



EDI ENVIRONMENTAL DYNAMICS INC.
Natural Resource Consultants

**Peel River Watershed
Fisheries Information
Summary Report—
Preliminary Assessment**

Prepared for:

PEEL WATERSHED PLANNING COMMISSION

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The Peel Watershed Planning Commission retained Environmental Dynamics Inc. to complete this project with the objective of facilitating an integration of existing fish and fish habitat knowledge into the North Yukon regional land use planning process. Brian Johnston and John Ryder of the Peel Watershed Planning Commission contributed directly to the project, providing direction and/or technical support. Al von Finster (Fisheries and Oceans Canada), Don Toews (Yukon Environment), and Dick Mahoney (Na-Cho Nyäk Dun—Lands) provided technical direction and guidance to the project. Nathan Millar and Melanie VanGerwen-Toyne contributed considerable information and insight into the project. Ben Schonewille conducted project mapping.

DISCLAIMER

The information presented in this report is designed to act as a summary of existing fisheries information. Sources of information include documented (limited) Traditional Knowledge, past scientific/technical documentation, recent scientific/technical documentation, as well as personal communications. It should be understood that some information presented is based upon interpretations of such sources. It is therefore recommended that users interested in specific data presented in this report consult the original source of information to verify the context and substance of specific details.

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1.0 INTRODUCTION

Fish and their habitat are integral components of northern ecosystems. Therefore values associated with fish and fish habitat have fundamental implications for the planning of most land use activities and must be considered thoroughly in this regard. From a general biological perspective, the inclusion of fish and fish habitat into a land use planning exercise has benefits for many other species, both aquatic and terrestrial.

This project was undertaken to facilitate the incorporation of such fish related information into the Peel Watershed Land Use Planning process. The planning area of this process is the entire Peel River drainage within the Yukon (see Figure 1). The Peel River is a large tributary to the Mackenzie River, with the majority of its watershed draining the northern Yukon Territory. It joins the Mackenzie River at the southern end of the Mackenzie Delta, near Fort McPherson, Northwest Territories. The Yukon portion of the Peel watershed has six major 3rd order tributaries¹; the Snake, Bonnet Plume, Wind, Hart, Blackstone, and Ogilvie Rivers. As well, a large number of smaller 3rd and 4th order tributaries contribute to the drainage¹. The Peel River has a length of 585 km and drains an area of approximately 70,600 km². As with other northern watersheds, the majority of flow (90%) occurs during the summer from May to September, with peak flow (mid-May to mid-June) accounting for 50% of annual flows. The large variation in flows throughout the year (7,000m³/s at spring peak to 500 m³/s at winter low) create highly dynamic aquatic environments (VanGerwen-Toyne & Walker-Larsen, 2004). In such conditions, it is likely that the greatest limiting factor affecting fish populations and their habitat is the availability of quality water for over-wintering areas.

While there are no permanent settlements within the planning region and human impacts have been relatively minimal, the area does face some current and long-term pressures. Most human activity in the Peel watershed is conducted by boat from Fort McPherson, NWT, home of the Tetlit Gwich'in First Nation. Such boating is limited to the Peel system downstream of Aberdeen Canyon, located upstream of the Wind River. An exception to this is associated with the large volume of traffic along the Dempster Highway, affecting the Blackstone and Ogilvie Rivers with highway crossings and associated recreational fishing pressure. Portions of the watershed are also considered to have high mineral and petroleum potential, and some ongoing exploration is active in this regard. Ecotourism is also prevalent on the Snake, Bonnet Plume, and Wind rivers, and big game outfitting occurs throughout the watershed. However, these activities are limited by fly-in and horseback access only. Figure 1 provides an overview of the study area.

Large populations of anadromous and/or potadromous² fish (primarily Corregonids, or whitefish species) have long held, and continue to hold, a central role in Tetlit Gwich'in culture and economy. Various fisheries currently take place during the open water season and through the ice during the early winter. Traditional/Local Knowledge has indicated that historic harvests were much higher than today, although significant fisheries do continue. Changing lifestyles and a decreased reliance on dogs for transportation have likely decreased the overall fish harvest (VanGerwen-Toyne & Walker-Larsen, 2004) (Stewart, 1996).

¹ For the purposes of this study, the Mackenzie River was considered a 1st order stream, with the Peel a 2nd order stream, and tributaries of the Peel considered as 3rd order and so on.

² Anadromous refers to fish that live at sea, but spawn in freshwater, potadromous refers to fish that migrate only between different bodies of freshwater.

The Peel River watershed is on the periphery of the glacial refugium known as “Beringia,” and therefore significant portions of the watershed remained unglaciated during the recent and more distant glaciations. It is also the only extensive unglaciated part of the present Mackenzie River watershed. Due to this, the history of the development of the watershed and the distribution of fish species has been shaped by the repeated glaciation and subsequent glacial retreats in the surrounding areas. The Peel River was blocked by ice at least twice during the Pleistocene and overflowed westward into the Porcupine River and thereby into the Yukon River. During the last such glaciation, a large lake was formed covering the Peel and the lower portions of several tributaries, draining into the Eagle River at the Davis Lake divide (Bodaly & Lindsey, 1977). Due to this unique glacial history, fish populations in the Peel watershed are composed of species with both Mackenzie and Yukon River origins.

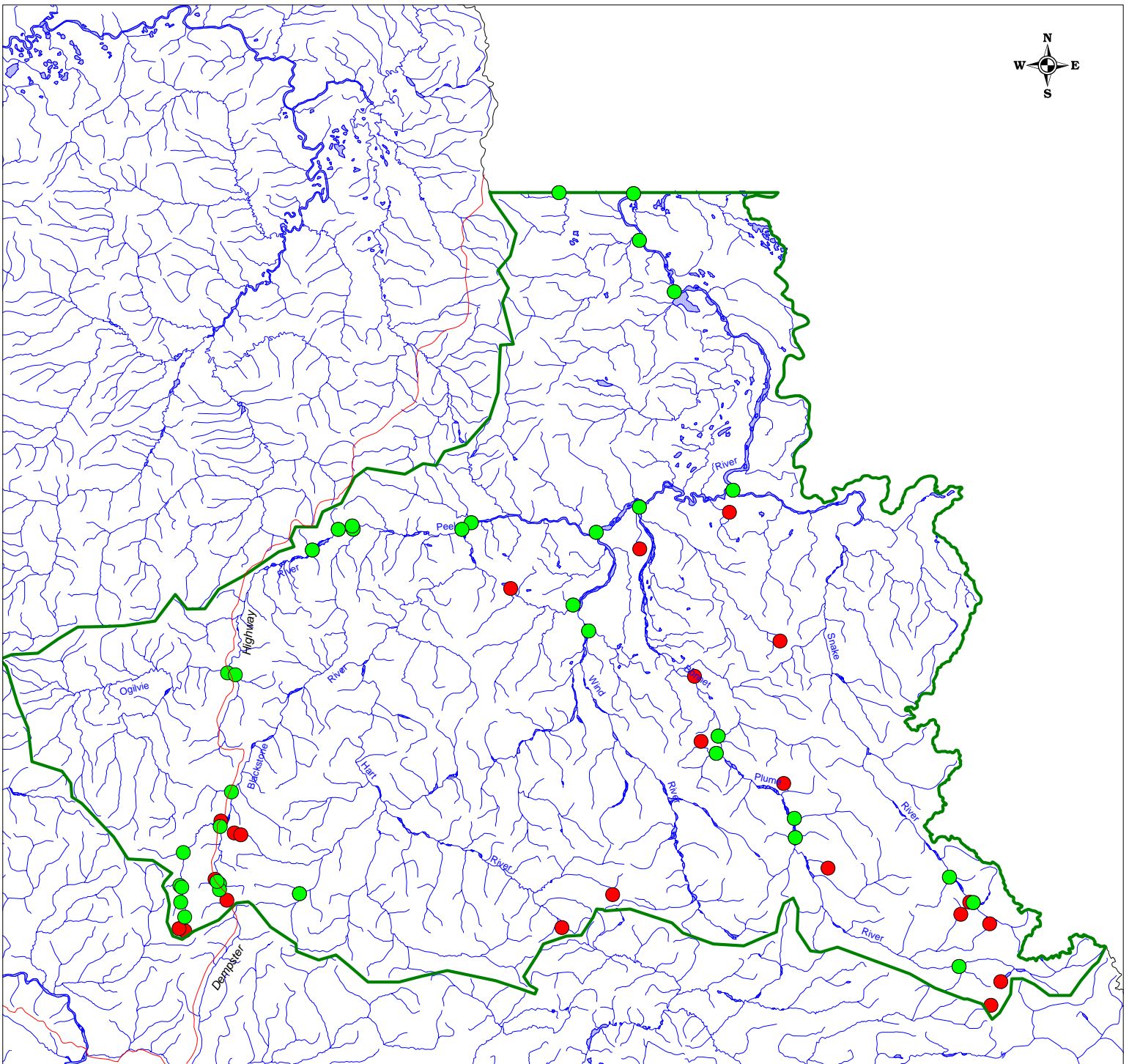








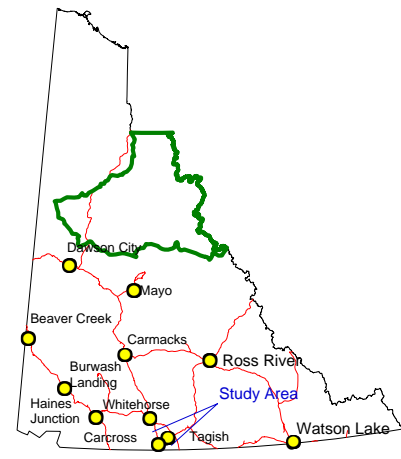


Figure 1. Overview map of the Peel River Watershed (Yukon portion only).

LEGEND

Scale 1:2,000,000

-  Streams
-  Waterbodies
-  Roads
-  Communities
-  Yukon Border
-  Peel River Watershed (Yukon only)
-  Stream Summary Points
-  Lake Summary Points



2.0 METHODS

The project was conducted in a number of phases as described below.

- 1) *Development of an approach:* A meeting was held with representatives of the Peel Watershed Planning Commission. A plan regarding how to best present the fisheries summary information was discussed and agreed upon. Known sources of information were also discussed, and methods of interpretation were agreed upon.
- 2) *Information gathering and analysis:* Sources of current, past, and historical information regarding fish in the Peel River watershed were gathered, reviewed, and interpreted by a biologist from Environmental Dynamics Inc.
- 3) *Completion of Mapping and Reporting:* The biologist also prepared a summary and preliminary analysis of reviewed information in the form of this report and associated maps.

3.0 SUMMARY RESULTS

Fisheries information gathered in this project has been listed according to 35 summary points documented/mapped for selected 2nd (Peel mainstem), 3rd, and 4th order streams. This includes all stream summary data, as detailed in Section 3.1. Information regarding 21 specific lakes has been summarized separately in Section 3.2. Maps in Appendices 1 through 8 illustrate the location of all stream and lake summary points.

Table 1 lists all 24 species of fish documented in the Peel River watershed. They are listed with their respective species code by which they are referred to in this report and the associated map products. These codes are standardised as used in the Fisheries Information Summary System- FISS and by the B.C. Government (Johnston & Slaney, 1996).

Dolly Varden char (*Salvelinus malma*) are present in various parts of the Peel River watershed. Various past reports have referred to the presence of arctic char (*Salvelinus alpinus*), and char species throughout the region are referred to locally as arctic char, or just char. However, according to Fisheries and Oceans Canada, genetic analysis has determined that all char species west of the Mackenzie River, including those in the Peel and the well-known anadromous stocks in the Rat River, are in fact Dolly Varden and not arctic char (DFO, 2001). Therefore, all references to arctic char have been documented in this report as Dolly Varden.

Table 1. Fish Species Identified in the Peel River Watershed

Category	Common Name	Scientific Name	Species Code
Salmon Species	chum salmon	<i>Oncorhynchus keta</i>	CM
Freshwater Game Fish Species³	arctic grayling	<i>Thymallus arcticus</i>	GR
	Dolly Varden	<i>Salvelinus malma</i>	DV
	lake trout	<i>Salvelinus namaycush</i>	LT
	least cisco (herring)	<i>Coregonus sardinella</i>	CS
	arctic cisco (herring)	<i>Coregonus autumnalis</i>	CA
	broad whitefish	<i>Coregonus nasus</i>	BW
	lake whitefish	<i>Coregonus clupeaformis</i>	LW
	inconnu (coney)	<i>Stenodus leucichthys</i>	IN
	burbot (loche)	<i>Lota lota</i>	BB
	northern pike	<i>Esox lucius</i>	NP
	walleye	<i>Stizostedion vitreum</i>	WP
Other Fish Species	longnose sucker	<i>Catostomus catostomus</i>	LSU
	white sucker	<i>Catostomus commersoni</i>	WSU
	lake chub	<i>Couesius plumbeus</i>	LKC
	flathead chub	<i>Platygobio gracilis</i>	FHC
	longnose dace	<i>Rhinichthys cataractae</i>	LNC
	pond smelt	<i>Hypomesus olidus</i>	PSM
	slimy sculpin	<i>Cottus cognatus</i>	CCG
	spoonhead sculpin	<i>Cottus ricei</i>	CRI
	round whitefish	<i>Prosopium cylindraceum</i>	RW
	pygmy whitefish	<i>Prosopium coulteri</i>	PW
	ninespine stickleback	<i>Pungitius pungitius</i>	NSB
trout perch	<i>Percopsis omiscomaycus</i>	TP	

3.1 Stream Summary Information

Refer to the maps in Figure 1 and Appendices 1 through 7 for further information regarding the location of 35 individual streams. The map in Figure 1 shows the location of all stream summary points, while Appendices 1 through 7 illustrate further detail. Summary information for each stream is presented below in Tables 2 to 36. References for all sources of information are noted in each stream summary and complete information for all references can be found in Section 5.0. It should be noted that many streams within the watershed are absent from the tables and that this is due only to a lack of information available, not an absence of fish.

It should be noted that the Peel River watershed in the Yukon contains many extremely remote areas with limited access. Therefore, there is limited information available regarding many areas of the watershed. In this regard, streams have been ranked in terms of the level of knowledge available. A ranking of Very Low, Low, Low to Moderate, or Moderate has been assigned to each stream summary.

Specific areas of known or suspected over-wintering have been identified, however such cases are very limited. Little such information is available. Some limited spawning information is available for the Peel River mainstem and the Vittrekwa River, and this information is included in the comments sections.

³ Species commonly consumed by humans and those defined under the Yukon Government Fishing Regulations summary.

Fish in the Peel watershed utilize a wide variety of habitats at various stages on an annual basis, as well as throughout their lives. If a particular body of water is accessible and has suitable habitat conditions, fish are likely to utilize it at some point during the year and/or their life cycle. It must be noted, therefore, that all streams and water bodies should be considered rearing habitat for fish, unless otherwise proven.

Table 2. Summary Information for Peel River, Downstream of Aberdeen Canyon.

<i>Stream:</i>	Peel River Mainstem
<i>Map Code:</i>	S1 (see Appendix 1)
<i>Drainage:</i>	Mackenzie River
<i>Level of Knowledge:</i>	Moderate
<i>Documented Species Present:</i>	CM, GR, DV, CS, CA, BW, LW, IN, BB, NP, WP, LSU, WSU, LKC, FHC, LNC, PSM, CCG, CRI, RW, PW, NSB, TP
<i>Identified or Inferred Overwintering Habitat:</i>	Yes
<i>Suspected or Potential Overwintering Habitat:</i>	Yes
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Further understanding overwintering usage, further understanding of corregonid spawning areas. • Patterns of use of all species. • Many smaller tributaries with no info. • Identification of critical habitats.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Includes captures made downstream of the Yukon border. • CS & CA most abundant species during large July & August upstream migrations. • Occasional reports of unidentified large salmon captured in lower Peel. • Spawning and overwintering habitat for migratory populations of both anadromous and potadromous Broad Whitefish--spawning concentrated near the Trail River. • Also significant evidence that significant populations of anadromous and/or potadromous LW, CS, CA, & IN spawn in the Peel River. • All char west of Mackenzie identified as DV by DFO-2001, all prior references to AC in the Peel were likely for DV.
<i>References:</i>	MacDonald-1994, McCart et al-1974, Indigo River-1996, von Finster-2003, Elson-1974, Beak-1979, DFO Stream Files-2006, VanGerwen-Toyne & Walker-Larsen-2004, DFO-1998, Chang-Kue K. & E. Jessop-1997, DFO-2001, Reist J. & Chang-Kue K.-1997, Bodaly and Lindsey-1977

Table 3. Summary Information for Vittrekwa River.

<i>Stream:</i>	Vittrekwa River
<i>Map Code:</i>	S2 (see Appendix 1)
<i>Drainage:</i>	Peel River
<i>Level of Knowledge:</i>	Low
<i>Documented Species Present:</i>	GR, DV
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	Yes
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Further understanding and confirmation of DV presence and habitat use. • Presence/habitat usage of other species. • Identification of critical habitats.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Anadromous DV believed to be present, spawning indicated, stock size unknown—however 5 years of migratory surveys in the Peel River mainstem (VanGerwen-Toyne & Walker-Larsen-2004) failed to catch DV.
<i>References:</i>	DFO-2001

Table 4. Summary Information for Road River.

<i>Stream:</i>	Road River
<i>Map Code:</i>	S3 (see Appendix 1)
<i>Drainage:</i>	Peel River
<i>Level of Knowledge:</i>	Very Low
<i>Documented Species Present:</i>	DV
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	No Data
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Confirmation of DV presence and habitat usage. • Presence/habitat usage of other species. • Identification of critical habitats.
<i>Other comments:</i>	<ul style="list-style-type: none"> • DV presence reported, little info. available.
<i>References:</i>	DFO-2001

Table 5. Summary Information for Trail River.

<i>Stream:</i>	Trail River
<i>Map Code:</i>	S4 (see Appendix 1)
<i>Drainage:</i>	Peel River
<i>Level of Knowledge:</i>	Very Low
<i>Documented Species Present:</i>	DV
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	No Data
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Confirmation of DV presence and habitat usage. • Presence/habitat usage of other species. • Identification of critical habitats.
<i>Other comments:</i>	<ul style="list-style-type: none"> • DV presence reported, little info. available.
<i>References:</i>	DFO-2001

Table 6. Summary Information for Snake River.

<i>Stream:</i>	Snake River
<i>Map Code:</i>	S5 (see Appendix 2)
<i>Drainage:</i>	Peel River
<i>Level of Knowledge:</i>	Low to Moderate
<i>Documented Species Present:</i>	GR, DV, IN, BB, NP, LSU, LKC, CCG, RW
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	No Data, but strong potential, especially in lower Snake
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Presence/extent of overwintering areas, • Presence/absence of corregonid spawning areas. • Patterns of use of all species. • Serious lack of tributary information. • Identification of critical habitats.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Lower 60kms is low gradient, with some riffles alternating with long pools of low current strength, with mud and gravel bottoms. • Above 60km is high gradient with heavily braided dynamic channels over coarse gravel bed, and less species diversity (GR, DV, RW, CCG)
<i>References:</i>	Elson-1974, Indigo River- 1996, Mahoney-1996, DFO Stream Files-2006, Bodaly and Lindsey-1977

Table 7. Summary Information for Unnamed Creek.

<i>Stream:</i>	Unnamed Creek (Trib.between Goz valley and Mt. MacDonald)
<i>Map Code:</i>	S6 (see Appendix 3)
<i>Drainage:</i>	Snake River
<i>Level of Knowledge:</i>	Very Low
<i>Documented Species Present:</i>	DV
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	No Data
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Extent of DV populations/habitat usage. • Presence/absence of overwintering habitats. • Presence/patterns of use of other species. • Identification of critical habitats.
<i>Other comments:</i>	<ul style="list-style-type: none"> • A juvenile DV was observed in this stream approximately 5 km upstream of the Snake River.
<i>References:</i>	Indigo River- 1996

Table 8. Summary Information for Reptile Creek.

<i>Stream:</i>	Reptile Creek
<i>Map Code:</i>	S7 (see Appendix 3)
<i>Drainage:</i>	Snake River
<i>Level of Knowledge:</i>	Very Low
<i>Documented Species Present:</i>	CCG
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	No Data
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Presence/absence of overwintering habitats. • Presence/patterns of use of other species. • Identification of critical habitats.
<i>Other comments:</i>	<ul style="list-style-type: none"> • n/a
<i>References:</i>	Indigo River- 1996

Table 9. Summary Information for Bonnet Plume River.

<i>Stream:</i>	Bonnet Plume River
<i>Map Code:</i>	S8 (see Appendix 2)
<i>Drainage:</i>	Peel River
<i>Level of Knowledge:</i>	Low to Moderate
<i>Documented Species Present:</i>	GR, DV, CCG, RW, LT
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	Yes
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Presence/extent of overwintering habitats. • Presence/patterns of use of other species. • Identification of critical habitats.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Excellent habitat throughout River for GR, DV, & RW. • Fish captured throughout mainstem. • LT stomach contained clams and snails. • Winter open water areas observed by Mayo resident.
<i>References:</i>	Elson-1974, DFO Stream Files-2006, Yukon Government-2000, Bodaly and Lindsey-1977, O'Donoghue pers. comm.-2006

Table 10. Summary Information for Rapitan Creek.

<i>Stream:</i>	Rapitan Creek
<i>Map Code:</i>	S9 (see Appendix 4)
<i>Drainage:</i>	Bonnet Plume River
<i>Level of Knowledge:</i>	Low
<i>Documented Species Present:</i>	GR, LSU, CCG
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	No Data
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Presence/extent of overwintering habitats. • Presence/patterns of use of other species. • Identification of critical habitats.
<i>Other comments:</i>	LSU observed near confluence with Bonnet Plume.
<i>References:</i>	Yukon Government-2000

Table 11. Summary Information for Slats Creek.

<i>Stream:</i>	Slats Creek
<i>Map Code:</i>	S10 (see Appendix 4)
<i>Drainage:</i>	Bonnet Plume River
<i>Level of Knowledge:</i>	Very Low
<i>Documented Species Present:</i>	GR, CCG
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	No Data
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Presence/extent of overwintering habitats. • Presence/patterns of use by all species. • Identification of critical habitats.
<i>Other comments:</i>	<ul style="list-style-type: none"> • n/a
<i>References:</i>	Yukon Government-2000

Table 12. Summary Information for Unnamed Creek.

<i>Stream:</i>	Unnamed Creek
<i>Map Code:</i>	S11 (see Appendix 4)
<i>Drainage:</i>	Bonnet Plume River
<i>Level of Knowledge:</i>	Very Low
<i>Documented Species Present:</i>	DV
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	No Data
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Presence/extent of overwintering habitats. • Presence/patterns of use of other species. • Identification of critical habitats.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Fish captured 100m upstream from Bonnet Plume
<i>References:</i>	Yukon Government-2000

Table 13. Summary Information for Unnamed Creek.

<i>Stream:</i>	Unnamed Creek
<i>Map Code:</i>	S12 (see Appendix 4)
<i>Drainage:</i>	Bonnet Plume River
<i>Level of Knowledge:</i>	Very Low
<i>Documented Species Present:</i>	DV
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	No Data
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Presence/extent of overwintering habitats. • Presence/patterns of use of other species. • Identification of critical habitats.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Fish captured 100m upstream from Bonnet Plume
<i>References:</i>	Yukon Government-2000

Table 14. Summary Information for Unnamed Creek.

<i>Stream:</i>	Unnamed Creek
<i>Map Code:</i>	S13 (see Appendix 3)
<i>Drainage:</i>	Bonnet Plume River
<i>Level of Knowledge:</i>	Very Low
<i>Documented Species Present:</i>	DV
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	No Data
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Presence/extent of overwintering habitats. • Presence/patterns of use of other species. • Identification of critical habitats.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Fish captured 100m upstream from Bonnet Plume
<i>References:</i>	Yukon Government-2000

Table 15. Summary Information for Wind River.

<i>Stream:</i>	Wind River
<i>Map Code:</i>	S14 (see Appendix 2)
<i>Drainage:</i>	Peel River
<i>Level of Knowledge:</i>	Moderate
<i>Documented Species Present:</i>	GR, DV, LSU, CCG, RW
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	Yes, good potential throughout mainstem.
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Further understanding/ confirmation of overwintering, patterns of use of all species. • Identification of critical habitats.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Some open water during winter and aufies build up in certain areas, sampling conducted throughout mainstem • Excellent spawning and rearing habitat for GR, DV, & RW throughout upper 160km.
<i>References:</i>	LGL-1981, Elson-1974, DFO Stream Files-2006, Bodaly and Lindsey-1977

Table 16. Summary Information for Hungry Creek.

<i>Stream:</i>	Hungry Creek
<i>Map Code:</i>	S15 (see Appendix 2)
<i>Drainage:</i>	Wind River
<i>Level of Knowledge:</i>	Very Low
<i>Documented Species Present:</i>	NP
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	No Data
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Presence/extent of overwintering habitats. • Presence/patterns of use of other species. • Identification of critical habitats.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Slow moving, silt-laden stream draining Hungry Lake. • Only NP captured.
<i>References:</i>	DFO Stream Files-2006

Table 17. Summary Information for Illtyd Creek.

<i>Stream:</i>	Illtyd Creek
<i>Map Code:</i>	S16 (see Appendix 2)
<i>Drainage:</i>	Wind River
<i>Level of Knowledge:</i>	Low
<i>Documented Species Present:</i>	GR, DV, CCG
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	Yes
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Confirmation/ extent of overwintering habitats. • Presence/patterns of use of all species. • Identification of critical habitats.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Open water during winter, aulfies build up.
<i>References:</i>	LGL-1981, DFO Stream Files-2006

Table 18. Summary Information for Peel River Mainstem--Upstream of Aberdeen Canyon.

<i>Stream:</i>	Peel River Mainstem--Upstream of Aberdeen Canyon
<i>Map Code:</i>	S17 (see Appendix 2)
<i>Drainage:</i>	Mackenzie River
<i>Level of Knowledge:</i>	Low to Moderate
<i>Documented Species Present:</i>	GR, DV, LW, BB, LSU, LKC, CCG, RW
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	No Data, strong potential throughout mainstem.
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Presence/extent of overwintering habitats. • Presence/patterns of use by all species. • Identification of critical habitats.
<i>Other comments:</i>	<ul style="list-style-type: none"> • A number of flow reversals occurred during the last glacial period—portions of the Peel into the Porcupine and vice-versa. • Only char above canyon are DV.
<i>References:</i>	von Finster-2003

Table 19. Summary Information for Dalglish Creek.

<i>Stream:</i>	Dalglish Creek
<i>Map Code:</i>	S36 (see Appendix 2)
<i>Drainage:</i>	Peel River
<i>Level of Knowledge:</i>	Low
<i>Documented Species Present:</i>	GR, LW, LSU, CCG, RW
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	Yes
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Presence/extent of overwintering habitats. • Identification of critical habitats. • Patterns of use by all species.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Suspect overwintering in lower reaches of stream. • Fish captured in spring and fall.
<i>References:</i>	ACCESS-2001

Table 20. Summary Information for Hart River.

<i>Stream:</i>	Hart River
<i>Map Code:</i>	S18 (see Appendix 2)
<i>Drainage:</i>	Peel River
<i>Level of Knowledge:</i>	Very Low
<i>Documented Species Present:</i>	GR, RW
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	No Data
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Significant/medium sized river with almost no information available. • Seriously needs attention prior to planning for development activities. • Presence/extent of overwintering habitats. • Presence/patterns of use by all species. • Identification of critical habitats.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Only extreme headwaters sampled
<i>References:</i>	Elson-1974

Table 21. Summary Information for Char Creek.

<i>Stream:</i>	Char Creek (trib. to Hart)
<i>Map Code:</i>	S19 (see Appendix 7)
<i>Drainage:</i>	Hart River
<i>Level of Knowledge:</i>	Very Low
<i>Documented Species Present:</i>	DV
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	No Data
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Presence/extent of overwintering habitats. • Presence/patterns of use by all species. • Identification of critical habitats.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Observation of spawning DV reported, location not specified—source from Dan McDiarmid.
<i>References:</i>	Yukon Government -2003

Table 22. Summary Information for Enterprise Creek.

<i>Stream:</i>	Enterprise Creek
<i>Map Code:</i>	S37 (see Appendix 2)
<i>Drainage:</i>	Peel River
<i>Level of Knowledge:</i>	Low
<i>Documented Species Present:</i>	GR, CCG, RW
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	Yes
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Presence/extent of overwintering habitats. • Identification of critical habitats. • Patterns of use by all species.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Suspect overwintering in lower reaches of stream. • Only CCG captured during spring.
<i>References:</i>	ACCESS-2001

Table 23. Summary Information for Blackstone River.

<i>Stream:</i>	Blackstone River
<i>Map Code:</i>	S20 (see Appendix 6)
<i>Drainage:</i>	Peel River
<i>Level of Knowledge:</i>	Moderate
<i>Documented Species Present:</i>	GR, DV, BB, LSU, LKC, CCG, RW
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	Yes, good potential throughout watershed.
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Confirmation of overwintering habitats and patterns of use of all species. • Identification of critical habitats.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Possible overwintering habitat in many areas--much open water in winter.
<i>References:</i>	von Finster-1999, Yukon Government -2003, Beak-1979, DFO Stream Files-2006, Bodaly and Lindsey-1977

Table 24. Summary Information for Cache Creek.

<i>Stream:</i>	Cache Creek
<i>Map Code:</i>	S21 (see Appendix 7)
<i>Drainage:</i>	Blackstone River
<i>Level of Knowledge:</i>	Very Low
<i>Documented Species Present:</i>	GR, DV
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	No Data
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Presence/extent of overwintering habitats. • Presence/patterns of use by all species. • Identification of critical habitats.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Spawning and rearing habitat for GR & DV.
<i>References:</i>	Beak-1979

Table 25. Summary Information for East Seela Creek.

<i>Stream:</i>	East Seela Creek
<i>Map Code:</i>	S22 (see Appendix 7)
<i>Drainage:</i>	Blackstone River
<i>Level of Knowledge:</i>	Low
<i>Documented Species Present:</i>	DV, CCG
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	No Data
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Presence/extent of overwintering habitats. • Presence/patterns of use by all species. • Identification of critical habitats.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Fish captured in lower 400 m of stream.
<i>References:</i>	Yukon Government -2003

Table 26. Summary Information for Junior Creek.

<i>Stream:</i>	Junior Creek
<i>Map Code:</i>	S23 (see Appendix 7)
<i>Drainage:</i>	Blackstone River
<i>Level of Knowledge:</i>	Low
<i>Documented Species Present:</i>	CCG, DV
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	No Data
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Presence/extent of overwintering habitats. • Presence/patterns of use by all species. • Identification of critical habitats.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Fish captured in lower 200 m of stream.
<i>References:</i>	Yukon Government -2003

Table 27. Summary Information for Arrow Creek.

<i>Stream:</i>	Arrow Creek
<i>Map Code:</i>	S24 (see Appendix 7)
<i>Drainage:</i>	Blackstone River
<i>Level of Knowledge:</i>	Low
<i>Documented Species Present:</i>	GR, CCG
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	No Data
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Presence/extent of overwintering habitats. • Presence/patterns of use by all species. • Identification of critical habitats.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Fish captured in lower 300 m of stream.
<i>References:</i>	Yukon Government -2003

Table 28. Summary Information for Bompas Creek.

<i>Stream:</i>	Bompas Creek
<i>Map Code:</i>	S25 (see Appendix 7)
<i>Drainage:</i>	Blackstone River
<i>Level of Knowledge:</i>	Low
<i>Documented Species Present:</i>	DV, CCG
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	No Data
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Presence/extent of overwintering habitats. • Presence/patterns of use by all species. • Identification of critical habitats.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Fish captured in lower 250 m of stream.
<i>References:</i>	Yukon Government-2003

Table 29. Summary Information for Azure Creek.

<i>Stream:</i>	Azure Creek
<i>Map Code:</i>	S26 (see Appendix 7)
<i>Drainage:</i>	Blackstone River
<i>Level of Knowledge:</i>	Low
<i>Documented Species Present:</i>	GR, DV, CCG
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	No Data
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Presence/extent of overwintering habitats. • Presence/patterns of use by all species. • Identification of critical habitats.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Fish captured in lower 150 m of stream.
<i>References:</i>	Yukon Government-2003

Table 30. Summary Information for East Blackstone River.

<i>Stream:</i>	East Blackstone River
<i>Map Code:</i>	S27 (see Appendix 7)
<i>Drainage:</i>	Blackstone River
<i>Level of Knowledge:</i>	Low to Moderate
<i>Documented Species Present:</i>	GR, DV, CCG, RW
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	Yes
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Confirmation of overwintering habitats and patterns of use of all species. • Identification of critical habitats.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Very few adult fish observed despite excellent habitat (2004). • Spawning and rearing habitat for DV. • Possible overwintering habitat.
<i>References:</i>	Yukon Government-2005, Beak-1979, DFO Stream Files-2006

Table 31. Summary Information for Yakamaw Creek.

<i>Stream:</i>	Yakamaw Creek
<i>Map Code:</i>	S28 (see Appendix 7)
<i>Drainage:</i>	East Blackstone River
<i>Level of Knowledge:</i>	Low
<i>Documented Species Present:</i>	GR, DV, CCG
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	No Data
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Presence/extent of overwintering habitats. • Presence/patterns of use by all species. • Identification of critical habitats.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Fish captured 2/3 of the way up the stream to the small lake near the start of the stream. • Stream is free of barriers up to lake.
<i>References:</i>	Yukon Government-2003

Table 32. Summary Information for Unnamed Creek.

<i>Stream:</i>	Unnamed Creek
<i>Map Code:</i>	S29 (see Appendix 7)
<i>Drainage:</i>	East Blackstone River
<i>Level of Knowledge:</i>	Very Low
<i>Documented Species Present:</i>	GR, CCG
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	No Data
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Presence/extent of overwintering habitats. • Presence/patterns of use by all species.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Small stream drains lake east of D. Highway just upstream of Foxy Cr. • Spawning and rearing habitat for GR.
<i>References:</i>	Beak-1979

Table 33. Summary Information for Foxy Creek.

<i>Stream:</i>	Foxy Creek
<i>Map Code:</i>	S30 (see Appendix 7)
<i>Drainage:</i>	East Blackstone River
<i>Level of Knowledge:</i>	Very Low
<i>Documented Species Present:</i>	GR, DV, CCG
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	No Data
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Presence/extent of overwintering habitats. • Presence/patterns of use by all species.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Excellent confirmed GR & DV spawning and rearing habitat. • Possibly some minor overwintering.
<i>References:</i>	Beak-1979

Table 34. Summary Information for Ogilvie River.

<i>Stream:</i>	Ogilvie River
<i>Map Code:</i>	S31 (see Appendix 6)
<i>Drainage:</i>	Peel River
<i>Level of Knowledge:</i>	Moderate
<i>Documented Species Present:</i>	GR, BB, LSU, CCG, RW
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	Yes, good potential throughout mainstem
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Significant/medium sized river with little information available--nothing upstream of Dempster Hwy. Crossing. • Seriously needs attention. • Presence/extent of overwintering habitats. • Presence/patterns of use by all species.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Ogilvie mainstem sampled at three locations. • Suspected significant overwintering areas. • Excellent GR habitat of all types. • Significant habitat for various species.
<i>References:</i>	Beak-1979, DFO Stream Files-2006, Bodaly and Lindsey-1977, ACCESS-2001

Table 35. Summary Information for Unnamed Creek.

<i>Stream:</i>	Unnamed Creek
<i>Map Code:</i>	S32 (see Appendix 6)
<i>Drainage:</i>	Ogilvie River
<i>Level of Knowledge:</i>	Very Low
<i>Documented Species Present:</i>	GR
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	No Data
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Patterns of use by all species.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Small stream below Scriver Creek, drains valley adjacent to Dempster Highway. • Only juvenile GR captured.
<i>References:</i>	Beak-1979

Table 36. Summary Information for Scriver Creek.

<i>Stream:</i>	Scriver Creek
<i>Map Code:</i>	S33 (see Appendix 6)
<i>Drainage:</i>	Ogilvie River
<i>Level of Knowledge:</i>	Very Low
<i>Documented Species Present:</i>	GR
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	No Data
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Patterns of use by all species.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Small stream drains valley adjacent to Dempster Highway. • Only juvenile GR captured.
<i>References:</i>	Beak-1979

Table 37. Summary Information for Engineer Creek.

<i>Stream:</i>	Engineer Creek
<i>Map Code:</i>	S34 (see Appendix 6)
<i>Drainage:</i>	Ogilvie River
<i>Level of Knowledge:</i>	Low
<i>Documented Species Present:</i>	GR, BB, CCG, RW
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	Yes
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Presence/extent of overwintering habitats. • Presence/patterns of use by all species.
<i>Other comments:</i>	<ul style="list-style-type: none"> • Heavily used rearing habitat for GR. • Possibly some overwintering habitat.
<i>References:</i>	Beak-1979, Duncan pers. comm-2006

Table 38. Summary Information for Soldier Creek.

<i>Stream:</i>	Soldier Creek
<i>Map Code:</i>	S35 (see Appendix 6)
<i>Drainage:</i>	Engineer Creek
<i>Level of Knowledge:</i>	Very Low
<i>Documented Species Present:</i>	GR
<i>Identified or Inferred Overwintering Habitat:</i>	No Data
<i>Suspected or Potential Overwintering Habitat:</i>	No Data
<i>Data Gaps:</i>	<ul style="list-style-type: none"> • Presence/extent of overwintering habitats
<i>Other comments:</i>	<ul style="list-style-type: none"> • n/a
<i>References:</i>	DFO Stream Files-2006

3.2 Specific Lake Information

Information on 22 specific lakes was summarized from past scientific/technical studies. The information presented is generally limited and/or of a “snapshot” nature. Lakes identified as having over-wintering populations of fish, or are suspected to provide such habitat, have been identified as such. In cases where no such information is available and LT are present, over-wintering has been inferred as “suspected.” Considering the geological and glacial history of the area, most lakes in the Peel watershed are likely to provide over-wintering habitat for fish and therefore should always be assumed as such until proven otherwise. However, in most cases, the information sources should be considered limited. The information collected regarding each lake is presented below in Tables 37 to 57. Also, for maps illustrating the locations of the lakes, see Appendices 1 through 7.

Table 40. Specific Information for Dog Lake.

Lake:	Dog Lake
Map Code:	L2 (see Appendix 2)
Drainage:	Solo Creek
Known Species Present:	WSU, LKC
Knowledge level:	Very low
Overwintering Potential:	Suspected
Other Comments:	<ul style="list-style-type: none"> • Most upstream location of WSU
References:	Bodaly and Lindsey-1977

Table 41. Specific Information for Popcornfish Lake.

Lake:	Popcornfish Lake
Map Code:	L3 (see Appendix 2)
Drainage:	Noisy Creek
Known Species Present:	GR, LSU, RW
Knowledge level:	Low
Overwintering Potential:	Unknown
Other Comments:	<ul style="list-style-type: none"> • LSU stocks may be a mix of Yukon and Mackenzie origins.
References:	Bodaly and Lindsey-1977, Yukon Government-2005

Table 42. Specific Information for Quartet Lakes.

Lake:	Quartet Lakes
Map Code:	L4 (see Appendix 4)
Drainage:	Bonnet Plume River
Known Species Present:	LW
Knowledge level:	Very Low
Overwintering Potential:	Suspected
Other Comments:	<ul style="list-style-type: none"> • Origin of LW stock not determined to date.
References:	Yukon Government-2005

Table 43. Specific Information for Margaret Lake.

Stream:	Margaret Lake
Map Code:	L5 (see Appendix 2)
Drainage:	Bonnet Plume River
Known Species Present:	LT, LW, NP, CCG
Knowledge level:	Low to Moderate
Overwintering Potential:	Strongly Suspected
Other Comments:	<ul style="list-style-type: none"> • Very large NP present. • LW stock is a relict of Yukon River origin--likely highly genetically significant. • NP also show more affinity to Yukon origins.
References:	Yukon Government-2005, Archibald-1977, Elson-1974, DFO-Stream Files-2006, Bodaly and Lindsey-1977

Table 44. Specific Information for Pinguicula Lake.

<i>Lake:</i>	Pinguicula Lake
<i>Map Code:</i>	L6 (see Appendix 4)
<i>Drainage:</i>	Bonnet Plume River
<i>Known Species Present:</i>	LT, RW
<i>Knowledge level:</i>	Low
<i>Overwintering Potential:</i>	Suspected
<i>Other Comments:</i>	n/a
<i>References:</i>	Yukon Government-2000, Yukon Government-2005, Bodaly and Lindsey-1977

Table 45. Specific Information for Bonnet Plume Lake.

<i>Lake:</i>	Bonnet Plume Lake
<i>Map Code:</i>	L7 (see Appendix 3)
<i>Drainage:</i>	Bonnet Plume River
<i>Known Species Present:</i>	GR, LT, CCG, RW
<i>Knowledge level:</i>	Low to Moderate
<i>Overwintering Potential:</i>	Suspected
<i>Other Comments:</i>	n/a
<i>References:</i>	Yukon Government-2000, Yukon Government-2005, Bodaly and Lindsey-1977

Table 46. Specific Information for Duo Lakes.

<i>Lake:</i>	Duo Lakes
<i>Map Code:</i>	L8 (see Appendix 3)
<i>Drainage:</i>	Bonnet Plume River
<i>Known Species Present:</i>	GR, LT, CCG
<i>Knowledge level:</i>	Low
<i>Overwintering Potential:</i>	Strongly Suspected
<i>Other Comments:</i>	<ul style="list-style-type: none"> • Probable overwintering habitat
<i>References:</i>	Yukon Government-2000, DFO Stream Files-2006

Table 47. Specific Information for Goz Lakes.

<i>Lake:</i>	Goz Lakes
<i>Map Code:</i>	L9 (see Appendix 3)
<i>Drainage:</i>	Bonnet Plume River
<i>Known Species Present:</i>	RW, LT
<i>Knowledge level:</i>	Very low
<i>Overwintering Potential:</i>	Unknown
<i>Other Comments:</i>	LT used this lake up to the mid-1980s.
<i>References:</i>	Yukon Government-2000, O'Donoghue pers comm.-2006

Table 48. Specific Information for Fairchild Lake.

Lake:	Fairchild Lake
Map Code:	L10
Drainage:	Bonnet Plume River
Known Species Present:	LT, CCG
Knowledge level:	Low
Overwintering Potential:	Suspected
Other Comments:	n/a
References:	Yukon Government-2005, Bodaly and Lindsey-1977

Table 49. Specific Information for Unnamed Lake.

Lake:	Unnamed Lake
Map Code:	L11 (see Appendix 3)
Drainage:	Bonnet Plume River
Known Species Present:	DV, CCG
Knowledge level:	Very Low
Overwintering Potential:	Unknown
Other Comments:	<ul style="list-style-type: none"> • Small lake at start of Bonnet Plume River
References:	Yukon Government-2000

Table 50. Specific Information for Chappie Lakes

Lake:	Unnamed Lake
Map Code:	L22 (see Appendix 2)
Drainage:	Bonnet Plume River
Known Species Present:	NP
Knowledge level:	Very Low
Overwintering Potential:	Unknown
Other Comments:	<ul style="list-style-type: none"> • Shallow Lakes, NP observed in two of the smaller lakes • Chappie Lake (largest) itself appears to be very shallow
References:	Mossop et al.- 2002

Table 51. Specific Information for Hungry Lake.

Lake:	Hungry Lake
Map Code:	L12 (see Appendix 2)
Drainage:	Wind River
Known Species Present:	NP
Knowledge level:	Low
Overwintering Potential:	Unknown
Other Comments:	<ul style="list-style-type: none"> • Only NP captured, & these stocks show more affinity for Yukon origins than Mackenzie
References:	DFO Stream Files-2006, Bodaly and Lindsey-1977

Table 52. Specific Information for Lamond Lake.

Lake:	Lamond Lake
Map Code:	L21 (see Appendix 7)
Drainage:	Hart River
Known Species Present:	GR, RW
Knowledge level:	Low
Overwintering Potential:	Suspected
Other Comments:	<ul style="list-style-type: none"> • Start of Lamond Cr., likely overwintering habitat.
References:	DFO Stream Files-2006, Mann & Tsui-1977

Table 53. Specific Information for Hart Lake.

Lake:	Hart Lake
Map Code:	L13 (see Appendix 5)
Drainage:	Hart River
Known Species Present:	GR, LT, LSU, RW
Knowledge level:	Low
Overwintering Potential:	Suspected
Other Comments:	<ul style="list-style-type: none"> • Start of Hart River
References:	Elson-1974, Bodaly and Lindsey-1977

Table 54. Specific Information for Elliot Lake.

Lake:	Elliot Lake
Map Code:	L14 (see Appendix 5)
Drainage:	Hart River
Known Species Present:	GR, DV, LT, LSU, CCG, RW, PW
Knowledge level:	low
Overwintering Potential:	Suspected
Other Comments:	<ul style="list-style-type: none"> • Headwaters of Hart River
References:	Elson-1974, Bodaly and Lindsey-1977

Table 55. Specific Information for Unnamed (Horn) Lake.

Lake:	Unnamed (Horn) Lake
Map Code:	L15 (see Appendix 7)
Drainage:	Blackstone River
Known Species Present:	DV
Knowledge level:	Very Low
Overwintering Potential:	Unknown
Other Comments:	<ul style="list-style-type: none"> • Located at the Base of Mt. Horn, possibly important overwintering habitat.
References:	Yukon Government -2004

Table 56. Specific Information for Unnamed Lake.

Lake:	Unnamed Lake
<i>Map Code:</i>	L16 (see Appendix 7)
<i>Drainage:</i>	Blackstone River
<i>Known Species Present:</i>	LT
<i>Knowledge level:</i>	Very low
<i>Overwintering Potential:</i>	Suspected
<i>Other Comments:</i>	<ul style="list-style-type: none"> • Located on Hammer Creek, at the Base of Prune Mt., likely important overwintering habitat.
<i>References:</i>	Yukon Government -2003

Table 57. Specific Information for Chapman Lake.

Lake:	Chapman Lake
<i>Map Code:</i>	L17 (see Appendix 7)
<i>Drainage:</i>	Blackstone River
<i>Known Species Present:</i>	GR, BB, LSU, RW
<i>Knowledge level:</i>	Low to Moderate
<i>Overwintering Potential:</i>	Confirmed Overwintering
<i>Other Comments:</i>	<ul style="list-style-type: none"> • Important habitat for all life stages, and overwintering for all species. • Connection with Blackstone uncertain.
<i>References:</i>	Beak-1979, DFO Stream Files-2006, Mann & Tsui-1977, Bodaly and Lindsey-1977

Table 58. Specific Information for Unnamed Lake.

Lake:	Unnamed Lake
<i>Map Code:</i>	L18 (see Appendix 7)
<i>Drainage:</i>	East Blackstone River
<i>Known Species Present:</i>	DV
<i>Knowledge level:</i>	Very Low
<i>Overwintering Potential:</i>	Confirmed Overwintering
<i>Other Comments:</i>	<ul style="list-style-type: none"> • Small deep lake, drained by small intermittent stream. • Overwintering habitat.
<i>References:</i>	Mann & Tsui-1977

Table 59. Specific Information for Unnamed Lake.

Lake:	Unnamed Lake
<i>Map Code:</i>	L19 (see Appendix 7)
<i>Drainage:</i>	East Blackstone River
<i>Known Species Present:</i>	GR, RW
<i>Knowledge level:</i>	Very Low
<i>Overwintering Potential:</i>	Suspected
<i>Other Comments:</i>	<ul style="list-style-type: none"> • Possible overwintering habitat.
<i>References:</i>	Mann & Tsui-1977

Table 60. Specific Information for Unnamed Lake.

<i>Lake:</i>	Unnamed Lake
<i>Map Code:</i>	L20 (see Appendix 7)
<i>Drainage:</i>	East Blackstone River
<i>Known Species Present:</i>	GR, RW
<i>Knowledge level:</i>	Low
<i>Overwintering Potential:</i>	Unknown
<i>Other Comments:</i>	<ul style="list-style-type: none"> • Shallow Lake, important rearing habitat for GR, lake near head of E. Blackstone. • Water was anoxic in mid-November. • "North Fork Pass Lake" in Bodaly and Lindsey-1977.
<i>References:</i>	Beak-1979, Mann & Tsui-1977, Bodaly and Lindsey-1977

4.0 DISCUSSION

The information summarized in this report is a documentation of existing fisheries knowledge regarding the Yukon portion of the Peel River watershed. Most relevant information has been obtained and summarized/synthesized into this report and associated map products.

It should be noted that as with fish populations, fish habitat is not a static resource. Rather, it is influenced by a complex and dynamic set of factors, components, and systems that work together to create a particular set of conditions in a particular place and time. That is, the biotic and abiotic components of ecosystems that result in aquatic habitats favourable to fish are dynamic and in constant flux. For example, a particularly dry summer may result in lower than average groundwater discharges throughout the following winter. Alternatively, an extremely cold winter could result in a lake that normally over-winters fish becoming anoxic. Both of these examples have the potential to significantly impact over-wintering populations of fish. Another example of the dynamic nature of fish habitat could be changes in natural water quality due to changes in subsurface and surface hydrological pathways (i.e. exposure to different areas of bedrock or sedimentation from changing permafrost conditions). As mentioned above, the factors and variables that influence habitat conditions are many and complex. From a Land Use Planning perspective, understanding processes that create favourable fish habitat can provide an opportunity to plan land-use developments in a manner that may work within natural processes and systems. Through this approach, such planning can effectively minimize or prevent impacts upon fish populations and their habitat.

Generally, the amount of information available regarding the Peel River watershed is limited and patchy. Some sampling has been conducted in various parts of the watershed, however the vast majority of it is of a “snapshot” nature and thereby provides very limited insight into the habitat use. In some streams, enough of such sampling has been conducted over the years to provide at least a basic understanding of species presence/absence. In others, even this is not the case. Very little information is available regarding habitat usage, however some limited such information does exist in particular areas.

4.1 Corregonids

Anadromous and potadromous populations of Corregonids (whitefish species and inconnu) utilize the Peel River downstream of Aberdeen Canyon for spawning, overwintering, and as a migration route (VanGerwen-Toyne & Walker-Larsen, 2004). Upstream of Aberdeen Canyon (impassable to fish), the presence of Corregonids has not been documented with the exception of round whitefish. The lower 60 km of the Snake River exhibits habitat characteristics similar to the lower Peel, however the use of this area by Corregonids has not been established. Inconnu, however, have been captured in the lower Snake (Elson, 1974).

The most significant migratory Corregonid species in the Peel River is broad whitefish. An extensive study of migratory Corregonids and inconnu in the Peel was conducted over 5 years from 1998 to 2002. This research found that broad whitefish composed 47.6 percent of the total catch. Next was lake whitefish, at 15.5 percent of the total catch, followed by arctic cisco at 11.6 percent, inconnu at 9.5 percent, and least cisco at 4.4 percent. This study provides a basic understanding of the biology and migratory behaviour of corregonid and inconnu populations in the lower Peel watershed. All population samples appeared to vary in size from year to year. However, broad whitefish and lake whitefish appeared to be the most stable while the others fluctuated widely. A notable finding in this regard were the results for least cisco, which exhibited a clear pattern of very low to no captures on alternate years

(VanGerwen-Toyne & Walker-Larsen, 2004). Dillinger et al (1992) found that arctic cisco populations utilizing the Peel River may behave differently than other arctic cisco populations in the Mackenzie system in that they may migrate upstream earlier (during the summer) than other populations. However, the later work by VanGerwen-Toyne & Walker-Larsen (1998-2003) could not confirm nor substantiate this possibility, but rather presented inconclusive and conflicting information in this regard. It is therefore clear that further research is required to understand migratory patterns of arctic cisco.

Broad whitefish radio tagging and telemetry studies conducted in the Mackenzie Delta region between 1982 and 1993 identified a spawning area in the Peel mainstem near the mouth of the Trail River, as well as overwintering areas downstream of this area (Chang-Kue & Jessop, 1997).

While studies mentioned above regarding the Peel River provide a solid preliminary understanding of the migratory patterns of Corregonid populations, there are many critical areas requiring further investigation. The existing information base can be built upon to identify areas of critical habitat, especially the identification of all spawning and overwintering areas for all Corregonids.

4.2 Char Species

The nature and patterns of use of documented Dolly Varden populations in various portions of the Peel watershed are of interest. The large tributaries to the Peel, including the Snake, Bonnet Plume, Wind, Hart, and Blackstone rivers all have documented populations of Dolly Varden that are likely resident throughout portions of the rivers, various tributaries, and certain associated lakes. This is particularly the case in the upstream portions of each drainage basin. The notable exception to this is the Ogilvie River, and while it is commonly believed that Dolly Varden are present in the Ogilvie, no such documented evidence was identified. This may be due to the lack of available information rather than an absence of Dolly Varden, as no documented sampling was identified upstream of the Dempster Highway crossing—which includes the upstream areas most likely to have populations of this species. Those populations upstream of Aberdeen Canyon (Hart & Blackstone) are most certainly resident, as the Canyon is an impassable barrier to the upstream migration of fish. It has been assumed in the past that populations found in the upstream portions of the other large tributaries may also be resident, but that anadromous stocks may utilize more downstream areas or smaller tributaries to the Peel. Adult, juvenile, and young-of-year Dolly Varden have been captured in the Vittrekwa River during fall surveys (DFO, 2001), indicating that spawning does take place there. Residents of Fort McPherson have also reported the presence of Dolly Varden in the Road and Trail rivers. It has been suspected that these stocks may be anadromous, however no such definitive information is available. Stewart (1996) reports records of commercial and subsistence catches of Dolly Varden by Fort McPherson residents in the Peel River from 1978 and 1990. However, a subsequent five-year extensive study of Peel River fish stocks failed to capture any Dolly Varden. This was despite the use of appropriate sampling gear (variable sized gillnets) at several locations in the Peel River mainstem in the NWT and Yukon throughout the spawning and migratory period for Dolly Varden (VanGerwen-Toyne & Walker-Larsen, 2004, VanGerwen-Toyne, 2006). This would indicate that anadromous stocks of Dolly Varden are not currently utilizing the Peel River watershed. It is possible that such anadromous stocks were present in the recent past, however, further investigations would be required to account for these conflicting results/reports. Past fish sampling in the Peel mainstem, albeit limited in scope, has also not captured significant numbers of Dolly Varden, although a single adult was captured approximately 13 km upstream of the Snake River in 1973 (Elson, 1974). Further investigation is required to determine the life cycles and patterns of habitat use for Dolly Varden in the Peel River watershed, particularly those in the Vittrekwa, and possibly the Road and Trail rivers.

Lake trout, the other char species present in the Peel River watershed appears to be limited in distribution to particular lakes. The data obtained in this study indicates the presence of lake trout most frequently located in the headwater regions of the major tributaries, however, this may be a function of where most sampling has occurred rather than a true representation of distribution. The populations sampled have also generally appeared limited in both numbers and individual size. There was also a single lake trout caught in the Bonnet Plume River at the mouth of Rapitan Creek. While this may have been an anomaly, little can be concluded about the distribution and abundance of lake trout in the Peel River watershed with the limited information currently available.

4.3 Salmon Species

The presence of confirmed salmon species in the Peel River watershed has been limited to chum salmon. However, significant evidence of an annual migration of this species has not been confirmed. Findings to date are limited to anecdotal catches of chum by Fort McPherson fishers and the results of a five-year Peel River Fish Study (1998-2002). During the first year of this study, 30 chum salmon were captured in the Peel River as far upstream as Trail River in the Yukon, however, none were captured in the subsequent four years despite increased sampling effort (VanGerwen-Toyne & Walker-Larsen, 2004). Therefore, the presence of a spawning population of chum within the Peel River watershed remains unestablished. It is possible that with climate change more salmon populations may establish themselves in the Mackenzie River system. Should suitable spawning habitat exist within the Peel watershed, it may be possible that the presence of salmon will become more prevalent.

4.4 Relict Species

Many fish species found in the Peel watershed exist over North America in two or more distinct “racial” types as a result of their separation by the Wisconsin Ice Mass, the most recent glacial event. Species presently found in the Peel River system may originate from the Bering Refuge in the unglaciated Yukon basin, or from “races” originating from the Mississippi refuge south of the ices sheet in the upper Missouri and/or Mississippi drainages. Due to the unique glacial history involving the Peel watershed, fish populations found there include species of both Yukon River and Mackenzie River origins. This includes relict populations of Beringian origin that may be of significant genetic importance in terms of biodiversity and understanding past species dispersion/biology. Key in this regard are a population of lake whitefish found in Margaret Lake, which is located within the drainage of the Bonnet Plume River but currently does not have a surface connection to the river. These lake whitefish have genetically been determined to be of pure Beringian origin (Bodaly & Lindsey, 1976). Lake whitefish have also been captured in the Quartet Lakes, also in the Bonnet Plume drainage, but the genetic origins of this population have not yet been determined (Yukon Government, 2005). Such populations may be genetic “islands” of Yukon River origin stocks (certainly in Margaret Lake), and are therefore uniquely important in this regard.

Several other fish species in the Peel watershed show morphological affinity (similar physical characteristics ranging from some to much) with Yukon River origin stocks. These include slimy sculpin, northern pike, arctic grayling, longnose sucker, and lake trout. Some include indications of both Mackenzie and Yukon origins, suggesting that populations from both sources have mixed (Bodaly & Lindsey, 1976). Further genetic research in this regard could prove to be of scientific significance. Furthermore, the current dispersion of Dolly Varden in the headwaters of the Peel River may make them a valuable target of such research. Investigations to determine the genetic origins of Dolly Varden in the

upper reaches of the Peel Watershed in comparison with other northern stocks such as in the Rat and North Slope Rivers, as well as those located in various portions of the Yukon River watershed, could be of significance and relevance to understanding historical dispersions of fish in the area.

4.5 Natural Factors Affecting Fish Habitat Quality

As indicated thus far, information regarding fish populations and their habitat in the Peel River watershed is limited. As well, gathering information using standard methodology in such isolated conditions is generally very expensive. Further, from a land use management perspective, such information is limited in context and at times possibly misleading in terms of fish habitat usage. Understanding fish habitat usage in a northern system such as the Peel watershed may require a novel approach.

A constant barrier to developing such understandings is the migratory nature of many fish populations. That is, habitats are utilised on a seasonal basis, rendering “snapshot” fish sampling less effective. An understanding of the limiting factors in terms of fish habitat and associated productivity may provide a greater understanding of fish habitat in the Peel River watershed. Understanding and assessing the indicators of such factors may be a preferable and cost-effective means of ensuring that land-use activities do not impact adversely on fish habitat. Further in this regard, it should be noted that the effects of climate change are expected to be the most pronounced at high latitudes. Therefore, shifting climatic temperatures will impact fish habitat in ways that have not yet been significantly documented. Such possible effects include changing water temperatures both due to melting of subsurface ice, changing flow regimes due to changing patterns of precipitation, and increased sedimentation resulting from increased erosion due to increased melting of permafrost adjacent to riparian areas.

4.5.1 Winter Water Flows

Winter water flows are believed to represent a significant limiting factor regarding fish habitat availability and productivity in the Peel River watershed. Due to low winter temperatures and associated low flows, the amount and quality of overwintering habitat is considered to be a critical limiting factor of fish populations. Such habitat is generally found where there is sufficient water depth and inputs of oxygenated water to maintain adequate dissolved oxygen levels throughout the winter. Locations of such habitats typically can be found in the Peel River mainstem and certain lakes. As well, important overwintering habitats for fish are found in locations where there is sufficient groundwater discharge throughout the winter at a temperature that prevents freezing of the stream. In some cases this may be evident by a constant large area of open water. In other cases, groundwater discharge may occur in lower volumes and spread over a greater area of streambed. This results in constant flow under the ice and smaller areas of thin ice or open water throughout the length of a stream. Examples of these situations can be found in the Blackstone River, parts of the Wind River, as well as portions of the lower Bonnet Plume River.

4.5.2 Natural Water Quality (Bedrock Geology)

Natural water quality is considered to be another limiting factor with regard to the productivity of aquatic ecosystems in the Peel River watershed. Considering the critical nature of winter groundwater flows, the natural quality of groundwater discharges is highly significant to the value of potential overwintering habitat. Examples include sources of water discharging from bedrock formations of limestone, which tend to be hard, with high concentrations of dissolved calcium and magnesium compounds. Such hard water sources appear to be highly productive for aquatic life. On the other hand, sources of water

discharging from bedrock formations of sulphurous shale found throughout Eagle Plains tend to have higher concentrations of heavy metals such as iron, zinc, or aluminium, and may also be acidic (low pH). These sources tend to produce aquatic environments with limited biological productivity and in some cases may be completely abiotic (von Finster pers comm., 2004). Bedrock geology, therefore, may provide an indicator of water quality in a given area, and may indicate the fish habitat potential of a given water source. Such indications should, of course, always be verified through sampling and analysis.

4.5.3 Dissolved Nutrients

A further factor affecting water quality is the natural level of dissolved nutrients (ie: nitrates, phosphates, potassium). Streams with surface and ground water inputs exhibiting higher levels of such dissolved nutrients tend to be more biologically productive than those with lower levels. This also tends to be linked to bedrock geology. For example, drainage from areas of intrusive bedrock, such as granitic basoliths tend to have low nutrient levels, while drainage from sedimentary, volcanic or metamorphic formations tend to have greater nutrient levels (von Finster pers comm., 2004).

4.6 Fish Habitat and Land Use Planning

Sources of water that exhibit indications of being productive as fish habitat must be considered as such, regardless of the presence or absence of fish at the time of sampling. As mentioned previously, this is due to the migratory nature of many fish populations in the Peel watershed. Fish utilize certain habitats on a seasonal basis, and therefore such important habitats may at times appear to be void of fish. As well, dynamic population characteristics may create circumstances where populations of fish appear absent from a particular habitat during a particular year, however, may rebound to utilize said habitat in subsequently years. Such fluctuations in the use of a particular area of habitat may result from changing population sizes (effects of disease, predation, or environmental factors), or, from changing environmental factors (such as higher/lower water levels) that the change the distribution of habitat usage in a watershed.

From a land-use management perspective, watercourses and bodies associated with potential impacts from a land use activity must be assessed for fish habitat values. Flowing or standing water under winter conditions having the potential to support fish should be considered important fish habitat. Such identified fish habitats must be considered appropriately in terms of water extraction activities and other activities associated with such habitat.

From a fish habitat management perspective, limited water flows in winter is the most critical/limiting factor for fish populations in the north Yukon. Therefore, while it is a preferable option to target water extraction/consumption from water sources with natural qualities that do not favour fish at all times, this consideration becomes critical during winter months. Further, in this regard it will be critical to consider the nature of potential developments at the land use planning level. For example, most foreseeable large-scale development activity in the Peel River watershed will occur primarily during the winter, with most requiring substantial volumes of water for the construction of winter roads as well as supplying camps and possible industrial applications. Therefore, to facilitate such requirements of water supply, planning for the appropriate location and provision of infrastructure prior to actual project specific planning may be essential for protection of critical fish habitats as defined in this report.

Further to this, the impending effects of climate change should also be factored into land-use planning. Climate change has important implications for the availability of water. Should drier summers become

standard for the Peel River region, less water will be available to re-charge groundwater reserves. Even in the event that warmer temperatures do not bring drier summers, increased water losses through increased evapotranspiration may also result in less water being available to re-charge groundwater reserves. Either scenario will decrease groundwater discharges during critical winter periods, thereby reducing the current availability of overwintering habitats. This further highlights the importance of protecting winter water flows of a quality and quantity suitable for fish overwintering habitats.

5.0 CONCLUSION

As the second comprehensive Chapter 11 Land Use Plan mandated under the Yukon First Nations Umbrella Final Agreement, the Peel Watershed Regional Land Use Plan has the unique potential to “do development right.” Little development of any kind has impacted the Peel River watershed and, from a fish habitat perspective, can be considered nearly “pristine”. The opportunity represented by the Chapter 11 Land Use Planning process is therefore highly significant. As well, the results of the process and the lessons learned can provide a model for other planning processes throughout the Yukon, although some factors related to fish habitat may differ from region to region.

The information presented in this report is, at this time, the most complete available source of fisheries information regarding the Peel River watershed. A further analysis of this information, particularly in the form of maps, could provide valuable insight into habitat characteristics and ensure the comprehensive nature of this compilation. Further, Traditional Knowledge has not significantly contributed to this report, and, if available, its inclusion could prove very valuable. A focus in this regard should be the documentation of historic fishing locations, particularly fish trap locations, including listing of the number and types of species captured (if available), as well as the time of year. As additional knowledge and information becomes available, it should be incorporated into future planning and assessment activities.

Additional fish and fish habitat inventories in areas considered for development may be of assistance in defining what parameters may ensure that such development does not infringe upon critical or unique habitats and/or fish stocks.

Of *critical importance* and primary urgency in terms of land use planning and fish habitat conservation is the identification of over-wintering areas, the knowledge of which, as previously indicated, is currently very limited.

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Personal Communications:

Al von Finster. Resource Restoration Biologist, Fisheries and Oceans Canada, Whitehorse office. Telephone conversation, November 2004.

Jake Duncan. Independent Consultant, Dawson City. Telephone conversation, March 2006.

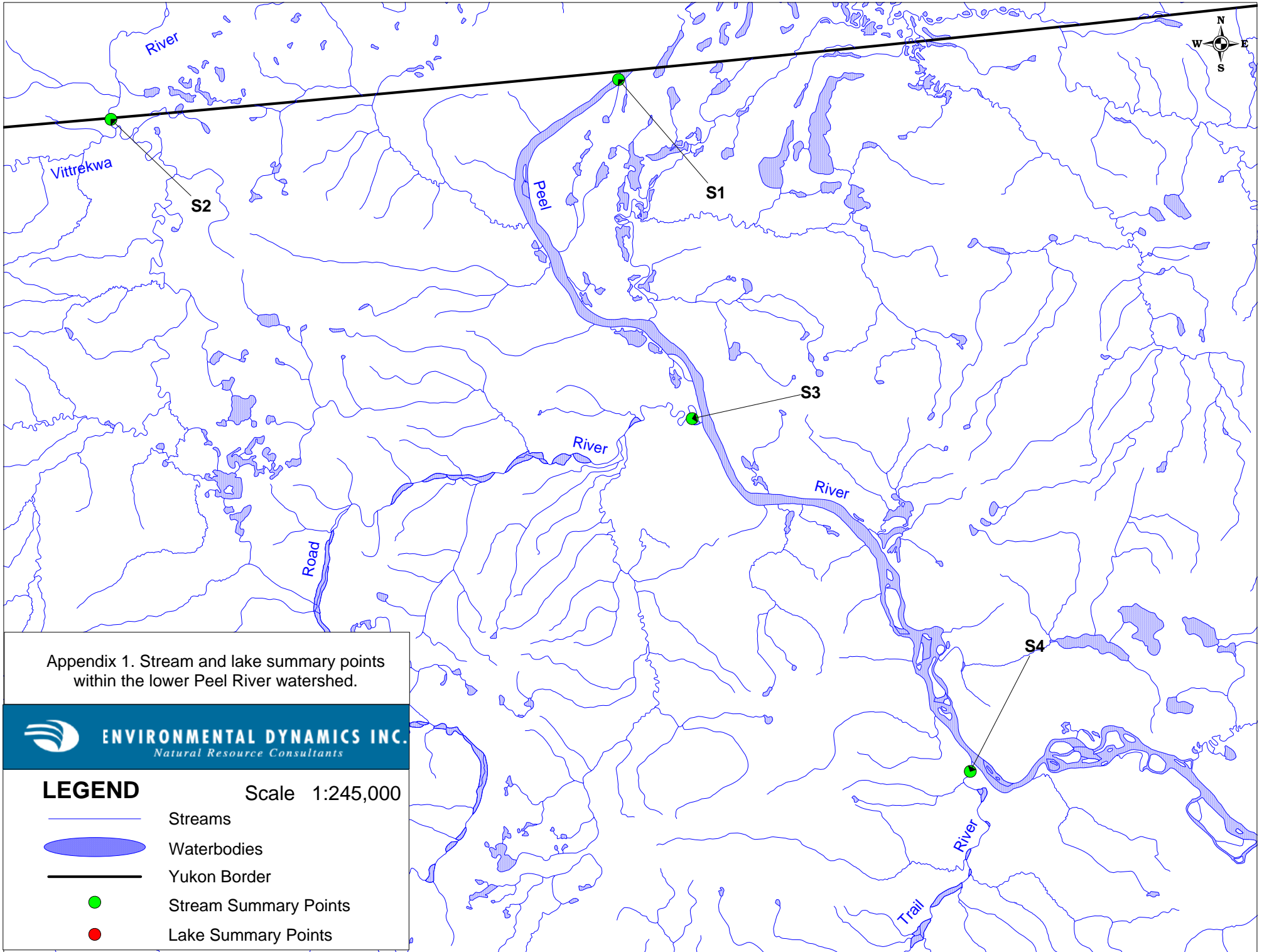
Melanie VanGerwen-Toyne. Research Biologist, Fisheries and Oceans Canada, Arctic Research Division, Winnipeg Office. Telephone conversation, March 2006.

Mark O'Donoghue. Mayo Area Regional Biologist, Department of Environment, Yukon Government. Telephone conversation, September, 2006.

7.0 APPENDICES

Detailed maps of stream and lake summary points are presented in Appendices 1 through 7.

APPENDIX 1: Stream and lake summary points within the lower Peel River watershed.








Appendix 1. Stream and lake summary points within the lower Peel River watershed.



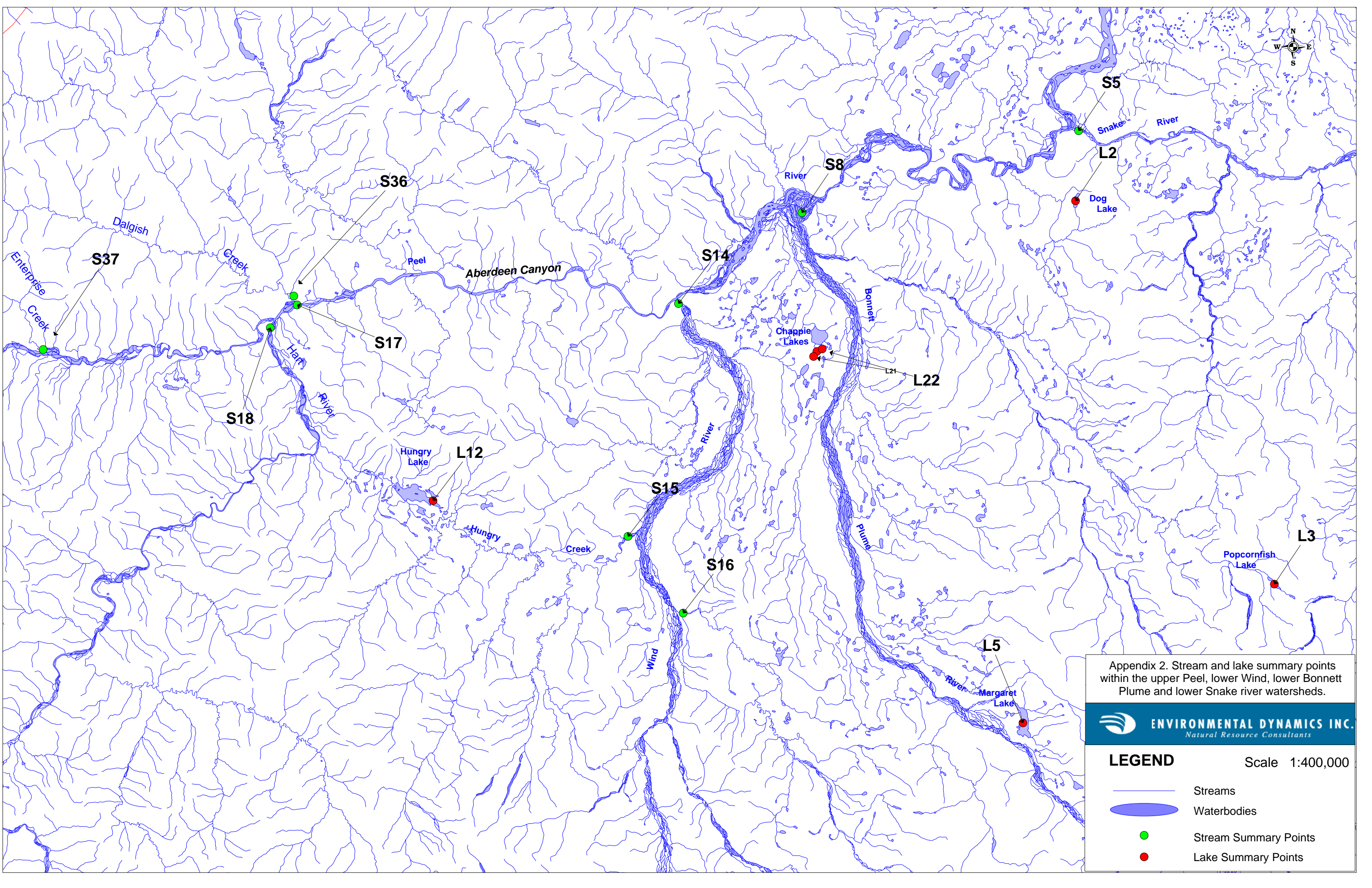
ENVIRONMENTAL DYNAMICS INC.
Natural Resource Consultants

LEGEND

Scale 1:245,000

-  Streams
-  Waterbodies
-  Yukon Border
-  Stream Summary Points
-  Lake Summary Points





APPENDIX 2: Stream and lake summary points within the upper Peel , lower Wind, lower Bonnet Plume, lower Snake watersheds.



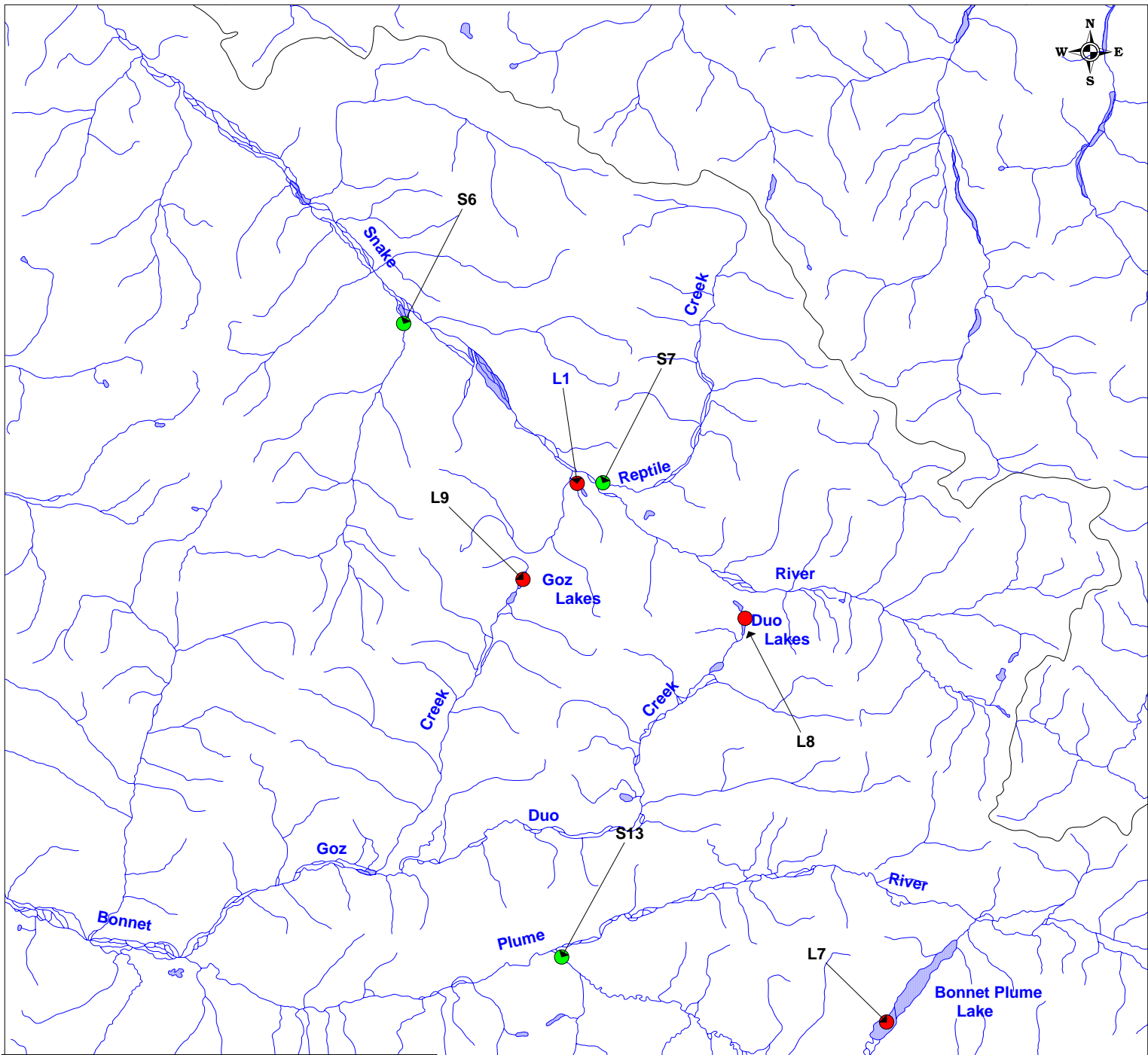
Appendix 2. Stream and lake summary points within the upper Peel, lower Wind, lower Bonnett Plume and lower Snake river watersheds.



LEGEND Scale 1:400,000

	Streams
	Waterbodies
	Stream Summary Points
	Lake Summary Points






APPENDIX 3: Stream and lake summary points within the upper Bonnet Plume and Snake watersheds.



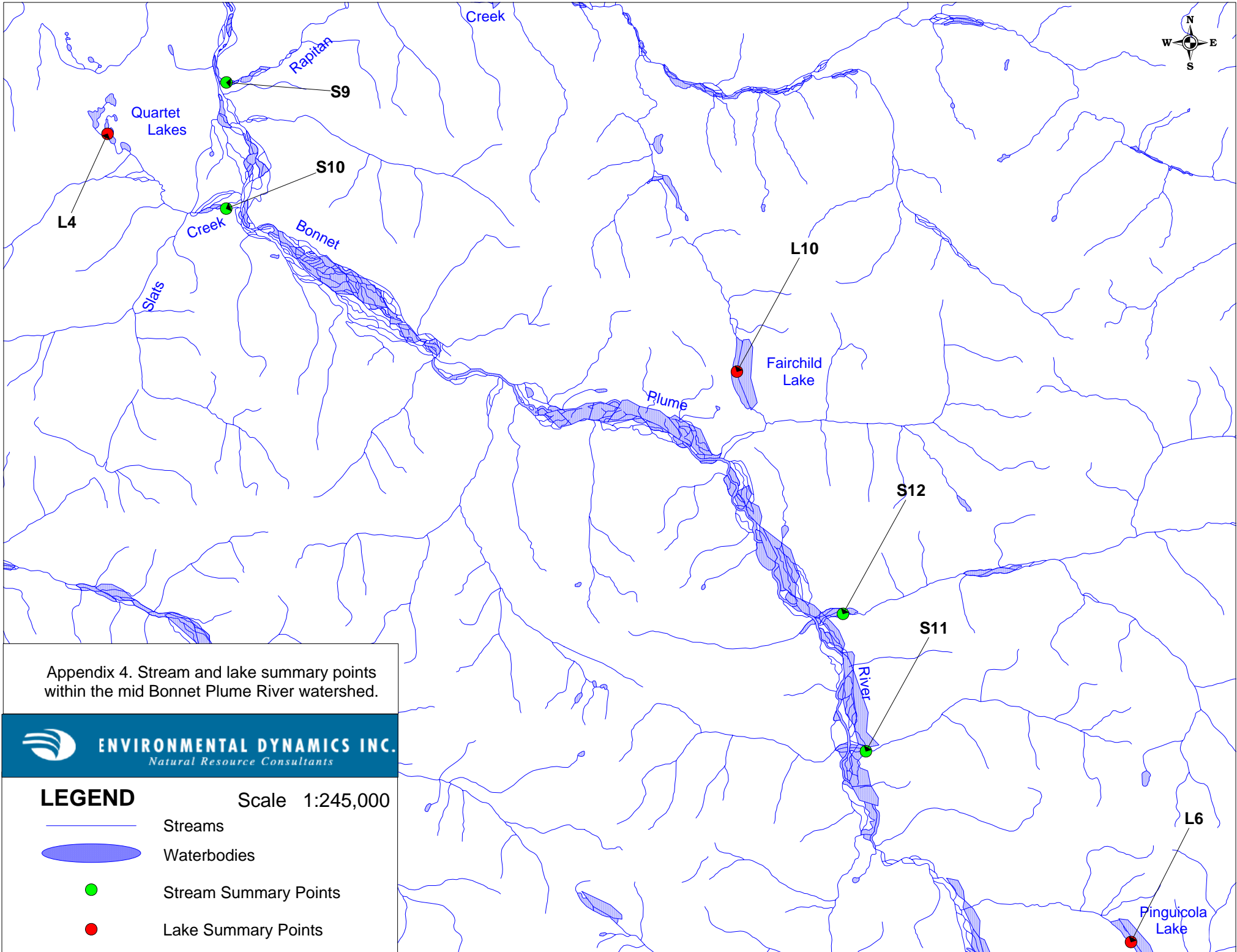
Appendix 3. Stream and lake summary points within the upper Bonnet Plume and upper Snake river watersheds.



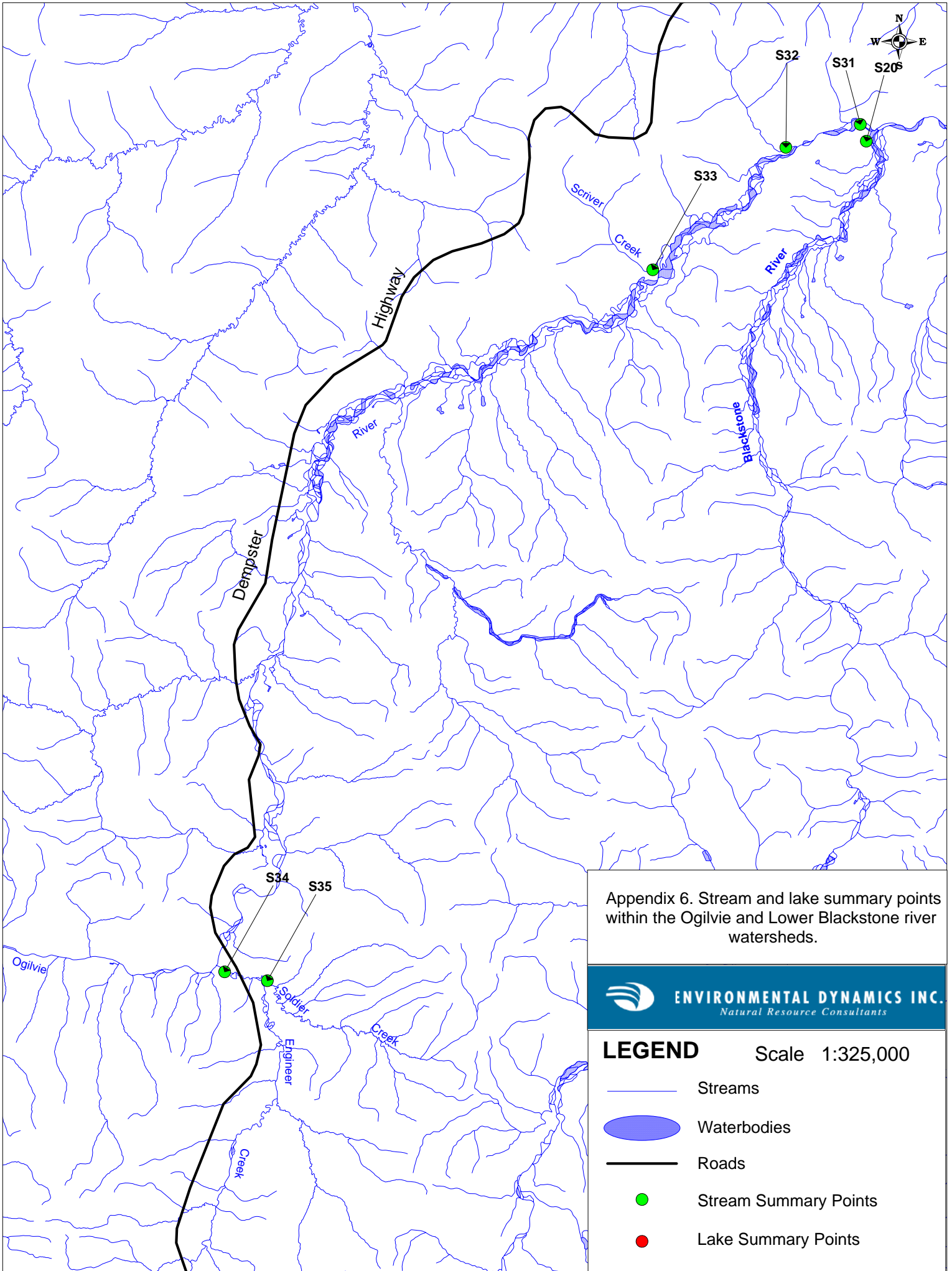
LEGEND Scale 1:300,000

-  Streams
-  Waterbodies
-  Yukon Border
-  Stream Summary Points
-  Lake Summary Points

APPENDIX 4: Stream and lake summary points within the mid Bonnet Plume watershed.








APPENDIX 5: Stream and lake summary points within the upper Hart watershed.



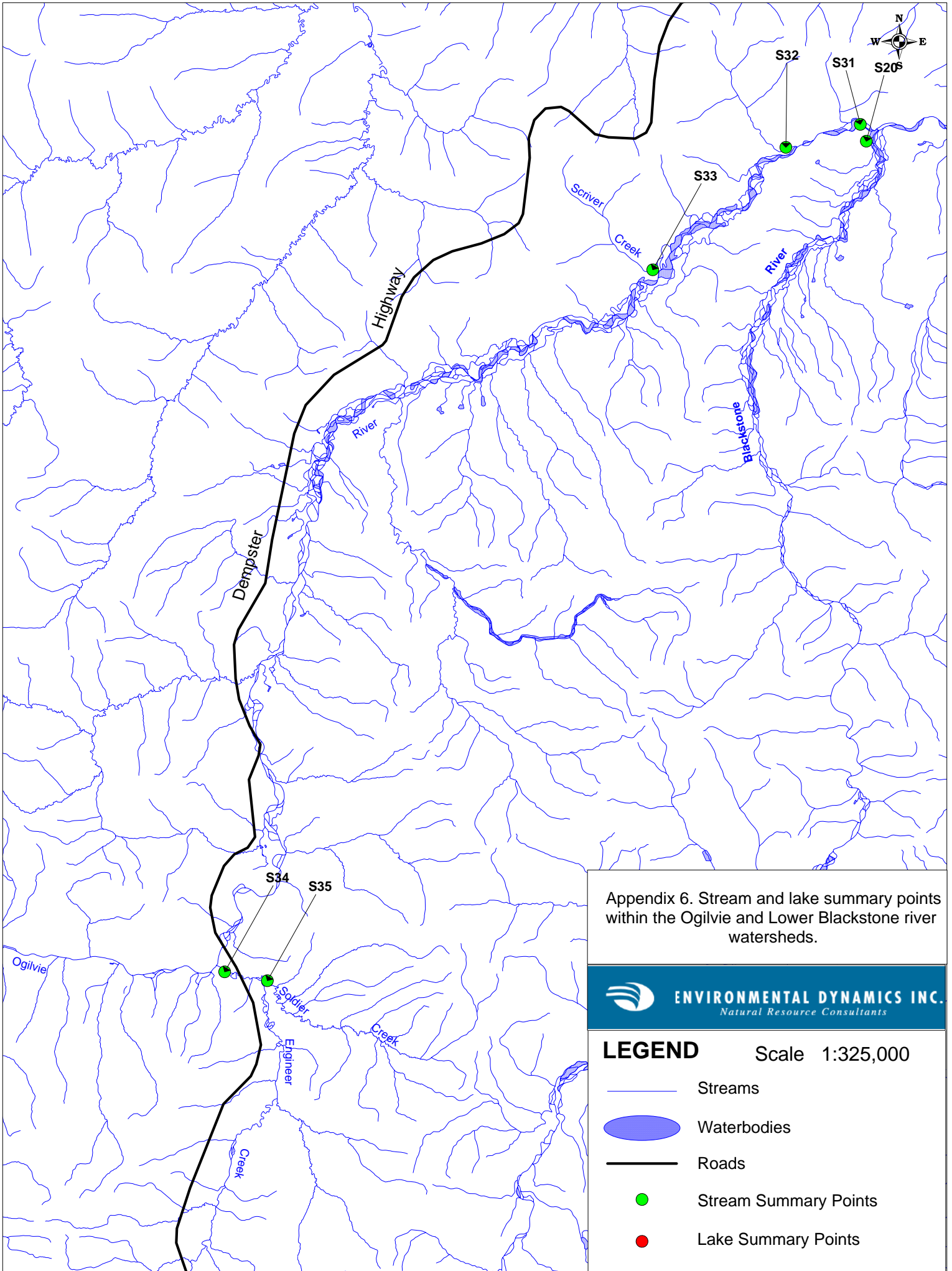
Appendix 6. Stream and lake summary points within the Ogilvie and Lower Blackstone river watersheds.



LEGEND Scale 1:325,000

-  Streams
-  Waterbodies
-  Roads
-  Stream Summary Points
-  Lake Summary Points






APPENDIX 6: Stream and lake summary points within the Ogilvie and Lower Blackstone watersheds.



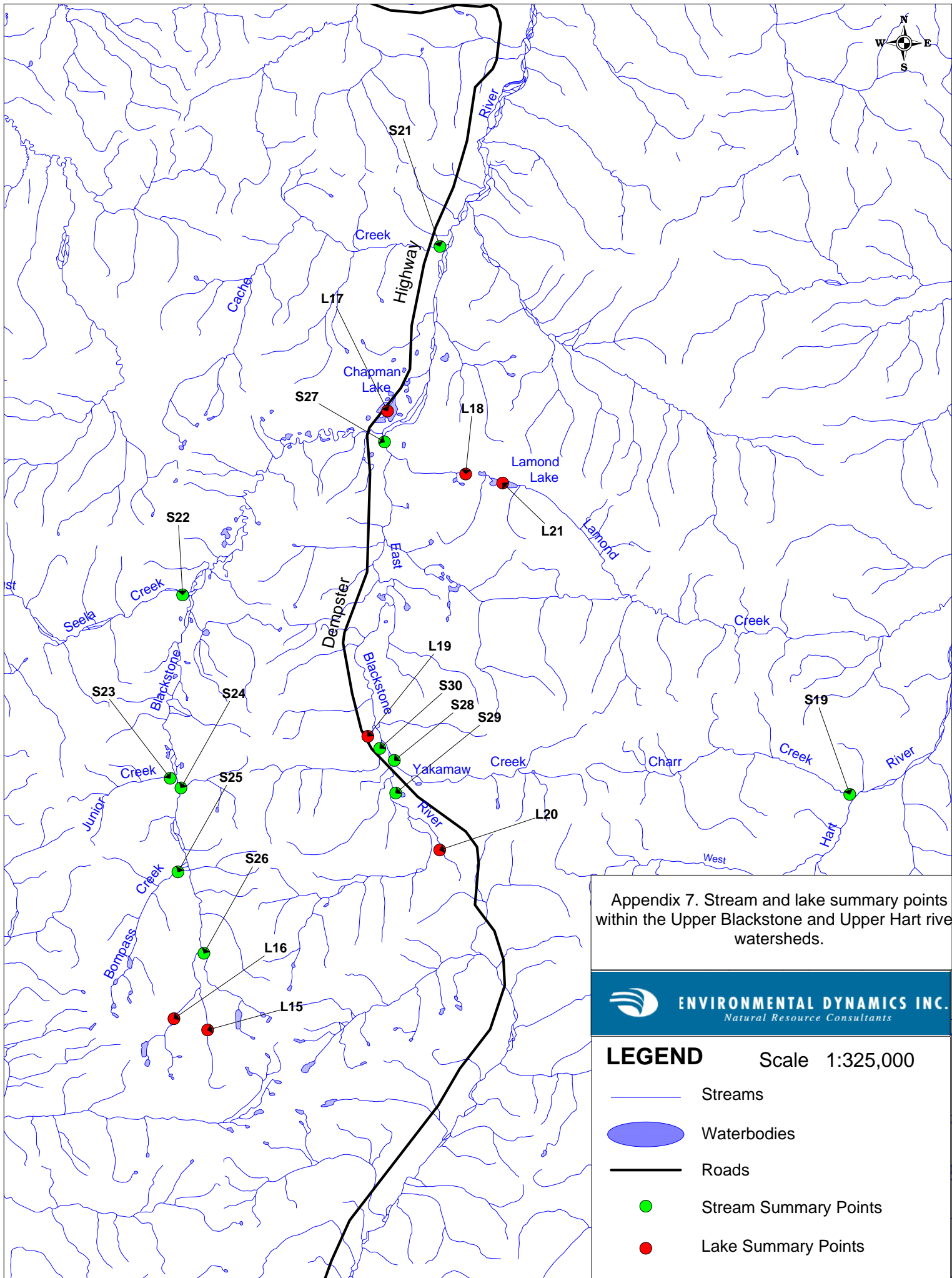
Appendix 6. Stream and lake summary points within the Ogilvie and Lower Blackstone river watersheds.



LEGEND Scale 1:325,000

-  Streams
-  Waterbodies
-  Roads
-  Stream Summary Points
-  Lake Summary Points






APPENDIX 7: Stream and lake summary points within upper Blackstone and upper Hart watersheds.



Appendix 7. Stream and lake summary points within the Upper Blackstone and Upper Hart river watersheds.



LEGEND Scale 1:325,000

-  Streams
-  Waterbodies
-  Roads
-  Stream Summary Points
-  Lake Summary Points