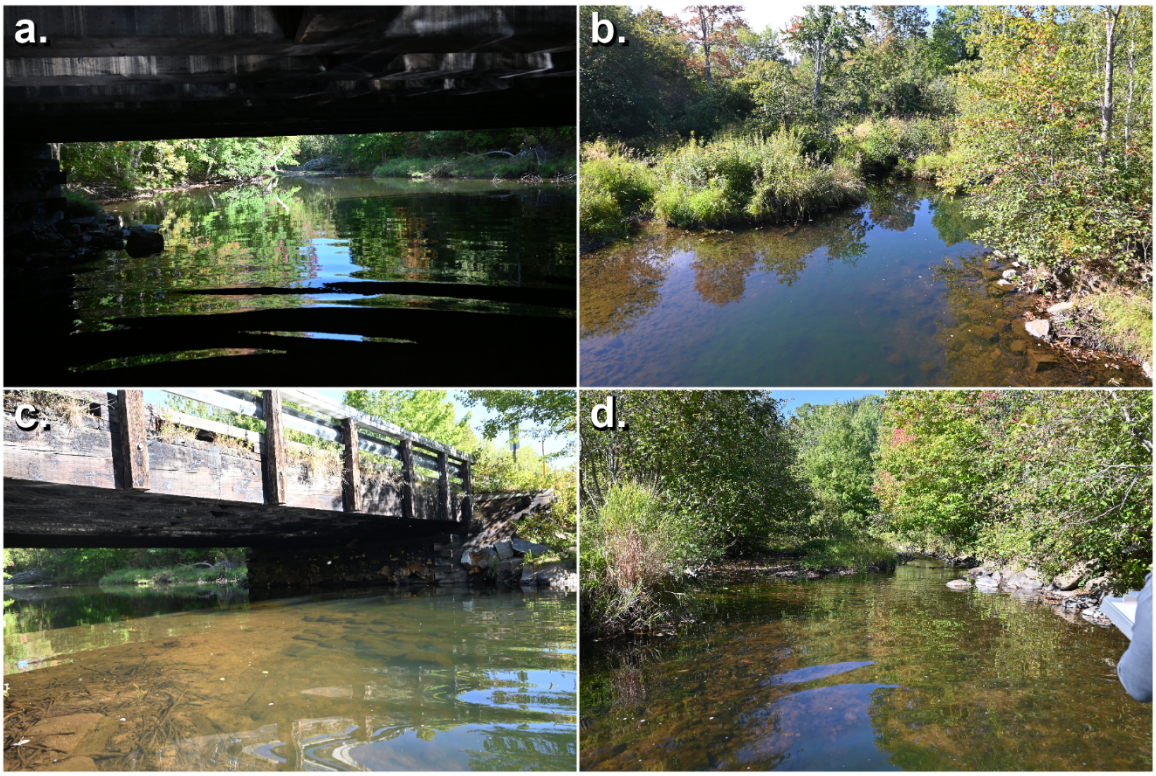


Figure 44 – Photographs of sampling site BlackNS003, on the Black River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Looking downstream on Black River from beneath the bridge at BlackNS003. b. Upstream view of Black River from BlackNS003 with visible algal growth in the middle of the channel. c. Looking downstream towards the bridge at BlackNS003. The bridge had minimal clearance above the river. d. Upstream view of Black River from beyond a bend in the river upstream of panel b.



Figure 45 – Photographs of sampling site BloodyCreek001, on the Bloody Creek Brook, NS, in the Nova Scotia Southern Upland Designatable Unit. a. View downstream on Bloody Creek Brook towards the Highway 201 bridge at BloodyCreek001. b. View upstream on Bloody Creek Brook from BloodyCreek001. c. Looking downstream on Bloody Creek Brook from below the Highway 201 bridge. Below the bridge the brook flows through agricultural land until it joins the Annapolis River. d. One of several connected pools with a small drop upstream of BloodyCreek001.



Figure 46 – Photographs of sampling site Roundhill002, on Round Hill River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. View looking downstream on the Roundhill River from above Roundhill002. Exposed riverbed can be seen on both sides of the water channel, highlighting the low water levels present during the site visit. b. View looking upstream from below the Highway 201 bridge over Round Hill River, with exposed riverbed on the left of the image. c. Looking downstream towards the bridge at Roundhill002 from the same vantage point as panel b. d. Digger logs at Roundhill002 attached to the substrate with rebar indicating this location has been the site of previous Atlantic Salmon habitat improvement efforts.

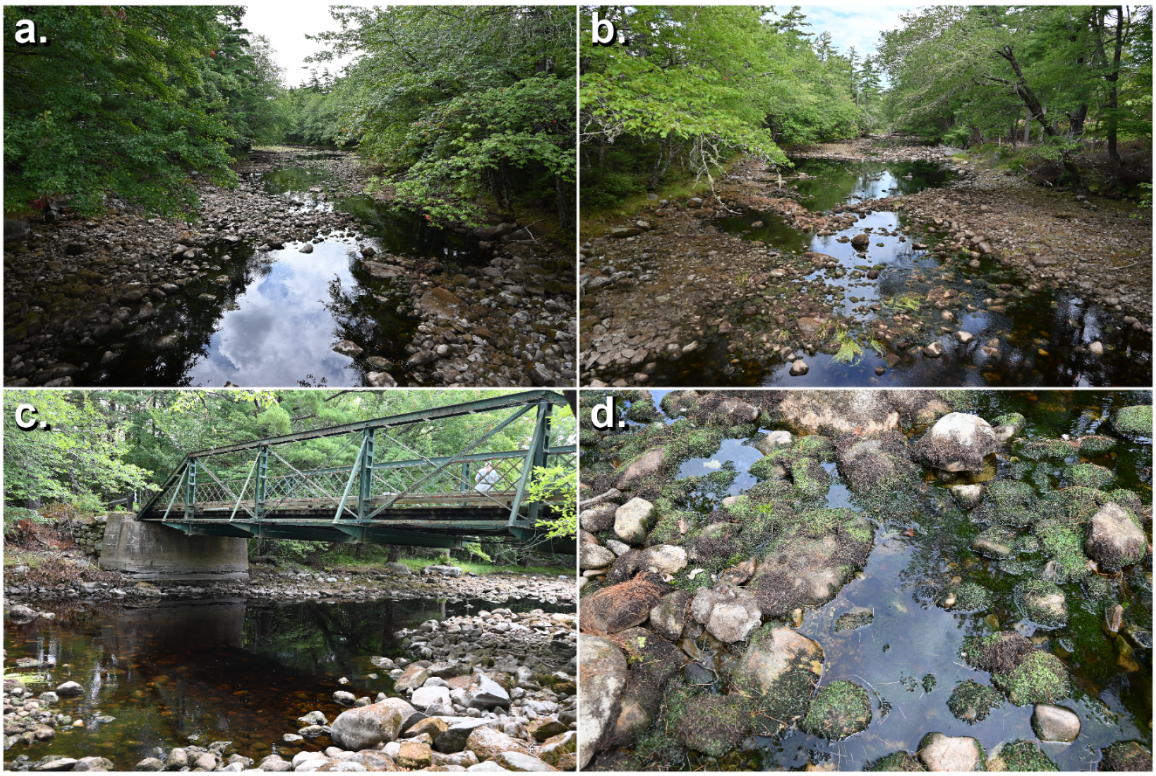


Figure 47 – Photographs of sampling site Clyde002, on the Clyde River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Facing downstream on Clyde River from the Middle Clyde Road bridge at Clyde002. The river was approximately 1/3 of its usual width based on the exposed riverbed on either side of the channel. b. Facing upstream on Clyde River from the Middle Clyde Road bridge at Clyde002. c. The bridge at Clyde002 with visible water lines showing more typical water depth at the site. d. Algae and moss growing on the cobble substrate at Clyde002.

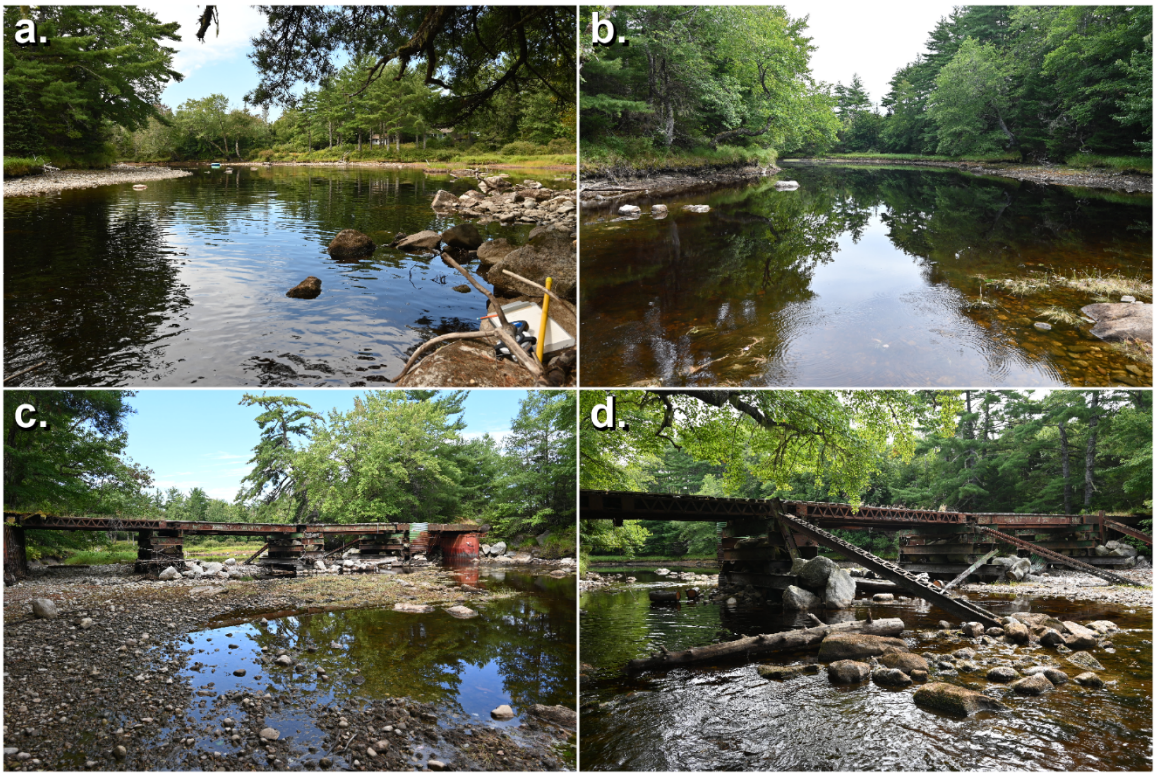


Figure 48 – Photographs of sampling site Clyde100, on the Clyde River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Facing downstream from below the ATV bridge over Clyde River at Clyde100. A few buildings on private property and an inflatable raft can be seen in the background. b. Facing upstream at Clyde100. c. Facing downstream towards the ATV bridge at Clyde100. More typical water levels can be inferred from colour variation on the bridge structure and the exposed riverbed. d. Facing upstream towards the ATV bridge at Clyde100 with downstream bridge supports and a large tree trunk, which may be evidence of flooding.

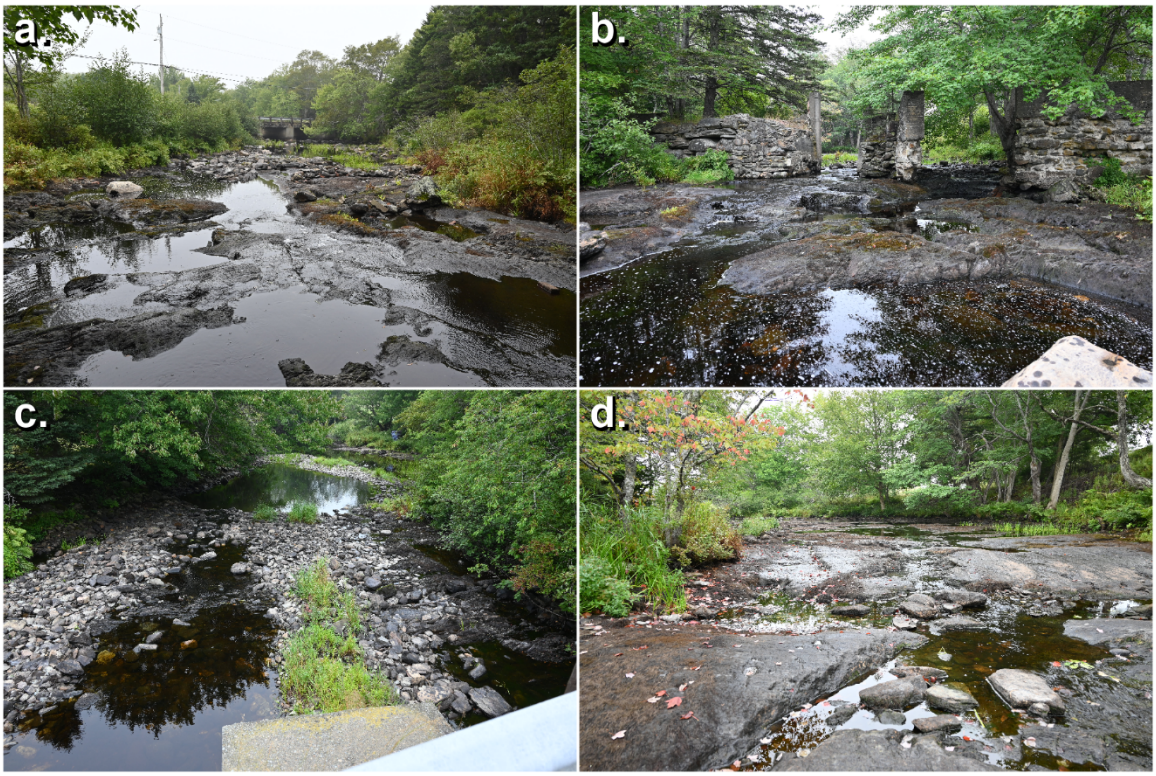


Figure 49 – Photographs of sampling site Annis002, on the Annis River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. View towards the Haley Drive bridge over Annis River at Annis002 showing the bedrock substrate with connected pools. Human-made rock weir structures can be seen in the middle of the image. b. View from the same point as panel a. facing upstream on Annis River towards the old dam structure. Two channels allow water to flow around the structure. c. Facing downstream on Annis River from the Haley Drive bridge. The substrate here was cobble overlying the bedrock. d. Upstream of the dam structure at Annis002 looking towards Hoopers Lake. The river here has bedrock substrate with small, connected pools.

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RIVERS NOT SUITABLE FOR A MONITORING FENCE

Outer Bay of Fundy

Of the 38 site visits across 19 rivers in the Outer Bay of Fundy DU, 27 were not suitable for the installation of a fish counting fence. All of these sites scored a four or below on the decision tree ranking (Table 5); those that scored highly had specific challenges that made them unsuitable (Table S1). Rivers are presented in order from the New Brunswick border with Maine, USA to the northeastern edge of the OBoF DU.

Waweig River

Waweig River is in Charlotte County, New Brunswick, near the border with the USA (Figure 5A). The mouth of the river empties in to the St. Croix River which flows into Passamaquoddy Bay. Waweig River is located 20 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that most of the salmon that return to the river are escaped aquaculture salmon; escapees have previously been detected in the St. Croix River system (DFO 2014; Keyser et al. 2018). The closest dedicated salmon monitoring facility to Waweig River is the St. George Fishway on the Magaguadavic River in St. George, New Brunswick, also in Charlotte County. The river has a small amount of Salmon Production Habitat Area [556 productive salmon habitat units (100 m^2; Jones et al. 2014)] and there is likely no wild salmon population in the river (DFO 2014). Salmon DNA was not detected in eDNA samples taken at WGNEW in 2024. Neither stocking of landlocked Atlantic Salmon by the government of New Brunswick nor DFO intervention through the Live Gene Bank occur in the watershed. Several other anadromous species can be found in the river. Few groups work on the river and surrounding system and Waweig River has limited evidence of human activity.

Site Waweig001

Decision Tree score: 3

Waweig001 is not a suitable location for aquaculture escapee monitoring because the site can only be accessed from a busy road with shoulder parking and the river itself is narrow and shallow at the site (Figure S1). The site is in Charlotte County, New Brunswick, where New Brunswick Highway 127 crosses Waweig River. The river has bedrock, cobble, and sand substrate near the site. During the site assessment in June 2025 the river was approximately 4 – 6 m wide (depth and temperature measurements weren't taken) with limited evidence of flooding. The road bridge is the only infrastructure near the site and the land around the site (apart from the roadway) is privately owned.

Site Waweig002

Decision Tree score: 3

Waweig002 is not a suitable location for aquaculture escapee monitoring because the site can only be accessed from a busy road with shoulder parking and the river itself is narrow and shallow at the site (Figure S2). The site is in Charlotte County, New Brunswick, where New Brunswick Route 760 crosses Waweig River. The river has bedrock, cobble, and sand substrate near the site. During the site assessment in June 2025 the river was approximately 50 cm deep (width and temperature measurements weren't taken) with limited evidence of flooding. The road bridge is the only infrastructure near the site and the land around the site is a mix of privately owned and Crown land.

Site WGNEW

Decision Tree score: 2

WGNEW is not a suitable location for aquaculture escapee monitoring because the site can only be accessed from a busy road with shoulder parking and the river itself is narrow and shallow at the site (Figure S3). The site is in Charlotte County, New Brunswick, downstream from where New Brunswick Route 760 crosses Waweig River. Specific site measurements weren't taken during sampling and site assessment in August 2024. The nearby road bridge is the only infrastructure near the site and the land around the site is privately owned.

Bocabec River

Bocabec River is in Charlotte County, New Brunswick, near Bocabec Cove, and empties into Passamaquoddy Bay (Figure 5A). The closest active salmon aquaculture lease is 14 km from the mouth of the river. The dispersal model predicts that most of the salmon that return to the river are escaped aquaculture salmon and escapees have previously been detected in the river (DFO 2014; Keyser et al. 2018). The closest dedicated salmon monitoring facility to Bocabec River is the St. George Fishway on the Magaguadavic River in St. George, New Brunswick, also in Charlotte County. The river has a small amount of Salmon Production Habitat Area [427 productive salmon habitat units (100 m^2; Jones et al. 2014)] and there is likely a wild salmon population in the river (DFO 2014). Neither stocking of landlocked Atlantic Salmon by the government of New Brunswick nor DFO intervention through the Live Gene Bank occur in the watershed. No hatcheries or fishing facilities are located in the system. Several other anadromous species can be found in the river. Bocabec River likely has limited human activity, although there is a recreational fishery.

Site Bocabec001

Decision Tree score: 3

Bocabec001 is not a suitable location for aquaculture escapee monitoring because the site is tidally influenced wetland habitat and the river is fairly small at the site (Figure S4). The site is in Charlotte County, New Brunswick, near Kerrs Ridge where Bocabec Ridge Road crosses Bocabec River. The river has large cobble and small boulder substrate near the site and the river and the marsh surrounding it are likely tidally influenced. Specific site measurements weren't taken during sampling and site assessment in June 2025. The nearby road bridge is the only infrastructure near the site and the land around the site is privately owned.

Digdeguash River

Digdeguash River is in Charlotte County, New Brunswick, near the border with the United States of America (Figure 5A). The mouth of the river is in Digdeguash, where it empties into Passamaquoddy Bay. Digdeguash River is located about 16 km away from the nearest active salmon sea pen aquaculture lease and there is a rearing facility located in the watershed. The dispersal model predicts that most of the salmon that return to the river are escaped aquaculture salmon and escapees have previously been detected in the river (Morris et al. 2008). The closest dedicated salmon monitoring facility to Digdeguash River is the St. George Fishway on the Magaguadavic River in St. George, New Brunswick, also in Charlotte County. Digdeguash River has a moderate amount of salmon habitat [4220 productive salmon habitat units (100 m^2; O'Connell et al. 1997)] and there is likely a wild salmon population in the river (DFO 2014); salmon DNA was not detected in the eDNA sample from site DIG2 in 2024 either by qPCR or metabarcoding, however both methods detected salmon DNA at site DIG1 downstream (Table 4). DFO intervention programs do not target Digdeguash River, but landlocked salmon stocking is undertaken by the government of New Brunswick in Lake Digdeguash (upstream of DIG2 in the watershed) and there are also Atlantic Salmon hatcheries

located on the river, but they are downstream of DIG1 and unlikely to influence our results. At least one organization is actively engaged in conservation and fisheries-related work in the river and surrounding system. Several other anadromous species can be found in the river. The river has limited evidence of human activity, including fishing.

Site Dig001

Decision Tree score: 2

Dig001 is not a suitable location for aquaculture escapee monitoring because the river is wide, deep, and difficult to access at the site (Figure S5). The site is in Charlotte County, New Brunswick, where Stillwater Road crosses Digdeguash River. The river substrate is mostly small boulders and mud near the site. During the site assessment in June 2025 the river was approximately 30 m wide (depth and temperature measurements weren't taken) and water lines on the nearby bridge suggest water levels are regularly 1 m higher than they were during the site visit. The land around Dig001 is privately owned.

Site DIG1

Decision Tree score: 3

DIG1 is not a suitable location for aquaculture escapee monitoring because the river is large and flows though wetlands near the site (Figure S6). The site is in Charlotte County, New Brunswick, where New Brunswick Route 760 crosses Digdeguash River at the McGuire Covered Bridge. The river substrate is mostly large cobble, small boulders, and mud near the site. Specific site measurements weren't taken during sampling and site assessment in August 2024. The covered bridge is the only infrastructure near the site and the land around the site is a mix of privately owned and Crown land.

Cripps Stream

Cripps Stream is in Charlotte County, New Brunswick, near the border with the USA (Figure 5A). The mouth of the stream is near Beaver Harbour where it empties into the Bay of Fundy. Cripps Stream is located 5 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that few of the salmon that return to the stream are escaped aquaculture salmon, but escapees have been detected in the past (Keyser et al. 2018; Morris et al. 2008). The closest dedicated salmon monitoring facility to Cripps Stream is the St. George Fishway on the Magaguadavic River in St. George, New Brunswick, also in Charlotte County. Based on our linear model of salmon habitat area by river axial length for OBoF rivers, Cripps Stream is predicted to have a small amount of salmon habitat [743 productive salmon habitat units (100 m^2)]. No information is available about current populations in the stream but it is generally not considered salmon habitat – beaver activity limits access to the stream. Neither stocking of landlocked Atlantic Salmon by the government of New Brunswick nor DFO intervention through the Live Gene Bank occur in the watershed and there is limited evidence of human activity in Cripps Stream.

Site Cripps001

Decision Tree score: 1

Cripps001 is not a suitable location for aquaculture escapee monitoring because there is possibly a barrier to fish passage near the mouth of the stream and the area around the site was mostly wetland with a beaver dam blocking the stream (Figure S7). The site is in Charlotte County, New Brunswick, where Foleys Cove Road crosses Cripps Stream. The stream substrate is mostly mud near the site. During the site assessment in June 2025 the stream was approximately 1.3 m deep (width and temperature measurements weren't

taken). The wetland surrounding the stream suggests some regular flooding or water level changes. The nearby road bridge is the only infrastructure near the site and the land around the site is privately owned.

Knights Mill Brook

Knights Mill Brook is in Charlotte County, New Brunswick, near the border with the USA (Figure 5A). The mouth of the brook is near Crow Harbour where it empties into the Bay of Fundy. Knights Mill Brook is located 1 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that few of the salmon that return to the brook are escaped aquaculture salmon. The closest dedicated salmon monitoring facility to Knights Mill Brook is the St. George Fishway on the Magaguadavic River in St. George, New Brunswick, also in Charlotte County. Based on our linear model of salmon habitat area by river axial length for OBoF rivers, Knights Mill Brook is predicted to have a moderate amount of salmon habitat [1083 productive salmon habitat units (100 m^2)]. No information is available about current populations in the brook but it is generally not considered salmon habitat – beaver activity limits access to the brook. Neither stocking of landlocked Atlantic Salmon by the government of New Brunswick nor DFO intervention through the Live Gene Bank occur in the watershed and there is limited evidence of human activity in the brook.

Site Crow001

Decision Tree score: 1

Crow001 is not a suitable location for aquaculture escapee monitoring because there is a beaver dam blocking the brook near the site, creating a deep pool and preventing fish passage (Figure S8). The site is in Charlotte County, New Brunswick, New Brunswick Highway 175 crosses Knights Mill Brook. The brook substrate is mostly mud near the site. Specific site measurements weren't taken during sampling and site assessment in June 2025. The culvert under the road at the site has a fish ladder, however the ladder and culvert were partly blocked with debris, likely from beaver activity and seasonal flooding. The land around the site is privately owned.

Pocologan River

Pocologan River is in Charlotte County, New Brunswick, halfway between Saint John and the border with the USA (Figure 5A). The mouth of the river is in Pocologan where it empties into the Bay of Fundy and is about 2 km away from the nearest active salmon sea pen aquaculture lease. The dispersal model suggests that most of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility is the St. George Fishway on the Magaguadavic River in St. George, New Brunswick, also in Charlotte County. Pocologan River has a small amount of salmon habitat [226 productive salmon habitat units (100 m^2; Jones et al. 2014)]. There is likely a wild salmon population in the river (Jones et al. 2023) and salmon DNA was detected in eDNA samples taken at PN1 and PN2 in 2024 (Table 4). Stocking of landlocked Atlantic Salmon by the government of New Brunswick occurs in the watershed but DFO intervention programs are not present in Pocologan River. At least one organization is actively engaged in conservation and fisheries-related work in the river and surrounding system. Several other anadromous species can be found in the river. Pocologan River has evidence of moderate human activity, including ATV trails.

Site Poc001

Decision Tree score: 4

Poc001 is not a suitable location for aquaculture escapee monitoring because the river is tidally influenced at the site and the site is difficult to access without an ATV (Figure S9).

The site is in Charlotte County, New Brunswick, where New Brunswick Highway 1 crosses Pocologan River. During the site assessment in June 2025 the river was 4 – 6 m wide and 50 cm deep near the site and the water was 15.6°C. The substrate near the site was mostly cobble and gravel. There was some evidence of flooding near the site, likely due to tidal influence causing the fresh river water to back up. The only infrastructure near the site was the highway bridge, and the land around the site is a mix of Provincial and Crown land.

Site PN2/Poc002

Decision Tree score: 3

Poc002 (PN2 for 2024 sampling) is not a suitable location for aquaculture escapee monitoring because the river is tidally influenced at the site and the site is difficult to access from the road (Figure S10). The site is in Charlotte County, New Brunswick, where Pocologan Causeway Road crosses Pocologan River near the river mouth. Specific site measurements weren't taken during sampling and site assessment in August 2024 and June 2025. There are culverts under the river that likely prevent saltwater intrusion past the causeway, but the river is likely only accessible to salmon during high tide. The land around the site is privately owned.

New River

New River is in Charlotte County, New Brunswick, near the border with the USA (Figure 5A). The mouth of the river is near New River Beach where it empties into the Bay of Fundy. New River is located 4 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that most of the salmon that return to the river are escaped aquaculture salmon, however wild salmon and other anadromous species are unlikely to be found in the river as impassable waterfalls are located along the system. The closest dedicated salmon monitoring facility is the St. George Fishway on the Magaguadavic River in St. George, New Brunswick, also in Charlotte County. The river has a small amount of salmon habitat [604 productive salmon habitat units (100 m^2; Jones et al. 2014)]. There is likely a wild salmon population is the river (Jones et al. 2023) and salmon DNA was detected in eDNA samples taken at NRB1 in 2024. Neither stocking of landlocked Atlantic Salmon by the government of New Brunswick nor DFO intervention through the Live Gene Bank occur in the watershed.

Site New001

Decision Tree score: 2

New001 is not a suitable location for aquaculture escapee monitoring because the river had very low flow during the site assessment and moose fencing blocked easy access to the site (Figure S11). The site is in Charlotte County, New Brunswick, where New Brunswick Highway 1 crosses New River. During the site assessment in June 2025 the river was 22 m wide and 1 m deep near the site and the water was 17.3°C. The river substrate was mostly bedrock and cobble near the site and there was some evidence of flooding. The land around the site is a mix of Provincial and Crown land.

Site New002

Decision Tree score: 2

New002 is not a suitable location for aquaculture escapee monitoring because the river had significant evidence of flooding near the site and the substrate is not ideal for fence installation (Figure S12). The site is in Charlotte County, New Brunswick, where New Brunswick Route 780 crosses New River near New River Falls. The river was 60 cm deep

during the site assessment in June 2025 (width and temperature measurements weren't taken). The river substrate was mostly bedrock near the site and there was significant evidence of flooding with the potential for flash flooding. There is an old bridge just upstream of the site, and the land around the site is a mix of Provincial, Crown, and privately owned land.

Site New003/NRB1

Decision Tree score: 2

New003 is not a suitable location for aquaculture escapee monitoring because the river had significant evidence of flooding near the site and the substrate is not ideal for fence installation (Figure S13). The site is in Charlotte County, New Brunswick, near the mouth of New River where New Brunswick Route 175 crosses the river and slightly upstream in a power line clearcut off of Detour Road. The river was 1.3 m deep during the site assessment in June 2025 (width and temperature measurements weren't taken). The river substrate was mostly bedrock near the site and there was significant evidence of flooding with the potential for flash flooding. The land around the site is a mix of Provincial, Crown, and privately owned land.

Lepreau River

Lepreau River is in Charlotte County, New Brunswick, near the border with the USA (Figure 5A). The mouth of the river is near Mink Brook where it empties into the Bay of Fundy. Lepreau River is located 6 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that most of the salmon that return to the river are escaped aquaculture salmon, however wild salmon and other anadromous species are unlikely to be found in the river as impassable waterfalls are located along the system (Jones et al. 2014). The closest dedicated salmon monitoring facility is the St. George Fishway on the Magaguadavic River in St. George, New Brunswick, also in Charlotte County. Based on our linear model of salmon habitat area by river axial length for OBoF rivers, Lepreau River is predicted to have a moderate amount of salmon habitat [2533 productive salmon habitat units (100 m^2)]. DFO intervention programs do not target Lepreau River, but the Government of New Brunswick stocks salmon in the watershed at East Long Lake.

Site Lepreau001

Decision Tree score: 4 (barrier)

Lepreau001 is not a suitable location for aquaculture escapee monitoring because there is a waterfall near the river mouth that salmon cannot pass (Figure S14). The site is in Charlotte County, New Brunswick, where New Brunswick Route 175 crosses Lepreau River. The river was 1 m deep and between 25 and 50 m wide during the site assessment in June 2025 and the water was 17.1°C. The river substrate was mostly silt and cobble near the site and there was no evidence of flooding. The land around the site is a mix of Crown and privately owned land.

Little Lepreau River

Little Lepreau River is in Kings County, New Brunswick, but the mouth of the river is located in Charlotte County (Figure 5A). The mouth of the river is near Little Lepreau where it empties into the Bay of Fundy. Little Lepreau River is located 4 km away from the nearest active salmon aquaculture lease. It was not explicitly included in the model for escapee salmon predictions, but most of salmon returning to nearby Lepreau River are predicted to be escaped aquaculture salmon. The closest dedicated salmon monitoring facility is the St. George Fishway on the Magaguadavic River in St. George, New Brunswick, also in Charlotte County. Based on our

linear model of salmon habitat area by river axial length for OBoF rivers, Little Lepreau River is predicted to have a small amount of salmon habitat [405 productive salmon habitat units (100 m^2)]. No information is available about current populations in the river, but salmon stocking does not occur in the watershed and DFO intervention programs do not target Little Lepreau River. The mouth of the river has small but passable falls, and evidence of elver fishing was present at the mouth of the river.

Site LittleLepreau001

Decision Tree score: 3

LittleLepreau001 is not a suitable location for aquaculture escapee monitoring because the site is tidally influenced, there is a beaver dam upstream of the site, and there is an active fishing weir just downstream of the site (Figure S15). The site is in Charlotte County, New Brunswick, where Little Lepreau Road crosses the river at the Mill Pond Covered Bridge. The river was around 5-6 m wide during the site assessment in June 2025 (depth and temperature measurements weren't taken). The river substrate was mostly bedrock near the site and the site was tidally influenced. There were large culverts under the road at the site which are likely passable by salmon but would prevent saltwater from intruding further upstream. The land around the site is privately owned.

Keswick River (Saint John River system)

Keswick River is in in York County, New Brunswick, near Fredericton where it empties into the Saint John River (Figure 5B). The closest active salmon aquaculture lease is 38 km from the mouth of the Saint John system; the mouth of Keswick River is approximately 130 km further into the system. The dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon although escapees have been detected in the Saint John River system (DFO 2014). The closest dedicated salmon monitoring facilities to Keswick River are both in the Saint John River system: the Nashwaak Fence on the Nashwaak River just downstream of Keswick River and Mactaquac Dam upstream of Keswick River (under review for closure in 2026). The river has a large amount of salmon habitat [10100 productive salmon habitat units (100 m^2; Marshall et al. 1997)] and there is likely a wild salmon population in the river (DFO 2014). DFO intervention programs do not target the Keswick River but the Government of New Brunswick stocks salmon in the Saint John River system at Grand Lake, downstream of Keswick River. The presence of salmon DNA was inconclusive in eDNA samples taken at KSW1 in 2024.

Site KSW1

Decision Tree score: N/A

In addition to the model prediction that no escaped aquaculture salmon will enter the system, KSW1 is not a suitable location for aquaculture escapee monitoring because the site is very close to Mactaquac Dam which would duplicate effort in the area (Figure S16). The site is in York County, New Brunswick, where New Brunswick Route 105 crosses Keswick River. Specific site measurements weren't taken during sampling and site assessment in August 2024. The land around the site is a mix of privately owned and Crown land.

Nashwaaksis Stream (Saint John River system)

Nashwaaksis Stream is in in York County, New Brunswick, near Fredericton where it empties into the Saint John River (Figure 5B). The closest active salmon aquaculture lease is 38 km from the mouth of the Saint John system; the mouth of Nashwaaksis Stream is approximately 115 km further into the system. The dispersal model predicts that none of the salmon that return

to the stream are escaped aquaculture salmon although escapees have been detected in the Saint John River system (DFO 2014). The closest dedicated salmon monitoring facilities to Nashwaaksis Stream are both in the Saint John River system: the Nashwaak Fence on the Nashwaak River just downstream of Nashwaaksis Stream and Mactaquac Dam upstream of Nashwaaksis Stream (under review for closure in 2026). The stream has a moderate amount of salmon habitat [2570 productive salmon habitat units (100 m^2; Marshall et al. 1997)] and there is likely a wild salmon population in the stream (Jones et al. 2023). DFO intervention programs do not target the Nashwaaksis Stream but the Government of New Brunswick stocks salmon in the Saint John River system at Grand Lake, downstream of Nashwaaksis Stream. Salmon DNA was not detected in the eDNA samples taken at NKS/NKS_BR in 2024.

Site NKS/NKS_BR

Decision Tree score: N/A

In addition to the model prediction that no escaped aquaculture salmon will enter the system, NKS (also called NKS_BR) is not a suitable location for aquaculture escapee monitoring because the site is very close to Mactaquac Dam and the fish fence on Nashwaak River (Figure S17). The site is in York County, New Brunswick, near Royal Road where an unnamed dirt road off of New Brunswick Route 620 crosses Middle Branch, Nashwaaksis Stream. Specific site measurements weren't taken during sampling and site assessment in August 2024. The nearby road bridge is the only infrastructure near the site and the land around the site is privately owned.

Mill Brook (Saint John River system)

Mill Brook is in Queens County, New Brunswick, near Canaan River and Cambridge-Narrows, and drains into Washademoak Lake in the Saint John River system (Figure 5B). The closest active salmon aquaculture lease is 38 km from the mouth of the Saint John system; the mouth of Mill Brook is approximately 70 km further into the system. The dispersal model predicts that none of the salmon that return to the brook are escaped aquaculture salmon although escapees have been detected in the Saint John River system (DFO 2014). The closest dedicated salmon monitoring facilities to Mill Brook are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam (under review for closure in 2026), both in the Saint John River system upstream of Mill Brook. Salmon stocking does occur in the larger Saint John River watershed and several hatcheries and fishing facilities are located in the system, although the brook and nearby Canaan River are not supplemented by the DFO LGB program. No information is available about current populations in the brook, and salmon DNA was not detected in the eDNA sample taken at HAR in 2024. Several other anadromous species can be found in nearby rivers. Many groups work on the brook and surrounding system. Mill Brook has limited evidence human activity, although it is likely used for recreational fishing.

Site HAR

Decision Tree score: N/A

In addition to the model prediction that no escaped aquaculture salmon will enter the system, HAR is not a suitable location for aquaculture escapee monitoring because the site is on a small tributary in the Saint John River system which is already very well studied and monitored (Figure S18). The site is in Queens County, New Brunswick, near Bridge Drive (a logging road) crosses Mill Brook. Specific site measurements weren't taken during sampling and site assessment in August 2024. The nearby road bridge is the only infrastructure near the site and the land around the site is privately owned.

Kennebecasis River (Saint John River system)

Kennebecasis River is in Kings County, New Brunswick, and drains into Kennebecasis Bay in the Saint John River system (Figure 5B). The closest active salmon aquaculture lease is 38 km from the mouth of the Saint John system; the mouth of Kennebecasis River is approximately 30 km further into the system. The dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon and escapees have been detected in the Saint John River system (DFO 2014). The closest dedicated salmon monitoring facilities to the Kennebecasis River are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam (under review for closure in 2026), both in the Saint John River system upstream of Kennebecasis River. The river has a large amount of salmon habitat [20690 productive salmon habitat units (100 m^2; Marshall et al. 1997)] and there is likely a wild salmon population in the river (DFO 2014). DFO intervention programs do not target the Kennebecasis River but salmon stocking occurs in the watershed and several hatcheries and fishing facilities are located in the system. Salmon DNA was detected in the eDNA sample from site KSL in 2024, but it was not detected in 2024 sample from site KS5 further upstream in the system, and no salmon were detected using electrofishing at sites KS5 and KSL in 2024. Several other anadromous species can be found in the river. Many groups work on the Kennebecasis River and surrounding system, and Kennebecasis River has evidence of high human activity, including a busy recreational fishery.

Site Kenneb001

Decision Tree score: 3

Kenneb001 is not a suitable location for aquaculture escapee monitoring because the river is large and muddy with very low flow at the site (Figure S19). The site is in Kings County, New Brunswick, near Bloomfield where Bloomfield Station Road crosses Kennebecasis River. The river was approximately 50 m wide and 19.7°C during the site visit in June 2025 (depth measurements weren't taken). The substrate was primarily silt and mud with marshy areas along the banks and there was limited evidence of flooding near the site. The Bloomfield Station Road bridge is the only major infrastructure near the site and the land around the site is privately owned.

Site Kenneb002

Decision Tree score: 4 (high human use)

Kenneb002 is not a suitable location for aquaculture escapee monitoring because it is near a community boat launch and is heavily used for swimming, boating, and other recreation (Figure S20). The site is in Kings County, New Brunswick, where Bridge Street crosses Kennebecasis River near the Apohaqui Community Center. During the site visit in June 2025, the river was 39 m wide and 30 cm deep (temperature measurements weren't taken). The substrate near the site was mostly silt and mud and there was limited evidence for flooding near the site. The Bridge Street bridge and the Apohaqui Community Center boat launch are the only infrastructure near the site and the land around the site is privately owned.

Site KSL

Decision Tree score: 2

KSL is not a suitable location for aquaculture escapee monitoring because the site is very far upstream on the Kennebecasis River and would likely not capture many fish entering the river (Figure S21). The site is in Kings County, New Brunswick, McCully Station Road crosses Kennebecasis River. Specific site measurements weren't taken during sampling

and site assessment in August 2024. The nearby McCully Station Road bridge is the only infrastructure near the site and the land around the site is privately owned.

Site KS5

Decision Tree score: 2

KS5 is not a suitable location for aquaculture monitoring because, similar to KSL, the site is very far upstream on the Kennebecasis River and would not capture most fish entering the river (Figure S22). The site is in Albert County, New Brunswick, near Portage Vale where New Brunswick Route 895 crosses Kennebecasis River. Specific site measurements weren't taken during sampling and site assessment in August 2024. The nearby bridge is the only infrastructure near the site and the land around the site is privately owned.

Hammond River (Saint John River system)

Hammond River is in Kings County, New Brunswick, and drains into Kennebecasis Bay in the Saint John River system (Figure 5B). The closest active salmon sea pen aquaculture lease is 38 km from the mouth of the Saint John River system; the mouth of Hammond River is approximately 30 km farther upstream. The dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon; escaped farmed salmon have been detected in the Saint John River system (DFO 2014), but Keyser et al. (2018) do not specify if they were detected in the Hammond River. The closest dedicated salmon monitoring facilities to Hammond River are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system upstream of Hammond River (both under review for closure in 2026). Hammond River has a large amount of salmon habitat [16620 productive salmon habitat units (100 m^2) and 3.3% of all OBoF productive salmon habitat (Marshall et al. 1997)] and there is likely a wild salmon population in the river (DFO 2014); salmon were caught via electrofishing and salmon DNA was detected in the eDNA sample at site HD11 in 2024 but it was not detected in the sample from site HDL further downstream in the system (Table 4). DFO intervention programs do not target the Hammond River. Stocking of landlocked Atlantic Salmon by the government of New Brunswick does occur in Grand Lake in the Saint John system, although fish from Grand Lake are very unlikely to enter Hammond River. Several other anadromous species can be found in the river, including smelt. Many organizations, including conservation groups, Indigenous communities, and other environmental non-governmental organizations are actively engaged in conservation and fisheries-related work in the river and surrounding system. The Hammond River has evidence of high human activity, including a recreational fishery.

Site Hammond002

Decision Tree score: 4 (limited access)

Hammond002 is not a suitable location for aquaculture escapee monitoring because the area is used heavily for recreation including swimming, boating, and fishing, and rivers in the Saint John River system are already well studied. (Figure S23). The site is in Kings County, New Brunswick, near Damascus and Smithtown where Damascus Road crosses Hammond River at the Historic Smithtown Covered Bridge. During the site visit in June 2025, the river was 27 m wide and 50 cm deep with a shallow riffle (~10 cm deep) upstream of Hammond002 and limited evidence of flooding (temperature measurements weren't taken). The substrate near the site is mostly gravel with some large rocks in deeper areas of the river. The covered bridge is the only major infrastructure near the site and the land around the site is privately owned.

Site HD11

Decision Tree score: 3

HD11 is not a suitable location for aquaculture escapee monitoring because it is far upstream on Hammond River and would not capture most fish entering the river and it is not easy to access (Figure S24). The site is in Kings County, New Brunswick, near Hillsdale, down a dirt road off of New Brunswick Route 111/St. Martins Road. River. Specific site measurements weren't taken during sampling and site assessment in August 2024. There is no existing infrastructure near the site and the land around the site is privately owned.

Inner Bay of Fundy

Of the 76 site visits across 53 rivers in the Inner Bay of Fundy DU, 53 were not suitable for the installation of a fish counting fence. All of these sites scored a four or below on the decision tree ranking (Table 5); those that scored highly had specific challenges that made them unsuitable (Table S1). Rivers are presented in order from the border between OBoF and IBoF to the eastern edge of the IBoF DU.

Mispec River

Mispec River is in Saint John County, New Brunswick, southeast of Saint John, and runs from Robertson Lake to the Bay of Fundy near Mispec Beach (Figure 17A). Mispec River is located approximately 43 km away from the nearest active salmon sea pen aquaculture lease. The dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facilities to Mispec River are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Mispec River is predicted to have a moderate amount of salmon habitat [3349 productive salmon habitat units (100 m^2)] and there is likely a wild salmon population in the river (Reader et al. 2024b); salmon DNA was detected by qPCR in eDNA samples taken at Mispec002 (Table 4) and juvenile salmon were caught during electrofishing surveys at Mispec003, both in 2025 (Table 3). Stocking of landlocked Atlantic Salmon by the government of New Brunswick occurs in Loch Lomond, which connects to Mispec River via Robertson Lake. DFO intervention through the LGB does not occur in Mispec River. Several other anadromous species can be found in the river. Several organizations are actively engaged in conservation and fisheries-related work in the river. Mispec River has evidence of moderate human activity, including a recreational trout fishery and ATV and boating use.

Site Mispec001

Decision Tree Score: 2

Mispec001 is not a suitable location for aquaculture escapee monitoring because the site is difficult to access and is already used for many activities including recreation and research, including elver research (Figure S25). The site is in Saint John County, New Brunswick, along a trail off of Old Read Head Road. During the site visit in October 2025, the river was 2 – 6 m wide in runs and up to 20 m wide in pools and was approximately 60 cm deep with some pools deeper than 2 m. The substrate was mostly bedrock with some stretches of cobble. There was some evidence of seasonal flooding near the site. There was no existing infrastructure near the site, and the land nearby is privately owned but used by the public.

Black River (Saint John County, New Brunswick)

Black River is in Saint John County, New Brunswick, near Garnett Settlement and Willow Grove (Figure 17A). The mouth of Black River empties into the Bay of Fundy near Powers Beach. Black River is located about 57 km away from the nearest active salmon sea pen aquaculture lease. The dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon and escaped farmed salmon have previously been detected in the river (Keyser et al. 2018; Morris et al. 2008). The closest dedicated salmon monitoring facilities to Black River are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Black River is predicted to have a moderate amount of salmon habitat [3329 productive salmon habitat units (100 m^2)] and there is likely a wild salmon population in the river (Reader et al. 2024b); salmon DNA was detected in eDNA samples taken at BlackNB003 in 2025 (Table 4) and a single salmon was caught by electrofishing at BlackNB004 in 2025 (Table 3). Neither stocking of landlocked Atlantic Salmon by the government of New Brunswick nor DFO intervention through the LGB occur in the watershed. Several other anadromous species can be found in the river, although small falls in the system may prevent some smaller species from entering the river. Several organizations are actively engaged in conservation and fisheries-related work in the river. Black River has evidence of moderate human activity, including recreational fishing and ATV and boating use in addition to white water rafting during periods with high water levels.

Site BlackNB001

Decision Tree score: 3

BlackNB001 is not a suitable location for aquaculture escapee monitoring because it is difficult to access (ATV required), the bedrock substrate would make fence installation difficult, and a more suitable site is present in the system (Figure S26). The site is in Saint John County, New Brunswick, downstream of the confluence of Black River and the East Branch and up a 1.5 km ATV trail that starts at the intersection of Old Black River Road and Wharf Road. During the site visit in early September 2025, the river was approximately 8 m wide (wet width, ~15 m bankfull), 50 cm deep in riffles, and up to 2 m deep in pools. The banks were a mix of shrubs, trees, and some steeper bedrock sections, and the substrate was a mix of shale, cobble, boulders, and bedrock. There was some evidence of flooding, and although there was also a large area of gravel riverbed uncovered indicating the site had capacity to accommodate higher water levels and flows, bedrock substrate and some bedrock along the banks could contribute to flooding risk. There is no infrastructure in the river near the site and the land is privately owned.

Site BlackNB004

Decision Tree Score: 3

BlackNB004 is not a suitable location for aquaculture escapee monitoring because the site is very far upstream in the system and would not capture most fish entering the river and because there was significant debris across the river near the site (Figure S27). The site is in Saint John County, New Brunswick, just upstream of the St. Martins Road/New Brunswick Route 111 bridge over Black River. Specific site measurements weren't taken during sampling and site assessment in September 2025, but debris in the river near the site indicates the possibility of flooding and beaver activity. The only infrastructure near the site is the St. Martins Road/New Brunswick Route 111 bridge and the land around the site is privately owned.

East Branch (Black River system)

The East Branch of Black River is in Saint John County, New Brunswick, southeast of Garnett Settlement and Willow Grove (Figure 17A). The mouth of the East Branch joins Black River approximately 1 km upstream from the mouth of Black River at the Bay of Fundy near Powers Beach. Black River is located 57 km away from the nearest active salmon aquaculture lease. Per model estimation some of the salmon returning to the river are predicted to be escaped aquaculture salmon and escapees have previously been detected in the system (Morris et al. 2008). The closest dedicated salmon monitoring facilities to Black River are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Black River is predicted to have a moderate amount of salmon habitat [1995 productive salmon habitat units (100 m^2)] and there is likely a wild salmon population in the river (Reader et al. 2024b). Landlocked salmon stocking also occurs in the watershed, but the river is not supplemented by the DFO LGB program. Few other anadromous species can be found in the river. Several groups work on the river and surrounding systems. The East Branch Black River has limited evidence of human activity.

Site BlackNBEast001

Decision Tree Score: 3

BlackNBEast001 is not a suitable location for aquaculture escapee monitoring because the river was almost completely dry during the site visit in September 2025 and could dry out again in the future (Figure S28). The site is in Saint John County, New Brunswick, where Garnett Settlement/New Brunswick Route 825 crosses East Branch, Black River. Because the river was dry, specific measurements weren't taken during the site visit in September 2025, but the river substrate near the site was primarily boulders and cobble. There was very little evidence of flooding near the site, and the land around the site is primarily privately owned.

Emerson Creek

Emerson Creek is in Saint, New Brunswick, near Black River. The mouth of the creek is near McLeods Beach where it empties into the Bay of Fundy (Figure 15A). Emerson Creek is located 58 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that some of the salmon that return to the creek are escaped aquaculture salmon. The closest dedicated salmon monitoring facilities to Emerson Creek are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Emerson Creek is predicted to have a moderate amount of salmon habitat [2771 productive salmon habitat units (100 m^2)] and there is likely a wild salmon population in the river (Reader et al. 2024b). Neither stocking of landlocked Atlantic Salmon by the government of New Brunswick nor DFO intervention through the Live Gene Bank occur in the watershed. Few other anadromous species can be found in the river. Several organizations are actively engaged in conservation and fisheries-related work in the river. Emerson Creek has limited evidence of human activity.

Site Emerson004

Decision Tree Score: 2

Emerson004 is not a suitable location for aquaculture escapee monitoring because the creek was almost completely dry during the site assessment and the size of the exposed creek bed suggests it would be too small even under average rainfall conditions (Figure S29). The site is in Saint John County, New Brunswick, where Old Gardener Creek Road

crosses Emerson Creek. The river has mostly cobble substrate near the site. During the site assessment in September 2025 the creek bed was approximately 5 m wide (depth and temperature measurements couldn't be taken). There was some debris across the creek bed (fallen trees and branches) which could indicate flooding during times with higher rainfall. The road bridge is the only infrastructure near the site and the land around the site (apart from the roadway) is privately owned.

Gardner Creek

Gardner Creek is in Saint John County, New Brunswick, near Fairfield and Coleraine (Figure 17A). The mouth of the creek empties into the Bay of Fundy at Gardner Creek Beach Cove near Forbes Beach. Gardner Creek is located 64 km away from the nearest active salmon sea pen aquaculture lease and the dispersal model predicts that some of the salmon that return to the creek are escaped aquaculture salmon. The closest dedicated salmon monitoring facilities to Gardner Creek are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Gardner Creek is predicted to have a moderate amount of salmon habitat [2968 productive salmon habitat units (100 m^2)] and there is likely a wild salmon population in the river (Reader et al. 2024b) although salmon DNA was Not Detected in eDNA samples taken at Gardner002 in 2025 (Table 4). Neither stocking of landlocked Atlantic Salmon by the government of New Brunswick nor DFO intervention through the LGB occur in the watershed. Several other anadromous species can be found in the river. Several organizations are actively engaged in conservation and fisheries-related work in the river. Gardner Creek has evidence of moderate human activity, including recreational fishing and ATV and boating use.

Site Gardner002

Decision Tree Score: 2

Gardner002 is not a suitable location for aquaculture escapee monitoring because the water levels were extremely low during the site visit and there was debris and other evidence of flooding near the site (Figure S30). The site is in Saint John County, New Brunswick, where Rankin Road crosses Gardner Creek. During the site visit in September 2025, the creek was approximately 2 – 3 m wet width (10 m bankfull) and between 10 and 30 cm deep with a 1.5 m pool downstream of the site. The water was 18.2°C and the creek substrate was a mix of sandstone, gravel, and cobble. The Rankin Road bridge is the only infrastructure at the site and the land near the site is privately owned.

Ten Mile Creek (Tynemouth Creek system)

Ten Mile Creek is in Saint John County, New Brunswick, west of Bains Brook (Figure 17A). The mouth of the creek empties into Tynemouth Creek which flows into the Bay of Fundy. Ten Mile Creek is located 69 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that some of the salmon returning to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facilities to Ten Mile Creek are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Ten Mile Creek is predicted to have a moderate amount of salmon habitat [2124 productive salmon habitat units (100 m^2)] and there is likely a wild salmon population in the creek (COSEWIC 2006). Neither stocking of landlocked Atlantic Salmon by the government of New Brunswick nor DFO intervention through the Live Gene Bank occur in the watershed. Salmon DNA was Not Detected in eDNA samples taken at Bains005 (Table 4) and no salmon were caught using electrofishing at Bains004 (Table 3), both in 2025. Several other anadromous species can be found in the system. Several organizations are actively engaged in conservation and fisheries-

related work in the river. Ten Mile Creek has evidence of high human activity, including recreation and farming activities.

Site Bains005

Decision Tree Score: 4 (too small)

Bains005 is not a suitable location for aquaculture escapee monitoring because the creek is too small near the site, particularly with the low water levels in the area during the summer of 2025 (Figure S31). The site is in Saint John County, New Brunswick, where New Brunswick Highway 111/St. Martins Road crosses an unnamed tributary of Ten Mile Creek. During the site visit in September 2025, the creek was 1 m wide wet width (4 m bankfull) and 15 – 20 cm deep. The water was 17.5°C and the substrate of the creek was mostly small boulders and gravel. The only infrastructure near the site was the road bridge over the creek and the land around the site is privately owned.

Mosher River

Mosher River is in Saint John County, New Brunswick near St. Martins (Figure 17A). The mouth of the Mosher River is in West Quaco where it empties into the Bay of Fundy. Mosher River is located 79 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that some of the salmon returning to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facilities to Mosher River are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Mosher River is predicted to have a moderate amount of salmon habitat [2202 productive salmon habitat units (100 m^2)] and there is likely a wild salmon population in the creek (Reader et al. 2024b). Landlocked stocking does occur in the watershed and systems nearby but the river is not supplemented by the DFO LGB program. Salmon DNA was Not Detected in eDNA samples taken at Mosher001 (Table 4) and no salmon were caught using electrofishing at Mosher001 (Table 3), both in 2025. Several other anadromous species can be found in the river. Several groups work on the river and surrounding systems. Mosher River has evidence of moderate human activity, including recreational fishing and ATV and boating use.

Site Mosher001

Decision Tree score: 3

Mosher001 is not a suitable location for aquaculture escapee monitoring because the site is likely tidally influenced and there was evidence of beaver activity in the river near the site (Figure S32). The site is the furthest downstream on Mosher River and is in Saint John County, New Brunswick, where New Brunswick Highway 111/St. Martins Road crosses Mosher River near the mouth of the river. During the site visit in September 2025, the river at the site was 2 – 4m wide wet (4 – 6 m bankfull) and between 25 and 50 cm deep with some pools deeper than 1 m. The water temperature was 14.3°C and the river substrate was mostly gravel and sand. There was a lot of debris in the river upstream of the site both from beaver activity and seasonal or tidal flooding. The bridge over the river is the only infrastructure near the site, and the land around the site is privately owned.

Site Mosher003

Decision Tree score: 3

Mosher003 is not a suitable location for aquaculture escapee monitoring because there was almost no flow at the site during the site assessment and water levels were visibly low (Figure S33). The site is in Saint John County, New Brunswick, where New Brunswick

Highway 111/St. Martins Road crosses Mosher River near the intersection with Patterson Siding Road. During the site visit in September 2025, the river was 2 – 4 m wide wet (6 m bankfull) and approximately 70 cm deep with some pools more than 1 m deep. The water was 19.2°C and the substrate of the river was cobble with silt and mud. There was little evidence of flooding near the site but the low water levels caused by the regional drought meant there was very little flow near the site and there was noticeable algae growth in the stagnant river pools. The bridge over the river is the only infrastructure near the site, and the land around the site is a mix of private and Crown land.

Site Mosher100

Decision Tree Score: 3

Mosher100 is not a suitable location for aquaculture escapee monitoring because there was significant beaver activity in the river near the site (Figure S34). The site is in Saint John County, New Brunswick, along an ATV trail off of Mosher Hill Road. During the site visit in September 2025, the river was 1 m wide in riffles and 5 – 8 m wide in pools and approximately 40 cm deep with some pools for than 1 m deep. The water was 13.8°C and the substrate was mostly cobble and gravel. There are supports from an old bridge near the site, which could be useful infrastructure for equipment installations, but just below the old bridge was a beaver dam blocking about half of the river and creating marshy conditions upstream of the site. The area is used for ATV riding and hunting and the land is privately owned.

Irish River

Irish River is in Saint John County, New Brunswick, near Orange Hill. The mouth of the river empties into the Bay of Fundy (Figure 17A). The Irish River system is located 81 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that some of the salmon returning to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facilities to Irish River are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Irish River is predicted to have a moderate amount of salmon habitat [3234 productive salmon habitat units (100 m^2)] and there is likely a wild salmon population in the creek (Reader et al. 2024b). Landlocked stocking does occur in the watershed and systems nearby but the river is not supplemented by the DFO LGB program. Salmon DNA was not detected in eDNA samples taken (Table 4) and no salmon were caught using electrofishing (Table 3) at Irish001 in 2025. Many other anadromous species can be found in the river system. Several groups work on the river and surrounding systems. Irish River has evidence of moderate human activity, including recreational fishing and boating use, particularly around the mouth and head of tide.

Site Irish001

Decision Tree Score: 3

Irish001 is not a suitable location for aquaculture escapee monitoring because the river is very wide and potentially tidally influenced near the site and the substrate was extremely slippery, making river access difficult (Figure S35). The site is in Saint John County, New Brunswick, where Main Street/Vaughan Creek Road crosses Irish River at the Hardscrabble Covered Bridge near the head of tide. During the site visit in September 2025, the water levels were likely much lower than they would be during a year with average precipitation levels. The river was 7 m wide wet (12 m bankfull) and 50 – 75 cm deep with exposed river bed downstream of the site more than 25 m wide. The water was 15.8°C and the substrate was a layer of cobble and fine gravel over naturally cemented

cobble. The banks of the river both up- and downstream of the site were steep and rocky in places and there was evidence of flashy flooding in the river. The land around the site is a mix of private and Crown land.

Curry Brook (Irish River system)

Curry Brook in the Irish River system is in Saint John County, New Brunswick, near Orange Hill (Figure 17A). The mouth of the branch joins Irish River approximately 8 km upstream of the mouth where Irish River empties into the Bay of Fundy. The Irish River system is located 81 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that some of the salmon returning to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facilities to the Irish River system are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Curry Brook is predicted to have a moderate amount of salmon habitat [2269 productive salmon habitat units (100 m^2)] and there is likely a wild salmon population in the brook (Reader et al. 2024b). Landlocked stocking does occur in the watershed and systems nearby but the river is not supplemented by the DFO LGB program. Few other anadromous species can be found in the brook. Several groups work on the brook and surrounding systems. Curry Brook has little evidence of human activity.

Site IrishCurry001

Decision Tree Score: 2

IrishCurry001 is not a suitable location for aquaculture escapee monitoring because the brook was almost completely dry (only one isolated pool remained near the site) during the site assessment (Figure S36). The site is in Saint John County, New Brunswick, where Vaughan Creek Road crosses Curry Brook far upstream in the Irish River system. During the site visit in September 2025, the brook was almost completely dry due to the drought in the region. The exposed river bed was 6 – 8 m wide and primarily cobble and gravel. Large debris including fallen trees could be seen across the river upstream of the site and smaller branches and other debris were present along the banks. The site is surrounded by Crown land.

East Branch (Irish River system)

The East Branch of the Irish River system is in Saint John County, New Brunswick, near Orange Hill (Figure 17A). The mouth of the brook joins Irish River approximately 2.5 km upstream of the mouth where Irish River empties into the Bay of Fundy. The Irish River system is located 81 km away from the nearest active salmon aquaculture and the dispersal model predicts that some of the salmon returning to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facilities to the Irish River system are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, East Branch, Irish River is predicted to have a moderate amount of salmon habitat [1860 productive salmon habitat units (100 m^2)] and there is likely a wild salmon population in the branch (Reader et al. 2024b). Landlocked stocking does occur in the watershed and systems nearby but the river is not supplemented by the DFO LGB program. A few other anadromous species can be found in the East Branch. Several groups work on the branch and surrounding systems, and the East Branch has little evidence of human activity.

Site IrishEast002

Decision Tree Score: 3

IrishEast002 is not a suitable location for aquaculture escapee monitoring because the river was narrow with low flow and had several large boulders across the river bed near the site (Figure 37). The site is in Saint John County, New Brunswick, where Vaughan Creek Road crosses East Branch, Irish River. During the site visit in September 2025, the river was 3.5 m wide and approximately 15 cm deep, with visible water marks on the rocks suggesting the river is closer to 50 cm deep during periods with more average rainfall. The river was 13.5°C with bedrock and gravel substrate. There were many large boulders throughout the river near the site, which would interfere with monitoring fence installation and operations. The bridge over the river is the only infrastructure near the site, and the site is surrounded by Crown land.

Big Salmon River

Big Salmon River is in Saint John and Kings Counties, New Brunswick, near Fundy Trail Provincial Park and Saddleback Brook Protected Natural Area (Figure 17B). The mouth of the river empties into the Bay of Fundy. Big Salmon River is located 89 km from the nearest active salmon aquaculture lease. The dispersal model predicts that few of the salmon returning to the river are escaped aquaculture salmon but escapees have previously been detected in the river (Keyser et al. 2018; Morris et al. 2008). The closest dedicated salmon monitoring facilities to Big Salmon River are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system, however salmon are also studied on Big Salmon River by swim-through surveys. The river has a moderate amount of Salmon Production Habitat Area [9092 productive salmon habitat units (100 m^2; O'Connell et al. 1997)] and there is likely an existing wild population in the river (Reader et al. 2024b). Landlocked stocking does occur in the watershed and systems nearby and the river is supplemented by the DFO LGB program. Salmon DNA was detected in eDNA samples taken at BigSalmon001 and BigSalmon002 in 2025. Several other anadromous species can be found in the river. Several groups work on the river and surrounding systems and the area is very well studied. Big Salmon River has moderate evidence of human activities, primarily hiking, camping, and some recreational fishing lower in the system.

Site BigSalmon001

Decision Tree Score: 3

BigSalmon001 is not a suitable location for aquaculture escapee monitoring because the river is already well-studied and any further monitoring would duplicate effort (Figure S38). The site is in Saint John County, New Brunswick, where the Fundy Trail Parkway crosses the river near the head of tide. During the site visit in September 2026, the river was 10 m wide (wet) and approximately 30 cm deep near the site, with some pools more than 1 m deep, but exposed river bed and water lines suggest the river is much deeper and wider during periods with more average rainfall amounts. The water was 19.6°C during the assessment and the river substrate was cobble and boulders overlying bedrock. There are two bridges over the river near the site (car and foot) and the area has a lot of human activity from the nearby hiking trails, lookouts, and nearby Fundy Trail Provincial Park. The area around the site is provincially owned.

Site BigSalmon002

Decision Tree Score: 2

BigSalmon002 is not a suitable location for aquaculture escapee monitoring because the river is already well-studied and any further monitoring would duplicate effort (Figure S39). The site is in Saint John County, New Brunswick, and can be accessed via several unnamed logging roads and ATV trails off of the Fundy Trail Parkway. During the site visit

in September 2025, the river was between 3 and 10 m wide, 30 to 40 cm deep in riffles, and up to 2 m deep below the ATV bridge and in pools located near the site. The banks of the river near the site were steep and rocky, suggesting the river width would not change with higher water levels. The water temperature was 16.8°C during the assessment, and the substrate near the site was large cobble and boulders over bedrock. The ATV bridge was the only infrastructure near the site and the site is surrounded by Crown land

Little Salmon River

Little Salmon River is in Saint John and Kings Counties, New Brunswick, east of Big Salmon River near Fundy Trail Provincial Park and mostly within Little Salmon River Protected Natural Area (Figure 17B). The mouth of the river empties into the Bay of Fundy. Little Salmon River is located 100 km from the nearest active salmon aquaculture lease. The dispersal model predicts that few of the salmon returning to the river are escaped aquaculture salmon but escapees have previously been detected in the river (Morris et al. 2008). The closest dedicated salmon monitoring facilities to Little Salmon River are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system, and the nearby Big Salmon River is monitored using swim-through surveys. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Little Salmon River is predicted to have a moderate amount of salmon habitat [4562 productive salmon habitat units (100 m^2)] and there is likely a wild salmon population in the river (Reader et al. 2024b). Landlocked stocking does occur in the watershed and nearby systems but the river is not supplemented by the DFO LGB program. Salmon DNA was not detected in eDNA samples taken at LittleSalmon001 and LittleSalmon002 (Table 4) and no salmon were caught using electrofishing at LittleSalmon001 (Table 3), both in 2025. Several other anadromous species can be found in the river. Several groups work on the river and surrounding systems and the area is very well studied. Little Salmon River has limited evidence of human activities, primarily hiking, camping, and some recreational fishing lower in the system, but it is largely protected and inaccessible along its length.

Site LittleSalmon001

Decision Tree Score: 3

LittleSalmon001 is not a suitable location for aquaculture escapee monitoring because it can only be accessed by ATV trails and the water levels were very low during the site assessment in September 2025 (Figure S40). The site is in Saint John County, New Brunswick, where an unnamed ATV trail off of Little Salmon River Road crosses the river. During the site visit in September 2025, the river was 8 m wide and between 10 and 50 cm deep with some pools deeper than 1.5 m. Exposed riverbed and water lines visible on some boulders in the river suggest that the river is approximately 20 – 30 cm deeper during periods with more average rainfall. The water was 12.9°C during the visit and the substrate and banks of the river were rocky with boulders and gravel over bedrock. Evidence of flooding could be seen along the banks and under the ATV bridge crossing the river and the banks and substrate suggest the river may be prone to flash flooding. The ATV bridge is the only infrastructure near the site and the site is on Crown land.

Site LittleSalmon002

Decision Tree Score: 3

LittleSalmon002 is not a suitable location for aquaculture escapee monitoring because it is far upstream in the system, the substrate is primarily bedrock, and the river seems prone to flash flooding near the site (Figure S41). The site is along the border between Saint John and Kings Counties, New Brunswick, where Cross Road crosses Little Salmon River. During the site visit in September 2025, the river width varied near the site from 1 m

in riffles to 11 m in pools, and depth ranged from 40 cm to more than 1 m. The water was 13.5°C during the assessment and the river substrate was primarily cobble over bedrock with some larger boulders. Evidence of flooding could be seen along the banks and suggests the river may be prone to flash flooding. The ATV bridge is the only infrastructure near the site and the site is on Crown land.

Northeast Branch (Little Salmon River system)

The Northeast Branch of the Little Salmon River is in Saint John County, New Brunswick (Figure 17B). The mouth of the Northeast Branch empties into Little Salmon River approximately 9 km upstream of the mouth of Little Salmon River, which flows into the Bay of Fundy. Little Salmon River is located 100 km from the nearest active salmon aquaculture lease. The dispersal model predicts that few of the salmon returning to the branch are escaped aquaculture salmon but escapees have previously been detected in the system (Morris et al. 2008). The closest dedicated salmon monitoring facilities to Little Salmon River are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system, and the nearby Big Salmon River is monitored using swim-through surveys. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Northeast Branch, Little Salmon River is predicted to have a moderate amount of salmon habitat [2888 productive salmon habitat units (100 m^2)] and there is likely a wild salmon population in the branch (Reader et al. 2024b). Landlocked stocking does occur in the watershed and nearby systems but the river is not supplemented by the DFO LGB program. Salmon DNA was not detected in eDNA samples taken at LittleSalmonNortheast001 in 2025. Several other anadromous species can be found in the river. Several groups work on the river and surrounding systems and the area is very well studied. The Northeast Branch of Little Salmon River has limited evidence of human activities, primarily hiking and camping, but is near logging operations.

Site LittleSalmonNortheast001

Decision Tree Score: 3

LittleSalmonNortheast001 is not a suitable location for aquaculture escapee monitoring because the river was narrow with very low water levels near the site (Figure S42). The site is in Saint John County, New Brunswick, where Dustin Brook Road crosses the river branch. During the site assessment in September 2025 the river was approximately 2 m wide and 10 – 20 cm deep with a 7 m wide and 1.5 m deep pool near the road bridge. Exposed river bed and water lines on the culvert under the bridge suggests the water is 30 cm deeper during non-drought periods. The water was 12.5°C with a cold spring above the bridge and the river substrate was mostly cobble over bedrock with some small boulders. There was some large debris across the river just downstream of the site with some evidence of flooding. The culvert under the road is the only infrastructure near the site and the site is on Crown land.

Quiddy River

Quiddy River is in Saint John County, New Brunswick, east of Little Salmon River (Figure 17B). The mouth of the river empties into the Bay of Fundy. Quiddy River is located 105 km away from the nearest active salmon aquaculture lease. The dispersal model predicts that few of the salmon returning to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facilities to Quiddy River are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Quiddy River is predicted to have a moderate amount of salmon habitat [3539 productive salmon habitat units (100 m^2)] and there is likely a wild salmon population in the branch (Reader et al. 2024b). Landlocked stocking does occur in

the watershed but the river is not supplemented by the DFO LGB program. Few other anadromous species can be found in the river. Several groups work on the river and surrounding systems and the area is well studied. Quiddy River has evidence of moderate human activity, including swimming and ATV trails.

Site Quiddy001

Decision Tree Score: 3

Quiddy001 is not a suitable location for aquaculture escapee monitoring because there is an impassable waterfall downstream of the site (Figure S43). The site is in Saint John County, New Brunswick, where Cross Road crosses Quiddy River. During the site visit in September 2025 the river near the site was 3 m wide and 20 – 40 cm deep with a bedrock, boulder, and gravel substrate. The water was 22°C during the site visit in September 2025 and exposed river bed suggested the water levels were lower than average during the assessment. There was little evidence of flooding near the site, and the only existing infrastructure is the covered bridge over the river. The land near the site is a mix of Crown and private land.

Site Quiddy002

Decision Tree Score: 3

Quiddy002 is not a suitable location for aquaculture escapee monitoring because there is an impassable waterfall downstream of the site and the water levels were extremely low during the site visit (Figure S44). The site is upstream of Quiddy001 in Kings County, New Brunswick, where Goose Creek Road crosses Quiddy River. The river was about 1 m wide and 15 cm deep during the site assessment in September 2025 and almost completely dry in some stretches near the site, with cobble and silt substrate. The water was 21.2°C in a large pool under the bridge over the river. There was little evidence of flooding near the site. The only infrastructure near the site was the road bridge and the land near the site is a mix of Crown and private land.

Goose Creek

Goose Creek is in Saint John Country, New Brunswick, near Fundy National Park of Canada (Figure 17B). The mouth of the creek empties into the Bay of Fundy. Goose Creek is located 108 km away from the nearest active salmon aquaculture lease. The dispersal model predicts that few of the salmon returning to the creek are escaped aquaculture salmon. The closest dedicated salmon monitoring facilities to Goose Creek are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Goose Creek is predicted to have a moderate amount of salmon habitat [2478 productive salmon habitat units (100 m^2)] and there is likely no wild salmon population in the branch (Reader et al. 2024b). Landlocked stocking does occur in the area but the creek is not supplemented by the DFO LGB program. Few other anadromous species can be found in the creek. Several groups work on the river and surrounding systems and the area is well studied. Goose Creek has limited evidence of human activity, primarily hiking.

Site GooseCreek001

Decision Tree Score: 2

GooseCreek001 is not a suitable location for aquaculture escapee monitoring because the water levels were very low during the site visit and the area around the creek is boggy (Figure S45). There is also a waterfall downstream of GooseCreek001 that may not be

passable to salmon migrating up the creek. The site is in Saint John County, New Brunswick, near the intersection of Cross Road and Goose Creek Road. During the site visit in September 2025, the creek was approximately 2 m wide and 25 cm deep with mud and gravel substrate and limited evidence of flooding. The water was 20.2°C. There is no infrastructure near the site and the site is on Crown land.

Site GooseCreek002

Decision Tree Score: 2

GooseCreek002 is not a suitable location for aquaculture escapee monitoring because the water levels were very low during the site visit and the area around the creek is boggy (Figure S45). There is also a waterfall downstream of GooseCreek001 that may not be passable to salmon migrating up the creek. The site is in Saint John County, New Brunswick, near the border with Kings County along an unnamed logging road off of Goose Creek Road, just upstream of GooseCreek001. During the site visit in September 2025 the creek was approximately 1 m wide and 15 cm deep with mud and gravel substrate. The water was 20.2°C. There was significant debris in the water and along the banks suggesting the creek is prone to flooding and that water levels are generally higher in the creek during periods with more average rainfall. There is no infrastructure near the site and the site is on Crown land.

Shepody River

Shepody River is in Albert County, New Brunswick, near Riverside-Albert and Shepody National Wildlife Area (Figure 17B). The mouth of the river is near Harvey and flows into Chignecto Bay in the Bay of Fundy. Shepody River is located 151 km away from the nearest active salmon aquaculture lease. The dispersal model predicts that none of the salmon returning to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facilities to Shepody River are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system, and the White Rock Dam on the Gaspereau River in Nova Scotia. Opportunistic monitoring also takes place on the nearby Petitcodiac River. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Shepody River is predicted to have a moderate amount of salmon habitat [4791 productive salmon habitat units (100 m^2)] and although there was likely a wild salmon population in the river, hatchery facilities previously existed in the system and there are barriers to salmon migration in the watershed (Reader et al. 2024b). Landlocked stocking does not occur in the watershed. Salmon DNA was not detected in eDNA samples taken at Shepody003 in 2025. Several other anadromous species can be found in the river. Several groups work on the river and surrounding systems. Shepody River has limited evidence of human activity, primarily boating.

Site Shepody003

Decision Tree Score: 3

In addition to the model prediction that no escaped aquaculture salmon will enter the system, Shepody003 is not a suitable location for aquaculture escapee monitoring because the river is wide, deep, and primarily wetland habitat near the site and there are barriers to fish migration in the Shepody River system (Figure S47). The site is in Albert County, New Brunswick, at the edge of the Shepody National Wildlife Area where Midway Road crosses Shepody River near Germantown. During the site visit in September 2025, the river was approximately 11 m wide and 1 m deep with sandy substrate and the water was 16°C. The area surrounding the river was wetland habitat and there was little evidence of flooding. The Midway Road bridge over the river is the only infrastructure near the site and land is a mix of private and Crown land.

Crooked Creek (Shepody River system)

Crooked Creek is in Albert County, New Brunswick, north of the main branch of Shepody River and near Caledonia Gorge (Figure 17B). The mouth of the creek is near Riverside-Albert and flows into Shepody River, which empties into Chignecto Bay in the Bay of Fundy. Shepody River is located 151 km away from the nearest active salmon aquaculture lease. The dispersal model predicts that none of the salmon returning to the creek are escaped aquaculture salmon. The closest dedicated salmon monitoring facilities to Shepody River and Crooked Creek are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system, and the White Rock Dam on the Gaspereau River in Nova Scotia. Crooked Creek has a moderate amount of Salmon Production Habitat Area. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Crooked Creek is predicted to have a moderate amount of salmon habitat [3314 productive salmon habitat units (100 m^2)] and although there was likely a wild salmon population in the system, hatchery facilities previously existed in the system and there are barriers to salmon migration in the watershed (Reader et al. 2024b). Landlocked stocking does not occur in the watershed. Salmon DNA was not detected in eDNA samples taken at ShepodyCrooked004B in 2025. Several other anadromous species can be found in the river. Several groups work on the river and surrounding systems. Crooked Creek has limited evidence of human activity, primarily fishing.

Site ShepodyCrooked004B

Decision Tree Score: 3

In addition to the model prediction that no escaped aquaculture salmon will enter the system, ShepodyCrooked004B is not a suitable location for aquaculture escapee monitoring because the river is tidally influenced at the site and there are barriers to fish migration in the Shepody River system (Figure S48). The site is in Albert County, New Brunswick, near Riverside-Albert and beside an old unused fish hatchery. During the site visit in September 2025 the river was 6 – 8 m wide (wet width) and more than 1 m deep with some shallower riffles and exposed river bed. The water was 18.5°C and the substrate was primarily sand and gravel. There was some evidence of flooding near the site with indications that the site may be prone to flash flooding and tidal influence. There is no infrastructure in the river near the site and the land around the site is privately owned.

Site ShepodyCrooked100

Decision Tree Score: 3

In addition to the model prediction that no escaped aquaculture salmon will enter the system, ShepodyCrooked100 is not a suitable location for aquaculture escapee monitoring because the water levels were extremely low during the site visit, the area is used extensively for recreation, and there are barriers to fish migration in the Shepody River system (Figure S49). The site is in Albert County, New Brunswick, near Chester and Riverside-Albert. During the site visit in September 2025, the river was 13 m wide (wet width) with exposed river bed at both banks. The river was very shallow in riffles but had a pool approximately 1.5 m deep that had evidence of human use. The water was 18.5°C and the substrate was primarily large cobble and gravel. There was some evidence of flooding near the site with indications that the site may be prone to flash flooding. There is no infrastructure in the river near the site and the land around the site is privately owned.

Demoiselle Creek

Demoiselle Creek is in Albert County, New Brunswick, near the Petitcodiac River (Figure 17B). The mouth of the creek empties into Chignecto Bay in the Bay of Fundy. Demoiselle Creek is located 161 km away from the nearest active salmon aquaculture lease. The dispersal model predicts that none of the salmon returning to the creek are escaped aquaculture salmon. The closest dedicated salmon monitoring facilities to Shepody River and Crooked Creek are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system, and the White Rock Dam on the Gaspereau River in Nova Scotia. Opportunistic monitoring also takes place on the nearby Petitcodiac River. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Demoiselle Creek is predicted to have a moderate amount of salmon habitat [2717 productive salmon habitat units (100 m^2)] and there is a suspected existing wild population in the creek (Reader et al. 2024b), although salmon DNA was not detected in eDNA samples taken at Demoiselle002 in 2025. Landlocked stocking does not occur in the watershed. Several other anadromous species can be found in the river. Several groups work on the river and surrounding systems. Demoiselle Creek has evidence of moderate human activity, primarily ATV use, swimming, and recreational fishing.

Site Demoiselle002

Decision Tree Score: 3

In addition to the model prediction that no escaped aquaculture salmon will enter the system, Demoiselle002 is not a suitable location for aquaculture escapee monitoring because there is no fish passage into the Creek (Figure S50). The site is in Albert County, New Brunswick, near Curryville. During the site visit in September 2025, the creek was 11 m wide (wet width) underneath the bridge over the water, 2 m wide (wet width) upstream of the site, and 15 m wide bankfull. The creek was approximately 20 cm deep in riffles and 2 m deep in the large pool underneath the bridge. The water was 16.8°C and the substrate was a mix of sand, gravel, and cobble. There was some evidence of flooding near the site and evidence of beaver activity. There is a wooden bridge over the creek at the site and the land nearby is privately owned.

East Branch (Apple River system)

The Apple River system is in Cumberland County, Nova Scotia, near Apple River and the Raven Head Wilderness Area. It contains several branches, including the East Branch, South Branch, and Morang Branch, that come together in a large salt marsh where the system empties into the Bay of Fundy (Figure 17C). The mouth of the East Branch empties into Apple River near the tidal mouth of the system, which flows into Chignecto Bay in the Bay of Fundy. Apple River is located 117 km away from the nearest active salmon sea pen aquaculture lease and the dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facilities to Apple River are the Nashwaak Fence on the Nashwaak River and Mactaquac Dam, both in the Saint John River system, and the White Rock Dam on the Gaspereau River in Nova Scotia, but these monitoring facilities are several hundred kilometres from the Apple River. Although no specific estimates for the East Branch exist, the Apple River main stem has a moderate amount of salmon habitat [2111 productive salmon habitat units (100 m^2; O'Connell et al. 1997)] and there is likely a wild salmon population in the river (Reader et al. 2024b). No salmon stocking occurs in the Apple River system. Several other anadromous species can be found in the river. A few organizations are actively engaged in conservation and fisheries-related work in the river. East Branch has evidence of moderate human activity, primarily hiking, camping, and some recreational fishing.

Site AppleEast003

Decision Tree Score: 3

In addition to the model prediction that no escaped aquaculture salmon will enter the system, AppleEast003 is not a suitable location for aquaculture escapee monitoring because it is difficult to access, there is evidence of flooding near the site, and there are more suitable sites within the system (Figure S51). The site is in Cumberland County, Nova Scotia, along a logging road off North Greville Road. During the site visit in July 2025 the river was 4 m wide and 30 – 40 cm deep. The water was 18.3°C and the substrate was a mix of cobble, gravel, fines, and some exposed bedrock. There was evidence of flooding near the site, including large trees down across the river upstream of the site. The remnants of an old wooden bridge cross the river at the site. The land around the site is provincially owned and the area nearby is primarily used for logging operations.

Ramshead River

Ramshead River is in Cumberland County, Nova Scotia, west of the community of Parrsboro (Figure 17C). The mouth of the river is in the town of Diligent River where it empties into the Bay of Fundy near the Minas Basin. Ramshead River is located 134 km away from the nearest active salmon sea pen aquaculture lease and the dispersal model predicts that few of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility is the White Rock Dam on Gaspereau River. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Ramshead River is predicted to have a moderate amount of salmon habitat [2387 productive salmon habitat units (100 m^2)] however there is likely no wild salmon population in the river (Reader et al. 2024b); salmon DNA was not detected in eDNA samples taken at Ramshead002 in 2025 (Table 4). No salmon stocking occurs in the Ramshead River. A few other anadromous species can be found in the river. Several organizations are actively engaged in conservation and fisheries-related work in the river. Ramshead River has limited evidence of human activity, primarily recreational fishing.

Site Ramshead001

Decision Tree Score: 3

In addition to the model prediction that no escaped aquaculture salmon will enter the system, Ramshead001 is not a suitable location for aquaculture escapee monitoring because it is difficult to access safely and other more suitable sites exist in the system (Figure S52). The site is in Cumberland County, Nova Scotia, near the community of Diligent River. During the site visit in July 2025, the river was approximately 15 m wide and 20 cm deep and the substrate was mostly gravel and cobble. There was evidence of flooding near the site, including large trees down across the river downstream of the site. The active road bridge and support pillars for an old bridge can be found near the site and the land near the site is privately owned.

Diligent River

Diligent River is in Cumberland County, Nova Scotia, west of Parrsboro near Wharton (Figure 17C). The mouth of the river empties into the Bay of Fundy near the Minas Basin. Diligent River is located 135 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility is the White Rock Dam on Gaspereau River. Diligent River has a small amount of salmon habitat [335 productive salmon habitat units (100 m^2; O'Connell et al. 1997)] and there is likely a wild salmon population in the river (Reader et al. 2024b). Landlocked stocking does not occur in the watershed but the river is not supplemented

by the DFO LGB program. A few other anadromous species can be found in the river. Several groups work on the river and surrounding systems. Diligent River has limited evidence of human activity, primarily ATV use.

Site Diligent100

Decision Tree Score: 3

In addition to the model prediction that no escaped aquaculture salmon will enter the system, Diligent100 is not a suitable location for aquaculture escapee monitoring because access requires an ATV (Figure S53). The site is in Cumberland County, Nova Scotia, south of Parrsboro Shore Road. During the site visit in July 2025, the river was approximately 12 m wide in pools, 20 cm deep in riffles, and 1.5 m deep in pools. The water was 20.3°C and the substrate was mostly gravel and silt. There was some evidence of flooding near the site, including debris downstream of the site. The site is surrounded by Crown land.

North Branch (Diligent River system)

The North Branch of Diligent River is in Cumberland County, Nova Scotia, west of Parrsboro near Wharton (Figure 17C). The North Branch joins Diligent River approximately 5 km from the mouth of the river where it empties into the Bay of Fundy near the Minas Basin. The Diligent River system is located 135 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility is the White Rock Dam on Gaspereau River. No specific measurements exist for the North Branch, but Diligent River main stem has a small amount of salmon habitat [335 productive salmon habitat units (100 m^2; O'Connell et al. 1997)] and there is likely a wild salmon population in the river (Reader et al. 2024b). Landlocked stocking does not occur in the watershed and the river is not supplemented by the DFO LGB program. A few other anadromous species can be found in the river. Several groups work on the river and surrounding systems. The North Branch of Diligent River has limited evidence of human activity, primarily hiking.

Site DNorth002

Decision Tree Score: 3

In addition to the model prediction that no escaped aquaculture salmon will enter the system, DNorth002 is not a suitable location for aquaculture escapee monitoring because the water level was very low during the site visit and there are impassable falls upstream of the site (Figure S54). The site is in Cumberland County, Nova Scotia, north of Parrsboro Shore Road. During the site visit in July 2025, the river was 4 m wide (with evidence that it would be approximately 2 m wider with more typical water levels) and 15 cm deep. The water was 15.7°C and the substrate was mostly large gravel and cobble. There was limited evidence of flooding near the site although the banks were undercut along one side of the river. There was a grassy parking area near the site but no other infrastructure and the land around the site is municipally owned.

Wharton Brook (Diligent River system)

Wharton Brook in the Diligent River system is in Cumberland County, Nova Scotia, west of Parrsboro near Wharton (Figure 17C). Wharton Brook joins Diligent River approximately 3 km from the mouth of the river where it empties into the Bay of Fundy near the Minas Basin. The Diligent River system is located 135 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that none of the salmon that return to the brook are escaped aquaculture salmon. The closest dedicated salmon monitoring facility is the White Rock Dam on

Gaspereau River. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Wharton Brook is predicted to have a moderate amount of salmon habitat [2067 productive salmon habitat units (100 m^2)] and there is likely a wild salmon population in the brook (Reader et al. 2024b). Landlocked stocking does not occur in the watershed and the river is not supplemented by the DFO LGB program. Very few other anadromous species can be found in the brook. Several groups work on the brook and surrounding systems. Wharton Brook has little evidence of human activity.

Site Wharton002

Decision Tree Score: 1

In addition to the model prediction that no escaped aquaculture salmon will enter the system, Wharton002 is not a suitable location for aquaculture escapee monitoring because the site was completely dry during the site visit in July 2025 (Figure S55). The site is in Cumberland County, Nova Scotia, near the intersection of Parrsboro Shore Road and Kirkhill Road. No measurements were taken at the site because the brook was completely dry, but the exposed river bed was mostly gravel and small cobble. There is a road bridge over the brook at the site, and the land around the site was mostly privately owned farmland.

Farrells River

Farrells River is in Cumberland County, Nova Scotia (Figure 17C). The mouth of the river is in Parrsboro where it empties into the Bay of Fundy near the Minas Basin. Farrells River is located 146 km away from the nearest active salmon aquaculture lease. The dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon but escapees have previously been detected in the river (Keyser et al. 2018). The closest dedicated salmon monitoring facility is the White Rock Dam on Gaspereau River. Farrells River has a small amount of salmon habitat [705 productive salmon habitat units (100 m^2; DFO 2008)] and there is likely a wild salmon population in the river (Reader et al. 2024b). Landlocked stocking does not occur in the watershed and the river is not supplemented by the DFO LGB program. A few other anadromous species can be found in the river. Several groups work on the river and surrounding systems. Farrells River has evidence of moderate human activity, primarily recreational fishing and urban use.

Site Farrells001

Decision Tree Score: 2

In addition to the model prediction that no escaped aquaculture salmon will enter the system, Farrells001 is not a suitable location for aquaculture escapee monitoring because there were several beaver dams both up- and downstream of the site (Figure S56). The site is in Cumberland County, Nova Scotia, near Parrsboro. During the site visit in July 2025, the river was 7 m wide and 30 – 40 cm deep. The water was 20°C and the river substrate was mostly mud with some cobble. There was little evidence of flooding but the land adjacent to the banks was boggy. There is a bridge over the river at the site and the land around the site is provincially owned.

Site Farrells003

Decision Tree Score: 2

In addition to the model prediction that no escaped aquaculture salmon will enter the system, Farrells003 is not a suitable location for aquaculture escapee monitoring because like Farrells001, there is significant beaver activity near the site (Figure S57). The site is in

Cumberland County, Nova Scotia, where Spence Road crosses Farrells River. During the site visit in July 2025 the river was 6 m wide (8 m in pools), 5 cm deep in riffles, and 30 cm deep in runs. The water was 17.3°C and the substrate was mostly mud and gravel. There was some evidence of flooding near the site and both up- and downstream were overgrown with shrubs. There is a bridge with wooden supports at the site and the land around the site is provincially owned.

Moose River

Moose River is in Cumberland Country, Nova Scotia (Figure 17C). The mouth of the river empties into Minas Basin in the Bay of Fundy. Moose River is located 155 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that few of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility is the White Rock Dam on Gaspereau River. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Moose River is predicted to have a moderate amount of salmon habitat [2797 productive salmon habitat units (100 m^2)] and there is likely no wild salmon population in the brook (Reader et al. 2024b). No salmon stocking occurs in the Moose River system. Several other anadromous species can be found in the river. Several other anadromous species can be found in the river. A few organizations are actively engaged in conservation and fisheries-related work in the river. Moose River has high evidence of human activity, including campfires, swimming, and camping.

Site Moose100

Decision Tree Score: 4

Moose100 is not a suitable location for aquaculture escapee monitoring because the river is tidally influenced at the site (Figure S58).The site is in Cumberland County, Nova Scotia, just downstream of the confluence of the East and West Branches of Moose River. During the site visit in July 2025 the river was 10 m wide (likely 15 m wide during high tide) and 1 m deep in pools. The water was 18°C and the river substrate was mostly silt and gravel with some cobble. There was evidence of tidal flooding near the site, likely due to freshwater backup rather than saltwater intrusion. There was evidence of camping and other recreation activities near the site and an old weir structure built into the river downstream of the site. The land around the site is provincially owned.

Harrington River

Harrington River is located between Cumberland and Colchester Counties, Nova Scotia (Figure 17C). The mouth of the river empties into the Minas Basin in the Bay of Fundy near Five Islands Provincial Park. Harrington River is located 161 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon, although escapees have previously been detected in the system (Keyser et al. 2018; Morris et al. 2008). The closest dedicated salmon monitoring facility is the White Rock Dam on Gaspereau River. Harrington River has a small amount of salmon habitat [629 productive salmon habitat units (100 m^2; O'Connell et al. 1997)] and there is likely a wild salmon population in the river (Reader et al. 2024b). Landlocked stocking does not occur in the watershed and the river is not supplemented by the DFO LGB program. A few other anadromous species can be found in the river. Several groups work on the river and surrounding systems. Harrington River has limited evidence of human activity.

Site Harrington001

Decision Tree Score: 1

In addition to the model prediction that no escaped aquaculture salmon will enter the system, Harrington001 is not a suitable location for aquaculture escapee monitoring because it is difficult to access with a very steep bank from the road to the river (Figure S59). The site is on the border between Cumberland and Colchester Counties, Nova Scotia, along Nova Scotia Highway 2/Glooscap Trail. During the site visit in July 2025, the river was 3 m wide in riffles, 7 m in runs, and 20 cm deep with many braiding channels. The water was 17.6°C and the substrate was a mix of cobble and exposed bedrock. There was some evidence of flooding with a fallen tree and other debris visible upstream of the site. The road bridge over the river is the only infrastructure near the site and the land around the site is provincially owned.

North River (Colchester County)

North River is in Colchester County, Nova Scotia, near Five Islands Provincial Park (there is another North River in Colchester County that is a part of the Salmon River system) (Figure 17C). The mouth of the river empties into the Minas Basin in the Bay of Fundy. North River is located 163 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility is the White Rock Dam on Gaspereau River. The river has a moderate amount of Salmon Production Habitat Area. North River has a moderate amount of salmon habitat [4485 productive salmon habitat units (100 m^2; DFO 2008)] and there is likely a wild salmon population in the river (Reader et al. 2024b). Landlocked stocking does not occur in the watershed and the river is not supplemented by the DFO LGB program. Few other anadromous species can be found in the river. Several groups work on the river and surrounding systems. North River has little evidence of human activity.

Site NorthCumberland001

Decision Tree Score: 1

In addition to the model prediction that no escaped aquaculture salmon will enter the system, NorthCumberland001 is not a suitable location for aquaculture escapee monitoring because the river is tidal at the site (Figure S60). The site is in Colchester County, Nova Scotia, where Nova Scotia Highway 2/Glooscap Trail crosses North River. No specific site measurements were taken during the site visit in July 2025 due to the obvious tidal nature of the river, but the substrate was primarily mud and sand near the site. The road bridge over the river is the only infrastructure near the site and the land around the site is privately and provincially owned.

East Branch (Economy River system)

The East Branch of Economy River is in Colchester County, Nova Scotia near Upper Economy (Figure 17C). The mouth of the river empties into Economy River approximately 4 km upstream of the mouth, which flows into Minas Basin in the Bay of Fundy Economy River is located 174 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility to Economy River is the White Rock Dam on Gaspereau River. No specific measurements are available for the East Branch, but the main stem of Economy River has a moderate amount of salmon habitat [2386 productive salmon habitat units (100 m^2; O'Connell et al. 1997)] and there is likely a wild salmon population in the river (Reader et al. 2024b). The river is intermittently supplemented by the DFO LGB program. Salmon DNA was not detected in eDNA samples taken at EconomyEast001 in 2025. Several other anadromous species can be found in the river. A few organizations are actively engaged in

conservation and fisheries-related work in the river The East Branch Economy River has limited evidence of human activity.

Site EconomyEast001

Decision Tree Score: 2

In addition to the model prediction that no escaped aquaculture salmon will enter the system, EconomyEast001 is not a suitable location for aquaculture escapee monitoring because the branch is fairly small near the site and there is evidence of beaver activity (Figure S61). The site is in Colchester County, Nova Scotia, where Economy River Road crosses the river. During the site visit in July 2025, the river was 1-2 m wide (wet width), 5 – 6 m wide (bankfull) near the road bridge, 5 cm deep in riffles, and 30 – 50 cm deep in pools. The water was 18°C and the substrate was silt over cobble. There was some evidence of flooding near the site, including evidence of road washout, and debris that may have been from beaver activity. The road bridge is the only infrastructure near the site and the land around the site is a mix of provincial and Crown land.

Bass River

Bass River is in Colchester County, Nova Scotia (Figure 17C). The mouth of the river empties into Cobequid Bay in the Bay of Fundy. Bass River is located 186 km away from the nearest active salmon sea pen aquaculture lease and the dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility to Bass River is in the Stewiacke River. Bass River has a small amount of salmon habitat [696 productive salmon habitat units (100 m^2; O'Connell et al. 1997)] and there is likely a wild salmon population in the river (Reader et al. 2024b), however salmon DNA was not detected in eDNA samples taken at Bass002 in 2025 (Table 4). The river was previously supplemented by the DFO LGB program although stocking no longer occurs in the system. Several other anadromous species can be found in the river. A few organizations are actively engaged in conservation and fisheries-related work in the river. Bass River has limited evidence of human activity, primarily fishing.

Site Bass001

Decision Tree Score: 3

In addition to the model prediction that no escaped aquaculture salmon will enter the system, Bass001 is not a suitable location for aquaculture escapee monitoring because it is very publicly accessible in the center of the community near West Colchester Consolidated School (Figure S62). The site is in Colchester County, Nova Scotia, near the intersection of Nova Scotia Highway 2/Glooscap Trail and Maple Ave. During the site visit in July 2025, the river was 2 – 4 m (wet width) with exposed river bed both up- and downstream of the site and 35 cm deep. The water was 18.3°C and the substrate was a mix of cobble and large boulders. There was some evidence of minor flooding near the site. The road bridge and several parking areas provide easy access to the site and the land around the site is municipally owned.

West Bass River

West Bass River is in Colchester County, Nova Scotia (Figure 17C). The mouth of the river empties into Bass River in the tidal portion, where it flows into Cobequid Bay in the Bay of Fundy. West Bass River is located 186 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility to Bass River is the White Rock Dam on Gaspereau River. No specific measurements are available for West

bass River, but the main stem of Bass River has a small amount of salmon habitat [696 productive salmon habitat units (100 m^2; O'Connell et al. 1997)] and there is likely a wild salmon population in the river (Reader et al. 2024b), however salmon DNA was not detected in eDNA samples taken at Bass002 in 2025 (Table 4). The river was previously supplemented by the DFO LGB program although stocking no longer occurs in the system. Several other anadromous species can be found in the river. A few organizations are actively engaged in conservation and fisheries-related work in the river. West Bass River has limited evidence of human activity, primarily fishing.

Site BassWest002

Decision Tree Score: 3

In addition to the model prediction that no escaped aquaculture salmon will enter the system, BassWest002 is not a suitable location for aquaculture escapee monitoring because the water was very low during the site visit and other suitable sites exist in the system (Figure S63). The site is in Colchester County, Nova Scotia, where Old Economy Road crosses West Branch, Bass River. During the site visit in July 2025, the river was 3 – 4 m wide (wet width) and 15 cm deep with exposed river bed suggesting the water levels were lower than average in July 2025. The water was 16.8°C and the substrate was mostly cobble with some boulders. There was some evidence of flooding at the site. The only infrastructure near the site is the wooden road bridge and the land around the site is Crown land.

North River (Salmon River system, Colchester County)

The North River (Salmon River system) is in Colchester County, Nova Scotia, near Truro (Figure 17D). The mouth of the North River flows into Salmon River near Onslow and empties into the eastern end of Cobequid Bay in the Bay of Fundy. The Salmon River system is located 208 km away from the nearest active salmon aquaculture lease. The dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon although escapees have previously been detected in the Salmon River system (Keyser et al. 2018). The closest dedicated salmon monitoring facility to the Salmon River system is the White Rock Dam on Gaspereau River. North River has a moderate amount of salmon habitat [4485 productive salmon habitat units (100 m^2; O'Connell et al. 1997)] and there is likely a wild salmon population in the river (Reader et al. 2024b). The river was historically supplemented by the DFO LGB program although stocking no longer occurs in the system. There is a “u-fish” stocking operation along the North River, however they mainly stock trout. Several other anadromous species can be found in the river. Many organizations are actively engaged in conservation and fisheries-related work in the river. The North River (Salmon River system) has evidence of moderate human activity, including boating and recreational fishing.

Site North002

Decision Tree Score: 2

In addition to the model prediction that no escaped aquaculture salmon will enter the system, North002 is not a suitable location for aquaculture escapee monitoring because there was evidence of potential flash flooding and the substrate is not ideal for fence installation (Figure S64). The site is in Colchester County, Nova Scotia, near Truro. During the site visit in August 2025, the river was 13.5 m wide (with steep banks), 80 cm deep in pools, and 40 – 50 cm deep elsewhere. The water levels were lower than average with water lines visible on boulders in the river. The water was 17°C and the substrate was mostly boulders with some cobble overlying bedrock. There is a road bridge downstream of the site but little other infrastructure and the land around the site is provincially owned.

West Branch (North River, Salmon River system, Colchester County)

The West Branch of the North River (Salmon River system) is in Colchester County, Nova Scotia, near Truro (Figure 17D). The mouth of the West Branch is near North River, where it flows into North River which flows into Salmon River near Onslow which empties into the eastern end of Cobequid Bay in the Bay of Fundy. The Salmon River system is located 208 km away from the nearest active salmon aquaculture lease (the West Branch of North River is 15 km upstream of the mouth of the system). The dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon although escapees have previously been detected in the Salmon River system (Keyser et al. 2018). The closest dedicated salmon monitoring facility to the Salmon River system is the White Rock Dam on Gaspereau River. No specific measurements exist for the West Branch, but North River has a moderate amount of salmon habitat [4485 productive salmon habitat units (100 m^2; O'Connell et al. 1997)] and there is likely a wild salmon population in the river (Reader et al. 2024b). The river was historically supplemented by the DFO LGB program although stocking no longer occurs in the system. Several other anadromous species can be found in the river. Many organizations are actively engaged in conservation and fisheries-related work in the river. The West Branch of the North River (Salmon River system) has limited evidence of human activity.

Site NorthWest002

Decision Tree Score: 2

In addition to the model prediction that no escaped aquaculture salmon will enter the system, NorthWest002 is not a suitable location for aquaculture escapee monitoring because the river water levels were very low, there was evidence of potential flash flooding, and the substrate is not ideal for fence installation (Figure S65). The site is in Colchester County, Nova Scotia, where Truro Road crosses West Branch, North River. During the site visit in August 2025, the river was 4 m wide wet width, 14 m wide bankfull, and approximately 15 cm deep with some deeper 45 cm pools. The water was 15.3°C and the substrate was mostly bedrock with some cobble near the banks. One bank of the river was a steep wall approximately 4 m high. The road bridge is the only existing infrastructure near the site and the land around the site is privately owned.

Salmon River (Colchester County)

The Salmon River system is in Colchester County, Nova Scotia, near Truro (Figure 17D). The mouth of the river is in Truro where it empties into the eastern end of Cobequid Bay in the Bay of Fundy. Salmon River is located 208 km away from the nearest active salmon sea pen aquaculture lease. The dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon however escaped aquaculture salmon have been detected in the river (Keyser et al. 2018). The closest dedicated salmon monitoring facility to the Salmon River system is in the Stewiacke River. Salmon River has a large amount of salmon habitat [13468 productive salmon habitat units (100 m^2; O'Connell et al. 1997)] and there is likely a wild salmon population in the river (Reader et al. 2024b); salmon DNA was detected in eDNA samples taken at SalmonTruro005 in 2025 (Table 4). The river was historically supplemented by the DFO LGB program although stocking no longer occurs in the system. Several other anadromous species can be found in the river. Many organizations are actively engaged in conservation and fisheries-related work in the river. Salmon River has evidence of high human activity, including fishing and urban use.

Site SalmonTruro003

Decision Tree Score: 3

In addition to the model prediction that no escaped aquaculture salmon will enter the system, SalmonTruro003 is not a suitable location for aquaculture escapee monitoring because the river is likely too deep for safe fence operation in periods with more average rainfall (Figure S66). The site is in Colchester County, Nova Scotia, where Riversdale Road crosses Salmon River. During the site visit in August 2025, the river had a channel 4 m wide (with exposed river bed on either site), riffles 11 m wide, and was 15 m wide under the bridge. The river near the site was approximately 25 cm deep with some shallower riffles and 1 m deep pools. The water was 16.7°C and the substrate was cobble overlying bedrock. There was some evidence of flooding near the site. The road bridge is the only infrastructure near the site and the site is surrounded by Crown land.

Black River (Salmon River system, Colchester County)

The Black River (Salmon River system) is in Colchester County, Nova Scotia, near Truro (Figure 17D). The mouth of the Black River flows into Salmon River approximately 25 km upstream of the mouth of the system, which empties into the eastern end of Cobequid Bay in the Bay of Fundy. The Salmon River system is located 208 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon although escaped aquaculture salmon have been detected in the river (Keyser et al. 2018). The closest dedicated salmon monitoring facility to Black River is the White Rock Dam on Gaspereau River. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Black River is predicted to have a moderate amount of salmon habitat [7826 productive salmon habitat units (100 m^2)] and there is likely a wild salmon population in the river (Reader et al. 2024b). The river was historically supplemented by the DFO LGB program although stocking no longer occurs in the system. Several other anadromous species can be found in the river. Many organizations are actively engaged in conservation and fisheries-related work in the river. The Black River (Salmon River system) has evidence of moderate human activity, including boating, recreational fishing, and camping.

Site Black001

Decision Tree Score: 3

In addition to the model prediction that no escaped aquaculture salmon will enter the system, Black001 is not a suitable location for aquaculture escapee monitoring because the site is fairly high in the system, would require significant brush clearing for access, and other, more appropriate sites already exist in the system (Figure S67). The site is in Colchester County, Nova Scotia, where Riversdale Road crosses Black River. During the site visit in August 2025, the river was 16 m wide in channels with narrower 4 m riffles upstream of the site and 20 – 40 cm deep. The water was 17.3°C and the substrate was primarily bedrock with some cobble. There was limited evidence of flooding near the site. The road bridge is the only infrastructure near the site and the site is surrounded by Crown land.

Gays River (Shubenacadie River system)

Gays River in the Shubenacadie River is located between Colchester and Hants Counties in Nova Scotia (Figure 17D). The mouth of Gays River flows into Shubenacadie River approximately 30 km upstream of the mouth of the system, where it empties into Cobequid Bay in Minas Basin in the Bay of Fundy. The Shubenacadie River system is located 208 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility to the Shubenacadie River system is the White Rock Dam on

Gaspereau River. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Gays River is predicted to have a moderate amount of salmon habitat [8419 productive salmon habitat units (100 m^2)] and there is likely a wild salmon population in the river (Reader et al. 2024b). There are hatcheries in the Shubenacadie River system, and landlocked stocking does occur in the area - the Stewiacke River, part of the Shubenacadie River system, is well-studied and supplemented by the DFO LGB program. Salmon DNA was not detected in eDNA samples taken at McLeans004 in 2025. Several other anadromous species can be found in the river system. Many groups work on the river and surrounding regions. Gays River has evidence of high human activity, including boating, and recreational and commercial fishing.

Site McLeans004

Decision Tree Score: 3

In addition to the model prediction that no escaped aquaculture salmon will enter the system, McLeans004 is not a suitable location for aquaculture escapee monitoring because the river is likely too deep for safe fence operation during periods of more average rainfall in the region (Figure S68). The site is on the border between Colchester and Halifax Counties, Nova Scotia, where Cooks Mill Road crosses Gays River. During the site visit in August 2025, the river was 7 m wide and 15 cm deep in riffles, 15 m wide in runs, 50 cm deep in other stretches, and close to 1 m deep below the bridge. The water was 20.6°C and the substrate was a mix of gravel, sand, and cobble. There was some evidence of flooding near the site, but limited evidence of flash flooding. The road bridge is the only infrastructure near the site, and the land around the site is privately owned and mostly agricultural.

Shubenacadie River

Shubenacadie River is located between Colchester and Hants Counties in Nova Scotia (Figure 17D). The mouth of the river is in Maitland, where it empties into Cobequid Bay in Minas Basin in the Bay of Fundy. Shubenacadie River is located 208 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility to the Shubenacadie River system is the White Rock Dam on Gaspereau River. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Shubenacadie River is predicted to have a large amount of salmon habitat [10340 productive salmon habitat units (100 m^2)] and there is likely a wild salmon population in the river (Reader et al. 2024b). There are hatcheries in the Shubenacadie River system, and landlocked stocking does occur in the area - the Stewiacke River, part of the Shubenacadie River system, is well-studied and supplemented by the DFO LGB program. Several other anadromous species can be found in the river system. Many groups work on the river and surrounding regions. Shubenacadie River has evidence of high human activity, including recreational and commercial fishing.

Site Shubenacadie001

Decision Tree Score: 1

In addition to the model prediction that no escaped aquaculture salmon will enter the system, Shubenacadie001 is not a suitable location for aquaculture escapee monitoring because the river and site are heavily used by people for both recreation and commercial activities (Figure S69). The site is on the border between Hants and Halifax Counties, Nova Scotia, where Nova Scotia Route 277 crosses Shubenacadie River near Lantz. Because the site is heavily used (including water intake or effluent pipes in the river under the bridge) and not appropriate for research activities, specific site measurements weren't taken during the site visit in August 2025. There was moderate evidence of flooding near

the site, and the road bridge over the river is the main infrastructure near the site, although other evidence of human use is also present near the site. The land around the site is provincially and municipally owned.

Nine Mile River (Shubenacadie River system)

Nine Mile River in the Shubenacadie River is located between Colchester and Hants Counties in Nova Scotia (Figure 17D). The mouth of Nine Mile River flows into Shubenacadie River approximately 40 km upstream of the mouth of the system, where it empties into Cobequid Bay in Minas Basin in the Bay of Fundy. The Shubenacadie River system is located 208 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility to the Shubenacadie River system is the White Rock Dam on Gaspereau River. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Nine Mile River is predicted to have a moderate amount of salmon habitat [7088 productive salmon habitat units (100 m^2)] and there is likely a wild salmon population in the river (Reader et al. 2024b). There are hatcheries in the Shubenacadie River system, and landlocked stocking does occur in the area - the Stewiacke River, part of the Shubenacadie River system, is well-studied and supplemented by the DFO LGB program. Several other anadromous species can be found in the river system. Many groups work on the river and surrounding regions. Gays River has evidence of high human activity, including boating, and recreational and commercial fishing.

Site NineMile003

Decision Tree Score: 2

In addition to the model prediction that no escaped aquaculture salmon will enter the system, NineMile003 is not a suitable location for aquaculture escapee monitoring because the site is high up in the Shubenacadie River system and is too deep for safe operation of a counting fence (Figure S70). The site is in Hants County, Nova Scotia, where Garden Road crosses Nine Mile River. During the site visit in August 2025, the river was 14 m wide and 70 cm deep, with evidence of higher water levels during periods with more average rainfall in the region. The water was 23.8°C and the substrate was a mix of large boulders and cobble. There was evidence of flooding near the site and flooding has previously been reported in the watershed. The road bridge is the only major infrastructure near the site, and the land around the site is provincially owned.

Kennetcook River (Avon River system)

The Kennetcook River (Avon River system) is in Hants County, Nova Scotia, along Nova Scotia Highway 236 between the communities of Upper Burlington and Kennetcook (Figure 17D). The mouth of the river flows into the tidal portion of the Avon River near Centre Burlington, and the Avon then empties into the Minas Basin. The Avon River system is located 179 km away from the nearest active salmon sea pen aquaculture lease (the mouth of Kennetcook River is a further 10 km upstream of the mouth of the system) and the dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility to the Avon River system is the White Rock Dam on Gaspereau River. The Kennetcook River has a moderate amount of salmon habitat [3976 productive salmon habitat units (100 m^2; O'Connell et al. 1997)] and there is likely a wild salmon population in the river (Reader et al. 2024b), however salmon DNA was not detected in eDNA samples taken at Kennetcook001 in 2025 (Table 4). A few hatcheries and fish facilities are located in the system, but the river is not supplemented by the DFO LGB program. Many organizations are actively engaged in conservation and fisheries-related work in the river. Kennetcook River has

evidence of high human activity, primarily lower in the system, including kayaking, camping, and fishing.

Site Kennetcook004

Decision Tree Score: 2

The Kennetcook River at site Kennetcook004 was almost completely dry at the time of our site visit, likely due to the ongoing severe drought affecting the area in 2025 (Figure S71). Although the substrate appeared appropriate for fence installation and the river could be accessed safely near the site, the risk of the site drying up again in future drought conditions means Kennetcook004 is not appropriate for escapee monitoring or fence installation. The site is in Hants County, Nova Scotia, where King Road crosses Kennetcook River. Because the river was dry apart from one stagnant pool near the site, specific measurements could not be taken during the site visit in August 2025, but the river substrate was mostly cobble. The are remains of an old mill or bridge structure just upstream of the site. The land around the site is privately owned.

West Branch (Avon River system)

The West Branch of the Avon River is in Hants County, Nova Scotia, near Martock (Figure 17D). The mouth of the West Branch joins the Avon River approximately 22 km upstream from where the river empties into the Minas Basin. The Avon River system is located 179 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility to the Avon River system is the White Rock Dam on Gaspereau River. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, West Branch is predicted to have a moderate amount of salmon habitat [5070 productive salmon habitat units (100 m^2)] but there is likely no wild salmon population in the river (Reader et al. 2024b). A few hatcheries and fish facilities are located in the system but the river is not supplemented by the DFO LGB program. Many other anadromous species can be found in the river. Many groups work on the river and surrounding system. The West Branch has evidence of moderate human activity including kayaking, camping, and fishing.

Site AvonWest002

Decision Tree Score: 2

In addition to the model prediction that no escaped aquaculture salmon will enter the system, AvonWest002 is not a suitable location for aquaculture escapee monitoring because there is significant river braiding near the site and water and flow levels were very low during the site assessment (Figure S72). The site is in Hants County, Nova Scotia, where Mines Road crosses West Branch, Avon River. During the site visit in August 2025, the river was 15 m wide (likely 18 m wide when not in a drought) and 35 cm deep with evidence of water levels deeper than 1 m during seasonal flooding. The water was 16.3°C with limited flow dur to low water levels in the region. The substrate was mostly sand with many large boulders. There was evidence of flooding near the site and there is limited infrastructure in the area. The land around the site is privately owned.

Halfway River (Avon River system)

Halfway River (Avon River system) is on the border between Hants and Kings Counties, Nova Scotia (Figure 17D). The mouth of Halfway River flows into the tidal portion of the Avon River near Hantsport, which empties into the Minas Basin. The Avon River system is located 179 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon. The closest

dedicated salmon monitoring facility to the Avon River system is the White Rock Dam on Gaspereau River. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Halfway River is predicted to have a moderate amount of salmon habitat [2891 productive salmon habitat units (100 m^2)] but there is likely no wild salmon population in the river (Reader et al. 2024b). A few hatcheries and fish facilities are located in the system but the river is not supplemented by the DFO LGB program. Many other anadromous species can be found in the river. Many groups work on the river and surrounding system. Halfway River has evidence of moderate human activity including kayaking, swimming, and fishing.

Site Halfway001

Decision Tree Score: 3

In addition to the model prediction that no escaped aquaculture salmon will enter the system, Halfway001 is not a suitable location for aquaculture escapee monitoring because the area is very accessible to the public and frequently used for recreation (Figure S73). The site is in Hants County, Nova Scotia, where Bog Road crosses Halfway River. During the site visit in July 2025, the river was approximately 4 m wide with braiding around exposed rocky islands in the river and 10 cm deep with some deeper pools. The water was 24°C and the river substrate was mostly bedrock with some cobble. There was evidence of flooding near the site and large debris along the banks in some areas. The road bridge is the only infrastructure near the site and the land around the site is privately owned.

Cornwallis River

Cornwallis River is in Kings County, Nova Scotia, near Kentville and Wolfville, and empties into the Minas Basin in the Bay of Fundy (Figure 17D). Cornwallis River is located 160 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility to the Cornwallis River system is the White Rock Dam on Gaspereau River. The Cornwallis River has a moderate amount of salmon habitat [1706 productive salmon habitat units (100 m^2; DFO 2008)] and there is likely a wild salmon population in the river (Reader et al. 2024b). Landlocked stocking does not occur in the system but the river is was historically supplemented by the DFO LGB program and the Coldbrook Biodiversity Facility is located in the system. Salmon DNA was not detected in eDNA samples taken at Cornwallis004 in 2025. Many other anadromous species can be found in the river. Many groups work on the river and surrounding system. Cornwallis River has evidence of moderate human activity, mostly catch-and-release fishing and boating.

Site Cornwallis004

Decision Tree Score: 3

In addition to the model prediction that no escaped aquaculture salmon will enter the system, Cornwallis004 is not a suitable location for aquaculture escapee monitoring because the river is likely too deep for safe fence operation (Figure S74). The site is in Kings County, Nova Scotia, where South Bishop Road crosses Cornwallis River near the community of Coldbrook. During the site visit in July 2025, the river was 14 m wide and 50 cm deep, although water line evidence along the banks of the river suggest it is more than 75 cm deep during periods with more average rainfall. The water was 19.8°C, the river substrate was mostly silt and mud over cobble, and there was evidence of flooding near the site. The road bridge is the only infrastructure near the site and the land around the site is a mix of private and municipally owned.

Mill Brook (Cornwallis River system)

Mill Brook in the Cornwallis River system is in Kings County, Nova Scotia, in Kentville (Figure 17D). The mouth of Mill Brook is located 10 km upstream of the mouth of Cornwallis River, which empties into the Minas Basin in the Bay of Fundy. The Cornwallis River system is located 160 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that none of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility to the Cornwallis River system is the White Rock Dam on Gaspereau River. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Mill Brook is predicted to have a moderate amount of salmon habitat [4650 productive salmon habitat units (100 m^2)] and there is a suspected existing wild population in the system (Reader et al. 2024b). Landlocked stocking does not occur in the system although the Cornwallis River system is was historically supplemented by the DFO LGB program and the Coldbrook Biodiversity Facility is located in the system. Several other anadromous species can be found in the brook. Many groups work on the brook and surrounding system. Mill Brook has little evidence of human activity, although it does flow through urban areas.

Site Mill001

Decision Tree Score: 2

In addition to the model prediction that no escaped aquaculture salmon will enter the system, Mill001 is not a suitable location for aquaculture escapee monitoring because it is in the middle of a residential neighbourhood in Kentville, Nova Scotia, with limited parking and staging and only steep access to the water (Figure S75). The site is in Kings County, Nova Scotia, along Brook Avenue where Nova Scotia Route 1/Evangeline Trail/Main Street crosses Mill Brook. Although brook characteristics near the site may be ideal for fence installation (cobble substrate, approximately 10 m wide and 50 cm deep), its location was not appropriate for monitoring so no specific measurements were taken during the site visit in July 2025. There was limited evidence of flooding and the land around the site was municipally and privately owned.

Site Mill002

Decision Tree Score: 2

In addition to the model prediction that no escaped aquaculture salmon will enter the system, Mill002 is not a suitable location for aquaculture escapee monitoring because the brook is tidally influenced at the site and influenced by saltwater (Figure S76). The site is in Kings County, Nova Scotia, behind the Glooscap Curling Club of Kentville where the Kentville Rail Trail crosses Mill Brook. Due to the tidal water levels, no specific measurements were taken at the site during the site visit in July 2025. Although there was no specific evidence of flooding, there was clear evidence of water level changes due to tides. There are a few small bridges over the brook at the site and the land near the area is provincially owned.

Habitant River

Habitant River is in Kings County, Nova Scotia, near Canning, and empties into the Minas Basin in the Bay of Fundy (Figure 17D). Habitant River is located 160 km away from the nearest active salmon aquaculture lease. The closest dedicated salmon monitoring facility to the Habitant River is the White Rock Dam on Gaspereau River. Based on our linear model of salmon habitat area by river axial length for IBoF rivers, Habitant River is predicted to have a moderate amount of salmon habitat [2251 productive salmon habitat units (100 m^2)] but there is no suspected

existing wild population in the system (Reader et al. 2024b), although there likely was a population historically. Landlocked stocking does not occur in the system, and the river is not supplemented by the DFO LGB program. Many other anadromous species can be found in the river. Several groups work on the river and surrounding system. Habitant River has evidence of moderate human activity, including fishing and agricultural use.

Site Habitant001

Decision Tree Score: 3

Habitant001 is not a suitable location for aquaculture escapee monitoring because the river is small and muddy near the site making it inappropriate for fence installation (Figure S77). The site is in Kings County, Nova Scotia, where Hillaton Road crosses Habitant River. During the site visit in July 2025 the river was approximately 4 m wide and 30 cm deep at the site. The water was 19.4°C during the site visit and the river substrate near the site was mud and silt. There was limited evidence of flooding near the site. The land around the river near the site is privately owned and mostly agricultural with significant human activity. The current road bridge and pilings from an old bridge are the only infrastructure near the site.

Southern Upland

Of the 50 site visits across 38 rivers in the Nova Scotia Southern Upland DU, 41 were not suitable for the installation of a fish counting fence. All of these sites scored a four or below on the decision tree ranking (Table 5); those that scored highly had specific challenges that made them unsuitable (Table S1). Rivers are presented in order from the border between IBoF and SU following the southern cost of Nova Scotia to Broad River.

Nictaux River (Annapolis River system)

Nictaux River is in Annapolis County, Nova Scotia, near Middleton (Figure 41A). Nictaux River flows into the Annapolis River near Middleton; the Annapolis River empties into the Annapolis Basin which is connected to the Bay of Fundy through the Digby Gut. Annapolis River is 19 km away from the nearest active salmon aquaculture lease (Nictaux River is approximately 50 km upstream of the mouth of Annapolis River). The dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon and escapees have previously been detected in Annapolis River (Keyser et al. 2018; Morris et al. 2008), however per Bowlby et al. (2013b) Nictaux River is known to have an obstacle preventing salmon from entering the river. There is also an inoperative tidal generating station on the Annapolis River near Annapolis Royal which may act as a partial barrier to fish entering the river but escapees were detected in the Annapolis River system even while the station was operational (Keyser et al. 2018) so it likely has a limited effect on salmon migration. The closest dedicated salmon monitoring facilities to Annapolis River are the White Rock Dam on Gaspereau River in Nova Scotia and the St. George Fishway, Mactaquac Dam, and Nashwaak Fence across the Bay of Fundy in New Brunswick. Nictaux River has a large amount of salmon habitat [37533 productive salmon habitat units (100 m^2) once the habitat inaccessible to salmon is removed (Bowlby et al. 2013b)] and there is likely a wild salmon population in the Annapolis River system (Bowlby et al. 2013a). No salmon stocking occurs in the Annapolis River system. Many other anadromous species can be found in the river and greater system. Many organizations are actively engaged in conservation and fisheries-related work in the river. Nictaux River has evidence of moderate human activity, primarily fishing and swimming.

Site Nictaux001

Decision Tree Score: 3

Nictaux001 is not a suitable location for aquaculture escapee monitoring because there is a barrier in the system preventing salmon from entering the river (Figure S78). The site is in Annapolis County, Nova Scotia, upstream of where Nova Scotia Route 201 crosses Nictaux River. During the site visit in September 2025, the river was 10 – 14 m wide and 40 cm deep with pools up to 2 m deep. Water line evidence on the banks suggest the river is closer to 70 cm deep during periods with more average rainfall in the region. The water was 15.3°C. There was evidence of flooding near the site. The river substrate at the site is a mix of cobble and gravel. There is a concrete barrier structure along one bank of the river just upstream of the site and the land around the site is a mix of private and provincially owned land.

Paradise Brook (Annapolis River system)

Paradise Brook is in Annapolis County, Nova Scotia, near Paradise (Figure 41A). Paradise Brook flows into the Annapolis River near Paradise; the Annapolis River empties into the Annapolis Basin which is connected to the Bay of Fundy through the Digby Gut. Annapolis River is 19 km away from the nearest active salmon aquaculture lease (South River is approximately 35 km upstream of the mouth of Annapolis River). The dispersal model predicts that some of the salmon that return to the brook are escaped aquaculture salmon and escapees have previously been detected in Annapolis River (Keyser et al. 2018; Morris et al. 2008). There is an inoperative tidal generating station on the Annapolis River near Annapolis Royal which may act as a partial barrier to fish entering the river but escapees were detected in the Annapolis River system even while the station was operational (Keyser et al. 2018) so it likely has a limited effect on salmon migration. The closest dedicated salmon monitoring facilities to Annapolis River are the White Rock Dam on Gaspereau River in Nova Scotia and the St. George Fishway, Mactaquac Dam, and Nashwaak Fence across the Bay of Fundy in New Brunswick. Based on our linear model of salmon habitat area by river axial length for SU rivers, Paradise Brook is predicted to have a moderate amount of salmon habitat [6099 productive salmon habitat units (100 m^2)]. There is likely a wild salmon population in the Annapolis River system (Bowlby et al. 2013a) however Paradise Brook is heavily influenced by beaver presence making it unsuitable for salmon. No salmon stocking occurs in the Annapolis River system. Several other anadromous species can be found in the river and greater system. Many organizations are actively engaged in conservation and fisheries-related work in the river. Paradise Brook has evidence of little human activity.

Site Paradise001

Decision Tree Score: 2

Paradise001 is not a suitable location for aquaculture escapee monitoring because the brook is deep near the site and the land around the site is boggy (Figure S79). The site is in Annapolis County, Nova Scotia, where Nova Scotia Route 201 crosses Paradise Brook. During the site visit in September 2025, the brook was 6 – 8 m wide and 1 m deep. The water was 16°C. There was some evidence of flooding near the site although the surrounding wetland likely tempers severe flooding. The brook substrate near the site is a mix of sand, mud, and gravel. The road bridge is the only existing infrastructure near the site and the land around the site is privately owned.

Daniels Brook (Annapolis River system)

Daniels Brook is in Annapolis County, Nova Scotia, between Paradise and Bridgetown (Figure 41A). Daniels Brook flows into the Annapolis River which empties into the Annapolis Basin which is connected to the Bay of Fundy through the Digby Gut. Annapolis River is 19 km away from the nearest active salmon aquaculture lease (South River is approximately 30 km

upstream of the mouth of Annapolis River). The dispersal model predicts that some of the salmon that return to the brook are escaped aquaculture salmon and escapees have previously been detected in Annapolis River (Keyser et al. 2018; Morris et al. 2008). There is an inoperative tidal generating station on the Annapolis River near Annapolis Royal which may act as a partial barrier to fish entering the river but escapees were detected in the Annapolis River system even while the station was operational (Keyser et al. 2018) so it likely has a limited effect on salmon migration. The closest dedicated salmon monitoring facilities to Annapolis River are the White Rock Dam on Gaspereau River in Nova Scotia and the St. George Fishway, Mactaquac Dam, and Nashwaak Fence across the Bay of Fundy in New Brunswick. Based on our linear model of salmon habitat area by river axial length for SU rivers, Daniels Brook is predicted to have a moderate amount of salmon habitat [3558 productive salmon habitat units (100 m^2)]. There is likely a wild salmon population in the Annapolis River system (Bowlby et al. 2013a). No salmon stocking occurs in the Annapolis River system. The presence of Salmon DNA was inconclusive in eDNA samples taken at Daniels001 in 2025. Many other anadromous species can be found in the river and greater system. Many organizations are actively engaged in conservation and fisheries-related work in the river. Daniels Brook has evidence of moderate human activity, primarily fishing and agricultural use.

Site Daniels001

Decision Tree Score: 3

Daniels001 is not a suitable location for aquaculture escapee monitoring because there is an old power generating station upstream of the site which may cause water levels in the brook to change rapidly with little warning (Figure S80). The site is in Annapolis County, Nova Scotia, where Nova Scotia Route 201 crosses Daniels Brook. During the site visit in September 2025, the brook was 5 m wide and 35 cm deep with some 1 m deep human-made pools. The water was 17.8°C. There was evidence of flooding near the site and the area has the potential for flash flooding. The brook substrate near the site is mostly small gravel and cobble. The road bridge over the brook is the only infrastructure near the site and the land around the site is privately owned.

Allains River (Annapolis River system)

Allains River is in Annapolis County, Nova Scotia, near Annapolis Royal (Figure 41A). Allains River flows into the Annapolis River which empties into the Annapolis Basin which is connected to the Bay of Fundy through the Digby Gut. Annapolis River is 19 km away from the nearest active salmon aquaculture lease (Allains River is approximately 8 km upstream of the mouth of Annapolis River). The dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon and escapees have previously been detected in Annapolis River (Keyser et al. 2018; Morris et al. 2008). There is an inoperative tidal generating station on the Annapolis River near Annapolis Royal which may act as a partial barrier to fish entering the river but escapees were detected in the Annapolis River system even while the station was operational (Keyser et al. 2018) so it likely has a limited effect on salmon migration. The closest dedicated salmon monitoring facilities to Annapolis River are the White Rock Dam on Gaspereau River in Nova Scotia and the St. George Fishway, Mactaquac Dam, and Nashwaak Fence across the Bay of Fundy in New Brunswick. Based on our linear model of salmon habitat area by river axial length for SU rivers, Allains River is predicted to have a moderate amount of salmon habitat [5637 productive salmon habitat units (100 m^2)]. There is likely a wild salmon population in the Annapolis River system (Bowlby et al. 2013a). No salmon stocking occurs in the Annapolis River system. Many other anadromous species can be found in the river and greater system. Many organizations are actively engaged in conservation and fisheries-related

work in the river. Allains River has limited evidence of human activity, primarily fishing near the head of tide.

Site Allains001

Decision Tree Score: 2

Allains001 is not a suitable location for aquaculture escapee monitoring because there is a hydroelectric dam in the river (Figure S81). Additionally, water levels were very low during the site visit (and could become so again in the future) and the substrate would make fence installation difficult. The site is in Annapolis County, Nova Scotia, where Clementsvale Road crosses Allains River. During the site visit in September 2025, the river was between 5 and 10 m wide wet width (13 m bankfull) and very shallow apart from a few 1 m deep pools. There was limited water in some sections of the river near the site. The water was 14.6°C. The substrate near the site is mostly boulders with some sand. The concrete bridge supports are the only infrastructure near the site and the land around the site is provincially owned.

Bear River

Bear River is located between Annapolis and Digby Counties, Nova Scotia, near Digby (Figure 41A). The mouth of the river is in Smiths Cove where it empties into the Annapolis Basin which is connected to the Bay of Fundy through the Digby Gut. Bear River is located 5 km away from the nearest active salmon aquaculture lease. The dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon and escapees have previously been detected in the river (Keyser et al. 2018; Morris et al. 2008), however per Bowlby et al. (2013b) Bear River is known to have an obstacle preventing salmon from entering the river. The closest dedicated salmon monitoring facilities to Bear River are the White Rock Dam on Gaspereau River in Nova Scotia and the St. George Fishway, Mactaquac Dam, and Nashwaak Fence across the Bay of Fundy in New Brunswick. Bear River has a moderate amount of salmon habitat [3559 productive salmon habitat units (100 m^2) once the habitat inaccessible to salmon is removed (Bowlby et al. 2013b)] however there is likely no wild population in the river (Bowlby et al. 2013b). No salmon stocking occurs in Bear River. Salmon DNA was not detected in eDNA samples taken at Bear001 in 2025. Many other anadromous species can be found in the river. A few organizations are actively engaged in conservation and fisheries-related work in the river. Bear River has evidence of moderate human activity, including fishing and general recreational use.

Site Bear001

Decision Tree Score: 2

Bear001 is not a suitable location for aquaculture escapee monitoring because there is a barrier to fish passage in the system (Figure S82). The site is on the border between Annapolis and Digby Counties, Nova Scotia, just downstream of the confluence of Bear River and West Branch, Bear River. During the site visit in August 2025, the river was 13 m wide and around 90 cm deep. The water was 21.5°C. There was evidence of flooding near the site, including warning signs for a dam located upstream of the site. The substrate near the site is mostly large boulders with small cobble and gravel. The bridge is the only infrastructure near the site and the land around the site is provincially owned.

West Branch (Bear River system)

The West Branch of Bear River is in Digby County, Nova Scotia, near Digby (Figure 41A). The West Branch joins Bear River in the community of Bear River, and the river empties into the Annapolis Basin which is connected to the Bay of Fundy through the Digby Gut. Bear River is

located 5 km away from the nearest active salmon aquaculture lease (the mouth of the West Branch is approximately 7 km into the system). The dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon and escapees have previously been detected in the river (Keyser et al. 2018; Morris et al. 2008), however per Bowlby et al. (2013b) Bear River is known to have an obstacle preventing salmon from entering the river. The closest dedicated salmon monitoring facilities to Bear River are the White Rock Dam on Gaspereau River in Nova Scotia and the St. George Fishway, Mactaquac Dam, and Nashwaak Fence across the Bay of Fundy in New Brunswick. Based on our linear model of salmon habitat area by river axial length for SU rivers, West Branch, Bear River is predicted to have a large amount of salmon habitat [11901 productive salmon habitat units (100 m^2)] however there is likely no wild population in the river (Bowlby et al. 2013b). Landlocked stocking does not occur in the watershed and the river is not supplemented by the DFO LGB program. Several other anadromous species can be found in the river. Several groups work on the river and surrounding system. The West Branch of Bear River has limited evidence of human activity.

Site BearWest002

Decision Tree Score: 4 (barrier)

BearWest002 is not a suitable location for aquaculture escapee monitoring because there is a barrier to fish passage in the system (Figure S83). The site is in Digby County, Nova Scotia, on West Branch, Bear River just upstream of Bear001. During the site visit in August 2025, the river was 4 m wide wet width (15 m bankfull) and around 20 cm deep with a 1 m deep pool, although there was evidence the water levels were likely 50 cm higher in periods with more average rainfall amounts. The water was 17.8°C. There was limited evidence of flooding near the site. The substrate near the site is large boulders with cobble. The road bridge is the only major infrastructure near the site although there was a structure similar

Belliveau River (with Rivière Grosses Coques)

Belliveau River is in Digby County, Nova Scotia, near Weymouth and Rivière Grosses Coques (Figure 41B). Belliveau River joins Rivière Grosses Coques and empties into St. Mary's Bay at the southern end of the Bay of Fundy. The River is located 20 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facilities to Belliveau River are the White Rock Dam on Gaspereau River in Nova Scotia and the St. George Fishway across the Bay of Fundy in New Brunswick. Belliveau River has a moderate amount of salmon habitat [1665 productive salmon habitat units (100 m^2; Bowlby et al. 2013b)]. There is not a suspected wild population in the river (Bowlby et al. 2013a) and landlocked stocking does not occur in the watershed (the river is not supplemented by the DFO LGB program). A few other anadromous species can be found in the river and greater system. A few groups work on the river and surrounding system. Belliveau River has limited evidence of human activity, primarily fishing near the head of tide.

Site Belliveau001

Decision Tree Score: 4 (too small)

Belliveau001 is not a suitable location for aquaculture escapee monitoring because the river is too small for fence installation near the site (Figure S84). The site is in Digby County, Nova Scotia, where Chemin Margo/ Margo Road crosses Belliveau River. During the site visit in August 2025, the river was approximately 5 m wide (with some stretches narrowing to less than 1 m) and 25 cm deep. The water was 18.3°C. There was evidence of flooding near the site, likely seasonal, and digger logs had been installed in the river

near the site. The river substrate near the site is a mix of cobble and boulders. The wooden bridge structure was the only other infrastructure near the site and the land around the site is privately owned.

Rivière Grosses Coques (with Belliveau River)

Rivière Grosses Coques is in Digby County, Nova Scotia, near Weymouth and Belliveau River (Figure 41B). Rivière Grosses Coques joins Belliveau River and empties into St. Mary's Bay at the southern end of the Bay of Fundy. The river is located 20 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facilities to Rivière Grosses Coques are the White Rock Dam on Gaspereau River in Nova Scotia and the St. George Fishway across the Bay of Fundy in New Brunswick. Based on our linear model of salmon habitat area by river axial length for SU rivers, Rivière Grosses Coques is predicted to have a moderate amount of salmon habitat [3132 productive salmon habitat units (100 m^2)]. There is not a suspected wild population in the river (Bowlby et al. 2013a) and landlocked stocking does not occur in the watershed (the river is not supplemented by the DFO LGB program). A few other anadromous species and beavers can be found in the river and greater system. A few groups work on the river and surrounding system. Rivière Grosses Coques has limited evidence of human activity.

Site GC001

Decision Tree Score: 2

GC001 is not a suitable location for aquaculture escapee monitoring because the river is small and overgrown and there is a large beaver dam upstream of the site (Figure S85). The site is in Digby County, Nova Scotia, where Wallace Dugas Road crosses Rivière Grosses Coques. During the site visit in August 2025, the river was approximately 1 – 3 m wide and 20 cm deep. Because the river was not a suitable location for fence installation, some measurements weren't collected. There was limited evidence of flooding near the site, but the land around the site was fairly boggy with overgrown shrubs which may help absorb floodwaters. There was a large beaver dam upstream of the site and more evidence of beaver activity in the area. The substrate near the site is slate and mud. The road bridge over the river is the only infrastructure near the site and the land around the site is privately owned.

Leblanc Brook (with Boudreau Stream)

Leblanc Brook is in Digby County, Nova Scotia, near Comeauville (Figure 41B). Leblanc Brook joins Ruisseau des Boudreau and empties into St. Mary's Bay at the southern end of the Bay of Fundy. The system is located 12 km away from the nearest active salmon aquaculture lease. The closest dedicated salmon monitoring facilities to Leblanc Brook are the White Rock Dam on Gaspereau River in Nova Scotia and the St. George Fishway across the Bay of Fundy in New Brunswick. Based on our linear model of salmon habitat area by river axial length for SU rivers, Leblanc Brook is predicted to have a moderate amount of salmon habitat [3571 productive salmon habitat units (100 m^2)]. No information is available about current populations in the river, but landlocked stocking does not occur in the watershed (the river is not supplemented by the DFO LGB program). Few other anadromous species and beavers can be found in the river and greater system. A few groups work on the river and surrounding system. Leblanc Brook has limited evidence of human activity.

Site Boudreau001

Decision Tree Score: 3

Boudreau001 is not a suitable location for aquaculture escapee monitoring because slipper substrate made the site difficult to access safely and algal growth suggested potential tidal influence (Figure S86). The site is in Digby County, Nova Scotia, where Nova Scotia Highway 1 crosses Leblanc Brook. During the site visit in August 2025, the brook was 6 m wide and 30 – 40 cm deep, with a stone retaining wall making up part of one bank. The water was 20.3°C. There was evidence of flooding and higher water levels, including debris along the banks and water lines on the concrete bridge support. The substrate near the site is a mix of bedrock and boulders. The bridge and the retaining wall are the main infrastructure near the site and the land around the site is provincially and privately owned.

Ruisseau des Boudreau (or Boudreau Stream)

Ruisseau des Boudreau is in Digby County, Nova Scotia, near Comeauville (Figure 41B). Ruisseau des Boudreau joins Leblanc Brook and empties into St. Mary's Bay at the southern end of the Bay of Fundy. The system is located 12 km away from the nearest active salmon aquaculture lease. The closest dedicated salmon monitoring facilities to Ruisseau des Boudreau are the White Rock Dam on Gaspereau River in Nova Scotia and the St. George Fishway across the Bay of Fundy in New Brunswick. Ruisseau des Boudreau has a moderate amount of salmon habitat [1795 productive salmon habitat units (100 m^2; Bowlby et al. 2013b)]. No information is available about current populations in the stream, but landlocked stocking does not occur in the watershed and the river is not supplemented by the DFO LGB program. Few other anadromous species and beavers can be found in the river and greater system. A few groups work on the river and surrounding system. Ruisseau des Boudreau has limited evidence of human activity.

Site Boudreau003

Decision Tree Score: 1

Boudreau003 is not a suitable location for aquaculture escapee monitoring because the stream was too small near the site and there was a large beaver dam upstream (Figure S87). The site is in Digby County, Nova Scotia, where Common Cross Road crosses Ruisseau des Boudreau. During the site visit in August 2025, the stream was about 4 m wide and 20 cm deep with a 60 cm pool nearby. The water was 19.7°C. There was some evidence of flooding near the site, including high water marks along the concrete walls of the culvert under the road bridge. The stream substrate near the site is bedrock overlain by sharp rocks. The bridge is the only infrastructure near the site and the land around the site is privately owned.

Meteghan River

Meteghan River is in Digby County, Nova Scotia, near Meteghan (Figure 41B), near Meteghan. The river empties into St. Mary's Bay at the southern end of the Bay of Fundy. The river is located 13 km away from the nearest active salmon aquaculture lease. The dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon and escapees have previously been detected in the river (Keyser et al. 2018; Morris et al. 2008), however per Bowlby et al. (2013b) Meteghan River is known to have an obstacle preventing salmon from entering the river. The closest dedicated salmon monitoring facilities to Meteghan River are the White Rock Dam on Gaspereau River in Nova Scotia and the St. George Fishway across the Bay of Fundy in New Brunswick. Meteghan River has a moderate amount of salmon habitat [2221 productive salmon habitat units (100 m^2) once the habitat inaccessible to salmon is removed (Bowlby et al. 2013b)]. The river does not have a suspected viable wild population (Bowlby et al. 2013b), and landlocked stocking does not occur in the watershed (the river is not

supplemented by the DFO LGB program). Salmon DNA was not detected in eDNA samples taken at Meteghan001 in 2025. Several other anadromous species can be found in the river. A few groups work on the river and surrounding system. Meteghan River has evidence of moderate human activity, including a recreational fishery.

Site Meteghan001

Decision Tree Score: 2

Meteghan001 is not a suitable location for aquaculture escapee monitoring because there is barrier preventing fish from accessing the river upstream of the site (Figure S88). The site is in Digby County, Nova Scotia, near the intersection of Placide Comeau Road and Chemin de la Montagne. During the site visit in August 2025, the river was 11 – 15 m wide, 10 cm deep in riffles, 50 cm deep in runs, and 1 m deep in a channel under the bridge. The water was 21.1°C. There was little evidence of flooding near the site although high water lines could be seen on the rock that made up part of the bank downstream of the site. The substrate near the site is bedrock with some cobble and gravel. The wooden bridge is the only infrastructure near the site and the land around the site is provincially owned.

Salmon River (Digby County)

Salmon River is in Digby County, Nova Scotia, near the community of Salmon River (Figure 41B). The mouth of the river empties into the Atlantic Ocean along the southwest coast of Nova Scotia. Salmon River is located 27 km away from the nearest active salmon aquaculture lease. The dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon and escapees have previously been detected in the river (Keyser et al. 2018; Morris et al. 2008). The closest dedicated salmon monitoring facilities to Salmon River are the White Rock Dam on Gaspereau River in Nova Scotia and the St. George Fishway across the Bay of Fundy in New Brunswick. Salmon River has a moderate amount of salmon habitat [6880 productive salmon habitat units (100 m^2) once the habitat inaccessible to salmon is removed (Bowlby et al. 2013b)]. There is currently a suspected existing wild population in the river (Lehnert et al. 2023) although Salmon DNA was not detected in eDNA samples taken at Salmon001 in 2025. Landlocked stocking does not occur in the watershed and the river is not supplemented by the DFO LGB program. Many other anadromous species can be found in the river system. A few groups work on the river and surrounding system. Salmon River has evidence of low human activity, but has a commercial fishery near the head of tide.

Site Salmon001

Decision Tree Score: 3

Salmon001 is not a suitable location for aquaculture escapee monitoring because it is very publicly accessible and the substrate would complicate fence installation (Figure S89). The site is in Digby County, Nova Scotia, where Hectanooga Road crosses Salmon River. During the site visit in August 2025, the river was 8 -10 m wide with some riffles less than 1 m wide and 20 - 50 cm deep. The water was 21.7°C. There was evidence of flooding near the site including high water marks under the bridge and along some of the rocks on the banks. The river substrate near the site is bedrock with some cobble and gravel. The bridge is the only infrastructure near the site and the land around the site is privately owned.

Site Salmon005

Decision Tree Score: 3

Salmon005 is not a suitable location for aquaculture escapee monitoring because the substrate would complicate fence installation and there was significant evidence of beaver activity including a dam being constructed (Figure S90). The site is in Digby County, Nova Scotia, alongside Hectanooga Road between Porter Road and Harrington Road. During the site visit in August 2025, the river was 25 m wide and 60 cm deep at the site; it was shallower downstream and much deeper upstream above the beaver dam. The water was 21°C. There was little evidence of flooding near the site potentially due to the beaver dam upstream. The river substrate near the site is bedrock with some sand and boulders. An ATV bridge downstream is the only infrastructure near the site and the land around the site is privately owned.

Indian River (Salmon River, Digby County)

Indian River is in the Salmon River system in Digby County, Nova Scotia, near the community of Salmon River (Figure 41B). Indian River flows into Salmon River which empties into the Atlantic Ocean along the southwest coast of Nova Scotia. Salmon River is located 27 km away from the nearest active salmon aquaculture lease (Indian River is approximately 6 km from the mouth of Salmon River). The dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon and escapees have previously been detected in the Salmon River system (Keyser et al. 2018; Morris et al. 2008). The closest dedicated salmon monitoring facilities to Indian River are the White Rock Dam on Gaspereau River in Nova Scotia and the St. George Fishway across the Bay of Fundy in New Brunswick. Based on our linear model of salmon habitat area by river axial length for SU rivers, Indian River is predicted to have a moderate amount of salmon habitat [4430 productive salmon habitat units (100 m^2)]. There is currently a suspected existing wild population in the river (Lehnert et al. 2023). Landlocked stocking does not occur in the watershed and the river is not supplemented by the DFO LGB program. Many other anadromous species can be found in the river system. A few groups work on the river and surrounding system. Indian River has evidence of low human activity, mostly commercial and recreational fishing.

Site Indian001

Decision Tree Score: 3

Indian001 is not a suitable location for aquaculture escapee monitoring because the river was small with low water, boggy areas, and bedrock substrate that would complicate fence installation (Figure S91). The site is in Digby County, Nova Scotia, where Porter Road crosses Indian River. During the site visit in August 2025, the river was 2 - 4 m wide and 5 - 20 cm deep and the water was 15.6°C. There was little evidence of flooding near the site. The river substrate near the site is mostly large boulders and cobble. The bridge is the only infrastructure near the site and the land around the site is privately owned.

Chegoggin River

Chegoggin River is in Yarmouth County, Nova Scotia, west of Yarmouth (Figure 41B). The river empties into the Atlantic Ocean along the southwest coast of Nova Scotia. Chegoggin River is located 49 km away from the nearest active salmon aquaculture lease. The closest dedicated salmon monitoring facilities to Chegoggin River are the White Rock Dam on Gaspereau River in Nova Scotia and the St. George Fishway across the Bay of Fundy in New Brunswick. Chegoggin River has a moderate amount of salmon habitat [1385 productive salmon habitat units (100 m^2; Bowlby et al. 2013b)]. There is not a suspected existing wild population in the river (Bowlby et al. 2013a) and landlocked stocking does not occur in the watershed (the river is not supplemented by the DFO LGB program). A few other anadromous species can be found in

the river. A few groups work on the river and surrounding systems. Chegoggin River has limited evidence of human activity.

Site Chegoggin002A

Decision Tree Score: 3

Chegoggin002A is not a suitable location for aquaculture escapee monitoring because the river is small and flows through boggy wetland near the site making it difficult to access the river (Figure S92). The site is in Yarmouth County, Nova Scotia, where Main Shore Road crosses Chegoggin River. During the site visit in August 2025, the river was 3 m wide and deep (exact depth and water temperatures weren't measured due to difficulty accessing the river). There was little evidence of flooding near the site. The river substrate near the site is a mix of rocks and mud. The bridge is the only infrastructure near the site and the land around the site is privately owned.

Site Chegoggin002B

Decision Tree Score: 1

Chegoggin002B is not a suitable location for aquaculture escapee monitoring because the river is small, flows through wetlands, and has evidence of beaver activity near the site (Figure S93). The site is in Yarmouth County, Nova Scotia, where Dayton Road crosses Chegoggin River. Because the site was visible not appropriate for escapee monitoring and difficult to access, no site measurements were taken during the site visit in August 2025. There was no evidence of flooding near the site. The river substrate near the site is mostly cobble and gravel. The culverts under Dayton Road are the only infrastructure near the site and the land around the site is privately owned.

Site Chegoggin002C

Decision Tree Score: 1

Chegoggin002C is not a suitable location for aquaculture escapee monitoring because the river is small, surrounded by wetlands, and there was a beaver lodge near the site (Figure S94). The site is in Yarmouth County, Nova Scotia, where MacCormack Road crosses Chegoggin River. Because the site was visible not appropriate for escapee monitoring and difficult to access, no site measurements were taken during the site visit in August 2025. There was no evidence of flooding near the site. The bridge is the only infrastructure near the site and the land around the site is privately owned.

Site Chegoggin005

Decision Tree Score: 2

Chegoggin005 is not a suitable location for aquaculture escapee monitoring because the river is small, difficult to access, and had very low water levels (Figure S95). The site is in Yarmouth County, Nova Scotia, where Nova Scotia Highway 1 crosses Chegoggin River upstream of Chegoggin Lake (also called Butlers Lake) near Pierce Road. During the site visit in August 2025, the river was 1 - 2 m wide and shallow over the rocky substrate downstream of the site. There was no evidence of flooding near the site. The river substrate near the site is mostly small boulders, cobble, and mud. The bridge is the only infrastructure near the site and the land around the site is privately owned.

Broad Brook

Broad Brook is in Yarmouth County, Nova Scotia, and runs through Yarmouth (Figure 41B). The mouth of the brook is near Kelleys Cove where it empties into the Atlantic Ocean along the

southwest coast of Nova Scotia. Broad Brook is located 57 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that some of the salmon that return to the brook are escaped aquaculture salmon. The closest dedicated salmon monitoring facilities to Broad Brook are the White Rock Dam on Gaspereau Brook in Nova Scotia and the St. George Fishway across the Bay of Fundy in New Brunswick. Based on our linear model of salmon habitat area by brook axial length for SU brooks, Broad Brook is predicted to have a moderate amount of salmon habitat [4191 productive salmon habitat units (100 m^2)]. No information is available about current populations in the brook, but landlocked stocking does not occur in the watershed and the brook is not supplemented by the DFO LGB program. Few other anadromous species can be found in the brook. A few groups work on the brook and surrounding systems. Broad Brook has limited evidence of human activity, although much of the brook runs through an urban environment.

Site Broad001A

Decision Tree Score: 2

Broad001A is not a suitable location for aquaculture escapee monitoring because the brook is small, difficult to access, and flows through wetlands at the site (Figure S96). The site is in Yarmouth County, Nova Scotia, where Regent Street crosses Broad Brook. During the site visit in August 2025, the brook was 2 - 3 m wide but depth and water temperature could not be measured safely. There was no evidence of flooding near the site. The substrate near the site is predominately mud. The bridge is the only infrastructure near the site and the land around the site is privately owned.

Site Broad001B

Decision Tree Score: 3

Broad001B is not a suitable location for aquaculture escapee monitoring because the brook is small, flows through marshy areas, and has evidence of beaver activity near the site (Figure S97). The site is in Yarmouth County, Nova Scotia, where Parade Street crosses Broad Brook. During the site visit in August 2025, brook size measurements weren't taken but the water was 18.4°C. There was no evidence of flooding near the site. The substrate near the site is muddy with some cobble. The road culvert is the only infrastructure near the site and the land around the site is municipally and privately owned.

Chebogue River

Chebogue River is in Yarmouth County, Nova Scotia, near Yarmouth (Figure 41B). The mouth of the river is in Central Chebogue, where it empties into the Atlantic Ocean along the south shore of Nova Scotia. Chebogue River is located 66 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that some of the salmon that return to the brook are escaped aquaculture salmon. The closest dedicated salmon monitoring facilities to Chebogue River are Morgan's Falls on the LaHave River in Nova Scotia and the St. George Fishway across the Bay of Fundy in New Brunswick. Based on our linear model of salmon habitat area by river axial length for SU rivers, Chebogue River is predicted to have a moderate amount of salmon habitat [4795 productive salmon habitat units (100 m^2)]. No information is available about current populations in the river, but landlocked stocking does not occur in the watershed and the river is not supplemented by the DFO LGB program. Salmon DNA was not detected in eDNA samples taken at Chebogue001 in 2025. Several other anadromous species can be found in the river. Few groups work on the river and surrounding systems. Chebogue River has limited evidence of human activity.

Site Chebogue001

Decision Tree Score: 3

Chebogue001 is not a suitable location for aquaculture escapee monitoring because there was a lot of debris in the river near the site and the trail to the river was blocked to prevent vehicle access (Figure S98). The site is in Yarmouth County, Nova Scotia, near the intersection of Small Gaines Road and Trefry Lake Road. During the site visit in August 2025, the river was 4 m wide and 15 cm deep, although water marks on the remains of an ATV bridge at the site suggest the water is more than 50 cm deep during periods with more average rainfall. The water was 15.8°C. There was little evidence of flooding near the site, although there were several fallen trees and branches and the remains of an old ATV bridge at the site. The substrate near the site is a mix of gravel, sand, and cobble. There is no infrastructure near the site and the land around the site is privately owned.

Annis River (Tusket River)

Annis River is part of the Tusket River system in Yarmouth County, Nova Scotia (Figure 41B). Annis River flows into Tusket River near Pleasant Lake, and Tusket River empties into the Atlantic Ocean near Wedgeport on the south coast of Nova Scotia. The Tusket River system is located 93 km away from the nearest active salmon sea pen aquaculture lease (Annis River is approximately 17 km into the system). The dispersal model predicts that few of the salmon that return to the river are escaped aquaculture salmon although escapees have previously been detected in Tusket River (Keyser et al. 2018; Morris et al. 2008). The closest dedicated salmon monitoring facilities to Annis River are Morgan's Falls on the LaHave River in Nova Scotia and the St. George Fishway across the Bay of Fundy in New Brunswick. Annis River has a moderate amount of salmon habitat [estimated at 3162 productive salmon habitat units (100 m^2) once the habitat inaccessible to salmon is removed (Bowlby et al. 2013b)] but there is likely no wild salmon population in the river (Bowlby et al. 2013a); the presence of salmon DNA was inconclusive in eDNA samples taken at Annis002 in 2025 (Table 4). No salmon stocking occurs in the Tusket River system. Several other anadromous species can be found in the river. Several organizations are actively engaged in conservation and fisheries-related work in the river. Annis River has evidence of moderate human activity, including fishing.

Site Annis003

Decision Tree Score: 2

Annis003 is not a suitable location for aquaculture escapee monitoring because the river in the area is heavily used for recreation and the substrate makes safe access difficult (Figure S99). The site is in Yarmouth County, Nova Scotia, where Nova Scotia Route 340 and Valley Crescent cross Annis River. During the site visit in August 2025, the river was 11 m wide and 40 cm deep with a 90 cm deep pool under the bridge. Water lines on the bridge supports suggest the water is 30 cm deeper during periods with more average rainfall. The water was 20.4°C. There was little evidence of flooding near the site. The substrate near the site is a mix of gravel, sand, and cobble. The bridge is the only infrastructure near the site and the land around the site is privately owned.

Carleton River (Tusket River)

Carleton River is part of the Tusket River system in Yarmouth County, Nova Scotia (Figure 41B). Carleton River flows into Tusket River at Lake Vaughan, and Tusket River empties into the Atlantic Ocean near Wedgeport on the south coast of Nova Scotia. The Tusket River system is located 93 km away from the nearest active salmon aquaculture lease (Annis River is approximately 30 km into the system) and the dispersal model predicts that few of the salmon

that return to the river are escaped aquaculture salmon although escapees have previously been detected in the Tusket River system (Keyser et al. 2018; Morris et al. 2008). The closest dedicated salmon monitoring facilities to Carleton River are Morgan's Falls on the LaHave River in Nova Scotia and the St. George Fishway across the Bay of Fundy in New Brunswick. Based on our linear model of salmon habitat area by river axial length for SU rivers, Carleton River is predicted to have a large amount of salmon habitat [26042 productive salmon habitat units (100 m^2)]. There is a suspected wild population in the river (Lehnert et al. 2023). Landlocked stocking does not occur in the watershed and the river is not supplemented by the DFO LGB program. Several other anadromous species can be found in the river. A few groups work on the river and surrounding system. Carleton River has evidence of moderate human activity, including fishing.

Site Carleton002

Decision Tree Score: 3

Carleton002 is not a suitable location for aquaculture escapee monitoring because the site is difficult to access, far upstream in the system, and the river substrate near the site would complicate fence installation (Figure S100). The site is in Yarmouth County, Nova Scotia, where Nova Scotia Route 203 crosses Carleton River. During the site visit in August 2025, the river was 11 m wide and 20 - 40 cm deep with some pools 75 cm deep. The water was 22.6°C. There was no evidence of flooding near the site. The river substrate near the site is mostly bedrock overlain by cobble, gravel, and boulders. The road bridge is the only infrastructure near the site and the land around the site is privately owned.

Argyle River

Argyle River is in Yarmouth County, Nova Scotia, east of Yarmouth (Figure 41B). The mouth of the river is in Central Argyle where it empties into the Atlantic Ocean on the south coast of Nova Scotia. Argyle River is located 87 km away from the nearest active salmon aquaculture lease. The closest dedicated salmon monitoring facilities to Argyle River are Morgan's Falls on the LaHave River in Nova Scotia and the St. George Fishway across the Bay of Fundy in New Brunswick. Argyle River has a moderate amount of salmon habitat [2711 productive salmon habitat units (100 m^2; Bowlby et al. 2013b)]. There is not a suspected existing wild population in the river (Bowlby et al. 2013a) and landlocked stocking does not occur in the watershed (the river is not supplemented by the DFO LGB program). Several other anadromous species can be found in the river. A few groups work on the river and surrounding systems. Argyle River has evidence of high human activity, including boating, fishing, and camping.

Site Argyle001

Decision Tree Score: 3

Argyle001 is not a suitable location for aquaculture escapee monitoring because the river is tidally influenced with saltwater intrusion at the site (Figure S101). The site is in Yarmouth County, Nova Scotia, where Argyle Head Road crosses Argyle River. During the site visit in August 2025, the river was 8 m wide and 70 cm deep (high tide) with a deeper channel in the middle of the river. There was no evidence of flooding near the site apart from regular tidal water level changes. The river substrate near the site is a mix of boulders and mud. There was a structure built on to the side of the road bridge at the site, possibly used for fishing, and the land around the site is privately owned.

Site Argyle002

Decision Tree Score: 3

Argyle002 is not a suitable location for aquaculture escapee monitoring because the site is far up the system, the substrate would complicate fence installation, and parts of the river at the site are too deep to safely access (Figure S102). The site is in Yarmouth County, Nova Scotia, where Forbes Road crosses Argyle River. During the site visit in August 2025, the river was 6 m wide and 15 - 20 cm deep in riffles with a 1 m channel on the upstream side of the site. The water was 21.7°C. There was no evidence of flooding near the site. The substrate near the site is mostly large boulders and cobble. The bridge is the only infrastructure near the site and the land around the site is privately owned.

Barrington River

Barrington River is in Shelburne County, Nova Scotia, near the community of Barrington (Figure 41C). The river empties into the Atlantic Ocean along the southeast coast of Nova Scotia. Barrington River is located 45 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility to Barrington River is Morgan's Falls on the LaHave River in Nova Scotia. Barrington River has a moderate amount of salmon habitat [6896 productive salmon habitat units (100 m^2; Bowlby et al. 2013b)]. No information is available about current populations in the river, but landlocked stocking does not occur in the watershed and the river is not supplemented by the DFO LGB program. Several other anadromous species can be found in the river. A few groups work on the river and surrounding systems. Barrington River has evidence of moderate human activity, primarily fishing.

Site Barrington002

Decision Tree Score: 2

Barrington002 is not a suitable location for aquaculture escapee monitoring because the river flows through marshland downstream of the site and the site is used as a boat launch for Barrington Lake (Figure S103). The site is in Shelburne County, Nova Scotia, where Barrington Lake empties into Barrington River along Old Hay Road. Because the site was visible not appropriate for escapee monitoring and difficult to access, no site measurements were taken during the site visit in August 2025. There was no evidence of flooding near the site. The private boat launch is the only infrastructure near the site and the land around the site is privately owned.

Site BarringtonHwy103

Decision Tree Score: 2

BarringtonHwy103 is not a suitable location for aquaculture escapee monitoring because the substrate would substantially complicate fence installation and there was evidence of active fishing near the site (Figure S104). The site is in Shelburne County, Nova Scotia, where Nova Scotia Highway 103 crosses Barrington River. During the site visit in August 2025, the river was 5.5 m wet width (14 m bankful) and 50 cm deep, with some pools more than 1.5 m deep. The water was 19.8°C. There was evidence of flooding near the site, including high water lines on boulders and the concrete bridge structure. The river substrate near the site is mostly large boulders with some cobble. The bridge is the only infrastructure near the site and the land around the site is provincially owned.

Bloody Creek (Clyde River)

Bloody Creek is part of the Clyde River system in Shelburne and Yarmouth Counties, Nova Scotia (Figure 41C). The mouth of the system is in Clyde River where it empties into the Atlantic Ocean. Clyde River is located 25 km away from the nearest active salmon aquaculture lease

(Bloody Creek is approximately 13 km upstream of the mouth of the river) and the dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility to the Clyde River system is Morgan's Falls on the LaHave River in Nova Scotia. The Clyde River main stem has a large amount of salmon habitat [24256 productive salmon habitat units (100 m^2; Bowlby et al. 2013b)]. There is not a suspected wild population in the river (Bowlby et al. 2013a). Landlocked stocking does not occur in the watershed and the river is not supplemented by the DFO LGB program. Many other anadromous species can be found in the river. A few groups work on the river and surrounding system. Bloody Creek has evidence of moderate human activity.

Site Clyde001

Decision Tree Score: 3

Clyde001 is not a suitable location for aquaculture escapee monitoring because even with generally low water levels in the area in 2025, the creek near the site was too deep for the safe operation of a counting fence (Figure S105). The site is in Shelburne County, Nova Scotia, where Upper Clyde Road crosses Bloody Creek. During the site visit in August 2025, the creek was more than 1 m deep. Other site measurements weren't taken because the creek was too deep to access safely. There was some evidence of flooding and higher water levels near the site including water lines and debris on the road bridge support structures. The road bridge is the only major infrastructure near the site, although and the land around the site is privately owned and some docks and floating platforms were present during the site visit.

Hamilton Branch (Clyde River)

The Hamilton Branch is part of the Clyde River system in Shelburne and Yarmouth Counties, Nova Scotia (Figure 41C). The mouth of the system is in Clyde River where it empties into the Atlantic Ocean. Clyde River is located 25 km away from the nearest active salmon aquaculture lease (Hamilton Branch is approximately 20 km upstream of the mouth of the river) and the dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility to the Clyde River system is Morgan's Falls on the LaHave River in Nova Scotia. The Clyde River main stem has a large amount of salmon habitat [24256 productive salmon habitat units (100 m^2; Bowlby et al. 2013b)]. There is not a suspected wild population in the river (Bowlby et al. 2013a). Landlocked stocking does not occur in the watershed and the river is not supplemented by the DFO LGB program. Many other anadromous species can be found in the river. A few groups work on the river and surrounding system. Hamilton Branch has evidence of moderate human activity.

Site ClydeHamilton001

Decision Tree Score: 3

ClydeHamilton001 is not a suitable location for aquaculture escapee monitoring because the site had very low water levels during the site visit and other more appropriate sites are available in the system (Figure S106). The site is in Shelburne County, Nova Scotia, where Upper Clyde Road crosses Hamilton Branch, Clyde River. During the site visit in August 2025, the river was 5.3 m wide wet width (10 m bankfull), 15-30 cm deep with some 50 cm deep pools. Based on water line evidence on the bridge, the water level was approximately 40 cm lower than it is during periods with more average rainfall. The water was 18.7°C. There was some evidence of flooding near the site, mainly high water marks on the boulders, bridge, and banks. The substrate near the site is a mix of cobble, gravel, boulders, and bedrock. The bridge is the only infrastructure near the site and the land around the site is privately owned.

Roseway River

Roseway River is in Shelburne Country, Nova Scotia (Figure 41C). The mouth of the river is in Shelburne where it empties into the Atlantic Ocean on the southeast coast of Nova Scotia. Roseway River is located 3 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility to Roseway River is Morgan's Falls on the LaHave River in Nova Scotia. Roseway River has a large amount of salmon habitat [17692 productive salmon habitat units (100 m^2; Bowlby et al. 2013b)]. There is not a suspected wild population in the river (Bowlby et al. 2013a). Landlocked stocking does not occur in the watershed and the river is not supplemented by the DFO LGB program. Salmon DNA was not detected in eDNA samples taken at Roseway001 in 2025. Many other anadromous species can be found in the river. A few groups work on the river and surrounding system. Roseway River has evidence of high human activity, including boating, fishing, and camping.

Site Roseway001

Decision Tree Score: 3

Roseway001 is not a suitable location for aquaculture escapee monitoring because the large boulders in the river would complicate fence installation and the river would likely be too deep for safe fence operation during periods with more average rainfall (Figure S107). The site is in Shelburne County, Nova Scotia, where Welshtown Road crosses Roseway River. During the site visit in August 2025, the river was 18 m wide and 40 cm deep with a 2 m deep pool under the bridge. The water was 21.1°C. There was evidence of flooding near the site including high water marks and debris along the banks. The substrate near the site is mostly sandy cobble with many large boulders. The bridge is the only infrastructure near the site and the land around the site is privately owned.

Site Roseway003

Decision Tree Score: 2

Roseway003 is not a suitable location for aquaculture escapee monitoring because the water level was extremely low during the site visit (almost dry in some stretches) and the site may be prone to low water during future drought conditions (Figure S108). The site is in Shelburne County, Nova Scotia, near the intersection of Riverview Drive and Nove Scotia Route 203. During the site visit in August 2025, the river was 10 m wide wet width, more than 30 m wide bankfull, and 60 cm deep on average with a 1 m deep pool. The water was 21.4°C. There was evidence of flooding near the site including debris along the river banks. The substrate near the site is cobble and many large boulders over bedrock. There is little infrastructure near the site and the land around the site is privately owned.

Blacks Brook

Blacks Brook is in Shelburne Country, Nova Scotia (Figure 41C). The mouth of the river is in Shelburne where it empties into the Atlantic Ocean on the southeast coast of Nova Scotia. Blacks Brook is located 3 km away from the nearest active salmon aquaculture lease. The closest dedicated salmon monitoring facility to Blacks Brook is Morgan's Falls on the LaHave River in Nova Scotia. Based on our linear model of salmon habitat area by river axial length for SU rivers, Blacks Brook is predicted to have a moderate amount of salmon habitat [6038 productive salmon habitat units (100 m^2)]. There is not a suspected existing wild population in the brook (Bowlby et al. 2013a). Landlocked stocking does not occur in the watershed and the brook is not supplemented by the DFO LGB program. A few other anadromous species can be

found in the brook. A few groups work on the brook and surrounding system. Blacks Brook has limited evidence of human activity.

Site BlacksNS001

Decision Tree Score: 1

BlacksNS001 is not a suitable location for aquaculture escapee monitoring because the brook near the site is deep, flows through bod-like habitat, and has evidence of beaver activity (Figure S109). The site is in Shelburne County, Nova Scotia, where Nova Scotia Highway 103 crosses Blacks Brook. During the site visit in August 2025, the brook was more than 10 m wide, but depth measurements weren't taken. The water was 22.2°C. There was no evidence of flooding near the site apart from debris that may have been the result of beavers. The substrate near the site is mostly boulders and large cobble. The bridge and culverts are the only infrastructure near the site and the land around the site is privately owned.

Rodney Brook

Rodney Brook is in Shelburne County, Nova Scotia, between Jordan Branch and Jordan Ferry (Figure 41C). The mouth of the brook it empties into the Atlantic Ocean along the southeast coast of Nova Scotia. Rodney Brook is located 9 km away from the nearest active salmon aquaculture. The closest dedicated salmon monitoring facility to Rodney Brook is Morgan's Falls on the LaHave River in Nova Scotia. Based on our linear model of salmon habitat area by river axial length for SU rivers, Rodney Brook is predicted to have a moderate amount of salmon habitat [1905 productive salmon habitat units (100 m^2)]. There is not a suspected existing wild population in the brook (Bowlby et al. 2013a). Landlocked stocking does not occur in the watershed and the river is not supplemented by the DFO LGB program. Salmon DNA was not detected in eDNA samples taken at Rodney001 in 2025. Several other anadromous species can be found in the brook. A few groups work on the brook and surrounding system. Rodney Brook has limited evidence of human activity.

Site Rodney001

Decision Tree Score: 3

Rodney001 is not a suitable location for aquaculture escapee monitoring because the brook was narrow, had very low water during the site visit, and had boulders in the brook bed that could complicate fence installation (Figure S110). The site is in Shelburne County, Nova Scotia, where Sandy Point Road crosses Rodney Brook. During the site visit in August 2025, the brook was 1 m wide wet width (2 m bankfull) and 5 - 15 cm deep with some 40 cm deep pools. There was evidence that the brook would be approximately 30 cm deeper during periods with more average rainfall. The water was 17.2°C. There was no evidence of flooding near the site. The substrate near the site is a mix of large boulders, small cobble, and gravel. The bridge is the only infrastructure near the site and the land around the site is privately owned.

Purney Brook

Purney Brook is in Shelburne County, Nova Scotia (Figure 41C). The mouth of the brook is in Jordan Branch where it empties into the Atlantic Ocean along the southeast coast of Nova Scotia. Purney Brook is located 8 km away from the nearest active salmon aquaculture lease. The closest dedicated salmon monitoring facility to Purney Brook is Morgan's Falls on the LaHave River in Nova Scotia. Based on our linear model of salmon habitat area by river axial length for SU rivers, Purney Brook is predicted to have a moderate amount of salmon habitat [4301 productive salmon habitat units (100 m^2)]. There is not a suspected existing wild

population in the brook (Bowlby et al. 2013a). Landlocked stocking does not occur in the watershed and the river is not supplemented by the DFO LGB program. Several other anadromous species can be found in the brook. A few groups work on the brook and surrounding system. Rodney Brook has evidence of limited human activity, primarily fishing

Site Purney001

Decision Tree Score: 3

Purney001 is not a suitable location for aquaculture escapee monitoring because there was evidence of saltwater intrusion indicating the site is influenced by the tides (Figure S111). The brook was also almost dry upstream of the bridge. The site is in Shelburne County, Nova Scotia, Jordan Branch Road crosses Purney Brook. During the site visit in August 2025, the brook was 6 m wide wet width (8 m bankfull) and 60 cm deep although depth may vary due to tidal influence. The water was 19.3°C. There was no evidence of flooding near the site apart from tidal water level changes. The substrate near the site is bedrock with very large cobble. The bridge is the only infrastructure near the site and the land around the site is privately owned.

Jordan River – Shelburne County

Jordan River is in Shelburne County, Nova Scotia (Figure 41C). The mouth of the river is in Jordan Falls where it empties into the Atlantic Ocean along the southeast coast of Nova Scotia. Jordan River is located 8 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility to Jordan River is Morgan's Falls on the LaHave River in Nova Scotia. Jordan River has a large amount of salmon habitat [15777 productive salmon habitat units (100 m^2; Bowlby et al. 2013b)]. There is not a suspected existing wild population in the river (Bowlby et al. 2013a). Landlocked stocking does not occur in the watershed and the river is not supplemented by the DFO LGB program. Salmon DNA was not detected in eDNA samples taken at JordanHwy103 in 2025. Several other anadromous species can be found in the river. A few groups work on the river and surrounding system. Jordan River has evidence of moderate human activity, including boating, swimming, and ATV use.

Site Jordan100

Decision Tree Score: 3

Jordan100 is not a suitable location for aquaculture escapee monitoring because the site is difficult to access and the river is wide at the site which increased the cost of a fence (Figure S112). The site is in Shelburne County, Nova Scotia, approximately 3 km upstream of the Nova Scotia Highway 103 bridge over Jordan River and can be accessed from an ATV trail. During the site visit in September 2025, the river was 36 m wide and 5 - 30 cm deep. Some sections of the river had exposed river bed indicating the water levels during the site visit were lower than average. The water was 18.3°C. There was no evidence of flooding near the site. The substrate near the site is mostly gravel and sand with some large. There is no infrastructure near the site and site is on Crown land.

Site JordanHwy103

Decision Tree Score: 3

JordanHwy103 is not a suitable location for aquaculture escapee monitoring because the river is tidally influenced at the site (Figure S113). The site is in Shelburne County, Nova Scotia, where Nova Scotia Highway 103 crosses Jordan River. During the site visit in

August 2025, the river was 10 m wide wet width at low tide, 40 m wide wet width during high tide, and 35 cm deep with a 60 cm deep channel under the bridge. The water was 17.7°C. There was no evidence of flooding near the site apart from tidal water level changes. The substrate near the site is bedrock with small cobble and boulders. The bridge is the only infrastructure near the site and site is on provincially owned and Crown land.

East River

East River is in Shelburne County, Nova Scotia, near West and East Green Harbour (Figure 41C). The mouth of the river flows into the Atlantic Ocean along the southeast coast of Nova Scotia. East River is located 7 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility to East River is Morgan's Falls on the LaHave River in Nova Scotia. East River has a moderate amount of salmon habitat [2519 productive salmon habitat units (100 m^2; Bowlby et al. 2013b)]. There is not a suspected existing wild population in the river (Bowlby et al. 2013a). Landlocked stocking does not occur in the watershed and the river is not supplemented by the DFO LGB program. Several other anadromous species can be found in the river. A few groups work on the river and surrounding system. East River has limited evidence of human activity.

Site East001

Decision Tree Score: 1

East001 is not a suitable location for aquaculture escapee monitoring because the water levels were very low during the site assessment and the substrate would complicate fence installation (Figure S114). The site is in Shelburne County, Nova Scotia, just upstream of where Nova Scotia Route 3/ Lighthouse Route crosses East River. During the site visit in August 2025, the river was 3 m wide wet width (8.5 m bankfull) and 40 cm deep although water lines indicated the river gets approximately 60 cm deeper. The water was 18.6°C. There was evidence of flooding near the site including debris along the banks. The substrate near the site is mostly large boulders. The bridge is the only infrastructure near the site and the land around the site is privately owned.

Sable River

Sable River is in Shelburne County, Nova Scotia, near the community of Sable River (Figure 41C). The mouth of the river is in Louis Head where it empties into the Atlantic Ocean along the southeast coast of Nova Scotia. Sable River is located 23 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility to Sable River is Morgan's Falls on the LaHave River in Nova Scotia. Sable River has a moderate amount of salmon habitat [6662 productive salmon habitat units (100 m^2; Bowlby et al. 2013b)]. There is not a suspected existing wild population in the river (Bowlby et al. 2013a). Many other anadromous species can be found in the river. A few groups work on the river and surrounding system. Sable River has evidence of moderate human activity, including recreational and commercial fishing.

Site Sable003

Decision Tree Score: 2

Sable003 is not a suitable location for aquaculture escapee monitoring because the river was tidally influenced and potentially brackish at the site (Figure S115). The site is in Shelburne County, Nova Scotia, off of Log Bridge Road approximately 1 km upstream

from where Nova Scotia Highway 103 crosses Sable River. Because the site was visibly not appropriate for escapee monitoring due to being tidally influenced, no site measurements were taken during the site visit in August 2025. The substrate near the site ism mostly mud and sand. There is no infrastructure near the site and the land around the site is privately owned.

Tidney River (Sable River System)

Tidney River is part of the Sable River system in Shelburne County, Nova Scotia, near the community of Sable River (Figure 41C). The mouth of the river is in Louis Head where it empties into the Atlantic Ocean along the southeast coast of Nova Scotia. The Sable River system is located 23 km away from the nearest active salmon aquaculture lease (Tidney River is approximately 13 km upstream of the mouth of the system) and the dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility to the Sable River system is Morgan's Falls on the LaHave River in Nova Scotia. Tidney River has a moderate amount of salmon habitat [5275 productive salmon habitat units (100 m^2; Bowlby et al. 2013b)]. There is not a suspected existing wild population in the river (Bowlby et al. 2013a). Many other anadromous species can be found in the river. A few groups work on the river and surrounding system. Tidney River has evidence of moderate human activity, including recreational and commercial fishing.

Site SableTidney001

Decision Tree Score: 1

SableTidney001 is not a suitable location for aquaculture escapee monitoring because the water level was very low during the site visit and the river substrate would significantly complicate fence installation (Figure S116). The site is in Shelburne County, Nova Scotia, where Nova Scotia Highway 103 crosses Tidney River. During the site visit in August 2025, the river was 2 - 6 m wide wet width (18 m bankfull) and shallow with a few pools more than 1 m deep. There were also deep, dry holes between some of the rocks in the river substrate. The water was 15.8°C. There was evidence of flooding and the potential for flash flooding near the site. The substrate near the site is bedrock with many large boulders. The bridge is the only infrastructure near the site and the land around the site is privately owned.

Site SableTidney002

Decision Tree Score: 2

SableTidney002 is not a suitable location for aquaculture escapee monitoring because the site was difficult to access, the water level was very low during the site visit, and the river substrate would significantly complicate fence installation (Figure S117). The site is in Shelburne County, Nova Scotia, just upstream of SableTidney001 where Nova Scotia Highway 103 crosses Tidney River, and was accessed via the Shelburne County Rail Trail. The site was very similar to SableTidney001 and the site assessments were withing 30 minutes of each other, so specific site measurements weren't taken. There was evidence of flooding and the potential for flash flooding near the site. The substrate near the site is bedrock with many large boulders. There is no infrastructure near the site and the land around the site is privately owned.

Granite Village Brook

Granite Village Brook is in Shelburne County, Nova Scotia, near Granite Village (Figure 41C). The brook flows directly into the Atlantic Ocean. Granite Village Brook is located 31 km away from the nearest active salmon aquaculture lease and was not included in the model predicting

the amount of escaped aquaculture salmon returning to the river, but nearby rivers were estimated to have 15-20% of returning salmon be escapees from aquaculture facilities. The closest dedicated salmon monitoring facility to Granite Village Brook is Morgan's Falls on the LaHave River in Nova Scotia. Granite Village Brook has a small amount of salmon habitat [851 productive salmon habitat units (100 m^2; Bowlby et al. 2013b)]. The brook does not have a suspected wild population (Bowlby et al. 2013a). Landlocked stocking does not occur in the watershed and the river is not supplemented by the DFO LGB program. Few other anadromous species can be found in the brook. Several groups work on the brook and surrounding system. Granite Village Brook has limited evidence of human activity.

Site Granite002

Decision Tree Score: 2

Granite002 is not a suitable location for aquaculture escapee monitoring because it was tidal (Figure S118). The site is in Shelburne County, Nova Scotia, where Nova Scotia Highway 103 crosses Granite Village Brook near the mouth of the brook. Because the site was visibly not appropriate for escapee monitoring due to being tidal, no site measurements were taken during the site visit in August 2025. The bridge is the only infrastructure near the site and the land around the site is privately owned.

Broad River

Broad River is in Queens County, Nova Scotia, near Summerville Beach Provincial Park (Figure 41C). Broad River flows into the Atlantic Ocean along the southwest coast of Nova Scotia. Broad River is located 20 km away from the nearest active salmon aquaculture lease and the dispersal model predicts that some of the salmon that return to the river are escaped aquaculture salmon. The closest dedicated salmon monitoring facility to Broad River is Morgan's Falls on the LaHave River in Nova Scotia. Broad River has a moderate amount of salmon habitat [5802 productive salmon habitat units (100 m^2; Bowlby et al. 2013b)]. No information is available about current populations in the river, but landlocked stocking does not occur in the watershed and the river is not supplemented by the DFO LGB program. Salmon DNA was not detected in eDNA samples taken at BroadRiver001 in 2025. Several other anadromous species can be found in the river. Several groups work on the river and surrounding system. Broad River has limited evidence of human activity, primarily swimming and camping near the provincial park.

Site BroadRiver001

Decision Tree Score: 2

BroadRiver001 is not a suitable location for aquaculture escapee monitoring because the river substrate would significantly complicate fence installation (Figure S119). The site is in Queens County, Nova Scotia, where Nova Scotia Highway 103 crosses Broad River. During the site visit in August 2025, the river was 3 - 5 m wide wet width (22 m bankfull) and 10 cm deep with some 1 m deep pools. The water was 23.1°C. There was evidence of flooding and the potential for flash flooding near the site. The substrate near the site is bedrock with many large boulders. There is no infrastructure near the site and the land around the site is privately owned.

APPENDIX TABLES

Table S 1 – Data rubric for all sites not suitable for escapee monitoring or other research activities. The rubric contains information on salmon habitat, proximity to aquaculture, salmon presence, and human activities for each river and detailed site measurements and characteristics for each site.

| Site Information | | | | | | | | Existing Data for the River | | | | River Biology | | | | | | | | | | River Geography | | | | | | | | Site Characteristics | | | | | | | | | |

Table S 2 - ANOVA tables for linear regressions of published available salmon habitat area (100 m^2 units) by axial length (km) for rivers in (a) Outer Bay of Fundy, (b) Inner Bay of Fundy, and (c) Nova Scotia Southern Upland.

(a)	**df**	**SS**	**MS**	**F**	**p-value**
Axial Distance	1	1.66×10^{9}	1.66×10^{9}	29.01	1.24×10^{-4}
Residual	13	7.42×10^{8}	5.71×10^{7}		
(b)	**df**	**SS**	**MS**	**F**	**p-value**
Axial Distance	1	1.05×10^{9}	1.05×10^{9}	47.576	4.95×10^{-7}
Residual	23	5.09×10^{8}	2.21×10^{7}		
(c)	**df**	**SS**	**MS**	**F**	**p-value**
Axial Distance	1	1.86×10^{10}	1.86×10^{10}	140.83	2.20×10^{-16}
Residual	65	8.57×10^{9}	1.32×10^{8}		

APPENDIX FIGURES

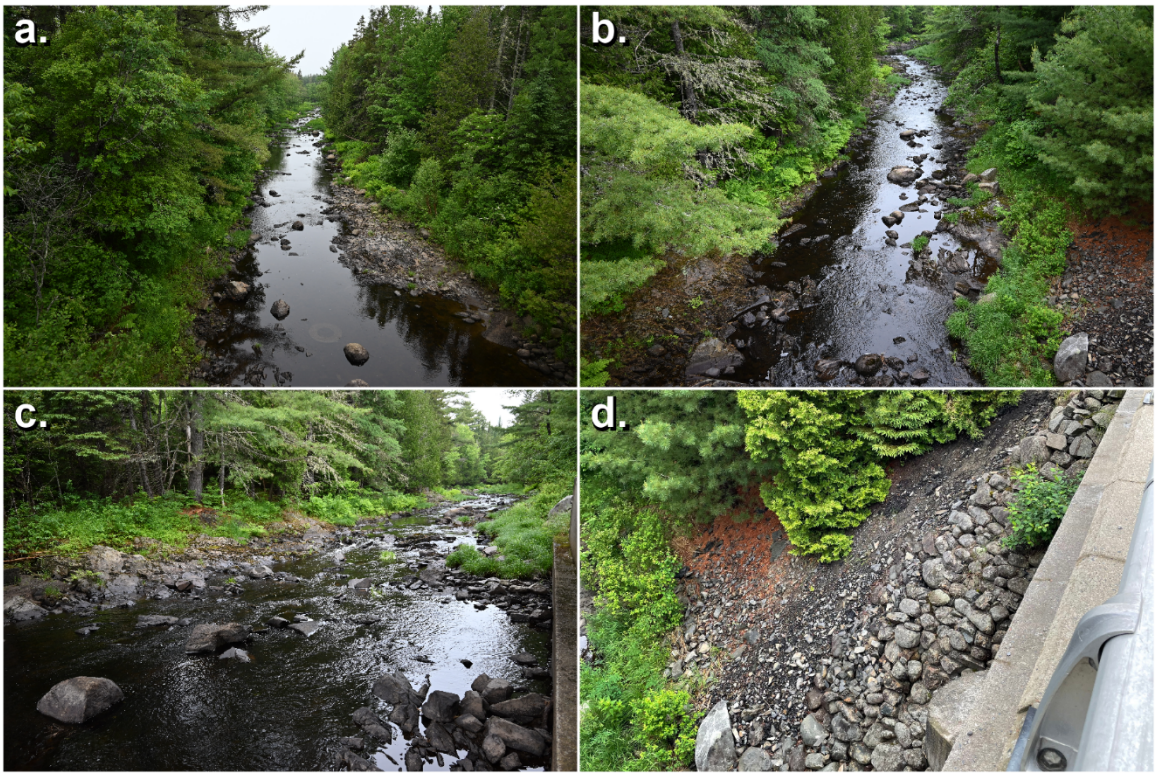


Figure S 1 - Photographs of sampling site Waweig001, on Waweig River, NB, in the Outer Bay of Fundy Designatable Unit. a. Looking downstream on Waweig River from the New Brunswick Highway 127 bridge. b. Looking upstream on Waweig River from the New Brunswick Highway 127 bridge. c. Looking upstream on Waweig River from under the New Brunswick Highway 127 bridge. d. The slope down to Waweig001 from New Brunswick Highway 127.

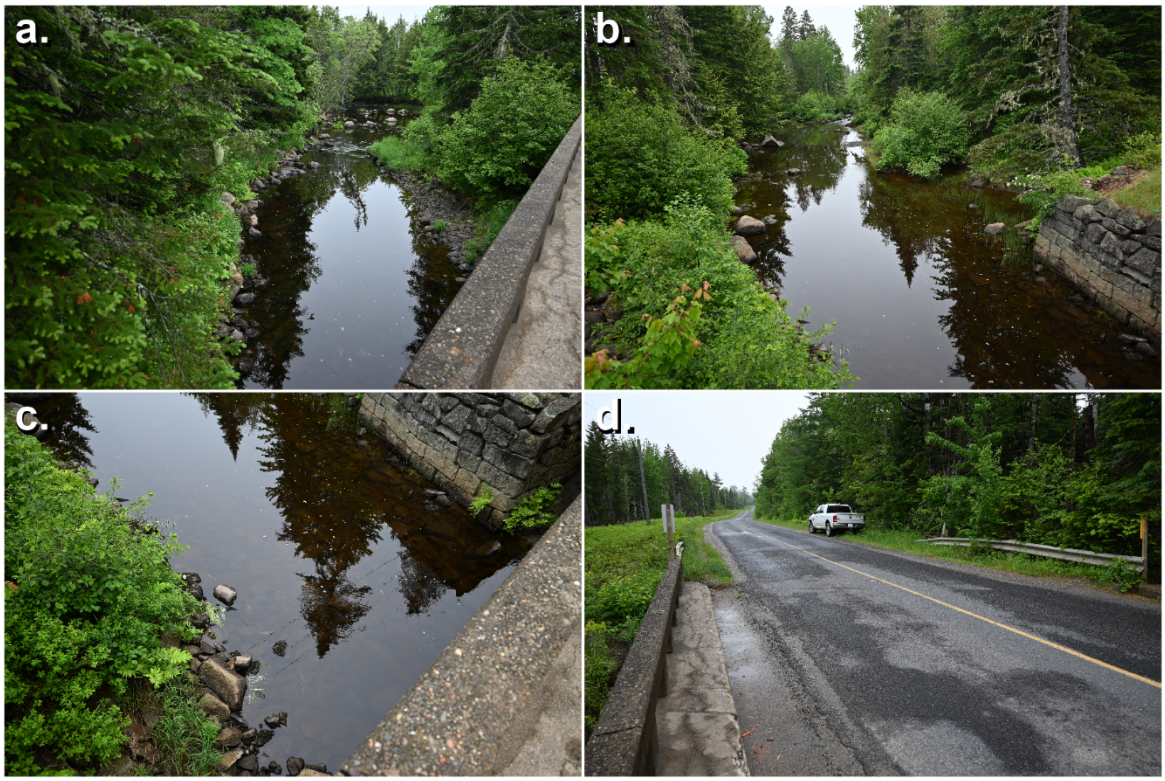


Figure S 2 - Photographs of sampling site Waweig002, on Waweig River, NB, in the Outer Bay of Fundy Designatable Unit. a. Looking downstream on Waweig River from the New Brunswick Route 760 bridge. b. Looking upstream on Waweig River from the New Brunswick Route 760 bridge. c. Looking down on the upstream side of the New Brunswick Route 760 bridge showing some visible river substrate and a stone wall. d. Available parking along New Brunswick Route 760 near Waweig002.

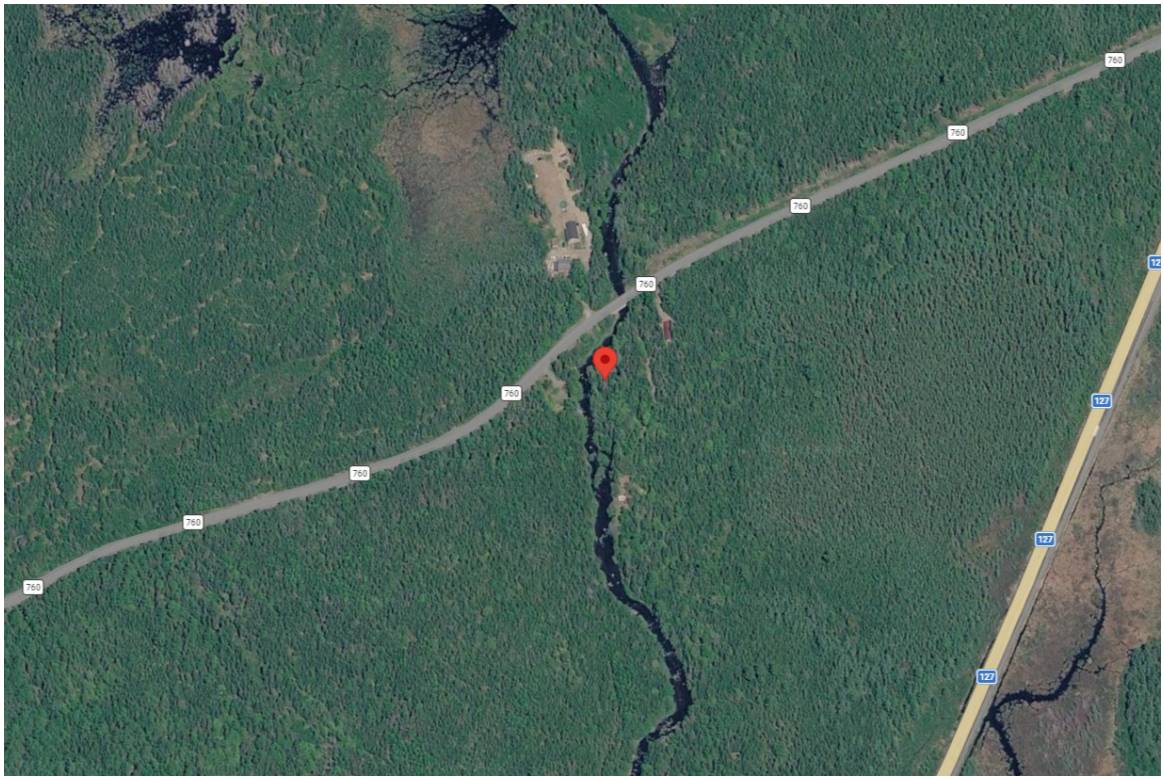


Figure S 3 - Google Maps screenshot of site WGNEW, on Waweig River, NB, in the Outer Bay of Fundy Designatable Unit.

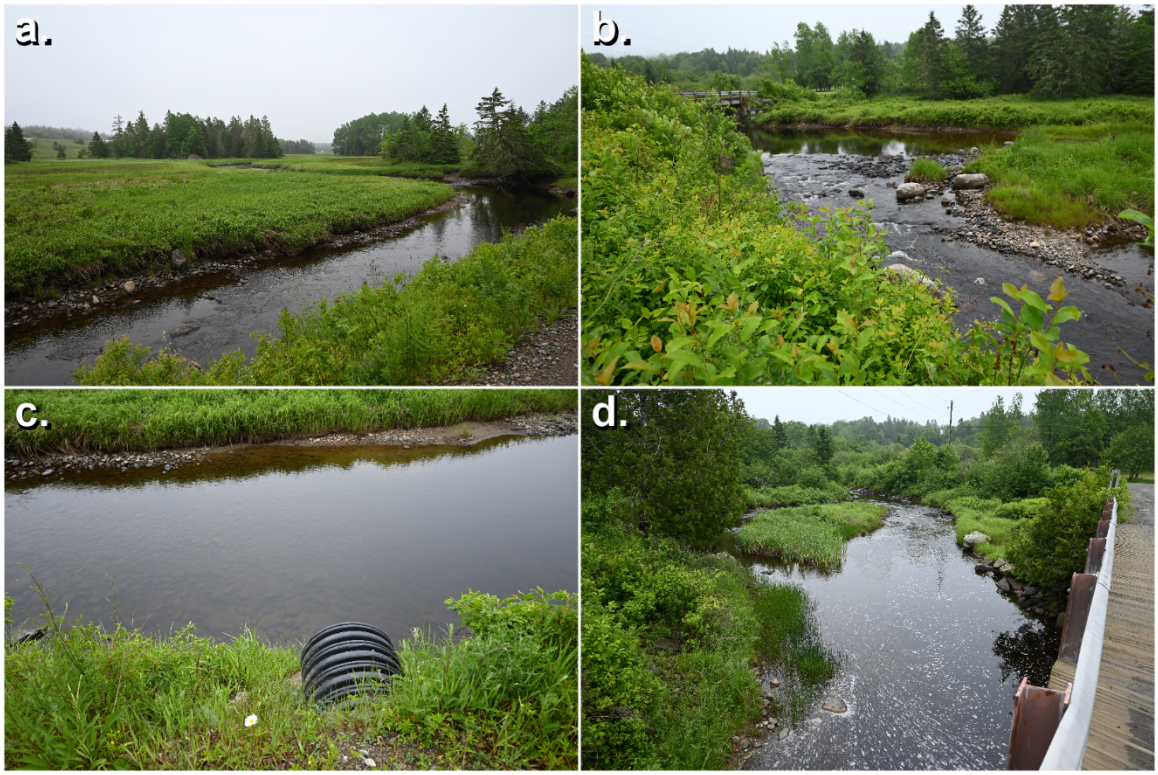


Figure S 4 - Photographs of sampling site Bocabec001, on Bocabec River, NB, in the Outer Bay of Fundy Designatable Unit. a. Looking downstream on Bocabec River from Bocabec Ridge Road. b. Looking upstream on Bocabec River from Bocabec Ridge Road. The Bocabec Ridge Road bridge over Bocabec River is visible in the background. c. Across Bocabec River at Bocabec001 showing some visible substrate and a culvert that enters the river from under the road. d. Looking upstream on Bocabec River from the Bocabec Ridge Road bridge showing marsh-like conditions near the site.

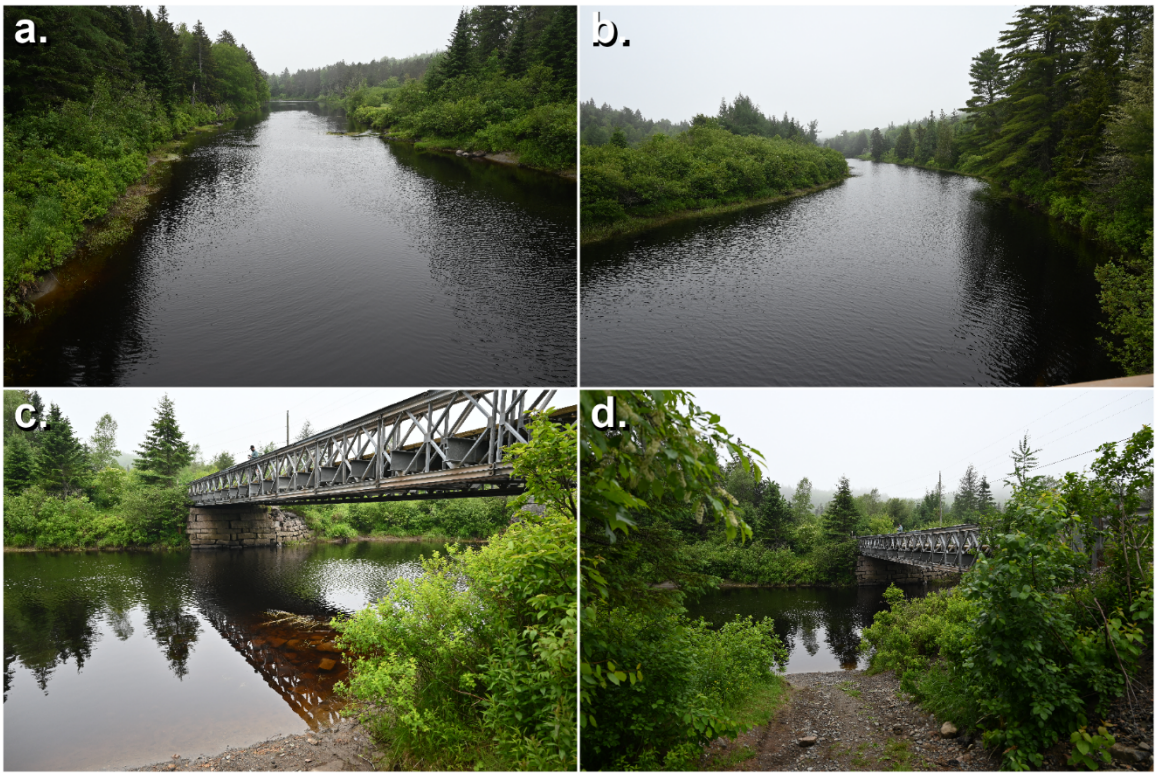


Figure S 5 - Photographs of sampling site Dig001, on Digdeguash River, NB, in the Outer Bay of Fundy Designatable Unit. a. Looking downstream at Digdeguash River from the Stillwater Road bridge. b. Looking upstream at the river from the Stillwater Road bridge. c. Looking across the river under the Stillwater Road bridge over Digdeguash River with some river substrate visible in the foreground. d. Looking across the river from the small pull-off next to the intersection of Stillwater Road and Burns Brook Road.



Figure S 6 - Google Maps screenshot of site DIG1, on Digdeguash River, NB, in the Outer Bay of Fundy Designatable Unit.

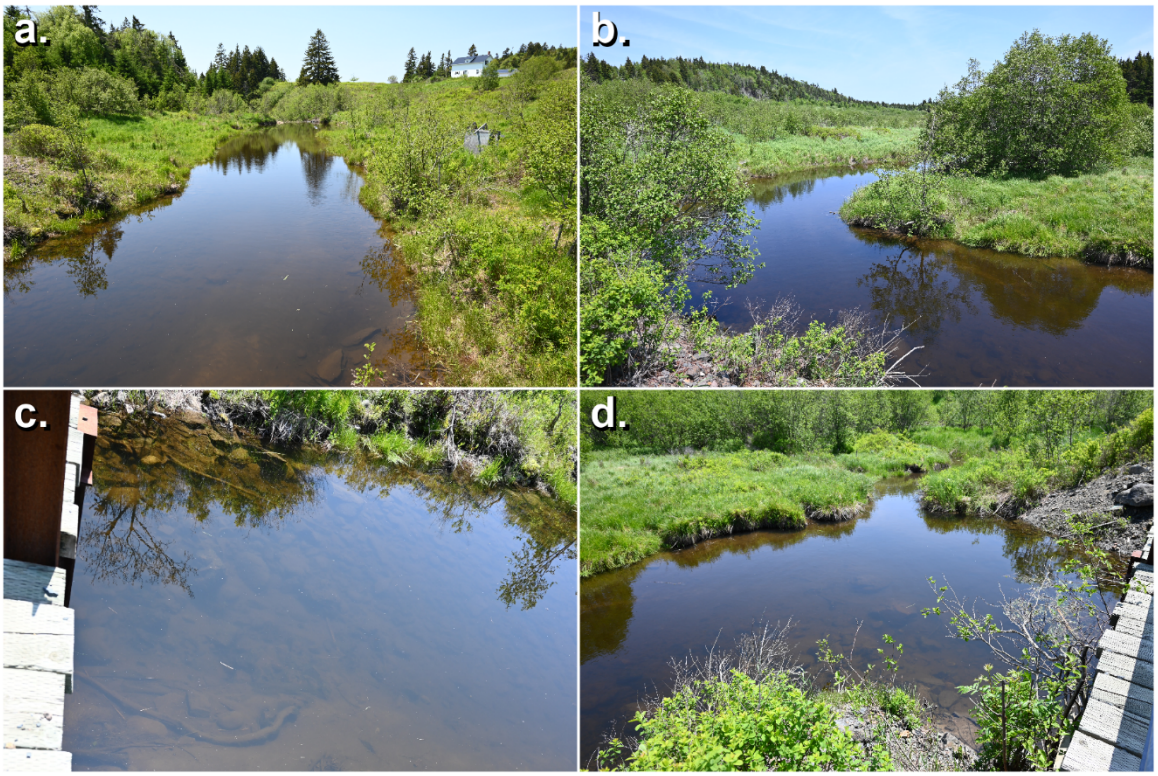


Figure S 7 - Photographs of sampling site Cripps001, on Cripps Stream, NB, in the Outer Bay of Fundy Designatable Unit. a. Downstream view of Cripps Stream from Foleys Cove Road. The end of the pool visible in the back of the image is a beaver dam. b. Upstream view of Cripps Stream from Foleys Cover Road. c. The substrate of Cripps Stream at Cripps001. d. View across Cripps Stream at Cripps001 showing a small channel joining the main stream (top, main stream channel coming from the left) and the marsh-like habitat around the stream.

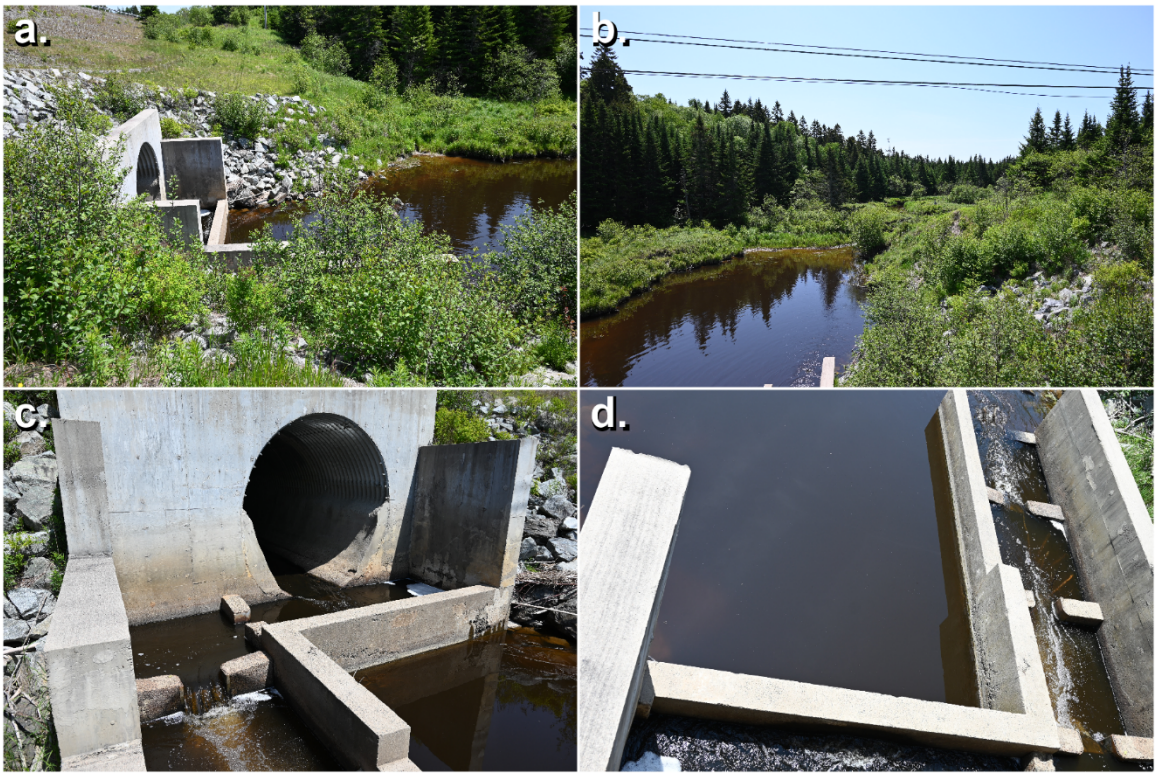


Figure S 8 - Photographs of sampling site Crow001, on Knights Mill Brook, NB, in the Outer Bay of Fundy Designatable Unit. a. View of Crow001 on the downstream side of New Brunswick Highway 175. Knights Mill Brook runs under the highway through the culvert. b. View looking downstream on Knights Mill Brook from the culvert at New Brunswick Highway 175. c. The culvert opening and top of the fish ladder at Crow001. d. Looking down at the fish ladder at Crow001 from the culvert under New Brunswick Highway 175. Debris can be seen built up in the fish ladder on the right.

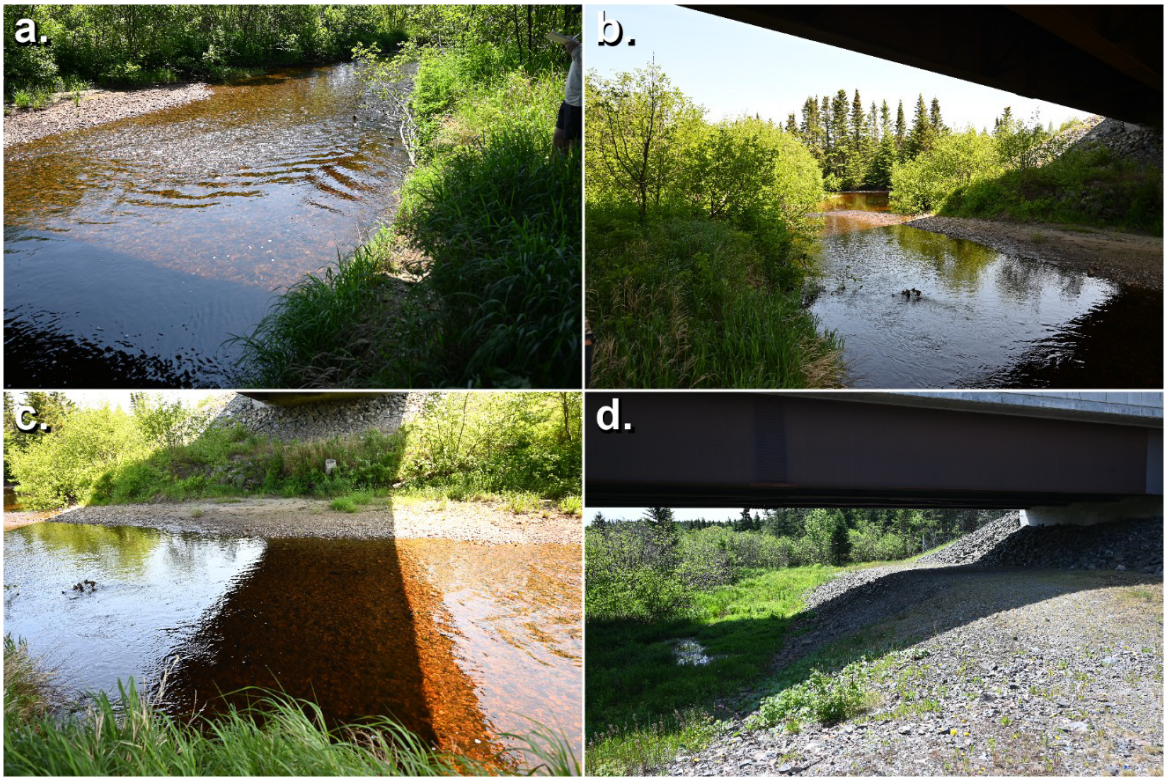


Figure S 9 - Photographs of sampling site Poc001, on Pocologan River, NB, in the Outer Bay of Fundy Designatable Unit. a. View downstream on Pocologan River from Poc001 under the New Brunswick Highway 1 bridge over the river. b. View upstream on Pocologan River from Poc001 under the New Brunswick Highway 1 bridge over the river. c. View across the Pocologan River from Poc001 showing cobble substrate and some uncovered river bed which suggests water levels were low during the site assessment. D. A potential staging area at Poc001 under the New Brunswick Highway 1 bridges. This area was not accessible by truck.



Figure S 10 - Google Maps screenshot of site Poc002 (2025 assessment, called PN2 for the 2024 assessment), on Pocologan River, NB, in the Outer Bay of Fundy Designatable Unit.

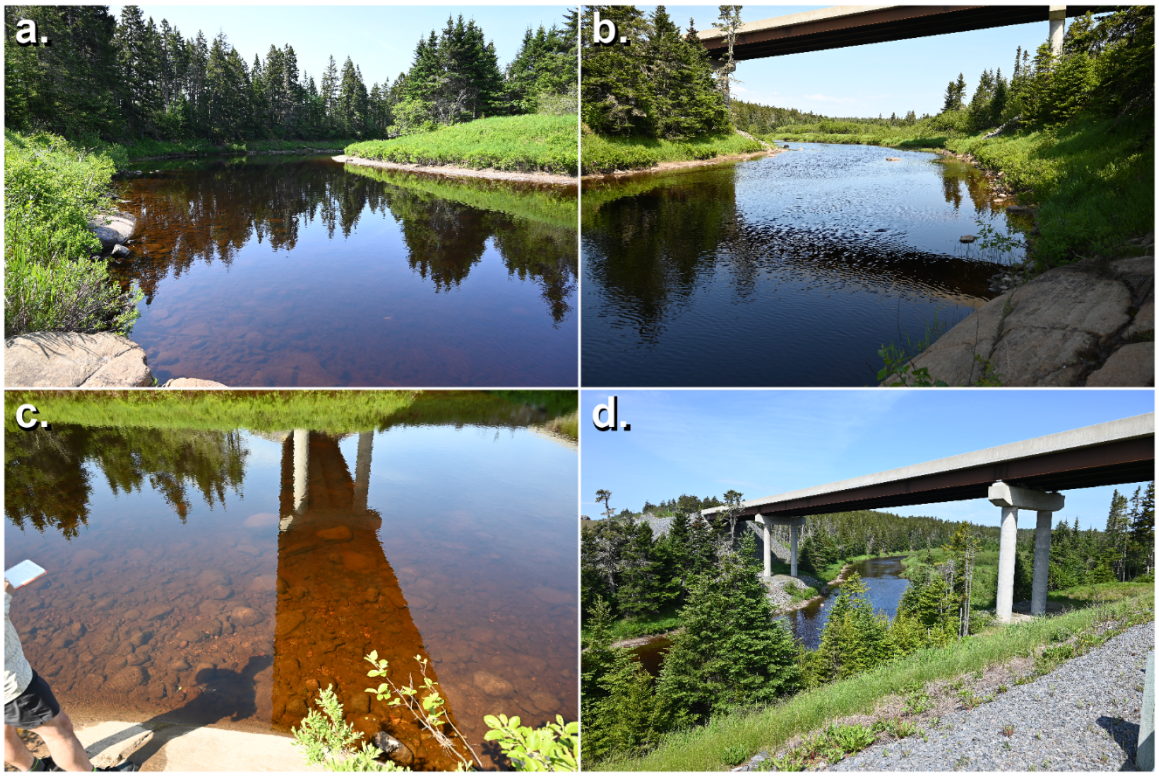


Figure S 11 - Photographs of sampling site New001, on New River, NB, in the Outer Bay of Fundy Designatable Unit. a. View looking downstream on New River from the bank of the river at New001. b. View looking upstream on New River from the bank of the river at New001. c. View looking across New River at New001 showing cobble and bedrock substrate. d. View looking upstream along New River from Detour Road near New001.

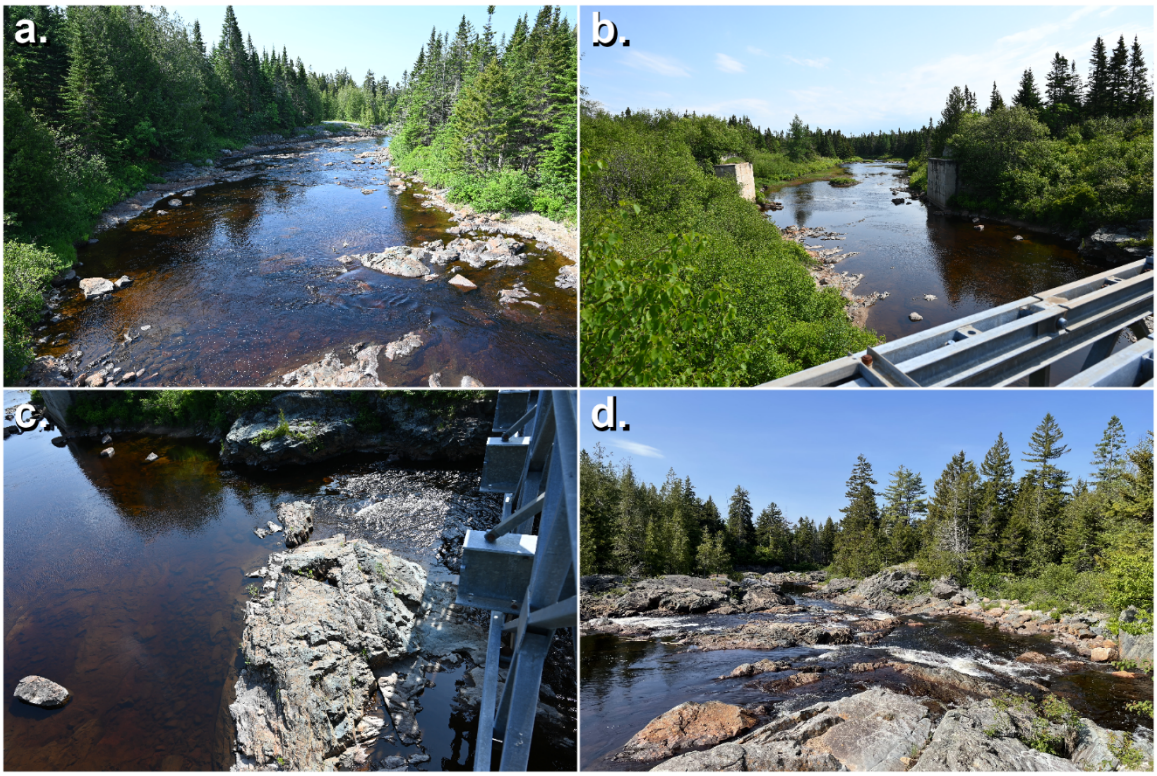


Figure S 12 - Photographs of sampling site New002, on New River, NB, in the Outer Bay of Fundy Designatable Unit. a. Looking downstream on New River from the New Brunswick Route 780 bridge over New River. b. Looking upstream on New River from the New Brunswick Route 780 bridge over New River, with concrete structures along the banks of the river. c. View of the river substrate below the bridge over New River. d. Part of New River Falls downstream of New002.

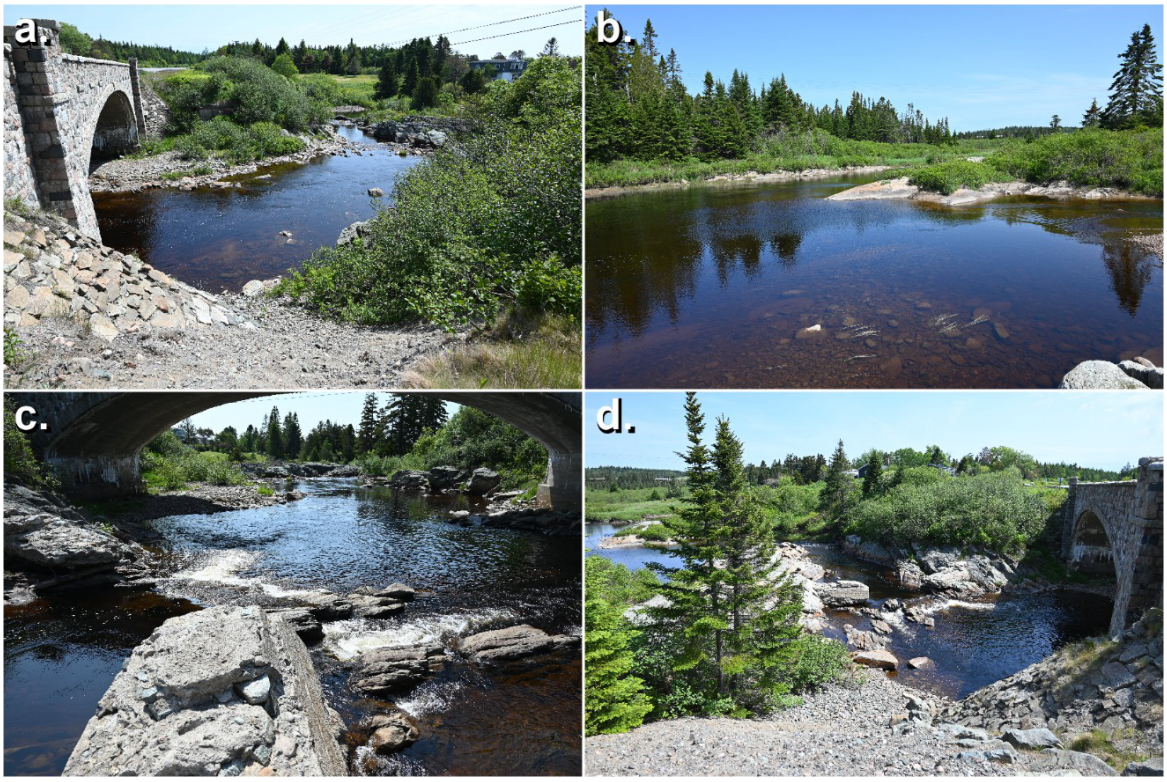


Figure S 13 - Photographs of sampling site New003, on New River, NB, in the Outer Bay of Fundy Designatable Unit. a. View looking downstream on New River at New003 on the downstream side of the New Brunswick Route 175 bridge. b. Looking upstream on New River at New003 just upstream of the New Brunswick Route 175 bridge. c. Looking downstream on New River under the bridge at New003. d. Looking down towards New River from the shoulder of New Brunswick Route 175, upstream of the bridge.

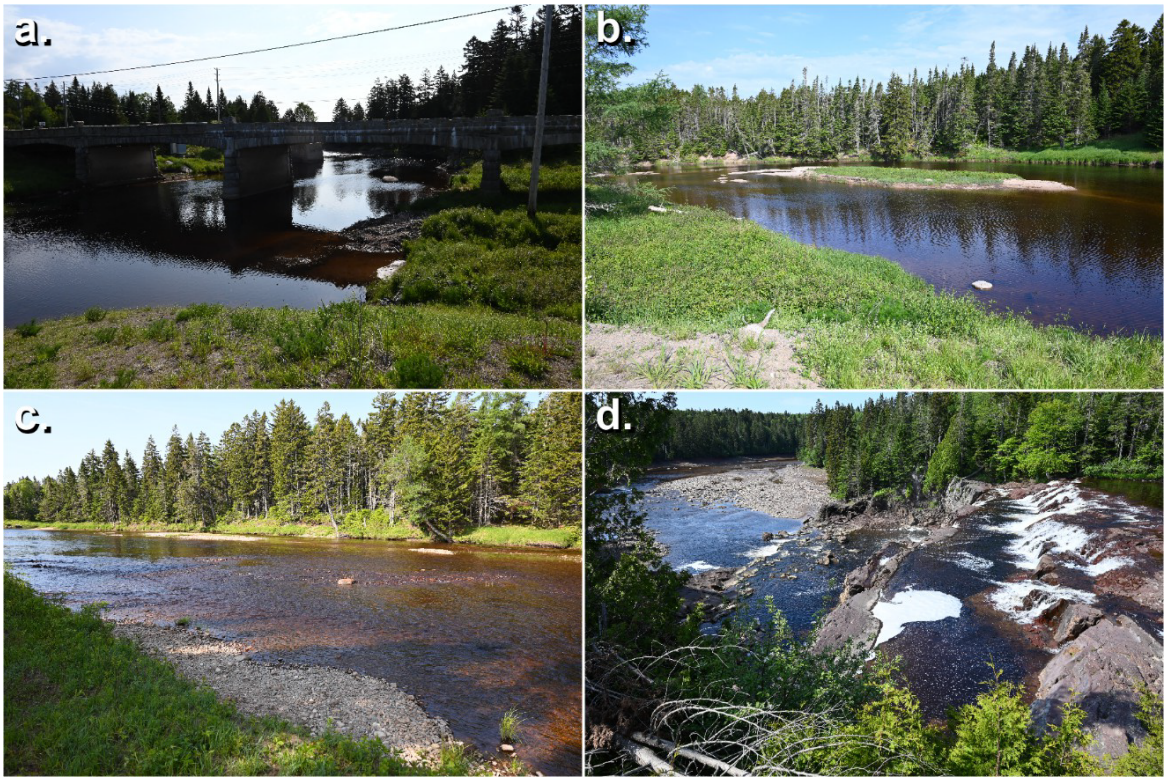


Figure S 14 - Photographs of sampling site Lepreau001, on Lepreau River, NB, in the Outer Bay of Fundy Designatable Unit. a. Downstream view of Lepreau River from Lepreau001 looking under the New Brunswick Route 175 bridge. b. Upstream view of Lepreau River from Lepreau001. c. Section of riffles upstream of Lepreau001. d. Part of the Lepreau River Falls near the mouth of Lepreau River, downstream of Lepreau001.

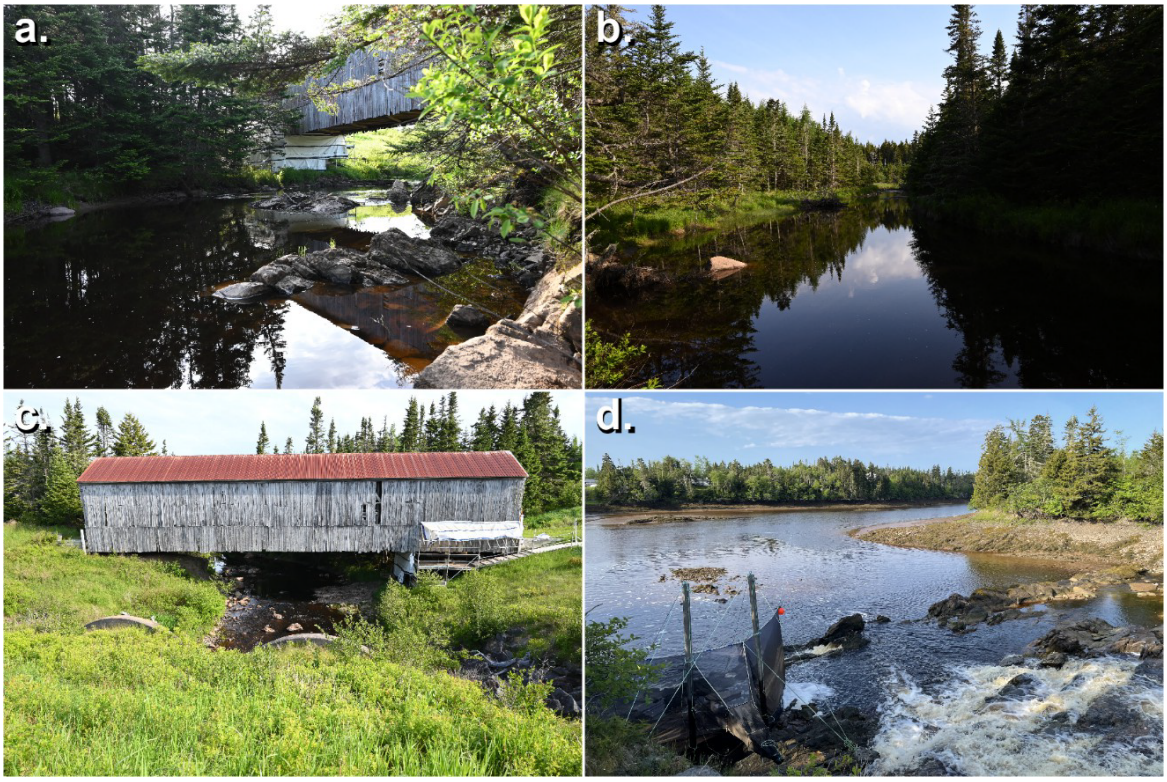


Figure S 15 - Photographs of sampling site LittleLepreau001, on Little Lepreau River, NB, in the Outer Bay of Fundy Designatable Unit. a. Downstream towards the Mill Pond Covered Bridge over Little Lepreau River from LittleLepreau001. b. Upstream view of Little Lepreau River from LittleLeperau001. c. Upstream view towards the Mill Pond Covered Bridge from Little Lepreau Road. d. Downstream view from Little Lepreau Road near LittleLepreau001 showing small falls (lower right), a fishing weir (lower left) and the tidal estuary of Little Lepreau River.



Figure S 16 - Google Maps screenshot of site KSW1, on Keswick River, NB, in the Outer Bay of Fundy Designatable Unit.

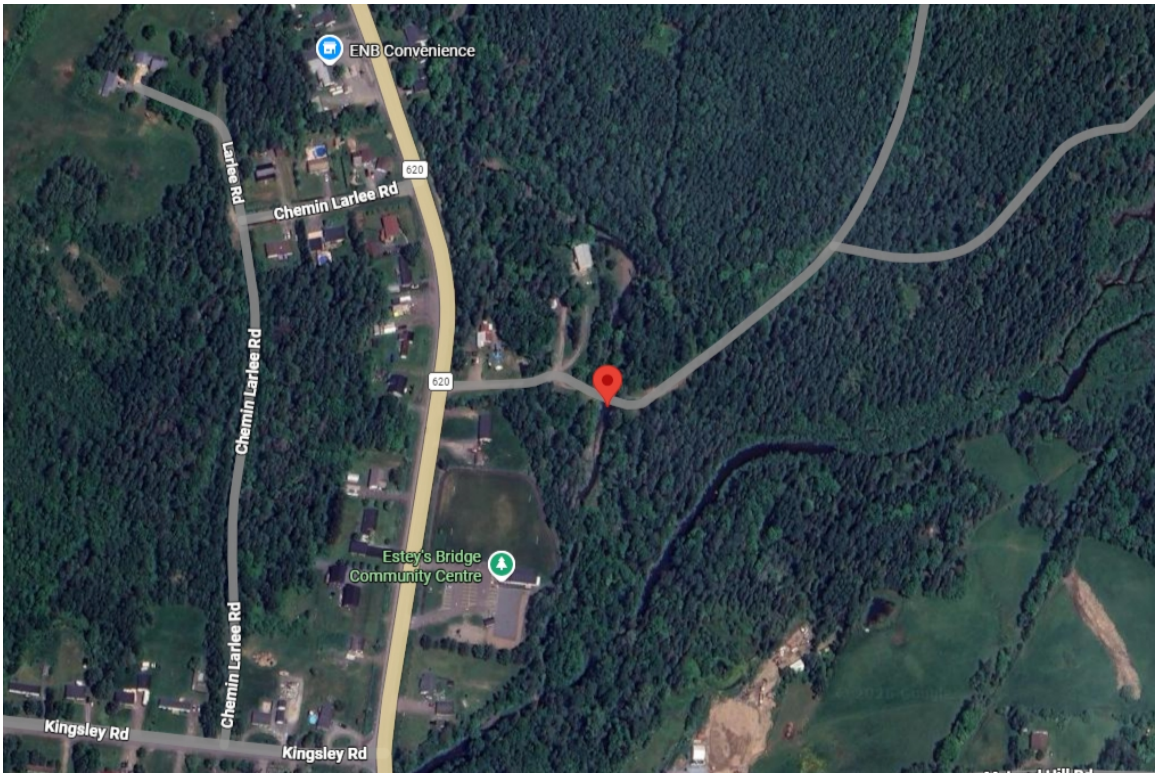


Figure S 17 - Google Maps screenshot of site NKS, on Nashwaaksis Stream, NB, in the Outer Bay of Fundy Designatable Unit.



Figure S 18 - Google Maps screenshot of site HAR, on Mill Brook (Saint John River system), NB, in the Outer Bay of Fundy Designatable Unit.

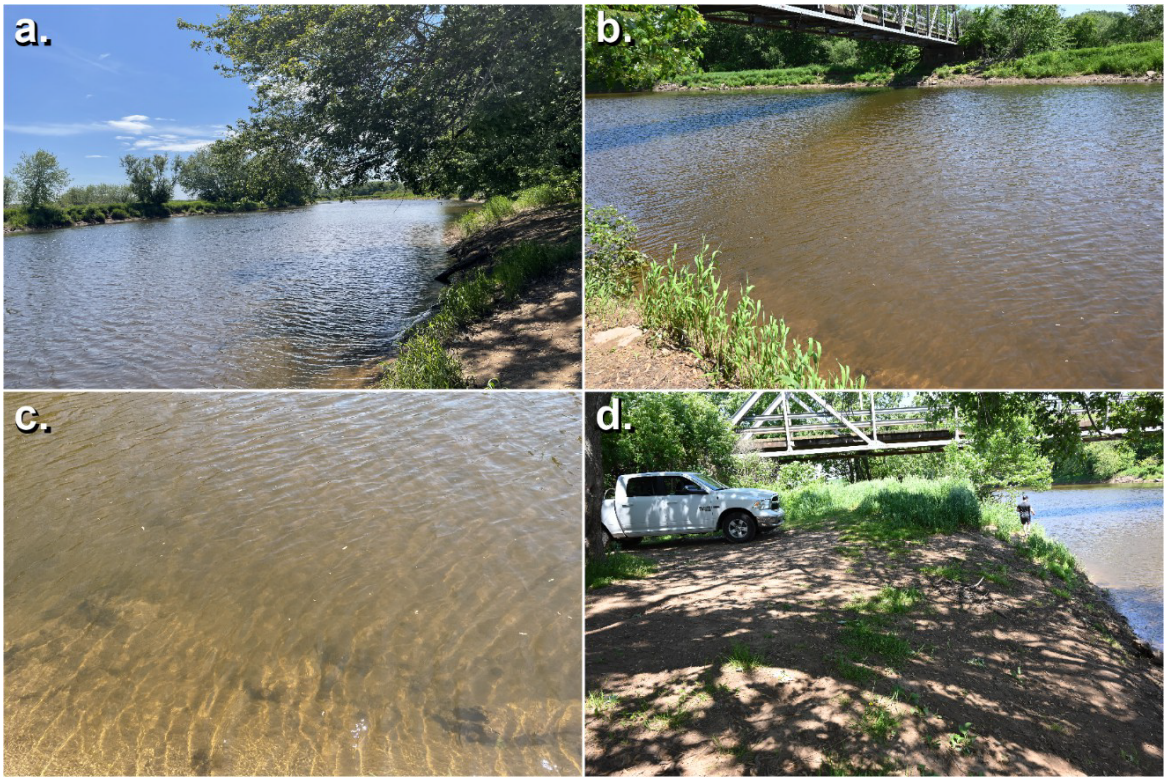


Figure S 19 - Photographs of sampling site Kenneb001, on Kennebecasis River (Saint John River system), NB, in the Outer Bay of Fundy Designatable Unit. a. Downstream view of Kennebecasis River from Kenneb001. b. Upstream view of Kennebecasis River from Kenneb001 with the Bloomfield Station Road bridge. c. The river substrate at Kenneb001. d. Staging and parking access next to Kennebecasis River at Kenneb001.

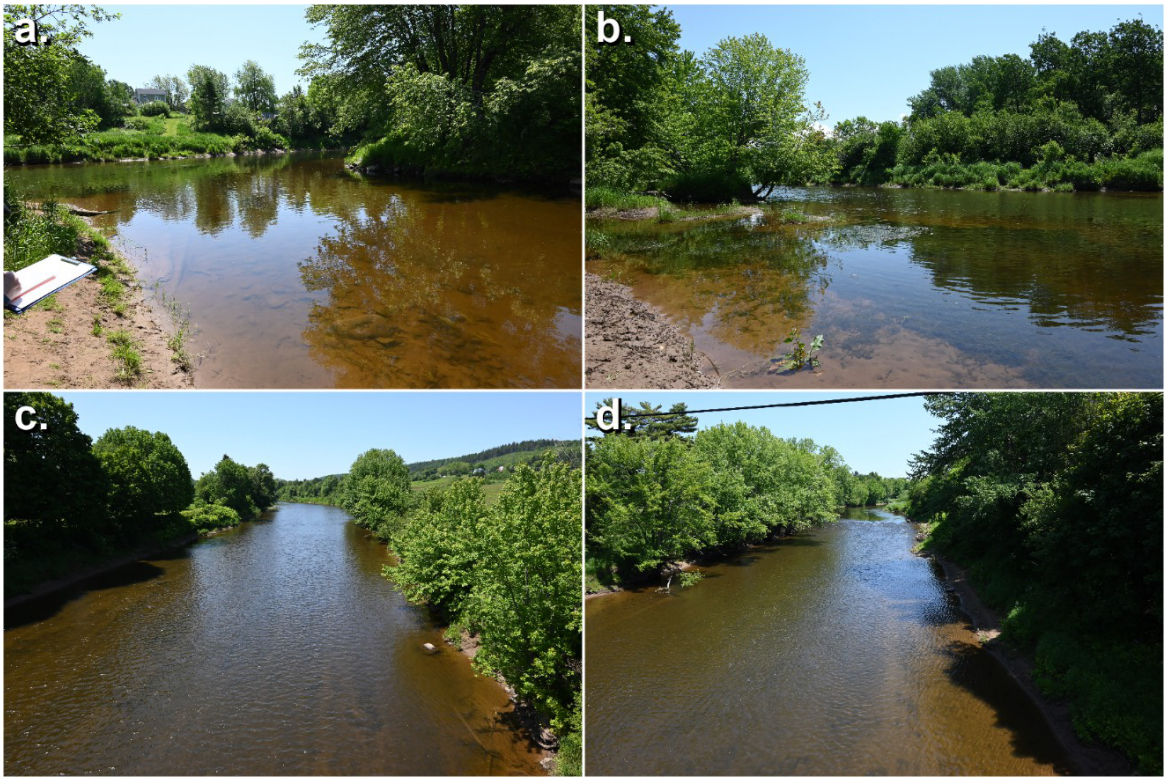


Figure S 20 - Photographs of sampling site Kenneb002, on Kennebecasis River (Saint John River system), NB, in the Outer Bay of Fundy Designatable Unit. a. Downstream view of the confluence of Kennebecasis River and Millstream River, just upstream of Kenneb002. In the photo, Kennebecasis River flows from left to upper right and Millstream River joins from the lower right. b. Upstream view of Kennebecasis River just upstream of Kenneb002 taken from the same point as Panel a. c. Downstream view of Kennebecasis River from the Bridge Street bridge in Apohaqui. d. Upstream view of Kennebecasis River from the Bridge Street bridge in Apohaqui. A shallow riffle can be seen in the distance.

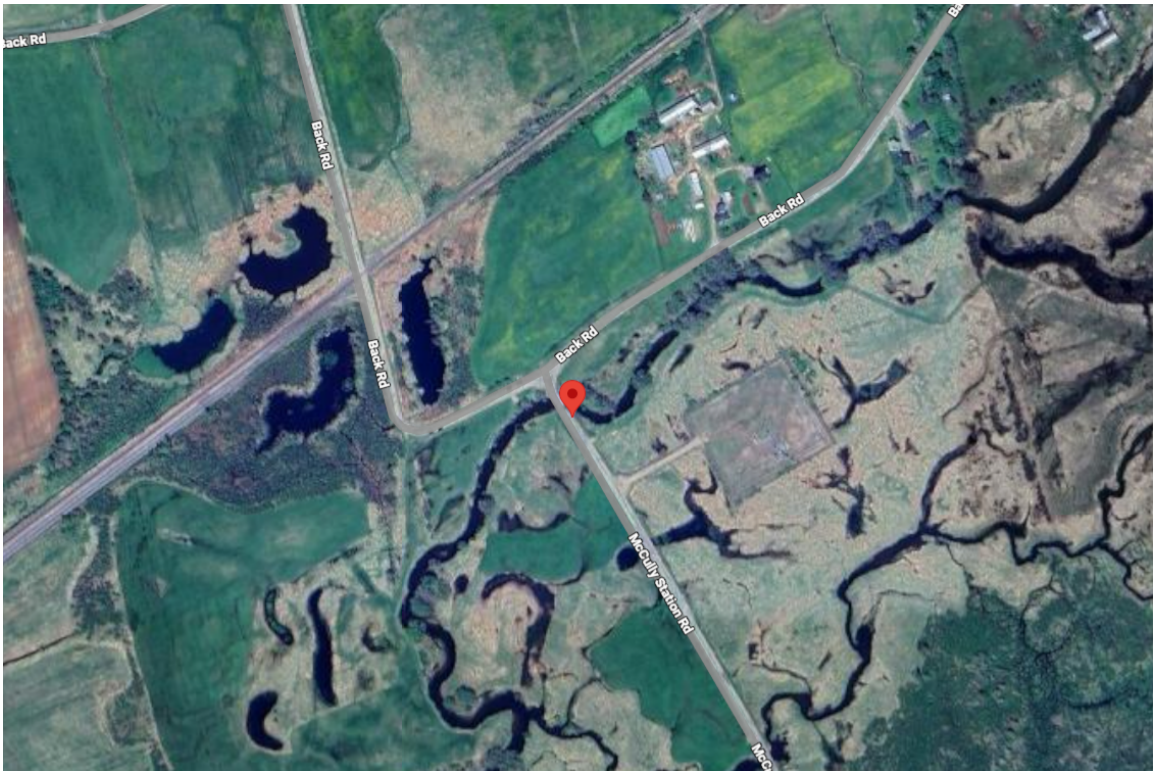


Figure S 21 - Google Maps screenshot of site KSL, on Kennebecasis River (Saint John River system), NB, in the Outer Bay of Fundy Designatable Unit.

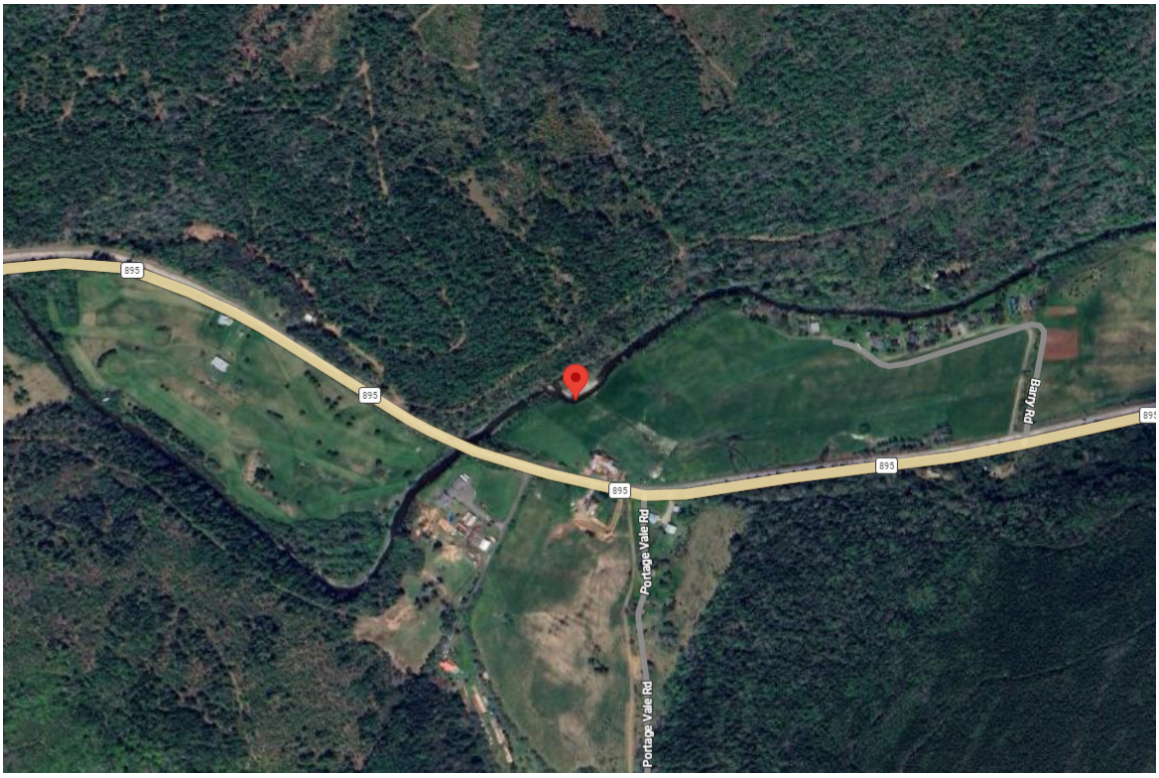


Figure S 22 - Google Maps screenshot of site KS5, on Kennebecasis River (Saint John River system), NB, in the Outer Bay of Fundy Designatable Unit.

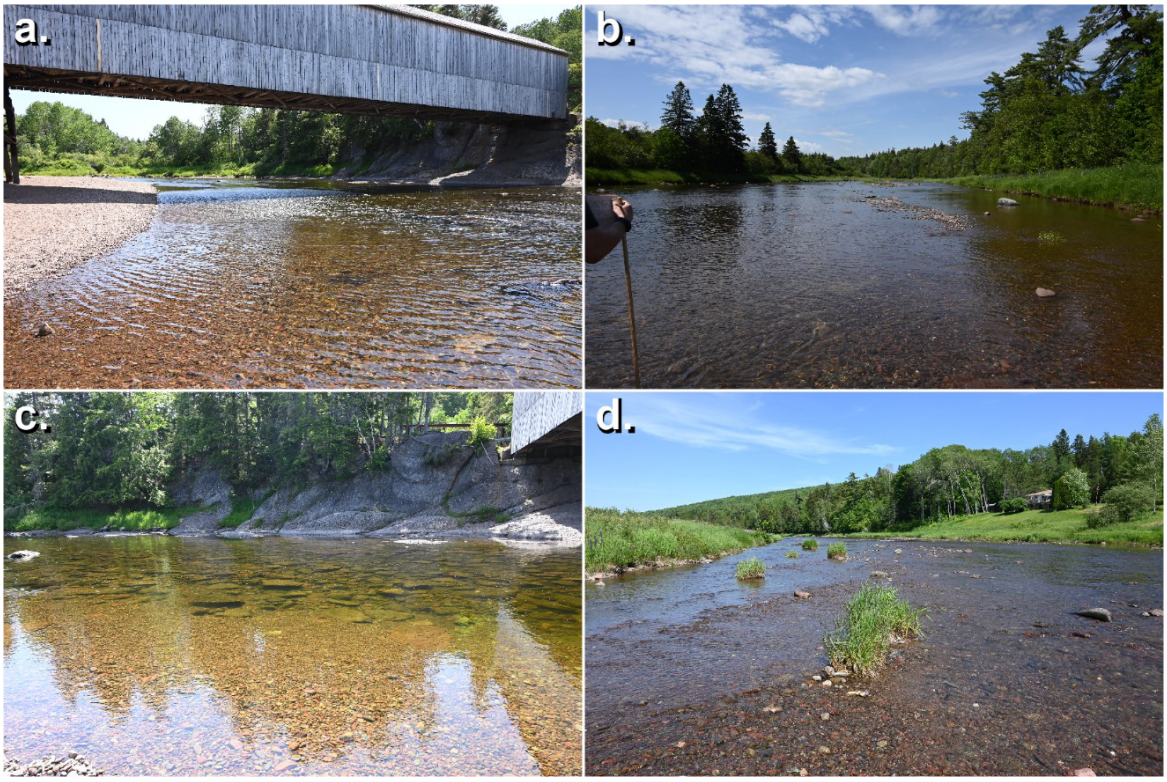


Figure S 23 - Photographs of sampling site Hammond002, on Hammond River (Saint John River system), NB, in the Outer Bay of Fundy Designatable Unit. a. Downstream view of Hammond River from Hammond002 where it flows under the Historic Smithtown Covered Bridge. b. Upstream view of Hammond River from Hammond002. c. View across Hammond River just downstream of Hammond002, with substrate visible along the stretch. d. Downstream view of Hammond River from just downstream of Hammond002.



Figure S 24 - Google Maps screenshot of site HD11, on Hammond River (Saint John River system), NB, in the Outer Bay of Fundy Designatable Unit.

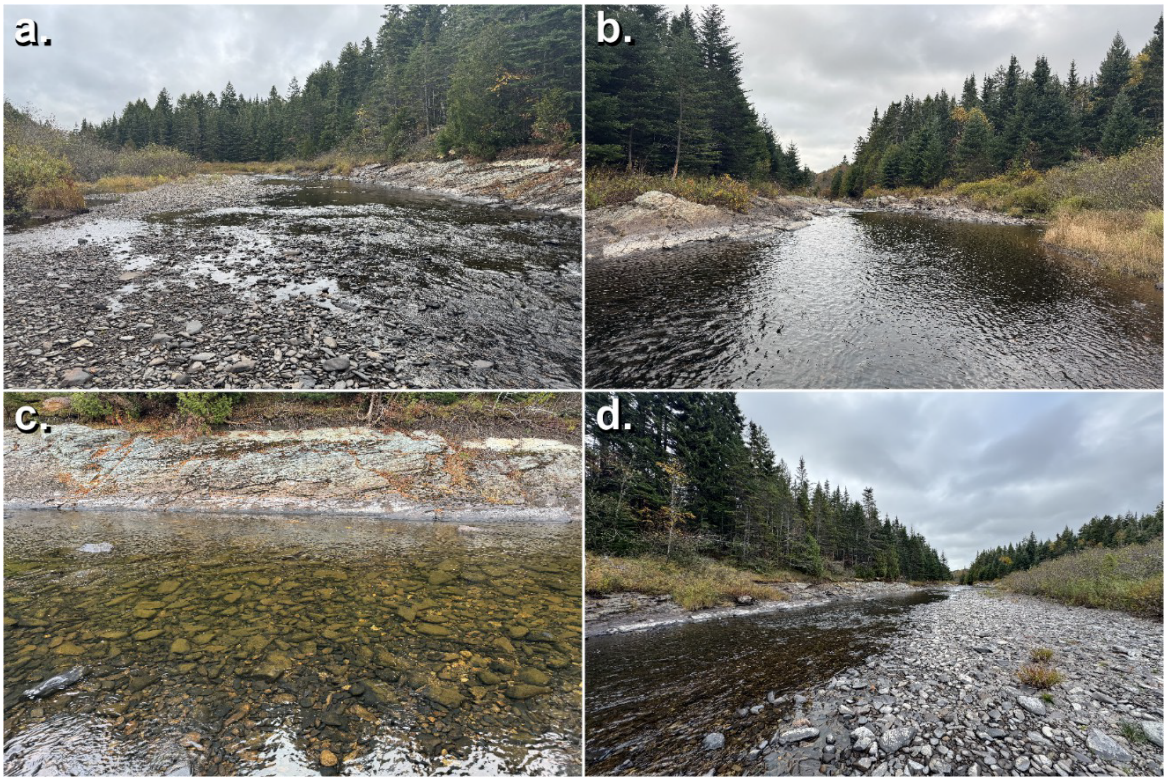


Figure S 25 - Photographs of sampling site Mispec001 on Mispec River, NB, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Mispec River from Mispec001. b. Downstream view of Mispec River from Mispec001. c. The substrate of Mispec River at Mispec001. d. Downstream view of Mispec River from upstream of Mispec001.

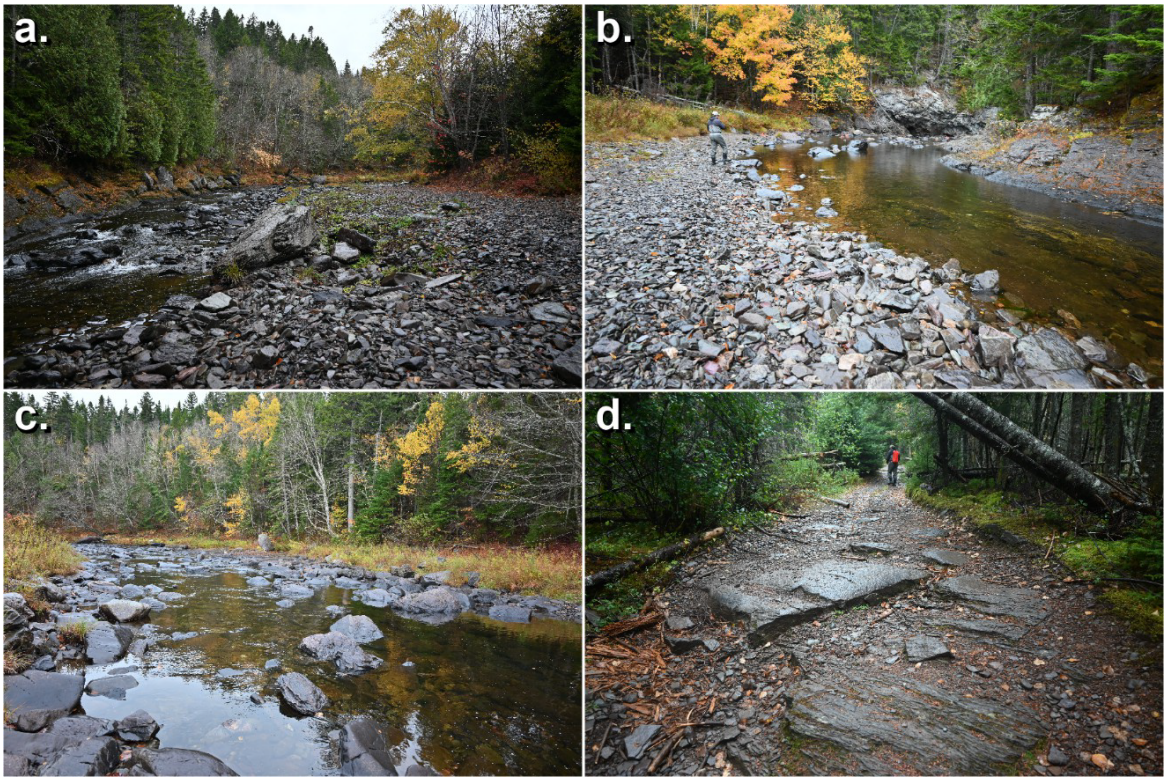


Figure S 26 – Photographs of sampling site BlackNB001, on Black River, NB, in the Inner Bay of Fundy Designatable Unit. a. View looking upstream from BlackNB001, showing bedrock and cobble substrate and exposed gravel and cobble likely submerged at higher water levels. b. View looking downstream from BlackNB001, showing an exposed gravel bank on the left (also visible in panel a.) and bedrock and boulder substrate and banks. c. Upstream of BlackNB001 looking downstream showing exposed large rocks in the riverbed. The banks in this area were mostly shrubs and ferns. d. Old Black River Road, the 1 km ATV trail used to access the site.

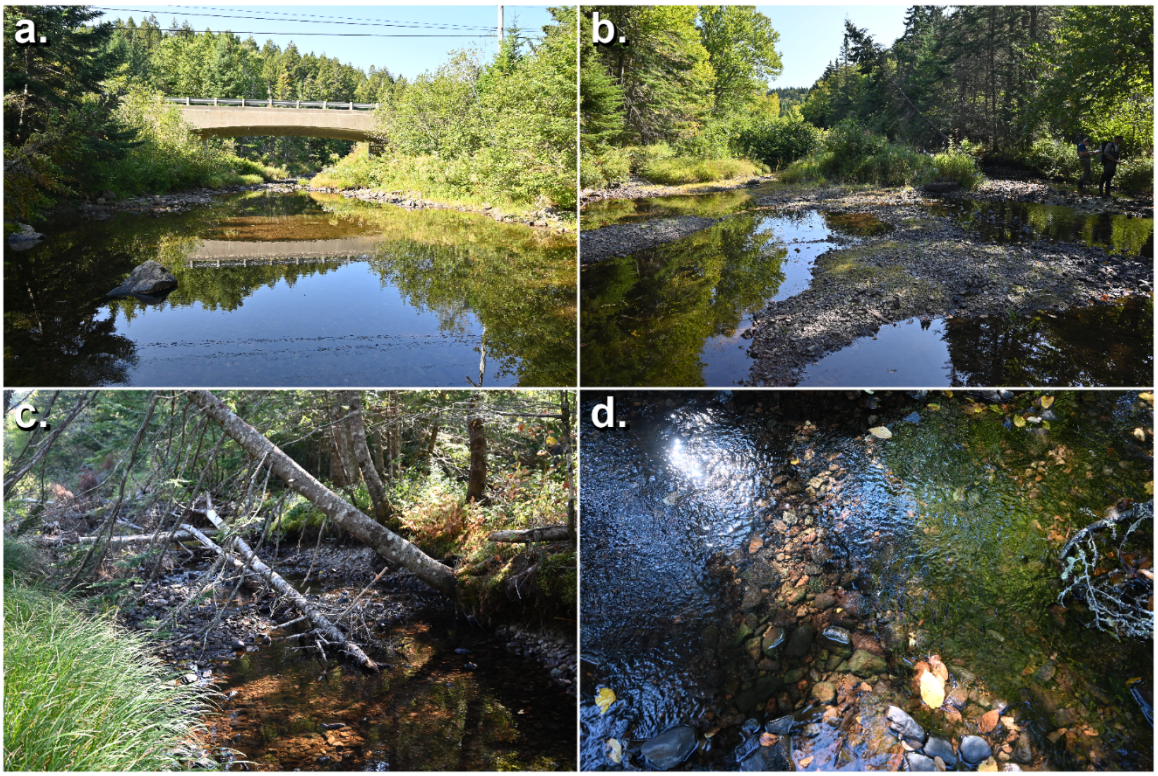


Figure S 27 - Photographs of sampling site BlackNB004 on Black River, NB, in the Inner Bay of Fundy Designatable Unit. a. Downstream view of Black River from BlackNB004 towards the New Brunswick Route 111/St. martins Road bridge. b. Upstream view of Black River from BlackNB004. c. Debris across Black River upstream of BlackNB004. d. The substrate of Black River at BlackNB004.



Figure S 28 - Photographs of sampling site BlackNBEast001 on East Branch, Black River, NB, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of East Branch, Black River East branch from the New Brunswick Route 825/Garnett Settlement bridge. b. Downstream view of East Branch, Black River from the New Brunswick Route 825/Garnett Settlement bridge. c. View of the substrate of East Branch, Black River below the New Brunswick Route 825/Garnett Settlement bridge. d. The bridge and shoulder of New Brunswick Route 825/Garnett Settlement where the road crosses East Branch, Black River.

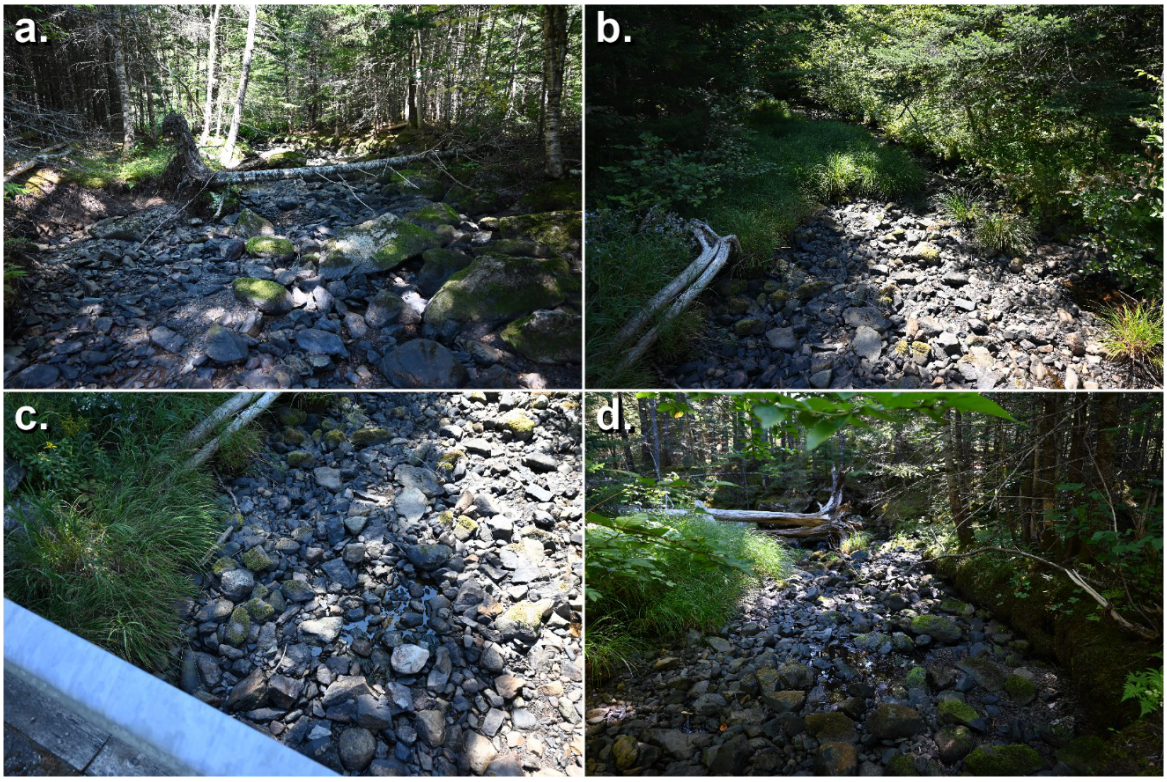


Figure S 29 - Photographs of sampling site Emerson004 on Emerson Creek, NB, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Emerson Creek from the Old Gardener Creek Road bridge that crosses the creek at Emerson004. b. Downstream view of Emerson Creek from the Old Gardener Creek Road bridge that crosses the creek at Emerson004. c. View of the creek bed from the bridge at Emerson004. d. Downstream view of Emerson Creek from downstream of Emerson004.

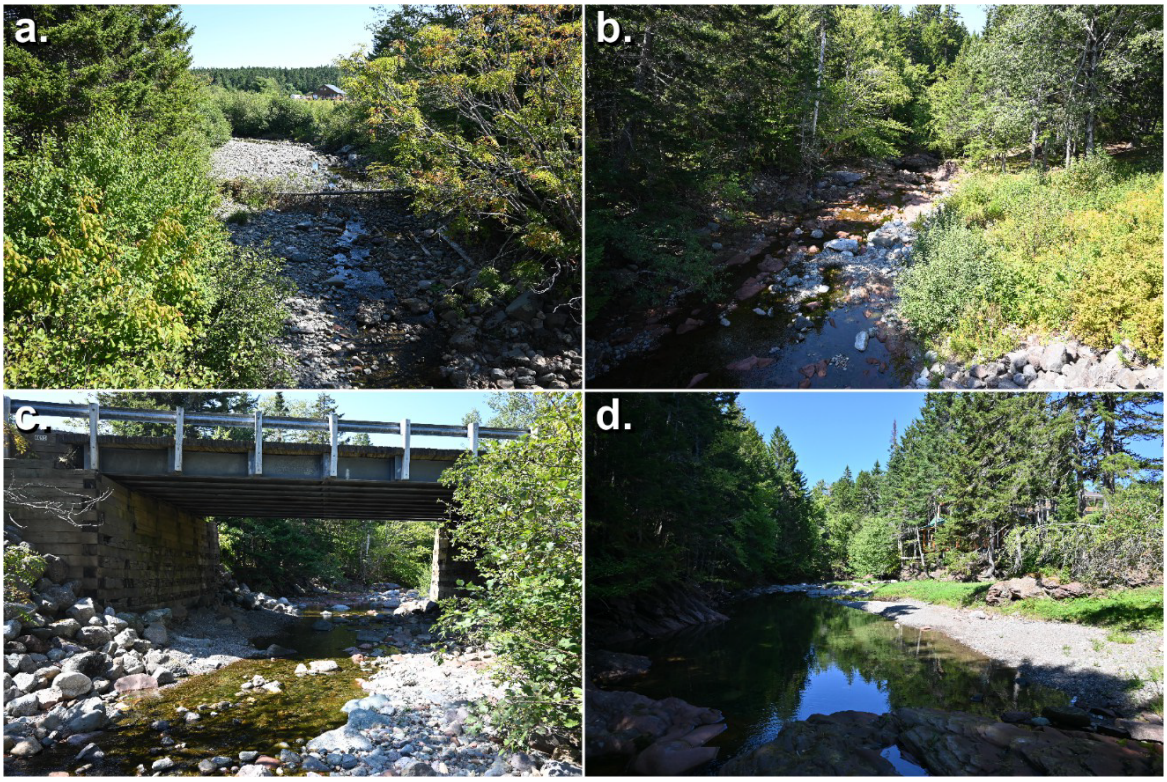


Figure S 30 - Photographs of sampling site Gardner002 on Gardner Creek, NB, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Gardner Creek from the Rankin Road bridge at Gardner002. b. Downstream view of Gardner Creek from the Rankin Road bridge at Gardner002. c. Downstream view of Gardner Creek from creek level, below the Rankin Road bridge over Gardner Creek. d. Pool just downstream of Gardner002 with a private residence on the bank in the right of the image.

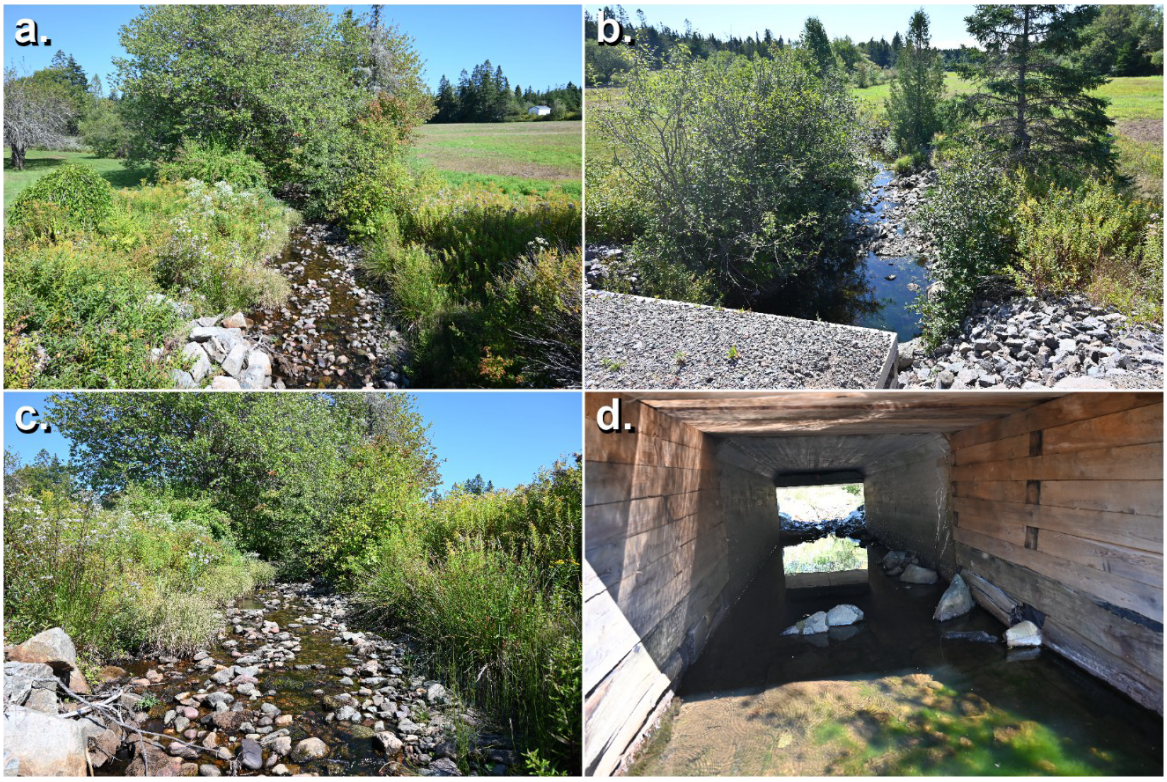


Figure S 31 - Photographs of sampling site Bains005 on Ten Mile Creek (Tynemouth Creek system), NB, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Ten Mile Creek from the New Brunswick Highway 111 bridge at Bains005. b. Downstream view of Ten Mile Creek from the New Brunswick Highway 111 bridge at Bains005. c. Upstream view of Ten Mile Creek from under the New Brunswick Highway 111 bridge at Bains005. d. The bridge structure and culvert under the New Brunswick Highway 111 bridge at Bains005.



Figure S 32 - Photographs of sampling site Mosher001 on Mosher River, NB, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Mosher River from Mosher001. b. Downstream view of Mosher River from Mosher001. c. Downstream view of Mosher River looking below the New Brunswick Highway 111/St Martins Road bridge at Mosher001. Tidal flats can be seen in the background downstream of the bridge. d. Debris in the Mosher River just upstream of Mosher001.



Figure S 33 - Photographs of sampling site Mosher003 on Mosher River, NB, in the Inner Bay of Fundy Designatable Unit. a. Downstream view of Mosher River from the New Brunswick Highway 111/St Martins Road bridge at Mosher003. b. Upstream view of Mosher River from the New Brunswick Highway 111/St Martins Road bridge at Mosher003. c. Downstream view of Mosher River from just downstream of Mosher003. d. The underside of the New Brunswick Highway 111/St Martins Road bridge at Mosher003.

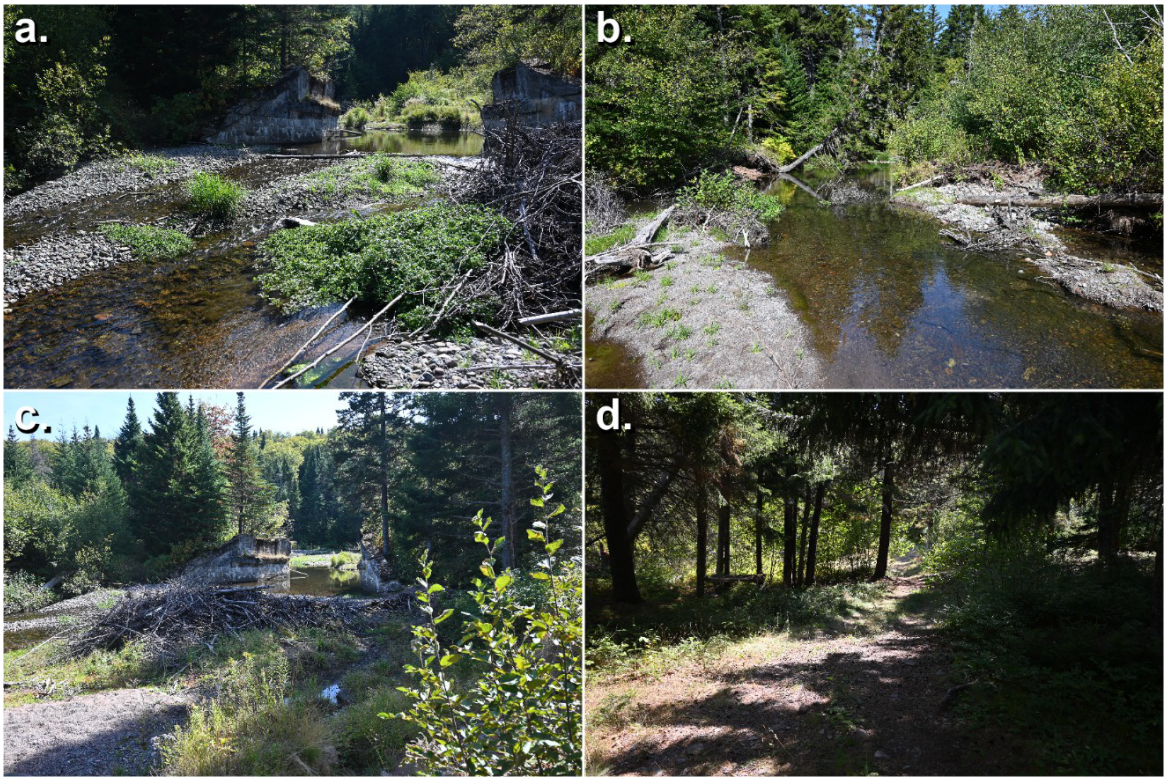


Figure S 34 - Photographs of sampling site Mosher100 on Mosher River, NB, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Mosher River from Mosher100. b. Downstream view of Mosher River from Mosher100. c. The beaver dam blocking approximately half of Mosher River at Mosher100. d. The path to Mosher River from available parking near Mosher100.

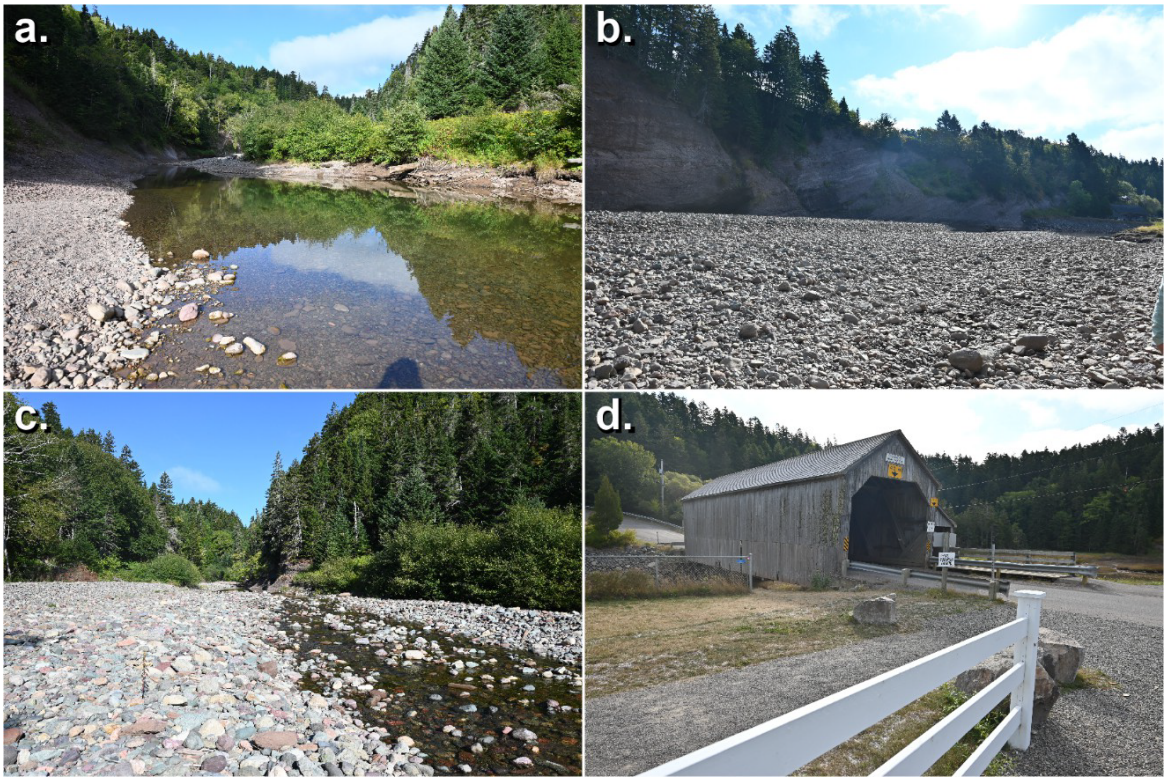


Figure S 35 - Photographs of sampling site Irish001 on Irish River, NB, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Irish River from Irish001. b. Downstream view of Irish River from Irish001. The river channel is behind the exposed cobble bank against the steep bank in the background. c. Upstream view of Irish River from upstream of Irish001. d. The Vaughan Creek Road/Main Street covered bridge over Irish River near Irish001.

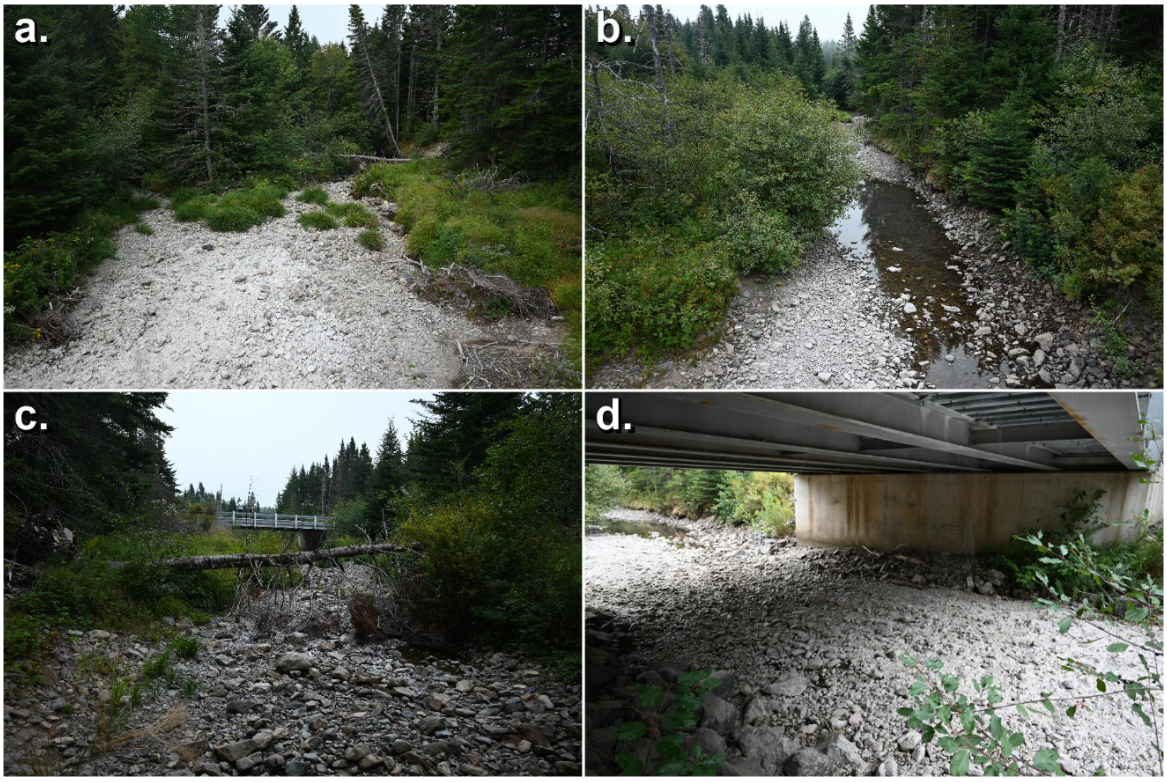


Figure S 36 - Photographs of sampling site IrishCurry001 on Curry Brook (Irish River system), NB, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of the dry riverbed of Curry Brook (Irish River system) from the Vaughan Creek Road bridge at IrishCurry001. b. Downstream view of Curry Brook (Irish River system) from the Vaughan Creek Road bridge at IrishCurry001. c. View looking downstream towards the Vaughan Creek Road bridge over Curry Brook at IrishCurry001. Debris can be seen across the riverbed. d. Underneath the Vaughan Creek Road bridge over Curry Brook at IrishCurry001.



Figure S 37 - Photographs of sampling site IrishEast002 on East Branch, Irish River, NB, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of East Branch, Irish River from the Vaughan Creek Road bridge at IrishEast002. b. Downstream view of East Branch, Irish River from the Vaughan Creek Road bridge at IrishEast002. c. View looking downstream towards the Vaughan Creek Road bridge from upstream of IrishEast002. d. The underside of the Vaughan Creek Road bridge at IrishEast002.s

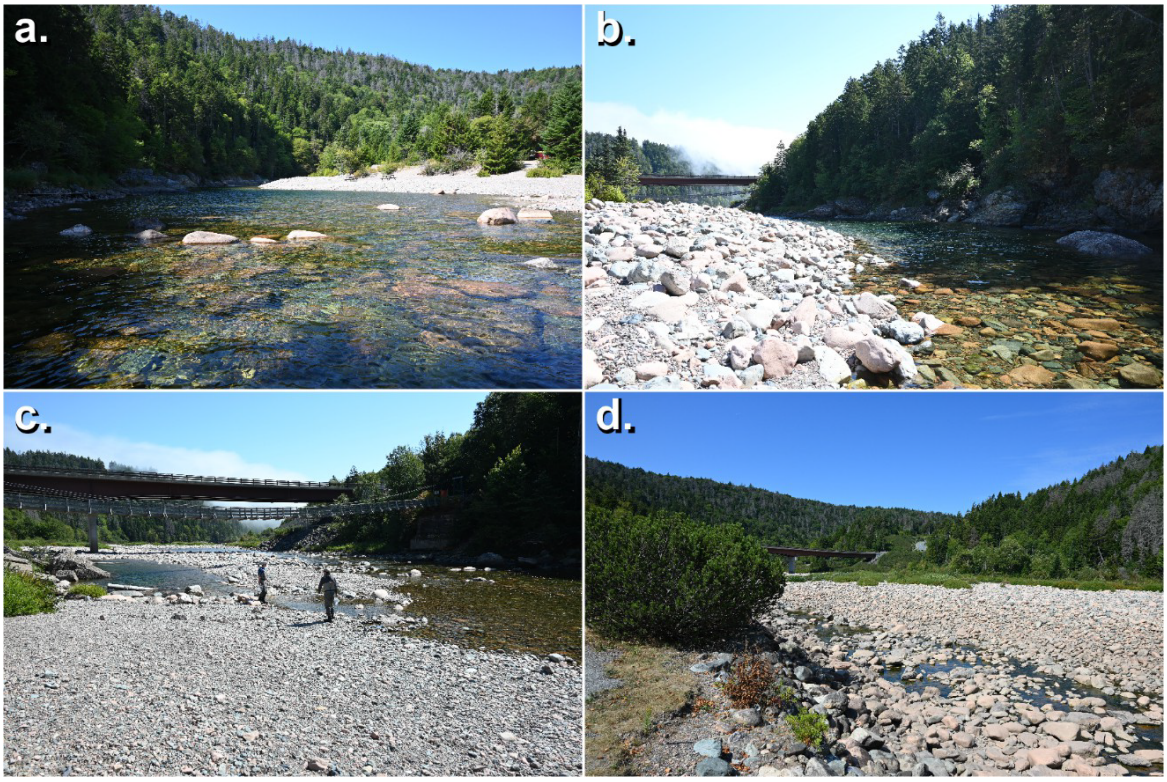


Figure S 38 - Photographs of sampling site BigSalmon001, on Big Salmon River, NB, in the Inner Bay of Fundy Designatable Unit. a. View looking upstream at BigSalmon001 on the Big Salmon River. The river was very wide at the site with a mixed boulder and cobble substrate. b. Looking downstream from BigSalmon001, with the Fundy Footpath and Fundy Trail Parkway bridges over the river. The boulder, cobble, and gravel substrate is exposed on the left of the image, suggesting water levels were lower than average due to the regional drought at the time of the site visit. c. Looking downstream on Big Salmon River from just downstream of BigSalmon001, with the Fundy Footpath and Fundy Trail Parkway bridges. d. Looking upstream towards the Fundy Trail Parkway bridge from the access point downstream of BigSalmon001.



Figure S 39 - Photographs of sampling site BigSalmon002 on Big Salmon River, NB, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Big Salmon River from BigSalmon002. b. Downstream view of Big Salmon River at BigSalmon002. c. View downstream along Big Salmon River towards the ATV bridge from just upstream of BigSalmon002. d. The underside of the ATV bridge at BigSalmon002.

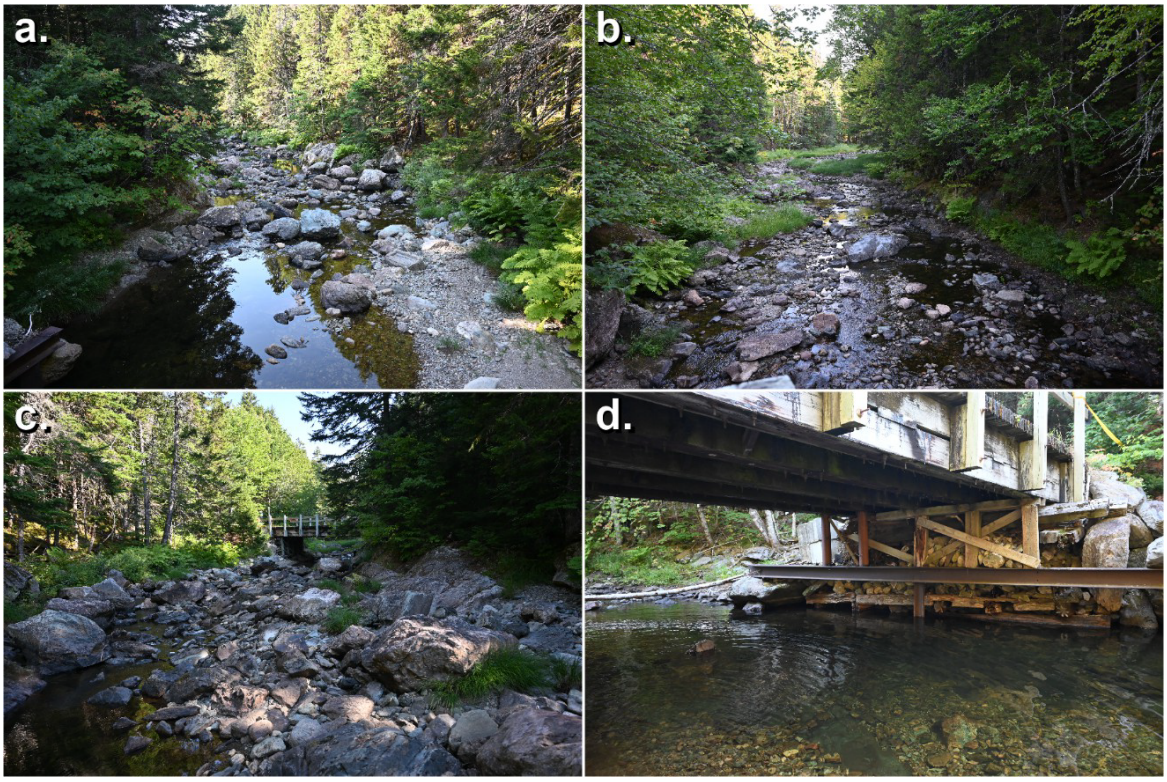


Figure S 40 - Photographs of sampling site LittleSalmon001, on Little Salmon River, NB, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Little Salmon River from the bridge at LittleSalmon001. b. Downstream view of Little Salmon River from the bridge at LittleSalmon001. C. Looking upstream towards the bridge from downstream of LittleSalmon001. d. The structure of the bridge supports at LittleSalmon001.



Figure S 41 - Photographs of sampling site LittleSalmon002 on Little Salmon River, NB, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Little Salmon River from LittleSalmon002. b. The pool on the downstream side of the Cross Road bridge over Little Salmon River at LittleSalmon002. c. Downstream view of Little Salmon River from just downstream of LittleSalmon002. d. Looking downstream on Little Salmon River underneath the Cross Road bridge at LittleSalmon002.

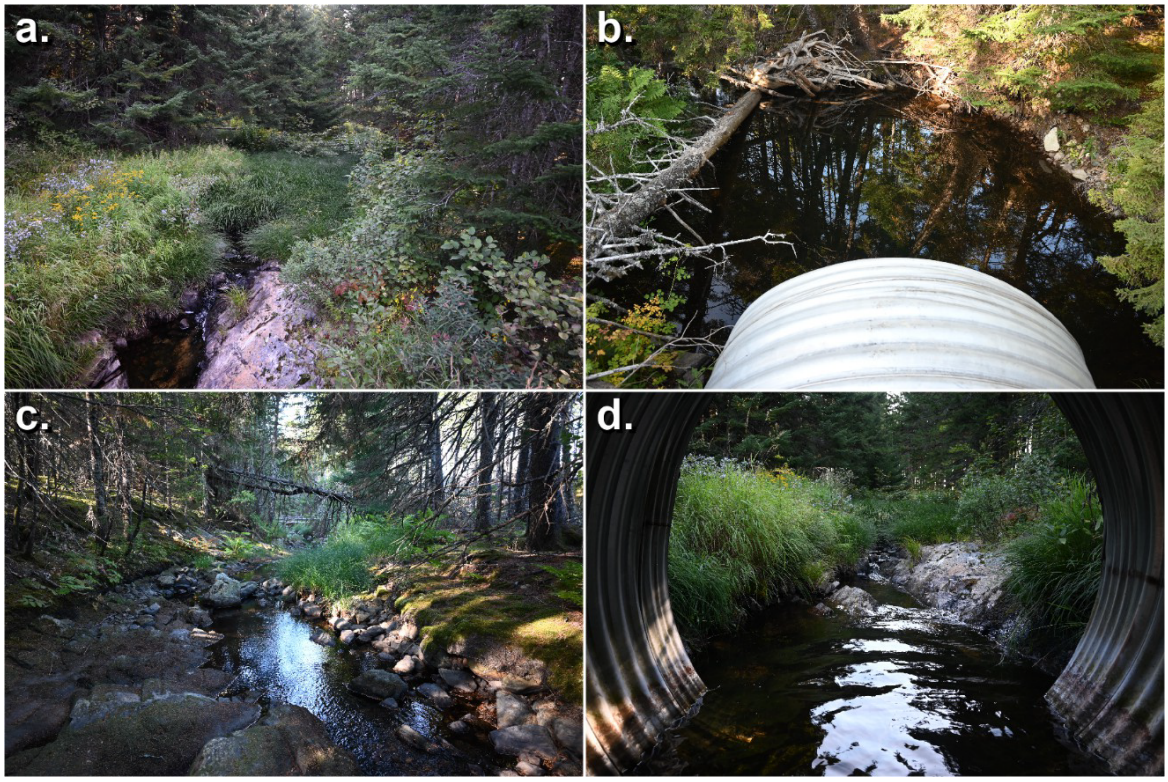


Figure S 42 - Photographs of sampling site LittleSalmonNortheast001 on Northeast Branch, Little Salmon River, NB, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Northeast Branch, Little Salmon River, from Dustin Brook Road at LittleSalmonNortheast001. b. Pool just downstream of Dustin Brook Road at LittleSalmonNortheast001. c. Downstream view of Northeast Branch, Little Salmon River, from downstream of LittleSalmonNortheast001. d. View looking upstream on Northeast Branch, Little Salmon River, from the culvert under Dustin Brook Road at LittleSalmonNortheast001.

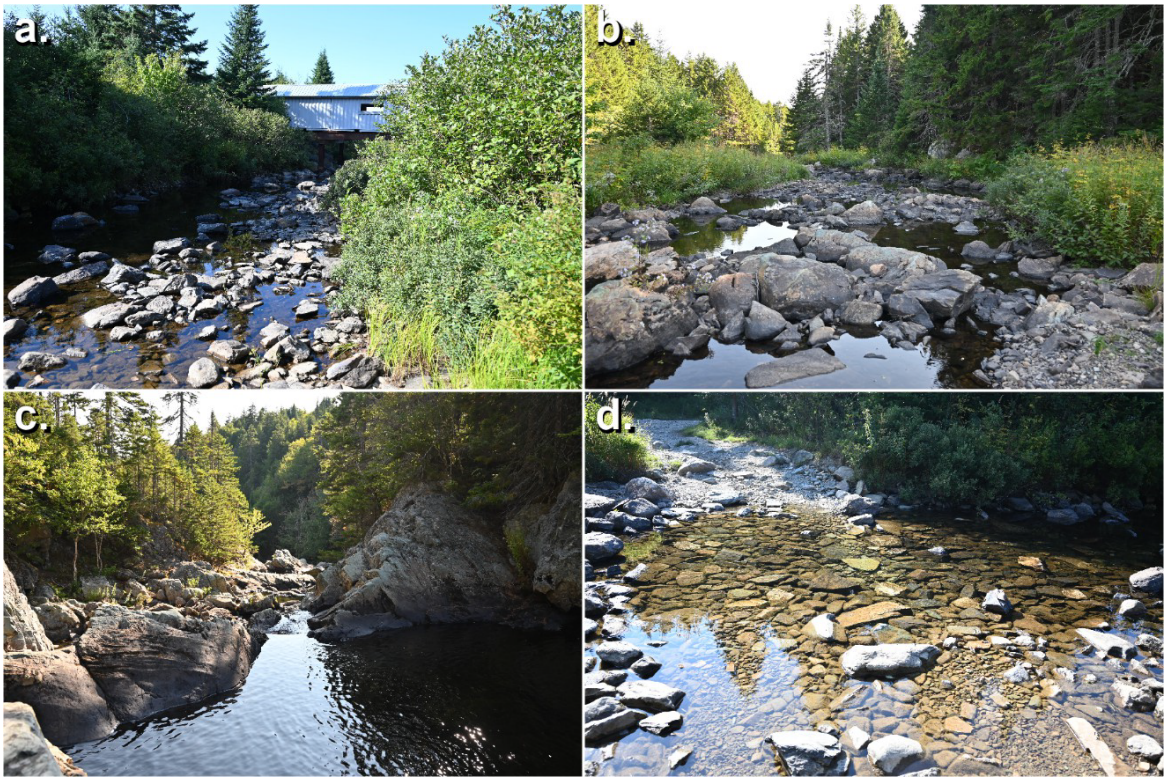


Figure S 43 - Photographs of sampling site Quiddy001 on Quiddy River, NB, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Quiddy River from the ATV trail at Quiddy001. b. Downstream view of Quiddy River from the ATV trail at Quiddy001. c. Downstream view of Quiddy River near the impassable falls downstream of Quiddy001. d. The ATV trail that crosses Quiddy River at Quiddy001.



Figure S 44 - Photographs of sampling site Quiddy002 on Quiddy River, NB, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Quiddy River from the eastern Goose Creek Road bridge at Quiddy002. b. Downstream view of Quiddy River underneath the eastern Goose Creek Road bridge at Quiddy002. c. The overgrown dry riverbed of Quiddy River at the western Goose Creek Road bridge at Quiddy002. d. Dry river substrate below the western Goose Creek Road bridge at Quiddy002.

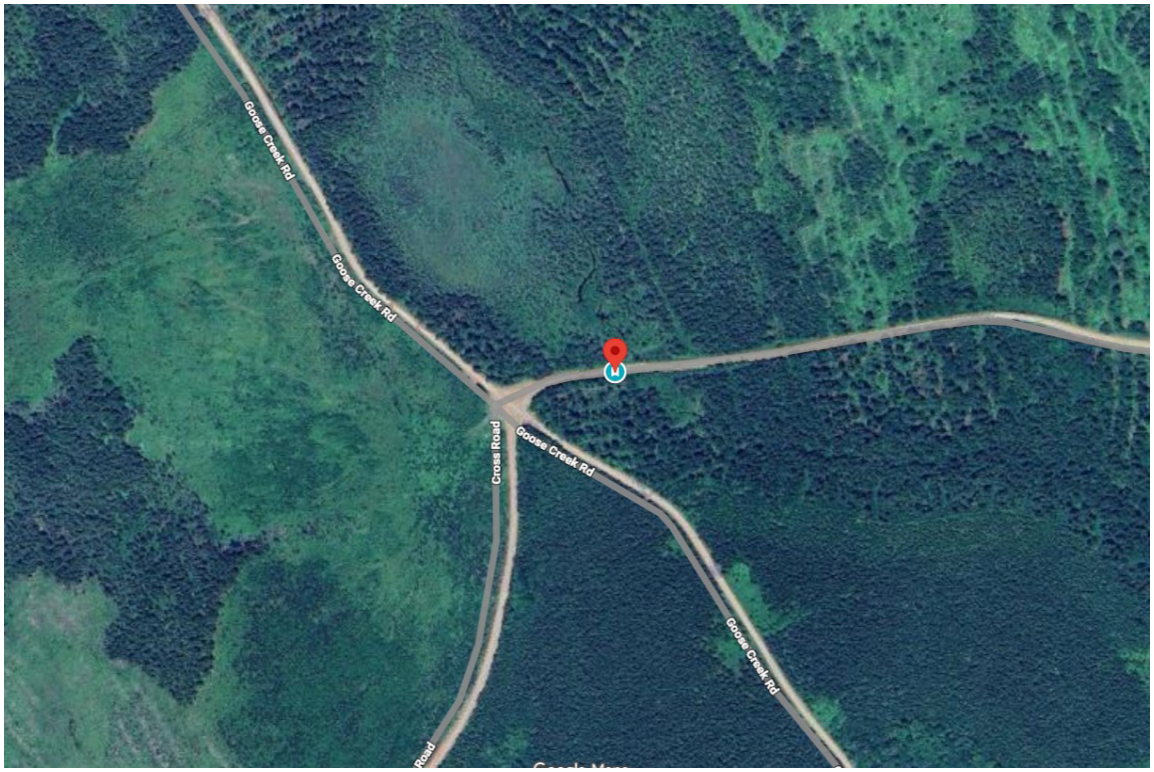


Figure S 45 - Google Maps screenshot of site GooseCreek001, on Goose Creek, NB, in the Inner Bay of Fundy Designatable Unit.

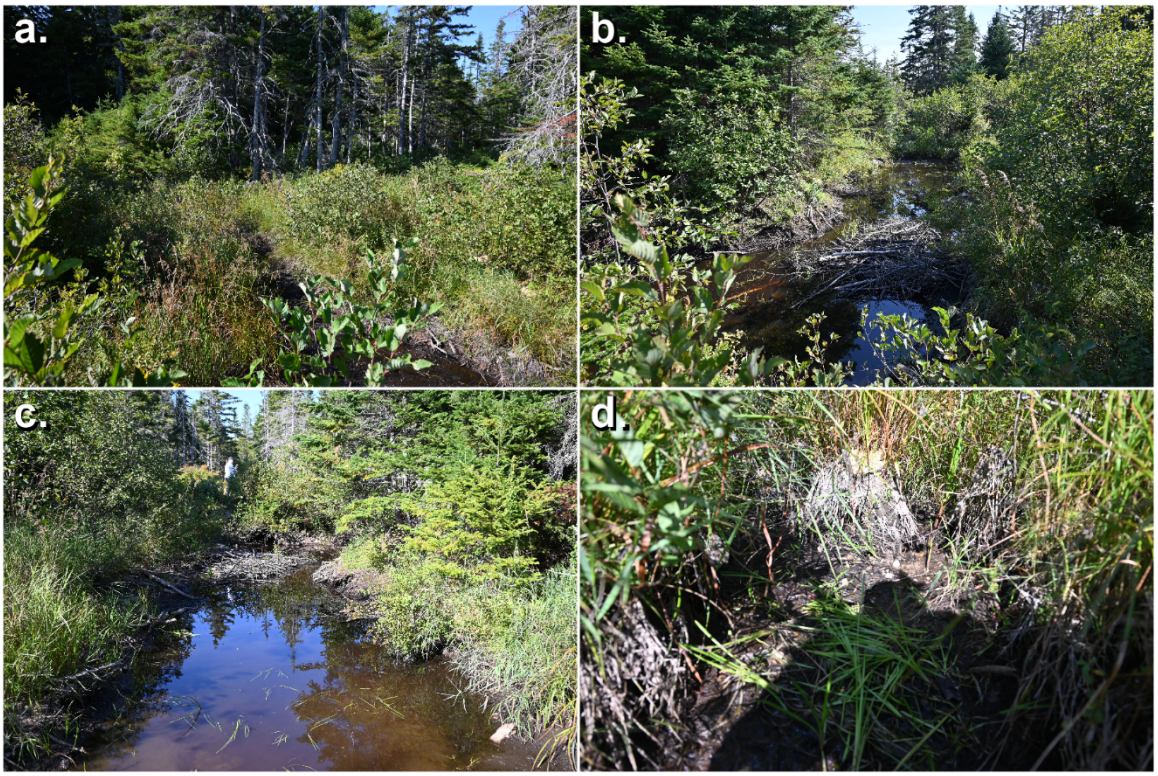


Figure S 46 - Photographs of sampling site GooseCreek002 on Goose Creek, NB, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Goose Creek at GooseCreek002, from the unnamed dirt road off of Goose Creek Road. b. Downstream view of Goose Creek at GooseCreek002, from the unnamed dirt road off of Goose Creek Road. c. Upstream view of Goose Creek from just downstream of GooseCreek002. d. Debris from higher water levels in the grasses along the banks of Goose Creek at GooseCreek002.

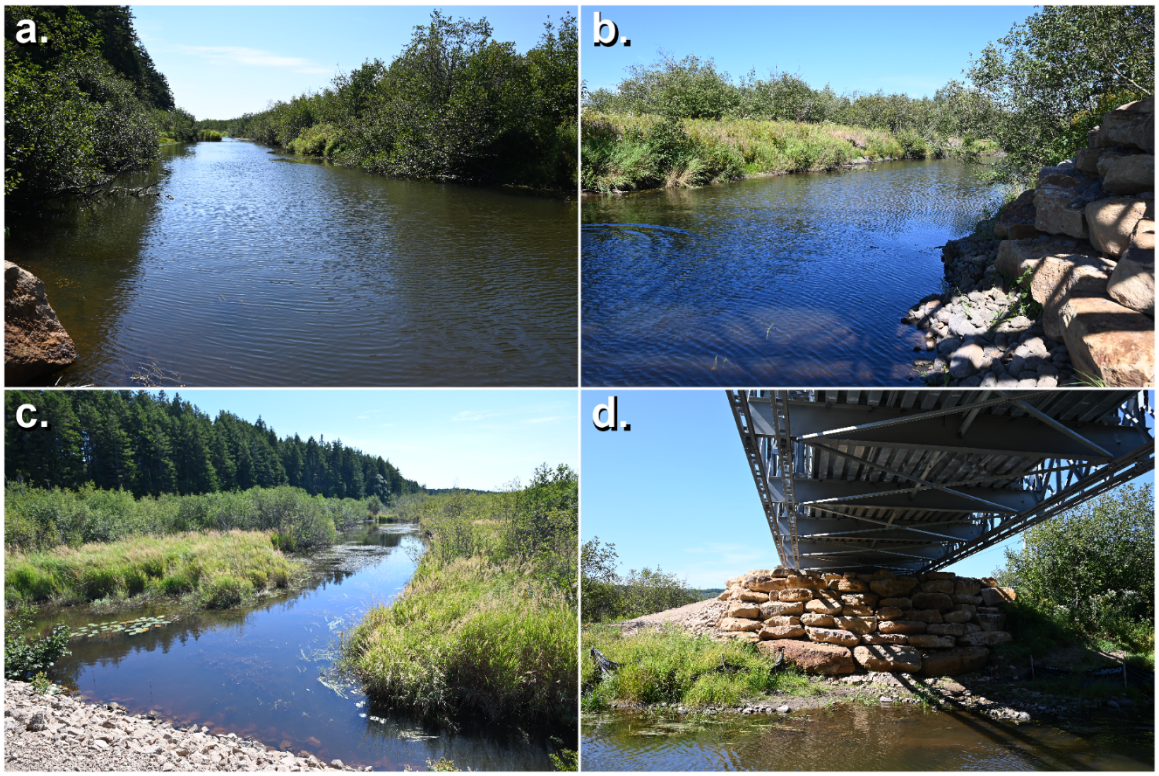


Figure S 47 - Photographs of sampling site Shepody003 on Shepody River, NB, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Shepody River from Shepody003. b. Downstream view of Shepody River from underneath the Midway Road bridge at Shepody003. c. Part of the wetland around Shepody River near Shepody003. d. The underside of the Midway Road bridge at Shepody003.

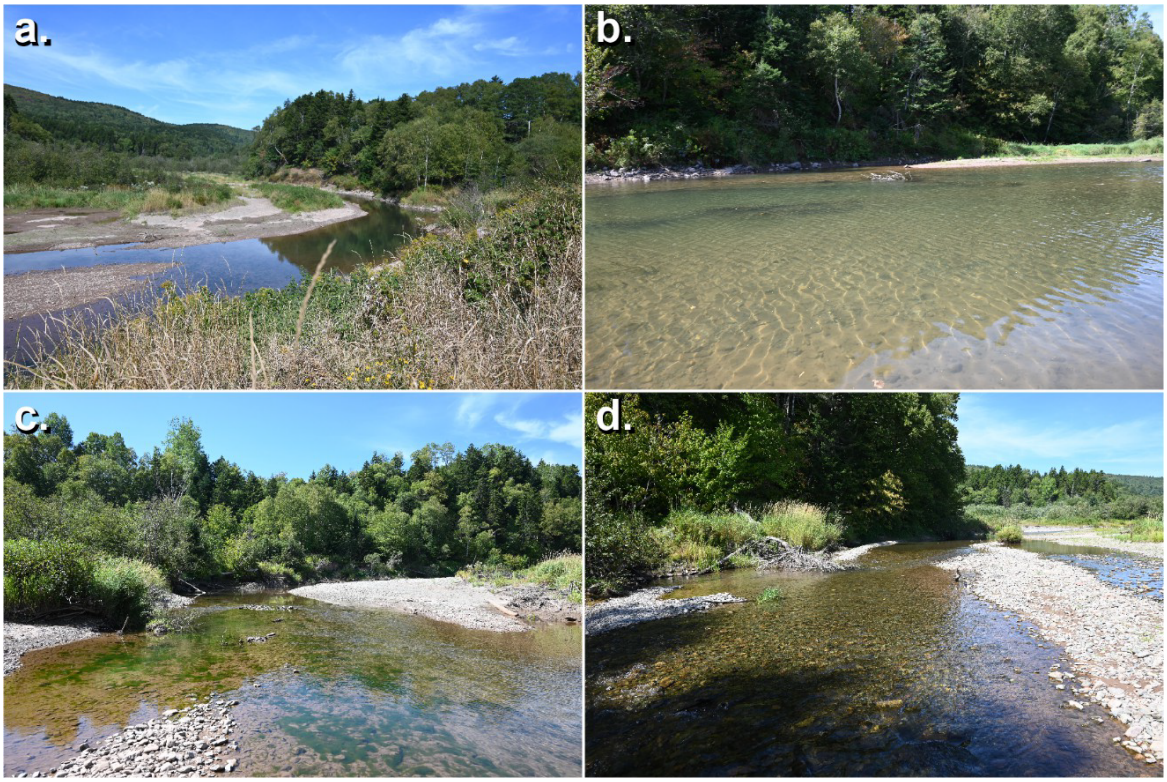


Figure S 48 - Photographs of sampling site ShepodyCrooked004B, on Crooked Creek (Shepody River system), NB, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Crooked Creek from the bank at ShepodyCrooked004B. b. Cross section of tidal portion of Crooked Creek downstream of ShepodyCrooked004B. The water was fresh but heavily influenced by the tide. c. Upstream view of Crooked Creek from just upstream of ShepodyCrooked004B. d. Upstream view of Crooked Creek upstream of ShepodyCrooked004B beyond the tidal influence.

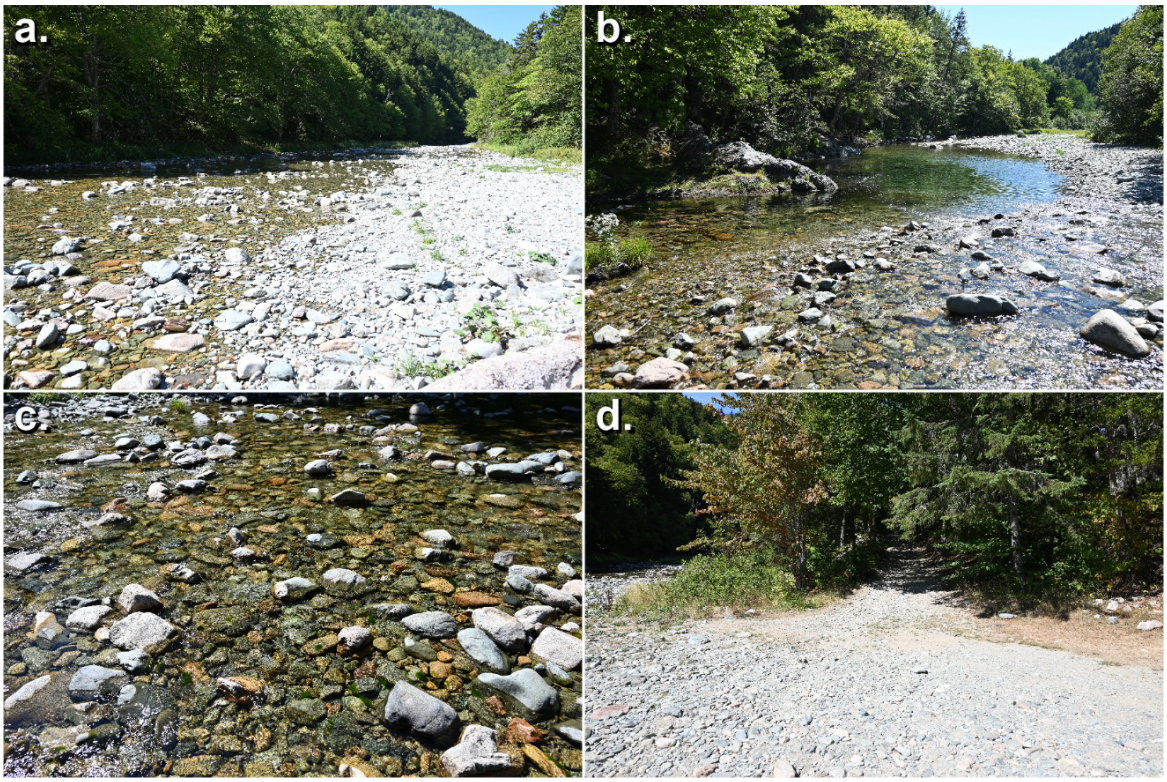


Figure S 49 - Photographs of sampling site ShepodyCrooked100 on Crooked Creek (Shepody River system), NB, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Crooked Creek from ShepodyCrooked100. b. Downstream view of Crooked Creek from ShepodyCrooked100 with a local swimming hole visible. c. The substrate of Crooked Creek at ShepodyCrooked100. d. The pathway down to Crooked Creek from Crooked Creek Road.

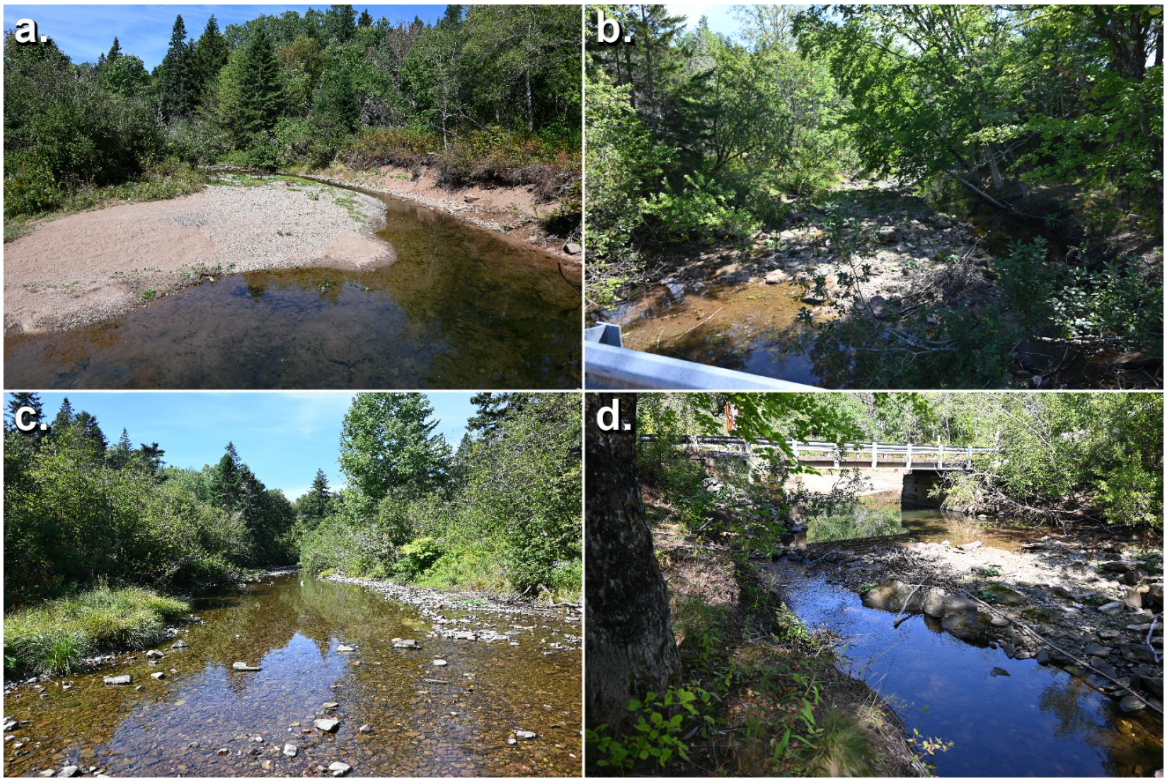


Figure S 50 - Photographs of sampling site Demoiselle002 on Demoiselle Creek, NB, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Demoiselle Creek from the Grub Road ATV bridge at Demoiselle002. b. Downstream view of Demoiselle Creek from the Grub Road ATV bridge at Demoiselle002. c. Upstream view of Demoiselle Creek from upstream of Demoiselle002 d. Upstream view of Demoiselle Creek towards the Grub Road ATV bridge from downstream of Demoiselle002. Evidence of a beaver dam and other beaver activity can be seen in the left of the creek.

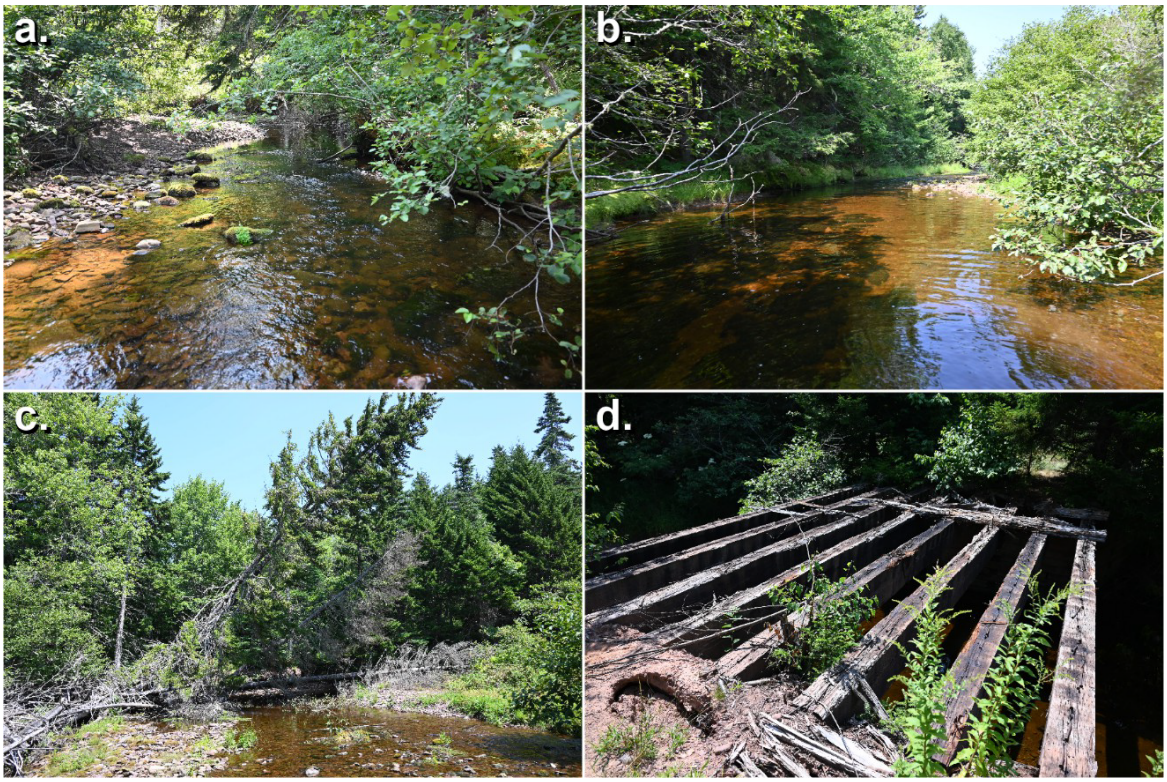


Figure S 51 - Photographs of sampling site AppleEast003 on East Branch, Apple River, NS, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of East Branch, Apple River, from AppleEast003. b. Downstream view of East Branch, Apple River, from AppleEast003. c. Debris upstream of AppleEast003. d. An old bridge structure at AppleEast003, likely part of an old logging road or ATV trail.

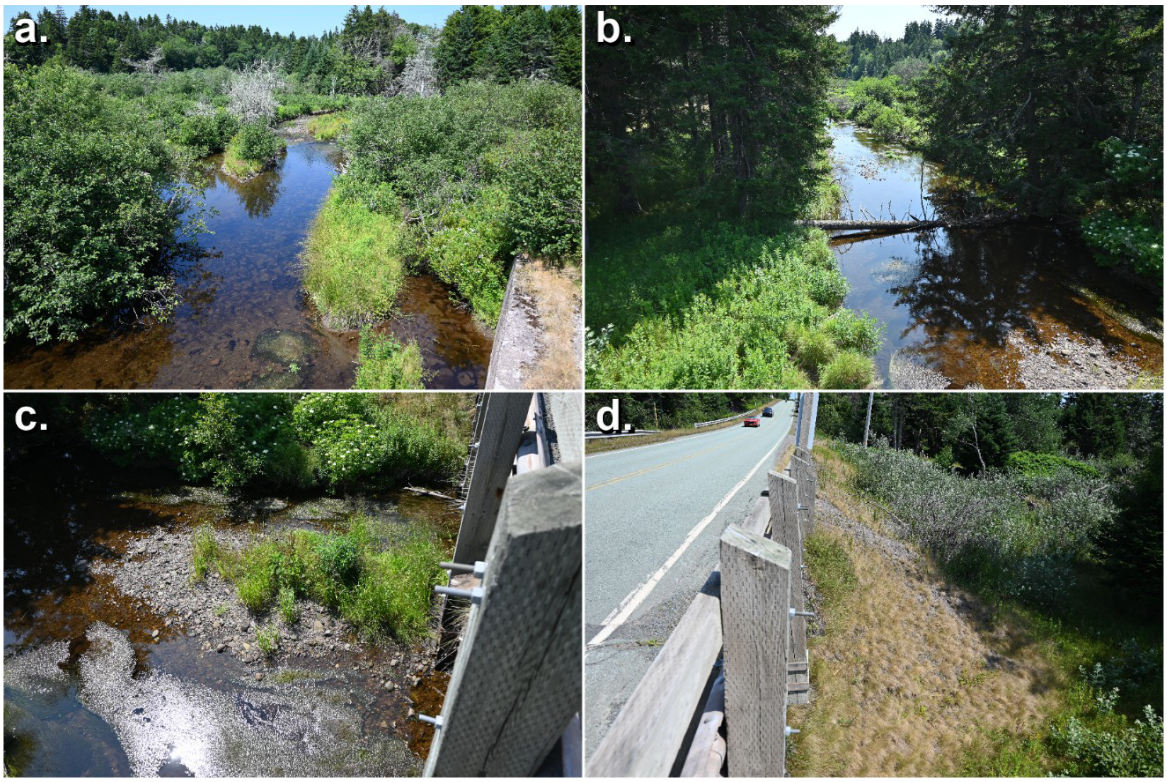


Figure S 52 - Photographs of sampling site Ramshead001 on Ramshead River, NS, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Ramshead River from the Nova Scotia Route 209 bridge over the river at Ramshead001. b. Downstream view of Ramshead River from the Nova Scotia Route 209 bridge over the river at Ramshead001. c. View of the river substrate at Ramshead001 on the downstream side of the Nova Scotia Route 209 bridge over Ramshead River. d. The slope down towards Ramshead River from the Nova Scotia Route 209 bridge over the river at Ramshead001.



Figure S 53 - Photographs of sampling site Diligent100 on Diligent River, NS, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Diligent River from Diligent100. b. Downstream view of Diligent River from Diligent100. A beaver dam can be seen partially blocking the river in the background. c. The ATV trail that crosses Diligent River at Diligent100. d. The wetland habitat surrounding Diligent River downstream of Diligent100.

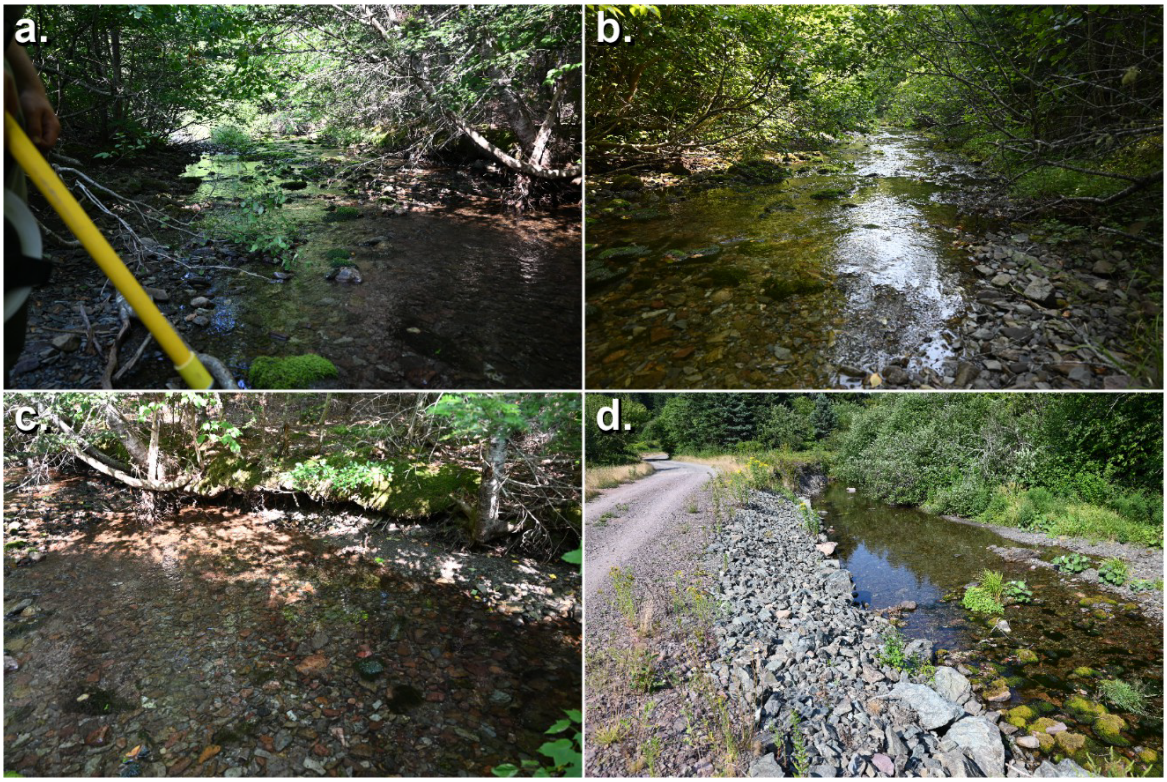


Figure S 54 - Photographs of sampling site DNorth002 on North Branch, Diligent River, NS, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of North Branch, Diligent River, from DNorth002. b. Downstream view of North Branch, Diligent River, from DNorth002 c. View across Diligent River at DNorth002 showing the cobble and gravel substrate and the undercut riverbank. d. Upstream view of North Branch, Diligent River, where the river runs along the unnamed gravel road approximately 200 m downstream of DNorth002.

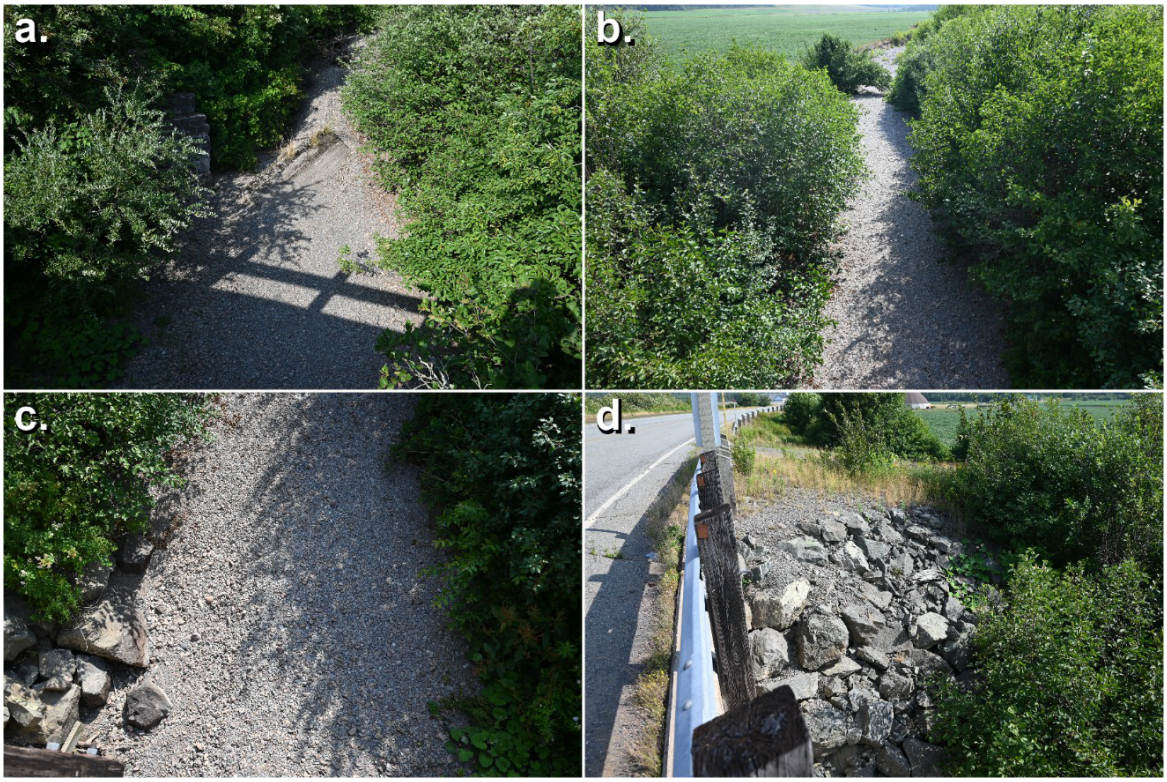


Figure S 55 - Photographs of sampling site Wharton002 on Wharton Brook (Diligent River system), NS, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of the dry riverbed of Wharton Brook from the Parrsboro Shore Road bridge over the brook at Wharton002. b. Downstream view of the dry riverbed of Wharton Brook from the Parrsboro Shore Road bridge over the brook at Wharton002. c. The brook substrate under the Parrsboro Shore Road bridge at Wharton002. d. The rocky slope down to Wharton Brook from Parrsboro Shore Road at Wharton002.

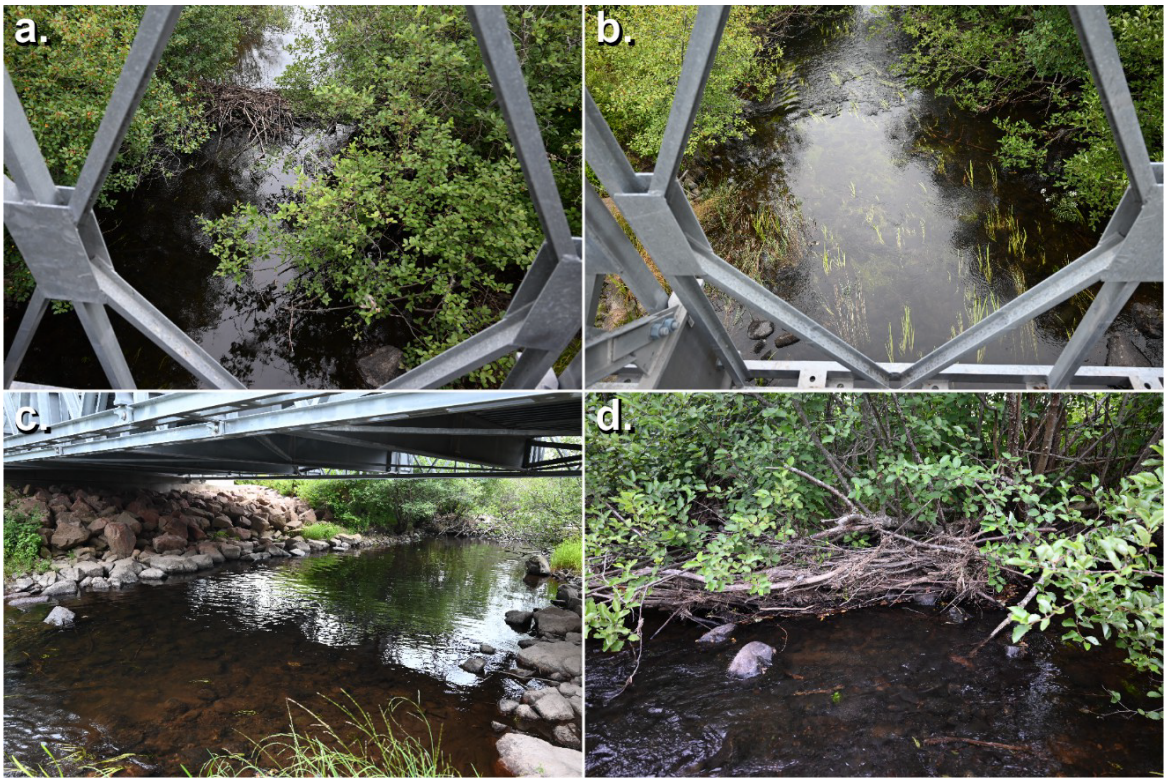


Figure S 56 - Photographs of sampling site Farrells001 on Farrells River, NS, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Farrells River from the Beaver Dam Road bridge over the river at Farrells001. A beaver dam can be seen blocking the river. b. Downstream view of Farrells River from the Beaver Dam Road bridge over the river at Farrells001. c. Upstream view of Farrells River from below the Beaver Dam Road bridge at Farrells001. Discolouration on the rocks under the bridge suggest water levels were lower than average during the site assessment. d. Debris along the banks of Farrells River at Farrells001, likely deposited by higher water levels or during seasonal flooding.

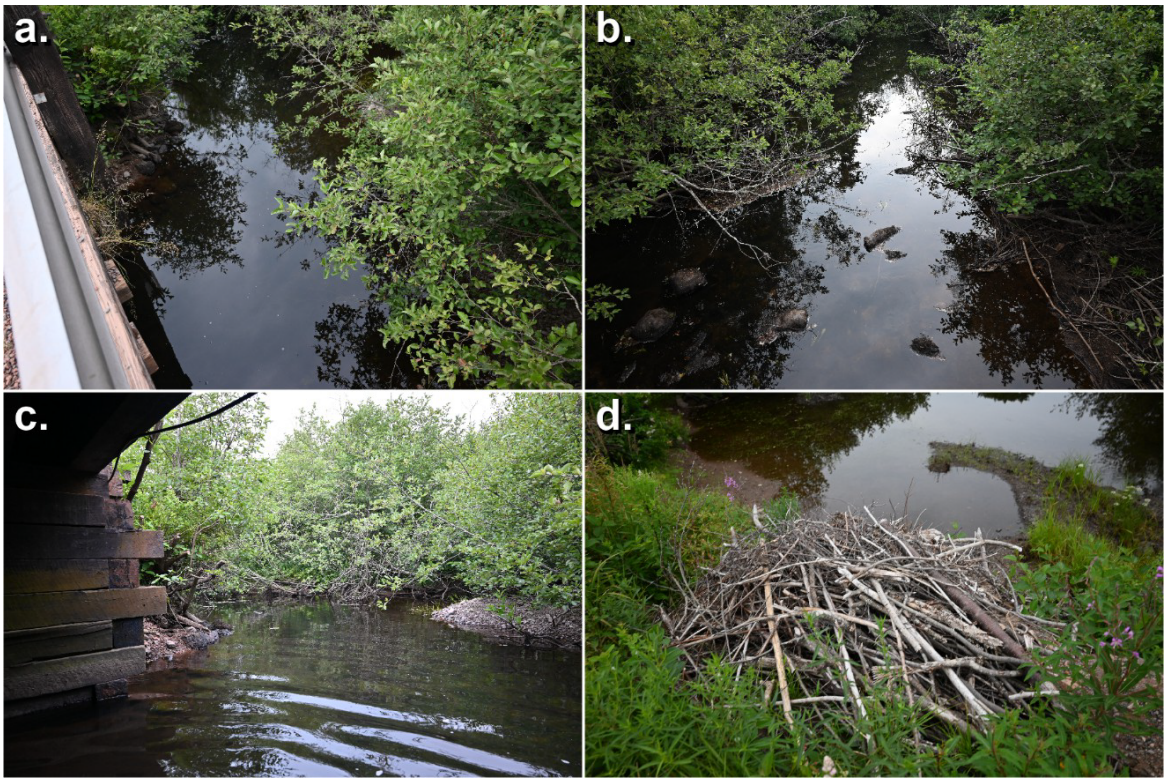


Figure S 57 - Photographs of sampling site Farrells003 on Farrells River, NS, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Farrells River from the Spence Road bridge at Farrells003. b. Downstream view of Farrells River from the Spence Road bridge at Farrells003. c. Upstream view of Farrells River from below the Spence Road bridge at Farrells003. d. Evidence of beaver activity in Farrells River near Farrells003.

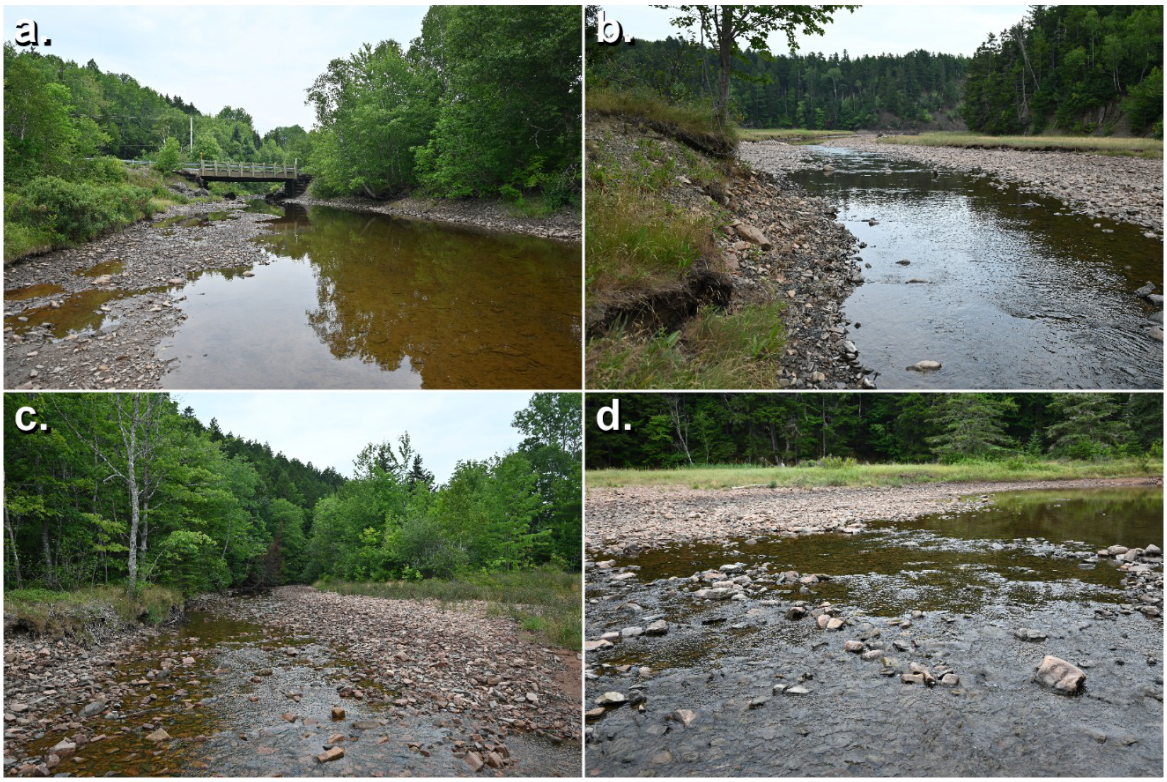


Figure S 58 - Photographs of sampling site Moose100 on Moose River, NS, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Moose River from Moose100. b. Downstream view of Moose River from Moose100. c. Upstream view of Moose River from upstream of Moose100 and the Nova Scotia Highway 2/Glooscap Trail bridge over Moose River. d. View across Moose River at Moose100 showing a shallower riffle and cobble substrate.

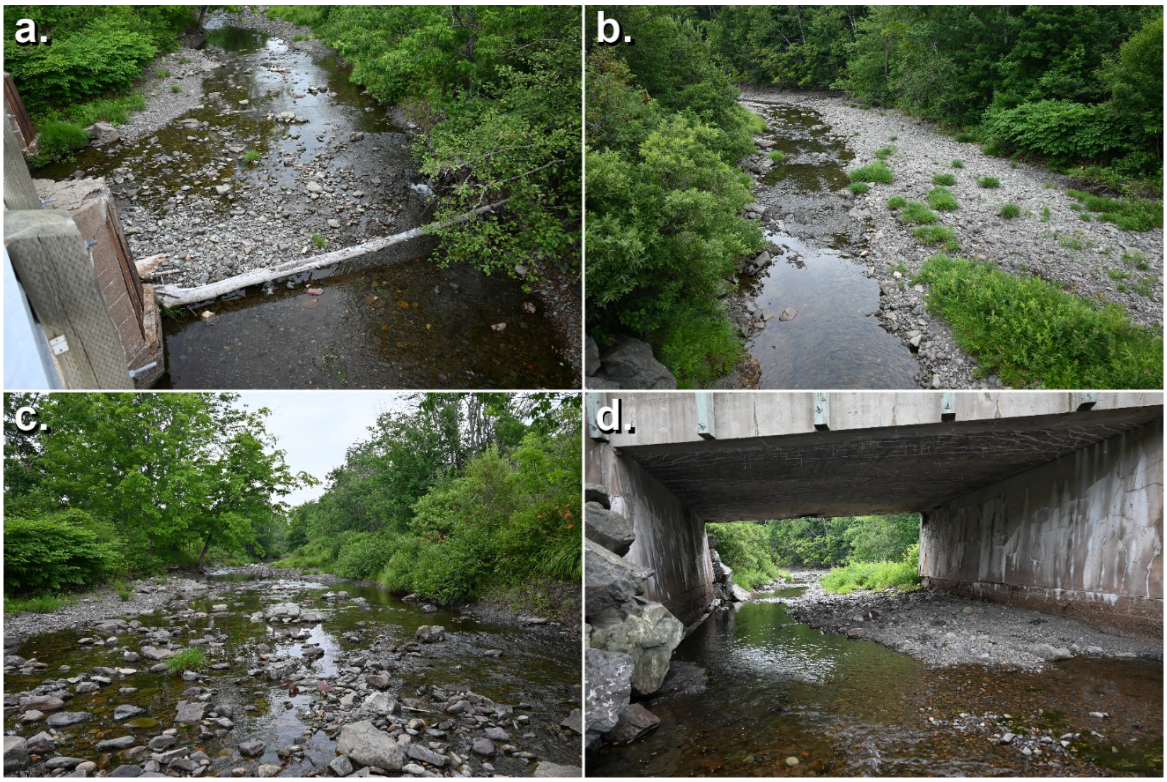


Figure S 59 - Photographs of sampling site Harrington001 on Harrington River, NS, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Harrington River from the Nova Scotia Highway 2/Glooscap Trail bridge at Harrington001. A fallen tree and other debris can be seen in the river. b. Downstream view of Harrington River from the Nova Scotia Highway 2/Glooscap Trail bridge at Harrington001. c. Upstream view of Harrington River from upstream of Harrington001. d. Downstream view of Harrington River under the Nova Scotia Highway 2/Glooscap Trail bridge at Harrington001.



Figure S 60 - Photographs of sampling site NorthCumberland001 on North River, NS, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of North River from the Nova Scotia Highway 2/Glooscap Trail bridge at NorthCumberland001. b. Downstream view of North River from the Nova Scotia Highway 2/Glooscap Trail bridge at NorthCumberland001. c. View of the substrate at NorthCumberland001 directly below the Nova Scotia Highway 2/Glooscap Trail bridge at NorthCumberland001. d. Slope to North River from Nova Scotia Highway 2/Glooscap Trail at NorthCumberland001.

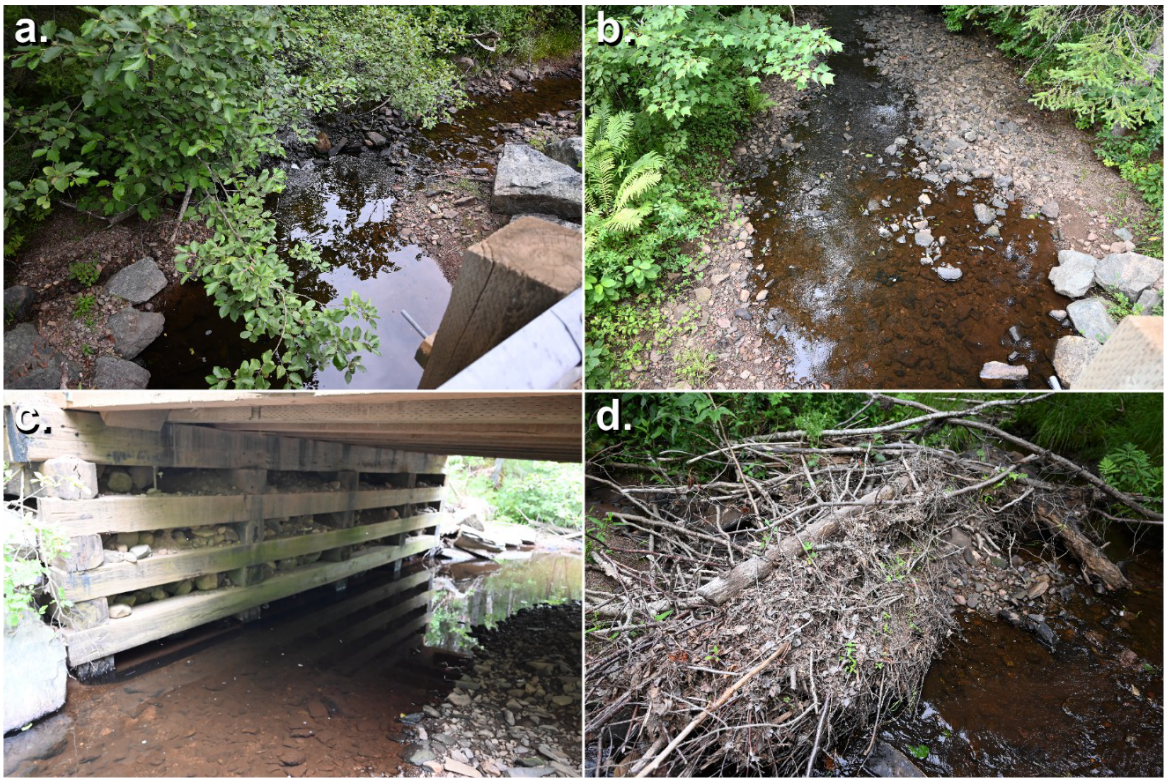


Figure S 61 - Photographs of sampling site EconomyEast001 on East Branch, Economy River, NS, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of East Branch, Economy River from the Economy River Road bridge at EconomyEast001. b. Downstream view of East Branch, Economy River from the Economy River Road bridge at EconomyEast001. c. The underside and support structure for the Economy River Road bridge at EconomyEast001. d. Debris, potentially from beaver activity, at EconomyEast001 on East Branch, Economy River.



Figure S 62 - Photographs of sampling site Bass001 on Bass River, NS, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Bass River from just downstream of the Nova Scotia Highway 2/Glooscap Trail bridge over the river at Bass001. b. Downstream view of Bass River from Bass001. c. Upstream view of Bass River from just upstream of Bass001. d. Downstream view of Bass River from just downstream of Bass001.

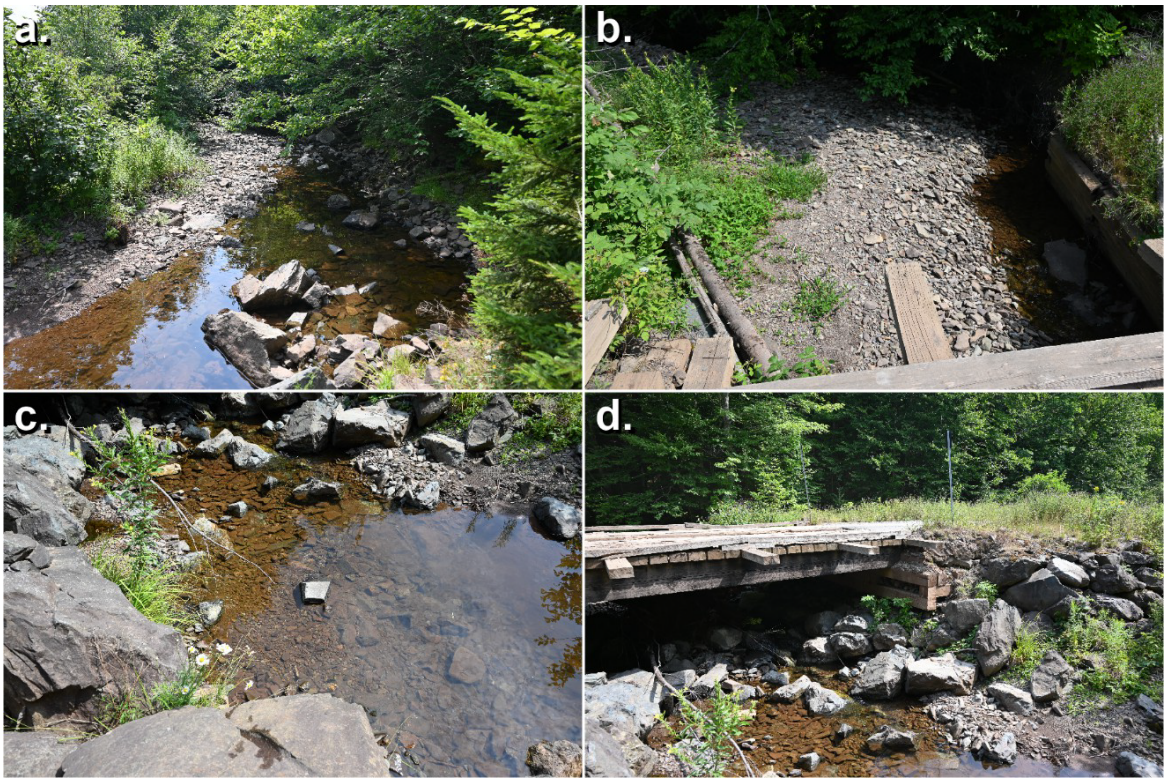


Figure S 63 - Photographs of sampling site BassWest002 on West Bass River, NS, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of West Bass River from the Old Economy Road bridge at BassWest002. b. Downstream view of West Bass River from the Old Economy Road bridge at BassWest002. c. The substrate of West Bass River below the Old Economy Road bridge at BassWest002. d. The structure of the Old Economy Road bridge over West Bass River at BassWest002.

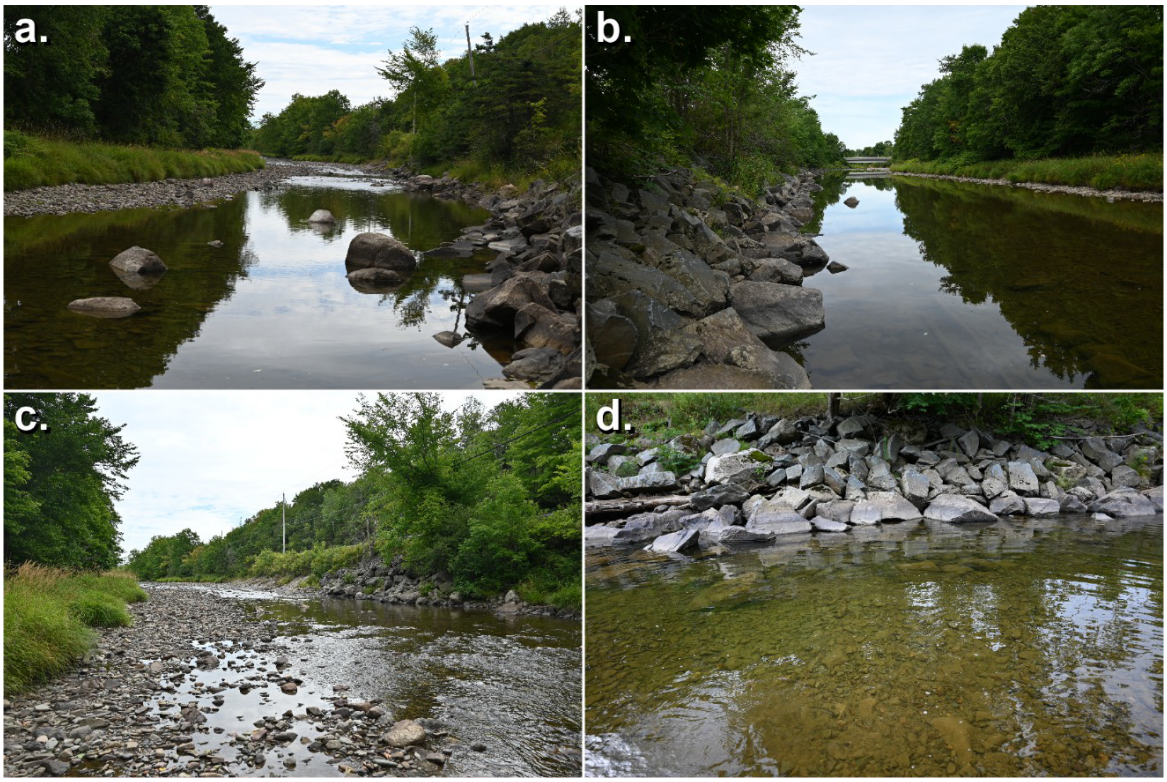


Figure S 64 - Photographs of sampling site North002 on North River (Salmon River system), NS, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of North River from Nova Scotia Route 311 where it runs alongside the river at North002. b. Downstream view of North River from Nova Scotia Route 311 where it runs alongside the river at North002. c. Upstream view of North River from upstream of North002. d. The rocky bank of North River along Nova Scotia Route 311 showing a visible waterline and some debris at North002.

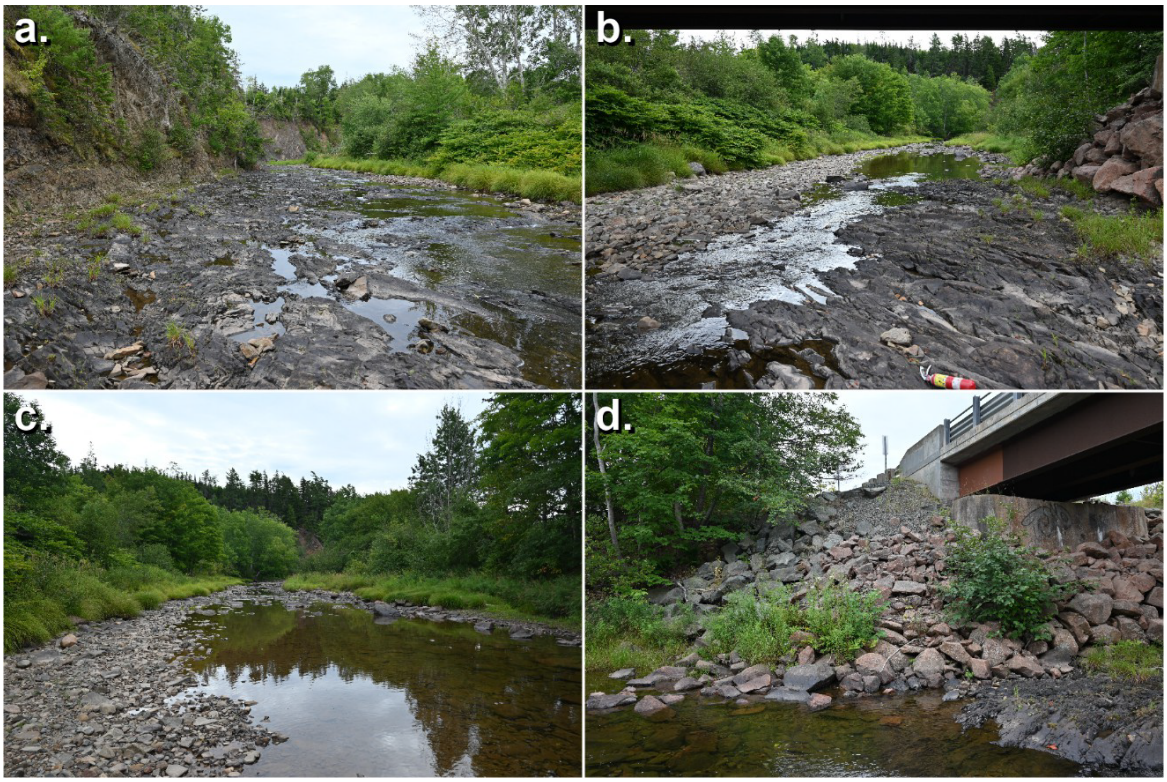


Figure S 65 - Photographs of sampling site NorthWest002 on West Branch, North River (Salmon River system), NS, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of West Branch, North River, from below the Truro Road bridge at NorthWest002. b. Downstream view of West Branch, North River, from below the Truro Road bridge at NorthWest002. c. Downstream view of West Branch, North River, from downstream of NorthWest002. d. The slope down to the river from Truro Road at NorthWest002.

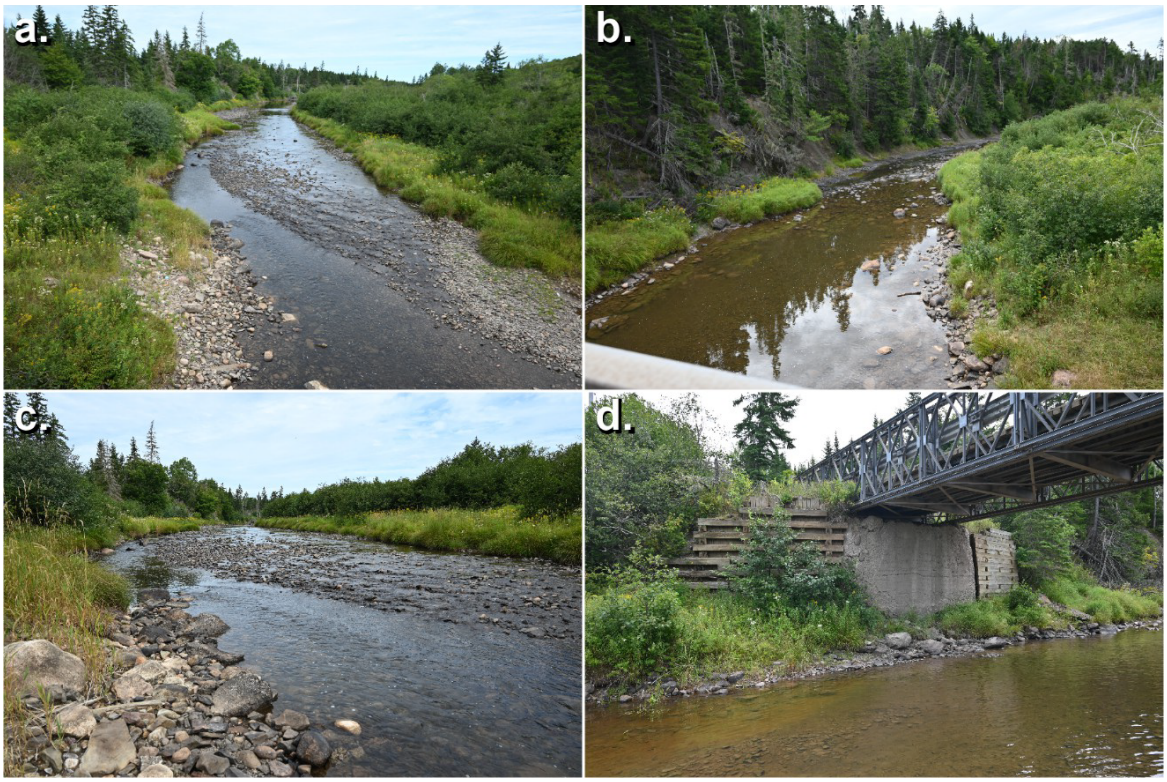


Figure S 66 - Photographs of sampling site SalmonTruro003 on Salmon River, NS, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Salmon River from the Riversdale Road bridge at SalmonTruro003. b. Downstream view of Salmon River from the Riversdale Road bridge at SalmonTruro003. c. Upstream view of Salmon River from below the Riversdale Road bridge at SalmonTruro003. d. The structure and supports of the Riversdale Road bridge over Salmon River at SalmonTruro003.

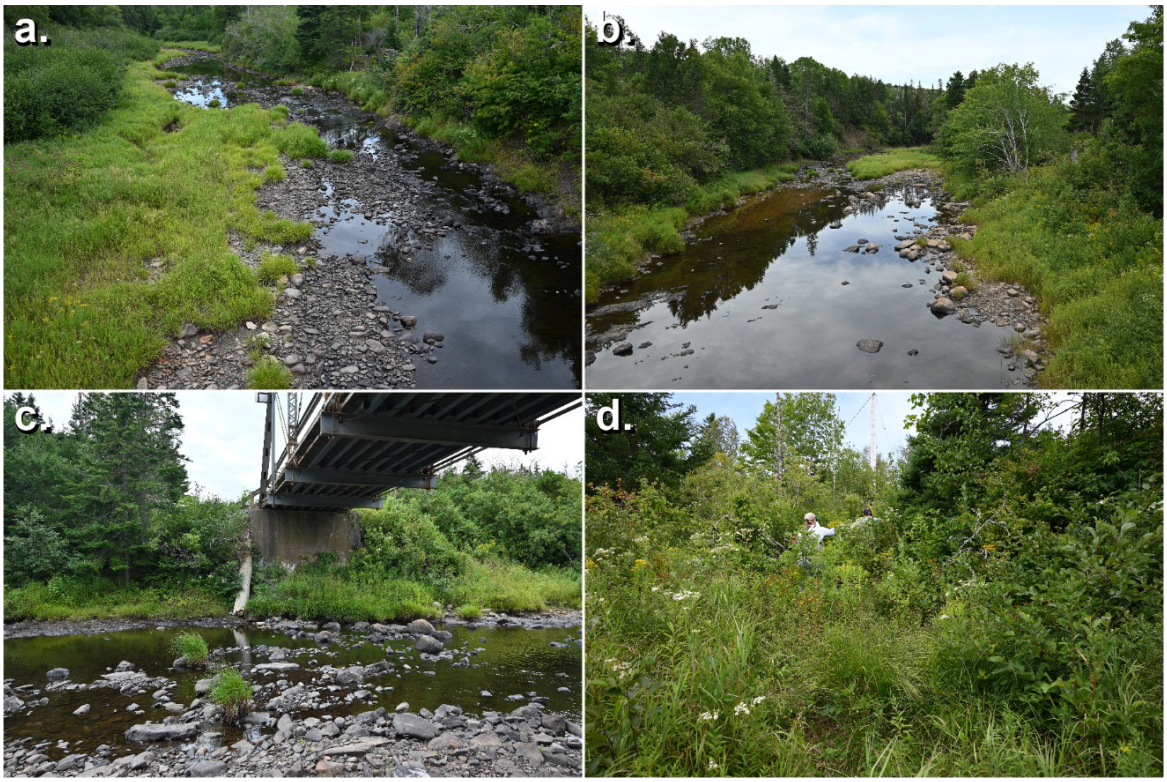


Figure S 67 - Photographs of sampling site Black001 on Black River (Salmon River system), NS, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Black River from the Riversdale Road bridge at Black001. b. Downstream view of Black River from the Riversdale Road bridge at Black001. c. The Riversdale Road bridge supports and structure and the substrate of Black River at Black001. d. The easiest access route to Black River at Black001.

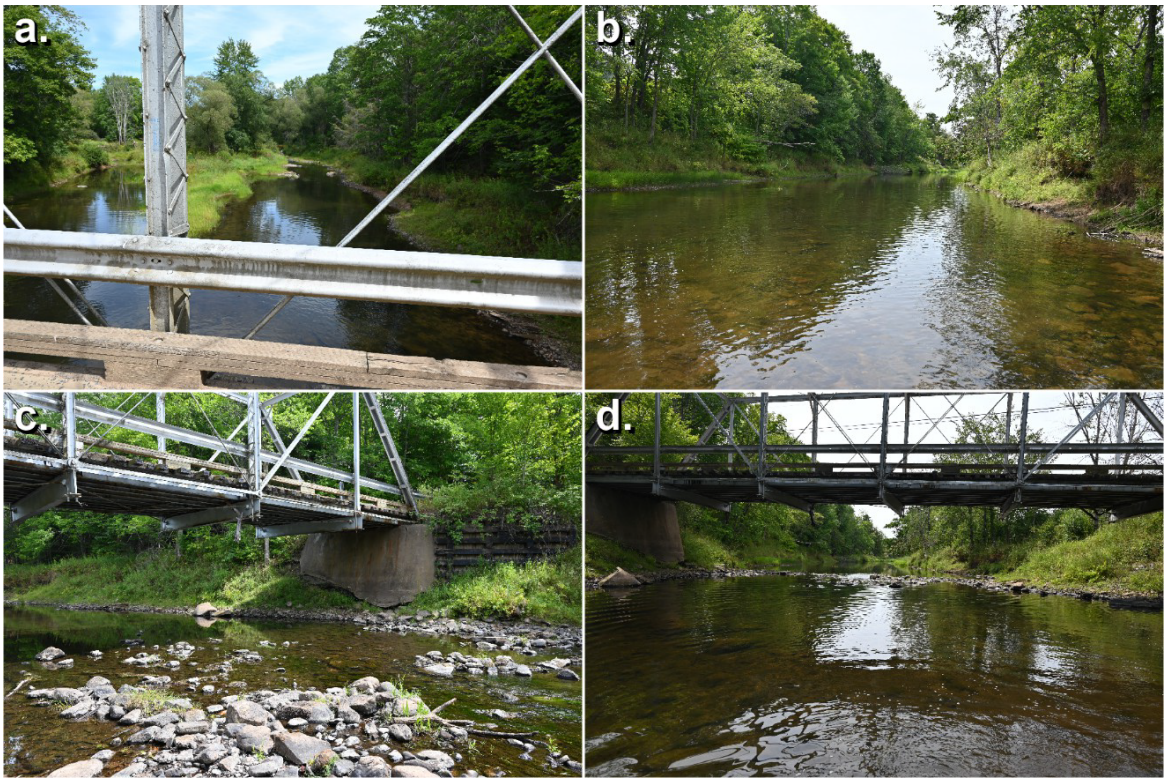


Figure S 68 - Photographs of sampling site McLeans004 on Gays River (Shubenacadie River system), NS, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Gays River from the Cooks Mill Road bridge at McLeans004. b. Downstream view of Gays River from under the Cooks Mill Road bridge at McLeans004. c. Looking upstream at the bridge structure and concrete supports of the Cooks Mill Road bridge at McLeans004. d. Looking downstream along Gays River underneath the Cooks Mill Road bridge at McLeans004.



Figure S 69 - Photographs of sampling site Shubenacadie001 on Shubenacadie River, NS, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Shubenacadie River from under the Nova Scotia Route 277 bridge at Shubenacadie001. b. Downstream view of Shubenacadie River from under the Nova Scotia Route 277 bridge at Shubenacadie001. c. The bridge support structures and river substrate under the Nova Scotia Route 277 bridge at Shubenacadie001. d. The slope to Shubenacadie River from Nova Scotia Route 277 at Shubenacadie001.



Figure S 70 - Photographs of sampling site NineMile003 on Nine Mile Branch (Shubenacadie River system), NS, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Nine Mile Branch from under the Garden Road bridge at NineMile003. b. Downstream view of Nine Mile Branch from under the Garden Road bridge at NineMile003. c. Upstream view of Nine Mile Branch and the Garden Road bridge at NineMile003. d. The large rock pile protecting the bridge supports at NineMile003. Debris from higher water levels can be seen among the rocks.

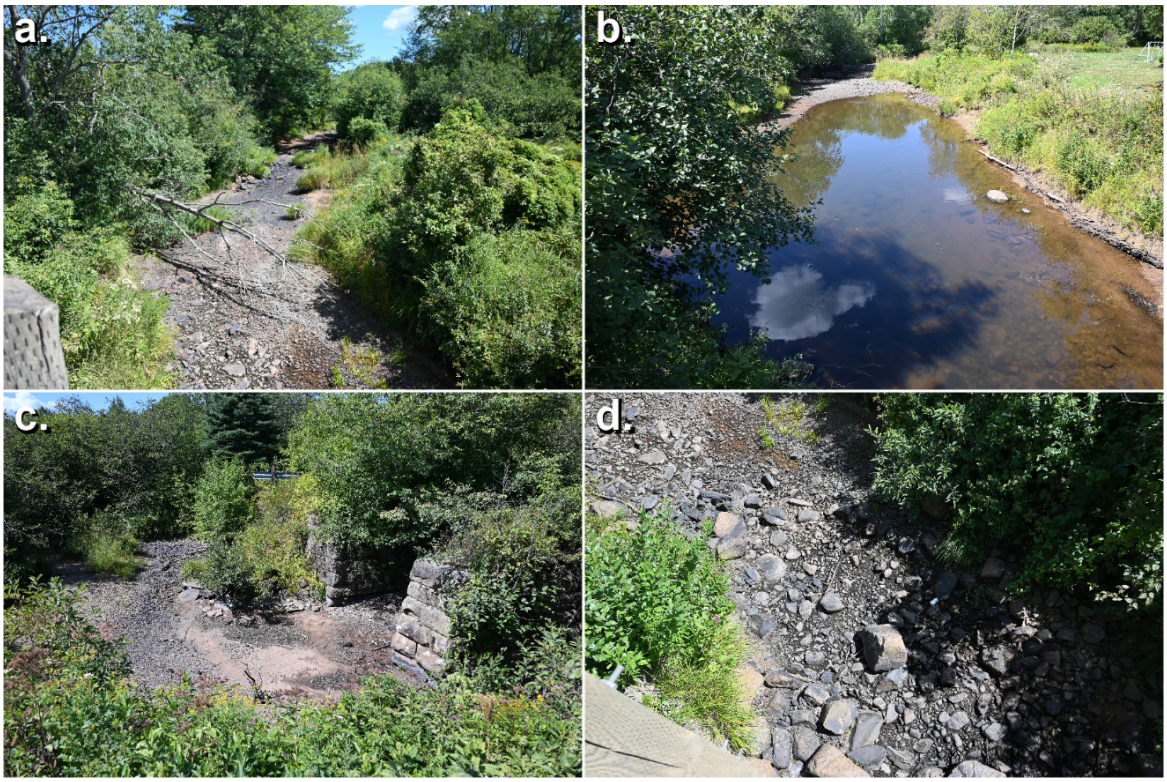


Figure S 71 - Photographs of sampling site Kennetcook004 on Kennetcook River (Avon River system), NS, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of the dry Kennetcook River bed from the King Road bridge at Kennetcook004. b. Downstream view of Kennetcook River from the King Road bridge at Kennetcook004 showing a large pool that was mostly stagnant. c. Old mill or bridge structure just in Kennetcook River just upstream of Kennetcook004. d. The dry riverbed showing rocky substrate from the King Road bridge at Kennetcook004.



Figure S 72 - Photographs of sampling site AvonWest002 on West Branch, Avon River, NS, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of West Branch, Avon River from AvonWest002. b. Downstream view of West Branch, Avon River from AvonWest002. c. The access path to AvonWest002 from Mines Road. d. The culvert under Mines Road just east of the Mines Road bridge over West Branch, Avon River at AvonWest002.

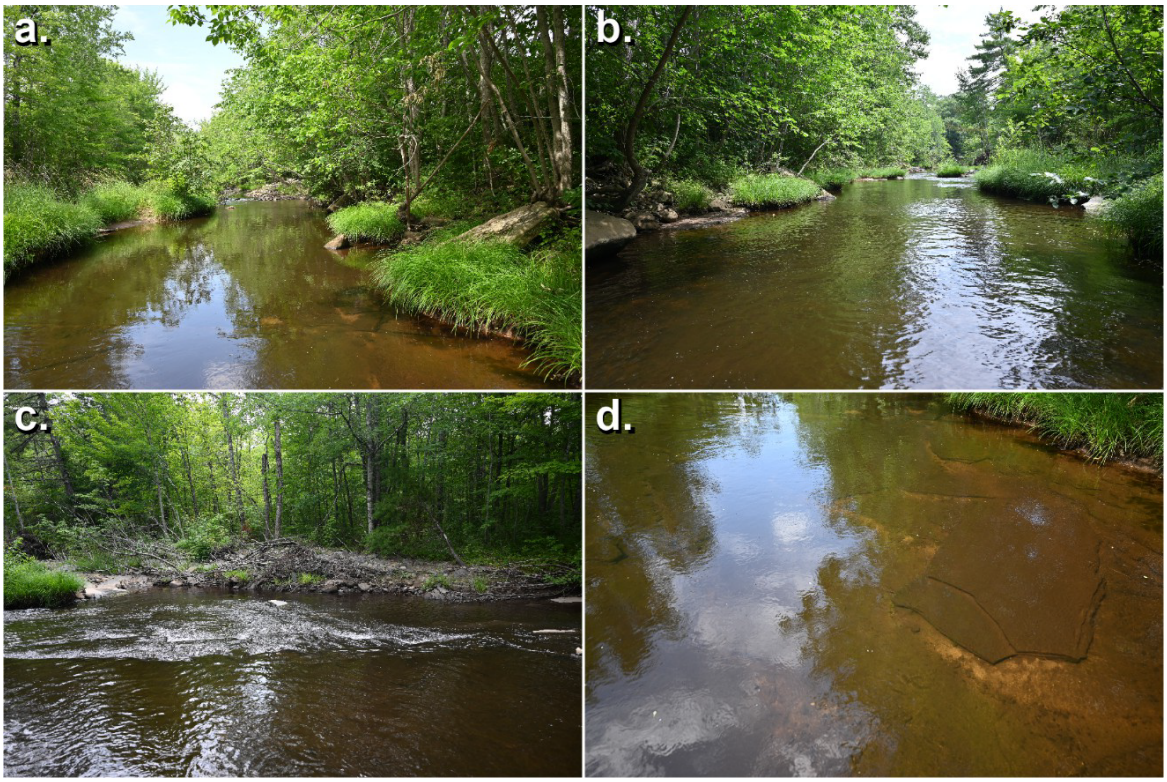


Figure S 73 - Photographs of sampling site Halfway001 on Halfway River (Avon River system), NS, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Halfway River from under the Bog Road bridge at Halfway001. b. Downstream view of Halfway River from under the Bog Road bridge at Halfway001. c. Debris from higher water levels along the banks of Halfway River near Halfway001. d. The predominately bedrock substrate of the Halfway River at Halfway001.

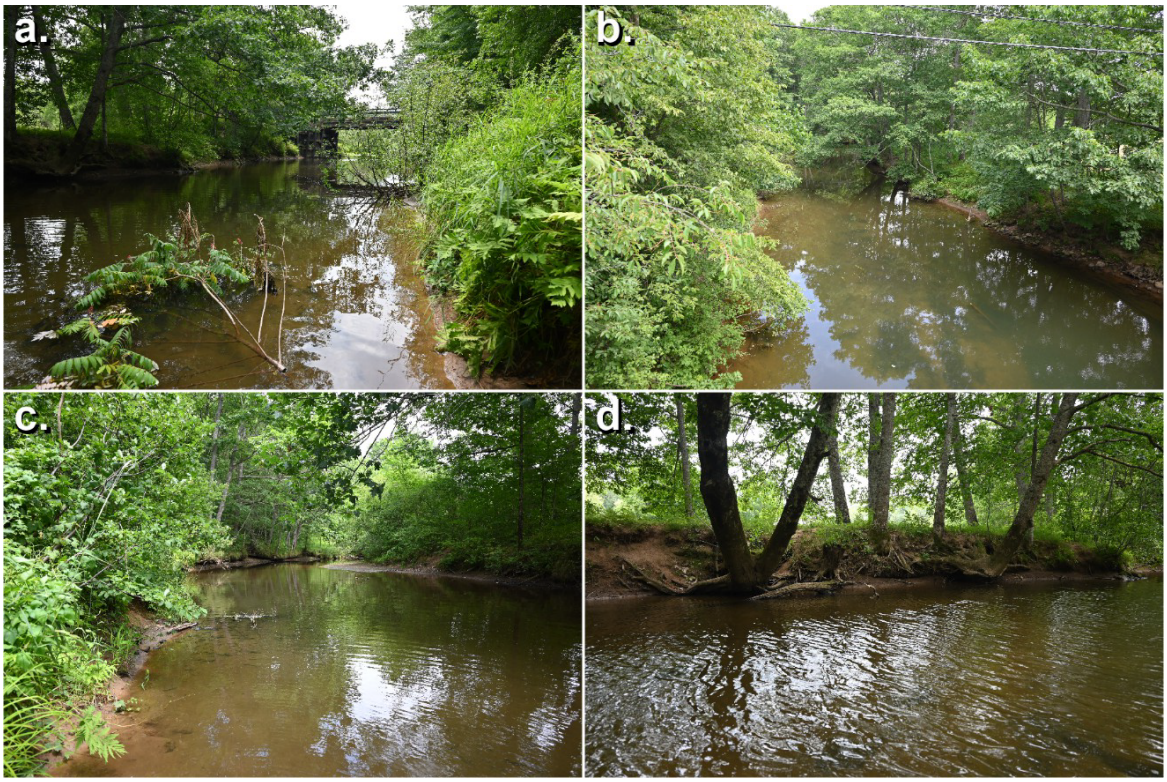


Figure S 74 - Photographs of sampling site Cornwallis004 on Cornwallis River, NS, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Cornwallis River from just downstream of the South Bishop Road bridge at Cornwallis004. b. Downstream view of Cornwallis River from the South Bishop Road bridge at Cornwallis004. c. Upstream view of Cornwallis River from underneath the South Bishop Road bridge at Cornwallis004. d. Downstream view of Cornwallis River from underneath the South Bishop Road bridge at Cornwallis004.



Figure S 75 - Photographs of sampling site Mill001 on Mill Brook, Cornwallis River, NS, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Mill Brook from Brook Ave which runs alongside the brook at Mill001. b. Downstream view of Mill Brook from Brook Ave which runs alongside the brook at Mill001. c. View across Mill Brook from Brook Ave which runs alongside the brook at Mill001. d. Brook Ave which runs alongside Mill Brook at Mill001. The brook is down a small embankment past the trees and shrubs at the right of the photo.

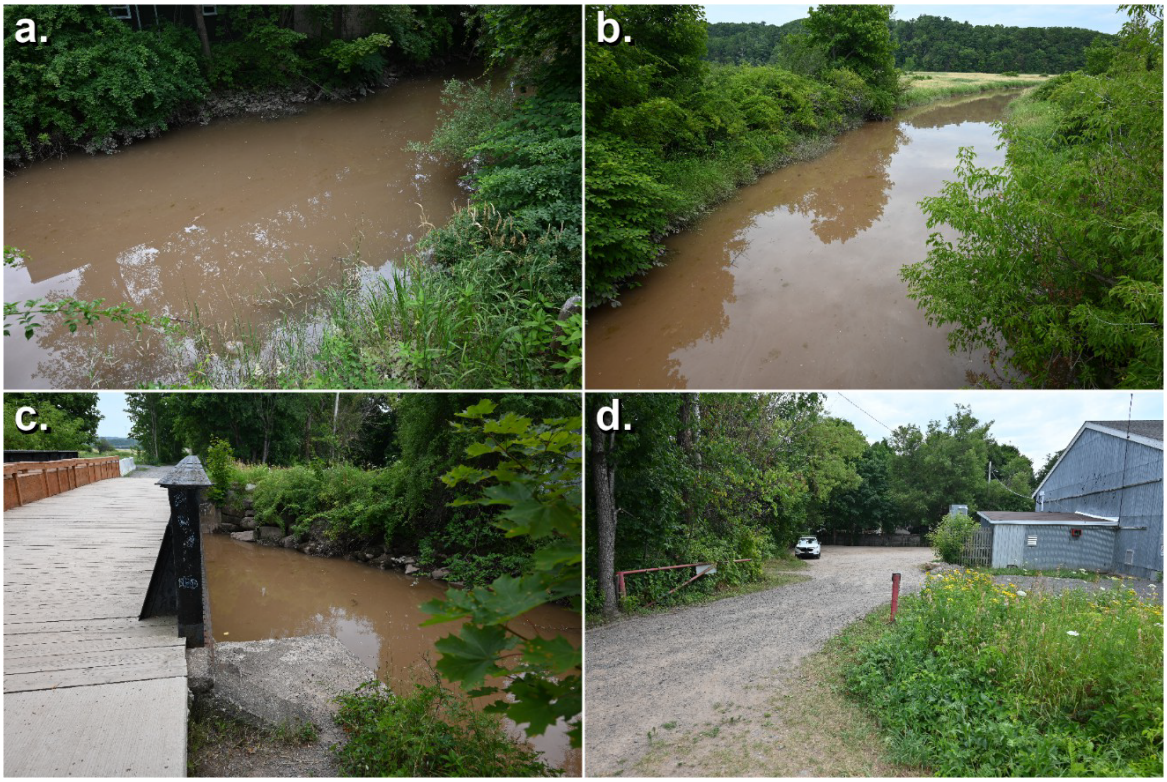


Figure S 76 - Photographs of sampling site Mill002 on Mill Brook, Cornwallis River, NS, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Mill Brook from one of two small bridges on the Kentville Rail Trail at Mill002. The water at the site was muddy from tidal influence. b. Downstream view of Mill Brook from one of two small bridges on the Kentville Rail Trail at Mill002. The water at the site was muddy from tidal influence. c. A path down to Mill Brook beside one of the Kentville Rail Trail bridges at Mill002. d. The parking lot of the Glooscap Curling Club of Kentville and path towards the Kentville Rail Trail and Mill Brook at Mill002.



Figure S 77 - Photographs of sampling site Habitant001 on Habitant River, NS, in the Inner Bay of Fundy Designatable Unit. a. Upstream view of Habitant River from the Hillaton Road Bridge over the river at Habitant001. b. Downstream view of Habitant River from the Hillaton Road Bridge over the river at Habitant001. c. Upstream view of Habitant River from under the Hillaton Road Bridge over the river at Habitant001. d. Downstream view of Habitant River from under the Hillaton Road Bridge over the river at Habitant001.



Figure S 78 - Photographs of sampling site Nictaux001 on Nictaux River, Annapolis River system, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Nictaux River from Nictaux001. b. Downstream view of Nictaux River from Nixtaux001. c. Upstream view of Nictaux River from upstream of Nictaux001. d. View across and slightly downstream on Nictaux River at Nictaux001 showing an existing concrete structure present upstream of the site.



Figure S 79 - Photographs of sampling site Paradise001 on Paradise Brook, Annapolis River system, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Paradise Brook from the Nova Scotia Route 201 bridge at Paradise001. b. Downstream view of Paradise Brook from the Nova Scotia Route 201 bridge at Paradise001. c. Marshy area along Paradise Brook upstream of Paradise001. d. The substrate of Paradise Brook at Paradise001.

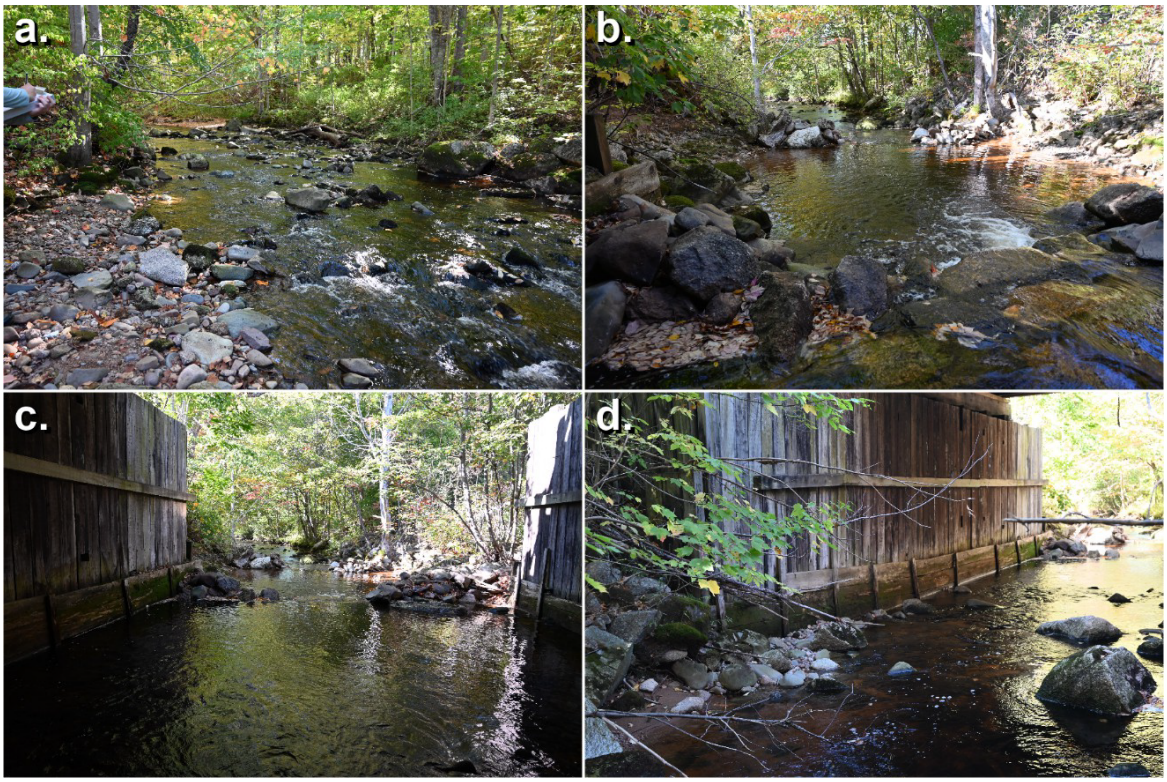


Figure S 80 - Photographs of sampling site Daniels001 on Daniels Brook, Annapolis River system, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Daniels Brook from Daniels001. b. Downstream view of Daniels Brook from Daniels001. c. Downstream view of Daniels Brook from underneath the Nova Scotia Route 201 bridge at Daniels001. d. The supports and structure of the Nova Scotia Route 201 bridge over Daniels Brook at Daniels001.

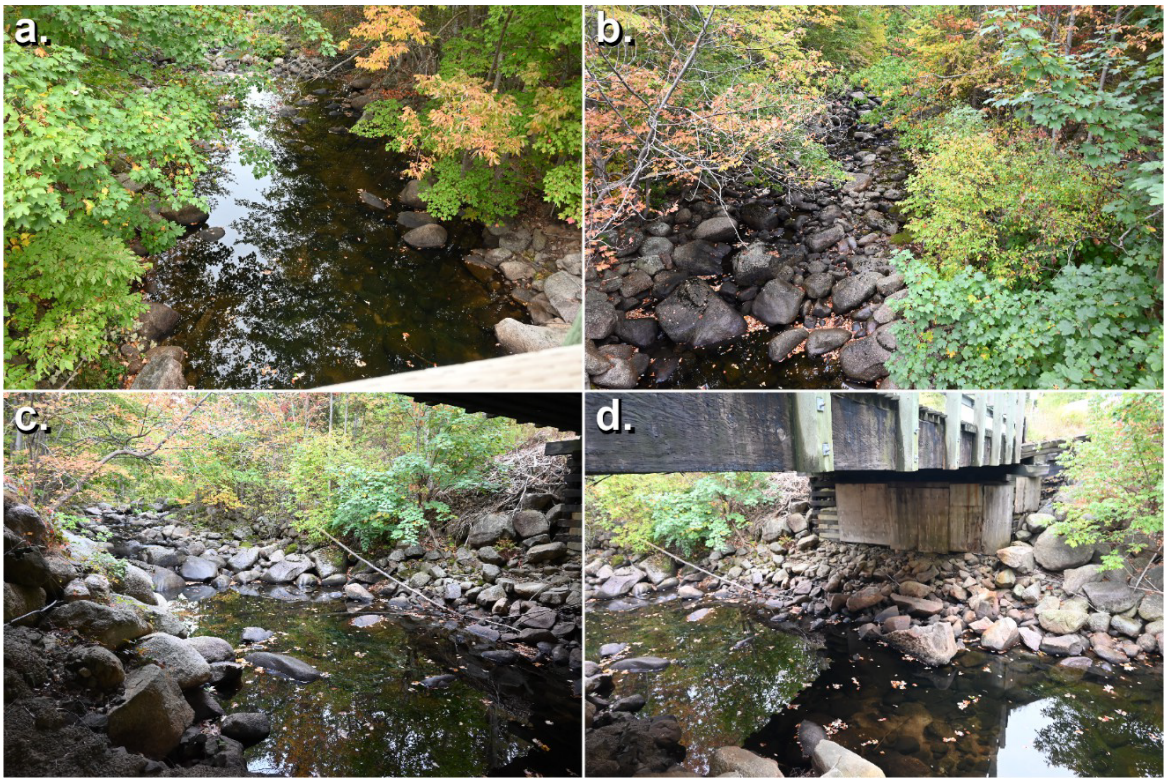


Figure S 81 - Photographs of sampling site Allains001 on Allains River, Annapolis River system, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Allains River from the Clementsvale Road bridge over the river at Allains001. b. Downstream view of Allains River from the Clementsvale Road bridge over the river at Allains001. c. Downstream view of Allains River from underneath the Clementsvale Road bridge at Allains001. d. The supports and structure of the Clementsvale Road bridge over Allains River at Allains001.

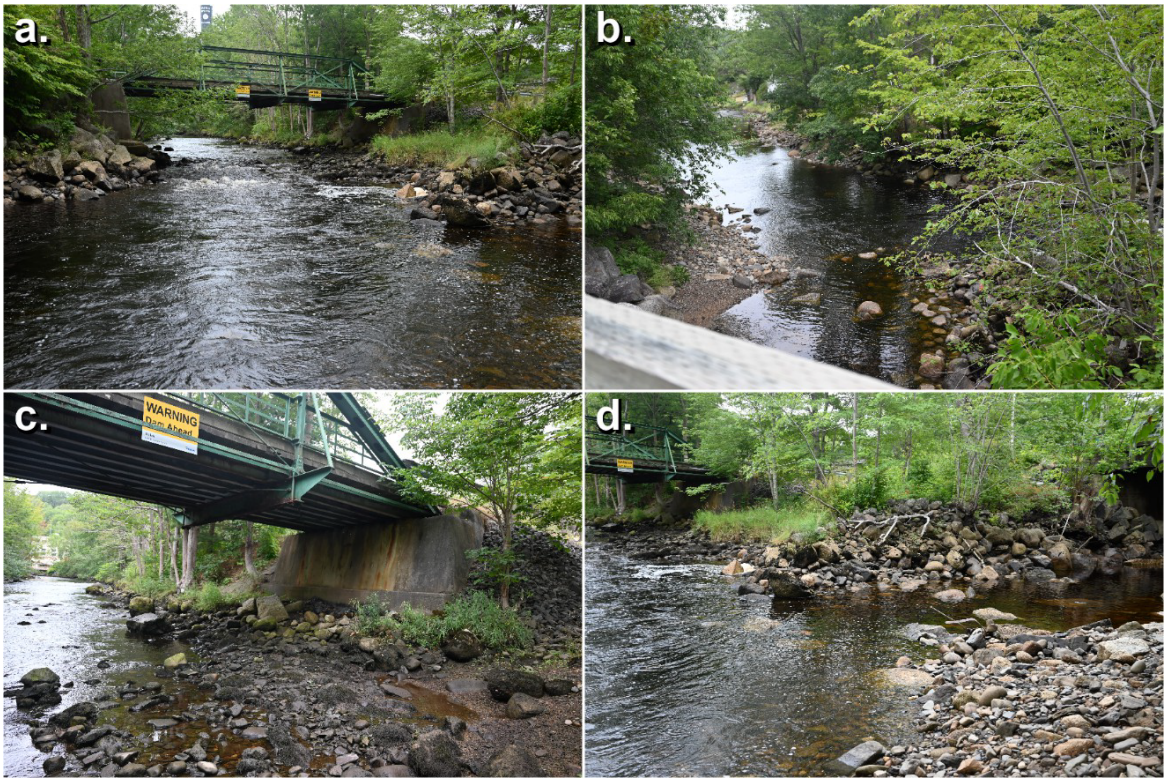


Figure S 82 - Photographs of sampling site Bear001 on Bear River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Bear River from Bear001. The Loop Road bridge over the river can be seen in the background. b. Downstream view of Bear River from the River Road Bridge over West Branch, Bear River, at Bear001. c. The supports and structure of the Loop Road bridge over Bear River at Bear001. d. The confluence of West Branch (on the right) and Bear River (running top to bottom along the left of the image).

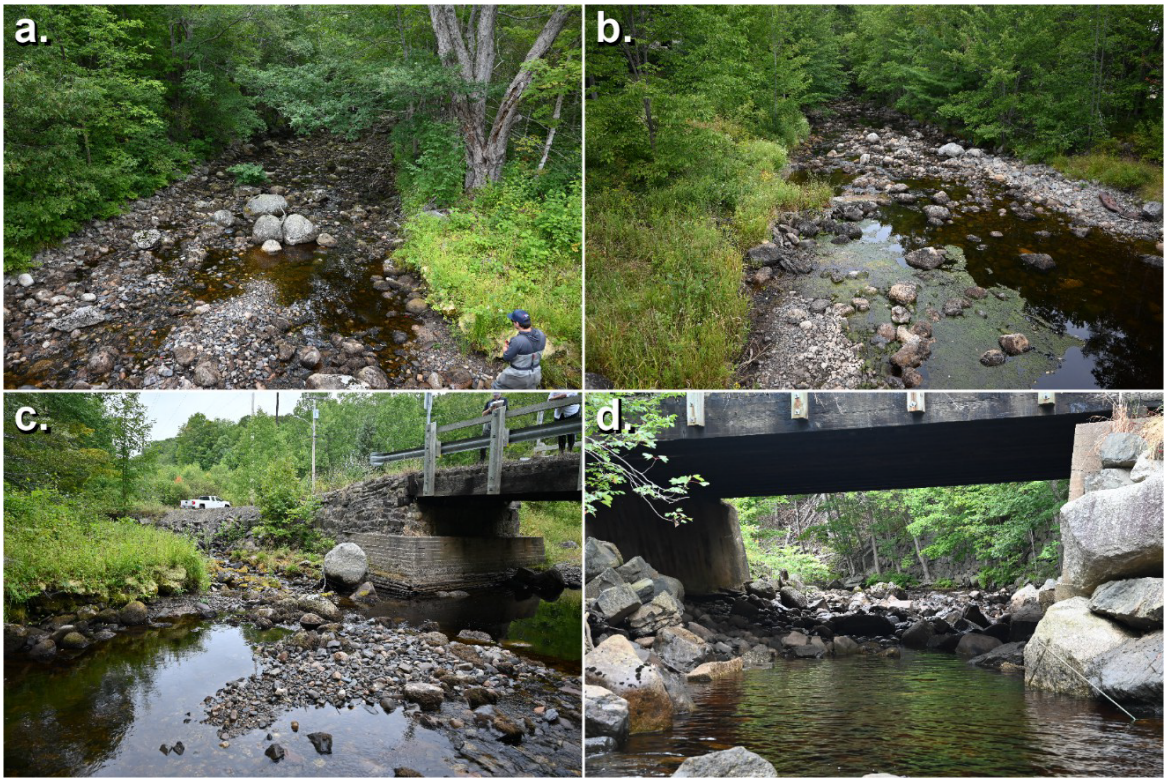


Figure S 83 - Photographs of sampling site BearWest002 on West Branch, Bear River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of West Branch, Bear River, from BearWest002. b. Downstream view of West Branch, Bear River, from BearWest002. c. Access from an unnamed gravel road to West Branch, Bear River, at BearWest002. d. Upstream view of West Branch, Bear River, from under the bridge at BearWest002.

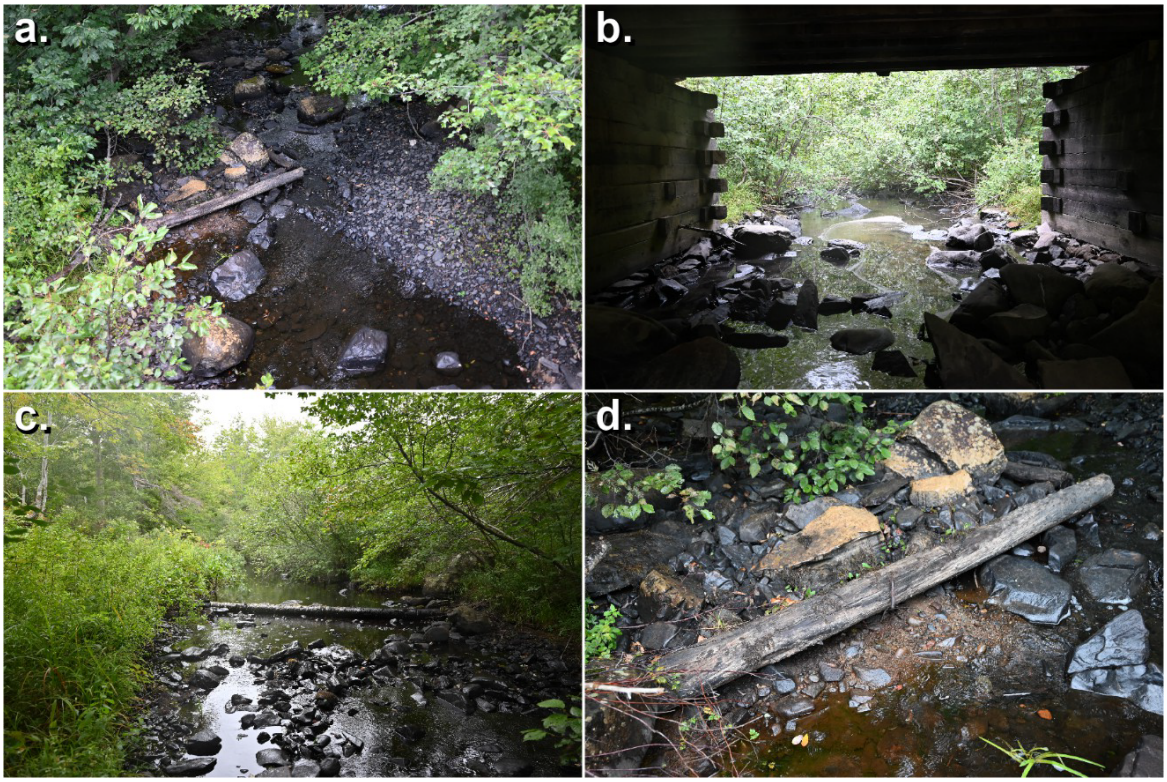


Figure S 84 - Photographs of sampling site Bealliveau001 on Belliveau River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Belliveau River from the Chemin Margo Road at Belliveau001. b. Downstream view of Belliveau River from underneath the Chemin Margo Road bridge at Belliveau001. c. Upstream view of Belliveau River from upstream of Belliveau001. d. A digger log installed in Belliveau River near Belliveau001.

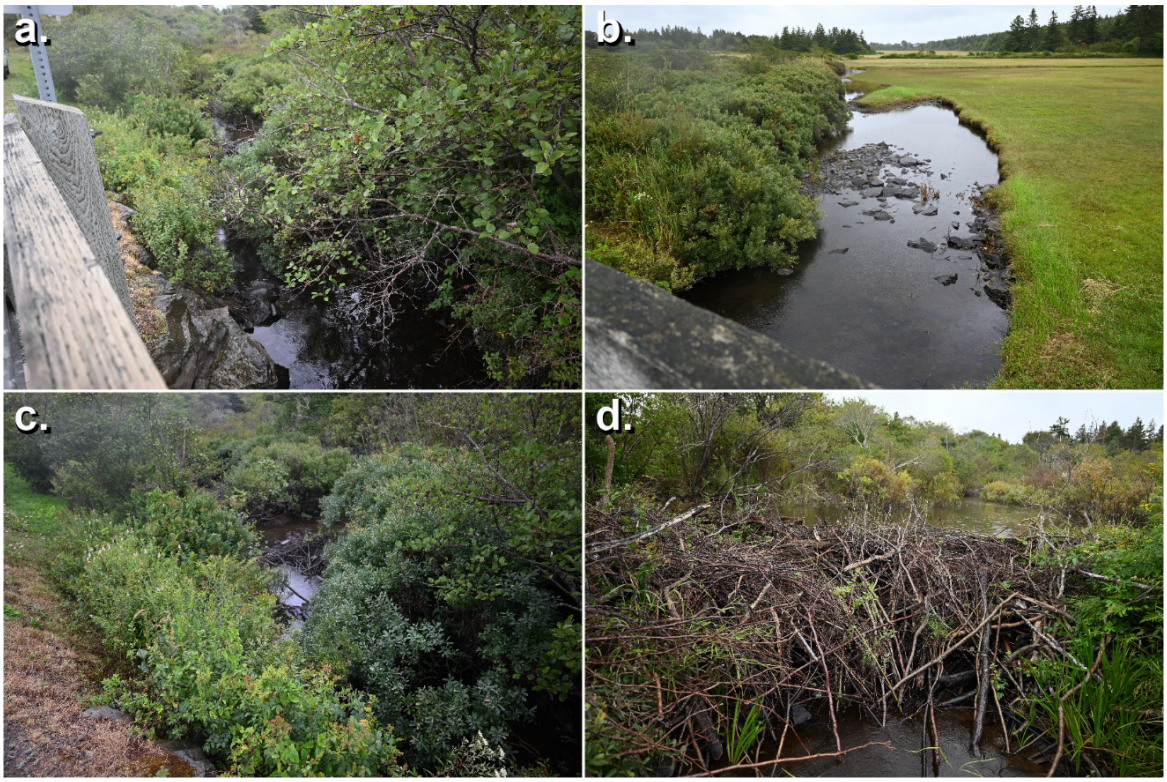


Figure S 85 - Photographs of sampling site GC001 on Rivière Grosses Coques, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Rivière Grosses Coques from the Wallace Dugas Road bridge over the river at GC001. b. Downstream view of Rivière Grosses Coques from the Wallace Dugas Road bridge over the river at GC001. c. Debris potentially from beaver activity in Rivière Grosses Coques upstream of GC001. d. A beaver dam across Rivière Grosses Coques upstream of GC001.



Figure S 86 - Photographs of sampling site Boudreau001 on Leblanc Brook, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Leblanc Brook from Boudreau001. b. Downstream view of Leblanc Brook from the Nova Scotia Route 7/Evangeline Trail bridge over the brook at Boudreau001. c. Upstream view underneath the Nova Scotia Route 7/Evangeline Trail bridge at Boudreua001. d. A rock wall with drainage pipes that forms part of the Leblanc Brook bank near Boudreau001.



Figure S 87 - Photographs of sampling site Boudreau003 on Ruisseau des Boudreau, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Ruisseau des Boudreau from Boudreau003. b. Downstream view of Ruisseau des Boudreau from Boudreau003. c. Downstream view of Ruisseau des Boudreau from downstream of Boudrea003. d. The channel underneath Common Cross Road where it crosses Ruisseau des Boudreau at Boudreau003.



Figure S 88 - Photographs of sampling site Meteghan001 on Meteghan River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Meteghan River from Meteghan001. The Nova Scotia Highway 101 bridge over the river can be seen in the background. b. Downstream view of Meteghan River from Meteghan001. c. Downstream view of Meteghan River from downstream of Meteghan001. d. The structure of the Placide Comeau Road bridge over Meteghan River at Meteghan001.



Figure S 89 - Photographs of sampling site Salmon001 on Salmon River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Salmon River from Salmon001. b. Downstream view of Salmon River from Salmon001. c. Upstream view of Salmon River from under the Hectanooga Road bridge over the river at Salmon001. d. Downstream view of Salmon River from downstream of Salmon001. Marshy area with growing plants can be seen in the background.

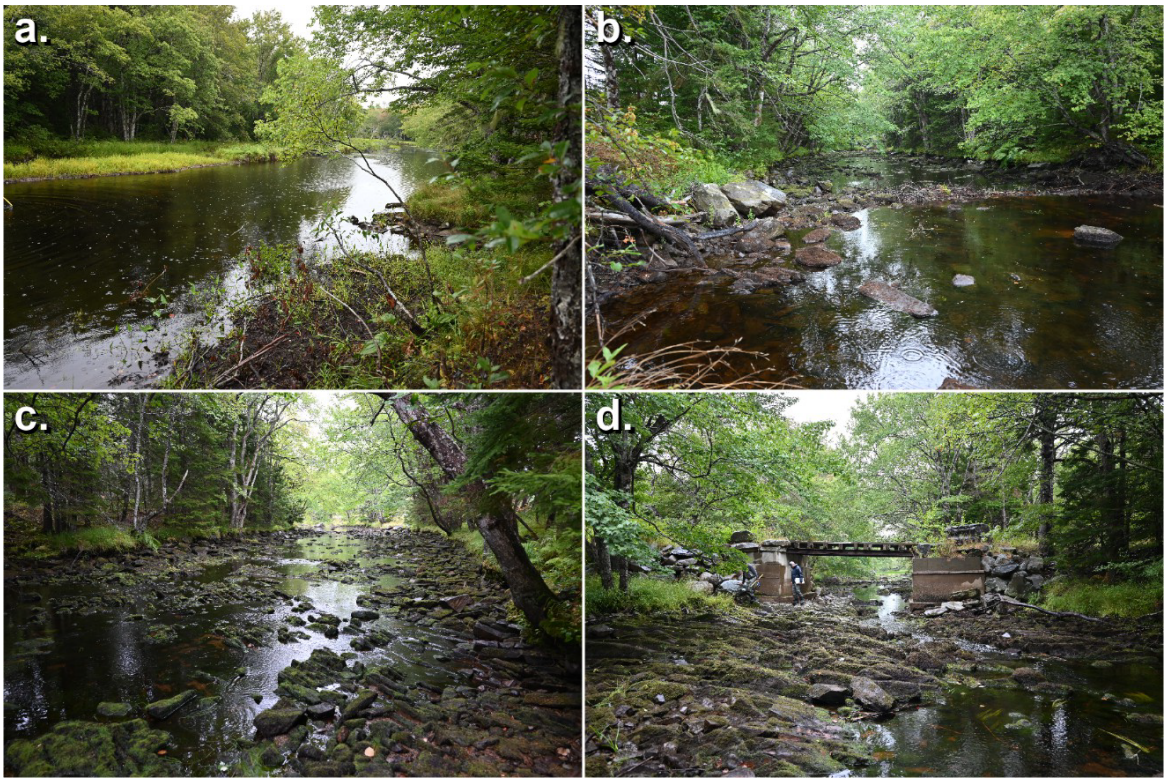


Figure S 90 - Photographs of sampling site Salmon005 on Salmon River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Salmon River from Site Salmon005 alongside Hectanooga Road. b. Downstream view of Salmon River from Salmon005. Some debris is visible extending across the river in the middle of the image. c. Upstream view of Salmon River from downstream of site Salmon005. d. An ATV bridge across Salmon River downstream of Salmon005.

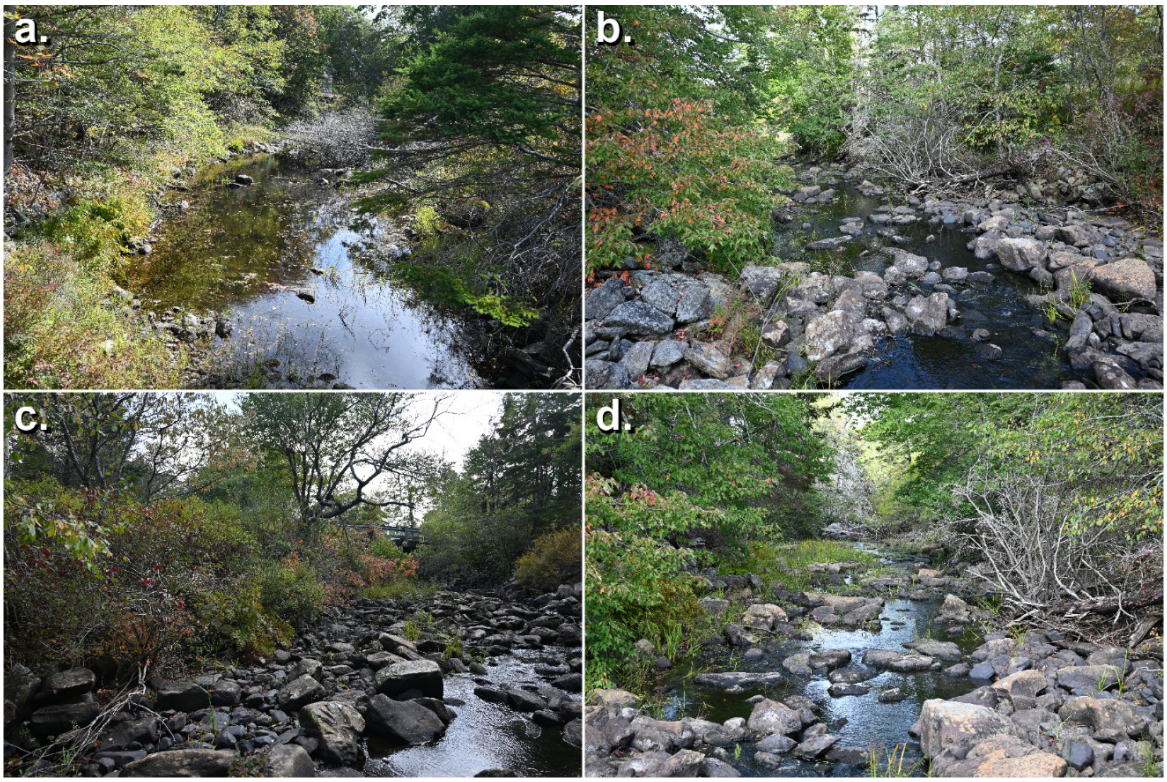


Figure S 91 - Photographs of sampling site Indian001 on Indian River, Salmon River system, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Indian River from the Porter Road bridge over the river at Indian001. b. Downstream view of Indian River from Indian001. c. Upstream view of Indian River towards the Porter Road bridge downstream of Indian001. d. Debris in Indian River downstream of Indian001.



Figure S 92 - Photographs of sampling site Chegoggin002A on Chegoggin River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Chegoggin River from the Main Shore Road bridge at Chegoggin002A. b. Downstream Upstream view of Chegoggin River from the Main Shore Road bridge at Chegoggin002A. c. Marshy area surrounding Chegoggin River downstream of Chegoggin002A. d. Marsh plants growing along Chegoggin River near Chegoggin002A.



Figure S 93 - Photographs of sampling site Chegoggin002B on Chegoggin River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Chegoggin River from the Dayton Road bridge over the river at Chegoggin002B. b. Downstream view of Chegoggin River from the Dayton Road bridge over the river at Chegoggin002B. c. Upstream view of Chegoggin River from upstream of Chegoggin002B. d. Culverts under Dayton Road where it crosses Chegoggin River at Chegoggin002B.

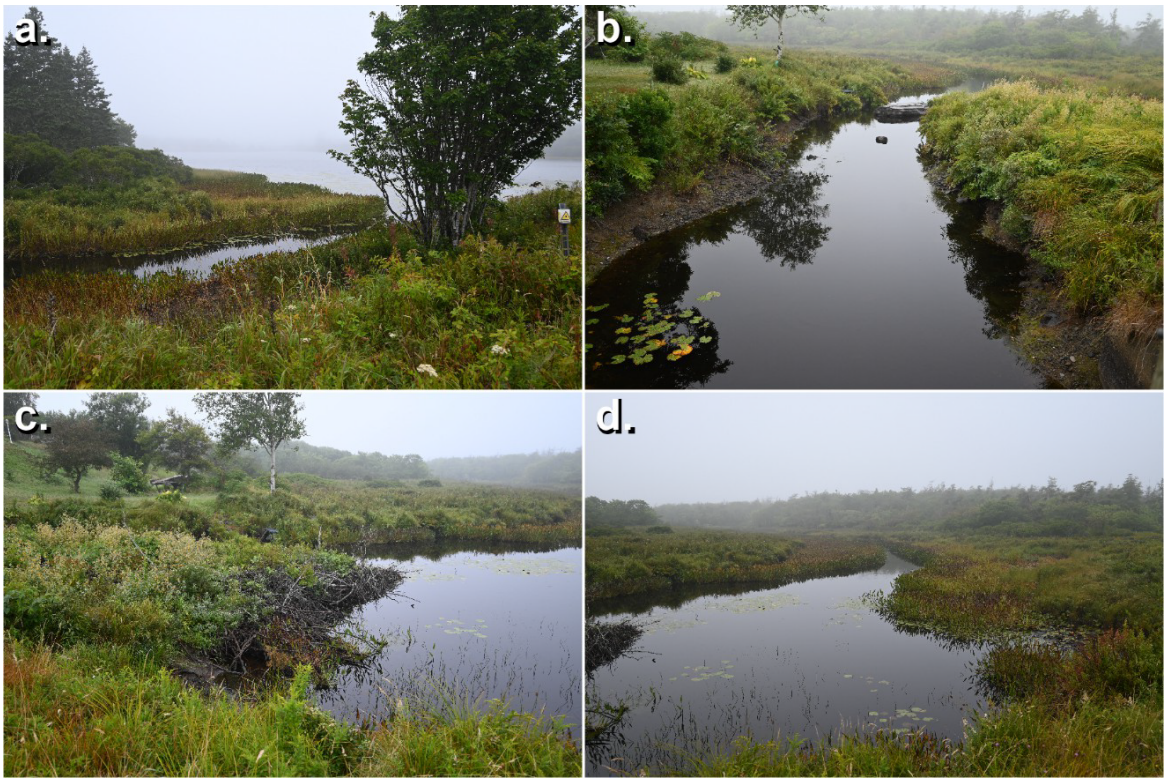


Figure S 94 - Photographs of sampling site Chegoggin002C on Chegoggin River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Chegoggin River from the MacCormack Road bridge over the river at Chegoggin002C. Rodneys Lake can be seen in the background. b. Downstream view of Chegoggin River from the MacCormack Road bridge over the river at Chegoggin002C. c. Debris (possible from beaver activity) along the banks of Chegoggin River at Chegoggin002C. d. Marsh habitat surrounding Chegoggin River downstream of Chegoggin002C.

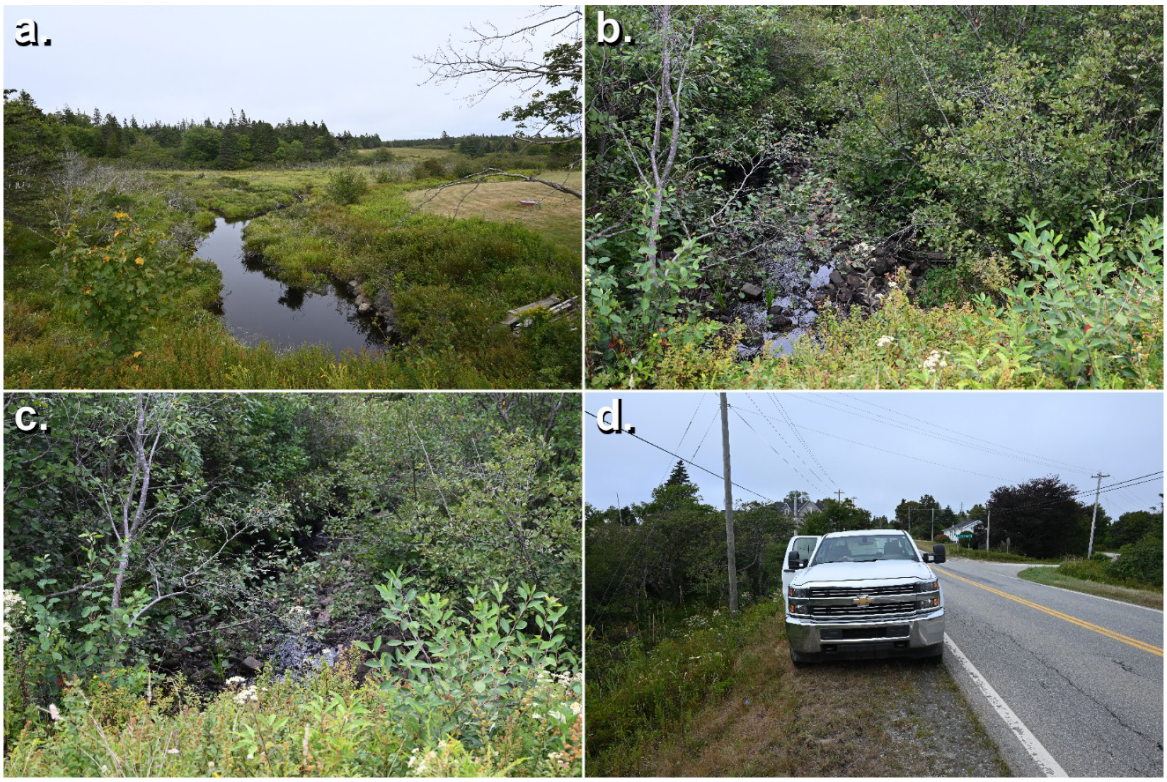


Figure S 95 - Photographs of sampling site Chegoggin005 on Chegoggin River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Chegoggin River at Chegoggin005. b. Downstream view of Chegoggin River at Chegoggin005. c. Downstream view of Chegoggin River at Chegoggin005. d. Shoulder parking along Nova Scotia Highway 1 at Chegoggin005.

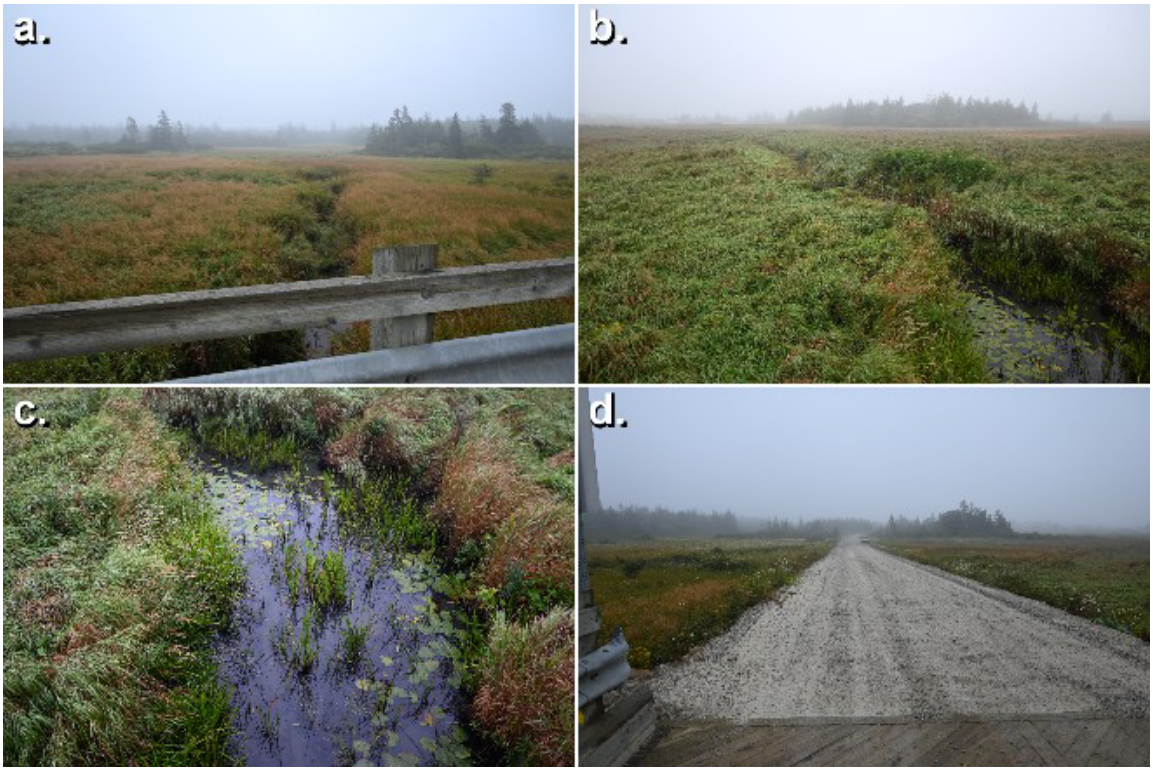


Figure S 96 - Photographs of sampling site Broad001A on Broad Brook, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Broad Brook from the Regent Street bridge at Broad001A. b. Downstream view of Broad Brook from the Regent Street bridge at Broad001A. c. Marsh habitat and plants in Broad Brook on the downstream side of the Regent Street bridge at Broad001A. d. Regent Street with shoulder parking near where it crosses Broad Brook at Broad001A.



Figure S 97 - Photographs of sampling site Broad001B on Broad Brook, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Broad Brook from the Parade Street bridge at Broad001B. b. Downstream view of Broad Brook from the Parade Street bridge at Broad001Bd. c. Breached beaver dam on Broad Brook just upstream of Broad001B. d. The culvert where Broad Brook flows under Parade Street at Broad001B.

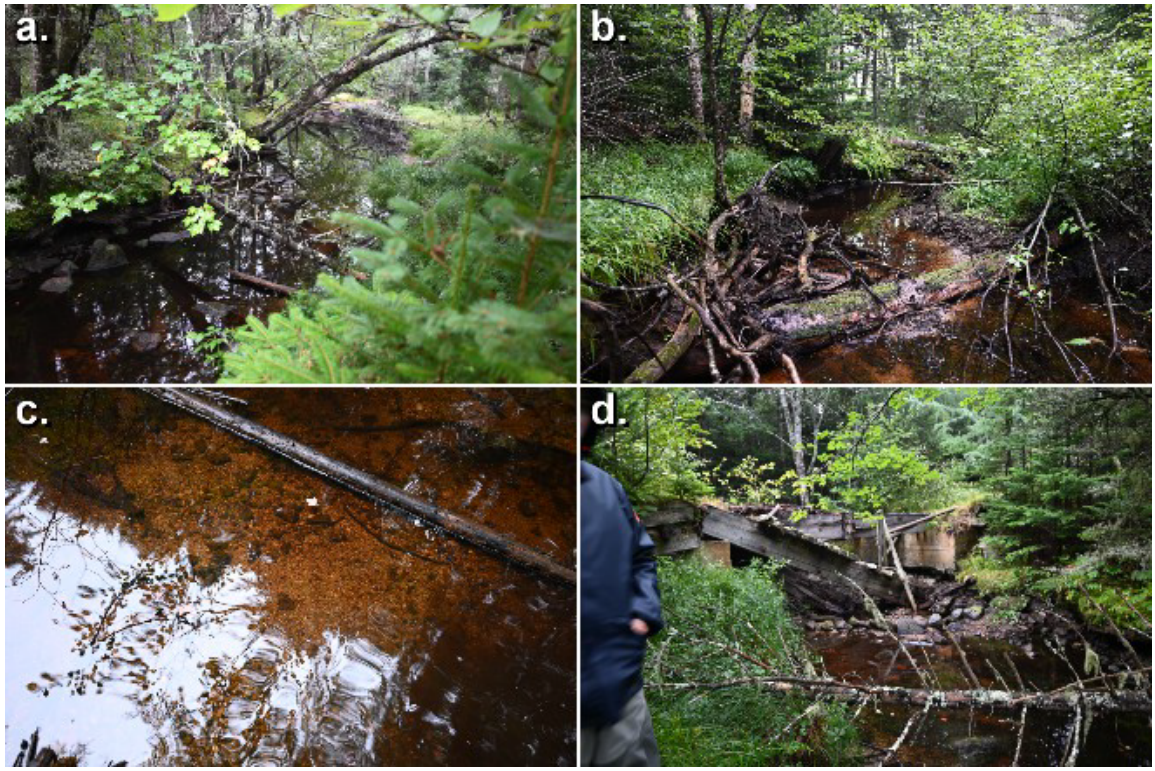


Figure S 98 - Photographs of sampling site Chebogue001 on Chebogue River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Chebogue River from Chebogue001. b. Downstream view of Chebogue River from Chebogue001. c. The sandy gravel substrate of Chebogue River at Chebogue001. d. The remains of an ATV trail bridge over Chebogue River at Chebogue001.



Figure S 99 - Photographs of sampling site Annis003 on Annis River, Tusket River system, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Annis River from Annis003. b. Downstream view of Annis River from Annis003. c. Grasses growing along the bank of Annis River and structures from the Nova Scotia Highway 340 bridge over Annis River at Annis003. d. The underside of the Nova Scotia Highway 340 bridge over Annis River at Annis003.



Figure S 100 - Photographs of sampling site Carleton002 on Carleton River, Tusket River system, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Carleton River from the Nova Scotia Route 203 bridge over the river at Carleton002. b. Downstream view of Carleton River from underneath the Nova Scotia Route 203 bridge over the river at Carleton002. c. Upstream view of Carleton River and the Nova Scotia Route 203 bridge from just downstream of Carleton002. d. The underside of the Nova Scotia Route 203 bridge and the banks of Carleton River at Carleton002.



Figure S 101 - Photographs of sampling site Argyle001 on Argyle River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Argyle River from Argyle001. b. Downstream view of Argyle River from Argyle001. c. The substrate of Argyle River beneath the Argyle Head Road bridge at Argyle001. d. The fishing shelters built along the Argyle Head Road bridge across Argyle River at Argyle001.

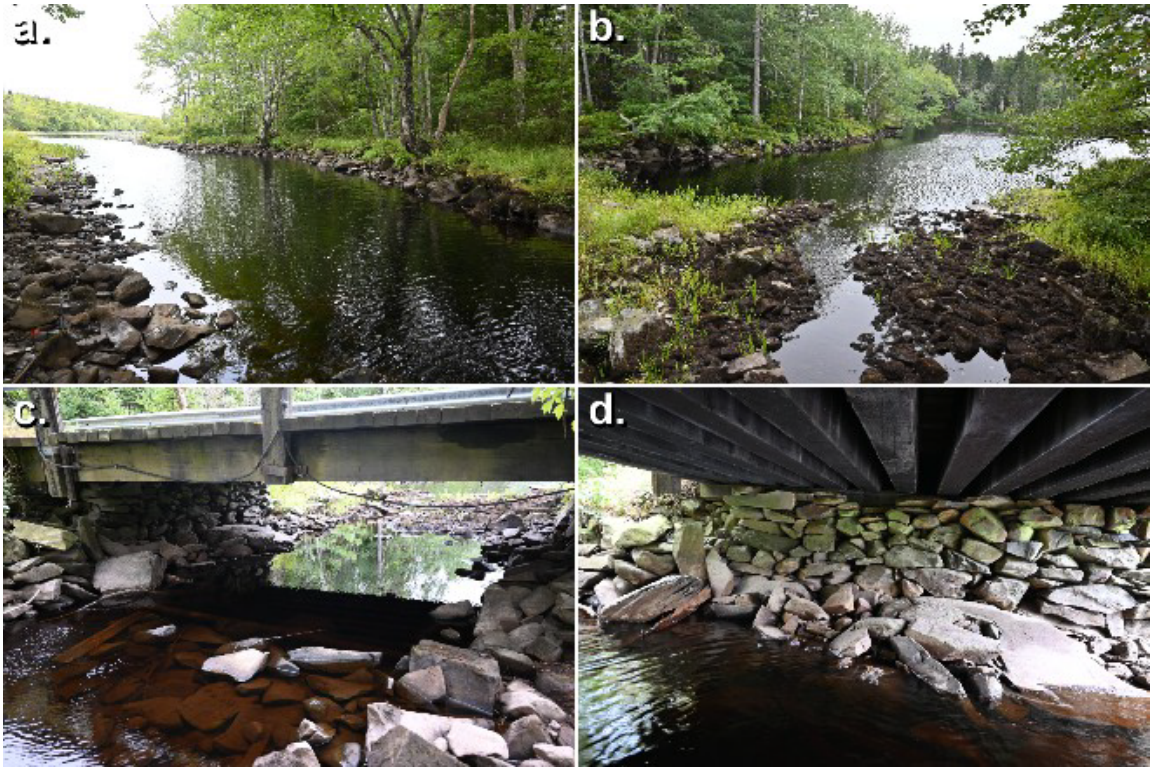


Figure S 102 - Photographs of sampling site Argyle002 on Argyle River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Argyle River from Argyle002 looking towards Randals Lake. b. Downstream view of Argyle River from Argyle002 c. Underneath the Forbes Road bridge over Argyle River at Argyle002. d. The wooden and rock supports of the Forbes Road bridge over Argyle River at Argyle002.

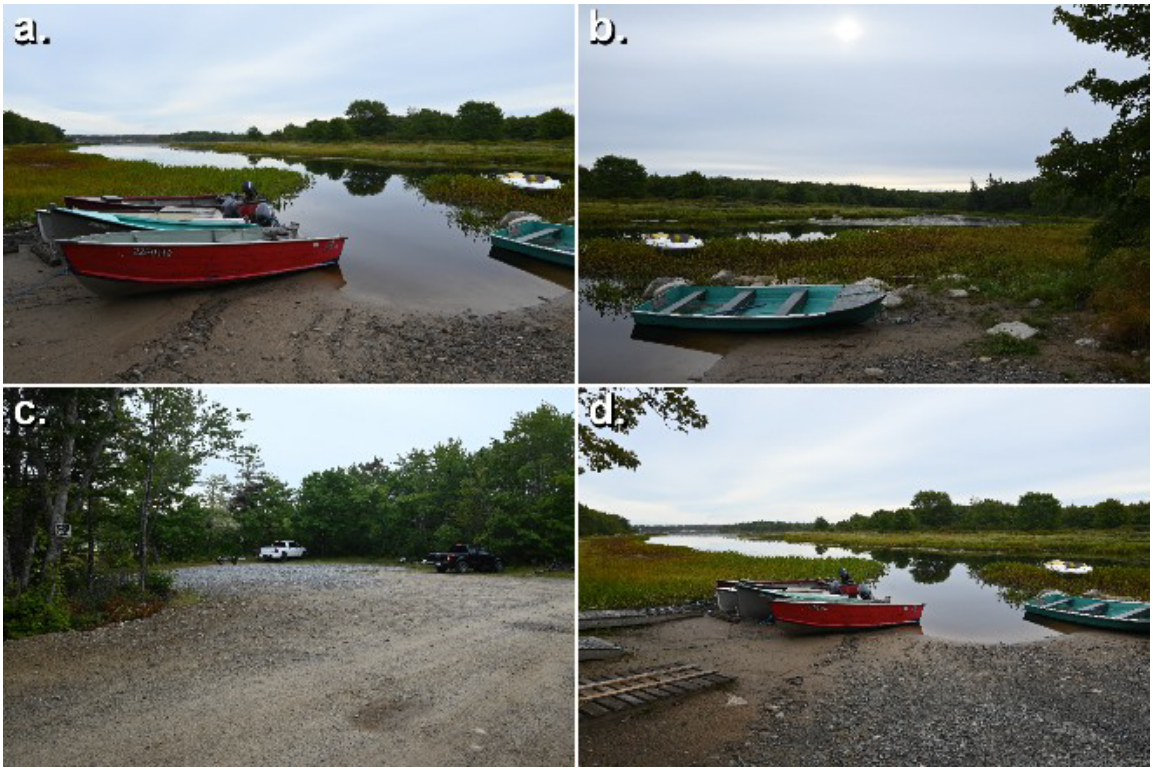


Figure S 103 - Photographs of sampling site Barrington002 on Barrington River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Barrington River from Barrington002 which is at a boat launch along Old Hay Road. b. Downstream view of Barrington River from the Old Hay Road boat launch at Barrington002. c. The parking area at the Old Hay Road boat launch near Barrington002. d. Fishing boats at the Old Hay Road boat launch into Barrington River at Barrington002.

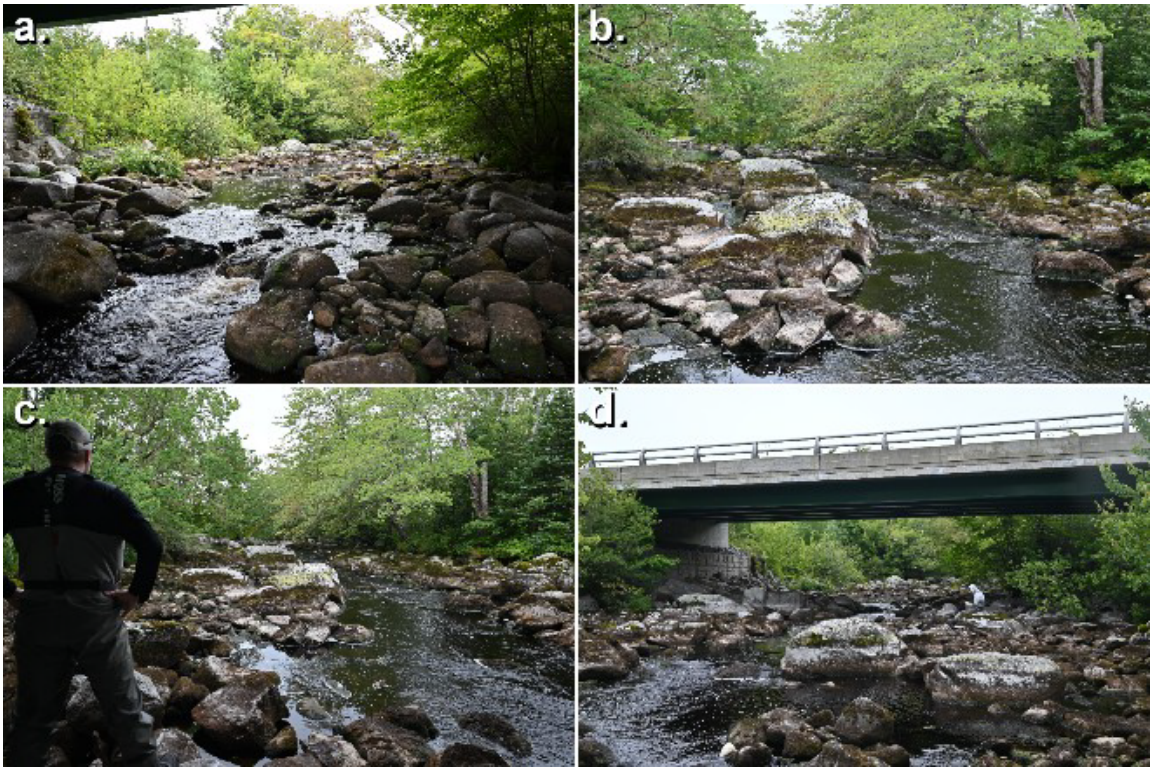


Figure S 104 - Photographs of sampling site BarringtonHwy103 on Barrington River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Barrington River from underneath the Nova Scotia Highway 103 bridge at BarringtonHwy103. b. Downstream view of Barrington River from BarringtonHwy103. c. Downstream view of Barrington River from underneath the Nova Scotia Highway 103 bridge at BarringtonHwy103. d. Upstream view towards the Nova Scotia Highway 103 bridge over Barrington River from BarringtonHwy103.

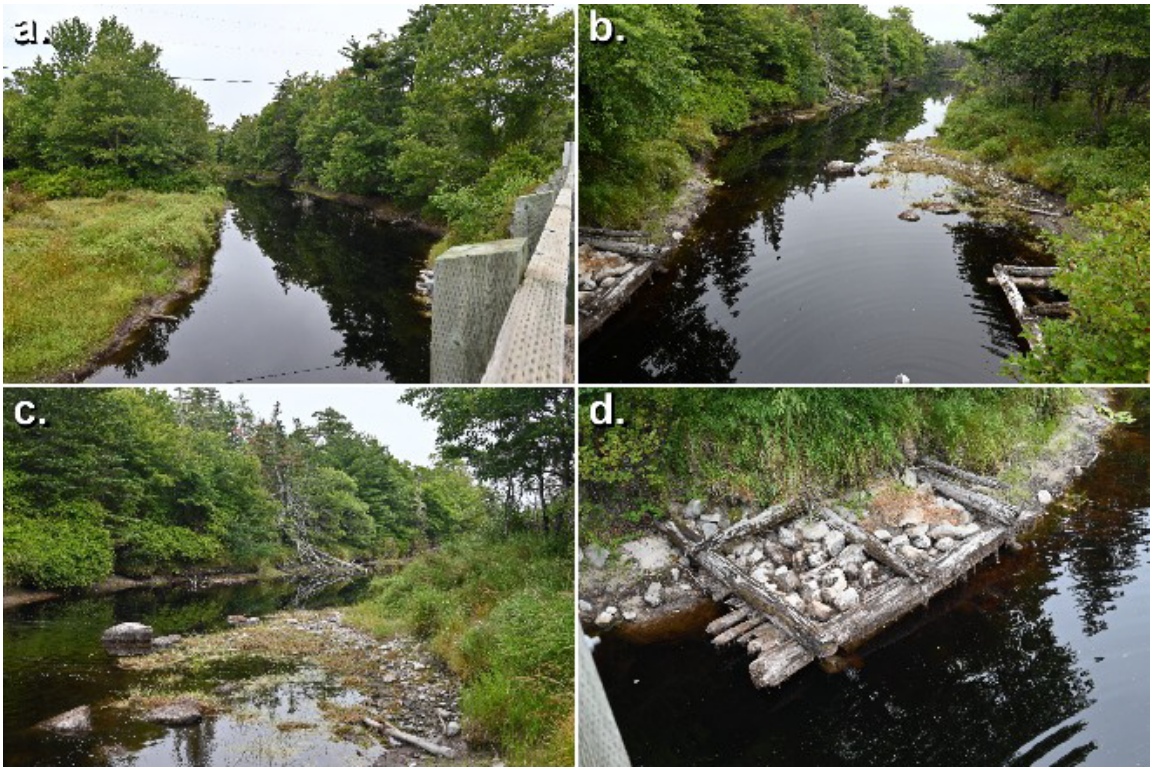


Figure S 105 - Photographs of sampling site Clyde001 on Bloody Creek, Clyde River system, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Bloody Creek from the Upper Clyde Road bridge at Clyde001. b. Downstream view of Bloody Creek from the Upper Clyde Road bridge at Clyde001. c. Debris visible in Bloody Creek downstream of Clyde001. d. Structures (potentially old bridge supports) in Bloody Creek just downstream of the Upper Clyde Road bridge at Clyde001.

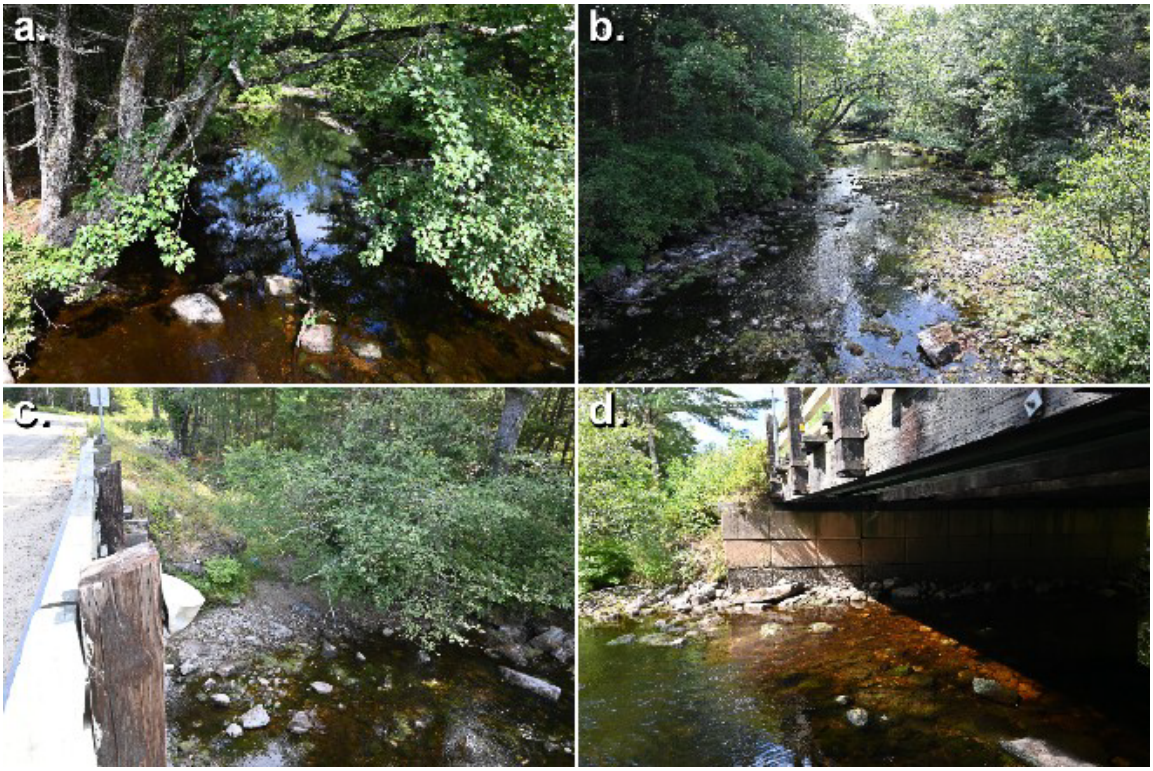


Figure S 106 - Photographs of sampling site ClydeHamilton001 on Hamilton Branch, Clyde River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Hamilton Branch, Clyde River, from the Upper Clyde Road bridge at ClydeHamilton001. b. Downstream view of Hamilton Branch, Clyde River, from the Upper Clyde Road bridge at ClydeHamilton001. c. Access to Hamilton Branch, Clyde River, alongside the Upper Clyde Road bridge at ClydeHamilton001. d. The support structures for the Upper Clyde Road bridge at ClydeHamilton001.

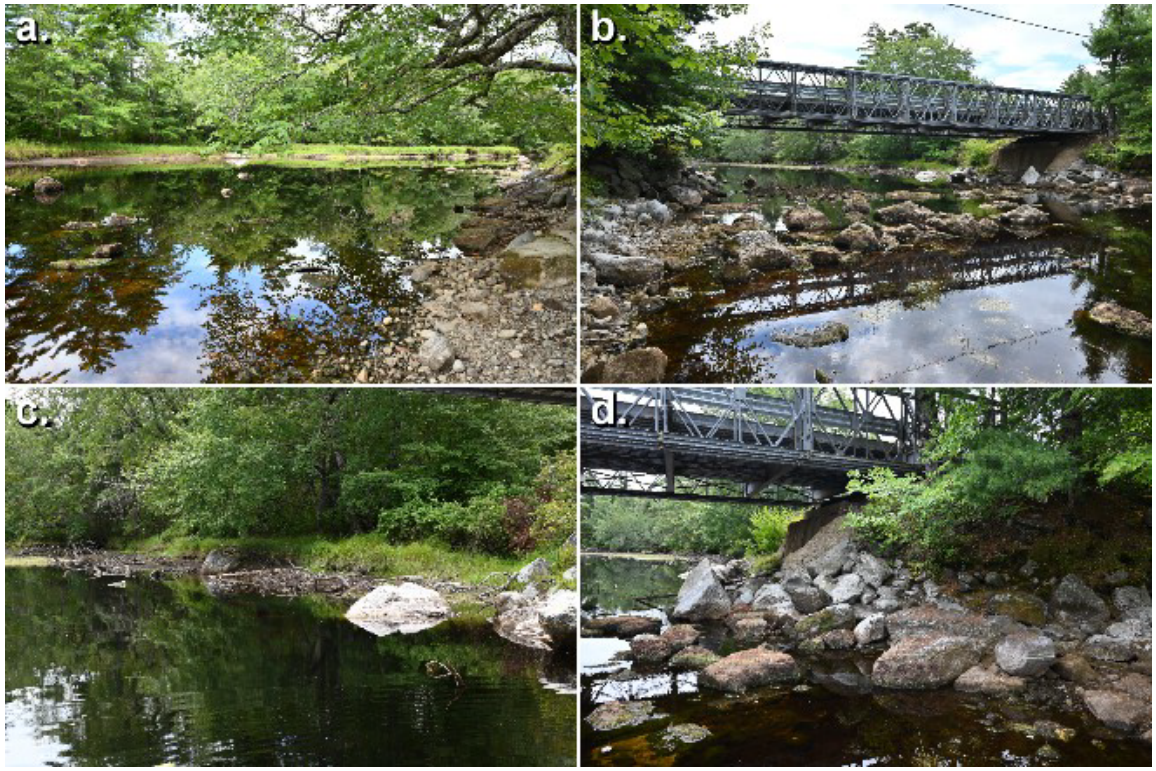


Figure S 107 - Photographs of sampling site Roseway001 on Roseway River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Roseway River from Roseway001. b. Downstream view of Roseway River and the Welshtown Road bridge at Roseway001. c. Debris along the banks of Roseway River at Roseway001, likely from seasonal flooding. d. The rocky banks of Roseway River underneath the Welshtown Road bridge at Roseway001.

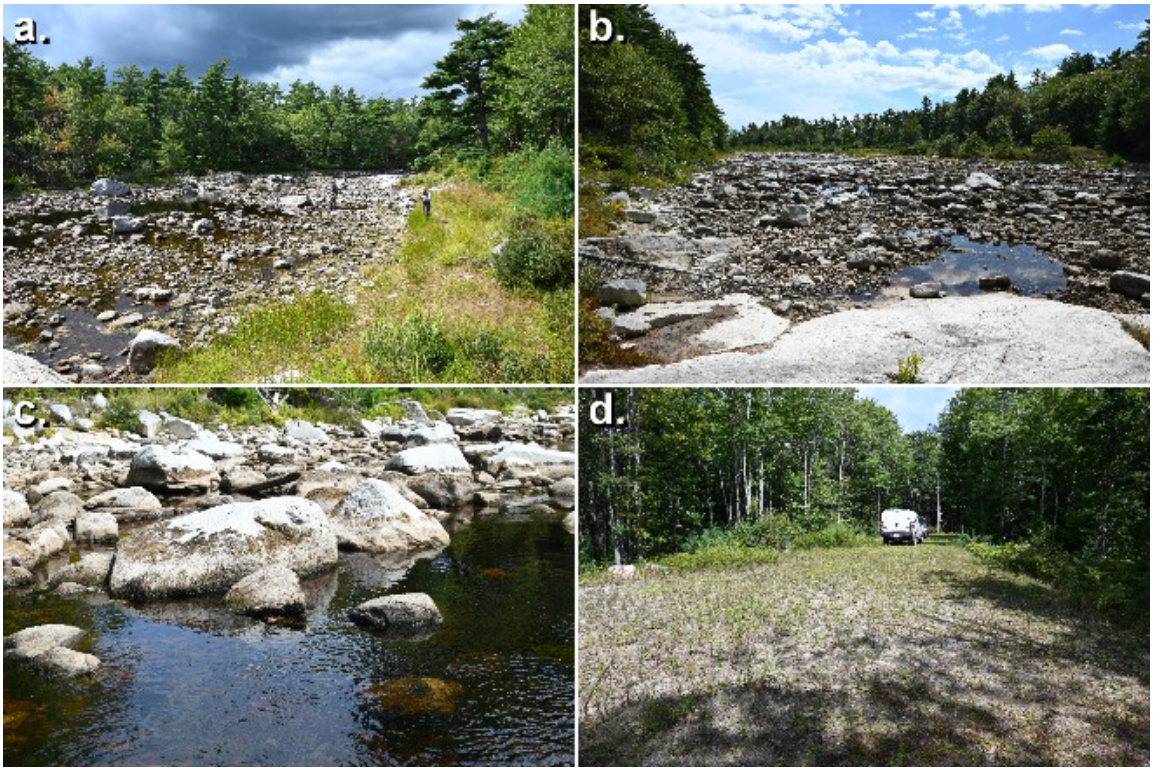


Figure S 108 - Photographs of sampling site Roseway003 on Roseway River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Roseway River from Roseway003. b. Downstream view of Roseway River from Roseway003. c. Water lines visible on rocks in Roseway River at Roseway003 indicating water levels that are likely present during periods with more average rainfall than summer 2025. d. The parking and staging area next to Roseway River at Roseway003.

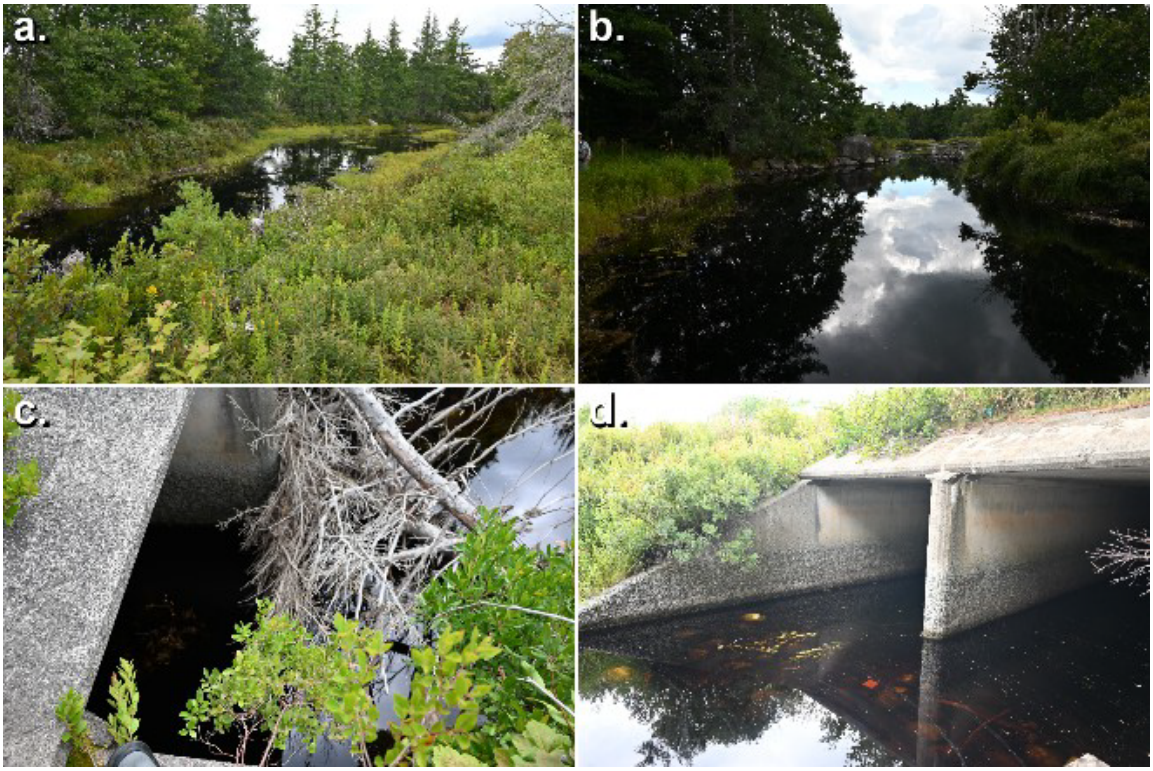


Figure S 109 - Photographs of sampling site BlacksNS001 on Blacks Brook, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Blacks Brook from BlacksNS001. b. Downstream view of Blacks Brook from BlacksNS001. c. Debris blocking the upstream side of the channels underneath the Nova Scotia Highway 103 bridge over Blacks Brook at BlacksNS001. d. The channels under the Nova Scotia Highway 103 bridge at BlacksNS001.



Figure S 110 - Photographs of sampling site Rodney001 on Rodney Brook, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Rodney Brook from Rodney001. b. Downstream view of Rodney Brook from Rodney001. c. Downstream view along Rodney Brook towards the Sandy Point Road bridge near Rodney001. d. Downstream view towards the mouth of Rodney Brook downstream of Rodney001 and the Sandy Point Road bridge.

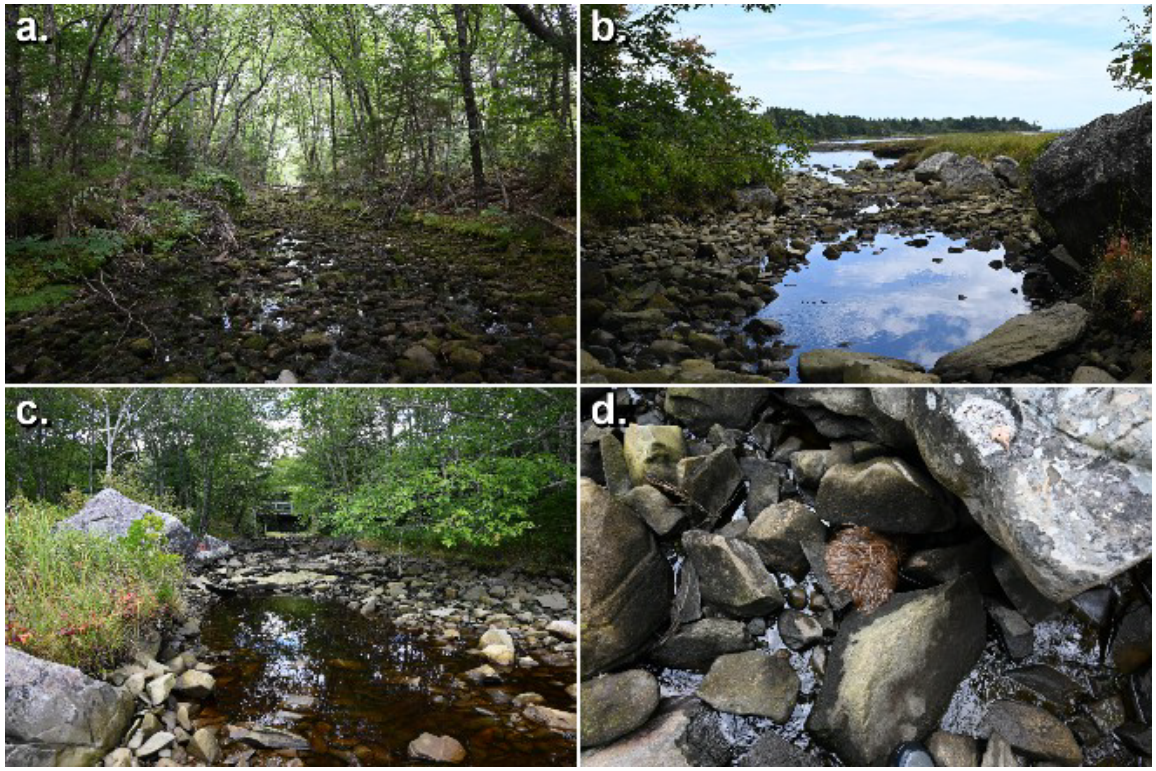


Figure S 111 - Photographs of sampling site Purney001 on Purney Brook, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Purney Brook from Purney001. b. Downstream view of Purney Brook from Purney001. c. Upstream view of Purney Brook towards the Jordan Branch Road bridge from downstream of Purney001. d. Eggs, likely from a squid, in Purney Brook at Purney001, indicating that the brook is influenced by tidal saltwater at Purney001.

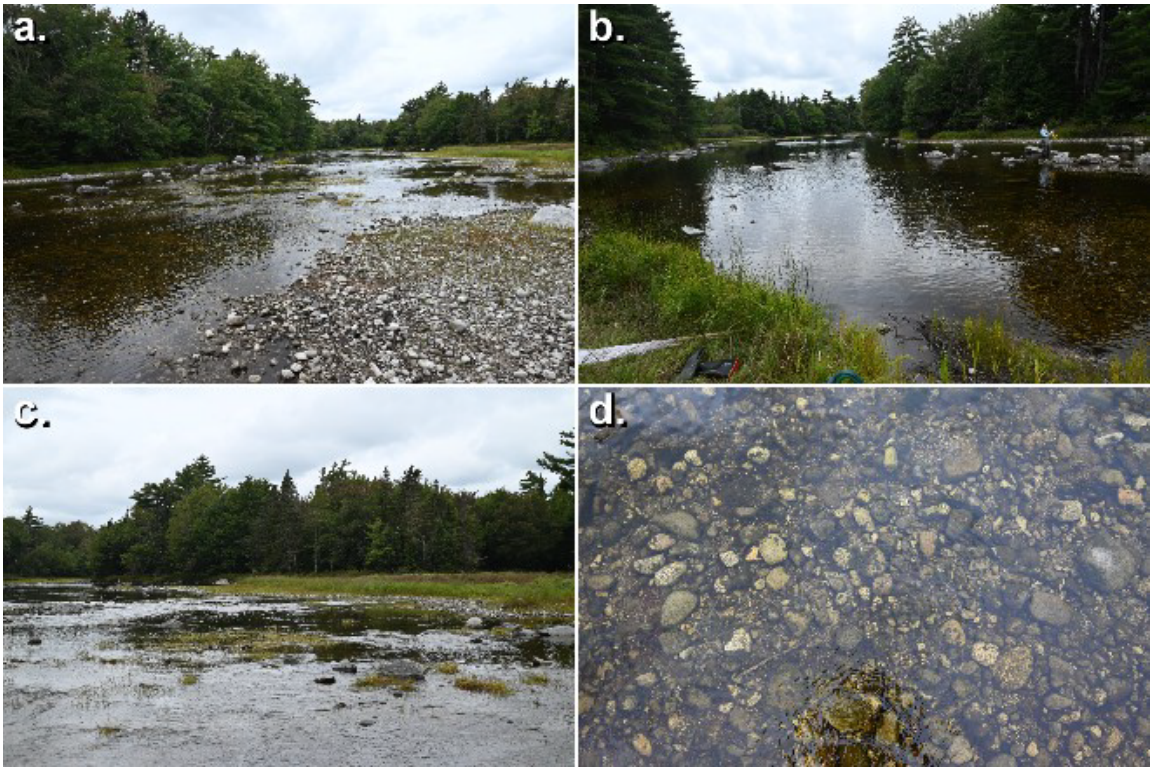


Figure S 112 - Photographs of sampling site Jordan100 on Jordan River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Jordan River from Jordan100. b. Downstream view of Jordan River from Jordan100. c. A marshy area along Jordan River near Jordan100. d. The substrate of Jordan River near Jordan100.

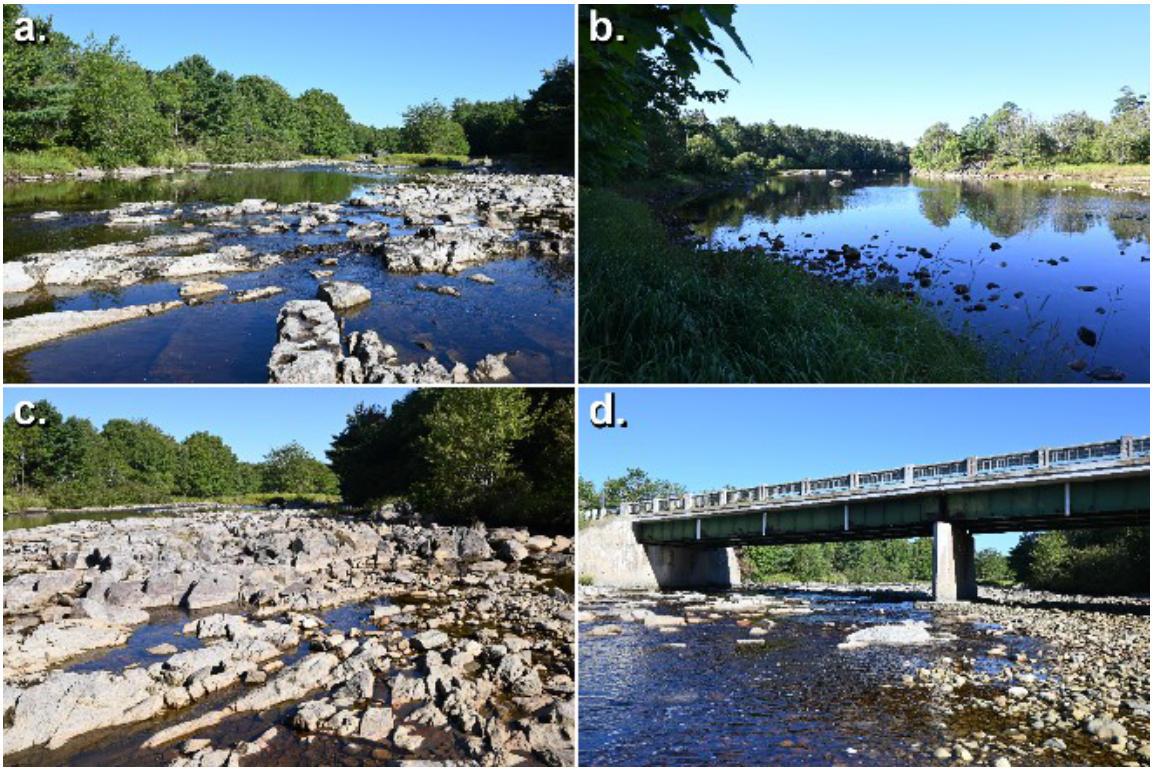


Figure S 113 - Photographs of sampling site JordanHwy103 on Jordan River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Jordan River from JordanHwy103. b. Downstream view of Jordan River from JordanHwy103. c. Bedrock substrate in Jordan River upstream of JordanHwy103. d. The Nova Scotia Highway 103 bridge over Jordan River at JordanHwy103.

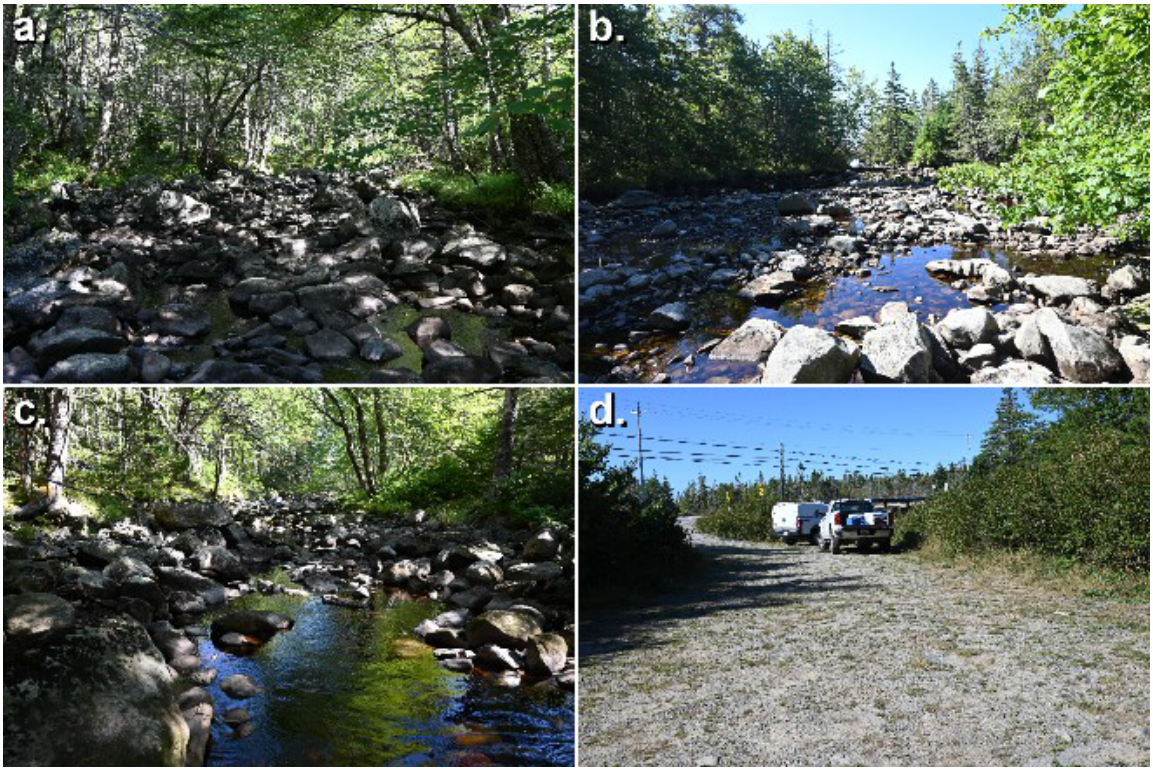


Figure S 114 - Photographs of sampling site East001 on East River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of East River from East001. b. Downstream view of East River from East001. c. Upstream view of East River from upstream of East001. d. Parking and staging space just off of Nova Scotia Route 3/Lighthouse Route along East River near East001.



Figure S 115 - Photographs of sampling site Sable003 on Sable River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Sable River from Sable003. b. Downstream view of Sable River from Sable003. c. Grasses growing along the banks and on small exposed islands in Sable River upstream of Sable003. d. The substrate of Sable River at Sable003.



Figure S 116 - Photographs of sampling site SableTidney001 on Tidney River, Sable River system, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Tidney River from downstream of the Nova Scotia Highway 103 bridge at SableTidney001. b. Downstream view of Tidney River from upstream of the Nova Scotia Highway 103 bridge at SableTidney001. c. Rocky banks along Tidney River near SableTidney001 downstream of the Nova Scotia Highway 103 bridge. d. Staff climbing over the riverbed of Tidney River downstream of the Nova Scotia Highway 103 bridge at SableTidney001.

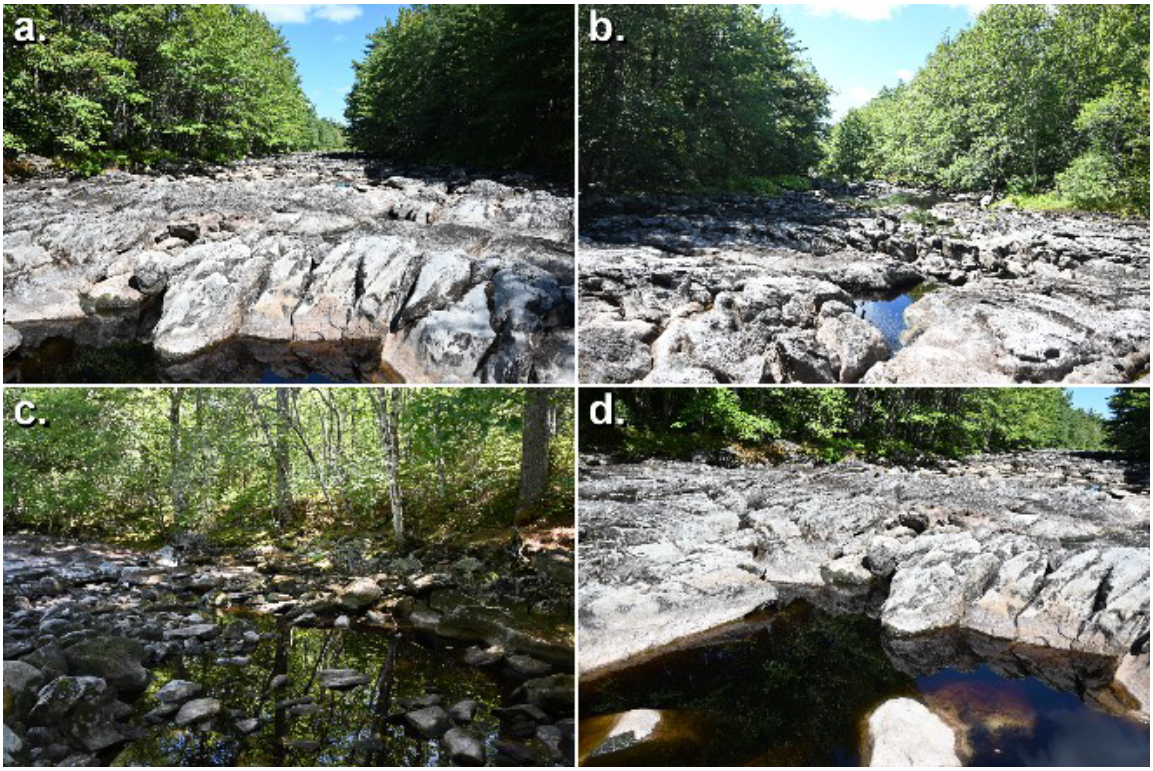


Figure S 117 - Photographs of sampling site SableTidney002 on Tidney River, Sable River system, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Tidney River from SableTidney002. b. Downstream view of Tidney River from SableTidney002. c. The river bank along Tidney River at SableTidney002. d. Exposed rocks with visible water lines in Tidney River at SableTidney002 indicating water levels that are likely present during periods with more average rainfall than summer 2025.



Figure S 118 - Google Maps screenshot of site Granite002, on Granite Village Brook, NS, in the Nova Scotia Southern Upland Designatable Unit.

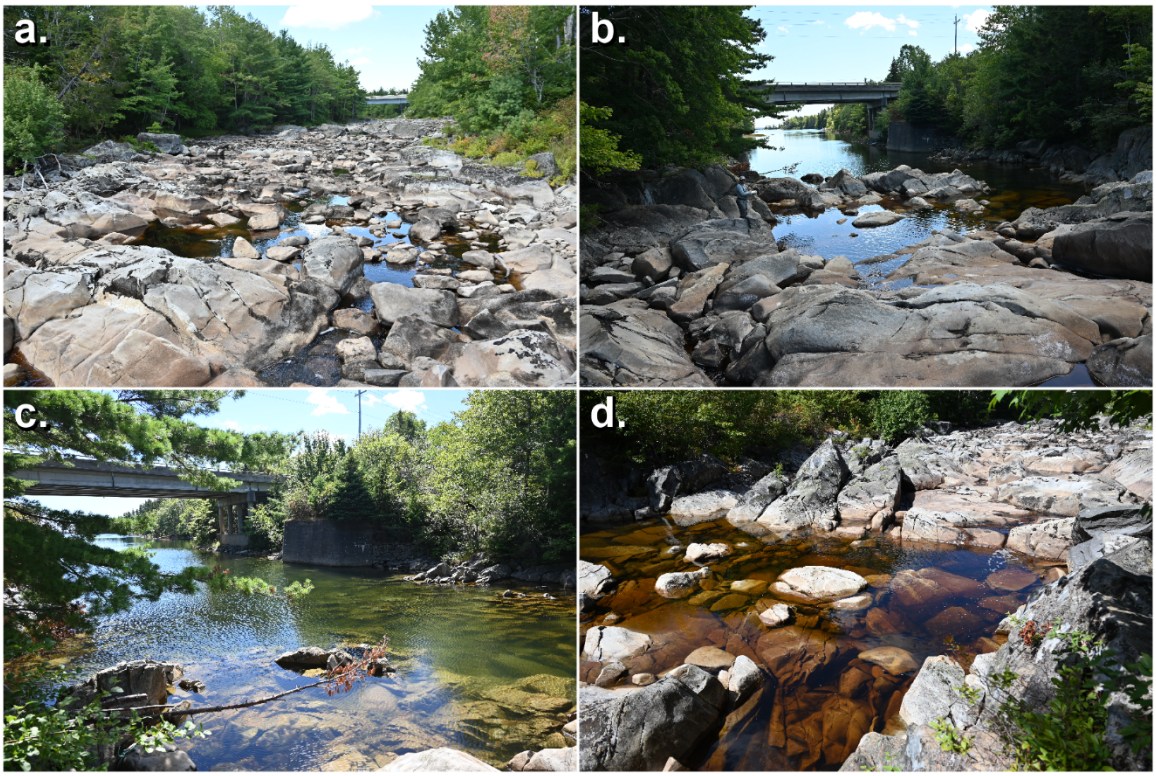


Figure S 119 - Photographs of sampling site BroadRiver001 on Broad River, NS, in the Nova Scotia Southern Upland Designatable Unit. a. Upstream view of Broad River from BroadRiver001. The Nova Scotia Highway 103 bridge can be seen in the background. b. Downstream view of Broad River from BroadRiver001. The Nova Scotia Route 3/Lighthouse Route bridge can be seen in the foreground and the Trestle Trail bridge can be seen in the far background. c. Downstream view towards the Nova Scotia Route 3/Lighthouse Route bridge from BroadRiver001 with old bridge supports visible in the foreground. d. The substrate of Broad River at BroadRiver001. Low water levels during the site visit are highlighted by visible water lines on the exposed rocks.