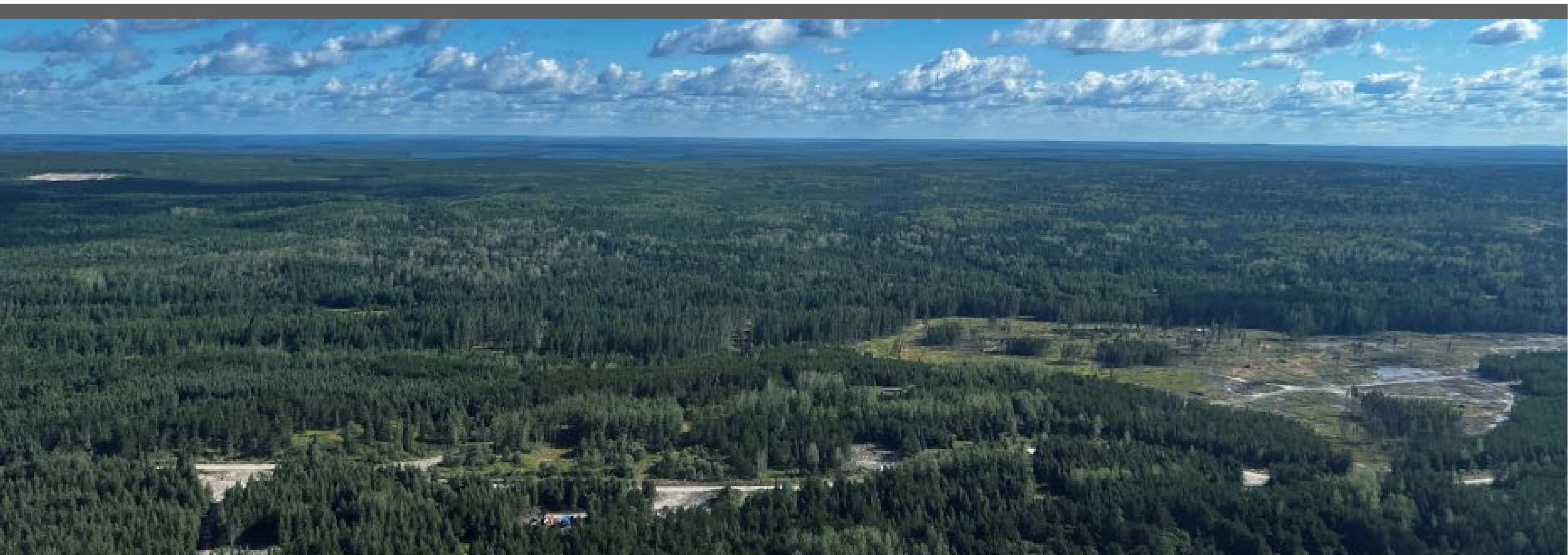
Great Bear Gold Project
Impact Statement

Appendix L-3:

Fish and Fish Habitat Supplemental Report – Dixie Creek



GREAT BEAR RESOURCES

GREAT BEAR PROJECT

FISH AND FISH HABITAT SUPPLEMENTAL REPORT - DIXIE CREEK

MARCH 2026

GREAT BEAR PROJECT

FISH AND FISH HABITAT SUPPLEMENTAL REPORT- DIXIE CREEK

GREAT BEAR RESOURCES

PROJECT NO.: OMEMA2303
MARCH 2026

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ABBREVIATIONS

BC EFN	British Columbia Environmental Flow Needs
BsM	Broad-scale Monitoring
DFO	Fisheries and Oceans Canada
eDNA	Environmental DNA
EFC	Ecological Flow Classification (Ontario)
EFF	Ecological Flow Framework (DFO)
HF	Hydrometric Flow Station
MAD	Mean Annual Discharge
MTO	Ontario Ministry of Transportation
qPCR	Quantitative Polymerase Chain Reaction
UTM	Universal Transverse Mercator
WSP	WSP Canada Inc.
YOY	Young-of-year

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1 INTRODUCTION

1.1 PROJECT BACKGROUND

Great Bear Resources Ltd. (Great Bear Resources), a wholly owned subsidiary of Kinross Gold Corporation, is proposing to develop a gold mine, the Great Bear Project (Project), approximately 25 kilometres (km) southeast of the Municipality of Red Lake (Figure 1-1) in northwestern Ontario. During preparation of the federal Impact Statement for the Project, technical support documents were voluntarily provided to Indigenous communities and federal regulators for their early review in advance of completion of the Impact Statement. Included with that information, was a Fisheries Resources Baseline document (WSP 2025a) and draft Fish Habitat Offset and Compensation Plan (WSP 2026a).

In follow up to those submissions, Fisheries and Oceans Canada (DFO) requested: additional information and analyses describing the habitat conditions of Dixie Creek; and a more detailed assessment of the potential for Project-related Dixie Creek flow changes to affect fish and fish habitat. Preliminary questions received from Lac Seul First Nation and Wabauskang First Nation requested additional information regarding potential flow reductions to Dixie Creek biota, as well as how potentially spawning Walleye could be monitored during the project. This report has been prepared by WSP Canada Inc. (WSP) to meet these requests.

This report provides supplemental fish and fish habitat data for Dixie Creek that has been collected or summarized since completion of the comprehensive Fisheries Resources Baseline Report (WSP 2025a) which summarized aquatic resources data collected between 2022 and 2024. Some data and observations previously reported have been brought forward into this document to provide context. Additional observations made in 2025 are presented in this report to provide additional clarity and insight into the fish community of Dixie Creek, and potential for its use by spawning Walleye and Lake whitefish.

Specifically, this supplemental document is intended to:

- Clarify the Dixie Creek fish community and report additional habitat data and eDNA sampling data not previously described
- Present fish habitat and spawning assessments not previously described
- Compare Dixie Creek hydrometric data and modeling with federal and provincial, environmental flow needs and classification guidelines
- Summarize potential effects to Dixie Creek fish and fish habitat based on a review of the supplemental data and analyses
- Specify proposed monitoring of Dixie Creek to confirm the predictions of the effects assessment presented in the Impact Statement.

1.2 PREVIOUS BASELINE REPORTING

Extensive environmental baseline data has been collected for all disciplines, and including for the local watercourses and waterbodies. The aquatic-related baseline data collected included: habitat conditions, water and sediment quality, invertebrate communities, fish communities and flow conditions between 2022 and 2025. The collected data has been compiled in comprehensive baseline reports as part of the Impact Statement and should be reviewed as the primary source of baseline data for the Project. This supplemental document is meant to complement the previous baseline documentation which include:

- Fisheries Resources Baseline Report (WSP 2025a), documents fish community sampling, fish habitat assessments, eDNA sampling, tissue contaminants, water and sediment quality sampling and lower trophic sampling

- Hydrogeology Baseline Report (WSP 2025b), discusses groundwater conditions, and includes surface water interactions in the Dixie Creek watershed
- Hydrology Baseline Report (WSP 2025c) includes local and regional climate and hydrologic conditions for the Project site and environs
- Water Quality Baseline Report (WSP 2025d) characterizes baseline water quality conditions of surface waters and groundwater in the local area.

The previous baseline documents and other technical support documents use station identifications that can differ between reports. For convenience, Table 1-1 below provides a quick reference between station identification for each baseline report, as well as the Receiver Water Balance Report (WSP 2025e), referenced later in this document.

Table 1-1: Station Identification Guide

Document	Approximate Equivalent Station Locations [1]			
Fisheries Resource Baseline Report (WSP 2025a)	DC-01	DC-02	DC-03	DC-04
Hydrology Baseline Report (WSP 2025b)	HF-07	HF-03	n/a	HF-01
Water Quality Baseline Report (WSP 2025d)	DC-US	SW-04	SW-08	SW-09 / SW-15
Receiver Water Balance (WSP 2025e)	DIX-1	DIX-2	DIX-3	DIX-4

Note:

1 Stations do not match exactly but refer to the closest matching station identification.

2 FISH COMMUNITY AND eDNA

2.1 CONVENTIONAL FISH COMMUNITY SAMPLING

Since spring 2022, fish community sampling has been undertaken in Dixie Creek and surrounding watercourses and waterbodies, with the most recent sampling taking place in late summer 2025. During that time, seven separate sampling events occurred during spring, summer and fall using conventional sampling equipment, intended to characterize the fish communities and collect baseline information on small- and large-bodied fish tissues. Four primary sampling locations were established in Dixie Creek for these efforts, co-located with hydrometric stations and designated as stations DC-01, DC-02, DC-03, and DC-04 (Table 1-1). These were station locations were selected to cover the spatial extent of Dixie Creek, from Dixie Lake outflow (DC-01) to the Chukuni River outlet (DC-04), targeting locations near the main Project site where potential impacts may occur (DC-02 and DC-03), harmonizing information collected with the hydrology baseline findings. The sampling events at these locations and primary objectives are listed below.

Locations and types of fish community sampling completed within the following years are documented in the Fisheries Resources Baseline Report (WSP 2025a; Table 2-1):

- Spring 2022: fish community sampling
- Summer 2022: fish community sampling
- Fall 2022: fish community sampling and large-bodied fish aging and contaminant assessment
- Spring 2023: fish community sampling
- Summer 2023: fish community sampling
- Fall 2023: fish community sampling and large-bodied fish aging and contaminant assessment.

In addition to the sampling reported in WSP (2025a), considerable additional small- and large-body fish sampling was completed in 2025 as part of ongoing studies.

The primary capture methods used in Dixie Creek has been gillnets for large-bodied fish and minnow traps for small-bodied fish. Dixie Creek conditions favoured these methods due to heavily vegetated, steep banks, frequent log and beaver dams and limited access that reduced the suitability of larger gear types (e.g., boat electrofishers), while the predominantly deep channel (> 1.5 metres; m) prevented seine netting and backpack electrofishing throughout most of the stream. Backpack electrofishing was conducted in adjacent tributaries to Dixie Creek where conditions were suitable.

A total of 232 fish were captured in Dixie Creek across 14 species, that included 187 large-bodied fish and 45 small-bodied fish (Table 2-1). These numbers reflect the combined catch from the previously reported baseline report (WSP 2025a) and the subsequent 2025 catches (Table 2-2). Most fish captured include Yellow Perch, Northern Pike, Walleye, White Sucker and Spottail Shiner comprising more than 86% of the total fish captured. Although not a precise metric due to species biases and efficiency of capture methods, it is a relative measure of species abundance as the methods used were consistent between stations and seasons.

Small-bodied fish numbers are low due to poor minnow trap success; however the adjacent tributaries to Dixie Creek were sampled concurrently confirming several other species were present in the watershed. These include: Central Mudminnow, Common Shiner, Fathead Minnow, Finescale Dace, Golden Shiner, Northern Pearl Dace, Northern Redbelly Dace and Slimy Sculpin. Total capture numbers for these tributaries were approximately 4,500 fish.

2.2 eDNA SAMPLING

Sampling for eDNA was undertaken in Dixie Creek during 2023 and again in 2025 to complement the conventional fisheries baseline data collection. The eDNA methods included metabarcoding analysis (identifies all species DNA present in the sample) and qPCR (quantitative polymerase chain reaction) analysis which is targeted to specific species. The qPCR method was used in the spring of 2025 in an attempt to identify active spawning of Walleye or presence of young-of-year (YOY) Lake Whitefish in locations identified as potential spawning sites shown in Figure 2-1A and Figure 2-1B.

Locations of eDNA sampling completed in 2023 are documented in the Fisheries Resources Baseline Report (WSP 2025a) and included spring, summer and fall sampling events at stations DC-01, DC-03 and DC-04. Additional eDNA sampling was completed in the spring 2025 after preparation of that report, in an effort to better understand potential spawning use of riffle habitats in Dixie Creek. Species-specific (Walleye and Lake Whitefish) qPCR sampling was completed at five target locations (potential spawning areas) and six non-target locations. Metabarcoding eDNA analysis was also completed at the conventional fish community sampling locations (DC-01, DC-02, DC-03 and DC-04) sampled in previous years.

The qPCR samples analysed for Walleye and Lake Whitefish DNA were collected at night or late evening to correspond with Walleye spawning timing during spring 2025. Sampling locations were selected based on potential Walleye and Lake Whitefish spawning habitat identified within Dixie Creek, and included both target (five locations) and non-target locations (six locations). Detailed eDNA sampling methods are presented in the Fisheries Resources Baseline Report (WSP 2025a).

Analysis of the 2023 metabarcoding samples identified DNA from 30 species of fish at the three Dixie Creek sampling locations (Table 2-3). Sculpin could only be identified to genus, but based on species distribution this sample location could be either Mottled Sculpin, Slimy sculpin or both. In 2023 DNA from species such as Lake Whitefish and Smallmouth Bass were only present at the DC-04 location closest to the Chukuni River, and Lake Whitefish were only detected during the fall. Overall, a much greater number of species detections were made at DC-04 (28), compared to DC-01 (17) and DC-03 (19), indicating species from the Chukuni River likely utilize the lower sections of Dixie Creek. Metabarcoding DNA results from Unnamed Waterbody 7 (locally known as Hiewall Creek) identified DNA from 24 species consistent with the species identified in Dixie Creek station DC-04, and likely also reflects use by species from the Chukuni River. As with the DC-04 location, Lake Whitefish were only detected at DC-07 in the fall.

The spring 2025 metabarcoding analysis only detected 15 species in the four Dixie Creek sampling locations (DC-01, DC-02, DC-03 and DC-04; Table 2-3). Lake Whitefish was detected at DC-03, the location that had the highest number of species detections (14). Contrary to 2023 sampling where DC-04 had the highest number of species detections during all seasons, in spring 2025 DC-04 it had the lowest detections. This may be due to several factors, including a much higher discharge and flow at the time diluting DNA material collection. Spring 2025 samples were collected in May, whereas in 2023 they were taken later in the season (during June) when flows are usually lower. Mostly large-bodied fish were detected in the 2025 samples. The small-bodied fish, which typically release smaller amounts of DNA and have smaller home ranges, had reduced detections.

The spring 2025 qPCR results had very few Walleye and Lake Whitefish detections (Table 2-4). Five species detections (two Walleye and three Lake Whitefish) were made, all at non-target locations. Due to an unseasonal heat wave during sampling (air temperatures of 35°C and rapidly increasing water temperatures), it is likely that Walleye were no longer actively spawning at the time of sampling, however egg would be expected to be present. White Sucker were observed actively spawning during this period and they are generally known to spawn after Walleye and use similar habitat.

Table 2-1: Total Species Fish Capture Numbers from Dixie Creek

Species	Total Captured (1)	Percent of Capture
Yellow Perch	63	27.2%
Northern Pike	59	25.4%
Walleye	32	13.8%
White Sucker	29	12.5%
Spottail Shiner	17	7.3%
Burbot	8	3.4%
Emerald Shiner	8	3.4%
Mooneye	6	2.6%
Rock Bass	3	1.3%
Shorthead Redhorse	3	1.3%
Brook Stickleback	1	0.4%
Iowa Darter	1	0.4%
Johnny Darter	1	0.4%
Lake Whitefish	1	0.4%
Total	**232**	**100%**

Note:

1 All programs to date; combined catch from baseline report (WSP 2025a) and the subsequent 2025 catches.

Table 2-2: Dixie Creek Fish Capture Numbers by Location.

Species	2022 and 2023 (1)				2025 (1)	
	DC-01	DC-02	DC-03	DC-04	Dixie Creek Lower (2)	Dixie Creek Upper (2)
Yellow Perch	18	3	4	11	-	27
Northern Pike	6	3	8	16	1	25
Walleye	-	-	-	1	1	30
White Sucker	-	1	-	1	-	27
Spottail Shiner	3	-	-	1	-	13
Burbot	-	7	1	-	-	-
Emerald Shiner	8	-	-	-	-	-
Mooneye	-	-	6	-	-	-
Rock Bass	-	-	2	1	-	-
Shorthead Redhorse	-	-	-	-	-	3
Brook Stickleback	-	-	1	-	-	-
Iowa Darter	-	-	1	-	-	-
Johnny Darter	-	-	1	-	-	-
Lake Whitefish	-	-	-	-	-	1
Total Captured	**35**	**14**	**24**	**31**	**2**	**126**

Notes:

1 - : not captured

2 Fish captured within Dixie Creek during 2025 sampling did not use the previous DC-01 to DC-04 locations as the creek was split into upper and lower reaches. Dixie Creek Lower sampling occurred upstream of the Chukuni River outlet to the Reach 2 potential spawning location (See Section 3.2). Dixie Creek Upper sampling occurred upstream of the DC-01 sampling location to Dixie Lake, and upstream of Dixie Lake to the upper Dixie Creek boat launch off Dixie Lake Road.

Table 2-3: Metabarcoding Results from 2023 and 2025 eDNA Sampling

Common Name	2023 (1,2,3)				2025 (1,2,3)			
	DC-01	DC-03	DC-04	WC-7	DC-01	DC-02	DC-03	DC-04
Large-bodied Fish:								
Burbot	X	X	X	X	-	-	-	-
Green Sunfish	-	-	X	-	-	-	-	-
Lake Whitefish	-	-	X	X	-	-	X	-
Mooneye	-	X	X	X	-	X	X	X
Northern Pike	X	X	X	X	X	X	X	X
Rock Bass	X	X	X	-	-	-	-	-
Sauger	X	X	-	-	-	-	-	-
Shorthead Redhorse	X	X	X	X	X	X	X	X
Silver Redhorse	X	-	X	X	-	-	-	-
Smallmouth Bass	-	-	X	X	-	-	-	-
Walleye	X	X	X	X	X	X	X	X
White Sucker	X	X	X	X	X	X	X	X
Yellow Perch	X	X	X	X	X	X	X	X
Small-bodied Fish:								
Blacknose / Longnose Dace	-	-	-	-	-	-	-	-
Blacknose Shiner	X	X	X	X	X	X	-	-
Central Mudminnow	X	X	X	X	-	X	-	X
Common Shiner	-	-	X	X	-	-	-	-
Creek Chub	-	-	X	-	-	-	-	-
Emerald Shiner	-		X	-	-	-	-	-
Fathead Minnow	X	-	X	X	-	-	X	-
Finescale Dace	-	X	X	X	-	-	-	-
Golden Shiner	-	X	X	X	-	-	-	-
Iowa Darter	X	X	X	X	-	-	-	-
Johnny Darter	X	X	X	X	X	X	X	-
Lake Chub	X	-	X	X	-	-	-	-
Mimic Shiner	-	X	X	X	-	-	-	-
Northern Pearl Dace	-	X	X	X	-	-	-	-
Northern Redbelly Dace	-	-	X	-	-	-	-	-
Sculpin	X	X		X	-	X	X	-
Spottail Shiner	X	X	X	X	X	X	X	X
Trout-Perch	-	-	X	X	X	X	X	X

Notes:

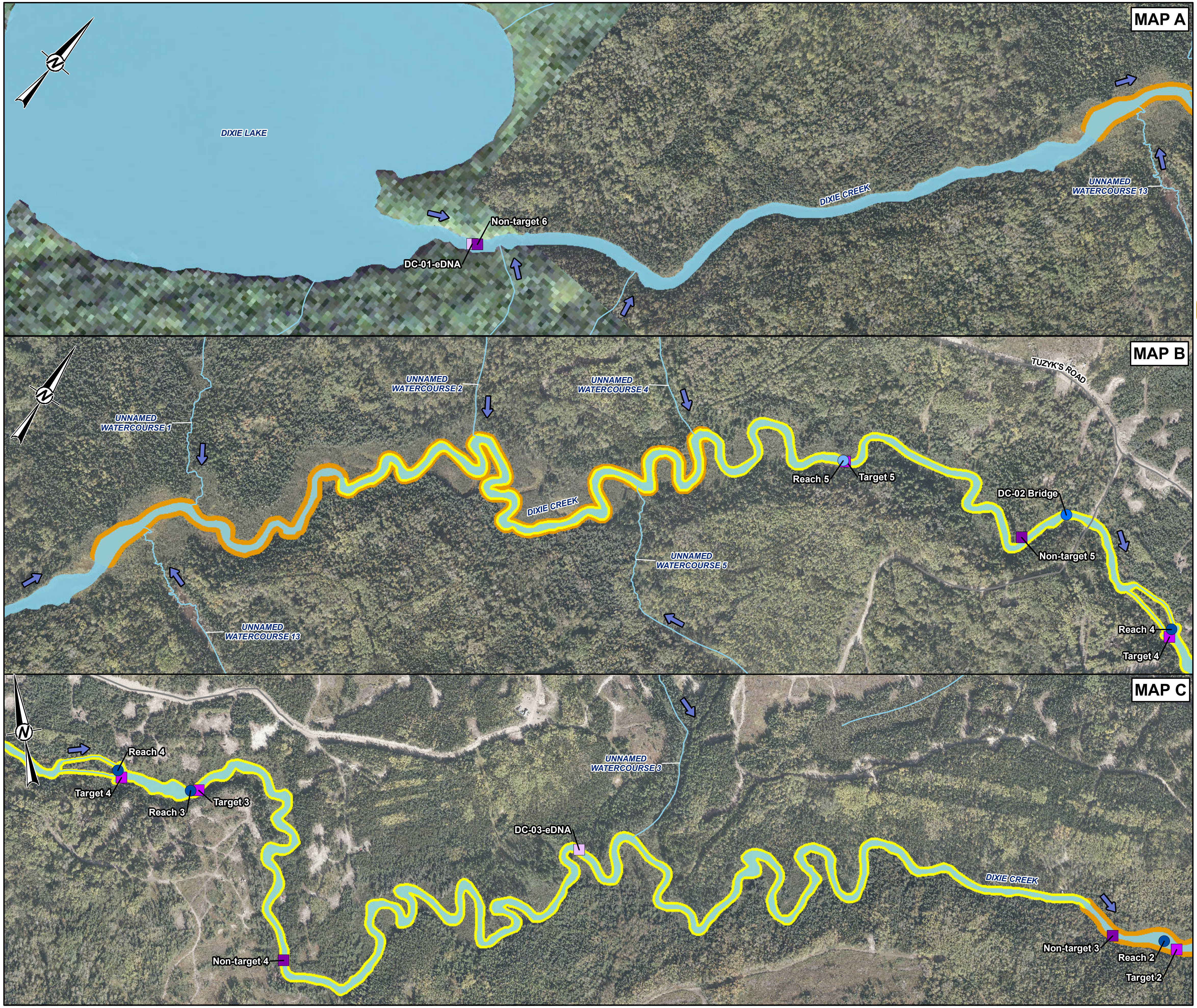
1 X : detected; - : non-detected.
2 Combined results from June, August and October.
3 Rows without a species designation are those only identified to the genus level and species was inferred by geographic location.

Table 2-4: Spring 2025 qPCR Results

Sample Location	Lake Whitefish [(1)]	Walleye [(1)]
Target 1	-	-
Target 2	-	-
Target 3	-	-
Target 4	-	-
Target 5	-	-
Non-target 1	-	-
Non-target 2	X	X
Non-target 3	-	-
Non-target 4	X	-
Non-target 5	X	X
Non-target 6	-	-

Note:

1 X : detected; - : not detected.



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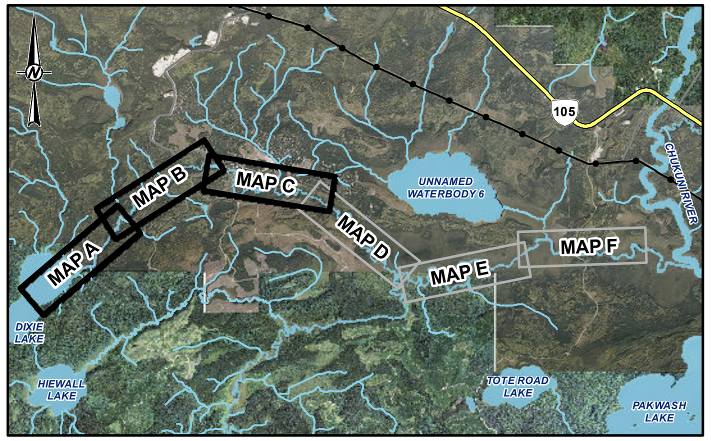

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LEGEND

- DRONE SURVEY (2023)
- DRONE SURVEY (2024)
- HIGHWAY
- LOCAL ROAD
- TRANSMISSION LINE
- WATERCOURSE
- WATERBODY
- FLOW DIRECTION

SUBSTRATUM SPAWNING POTENTIAL SAMPLING LOCATIONS

- LOW
- MODERATE
- HIGH

ENVIRONMENTAL DNA (eDNA) SAMPLING LOCATION

- 2024
- SPRING 2025 (TARGET)
- SPRING 2025 (NON-TARGET)

0 100 200 400

1:8,500 METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. AERIAL IMAGERY PROVIDED BY GREAT BEAR RESOURCES (SCENE DATE: SEPTEMBER 2022).
3. ROADS INFORMATION PROVIDED BY GREAT BEAR RESOURCES, AUGUST 2022.
4. COORDINATE SYSTEM: NAD 1983 UTM ZONE 15N

CLIENT
GREAT BEAR RESOURCES

PROJECT
GREAT BEAR PROJECT

TITLE
POTENTIAL FISH SPAWNING AND eDNA SAMPLING LOCATIONS

CONSULTANT

YYYY-MM-DD	2026-03-11
DESIGNED	----
PREPARED	MD
REVIEWED	JL
APPROVED	MR

PROJECT NO.	CONTROL	REV.	FIGURE
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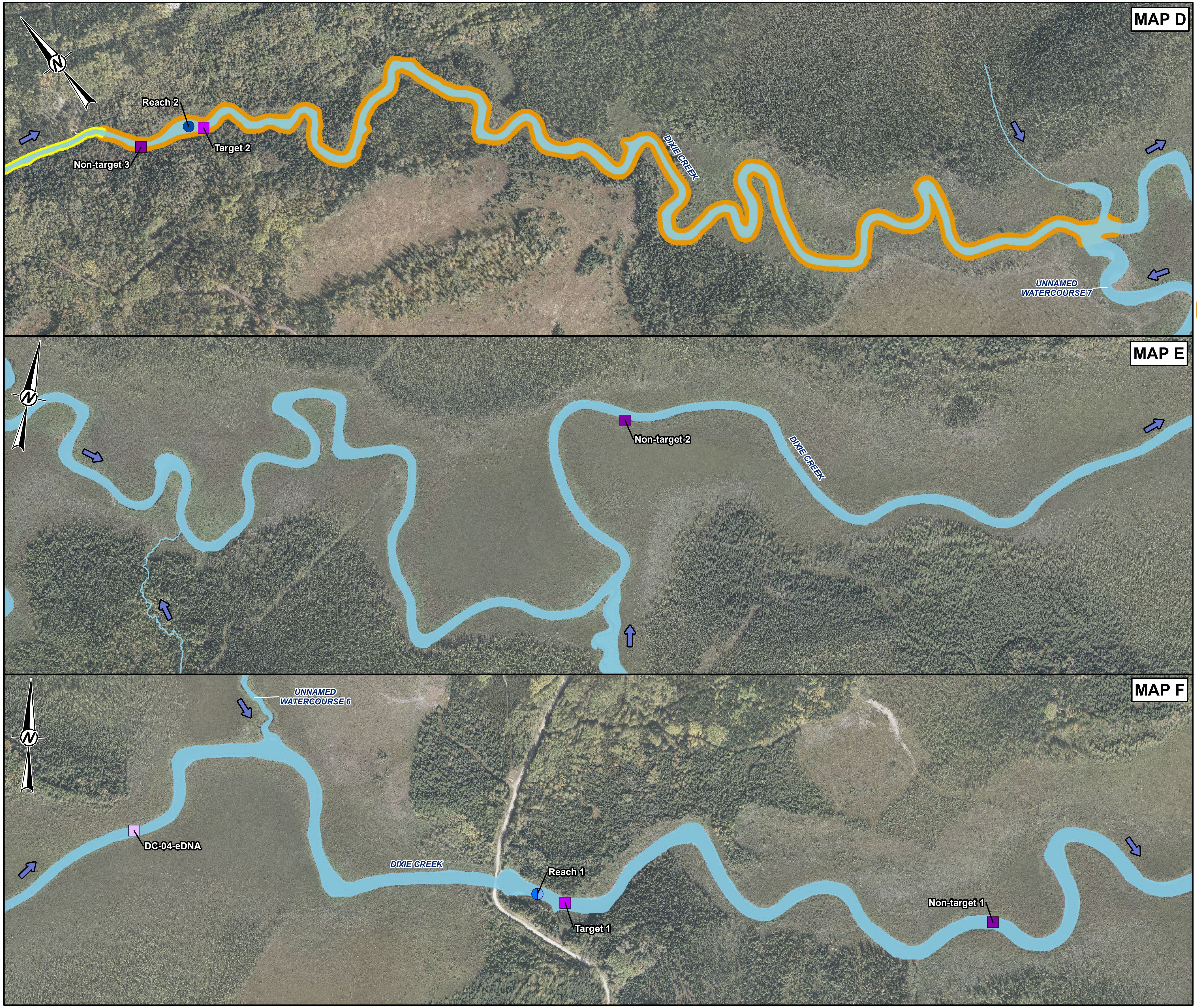
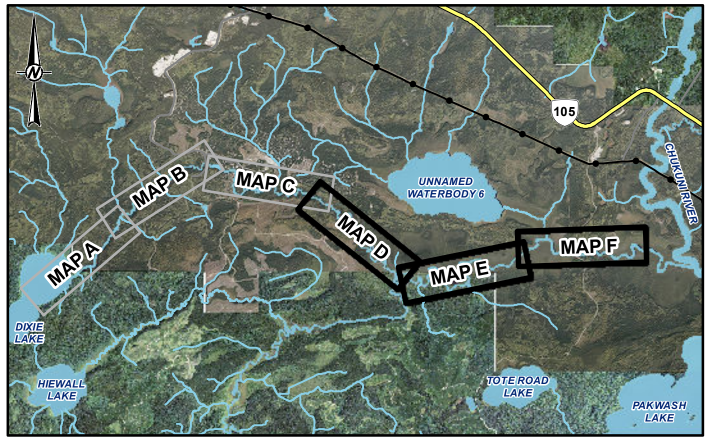


KEY MAP



SCALE 1:155,000

LEGEND

- DRONE SURVEY (2023)
- DRONE SURVEY (2024)
- HIGHWAY
- LOCAL ROAD
- TRANSMISSION LINE
- WATERCOURSE
- WATERBODY
- FLOW DIRECTION

SUBSTRATUM SPAWNING POTENTIAL SAMPLING LOCATIONS

- LOW
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- 2024
- SPRING 2025 (TARGET)
- SPRING 2025 (NON-TARGET)

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4. COORDINATE SYSTEM: NAD 1983 UTM ZONE 15N

CLIENT

GREAT BEAR RESOURCES

PROJECT

GREAT BEAR PROJECT

TITLE

POTENTIAL FISH SPAWNING AND eDNA SAMPLING LOCATIONS

CONSULTANT

wsp

YYYY-MM-DD	2026-03-11
DESIGNED	----
PREPARED	MD
REVIEWED	JL
APPROVED	MR

PROJECT NO.	CONTROL	REV.	FIGURE
CA0031271	0001	A	2-1B

3 FISH HABITAT ASSESSMENT

3.1 CHANNEL CONDITIONS AND MORPHOLOGY

Habitat assessments were conducted using a combination of Ontario Stream Assessment Procol (Ontario 2017) variables (where appropriate) and following the Ontario Ministry of Transportation Environmental Guide for Fisheries (MTO 2020) protocol. Habitat assessment variables included:

- Watercourse and waterbody type
- Permanence
- Stream order
- Description of the bank slope, stability
- Bankfull and wetted widths and depths, and cross section profiles
- In-situ water quality (i.e., temperature, dissolved oxygen, pH and conductivity)
- Substrate type and amount
- In-water vegetation and cover features type and amount
- Riparian vegetation communities
- Comments on sensitive features and / or potential contaminant point sources
- Photographs of the habitat present
- Additionally, sediment quality and benthic invertebrates were collected.

Four habitat stations (DC-01 to DC-04) co-located with established hydrometric model nodes in Dixie Creek have been sampled repeatedly since 2022 to provide long-term monitoring baseline data (Figure 3-1A and Figure 3-1B; Table 3-1 and Table 3-2). Detailed habitat assessments were completed at these locations along three transects and six sampling observation points per transect. The remaining reach segments of Dixie Creek were evaluated using high-level fish habitat assessments, as well as drone survey flight information from 2023 and 2024.

Dixie Creek, from the outlet of Dixie Lake to the Chukuni River, is characterized by a predominantly low-gradient, meandering watercourse set within a gradually widening floodplain. Higher sinuosity was observed between DC-02 through DC-04. Overall, the watercourse exhibits a low-gradient, flat slope with few exceptions. One such exception being a riffle habitat (extending approximately 200 m) downstream of Tuzyk's Road (downstream of hydrometric node HF-03) that results in approximately 3 m of elevation change (Figure 3-2). Fish habitat morphology in Dixie Creek is dominated by runs and long flats throughout the system with deep pools common along meander bends, comprising approximately 95% of the available habitat. Five riffle sections were identified between DC-02 and the Chukuni River, composed of gravel-boulder substrates and localized higher-velocity flows (see Section 3.2) in varying qualities.

Beginning near the Dixie Lake outlet, the channel in Dixie Creek at DC-01 consists of confined lotic riverine habitat with steep banks and a narrow floodplain. The wetted channel here is moderately deep and dominated by fine-grained sediments including silt, organics, and sand, with intermittent cobble and large woody debris (LWD) providing localized in-water cover. Riparian vegetation is composed of alder and willow along the margins, transitioning to upland black spruce and poplar, contributing consistent shading and bank stability. This reach provides suitable holding, rearing, and migration habitat for a variety of cool water species, although coarse spawning substrates are limited.

Downstream at DC-02, the Dixie Creek channel becomes temporarily constricted beneath a bridge crossing, resulting in increased water velocities and a narrower wetted width through the structure. Downstream of this constriction, the channel resumes a meandering pattern through a moderately wide floodplain composed primarily of clay over organic muck. Bankfull width expands slightly, while wetted depths remain moderate with occasional deeper runs and glides. Riparian vegetation is dense, consisting of mixed coniferous and deciduous species with extensive tag alder growth, creating significant overhanging cover. Substrates continue to be dominated by fine materials, although boulders and LWD become more common along margins. Broadleaf Arrowhead and other emergent macrophytes appear regularly in slack water zones. The reach between DC-02 and DC-03 contains one of two areas identified in 2024 as potentially supporting Walleye and Lake Whitefish spawning, extending approximately 500 m downstream from the DC-02 bridge.

Habitat conditions at DC-03 closely resemble those at DC-02, with moderate flow velocities, soft sediment dominated substrates, and dense alder-lined shorelines contributing to an abundance of overhead cover. The channel form consists primarily of long flats, runs, and occasional deeper pools, with the floodplain continuing to widen. Emergent vegetation and large woody debris create additional structural complexity suitable for rearing and foraging fish.

Approaching DC-04, Dixie Creek transitions into a wider, more open riverine reach with a larger bankfull width and moderate depths greater than 2 m. The adjacent floodplain is extensive, supporting alder thickets, sedges and grasses. Substrates remain dominated by soft fine-grained materials with occasional cobble and boulder, while emergent vegetation persists along the margins. This reach represents a seasonal backwater influence from the Chukuni River, with water levels at times reversing flow direction or inundating adjacent low-lying wetlands including Unnamed Waterbody 6 and Unnamed Watercourse 7. This hydrologic connectivity creates potential overwintering, refuge and feeding habitat for multiple fish species. A second potential spawning area for Lake Whitefish and Walleye was identified several kilometres upstream of DC-04, and although spawning was not observed, White Sucker and eggs were observed in the spring of 2025.

Beaver activity is widespread in Dixie Creek, particularly in the upper and middle reaches, influencing water levels, sediment deposition, and the development of ponded habitats that offer valuable nursery and refuge conditions but may impede upstream migration under certain flow conditions. Collectively, the Dixie Creek system provides a moderate quality cool water fish habitat supporting migration, seasonal feeding, rearing, and overwintering functions, with coarse substrate spawning opportunities present but limited in both extent and quality relative to the overall dominance of fine sediment channel conditions. Photos of the representative habitats and features described above are provided in Appendix A.

3.2 VISUAL SPAWNING HABITAT ASSESSMENT

Visual spawning habitat assessments were completed along Dixie Creek to identify and classify areas with a focus on evaluating habitat suitable for substratum-spawning species, including Walleye, Lake Whitefish, and White Sucker, as well as vegetation-associated spawners such as Northern Pike.

The length of Dixie Creek, from the Dixie Lake outlet to the Chukuni River confluence, was traversed during baseline studies between 2022 to 2025, and observations on habitat units (riffle, run and pool), substrate composition, channel morphology, flow characteristics, and the presence of potential migration barriers (e.g., beaver dams and large woody debris accumulations) were noted. Coarse substrate locations (gravel-cobble-boulder) and higher-velocity areas were mapped and flagged as potential spawning locations or targets (Figure 2-1A and Figure 2-1B)) and eDNA sampling at these locations was completed in spring 2025. These sites were revisited during the spring spawning window (late April to June). These observations were integrated with prior baseline habitat assessments, hydrology information, and known species-specific spawning requirements. A summary of habitat conditions observed at the identified potential spawning locations is provided in Table 3-3.

Dixie Creek is dominated by low gradient and fine substrate habitats. Coarse gravel-cobble-boulder substrates represent less than 5% of the total habitat. Suitable spawning areas were therefore spatially limited and occurred primarily in discrete riffle and run units between DC02 and the Chukuni River, as well as at the DC02 bridge crossing itself. Vegetation associated spawning habitat for Northern Pike was minimal, and largely restricted to areas near the Dixie Lake outlet and downstream backwater zones influenced by the Chukuni River.

Four of the six targeted sites displayed high or moderate-high suitability for substratum spawning species due to favourable substrate composition, flow characteristics, and adjacency to deeper holding water. Visual observations from the spring 2025 survey, which likely occurred after Walleye spawning, included:

- Eggs were observed at one site (Reach 2) but no fish were observed
- White Sucker active spawning behaviour was documented at three sites (Reach 2, Reach 3, DC-02 Bridge).

The presence of eggs and repeated observations of White Sucker spawning demonstrate that where suitable habitat exists, Dixie Creek is actively used for spring substratum spawning. As a result of the rapidly changing water temperatures, it is likely that any Walleye spawning was already finished during the 2025 survey period. Due to the dominance of fine sediment and low-velocity conditions system-wide, such habitats are limited and the DC-02 to DC-03 reaches remain the most consistently suitable reach, aligning with previous baseline assessments.

Fall spawning habitat for Lake Whitefish could not be fully evaluated through visual surveys in 2024. The thermal regime within Dixie Creek during late fall (2 to 6°C) is appropriate for Lake Whitefish spawning, but substrate quality and hydraulic conditions suggest that use may be limited to a few locations.

It should be noted that suitable spawning habitats are found throughout Chukuni River, Pakwash Lake and Dixie Lake for all of these species, including in higher qualities and quantities than those provided in Dixie Creek.

3.3 THERMAL CONDITIONS

Thermal conditions within Dixie Creek were evaluated using continuous temperature datasets obtained from the hydrometric stations along Dixie Creek, including HF-07 (Dixie Lake outlet, in close proximity to DC-01), HF-03 (mid-reach, in close proximity to DC-02), and HF-01 (downstream reach, in close proximity to DC-04). The water temperature for all three stations is plotted with air temperature for the period of record (2022 to 2025) in Figure 3-3. Maximum and average recorded temperature is summarized in Table 3-4.

Across all stations, Dixie Creek exhibits average temperatures consistent with a cool water thermal regime suitable for the thermal preferences of Walleye and Lake Whitefish; however, maximum summer temperature reaches and exceeds the thermal tolerance of Lake Whitefish for periods of each year. This suggests that although Walleye are capable of residing in the creek year-round, Lake Whitefish would need to leave the creek during portions of the year. This is consistent with the conventional fish sampling and eDNA results, where Walleye have been captured in all seasons in Dixie Creek, while Lake Whitefish have only been detected in the spring and fall.

Table 3-1: Dixie Creek Channel Measurements 2022 and 2023

Watercourse ID	Year	Season	Watercourse Width and Depth (m)			
			Bankfull width	Bankfull depth (max)	Wetted width	Wetted depth (max)
DC-01	2022	Spring	26	2.6	24.5	2.3
DC-02	2022	Fall	16.35	2.5	16.35	2.1
DC-04	2022	Fall	20	2.7	18.6	2.5
DC-02	2022	Summer	14.6	2.02	10.6	1.6
DC-03	2022	Summer	10.5	1.67	7.4	1.34
DC-01	2022	Fall	25.2	1.6	23.9	1.3
DC-02	2022	Fall	11.35	2.14	10.62	1.78
DC-03	2022	Fall	11.28	1.55	8.99	0.8
DC-04	2022	Fall	20	2.7	18.6	2.5
DC-02	2023	Fall	12	-	8.8	>1.0
DC-02	2023	Fall	12.2	-	8.6	>1.0

Table 3-2: Dixie Creek Habitat Morphology and Characteristics, 2023

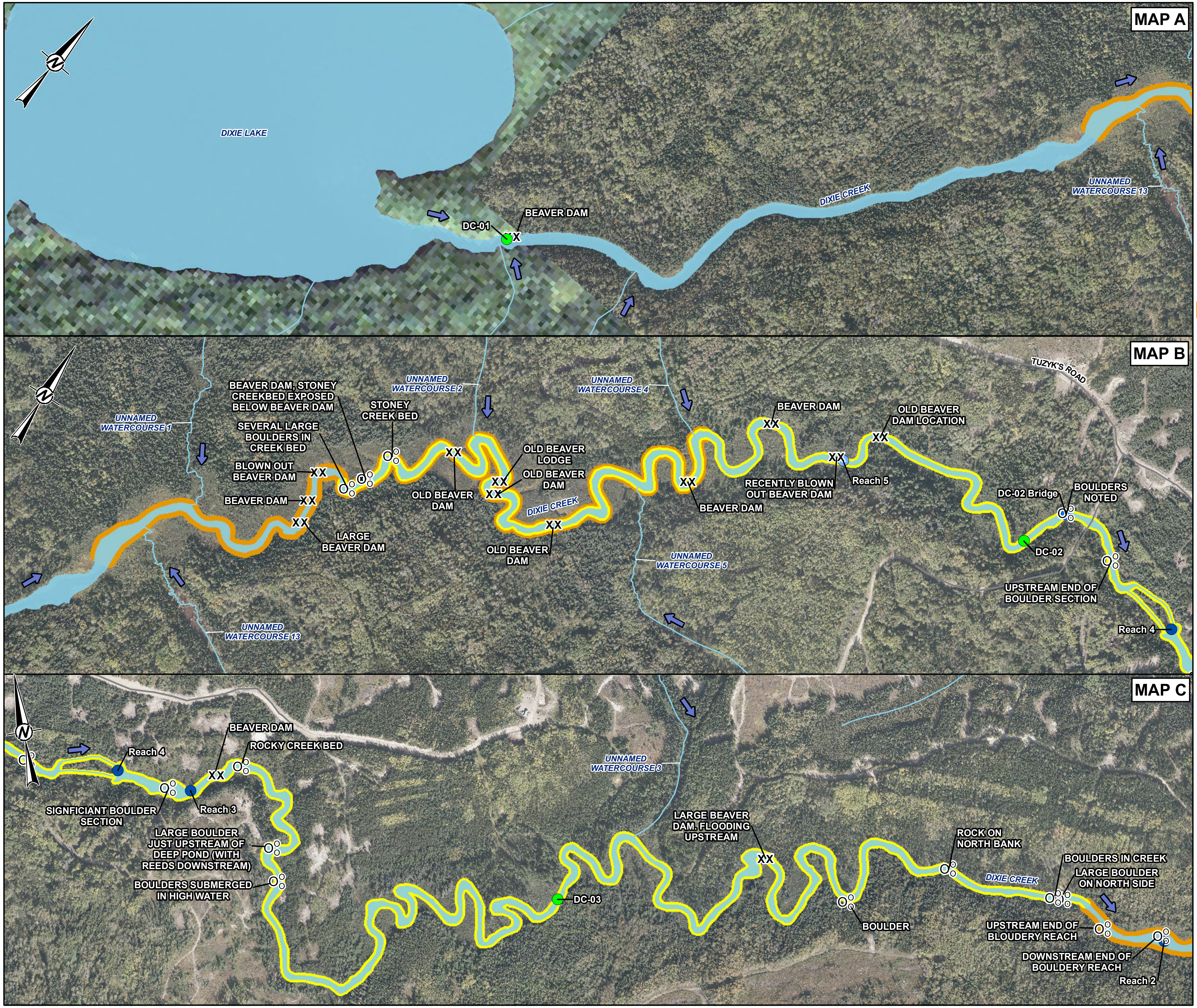
ID	Year	Channel Morphology (Type / %)	Instream Cover (%)	Cover Types (%)						Substrate (Type / %)	Max Substrate in Transect (%)
				Flat Rock	Round Rock	Wood	Vegetation	Bank	Other		
DC-01	2023	Pool /100	60	0	0	-	-	-	-	Fines / 100	<2 mm
DC-02	2023	Pool /100	65	0	0	70	27	3	0	Fines / 100	<2 mm
DC-04	2023	Pool /100	65	0	0	11	75	14	0	Fines / 100	<2 mm
DC-02	2023	Pool /100	65	0	0	70	27	3	0	Fines / 100	<2 mm
DC-01	2023	Pool /100	60	0	0	-	-	-	-	Fines / 100	<2 mm
DC-02	2023	Pool /100	65	0	0	70	27	3	0	Fines / 100	<2 mm
DC-03	2023	Pool /100	70	0	0	65	35	0	0	Fines / 100	<2 mm
DC-04	2023	Pool /100	65	0	0	11	75	14	0	Fines / 100	<2 mm

Table 3-3: Dixie Creek Habitat Characteristics of Potential Spawning Locations, 2024 and 2025

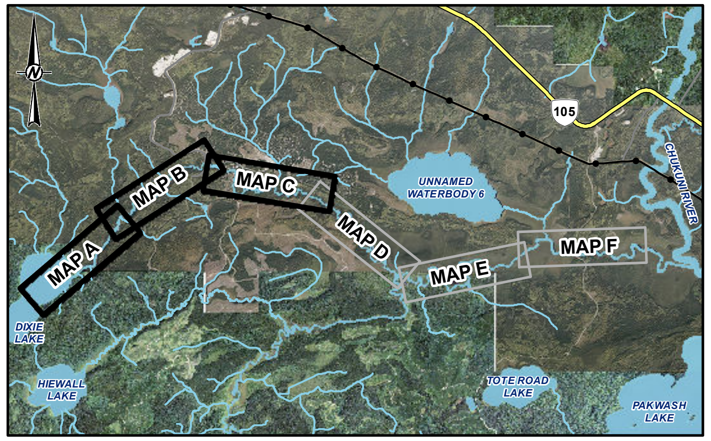
	Potential Spawning Location					
	Reach 1	**Reach 2**	**Reach 3**	**Reach 4**	**DC-02 Bridge**	**Reach 5**
Easting	463616	458527	456464	456313	455982	455502
Northing	5632091	5633085	5633770	5633841	5633930	5633767
Bankfull width (m)	50	20	22	15	13.3	6
Bankfull depth (m)	8	2.5	1.5	1.5	2.2	2.5
Wetted width (m)	48	15	10	10	11.1	4
Wetted depth (m)	6	1.5	0.8	0.8	1.8	1.5
Habitat morphology (Type)	Run / Pool / Riffle	Riffle / Pool	Riffle / Pool	Riffle	Run / Pool / Riffle	Run
Instream cover (Type, %)	85% depth, instream vegetation, substrate, woody debris and bank condition	25% depth, woody debris, substrate, bank condition, instream vegetation	15% depth, woody debris, instream vegetation, substrate, bank condition	15% depth, woody debris, instream vegetation, substrate, bank condition	65% depth, woody debris, instream vegetation, bank condition	15% depth, woody debris, bank condition
Substrate (Type, %)	5% boulder, 10% cobble, 10% gravel, 50% sand, 25% fines	10% boulder, 20% cobble, 40% gravel, 20% sand, 10% fines	10% boulder, 20% cobble, 40% gravel, 20% sand, 10% fines	10% boulder, 20% cobble, 40% gravel, 20% sand, 10% fines	5% boulder, 10% cobble, 10% gravel, 50% sand, 25% fines	Fines
Spawning potential	Low - moderate	High	High	High	Moderate - high	Low
Notes:	Larger cobble / boulder substrate at bridge crossing at tailout into pool.	White sucker spawning behaviour observed, eggs observed.	White sucker spawning behaviour observed	Short distance upstream of Reach #3, continuous with occasional larger pool.	Larger cobble / boulder substrate at bridge crossing at tailout into pool. Habitat observations taken downstream of bridge and pool. WHSC spawning behaviour observed.	Low spawning potential, long run with no observed riffles, pools, or larger substrate. Some sand observed but primarily fines.

Table 3-4: Summary of Maximum and Average Temperature in Dixie Creek, 2022 to 2025

Parameter	DC-01 (Hydrology Station HF-07)	DC-02 (Hydrology Station HF-03)	DC-04 (Hydrology Station HF-01)
Spring (Apr 1 – Jun 30) (°C)	Max 25.8 Average 13.5	Max 24.2 Average 12.9	Max 26.7 Average 13.1
Summer (Jul 1 – Sep 22 (°C)	Max 26.8 Average 20.6	Max 26.0 Average 18.9	Max 25.5 Average 18.7
Fall (Sep 23 – Dec 22) (°C)	Max 17.1 Average 5.3	Max 16.6 Average 4.2	Max 15.9 Average 4.3
Winter (Dec 23 – Mar 31) (°C)	Max 3.2 Average 1.4	Max 1.9 Average 0.1	Max 0.2 Average 0.1
Dissolved Oxygen (mg/L)	Range 4.3 – 12.4	Range 4.3 – 14.5	Range 6.6 – 13.6



KEY MAP



SCALE 1:155,000

LEGEND

- DRONE SURVEY (2023)
- DRONE SURVEY (2024)
- AQUATIC BASELINE SAMPLE LOCATION
- SUBSTRATE (LABELLED WITH DESCRIPTION)
- XX BEAVER DAM (LABELLED WITH DESCRIPTION)
- HIGHWAY
- LOCAL ROAD
- TRANSMISSION LINE
- WATERCOURSE
- WATERBODY
- FLOW DIRECTION

SUBSTRATUM SPAWNING POTENTIAL SAMPLING LOCATIONS

- LOW
- MODERATE
- HIGH

0 100 200 400
1:8,500 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. AERIAL IMAGERY PROVIDED BY GREAT BEAR RESOURCES (SCENE DATE: SEPTEMBER 2022).
3. ROADS INFORMATION PROVIDED BY GREAT BEAR RESOURCES, AUGUST 2022.
4. COORDINATE SYSTEM: NAD 1983 UTM ZONE 15N

CLIENT
GREAT BEAR RESOURCES

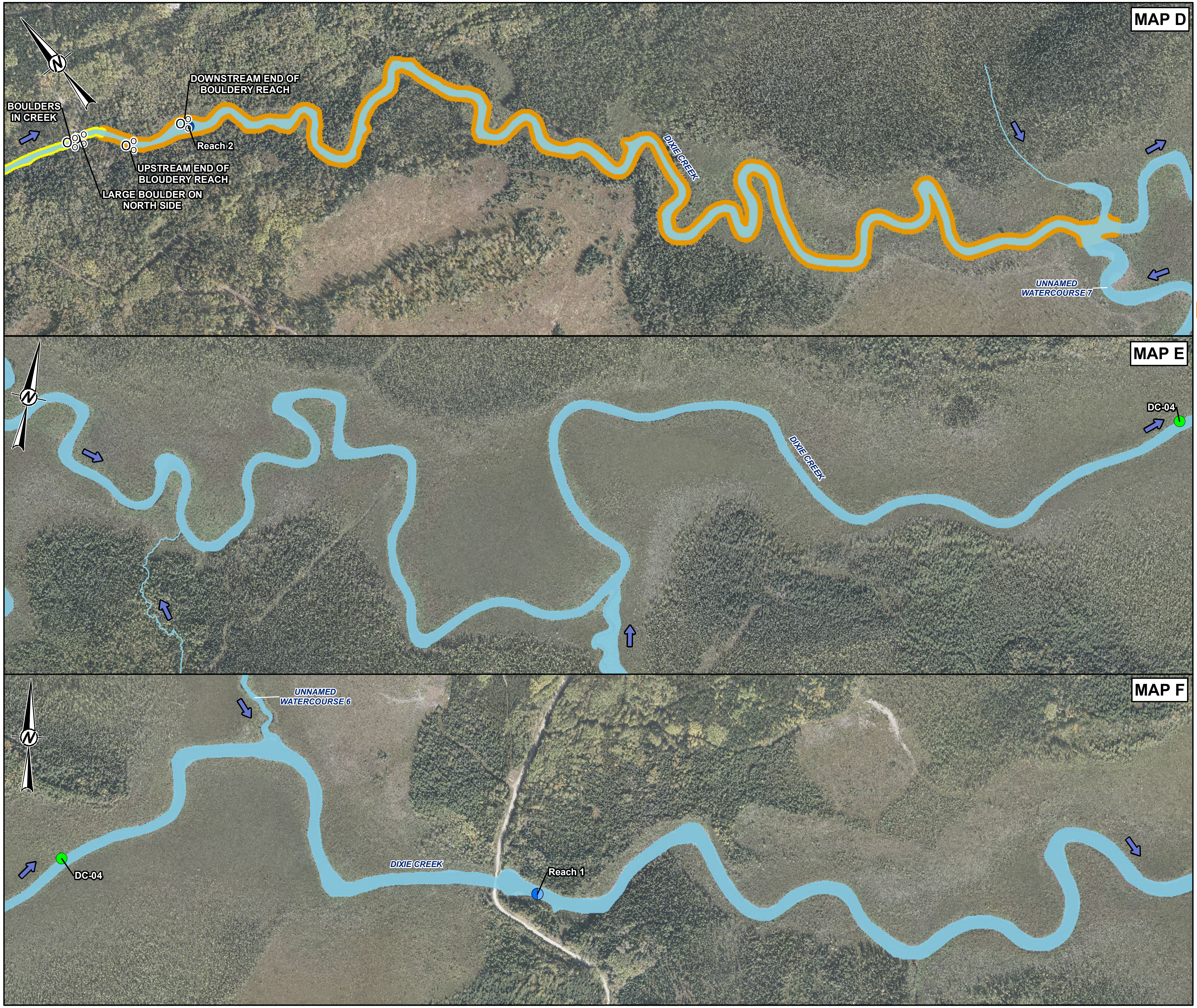
PROJECT
GREAT BEAR PROJECT

TITLE
FISH HABITAT ASSESSMENT RESULTS

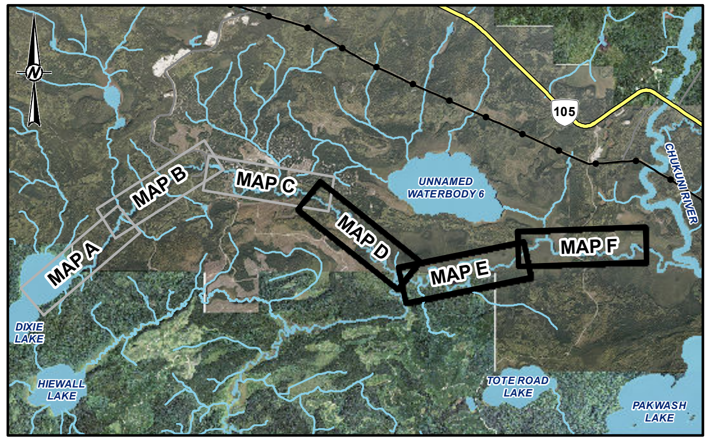
CONSULTANT

YYYY-MM-DD	2026-03-11
DESIGNED	----
PREPARED	MD
REVIEWED	JL
APPROVED	MR

PROJECT NO.	CONTROL	REV.	FIGURE
CA0031271	0001	A	3-1A



KEY MAP



SCALE 1:155,000

LEGEND

- DRONE SURVEY (2023)
- DRONE SURVEY (2024)
- AQUATIC BASELINE SAMPLE LOCATION
- SUBSTRATE (LABELLED WITH DESCRIPTION)
- XX BEAVER DAM (LABELLED WITH DESCRIPTION)
- HIGHWAY
- LOCAL ROAD
- TRANSMISSION LINE
- WATERCOURSE
- WATERBODY
- FLOW DIRECTION

SUBSTRATUM SPAWNING POTENTIAL SAMPLING LOCATIONS

- LOW
- MODERATE
- HIGH

0 100 200 400
1:8,500 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

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CONSULTANT

YYYY-MM-DD	2026-03-11
DESIGNED	----
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REVIEWED	JL
APPROVED	MR

PROJECT NO.	CONTROL	REV.	FIGURE
CA0031271	0001	A	3-1B

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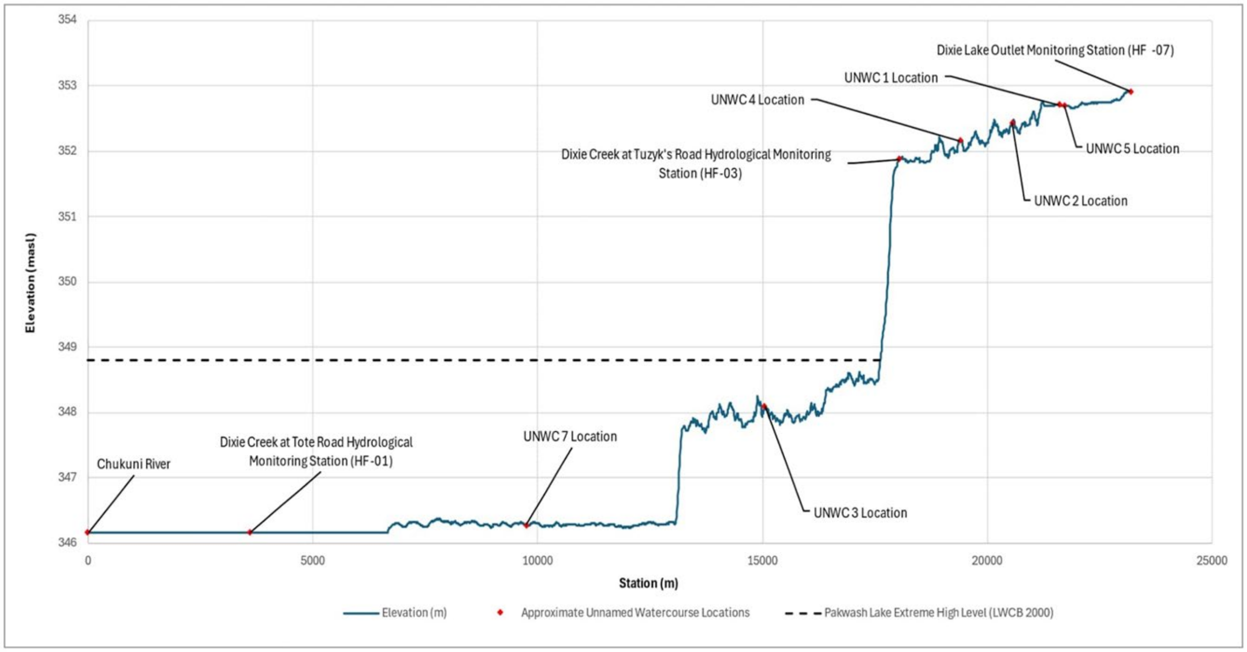
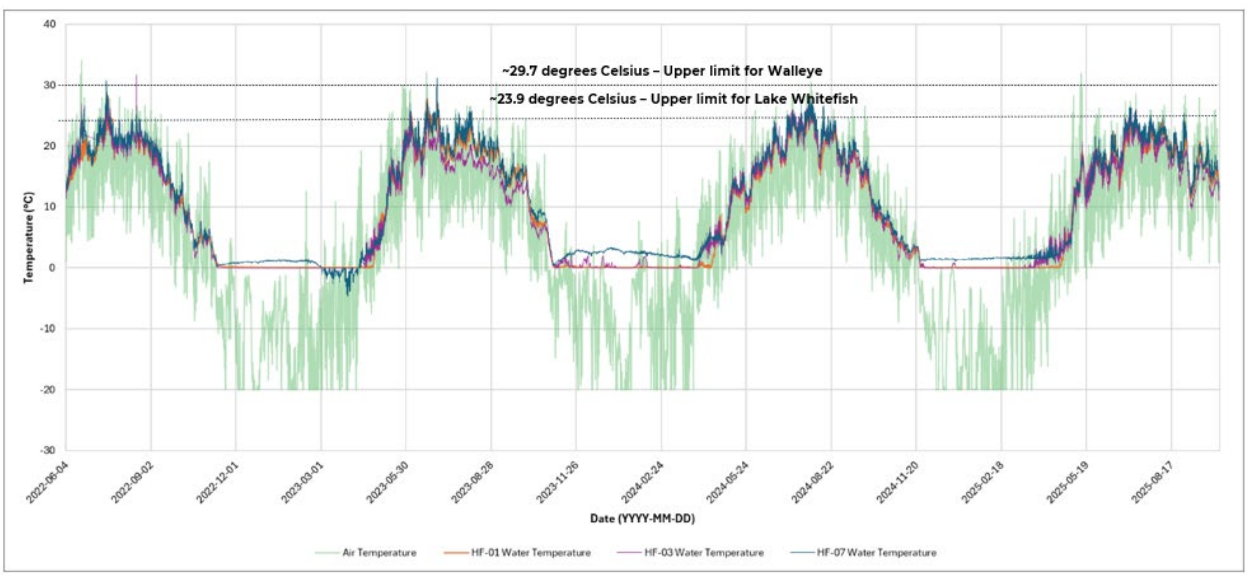


Profile is derived from LIDAR survey and elevations (profile) represents lowest elevation recorded along the creek. This lowest elevation may represent water surface, beaver dams, boulders or logs but is representative of the overall creek gradient

Figure 3-3: Dixie Creek Longitudinal Profile with Hydrometric Stations



Temperature measurements are from the pressure transducer data loggers installed at multiple stations, including HF-07 (Dixie Lake outlet, near DC-01), HF-03 (mid-reach, near DC-02), and HF-01 (downstream reach, near DC-04).
Source: Thermal Preferences for Walley and Lake Whitefish obtained from Hasnain et al 2010.

Figure 3-4: Dixie Creek Water Temperatures

4 FLOW AND HYDROLOGY ASSESSMENT

The baseline hydrology for the Project Area and adjacent watercourses has been studied is documented in the Hydrology Baseline Report (WSP 2025c). The baseline document describes relevant hydrological conditions that provided for estimated flow volume and water levels in the local waterbodies, in support the design, Impact Statement and environmental approvals for the Project. Hydrology studies are ongoing and will continue to confirm modelling predictions, including as documented in the Impact Statement.

The hydrology monitoring program began in June 2022 and currently includes:

- Tracking and analysis of five Water Survey of Canada long term hydrometric stations for regional and long term flow analysis
- Three Project hydrometric stations within the main channel of Dixie Creek
- 10 Project hydrometric stations within the inflow tributaries to Dixie Creek
- 3 Project hydrometric monitoring stations within watersheds draining north to the lakes that are part of the Chukuni River system
- 3 Project hydrometric monitoring stations on the Chukuni River

The hydrometric stations are shown in Figure 3.2 of the WSP (2025c). Each of the 19 Project-dedicated, hydrometric stations were instrumented with an automatic water level pressure datalogger (Van Essan Divers), used to record continuous water level and temperature data.

5 PREDICTED FLOW REDUCTIONS TO DIXIE CREEK

5.1 POTENTIAL FLOW REDUCTIONS

The data collected through the ongoing hydrometric program has been used to compare the predicted Project changes in flow, to thresholds and metrics used to assess the potential for effects to fish and fish habitat within Dixie Creek. The Receiver Water Balance Report (WSP 2025e) presents monthly and annual results from the receiver water balance model, simulating a 58-year period encompassing the construction, operations, closure and post-closure conditions for the Project.

Dixie Creek was evaluated in the receiver water balance using a continuous daily time step model, summarized on a monthly basis for all Project phases. Runoff contributions to each modeling node were estimated by pro-rating long-term flow data from representative Water Survey of Canada gauges. Runoff from the Project footprint was calculated through the mine site water balance (WSP 2025f), using runoff coefficients derived from the same gauges to ensure consistency between models.

Five modeling nodes (DIX-1 to DIX-5) were assessed along Dixie Creek, from the Dixie Lake outlet to the Tote Road bridge crossing located approximately 3.6 km upstream of the Chukuni River. Model results predict flow reductions at nodes DIX-2 through DIX-5 during construction, operations and closure phases of the Project, primarily due to reduced contributing watershed area where contact water management is required. Predicted mean annual flow reductions range from 3.5% to 10.3% under average climate conditions (Tables B-2, B-3 and B4 in WSP 2025e). Flow changes are expected to be reduced to below 1.5% after closure, as watershed areas are largely restored, aside from permanent diversions and land-use changes associated with site reclamation. Monthly flow predictions are provided in WSP 2025e and are reproduced with percent flow reductions and other metrics for the operations phase in Table 5-1 in this document. At a monthly time step, flow reductions are greatest during operations at flow model node Dix-3 with the calculated flow reductions ranging from 8% in January and July to 13.6% in April.

The predicted flow reductions are discussed in the following sections relative to current ecological flow needs for Dixie Creek. Consideration is given to the commonly cited DFO ecological framework (DFO 2013), as well as other more recent flow classification and risk assessments such as the Ecological Classification of Flow in Ontario (Jones et al. 2024) and the British Columbia Environmental Flow Needs Policy (British Columbia 2022)

5.2 COMPARISON TO DFO ECOLOGICAL FLOW FRAMEWORK

The DFO Ecological Flow Framework (EFF) was published (DFO 2013) to provide technical guidance to DFO managers and decision makes and among other purposes, to propose a general framework for the assessment ecological flow requirements for fisheries in Canada. Among the summary of the framework, three commonly cited observations for flow assessment are provided as:

- Cumulative flow alterations <10% in amplitude of the actual (instantaneous) flow in the river relative to a natural flow regime, have a low probability of detectable impacts to ecosystems that support commercial, recreational or Aboriginal fisheries; **such projects can be assessed with desktop methodologies**
- Cumulative flow alterations that result in instantaneous flows < 30% of the mean annual discharge (MAD) have a heightened risk of impacts to fisheries

- For cumulative water use >10% of instantaneous discharge or that results in flows < 30% of the MAD, a more rigorous level of assessment is recommended to evaluate potential impacts on ecosystem functions which support fisheries.

The Project has reviewed and applied the DFO EFF in the assessment of predicted changes to Dixie Creek using both the 10% instantaneous flow threshold and the 30% MAD. At an annual timestep the greatest predicted flow reduction is 10.3% during operations at model node DIX-3; which aligns with the upper range of the EFF 10% metric. There is greater fluctuation using a monthly time step as shown in Table 5-1, where minor increases in flow reduction above 10% are predicted during the spring and fall with a maximum flow reduction of 13.6% in April.

The EFF does not suggest a specific amount of flow reduction above the 10% metric would result in impacts to fish or fish habitat, only that values below would have a lower probability of detectable impacts to the ecosystem. The EFF emphasizes that the 10% metric allows for Projects to be assessed with just desktop methods, and that flow changes greater than this should also be assessed using more rigorous methods. Additional consideration to habitat conditions and fish community is provided below and in Section 5.5.

For comparison of the Project predicted flow reductions with the EFF criteria, Figure 5-1 provides the Dixie Creek flow hydrograph (natural flow regime) for model node DIX-3 at a weekly time step with:

- A prorated 10% flow reduction from natural (existing) conditions (reflects the EFF 10% instantaneous flow change)
- The predicted flow reduction during operations (greatest predicted flow change in Dixie Creek)
- Natural seasonal variation indicated by 25th and 75th percentiles of the existing flows
- The calculated 30% MAD.

The predicted flow reduction in Dixie Creek shows very minor deviations from the 10% threshold when viewed relative to the natural variation of the 25th and 75th percentiles in Figure 5-1. The figure also shows that the existing long term average flow is above the 30% MAD in all months; and that the predicted conditions during operations remain above the 30% MAD.

It is important to note that the flow reductions are constant and continuous primarily resulting from a reduction in drainage area. This means that the shape and duration of the flow hydrograph is adjusted by the flow reduction in a uniform and consistent manner as shown in figure 5-1. This is important as fish can accommodate the resulting conditions as the water levels and volumes follow the natural flow pattern they are acclimated to.

With respect to the potential effect the flow reductions may have on the seasonal use of habitats, the modeled water levels have been plotted for both a flat / pool habitat such as the conditions observed in approximately 95% of Dixie Creek (see Section 3) including model node DIX-3, and for a riffle habitat that has been surveyed downstream of model node DIX-2 (Figures 5-2 through Figure 5-5).

The water level at these locations have been plotted to reflect both a spring condition (April and May) and a fall condition (October and November) to consider the time of year where Dixie Creek would most likely be accessed by Walleye and Whitefish respectively. The figures show the existing water levels along with the modeled water level due to flow reductions during operations as well as the 25th and 75th percentile water levels as an indication of natural variability. Although water level fluctuates during the spring months, the predicted water level change from existing conditions to operations during the year is less than 3 centimetres (cm), and well within the range and natural variation.

Overall the assessment of flows shows that the potential effects are minor, well within the natural conditions of the creek, and in general alignment with the EFF.

5.3 COMPARISON TO BC FLOW NEEDS ASSESSMENT

The British Columbia Environmental Flow Needs (BC EFN) Policy (British Columbia 2022) was amended and approved in February 2022, making it one of the most current published, screening tools in Canada that can be used to assess the likelihood that a water withdrawal will affect the EFN of the proposed water source. The policy describes a recommended procedure for evaluating the likelihood that an application for a water authorization, if granted, would affect the waterbody. The EFN is defined as the volume and timing of water flow required for the proper functioning of the aquatic ecosystem of the stream, of the proposed water source.

The BC EFN begins with determining if the waterbody is fish bearing and if there are high sensitive species or habitats present that would warrant special consideration (Figure 5-6). The BC EFN risk assessment policy lists several examples of potential sensitive species or habitats such as:

- Species designated as threatened or endangered under provincial or federal Species at Risk listings, or regionally important aquatic species that are rare and/ or have limited distributions
- Species or habitats important for ecosystem function
- Sensitive stream designation under the *Water Sustainability Act* and Water Sustainability Regulation
- Presence of a Wildlife Management Area with a flow-related objective(s)
- A site-specific report identifying species or aquatic habitat with flow related concerns
- Cultural sensitivities, such as ceremonial sites or culturally important aquatic species.

With respect to the Project, no aquatic Species at Risk are present within Dixie Creek, and the watercourse has not been identified as a special management area that would indicate special flow related concerns. Species have been confirmed in Dixie Creek (including Walleye, Sucker, Pike, Yellow Perch and Lake Whitefish) that have also been identified as species commonly harvested and as such important to local Indigenous communities as identified through confidential Indigenous knowledge studies. These species are common in area waterbodies and there is no indication that Dixie Creek provides a disproportionate habitat contribution to local populations.

As such it is our understanding that the BC EFN risk assessment framework is an appropriate flow assessment methodology to apply to the project, but additional consideration should also be given to the potential effects of flow reduction on habitats that may be more sensitive to flow changes such as riffles, and species with life history dependencies on them such as Walleye and Lake Whitefish (Section 5.5)

The EFN screening consists of a risk assessment framework that considers the long term monthly discharge (lt MMD) as a percentage of the long term MAD (lt MAD) using the equation (lt MMD / lt MAD) x 100%). The resulting percentage of MAD is used to determine the flow sensitivity of the watercourse as:

- Greater than 20% lt MAD represent low flow sensitivity
- Between 10 and 20% lt MAD represent moderate flow sensitivity
- Less than 10% of lt MAD represent high flow sensitivity.

The flow sensitivity value is a measure of how sensitive the watercourse is to changes in flow with low being the least sensitive and high being the most sensitive. For Dixie Creek, this percentage is shown for each flow model node in Table 5-1. All months have mean monthly percentages of the MAD well above the risk assessment 20% threshold of low flow sensitivity, with the minimum monthly value of 43% observed in March being more than two times the criteria.

The next step in the BC EFN risk assessment is to use the flow sensitivity value to compare the cumulative water withdrawal to determine an overall EFN Risk Level as shown in Figure 5-6. The predicted percent flow reductions (cumulative withdrawal) to Dixie Creek is shown in Table 5-1 for each month, for all five Dixie Creek modeling nodes. The predicted percent flow reduction varies from zero in all months at the upstream DIX-1 node, to a maximum of 13.6% during April at node DIX-3.

Using the risk assessment framework with the Dixie Creek monthly flow reductions classifies the proposed Project changes to Dixie Creek flow during all months as Risk Management Level 1. This is the lowest risk category and is defined by the policy as:

– Risk Level 1 *“Where the EFN risk assessment process results in Risk Level 1, for that specific flow period (i.e., monthly) there is sufficient water available to provide for EFN as well as for proposed water diversion and use”*.

It is recognized that the BC EFN policy was not developed for Ontario; however the principle and science behind the framework are considered transferable, and the results of the assessment align well with the observations of the DFO 2013 framework assessment with the predicted Dixie Creek flows remaining well above the 30% MAD.

5.4 ONTARIO ECOLOGICAL FLOW CLASSIFICATION

A recent effort by the Ontario Ministry of Natural Resources has been made to better classify ecological flow regimes in Ontario. This has led to the recent publishing of a 2024 technical report that classifies Ontario stream flow regimes into one of four categories in order of regime stability as highly variable (urbanized areas), variable, stable, and highly stable (Jones et al. 2024).

Although the classification system does not provide a process to evaluate flow needs, it is a useful tool to understand the overall flow stability of watercourses in regions of Ontario. Dixie Creek and the project area are within an area of northwestern Ontario known to have stable and highly stable flow regimes. This classification aligns with the modeled Dixie Creek flows determination of the BC EFN framework that the watercourse has a low flow sensitivity classification; and with the DFO EFF framework 30% MAD threshold which is met by all long term monthly flow values.

5.5 HABITAT AND FISH COMMUNITY CONSIDERATION

Through discussion with DFO and review of confidential Indigenous knowledge studies and comments received from local Indigenous communities, it is recognized that additional consideration is needed with respect to riffle habitats that are more sensitive to flow changes, and the two fish species that may use the riffle habitats for spawning.

Section 2 and Section 3 provide detailed fish sampling results and habitat conditions that support the following findings:

– Walleye are present in Dixie Creek at all times of the year and may use several of the identified riffle type habitats for spawning. This is based on fish capture records, visual observations of the habitats, and direct observation of White Sucker spawning which are known to utilize similar habitats.

– Lake Whitefish are present in Dixie Creek during the spring and fall but in lower abundance and likely leave the creek during the summer months as temperatures periodically exceed their incipient lethal temperature.

– Lake Whitefish may use the identified riffle type habitats in Dixie Creek for spawning, but ongoing monitoring will be required to confirm this.

Making a conservative assumption that both species use the riffle type habitats for spawning, a comparison between existing water levels and predicted flow reduced water levels during the operations phase has been provided in Figures 5-2 through Figure 5-5. Changes in water levels are expected to be negligible (less than 3 cm) in comparison to the natural variability for the respective season which is in the order of 1 m (difference between 25th and 75th percentiles Figure 5-1).

Despite the analysis presented and the high confidence that the Project has a low probability of having measurable effects to fish and fish habitat is Dixie Creek, we are proposing additional ongoing monitoring measures to verify this conclusion (Section 6).

Table 5-1: Modeled Flows at Dixie Creek Nodes

Model Node	Flow Metric	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
DIX-1	Existing (m^3/s)	0.68	0.60	0.53	0.86	2.10	2.45	1.98	1.33	1.04	0.95	0.87	0.77	1.18
	Operations (m^3/s)	0.68	0.60	0.53	0.86	2.10	2.45	1.98	1.33	1.04	0.95	0.87	0.77	1.18
	Flow Reduction (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	BC- EFN	58%	50%	45%	73%	178%	206%	167%	112%	88%	80%	74%	65%	
DIX-2	Existing (m^3/s)	0.69	0.60	0.55	1.01	2.41	2.61	2.07	1.42	1.15	1.08	0.96	0.79	1.28
	Operations (m^3/s)	0.68	0.59	0.53	0.92	2.24	2.52	2.01	1.36	1.08	1.01	0.90	0.77	1.22
	Flow Reduction (%)	2%	1%	3%	8%	7%	4%	3%	4%	6%	7%	6%	3%	5%
	BC- EFN	54%	47%	43%	79%	188%	204%	161%	111%	89%	85%	75%	62%	
DIX-3	Existing (m^3/s)	0.74	0.64	0.59	1.06	2.54	2.77	2.19	1.50	1.21	1.14	1.01	0.84	1.36
	Operations (m^3/s)	0.68	0.58	0.53	0.92	2.25	2.53	2.02	1.36	1.08	1.00	0.90	0.76	1.22
	Flow Reduction (%)	8%	9%	10.2%	13.6%	11.5%	9%	8%	9%	11.1%	12.4%	11.4%	9%	10.3%
	BC- EFN	54%	47%	43%	78%	187%	204%	162%	111%	89%	84%	75%	62%	
DIX-4	Existing (m^3/s)	1.18	1.03	0.93	1.60	3.86	4.33	3.47	2.35	1.87	1.74	1.57	1.33	2.11
	Operations (m^3/s)	1.12	0.97	0.87	1.45	3.56	4.09	3.29	2.21	1.73	1.60	1.45	1.25	1.97
	Flow Reduction (%)	6%	6%	7%	9%	8%	6%	5%	6%	7%	8%	8%	6%	7%
	BC- EFN	56%	49%	44%	76%	183%	205%	164%	111%	89%	82%	74%	63%	
DIX-5	Existing (m^3/s)	1.27	1.11	1.00	1.73	4.18	4.68	3.74	2.54	2.03	1.89	1.70	1.44	2.28
	Operations (m^3/s)	1.21	1.05	0.94	1.57	3.87	4.43	3.56	2.39	1.88	1.73	1.57	1.36	2.14
	Flow Reduction (%)	5%	5%	6%	9%	7%	5%	5%	6%	7%	8%	7%	6%	6%
	BC- EFN	56%	48%	44%	76%	183%	205%	164%	111%	89%	83%	74%	63%	

Notes:

Existing flow is simulated mean monthly flows from long term record as presented in Appendix I-3 Table B-3.
Operations flow is simulated mean monthly flows from long term record as presented in Appendix I-3 Table B-3.
Flow Reduction is the predicted flow reduction in percent calculated as: (Existing Flow – Operations Flow) / Existing Flow x 100%.
Blue shading indicated flow reduction between 0 and 10%. Orange shading indicates flow reduction between 10 and 15%
BC EFN is the British Columbia calculated flow sensitivity metric used in the EFN Risk Assessment Framework (Figure 5-6) calculated as: (lt MMD/lt MAD) x 100%.

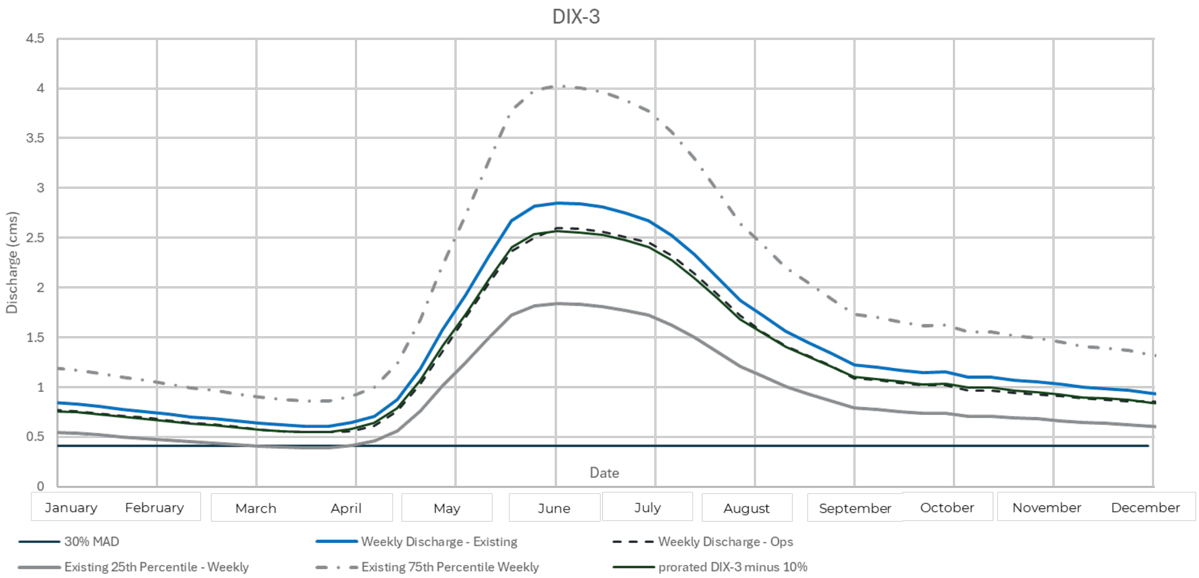


Figure 5-1: Weekly Discharge Values for DIX-3, Operations

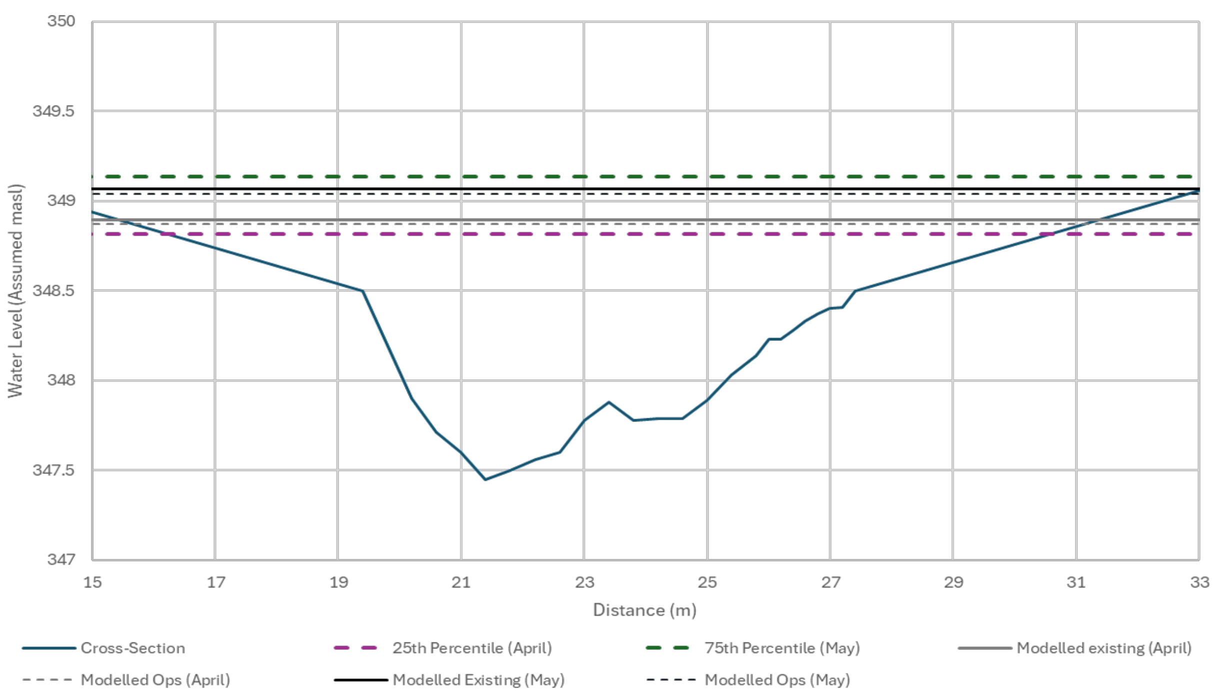


Figure 5-2: Water Levels at DIX-3 for Walleye Spawning Period (April and May)

Note: Dix-3 is a Flat / pool area.

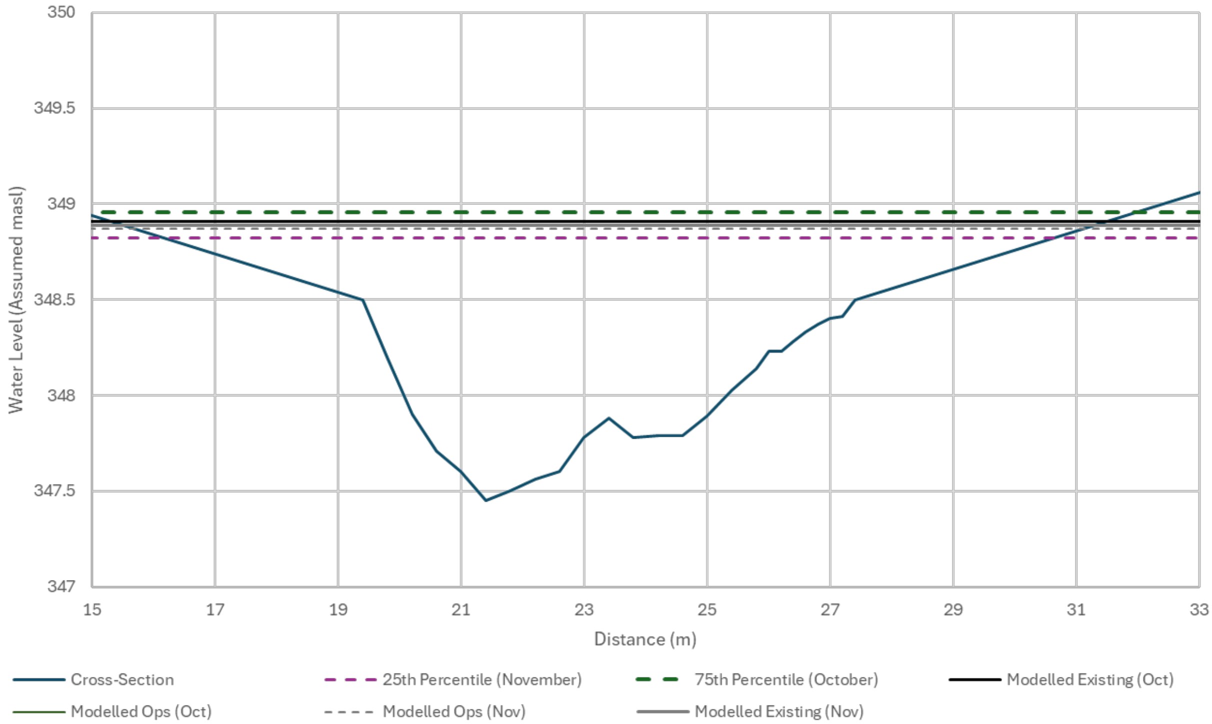


Figure 5-3: Water Levels at DIX-3 for Whitefish Spawning Period (October and November)

Note: Dix-3 is a flat / pool area.

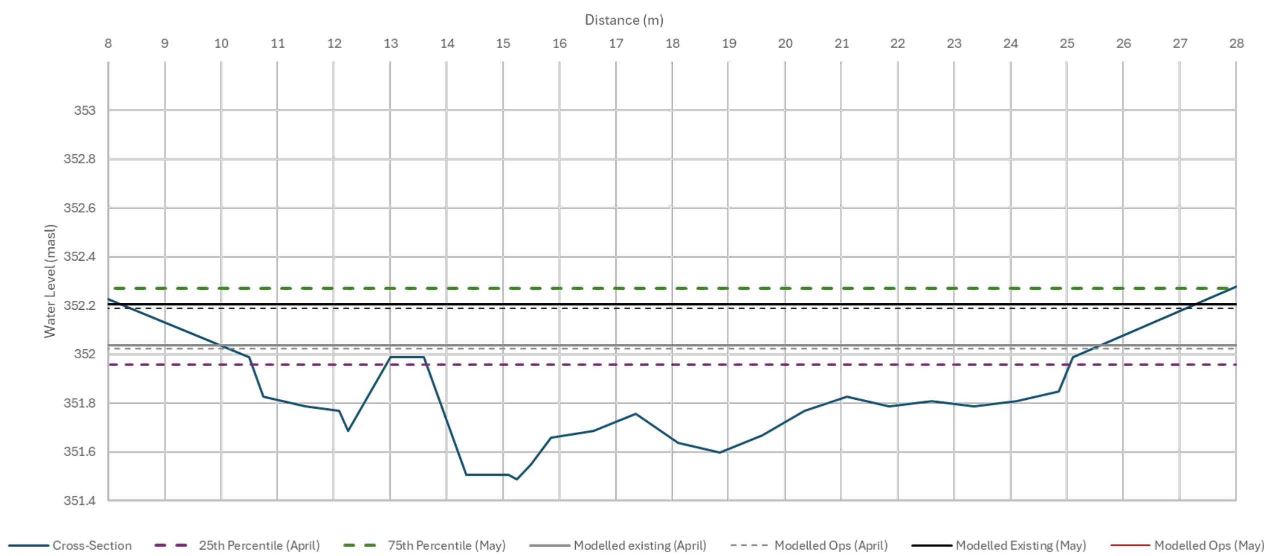


Figure 5-4: Water Levels in Riffle Area for Walleye Spawning Period (April and May)

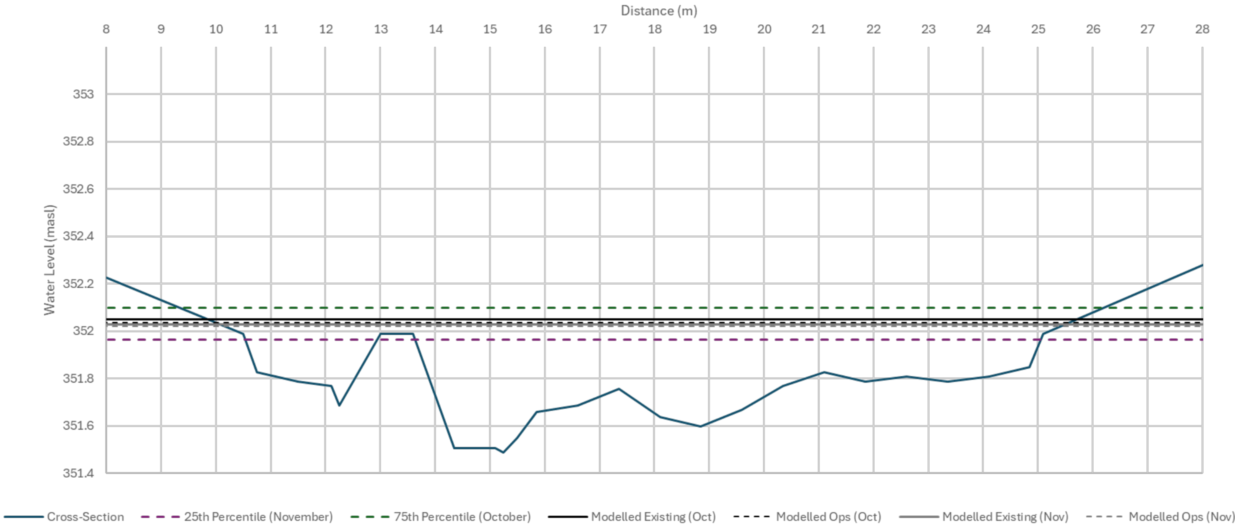
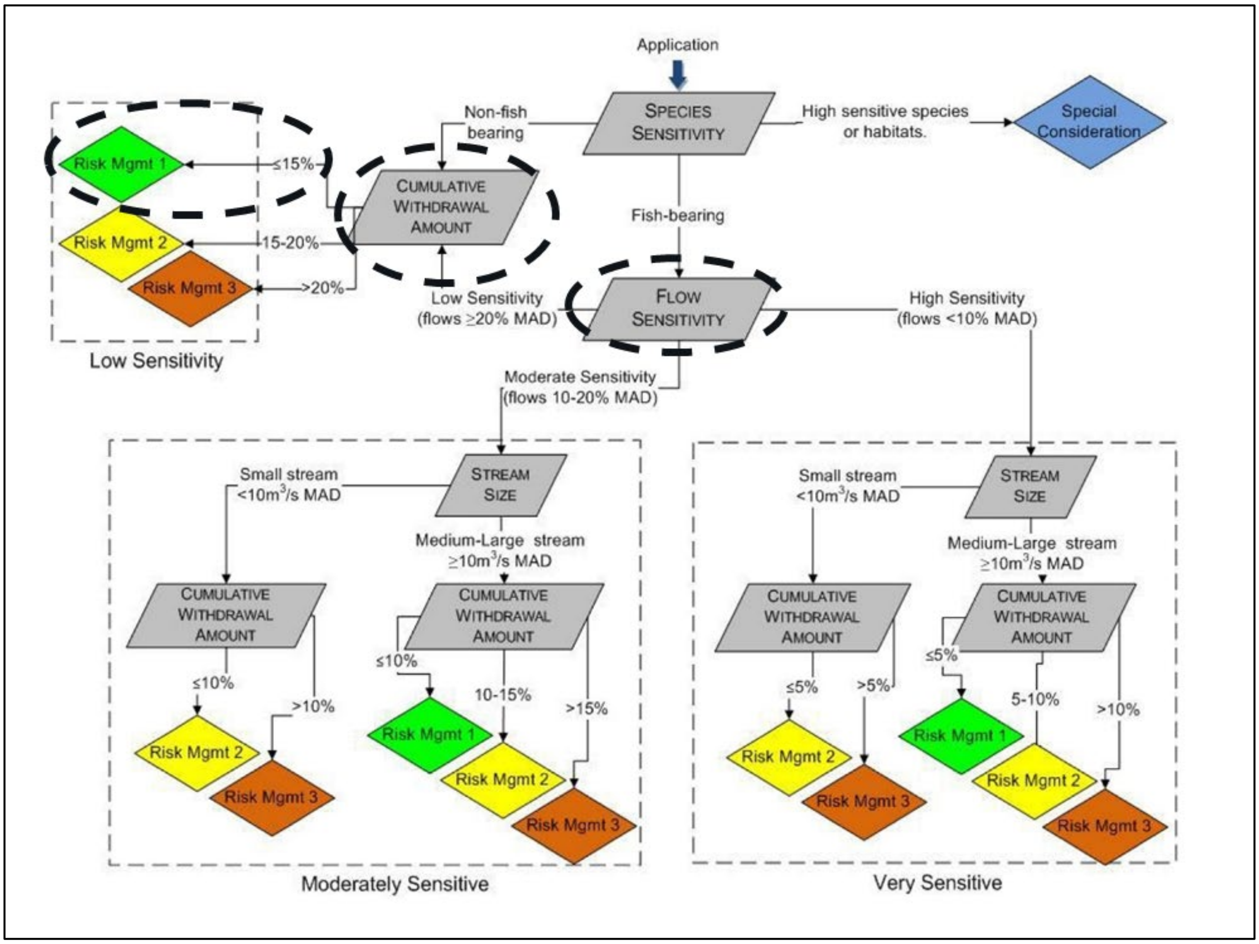


Figure 5-5: Water Levels in Riffle Area for Whitefish Spawning Period (October and November)



Notes:

All long term mean monthly flows were greater than 20% long term MAD (Min value was 43%)

Dashed ellipses show decision pathway using Dixie Creek flow calculations

Figure 5-6: British Columbia Environmental Flow Needs Risk Assessment Framework

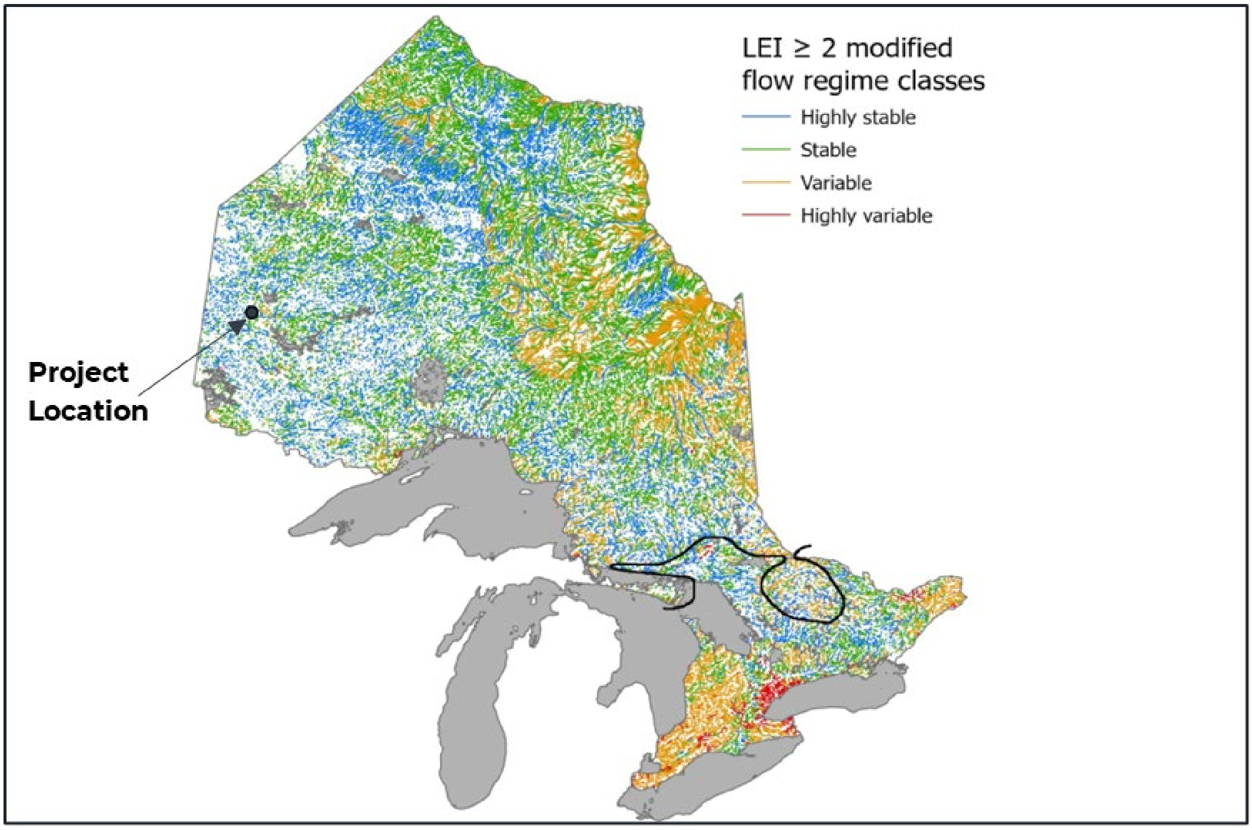


Figure 5-7: Flow Regimes in Ontario with Project Locations

(Source Jones et al. 2024)

6 PROPOSED MONITORING

A rigorous hydrology and hydrogeology monitoring program has been in place for a number of years. Monitoring is ongoing and will be continued over the life of the Project to confirm Impact Statement predictions, including changes to flows in Dixie Creek, and to meet other regulatory needs. Fish and fish habitat will be monitored consistent with the Fish Habitat Offset and Compensation Plan (WSP 2026a) and in compliance with federal approvals.

Additional monitoring is proposed to specifically address the concerns related to Dixie Creek habitat use by Walleye and Lake Whitefish as follows:

- Nighttime visual spawning surveys conducted during crepuscular periods to identify active Walleye spawning behaviour, egg deposition, and habitat use at the identified potential spawning locations
- Spring deployment of egg mats and D-shaped drift nets at identified or suitable substrate-based spawning locations to detect Walleye egg deposition and potentially drifting Lake Whitefish eggs
- Fall deployment of egg mats and D-shaped drift nets at historically identified or suitable substrate-based spawning locations to detect Lake Whitefish egg deposition and drifting eggs
- eDNA sampling collected at established stations downstream of identified spawning habitat targets to confirm presence and timing of Walleye use as a supplemental line of evidence.

Monitoring is meant to be adaptive and will be adjusted over time to reflect the observed results from both biological and physical studies.

7 REFERENCES

- British Columbia. 2022. Environmental Flow Needs (EFN) Policy. Policy updated January 11, 2022, issued under the *Water Sustainability Act*, FLNRORD & Water Management Branch.
- Fisheries and Oceans Canada (DFO). 2013. Framework for Assessing the Ecological Flow Requirements to Support Fisheries in Canada. Canadian Science Advisory Secretariat (CSAS) Science Advisory Report 2013/017, 16 pp.
- Hasnain, S. S., Minns, C. K., and Shuter, B. J. (2010). Key Ecological Temperature Metrics for Canadian Freshwater Fishes. Climate Change Research Report. Ontario Ministry of Natural Resources, Applied Research and Development Branch. 44 pp.
- Jones, N. E., Schmidt, B. J., and Allerton, M. L. 2024. Ecological Classification of Flow Regimes in Ontario. Ontario Ministry of Natural Resources and Forestry, Science and Research Branch. Science and Research Technical Report TR-60, 34 pp.
- Ministry of Transportation (MTO). 2020. MTO/DFO/MNRF Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings. Version 4, 2020
- Ontario. 2017. Ontario Stream Assessment Protocol. Updated: February 11, 2026. Published: February 11, 2026. Available at: https://www.ontario.ca/page/2017-ontario-stream-assessment-protocol
- WSP 2025a. Great Bear Project Fisheries Resources Baseline Report.
- WSP 2025b. Great Bear Project Hydrogeology Baseline Report.
- WSP 2025c. Great Bear Project Hydrology Baseline Report.
- WSP 2025d. Great Bear Project Water Quality Baseline Report.
- WSP 2025e. Great Bear Project Receiver Water Balance Report.
- WSP 2025f. Great Bear Project Mine Site Water Balance Report.
- WSP Canada Inc. 2026. Great Bear Project, Draft Fisheries Act Offset Plan and MDMER Schedule 2 Fish Habitat Compensation Plan.

Appendix A
Photo Log

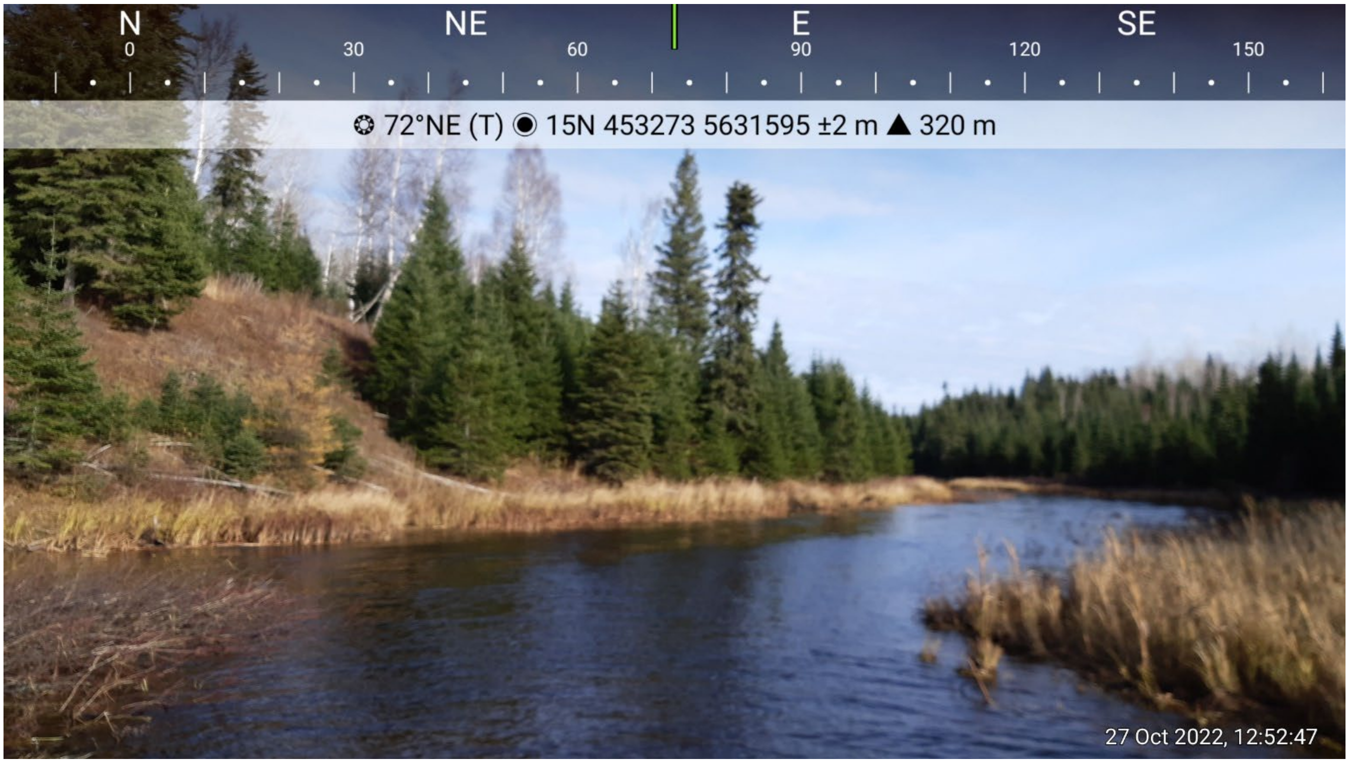


Photo 1. DC-01 – Facing downstream. Oct 27, 2022.

Photo 2. DC-01 – Facing upstream. Oct 27, 2022.

Photo 3. DC-02 – Facing downstream. Oct 22, 2022.

Photo 4. DC-02 – Facing upstream. Oct 22, 2022.

Photo 5. DC-03 – Facing downstream. Oct 22, 2022.

Photo 6. DC-03 – Facing upstream. Oct 22, 2022.

Photo 7. DC-03 – Facing downstream. July 23, 2022.

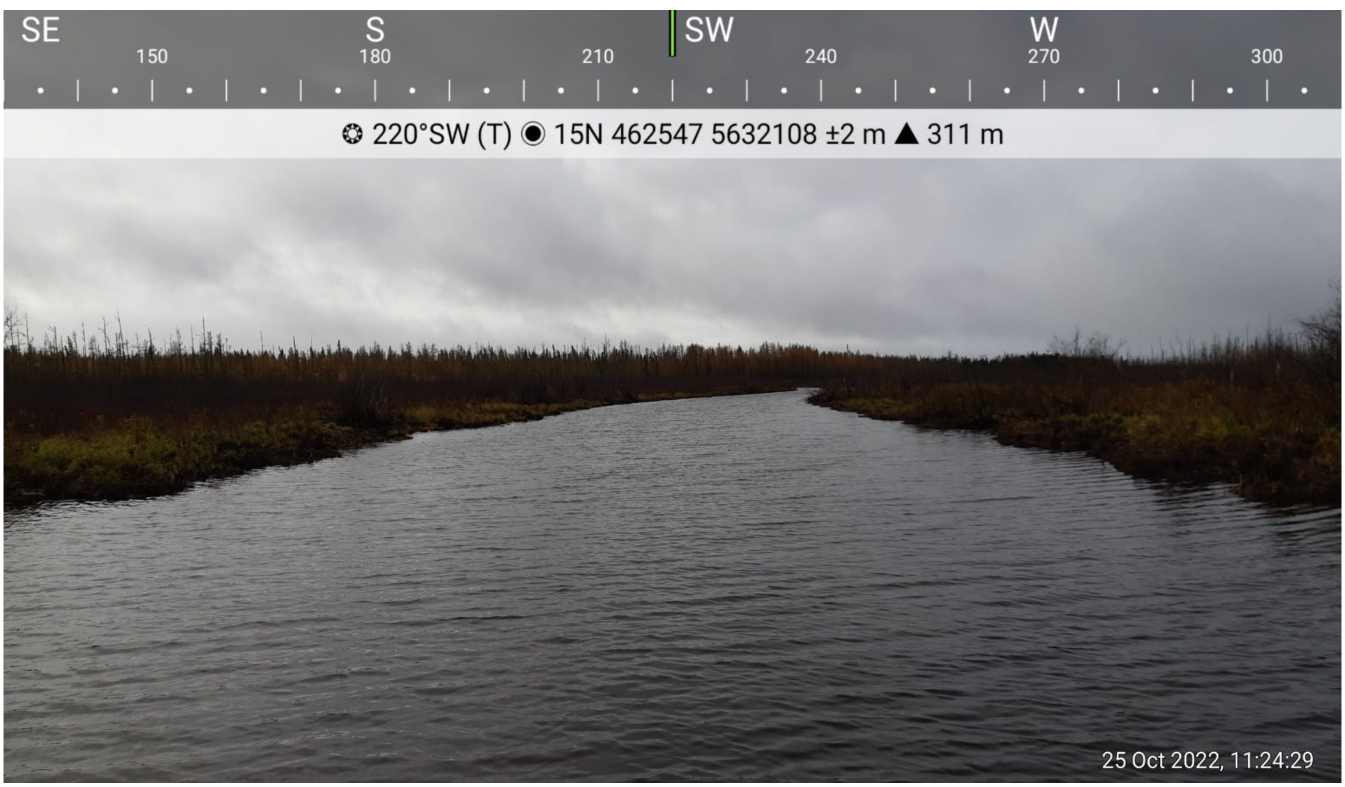


Photo 8. DC-03 – Facing downstream. July 23, 2022.

Photo 9. Reach 1 – Facing downstream – exposed gravel and coble along bridge abutment.

September 16, 2025

Photo 10. Reach 1 - Facing north – hydrology surveying unit measuring flow. October 20, 2023

Photo 11. Reach 2 – Facing upstream – riffle with high potential of fish spawning habitat. June 13, 2024

Photo 12. Reach 2 – Facing downstream – riffle with cobble/gravel/sand substate. May 10, 2025

Photo 13. Reach 3 – Facing upstream – riffle with high potential of fish spawning habitat. June 12, 2024

Photo 14. Reach 3 – Drone imagery – red circle represents area of photograph above. September 2023

Photo 15. Reach 4 – Facing downstream – log jam blocking middle island separating flow into channels. June 12, 2024

Photo 16. Reach 4 – Drone overview – low water conditions. September 2023

Photo 17. DC-02 Bridge – Facing upstream – large boulder and cobble substrate along edges of abutments. September 16, 2025

Photo 18. DC-02 Bridge – Drone imagery - Small reach of cobble and boulder and start of a beaver dam at low water conditions downstream of bridge. September 2023

Photo 19. Reach 5 – Drone arial imagery – low spawning potential. September, 2023

Photo 20. Facing upstreaming – large beaver dam at outlet of Dixie Lake. September 21, 2023

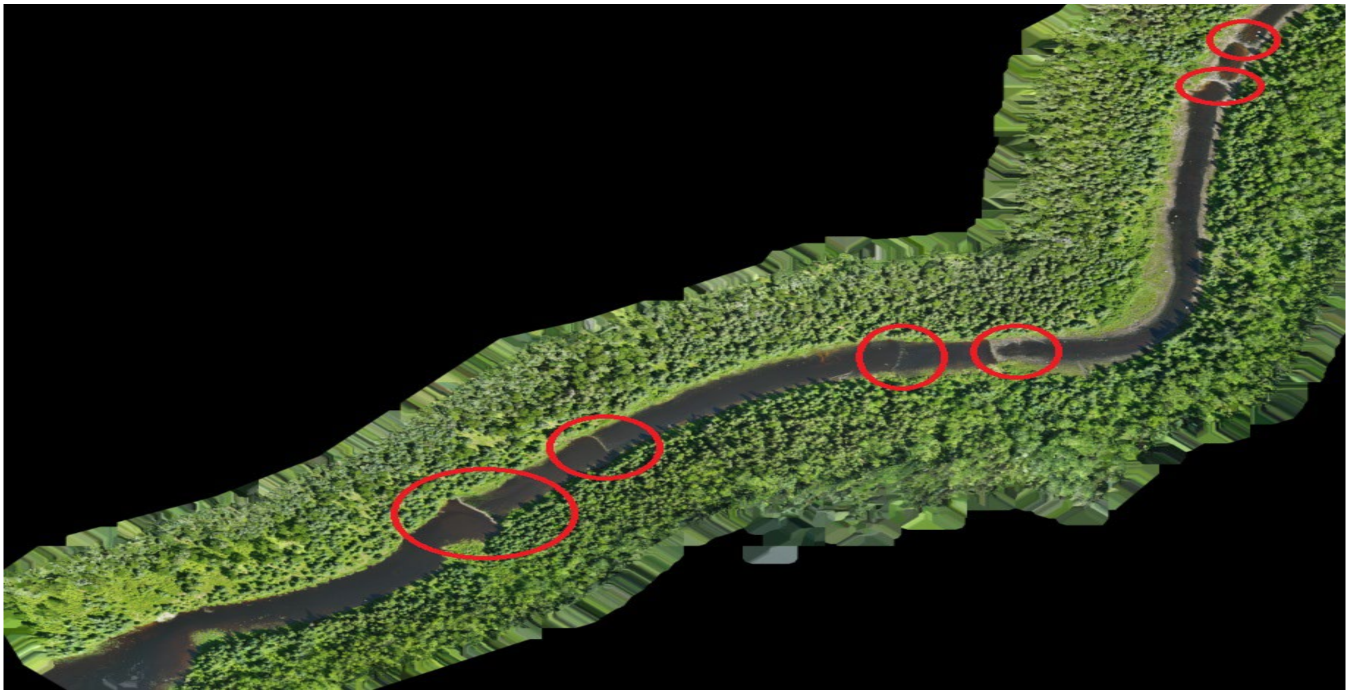


Photo 21. Drone arial imagery – series of beaver dams starting from Dixie Lake outlet (west) to approximately 600 m downstream (north east). September 2023

Photo 22. Drone overview – series of beaver dams in Dixie Creek at low water conditions. September 2023