

HQ1024 (1 of 3)

ENVIRONMENTAL DYNAMICS INC.

Natural Resource Consultants

**1995 AND 1996 FISH AND FISH HABITAT INVENTORY
WITHIN THE STUART LAKE AND BABINE LAKE
WATERSHED GROUPS**

Volume 1 of 3

Prepared for:

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IMPORTANT NOTE
RE: USE OF THE FOLLOWING INFORMATION

Please note that the printed version of the DFO/MoELP Stream Survey Form is not true to the data present in the digital database. Discrepancies between the digital database and the printed forms have been noted for the following categories:

- Header Information (Reach Length)
- Channel Characteristics (% Debris Area, Avg Max Pool Depth Method)
- Bed Material (Compaction)
- Banks (Height)

Please consult the digital database prior to using any of the following data to ensure its accuracy.

RE: DATABASE

This report consists of inventory data collected in both 1995 and 1996. Only the 1996 inventory was funded through the Forest Renewal BC Resources Inventory Program and therefore only the 1996 data was reviewed and audited accordingly.

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1.0 INTRODUCTION

Forest management has seen dramatic changes over the past few years. Management goals have shifted from a purely production based approach, to a broader ranging role incorporating a more diverse level of forest stewardship. This higher level of stewardship can only be achieved through the principle of integrated resource management, wherein all resource values, as well as social, economic, and environmental needs, are identified and considered. Forest planning will reflect social values and incorporate clear commitments to conserve biological diversity, maintain the inherent productivity of aquatic and terrestrial ecosystems, and meet the needs of an economically viable and sustainable forest industry.

The Canfor Corporation is committed to enhancing the forest resource through responsible environmental stewardship. Canfor intends to be a leader in renewing, managing and protecting forest resources for integrated use and sustainable development. In order to achieve these goals, Canfor is committed to:

- Sustaining the many values of the forest when planning and conducting forest activities.
- Respecting the social, economic and biological values of the forest and integrating these values into their activities.
- Protecting the quality of soils, lakes and streams on forest lands under their care.
- Integrating fish and wildlife habitat requirements into their forest management plans.
- Maintaining biological diversity over the forest landscape.
- Conducting forest operations in a safe, ecologically-based, efficient and sustainable manner.
- Practicing responsible forest management to maintain site productivity and enhance timber yields.
- Developing and maintaining their roads to standards that meet all applicable engineering and environmental requirements.
- Conducting safe and efficient harvest operations that recognize the ecological requirements of the site and promote optimum utilization of the timber resource.

In order to implement these commitments, Canfor requires detailed inventories of the many resources present on the forest land that it manages. The specific interests addressed in this inventory are the fish and fish habitat resources present within their managed land base.

Canfor is proud of the stewardship role it has played and its commitment to protecting the fisheries resources present within its operating areas. It also realizes that in order to achieve its goals of sustainable forest management, the availability of current, high quality resource information is imperative. This inventory initiative was undertaken when a review of the existing state of knowledge on fisheries resources within Canfor's Operating Areas revealed that little information was available. The fisheries information collected for Canfor was immediately integrated into harvesting and silviculture plans for submission to the Ministry of Forests and BC Environment for review. Planning and subsequent forestry activities utilized the new fisheries information in a manner that not only met but often exceeded Forest Practices Code requirements.

Forest Renewal BC (FRBC) has also recognized that up to date, high quality resource inventory data are necessary for resource assessment, resource utilization and biodiversity goals, and establishment of

protected areas. It is also fundamental for land use planning, regulation and planning initiatives such as timber supply reviews and Forest Practices Code (FPC). FRBC has also identified that the present lack of acceptable inventory data is complicating and impeding these initiatives.

Since sustainable forest management requires better information on non-timber resources, FRBC has established the Resources Inventory Program under its Land and Resources key activity. The Resources Inventory Program's main goals are to:

- aid and improve forest resource planning and decision-making, and
- facilitate the integration of non-timber resource values in forestry activities.

FRBC's inventory priorities are to be broadly based on:

- areas where inventory is of low quality or non existent,
- regional priorities based on regional inventory business plans that reflect community needs, and
- complying with FRBC provincial priorities.

The improved data generated by the Resources Inventory Program are also expected to assist in setting priorities and establishing direction for other FRBC activities such as the Watershed Restoration Program, as well as providing input to integrated planning for sustainable forest management. FRBC's objective of creating sustainable forest wealth through forest renewal and more intensive forest management can only be met through the application of better forest resource information.

Both the Fort St. James Division of Canadian Forest Products Ltd. (Canfor) and the provincial government's Forest Renewal BC Program (FRBC) have realized the lack of current, high quality aquatic resource information which is vital to achieve their goal of integrated and sustainable forest management. In an effort to address these issues, Canfor and FRBC have formed a partnership to inventory the aquatic resources in the Fort St. James Division's Operating Areas. It is this approach to forest resource stewardship that will be perpetuated and enhanced by activities of this project with a direct and immediate benefit being accrued to the forest ecosystem and the local community.

In 1995 and 1996, *EDI Environmental Dynamics Inc. (Environmental Dynamics)* was retained by the Fort St. James Division of Canfor to design and conduct stream inventories within selected portions of their Forest License (A40873). In 1996, this inventory work was expanded under FRBC Project No. OP-96-003. This document presents the results of inventories carried out in Canfor's operating areas within the Stuart Lake and Babine Lake watershed groups. The Stuart Lake Watershed Group is located in Canfor's Fort St. James Division, specifically within the Necoslie, Ocock, Whitefish, Karena, North Salmon, McKnab, Sqawfish, Zap-Carrier and Kuzkwa operating areas. Only a small portion on the southern edge of Babine Lake Watershed Group is also located within the chart area of Canfor's Fort St. James Division. This area incorporates two basins within Canfor's Whitefish Operating Area.

Reporting on stream inventories is typically presented on an individual Watershed Group basis. Due to the minimal amount of data collected within the Babine Lake Watershed Group, it did not warrant a separate report and has, therefore, been incorporated into the Stuart Lake Watershed Group Report. Both

watershed groups will be discussed separately unless otherwise specified within this document. It should be noted that this report format and contents were prepared to provide sufficient information for resource agency staff, including BC Environment, Ministry of Forests (MOF) and the Department of Fisheries and Oceans (DFO), as well as Canfor's staff and interested stakeholders. Reports describing the results of inventories conducted in other Watershed Groups within Canfor's operating areas have been prepared separately.

2.0 STUDY AREA

The Stuart Lake Watershed Group and a small section of the Babine Lake Watershed Group are located in the chart area of Canfor's Fort St. James Division within the Fort St. James Forest District of the Prince George Forest Region. This section of the report will only provide detailed information where stream inventory were conducted. Hence, detailed information for the entire area of the two Watershed Groups is not provided. As stated earlier, the watershed groups will be discussed separately, however, as the two watershed groups are both located within the same physiographic division and subdivision of central British Columbia, they are introduced together and are both presented in Figure 1.

Both watershed groups lie within the Interior Plateau physiographic division and the Nechako Plateau subdivision of central British Columbia (Holland 1976). The Nechako Plateau is an area of low lying relief with great expanses of flat or gently rolling terrain. Noticeable glacial features of the plateau surface include eskers and meltwater channels, many of the latter are now dry (Holland 1976). Bedrock predominantly consists of tertiary lava flows overlying older volcanic and sedimentary rocks. The volcanic rock types are comprised mainly of andesite, basalt and associated tuffs of breccias. The sedimentary rocks are dominantly chert, pebble conglomerate, shale and sandstone. Bedrock outcrops are uncommon due to the thick cover of glacial drift material (Langer, et al. 1992).

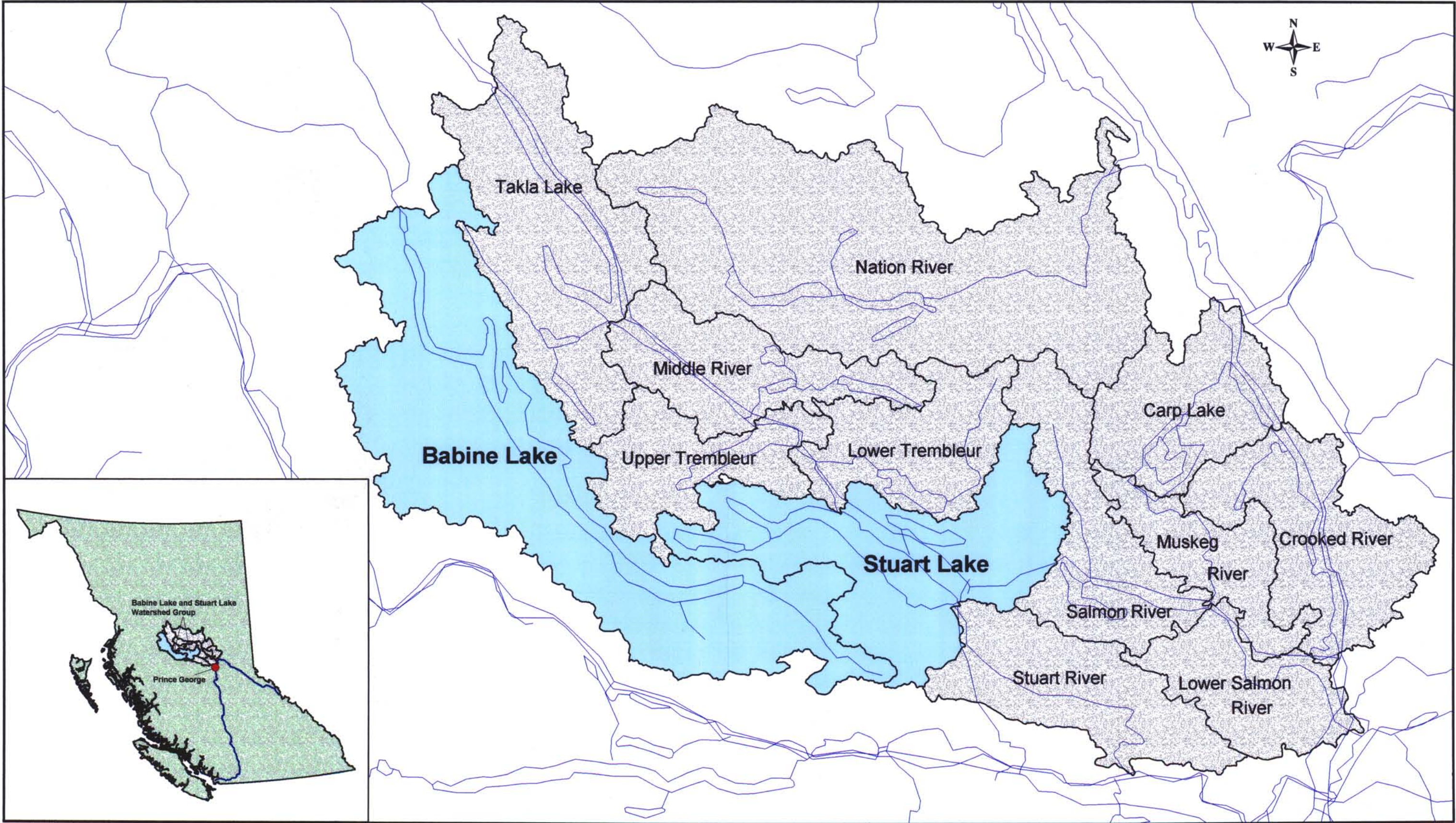
2.1 Stuart Lake Watershed Group

The Stuart Lake Watershed Group is located within BC Environment management units 7-13, 7-14, and 7-25 (BC Ministry of Environment, Lands and Parks 1993) and is in the chart area of Canfor's Fort St. James Division within the Fort St. James Forest District of the Prince George Forest Region. BC Environment's Inventory Section has delineated 82 watersheds/basins within the Stuart Lake Watershed Group. *Environmental Dynamics* conducted fish and fish habitat inventories on streams in 22 of these watersheds (Fig. 1). The basins are located in the chart area of Canfor's Fort James Division, specifically in the operating areas: 1) North Salmon, 2) Squawfish, 3) Zap-Carrier, 4) Ocock, 5) Necoslie, 6) Karena, 7) Kuzkwa, 8) Whitefish, and 9) McKnab. The total size of this watershed group is 334,000 ha (BC Environment 1997a).

According to the biogeoclimatic classification system used by the British Columbia Ministry of Forests, the Stuart Lake Watershed Group lies within the Sub-Boreal Spruce biogeoclimatic zone (SBS) and the Englemann Spruce and Subalpine Fir (ESSF) biogeoclimatic zone. Specifically the basins are situated within six sub-zones/variants: 1) the Nechako Moist Very Cold Engelmann Spruce-Subalpine Fir (ESSFmv1), 2) the Babine Moist Cold Sub-Boreal Spruce (SBSmc2), 3) the Stuart Dry Warm Sub-Boreal Spruce (SBSdw3), 4) the Dry Cool Sub-Boreal Spruce (SBSdk), 5) the Mossvale Moist Cool Sub-Boreal Spruce (SBSmk1) and 6) the Takla Wet Cool Sub-Boreal Spruce Variant (SBSwk3) (DeLong, et al. 1993; MacKinnon, et al. 1990). Each sub-zone/variant has representative site.

Figure 1. Location of Stuart Lake and Babine Lake Watershed Groups.

Scale 1:1,000,000



associations, and each vary in vegetation and soil. Vegetation and soil common to the six sub-zones/variants are described below.

Nechako ESSFmv1 Variant

Vegetation common in this variant include climax species of hybrid white spruce (*engelmanni x glauca*) and subalpine fir (*Abies lasiocarpa*). Lodgepole pine (*Pinus contorta*) dominates the drier sites. Black spruce (*Picea mariana*) will occur in specific sites such as wetlands and poor soil conditions such as upland sites. Black cottonwood (*Populus balsamifera* ssp. *trichocarpa*) occurs in riparian areas and is often associated with white spruce (*Picea glauca*). Soils that may be found throughout this variant will generally consist of Humo-Ferric Podzols and parent material is primarily morainal (DeLong, et al. 1993).

Babine SBSmc2 Variant

Vegetation common in this variant include climax species of hybrid white spruce and subalpine fir. Lodgepole pine is abundant in this variant, but dominates on drier sites. Black spruce is common in wetland areas and along with lodgepole pine occurs on poorer upland sites. Black cottonwood is common in riparian areas. Soils that may be found throughout this variant will generally consist of Brunisolic Gray Luvisols, Dystric Brunisols and Humo-Ferric Podzols (DeLong, et al. 1993).

Stuart SBSdw3 Variant

Conifers common in this variant include lodgepole pine, Douglas-fir (*Pseudotsuga menziesii*) dominating on drier sites and hybrid white spruce dominating on wetter sites. Black spruce is common in wetland areas with lodgepole pine occurring on poorer upland sites. Deciduous forests are dominated by trembling aspen (*Populus tremuloides*), but localized paper birch (*Betula papyrifera*) forests also exist. Black cottonwood is common in riparian areas (DeLong, et al. 1993). Soils that may be found throughout this variant will generally consist of Gray Luvisols, Brunisolic Gray Luvisols and Dystric Brunisols (DeLong, et al. 1993).

SBSdk Variant

Hybrid white spruce is the climax species in this variant. Douglas-fir occurs on drier sites and black spruce is restricted to wetland areas. Lodgepole pine and trembling aspen are the dominant tree species that follow major disturbances. Black cottonwood occurs in riparian areas and paper birch occurs sporadically in this sub-zone (DeLong, et al. 1993). Soils that may be found throughout this sub-zone will generally consist of Gray Luvisols, Dystric Brunisols and Humo-Ferric Podzols (DeLong, et al. 1993).

Mossvale SBSmk1 Variant

Vegetation common to this variant include climax species of hybrid white spruce. Douglas-fir occurs as a long lived seral species on drier warm aspects with coarse soils. Black spruce occurs in

wetlands in combination with lodgepole pine on poorer upland sites. Paper birch occurs sporadically, often in combination with Douglas-fir. Bedrock geology in this sub-zone is dominated by volcanic rocks of the Mesozoic age with small amounts of metamorphic rocks. Soils have formed on predominate morainal and lacustrine materials. Morainal deposits consisting of gravelly loam and clay textures associated with Gray Luvisolic soils, including Brunisolic Gray Luvisols (DeLong et. al. 1993).

Takla SBSwk3 Variant

Vegetation common in this variant include climax species of hybrid white spruce, subalpine fir and Douglas-fir. Lodgepole pine occurs as a dominant seral species. Deciduous pioneer species include trembling aspen and paper birch (MacKinnon, et al. 1990; Meidinger and Pojar 1991). Soils that may be found throughout this variant will generally consist of Brunisolic Gray Luvisols, Dystric Brunisols and Humo-Ferric Podzols (DeLong, et al. 1993). This variant includes a plant uncommon to the northern portion of the region in Site Series 02 SXWFD-Purple Peavine. The purple peavine (*Lathyrus nevadensis*) represents the northernmost extent of Douglas-fir and signifies a unique ecosystem. Management objectives should be to preserve these areas for research (MacKinnon et. al. 1990).

The Stuart Lake Watershed Group within the Fort St. James Forest District is bounded by Tezzeron Lake to the north, Great Beaver Lake to the east, Sutherland River to the southwest, and Babine Lake to the west. Major drainages within the study area of the Stuart Lake Watershed Group include: 1) Stuart Lake outlet, 2) Nahounli Creek, 3) Nielsp Creek, 4) Hyman Creek, 5) Ocock River, 6) Camsell Creek, and 7) Whitefish Creek. These systems eventually drain into Stuart Lake. To date, there are twelve gazetted lakes within the study basins, of which seven have been inventoried for fish and fish habitat (BC Environment, 1997b). One unnamed lake (alias Bone Lake) has also been inventoried. Inventory data are available at BC Environment, Prince George (BC Environment 1997b). All eight of the lakes inventoried are within the fish and fish habitat study areas for this project and will be discussed in detail at the beginning of the individual watersheds.

Canfor's Fort St. James Division, together with BC Environment have created Wildlife Movement Corridors (WMC) to be included in Canfor's five year development plan. These sections of land will not be fragmented by cutblocks and will allow wildlife cover and movement through non-logged areas. Established WMC's are located throughout various parts of the Stuart Lake Watershed Group. One WMC surrounds most of the Ocock River riparian area. The corridor extends from the headwaters and follows the Ocock River to approximately 7 km downstream of the Ocock River-Carrier Lake outlet. Another WMC surrounds part of the Tsilcoh River riparian area. The WMC's within the fish and fish habitat study area will be discussed in detail at the beginning of the individual watersheds.

Linear development within the Stuart Lake Watershed Group portion of the Fort St. James District is common due to active logging. As a result a myriad of roads lie within this watershed group. Major gravel roads inside the Fort St. James Forest District include the Teardrop Forest Service Road (FSR), the Teardrop-Carrier FSR, the Leo Creek FSR, the Cunningham FSR, the Germansen Landing-North Road, the Germansen-Tsilcoh FSR, the Ocock FSR, the Ocock South Main FSR, the Ocock West FSR and their adjoining sideroads (BC Ministry of Forests 1995; Canfor 1996).

The BC Forest Service has four recreation sites within the study basins of the Stuart Lake Watershed Group, Fort St. James Forest District. The Ocock River site provides facilities for day use only. Tsilcoh Falls provides facilities for day and overnight camping, and there is a hiking trail to the Tsilcoh River. Battleship Bay and Whitefish Bay recreation sites are both on Stuart Lake. Battleship Bay is accessible only by boat, and Whitefish Bay is accessible from the road (BC Ministry of Forests 1995).

Information on fish species known to be present in the study basins of the Stuart Lake Watershed Group was acquired from the Fisheries Information Summary System (FISS) and lake inventory maps available from BC Environment in Prince George (BC Environment, 1995; BC Environment, 1997b). According to the FPC's 'Fish-stream Identification Guidebook' (BC Ministry of Forests and BC Ministry of Environment 1995a), there are four categories of fish species with management concerns: 1) anadromous salmonids, 2) freshwater game fish, 3) threatened or endangered fish, and 4) regionally important fish. Fish species designated in the four categories are referred to as regionally significant fish within this document.

Table 1 lists the fish species deemed important under the FPC as well as all other fish species documented within the project basins of the Stuart Lake Watershed Group. Fish species documented within the Stuart Lake Watershed Group are included in three of the four FPC categories. Fish species documented within the individual watersheds are listed in the introduction to each watershed described in the results section of this report. A summary table of fish presence is also presented in the results section of this report.

Table 1. Fish species with management concerns and all other fish species documented within the Stuart Lake Watershed Group Study Area.

1. Anadromous salmonids	sockeye salmon	(<i>Oncorhynchus nerka</i>)
	chinook salmon	(<i>O. tshawytscha</i>)
2. Freshwater game fish	kokanee salmon	(<i>O. nerka</i>)
	rainbow trout	(<i>O. mykiss</i>)
	Dolly Varden ¹	(<i>Salvelinus malma</i>)
	lake whitefish	(<i>Coregonus clupeaformis</i>)
	mountain whitefish	(<i>Prosopium williamsoni</i>)
	burbot	(<i>Lota lota</i>)
3. Regionally important fish species	bull trout	(<i>Salvelinus confluentus</i>)
4. Other fish species	suckers, general	(<i>Catostomus</i> sp.)
	longnose sucker	(<i>C. catostomus</i>)
	largescale sucker	(<i>C. macrocheilus</i>)
	prickly sculpin	(<i>Cottus asper</i>)
	lake chub	(<i>Couesius plumbeus</i>)
	northern squawfish	(<i>Ptychocheilus oregonensis</i>)
	northern redbelly dace	(<i>Phoxinus eos</i>)
	redside shiner	(<i>Richardsonius balteatus</i>)
	speckled dace	(<i>Rhinichthys osculus</i>)

¹ The species identified as Dolly Varden (*Salvelinus malma*), in the Fisheries Information Summary System is, in all probability, bull trout (*Salvelinus confluentus*), as indicated by population distribution studies conducted by Haas and McPhail (1991).

2.2 Babine Lake Watershed Group

The Babine Lake Watershed Group lies within Management Unit 6-6 (BC Ministry of Environment, Lands and Parks 1993) of central British Columbia and is situated along geographical boundaries of the Stuart Lake Provincial Forest and the Babine Lake Provincial Forest (Department of Energy, Mines and Resources 1978). BC Environment's Inventory Section has delineated 97 watersheds within this

watershed group. Fish and fish habitat surveys conducted by *Environmental Dynamics* were in 2 of the 97 watersheds within Canfor's Whitefish Operating Area (BC Environment 1997a). The Babine Lake Watershed Group has a total size of 654,100 ha (BC Environment 1997a).

According to the biogeoclimatic classification system used by the British Columbia Ministry of Forests, the study area of Babine Lake Watershed Group lies within the Sub-Boreal Spruce biogeoclimatic zone (SBS) and the Englemann Spruce and Subalpine Fir (ESSF) biogeoclimatic zone. Specifically, the two watersheds are situated within three sub-zones/variants: 1) the Nechako Moist Very Cold Engelmann Spruce-Subalpine Fir sub-zone (ESSFmv1), 2) the Babine Moist Cold Sub-Boreal Spruce sub-zone (SBSmc2) and 3) the Stuart Dry Warm Sub-Boreal Spruce sub-zone (SBSdw3) (DeLong, et al. 1993; MacKinnon, et al. 1990). Each sub-zone/variant has representative site associations, and each vary in vegetation and soil. Vegetation and soil common to the three sub-zones/variants are described below.

Nechako ESSFmv1 Variant

Vegetation common in this variant include climax species of hybrid white spruce and subalpine fir. Lodgepole pine dominates the drier sites. Black spruce will occur in specific sites such as wetlands and poor soil conditions such as upland sites. Black cottonwood occurs in riparian areas and is often associated with white spruce. Soils that may be found throughout this variant will generally consist of Humo-Ferric Podzols and parent material is primarily morainal (DeLong, et al. 1993).

Babine SBSmc2 Variant

Vegetation common in this variant include climax species of hybrid white spruce and subalpine fir. Lodgepole pine is abundant in this variant, but dominates on drier sites. Black spruce is common in wetland areas with lodgepole pine occurring on the poorer upland sites. Black cottonwood is common in riparian areas. Soils that may be found throughout this variant will generally consist of Brunisolic Gray Luvisols, Dystric Brunisols and Humo-Ferric Podzols (DeLong, et al. 1993).

Stuart SBSdw3 Variant

Conifers common in this variant include lodgepole pine, Douglas-fir dominating on drier sites and hybrid white spruce dominating on wetter sites. Black spruce is common in wetland areas along with lodgepole pine occurring on poorer upland sites. Deciduous forests are dominated by trembling aspen, but localized paper birch forests also exist. Black cottonwood is common in riparian areas (DeLong, et al. 1993). Soils that may be found throughout this variant will generally consist of Gray Luvisols, Brunisolic Gray Luvisols and Dystric Brunisols (DeLong, et al. 1993).

The Babine Lake Watershed Group within the Fort St. James Forest District is bounded by the Sutherland River to the west, Shass Mountain to the south and the Stuart Lake Watershed Group to the north and east. The major drainage of this watershed is the Sutherland River which flows north into Babine Lake, which in turn drains out through the Babine River into the Skeena River. The major drainage within the study area is Jenny and Grassham lakes which flow into Shass Creek, then into Camsell Lake which drains into the Sutherland River. To date, there are four gazetted lakes which have been inventoried in the Babine Lake Watershed Group within the Fort St. James Forest District.

Inventory data are available at BC Environment, Prince George (BC Environment 1997b). All four of the lakes inventoried are within the fish and fish habitat study areas for this project and will be discussed in detail at the beginning of the individual watersheds.

Canfor's Fort St. James Division, together with BC Environment have created Wildlife Movement Corridors (WMC) to be included in Canfor's five year development plan. These sections of land will not be fragmented by cutblocks and will allow wildlife cover and movement through non-logged areas. Established WMC's are located throughout various parts of the Babine Lake Watershed Group. The WMC's within the fish and fish habitat study area will be discussed in detail at the beginning of the individual watersheds.

Linear development within the Babine Lake Watershed Group portion of the Fort St. James District is common due to active logging. As a result a series of roads lie within this watershed group. Major gravel roads include the Cunningham FSR and its adjoining sideroads (BC Ministry of Forests 1995; Canfor 1996).

The BC Forest Service has four recreation sites within the Babine Lake Watershed Group portion of the Fort St. James Forest District. All sites provide camping and are located around Grassham, Ogston and Camsell lakes. The Shass Mountain Trailhead, located along the north-western edge of Grassham Lake, is accessed by boat only and provides a recreational trail leading to Shass Mountain (BC Ministry of Forests 1995).

Information on fish species known to be present in the Babine Lake Watershed Group was acquired from FISS (BC Environment 1995) and lake inventory maps (BC Environment 1997b) available at BC Environment in Prince George. According to the FPC *Fish-stream Identification Guidebook* (BC Ministry of Forests and BC Ministry of Environment 1995a), there are four categories of fish species of management concern: 1) anadromous salmonids, 2) freshwater game fish, 3) threatened or endangered fish, and 4) regionally important fish. Fish species designated in the four categories are referred to as regionally significant fish within this document.

Table 2 shows the fish species deemed important under the FPC as well as all other fish species documented within the project basins of the Babine Lake Watershed Group. Fish species documented within are included in three of the four categories. Fish species documented within the individual watersheds are listed in the introduction to each watershed described in this report. A summary of fish presence is also presented in the results section of this report.

Table 2. Summary of fish species of management concern and other fish species documented within the Babine Lake Watershed Groups study area.

Freshwater game fish species	rainbow trout	(<i>Oncorhynchus mykiss</i>)
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3.0 METHODS

Stream inventories conducted during this project followed the *Resources Inventory Committee (RIC) Lake and Stream Inventory Standards and Procedures* (Draft) (BC Ministry of Environment, Lands and Parks 1995), and employed the following methodology.

3.1 Planning

Stream inventories were conducted in watershed locations that were identified to have little or no fish and fish habitat information. Much of the inventory occurred in areas where forest development was proposed. The use of the information collected from these surveys was viewed as a description of fish and fish habitat for inventory purposes and secondly, as important data for riparian management prior to forestry operations. It should be noted that in some sampling information was collected directly for Canfor to address Forest Practices Code concerns. Environmental Dynamics included this information in this inventory report because it was felt that all available information concerning this watershed should be presented.

To put a perspective on the methods used to conduct the fisheries inventories, the following definitions identify a stream and a stream reach. "A **stream** is a natural watercourse with an alluvial channel formed when water flows between continuous definable banks. Flow in the channel may be perennial, ephemeral (seasonal), or intermittent (spatially discontinuous). A **stream reach** is a relatively homogeneous section of a stream having a sequence of repeating structural characteristics (or processes) and fish habitat types. The key physical factors used to determine reaches in the field are channel pattern, channel confinement, gradient, and stream bed and bank materials. Stream reaches generally show uniformity in those characteristics and in discharge." (BC Ministry of Forests and BC Environment 1995a).

Two methods were employed to delineate stream reaches. The first of these was performed prior to the field survey and involved the use of 1:15,000 scale airphotos and Terrain Resource Inventory Management (TRIM) base maps to identify potential reach breaks and points of interest. It should be noted that airphoto and map work is only effective as an overview of the stream survey area. The airphotos and maps only provide enough detail for accurate identification of habitat features and reach breaks on streams greater than approximately 5 m in width. For streams less than 5 m in width airphotos and maps only provided estimates of reach breaks and interest points (e.g. barriers, gradient changes, point source sediment production sites, etc.). In many instances, streams greater than 5 m in width were located in wetland areas which had minimal riparian vegetation (trees) adjacent to the watercourse. In these cases, airphoto interpretation provided sufficient accuracy to properly identify reach breaks and other points of interest. Once field crews were aware of the potential reach breaks, as typed from the

airphotos, they would then proceed into the field to gather relevant inventory information. A priority of ground surveying was to walk the entire length of a reach. This, on occasion, could not be fulfilled due to possible safety hazards such as deep water encountered by the field crew.

The second method, ground truthing, was employed on all systems, with particular emphasis on streams less than 5 m wide. It was on these smaller systems that ground surveying proved to be the best method for gathering accurate inventory data. A typical ground survey involved a field crew walking the length of a stream and gathering pertinent inventory information (i.e. completing stream cards, gathering Global Positioning System (GPS) data, electroshocking, etc.). After each day of ground surveying, field crews would prepare hand-drawn maps of the areas inventoried during that day. These maps were usually 1:10, 000 scale (TRIM based), and contained information such as fish species present, reach breaks, FPC stream classification, and possible barriers (i.e. beaver dams, culverts, etc.).

In 1995 and 1996, *Environmental Dynamics* was retained by the Fort St. James Division of Canfor to inventory streams in the vicinity of proposed cutblocks. The inventory approach was to survey full sections of watersheds adjacent to these proposed cutblocks. In most scenarios, priority streams located within close proximity to the proposed cutblocks were surveyed first. Peripheral systems were usually inventoried on the way into or out of a proposed cutblock area. By following the approach of surveying priority streams first, *Environmental Dynamics* was able to provide Canfor with necessary riparian management information for their forest development plans. By broadening the inventory scope, to include peripheral streams, a significant contribution to the inventory information for the Central Interior was made. In addition, site surveys were conducted at all proposed road crossings and points of concern (e.g. areas with significant erosion). By incorporating these additional data, some baseline information (i.e. prior to development) regarding the status of stream crossing areas and possible future rehabilitation work was also provided.

Prior to field surveys, fish sampling permits were obtained from BC Environment and DFO, and relevant maps, aerial photographs and fisheries information were reviewed. These reviewed sources included:

- Department of Energy, Mines and Resources' National Topographic Series (NTS) 1:50,000 scale maps. These maps provide an overview of survey areas including information at a watershed level, revealing macro-scale drainage patterns. In addition, they contain primary linear developments and other types of infrastructure (e.g. railway lines, power lines, pipelines, hydro dams, etc.)
- Fisheries Information Summary System (FISS) 1:50,000 scale maps. These maps are based on 1:50,000 scale NTS maps and provide supplemental information. The FISS maps show documented fish species distribution and spawning areas, stream obstructions (e.g. logjams, beaver dams), and stream enhancement activities (e.g. fish stocking, barrier removals).
- FISS Database is associated with streams found on the 1:50,000 scale FISS maps and reports additional stream specific fish information (e.g. habitat, populations, etc.).

- Canadian Forest Products Ltd. Development Plan Maps. These maps provide supplemental information. They provide a wider range of information with regards to access roads, previously harvested cutblocks, proposed cutblocks, and major drainage patterns.
- Terrain Resource Information Management (TRIM) 1:20,000 scale maps. As well as showing the information on the 1:50,000 scale NTS maps, these maps provide greater detail regarding streams within a watershed and reveal streams and roads not shown on the NTS 1:50,000 scale maps. In addition, this is the base mapping used in the development of Forest Development Plans by Canfor.
- Forest Development Plan 1:10,000 scale maps. These maps are TRIM base maps enlarged to 1:10,000 scale. They are used for field level interpretation which includes field notation and orientation. These maps also depict striplines, proposed cutblock boundaries, and road alignments.
- Aerial Photographs (1:15,000 scale) provide an actual view of the stream survey areas. They were used to identify, potential stream reaches, wetlands and beaver ponds, and confirm stream locations indicated on the 1:10,000 scale maps. The aerial photographs were also beneficial in selecting access routes to stream survey locations.

Pre-field planning was important for determining the most efficient approach to accessing individual survey areas. Four wheel drive (4WD) vehicles provided primary transportation to the general survey regions. Upon reaching the extent of 4WD access, overland travel by foot was employed. It was at this point which ground surveys began. In situations where road access was difficult or did not exist, helicopters were used to ferry crews into the survey areas.

3.2 Data Collection

Surveys were conducted following the methodology outlined in the *Fish Habitat Inventory and Information Program (FHIIP) Stream Survey Field Guide* (Department of Fisheries and Oceans and BC Environment 1989), *Resources Inventory Committee (RIC) Lake and Stream Inventory Standards and Procedures* (Draft) (BC Ministry of Environment, Lands and Parks 1995), the *Forest Practices Code Fish-Stream Identification Guidebook* (BC Ministry of Forests and BC Environment 1995a), and the *Riparian Management Area Guidebook* (BC Ministry of Forests and BC Environment 1995b). Stream data collected during surveys included: channel characteristics, gradient, bed materials, obstructions, discharge and fish captured. Standard fish species codes in Watershed Restoration Program Technical Circular No.8 (Johnston and Slaney, 1996) were used for this project. This stream information was entered onto FHIIP stream survey cards.

A component of these cards requires that either a reach number or site number is entered. Information entered on a stream survey card with a reach designation was obtained from one representative location of the reach. This implied that the data collected were applicable throughout the reach since, by definition, a reach is a homogeneous section of stream. Fish sampling was conducted throughout the reach and entered onto the stream survey card. In most cases, information entered onto a stream survey card with a site designation was representative of only the site where the data were collected. The

exception to this was in inaccessible wetlands where surveying was limited to “small” sub-sample areas. A combination of airphoto interpretation and sub-sample information could be used to accurately delineate reach breaks on these wide (greater than 5 m wide) wetland encompassed streams.

3.2.1 Reach and Site Sampling

Ideally, stream (reach/site) sampling was conducted from the downstream end of the reach and proceeded sequentially in an upstream direction. However, in some instances, logistics required that sampling be done in a downstream direction. In the few cases where the latter approach was taken, the information collected is described in an upstream direction within this report. Also, logistics sometimes required that a site (minimum of 100 m) representative of the reach be sampled in the field and photo interpretation and contour maps (TRIM) were used to delineate the reach breaks. This particular method was only used when there was confidence that the reach break locations and the stream classifications assigned to those reaches were accurate.

If a field survey began at the mouth of a stream and was conducted in a continuous, upstream direction, reaches were numbered as they were delineated (e.g. 1,2,3, etc.). A variation of this occurred when surveys were initiated somewhere other than at the confluence. When a field crew was not aware of the stream characteristics between the confluence and their starting point, they would identify the reaches alphabetically (e.g. A,B,C, etc.) in an upstream manner. Some instances were encountered where a gap (unsurveyed area) existed between two reaches on the same stream. This is primarily due to the fact that not all inventory was conducted from the same initial access point. If a field survey was approached from one end of a basin and another inventory was conducted from the other end of the basin (possibly at different times), these two surveys may not cover the full extent of the stream, hence leaving a gap. A problem with this approach is that field crews surveying different portions of the same stream are not aware of the numbering system employed by the other crew(s). In order to ensure quality control, these situations are identified and corrected during formal mapping procedures. In cases where a stream survey card was completed for a site, rather than a reach, the sites were numbered as they were encountered.

3.2.2 Data Collection Methods

Magellan ProMark X Global Positioning System (GPS) units were used to obtain locational points for: stream confluences, reach breaks, habitat sampling sites, fish passage obstructions and impediments, beaver dams, Fisheries Sensitive Zones (FSZ), fish capture sites or for any other points of interest pertinent to the stream inventory. GPS files were differentially corrected using base station files provided by Forey Management Ltd., Prince George, BC. Lateral accuracy of corrected positions was within 5 m.

Two photographs were typically taken at each survey point to provide a pictorial account of the stream reaches or sites.

A number of fish sampling methods were employed to determine the presence/absence of fish. The primary sampling method employed was electrofishing using a Smith-Root Model 12A backpack electroshocker. Electroshocking was conducted in perspective pools and lies which typically provide holding areas for fish. Table 3 outlines the electrofisher mode and corresponding pulse and frequency for the settings used during fish sampling. The voltage used typically ranged from 200 V to 500 V. For a detailed explanation of terms please refer to the Smith Root, Inc. Model 12-B backpack electrofisher manual.

Table 3. Electrofisher modes and frequencies for settings used during fish sampling.

Electrofisher Mode	Pulse (ms)	Frequency (Hz)
G - 8 to G - 11	8-0.4	45
J - 6	n/a	70
J - 7 to J - 11	8-0.4	60
M - 6	n/a	100
M - 7 to M - 11	8-0.4	80
O - 7 to O - 11	4-0.2	80

When wet weather prevented the use of electroshockers, baited minnow traps were employed. The minnow traps were placed in potential fish holding areas of streams for periods of 18 to 24 hrs. In order to properly record locations of these traps, GPS units were utilized. One of these two fish sampling methods was conducted in almost every stream reach and site surveyed. The exceptions to this were stream reaches where it was hazardous to electroshock (i.e. wetlands), and reaches which were dry at the time of survey. It is envisioned that baited minnow traps will be used to sample these wetland areas in the future if deemed appropriate. Reaches which were dry at the time of survey may be scheduled for fish sampling earlier in the season during subsequent field studies.

3.2.3 Stream Classification

An important by-product of this stream inventory project is stream classifications. These classifications will be used by Canfor to set appropriate Riparian Management Areas (RMA) around bodies of water, in accordance with FPC requirements. The FPC recognizes two broad categories of streams: 1) fish streams, and 2) non-fish streams. These categories are based on the presence or absence of certain fish species (BC Ministry of Forests and BC Environment 1995a). A stream is recognized as fish bearing if it contains any life phase of the following fish at any time of the year:

1. anadromous salmonids
2. freshwater game fish
3. threatened or endangered fish
4. regionally important fish.

When conducting stream surveys for FPC stream classification the goal is to sample within stream reaches. The stream reach is the basic unit used when assessing a stream to assign the correct stream classification (BC Ministry of Forests and BC Environment 1995a). Table 4 outlines the criteria upon which the stream classifications are based. Average channel width calculations were derived by averaging six separate width measurements taken at equally spaced intervals at a representative section within a reach. The interval between measurement stations was approximately equal to the channel width at the first measurement. For more details on this procedure please refer to the *Riparian Management Guidebook* (BC Ministry of Forests and BC Environment 1995b).

Table 4. Designation of Fish Streams and Non-Fish Streams for FPC stream classification.

FPC Fish Species Present	Average Channel Width (m)	Stream Class	Designation
yes	>20	S1	Fish stream
yes	>5≤20	S2	Fish stream
yes	1.5≤5	S3	Fish stream
yes	<1.5	S4	Fish stream
no	>3	S5	Non-fish Stream
no	≤3	S6	Non-fish Stream

When anadromous salmonids, threatened or endangered fish, freshwater game fish or regionally important fish were not captured during a fish inventory survey, a stream classification as either fish-bearing or non-fish-bearing could not be assumed. To establish a stream classification, all stream reaches which provided fish habitat but did not contain barriers impeding fish movement were classified by default as fisheries streams. Hence, only the classifications S1 through S4 were eligible for default and have been documented within this report with an asterisk (*) after the classification. For example, S4*.

3.3 Data Presentation

The following data compilation and presentation methods were employed for this project.

3.3.1 Reporting

The amount of data collected for this inventory was extensive. In an effort to make efficient use of the data set, *Environmental Dynamics* designed a Microsoft Access database. This database contains the information that is useful for both the regulatory agencies and the licensee. Much of the data contained within this database were selected from sources such as the field survey information collected on the FHIIP stream survey cards, field notes, 5-Year Forest Development Plans, BC Environment's Watershed Atlas, and various maps. The information within the database has been imported into the results section of this document. The survey information collected on the FHIIP stream survey card was entered into a digital data entry program supplied by DFO. Printouts of these completed FHIIP stream survey cards have also been included in the results section of this report. Please note that the digital database submitted to BC Environment for this project includes stream data collected on tributaries to lakes inventoried by *Environmental Dynamics* but reported on in separate documents.

3.3.2 Mapping

The map set produced for this report presents the fisheries inventory data collected by *Environmental Dynamics*. MapInfo Professional™ was the Geographic Information System (GIS) used to produce the map set based on TRIM base maps supplied by BC Environment. MapInfo Professional™ has data integration capabilities with ArcInfo and Microstation, which are GIS/mapping programs used by MOF, BC Environment, and Canfor.

Corrected GPS positions and attributes were incorporated into a Microsoft Access database, which was linked to the MapInfo Professional™ GIS. Features which were not positioned through GPS units were added to the database, based on the TRIM digital base maps and the corresponding field maps/notes. Universal Transverse Mercator (UTM) positions of non-GPS generated points were entered into the database based the coordinates of features on the digital maps. Database fields included: Watershed Group, Canfor's Operating Area, cutblock number, locational point attribute, feature, feature code, UTM coordinates, date, and the source that the locational point was generated from (GPS or TRIM). It was necessary to create additional features (and corresponding feature codes) to express all of the pertinent information. These additions included:

- Forest Practices Code stream classifications.
- Interest points (e.g. slumps, eroding cutbanks, debris flow areas, etc.).
- Upper and lower limits of field survey - These were placed on the maps when complete stream reaches were not surveyed.
- Locations of unmapped stream channels - This feature was mapped when a GPS position identified an unmapped stream.
- Seepages - This feature indicated when the drainages depicted on the map were not actually streams.
- Dry depressions - This feature indicated when the drainages depicted on the map were not actually streams.
- No hydrologic features found at this location - This feature indicated when the drainages depicted on the map were not located in the field at the identified location.
- Stream upper limit - This feature was used when no other drainage features (i.e. seepages) were found upstream from the actual stream channel. This occurred when the stream started from an underground spring.
- Wetland - This feature was used when the maps only indicated a stream, with no indication of wetland.

All appropriate data from the habitat and fish surveys were mapped on 1:20,000 scale digital TRIM maps (Stream Inventory Map) compiled and created by *Environmental Dynamics*. The Stream Inventory Maps were produced through the integration of MapInfo Professional™ GIS mapping software and the Microsoft Access database which was developed by *Environmental Dynamics*. All confirmed fish bearing streams are identified on the map with the appropriate classification within a triangle symbol (e.g. S-1...S-6). An asterisk (*) was used to denote those reaches classified as defaulted fisheries streams, on the basis of fish habitat (identified from field survey), without fish actually being captured. Biophysical reach boundaries were used as the limits for stream class designations. The maps also display the known distribution limits of fish, physical reach boundaries within the immediate area surveyed, potential impediments or obstructions to upstream fish migration, and the previously mentioned new features created by *Environmental Dynamics*. Lengths surveyed were obtained by measuring the distance between differentially corrected GPS points and/or TRIM generated points using a map wheel.

All the waterbodies surveyed that appear on the 1:50,000 NTS maps sheets were identified and coded using the BC Ministry of Environment Watershed Code Dictionary. Streams which are unnamed, but appear on a NTS map are identified by watershed code on the map, the report, and in the data base. Because smaller streams do not appear on the 1:50,000 scale NTS map sheets (the base mapping for the FISS and watershed

coding system), *Environmental Dynamics* developed a coding system to uniquely identify each stream. The codes, EDI-1, EDI-2, etc., were assigned to those streams without a watershed code in order to help identify the systems. To facilitate the assignment of watershed codes, a list of Interim Locational Points (EDI-codes) has been provided to the BC Environment Inventory and Data Systems Section. In addition to the EDI code, a nearest downstream watershed code was included in the "Watershed Code" field of the FHIIP database. In this situation, where a stream does not have its own watershed code, the nearest downstream watershed code contains an extension. This extension is a sequence of three nines (999), and is incorporated to signify that the stream has not been assigned its own watershed code. An example is the watershed code 230-9068-556-759-999. This code indicates that the stream in question is a tributary to McLeod River, and does not have its own watershed code. A second number, the EDI unique identifier number, is placed in the "Local Stream Name" field of the FHIIP database. Anyone reading a stream inventory card (FHIIP) completed by *Environmental Dynamics*, may notice a '999' extension on the watershed code, and will realize that the stream in question has been given an EDI code. This naming convention was developed to give the best possible locational information for the streams which did not have watershed codes.

At the confluence of each stream surveyed, a complete species summary of all fish identified within the system was noted directly underneath the watershed code. This summary was based upon FISS data where available, and/or this project's field surveys. The fish species mapped along the streams are those which were found only at sampling locations during this particular field survey. This species information was placed on the map in the same locations as the sample sites in order to provide a point of input for the FISS system. It must be noted that this may not always be the exact sampling location, but a point representative as per the reach card. Hence, all points representative of the sampling location should contain fish.

4.0 RESULTS

Stream inventories were conducted in the individual watersheds of the Stuart Lake and Babine Lake watershed groups between; May and October, 1995 and May and November, 1996. Results from the individual watersheds are presented consecutively by watershed code and include the following six components:

General Background

This general background section provides an introduction to the watersheds. General information about the location, size, major features, drainage, fish species, and development, etc., of the individual watersheds is presented.

Map of the Individual Watershed

The map of the individual watershed locates that watershed and outlines its boundaries. Stuart Lake and Babine Lake watershed groups occupied separate individual watershed maps. These maps are based on the Watershed Atlas developed by the Fisheries Branch of BC Environment.

Database Information

The database information is presented in tabular form. This database was created in the GIS Department of *Environmental Dynamics* and contains data selected from FHIIP stream survey cards, field notes, Canfor's 5-Year Development Plans, BC Environment's Watershed Atlas and various maps.

FHIIP Stream Survey Card Information

FHIIP Stream Survey Card Information is presented as an output printed from the FHIIP data entry tool provided by the Department of Fisheries and Oceans, Vancouver.

Photographs of the Area Surveyed

Photographs of the area surveyed were usually taken at reach or site locations. However, photographs of points of interest are also included where appropriate. Photo documentation of all photographs taken at reach or site locations are included in Appendix 1.

Stream Inventory Maps (1:20,000 scale)

The Stream Inventory Map (1:20,000 scale) are TRIM based and present a summary of stream information including watershed codes, stream reach breaks, fish species present, and fish passage obstructions. Other information includes field determined features (seepages, dry depressions, wetlands), TRIM features (streams, lakes, wetlands, and linear development) and Interim Watershed Location Point References (Appendix 2). The Stream Inventory Maps (93J051, 93J061, 93J062, 93J071, 93K037, 93K047, 93K048, 93K050, 93K056, 93K057 and 93K077) are included in sleeves in Appendix 3.

4.1. Stuart Lake Watershed Group

4.1.1 Stuart Lake Watershed (182)

Watershed 182 is located within BC Environment Management Unit 7-25 (BC Ministry of Environment, Lands and Parks 1993) and is the largest of the 22 watersheds surveyed by *Environmental Dynamics* inside the Stuart Lake Watershed Group (Fig. 2). It flows through the central portion of the Stuart Lake Watershed Group, extending from the outlet of Stuart Lake located at the upper limit of the Stuart River to the northern headwaters of all tributaries flowing into Stuart Lake. The boundary of Watershed 182 primarily encompasses Stuart Lake and most of the minor, non-gazetted streams entering it. Occupying 77, 460 ha of the Stuart Lake Provincial Forest, the geographical relief ranges from approximately 680 m at the outlet of the Stuart Lake to approximately 885 m at its headwaters (BC Environment 1995; Department of Energy, Mines and Resources 1977). Only the central portion of Watershed 182, located south of Stuart Lake, was inventoried by *Environmental Dynamics* in 1995.

This watershed is dominated by four sub-zones/variants according to the biogeoclimatic units of the Prince George Forest Region. These units include: the Stuart Dry Warm Sub-Boreal Spruce sub-zone (SBSdw3), the Takla Wet Cool Sub-Boreal Spruce sub-zone (SBSwk3), the Dry Cool Sub-Boreal Spruce sub-zone (SBSdk) and the Babine Moist Cold Sub-Boreal Spruce sub-zone (SBSmc2) (DeLong et al. 1993).

According to the updated FISS data (1995), several fish species deemed important under the FPC have been documented in Watershed 182. These species include: Dolly Varden¹, mountain whitefish, rainbow trout, chinook salmon, kokanee and sockeye salmon (BC Environment 1995).

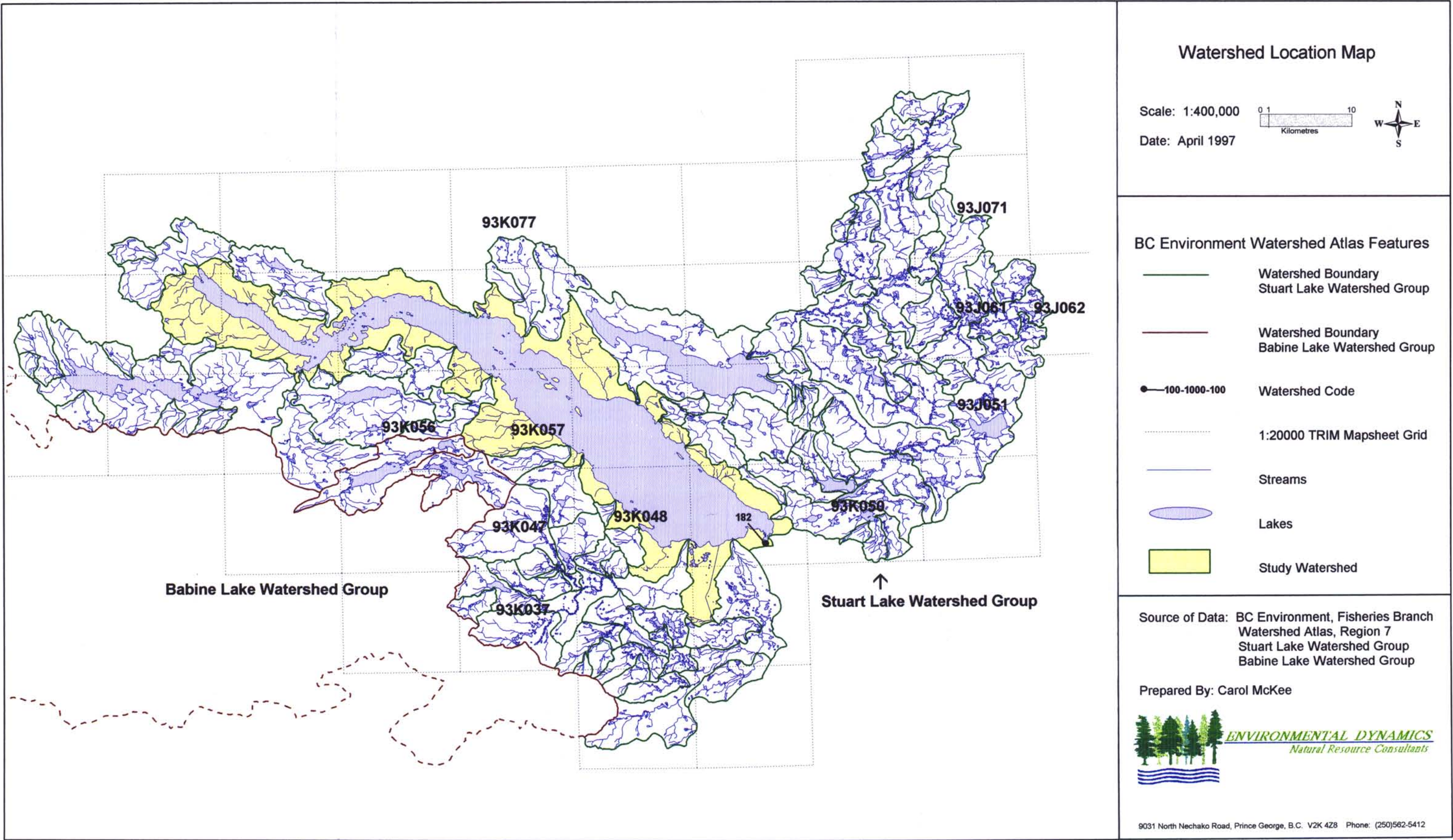
Canfor together with BC Environment have created Wildlife Movement Corridors (WMC) to be included in Canfor's five year development plans. These WMC's provide cover and allow animals to travel through non-logged areas. WMC's are not located within the Stuart Lake Watershed (Canfor 1996).

Since this watershed lies within portions of Canfor's Whitefish and Karena operating areas, there is extensive logging and logging related development. Linear development within the Stuart Lake Watershed consists of a series of secondary roads and the following major gravel roads within Fort St. James Forest District; the Leo Creek FSR and the Cunningham FSR (BC Ministry of Forests 1995; Canfor 1996).

Two recreational sites are located in the Stuart Lake Watershed (Stream 182). Both recreational sites are situated along Stuart Lake and offer fishing and camping. The Whitefish Bay site is accessible by road and offers a boat launch, however, the Battleship Bay site can only be accessed by boat (BC Ministry of Forests 1995). The Stuart Lake Provincial Park is located along the north side of Stuart Lake, providing many recreational activities (Department of Energy, Mines and Resources 1977).

¹The species identified as Dolly Varden (*Salvelinus malma*), in the Fisheries Information Summary System is, in all probability, bull trout (*Salvelinus confluentus*), as indicated by population distribution studies conducted by Haas and McPhail (1991).

Figure 2. Location of Stuart River Watershed (182) within the Stuart River Watershed Group



4.1.1.1 Stream 182-7373

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-7373
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/10
TRIM Map	93K057
Cutting Permit	092
Cutblock Number	001 & 002
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	13-Jun-95
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Recorded
Stream Width (m)	Not Recorded
Length Surveyed (m)	500
Habitat Type	Stream
Stream Order (1:20,000)	1~
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: The area surveyed is located along the eastern boundary of the proposed cutblock flowing easterly. No flowing water was present during the time of survey. Patches of standing water were present with lots of Devil's club noted. A reach card was not completed in this area. Fish sampling was not conducted. No fish were observed. Due to the poor fisheries potential, this area has been classified as S-6 under the Forest Practices Code. According to the Forest Cover map the stream extends into the proposed cutblock, but it does not on the TRIM-base map. Therefore, the same watershed code has been assigned as this section is an extension of the same stream. Note: ~means that the stream was not indicated on the TRIM-base map.	

4.1.1.2 Stream 182-7524-892

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-7524-892
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/10
TRIM Map	93K077
Cutting Permit	092
Cutblock Number	001 & 002
Operating Area	Whitefish
Development Type	Right-of-Way and Cutblock
Survey Date	12-Jun-95
Reach Number	Not Applicable
Site Number	1
Water Temperature (°C)	9
Stream Width (m)	1.1
Length Surveyed (m)	100
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This site is located outside of the northwestern boundary of cutblocks 92-01 and 92-02. It flows northwesterly with a low gradient of 1.5%. Total cover was high provided by overhanging vegetation (95%). Bed material was dominated by fines (75%). The stream was surveyed further east into the cutblock. The channeling became intermittent and flow was inconsistent. The surrounding area was swampy up to the headwaters. Fish sampling was not conducted. No fish were observed. This site was not assigned a stream classification under the Forest Practices Code, however the data gathered will be used for right-of-way design.	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Stream Survey Report

Watershed Code:

182-7524-892-000-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-7524-892-000-000-000-000-000-000-000	Reach No.:	0	Reach Length (km):	Method:
Location:	92-001 & 92-002 Whitefish	Site No.:	1	Length surveyed (m):	100.0 Method: GE
		Fish Card:	N	Field:	Yes Historical: No
Date: 6/12/95	Time: 15:15	Agency: EDI	Survey Crew: BR \EL ISC \ \ \ \ \	Photos:	N/A Air Photos:
		Map #:	93K/10		
		U.T.M.:	10.385406.6043672		

Channel Characteristics

Av. Chan. Width (m):	1.1	Method Av. Chan. Width (m):	MS	<table><thead><tr><th colspan="6">Specific Data</th></tr></thead><tbody><tr><td>1.1</td><td>0.9</td><td>1.4</td><td>0.9</td><td>1.1</td><td>0.9</td></tr></tbody></table>	Specific Data						1.1	0.9	1.4	0.9	1.1	0.9
Specific Data																
1.1	0.9	1.4	0.9	1.1	0.9											
Av. Wet. Width (m):	0.7	Method Av. Wet. Width (m):	MS													
Av. Max. Riff. Depth (cm):	2	Av. Max. Riffle Depth (cm):	MS													
Av. Max. Pool Depth (cm):	10	Av. Max. Pool Depth (cm):	2													
Gradient (%):	1.5	Method Gradient:	CL													
% Pool: 5	% Riffle: 10	% Run: 85	% Other: 0	Method:	GE											
% Side Channel:	0-10	Method Side Channel:	GE													
% Debris Area:	0-10	Method Debris Area:	GE													

Cover

Cover Total % :	75	Method Cover Total %:	GE						
Dp Pool : 0 L.O.D.:	5	Boulder: 0	In Veg.: 0	Over Veg: 95	Cutbank:	0			
Crown Closure % :	60	Method Crown Closure:	GE	Aspect :	N	Method Aspect:	C		

Discharge

Wetted Width (m) :	0.7	Method Wetted Width (m) :	MS	<table><thead><tr><th colspan="6">Specific Data</th></tr></thead><tbody><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>	Specific Data											
Specific Data																
Mean Depth (m) :	0.0	Method Mean Depth (m) :	MS													
Mean Velocity (m/s) :	0.13	Method Mean Velocity (m/s)	F													
Discharge (m3/s) :	0.00	Method Discharge (m3/s) :	f													

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) (Bed Material)

Bed Material

% Fines (<2mm):	70	% Fines (<2mm):	70
% Gravels:	25	Small (2-16mm):	10
		Large (16-64mm):	15
% Larges:	5	Small cobble (64-128mm):	5
		Large cobble (128-256mm):	0
		Boulder cobble (>256mm):	0
% Bedrock:	0	% Bedrock:	0
D90 (cm):	6	Compaction:	High

Banks

Height (m):	0.1	% Unstable:	
Textures Fines:	Yes	Gravel: No	Larges: No Bedrock: No
Confinement:	3		
Valley: Chan. Ratio:			
Stage:	M		
Flood Signs Ht(m):		Method Flood Signs:	
Braided:	Y	Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	9.0	Method Temperature:	
Turb. (cm):		Method Turbidity:	
Cond. (umhos):		Method Conductivity:	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-7524-892-000-000-000-000-000-000-000

Fish Summary***Obstructions***

Comments

C1

No photos.

Fish sampling was not conducted. No fish were observed.

This section of stream is classified as a S-6 stream under the Forest Practices Code.

4.1.2 Nahounli Creek Watershed (182-5941)

Nahounli Creek Watershed is located within BC Environment Management Unit 7-14 (BC Ministry of Environment, Lands and Parks 1993), and is the second largest of the 22 watersheds in which fish and fish habitat inventories were conducted within the Stuart Lake Watershed Group (Fig 3). The basin is situated at the southeastern corner of the Stuart Lake Watershed Group, along the southeastern portion of Stuart Lake. The basin encompasses Nahounli Creek and its minor tributaries and drains directly into Stuart Lake. Occupying 4,528 ha of the Stuart Lake Provincial Forest, the geographical relief ranges from approximately 700 m, at the Stuart Lake inlet, to approximately 1,130 m in the southern headwaters (BC Environment 1995; Department of Energy, Mines and Resources 1977). Major geographical features of note within the region include Nahounli Creek, and Spad and Nahounli lakes.

This watershed is dominated by two sub-zones/variants according to the biogeoclimatic units of the Prince George Forest Region. These units include the Stuart Dry Warm Sub-Boreal Spruce sub-zone (SBSdw3), and the Mossvale Moist Cool Sub-Boreal Spruce sub-zone (SBSmk1) (DeLong et al. 1993).

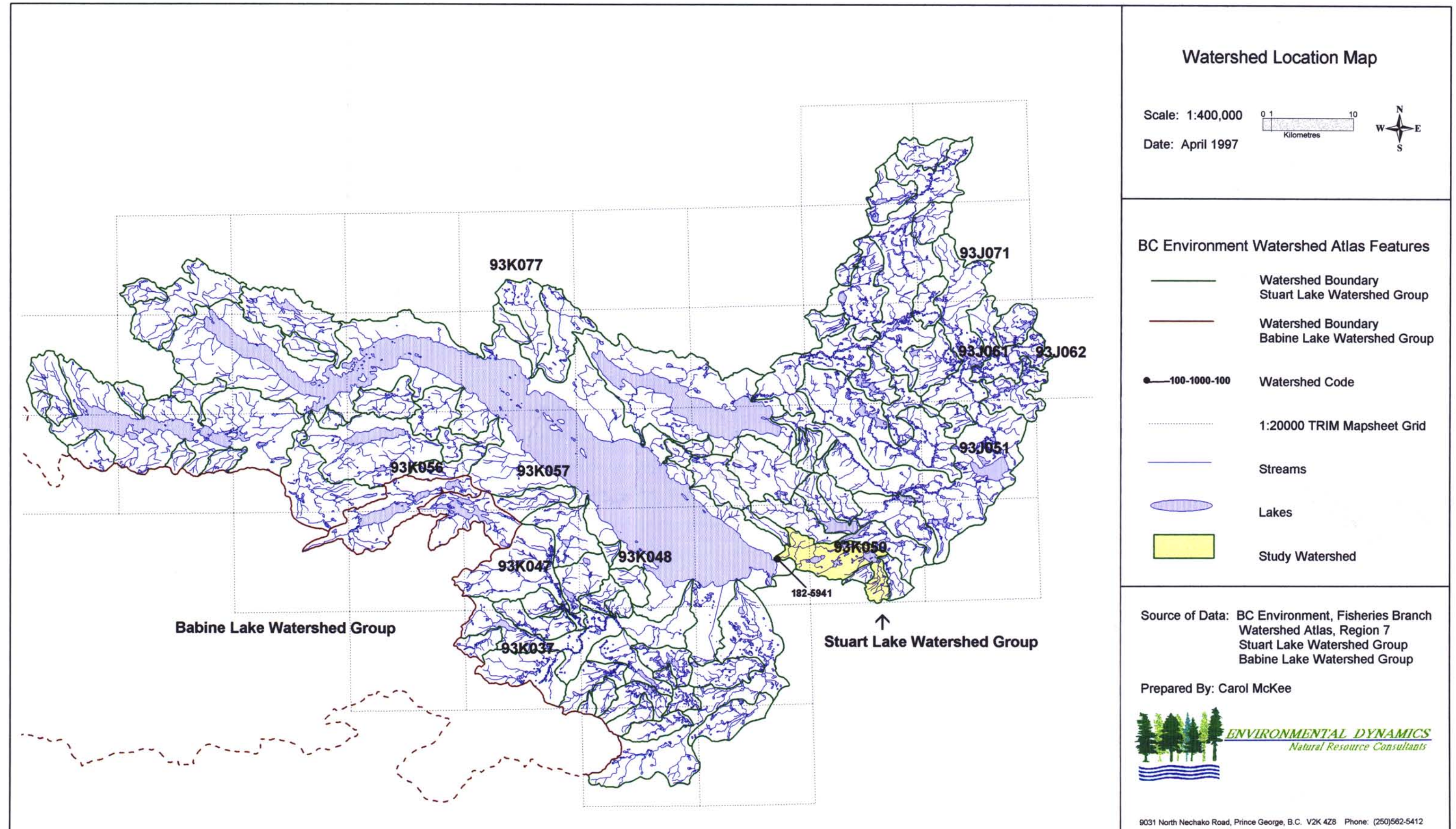
According to the BC Environment lake inventory, lakechub, longnose sucker and rainbow trout were present in Spad Lake (BC Environment 1997b). However, as Nahounli Creek flows directly into Stuart Lake, it has great potential to also support Dolly Varden¹, chinook salmon, sockeye salmon, kokanee, and mountain whitefish (BC Environment 1995).

Canfor together with BC Environment have created Wildlife Movement Corridors (WMC) to be included in Canfor's five year development plans. These WMC's provide cover and allow animals to travel through non-logged areas. WMC's are not located within Nahounli Creek Watershed (Canfor 1996).

Since this watershed lies within a portion of Canfor's Necoslie Operating Area, linear development is common throughout the area (Ministry of Forests 1995; Canfor 1996). The major gravel road located in this watershed is the Teardrop FSR and its adjoining sideroads (Canfor 1996).

¹The species identified as Dolly Varden (*Salvelinus malma*), in the Fisheries Information Summary System is, in all probability, bull trout (*Salvelinus confluentus*), as indicated by population distribution studies conducted by Haas and McPhail (1991).

Figure 3. Location of Nahounli Creek Watershed (182-5941) within the Stuart Lake Watershed Group



Gazetted Stream Name	Nahounli Creek
Local Stream Name	Not Applicable
Watershed Code	182-5941
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/8
TRIM Map	93K050
Cutting Permit	015
Cutblock Number	033
Operating Area	Necoslie
Development Type	Cutblock
Survey Date	30-May-95
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	8
Stream Width (m)	2.1
Length Surveyed (m)	1100
Habitat Type	Stream
Stream Order (1:20,000)	4,3
Forest Practices Code Stream Classification	S-3
Fish Species Identified	RB - Rainbow Trout
Description: This low gradient (3%) reach flows in a northerly direction along the southwestern boundary of the proposed cutblock. Total cover was 20% with the majority being overhanging vegetation (45%), LWD (20%) and undercut banks (20%). The bed material was dominated by gravels (45%) and larges (40%). Fish sampling (electroshocking) was conducted for 118 sec. Two rainbow trout were caught. Since regionally significant fish were caught, this reach has been classified as S-3 under the Forest Practices Code.	

DFO/MoELP Stream Survey Form

20-Aug-97

Stream: Nahounli Creek

Stream Survey Report

Watershed Code:

182-5941-000-000-000-000-000-000-000-000

Header Information

Stream Name: Nahounli Creek Stream "Local": N/A Access: FT
Watershed Code: 182-5941-000-000-000-000-000-000-000-000-000 Reach No.: 1 Reach Length (km): 1.10000 Method: MW
Location: 15-33 Necoslie Map #: 93K/8 Site No.: 0 Length surveyed (m): 1100.0 Method: MW
U.T.M.: 10.429876.6033193 Fish Card: N Field: Yes Historical: No
Date: 23/05/95 Time: 09:45 Agency: EDI Survey Crew: RV \ \ \ \ \ \ \ \ Photos: 2: 6 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 2.1 Method Av. Chan. Width (m): TF
Av. Wet. Width (m): 1.5 Method Av. Wet. Width (m): TF
Av. Max. Rif. Depth (cm): 11 Av. Max. Riffle Depth (cm): TF
Av. Max. Pool Depth (cm): 30 Av. Max. Pool Depth (cm): 11
Gradient (%): 3.0 Method Gradient: CL
% Pool: 25 % Riffle: 25 % Run: 50 % Other: 0 Method: GE
% Side Channel: 0 Method Side Channel: GE
% Debris Area: 0-10 Method Debris Area: GE

Specific Data

2.0	2.6	1.5	1.8	2.2	2.2
0.8	1.3	1.4	1.8	1.4	2.0

Bed Material

% Fines (<2mm): 15 % Fines (<2mm): 15
% Gravels: 45 Small (2-16mm): 15
Large (16-64mm): 30
% Larges: 40 Small cobble (64-128mm): 25
Large cobble (128-256mm): 10
Boulder cobble (>256mm): 5
% Bedrock: 0 % Bedrock: 0
D90 (cm): Compaction: Medium

Cover

Cover Total %: 20 Method Cover Total %: GE
Dp Pool: 10 L.O.D.: 20 Boulder: 5 In Veg.: 0 Over Veg: 45 Cutbank: 20
Crown Closure %: 5 Method Crown Closure: GE Aspect: N Method Aspect: C

Discharge

Wetted Width (m): Method Wetted Width (m):
Mean Depth (m): Method Mean Depth (m):
Mean Velocity (m/s): Method Mean Velocity (m/s)
Discharge (m3/s): Method Discharge (m3/s):

Specific Data

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope)

(Bed Material)

Banks

Height (m): 0.5 % Unstable: 0
Textures Fines: Yes Gravel: No Larges: No Bedrock: No
Confinement: 2
Valley: Chan. Ratio:
Stage: M
Flood Signs Ht(m): Method Flood Signs:
Braided: N Method Braided:
Bars (%): Method Bars:
pH: Method pH:
O2 (ppm): Method Dissolved Oxygen:
Water Temp. (°C): 8.0 Method Temperature: HT
Turb. (cm): Method Turbidity:
Cond. (µmhos): Method Conductivity:

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-5941-000-000-000-000-000-000-000-000

Fish Summary

Species	Number	Size Range (mm)	Life Stage	Sex	Disc 2	Disc 3	Method/Reference
RB	2	55-100	J	R			EL

Obstructions

Comments

CI

Film 2: 6 u/s.

Fish sampling (electroshocking) was conducted for 118 seconds. Two rainbow trout were captured.

This section of stream was given a S-3 classification under the Forest Practices Code.



Photo 1. Upstream view of Stream 182-5941 at Reach 1

Gazetted Stream Name	Nahounli Creek
Local Stream Name	Not Applicable
Watershed Code	182-5941
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/8
TRIM Map	93K050
Cutting Permit	Nec
Cutblock Number	051
Operating Area	Necoslie
Development Type	Cutblock
Survey Date	19-Jun-96
Reach Number	B
Site Number	Not Applicable
Water Temperature (°C)	5.5
Stream Width (m)	0.9
Length Surveyed (m)	1000
Habitat Type	Stream
Stream Order (1:20,000)	1,2
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This mid-gradient (8%) reach is located along the western boundary of the proposed cutblock, flowing in a northerly direction. Total cover is 30% with the majority being large organic debris (40%) and overhanging vegetation (30%). Bed materials are dominated by fines (75%) and larges (20%). Fish sampling (electroshocking) was conducted for 65 sec. No fish were captured or observed. This reach did not contain potential fisheries habitat. It was, therefore, classified as S-6 under the Forest Practices Code.	

Header Information

Stream Name:	Nahounli Creek	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-5941-000-000-000-000-000-000-000-000	Reach No.:	998	Reach Length (km):	0.80000 Method: MW
Location:	Nec 51	Site No.:	0	Length surveyed (m):	1000.0 Method: MW
		Map #:	93K/8	Fish Card:	N Field: Yes Historical: No
		U.T.M. :	10.430210.6030090	Photos:	#2:23,24 Air Photos:
Date: 96/06/19	Time: 10:59	Agency: EDI	Survey Crew: ST\RD\BR\ \ \ \ \ \		

Channel Characteristics

Av. Chan. Width (m):	0.9	Method Av. Chan. Width (m):	MS
Av. Wet. Width (m):	0.8	Method Av. Wet. Width (m):	MS
Av. Max. Rif. Depth (cm):	5	Av. Max. Riffle Depth (cm):	MS
Av. Max. Pool Depth (cm):	20	Av. Max. Pool Depth (cm):	5
Gradient (%):	8.0	Method Gradient:	CL
% Pool: 10	% Riffle: 20	% Run: 70	% Other: 0
% Side Channel:	0-10	Method Side Channel:	GE
% Debris Area:	>40	Method Debris Area:	GE

Specific Data					
0.8	0.9	0.9	0.8	1.0	0.8

Method: GE

Cover

Cover Total % :	30	Method Cover Total %:	GE
Dp Pool: 15 L.O.D.:	40	Boulder: 5	In Veg.: 0
Crown Closure % :	5	Method Crown Closure:	GE
		Over Veg: 30	Cutbank: 10
		Aspect : NW	Method Aspect: C

Discharge

Wetted Width (m) :	Method Wetted Width (m) :
Mean Depth (m) :	Method Mean Depth (m) :
Mean Velocity (m/s) :	Method Mean Velocity (m/s)
Discharge (m3/s) :	Method Discharge (m3/s) :

Specific Data					

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope)

(Bed Material)

Bed Material

% Fines (<2mm):	75	% Fines (<2mm):	75
% Gravels:	5	Small (2-16mm):	5
		Large (16-64mm):	0
% Larges:	20	Small cobble (64-128mm):	10
		Large cobble (128-256mm):	5
		Boulder cobble (>256mm):	5
% Bedrock:	0	% Bedrock:	0
D90 (cm):	24	Compaction:	Medium

Banks

Height (m):	0.1	% Unstable:	10
Textures Fines:	Yes	Gravel: No	Larges: No
Confinement:	4	Bedrock:	No
Valley: Chan. Ratio:			
Stage:	M		
Flood Signs Ht(m):	0.75	Method Flood Signs:	MS
Braided:		Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	5.5	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

DFO/MoELP Stream Survey Form

23-Feb-98

Stream: Nahounli Creek

Watershed Code:

Stream Survey Report

182-5941-000-000-000-000-000-000-000-000

Fish Summary

Obstructions

Comments

C1

Film 2:23 d/s, 24 u/s

Note: Reach '998' should read Reach 'B'

Fish sampling (electroshocking) was conducted for 65 seconds. No fish were captured or observed.

This stream has a S-6 classification.



Photo 2. Upstream view of Stream 182-5941 at Reach B.



Photo 3. Downstream view of Stream 182-5941 at Reach B.

4.1.2.1 Stream 182-5941-639

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-5941-639
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/8
TRIM Map	93K050
Cutting Permit	015
Cutblock Number	030
Operating Area	Necoslie
Development Type	Cutblock
Survey Date	31-May-95
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	100
Habitat Type	Wetland
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This wetland occupied a flat area containing numerous braided channels with ponded water and no detectable flow. Vegetation mainly consisted of alder and willow. Fish sampling was not conducted. No fish were observed. As this is a wetland and not a stream, it does not require stream classification under the Forest Practices Code. This wetland should be protected accordingly.	

4.1.2.2 Stream 182-5941-890

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-5941-890
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/8
TRIM Map	93K050
Cutting Permit	Nec
Cutblock Number	051
Operating Area	Necoslie
Development Type	Cutblock
Survey Date	19-Jun-96
Reach Number	Not Applicable
Site Number	1
Water Temperature (°C)	5.5
Stream Width (m)	0.9
Length Surveyed (m)	100
Habitat Type	Stream
Stream Order (1:20,000)	1~
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This low gradient (2.5%) reach is located outside the northwestern boundary of the proposed cutblock flowing in a northeasterly direction. Total cover is 35%, provided by overhanging vegetation (40%). Bed material is dominated by fines (90%). This stream was not indicated on the TRIM map, but was found during the field survey. Fish sampling (electroshocking) was conducted for 300 sec. No fish were captured or observed. This site was not assigned a stream classification under the Forest Practices Code, however the data gathered will be used for right-of-way design.	

DFO/MoELP Stream Survey Form

31-Dec-97

Stream: Unnamed

Stream Survey Report

Watershed Code:

182-5941-890-000-000-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-5941-890-000-000-000-000-000-000-000-000	Reach No.:	0	Reach Length (km):	Method:
Location:	Nec 51	Site No.:	1	Length surveyed (m):	100.0 Method: MW
		Map #:	93K/8	Fish Card:	N Field: Yes Historical: No
		U.T.M.:	10.430130.6030470	Photos:	#18-1,2 Air Photos:
Date:	6/19/96	Time:	12:00	Agency:	EDI
		Survey Crew:	BR\ST\RD \ \ \ \ \		

Channel Characteristics

Av. Chan. Width (m):	0.9	Method Av. Chan. Width (m):	MS
Av. Wet. Width (m):	0.8	Method Av. Wet. Width (m):	MS
Av. Max. Rif. Depth (cm):	5	Av. Max. Riffle Depth (cm):	MS
Av. Max. Pool Depth (cm):	30	Av. Max. Pool Depth (cm):	5
Gradient (%):	2.5	Method Gradient:	CL
% Pool: 25	% Riffle: 10	% Run: 65	% Other: 0
% Side Channel:	0	Method Side Channel:	GE
% Debris Area:	10-40	Method Debris Area:	GE

Specific Data					
1.0	0.6	0.6	1.2	1.2	0.8

Cover

Cover Total % :	35	Method Cover Total %:	GE
Dp Pool: 25 L.O.D.:	20	Boulder: 0	In Veg.: 0
Crown Closure % :	25	Method Crown Closure:	GE
		Aspect :	NE
		Method Aspect:	C

Discharge

Wetted Width (m) :	1.1	Method Wetted Width (m) :	
Mean Depth (m) :	0.2	Method Mean Depth (m) :	
Mean Velocity (m/s) :	0.20	Method Mean Velocity (m/s)	
Discharge (m3/s) :	0.41	Method Discharge (m3/s) :	

Reach Symbol

(Fish)	
(Width, Valley: Channel, Slope)	(Bed Material)

Bed Material

% Fines (<2mm):	90	% Fines (<2mm):	90
% Gravels:	10	Small (2-16mm):	5
		Large (16-64mm):	5
% Larges:	0	Small cobble (64-128mm):	0
		Large cobble (128-256mm):	0
		Boulder cobble (>256mm):	0
% Bedrock:	0	% Bedrock:	0
D90 (cm):		Compaction:	High

Banks

Height (m):	0.2	% Unstable:	10
Textures Fines:	Yes	Gravel: No	Larges: No
Confinement:	5	Bedrock:	No
Valley: Chan. Ratio:			
Stage:	M		
Flood Signs Ht(m):		Method Flood Signs:	
Braided:	Y	Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	5.5	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

DFO/MoELP Stream Survey Form

31-Dec-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-5941-890-000-000-000-000-000-000-000

Fish Summary

Obstructions

Comments

C1

Film 18: 1 u/s, 2 d/s.

Fish sampling (electroshocking) was conducted for 300 seconds. The electrofishing was conducted by a second crew member at a later time. No fish were captured or observed.

This stream does not have a stream classification under the Forest Practices Code.



Photo 4. Upstream view of Stream 182-5941-890 at Site 1



Photo 5. Downstream view of Stream 182-5941-890 at Site 1

4.1.2.3 Stream 182-5941-894

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-5941-894
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/8
TRIM Map	93K050
Cutting Permit	Nec
Cutblock Number	051
Operating Area	Necoslie
Development Type	Cutblock
Survey Date	19-Jun-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	1150
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This tributary is not a stream, it is a seepage. It is located along the eastern border of the proposed cutblock. There are no definable channels, and the substrate is composed entirely of organics. Vegetation consists of alder, Devil's club and twinberry. Fish sampling was not conducted. No fish were observed. As this is a seepage, stream classification is not required under the Forest Practices Code.	

4.1.3 Watershed 182-5941-454

Watershed 182-5941-454 is located within in BC Environment Management Unit 7-14 (BC Ministry of Environment, Lands and Parks 1993), and covers part of the southeastern portion of the Stuart Lake Watershed Group (Fig. 4). The main system flows into Nahounli Creek (182-5941) and eventually into Stuart Lake. It is bounded by Nahounli Creek to the southwest, Nahounli Lake to the south and the Ocock River is approximately 6 km north of the basin's confluence with Nahounli Creek. Occupying 2,383 ha of the Stuart Lake Provincial Forest, the geographical relief ranges from approximately 790 m at the confluence of Stream 182-5941-454 and Nahounli Creek, to approximately 950 m in the southern headwaters (BC Environment 1995; Department of Energy, Mines and Resources 1977).

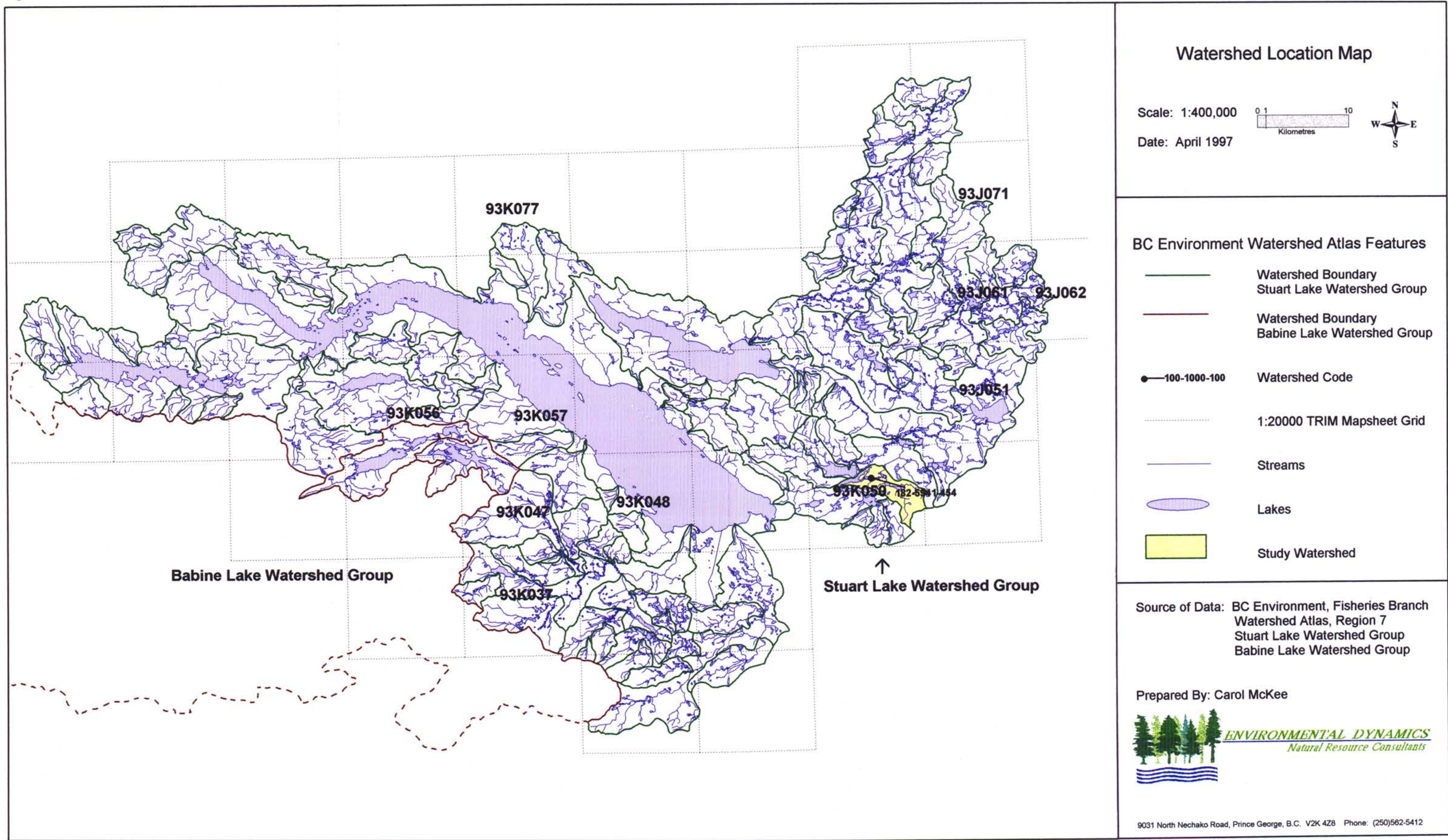
According to the biogeoclimatic units of the Prince George Forest, this watershed is dominated by the Stuart Dry Warm Sub-Boreal Spruce sub-zone (SBSdw3) (DeLong et al. 1993).

According to BC Environment lake inventory files (1997), longnose sucker and largescale sucker were documented in Bone Lake (alias) within this watershed (BC Environment 1997b).

Canfor together with BC Environment have created Wildlife Movement Corridors (WMC) to be included in Canfor's five year development plans. These WMC's provide cover and allow animals to travel through non-logged areas. WMC's are not located within Watershed 182-5941-454 (Canfor 1996).

Since this watershed lies within a portion of Canfor's Necoslie Operating Area, linear development is common throughout the area (Ministry of Forests 1995; Canfor 1996). The major gravel road located in this watershed is the Teardrop FSR and its adjoining sideroads (Canfor 1996).

Figure 4. Location of Watershed 182-5941-454 within the Stuart Lake Watershed Group



Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-5941-454
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/8
TRIM Map	93K050
Cutting Permit	015
Cutblock Number	041
Operating Area	Necoslie
Development Type	Cutblock
Survey Date	17-May-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	1700
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage area is located along the eastern side of the cutblock and drains in a northerly direction. The channel is intermittent for 600 m upstream from its confluence. The channel is not continuous and water occasionally flows over organic substrates. The channelled area contained willow and alder. The gradient was 22 % at the proposed road crossing, and the surrounding vegetation consisted of alder and red osier dogwood. Note: According to the TRIM base map, this system is actually a tributary to stream 182-6976-928-280-072-790. Fish sampling (electroshocking) was conducted for 100 sec throughout the channelled area. No fish were captured or observed. This seepage area does not require a stream classification under the Forest Practices Code.	

4.1.3.1 Stream EDI-786

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	786
Nearest Downstream Watershed Code	182-5941-454
NTS Map (1:50,000)	93K/08
TRIM Map	93K050
Cutting Permit	015
Cutblock Number	041
Operating Area	Necoslie
Development Type	Cutblock
Survey Date	17-May-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	100
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage area is located at the northeastern corner of the cutblock and drain in a notheasterly direction. No defined channel were found in this area. Fish sampling was not conducted and no fish were observed. This seepage area does not require a stream classification under the Forest Practices Code.	

4.1.3.2 Stream 182-5941-454-457

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-5941-454-457
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/8
TRIM Map	93K050
Cutting Permit	015
Cutblock Number	030
Operating Area	Necoslie
Development Type	Cutblock
Survey Date	31-May-95
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Recorded
Stream Width (m)	Not Recorded
Length Surveyed (m)	100
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This stream is located inside the eastern boundary of the proposed cutblock flowing northeasterly. The channel is braided and occasionally confined. Water was present in standing pools, however, the channel was mainly dry at the time of survey. A stream card was not completed. Fish sampling was not conducted. No fish were observed. This stream contained no fisheries values. It was classified as S-6 under the Forest Practices Code.	

4.1.3.3 Stream EDI-488

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	488
Nearest Downstream Watershed Code	182-5941-454-457
NTS Map (1:50,000)	93K/8
TRIM Map	93K050
Cutting Permit	015
Cutblock Number	030
Operating Area	Necoslie
Development Type	Cutblock
Survey Date	31-May-95
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	100
Habitat Type	Wetland
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This wetland occupies a flat area vegetated mainly with alder. Several dry, discontinuous braided channels were spread out through the vegetation. Fish sampling was not conducted. No fish were observed. As this is a wetland, stream classification is not required under the Forest Practices Code. However, this area should be protected accordingly.	

4.1.4 Watershed 182-5941-711

This watershed is located within BC Environment Management Unit 7-14 (BC Ministry of Environment, Lands and Parks 1993), and covers part of the southeastern corner of the Stuart Lake Watershed Group (Fig. 5). The main system (182-5941-711) flows into Nahounli Lake which drains into Nahounli Creek and eventually into Stuart Lake. The basin is bounded by Nahounli Lake to the north, Ocock River to the northeast and the Necoslie River to the south. Occupying 952 ha of the Stuart Lake Provincial Forest, the geographical relief ranges from approximately 780 m at the inlet of Nahounli Lake, to approximately 1,030 m at its southern headwaters. A geographical feature east of this basin is Mount Prince, which stands at 1,240 m elevation (BC Environment 1995; Department of Energy, Mines and Resources 1977).

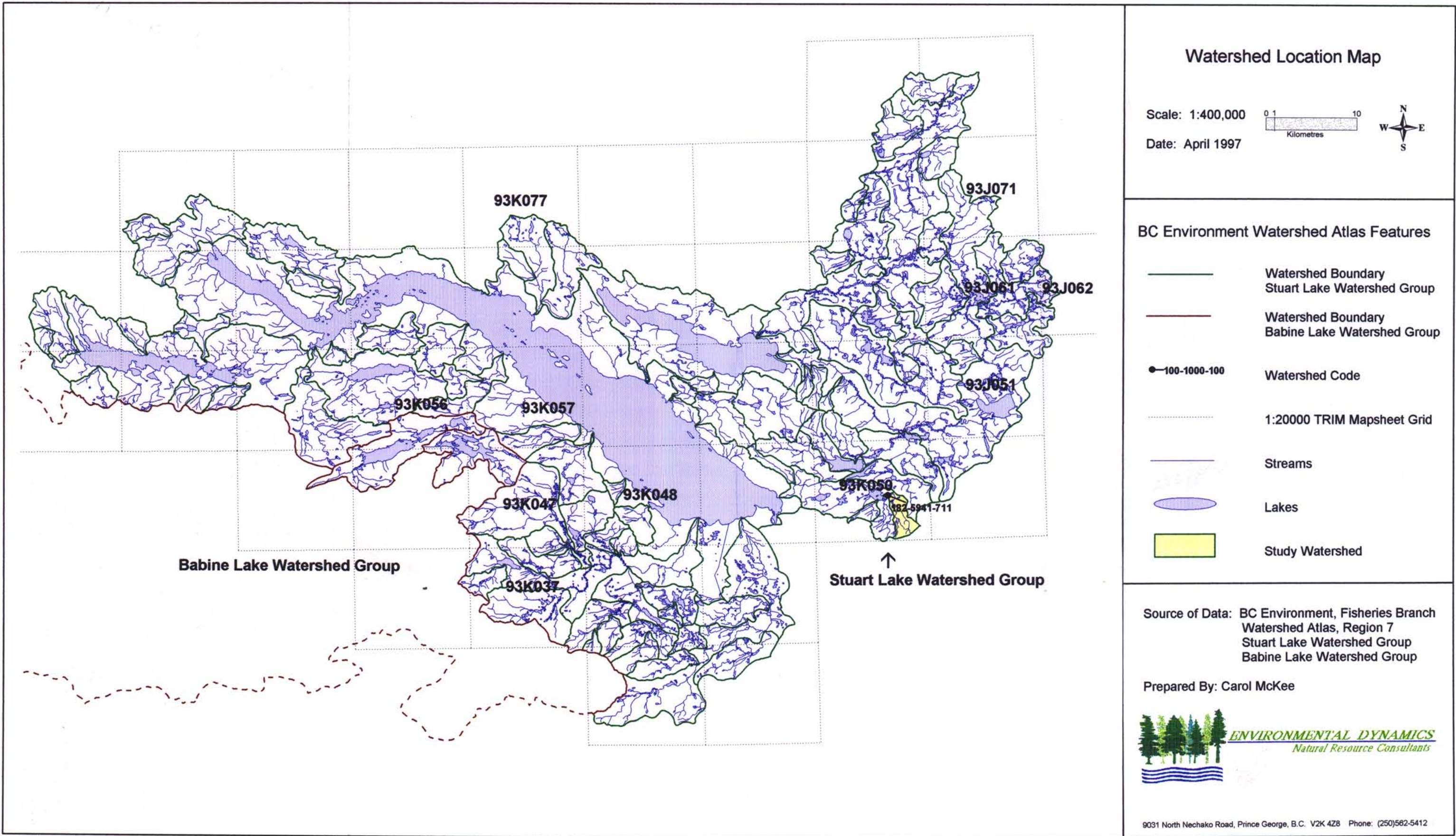
This watershed is dominated by two sub-zones/variants according to the biogeoclimatic units of the Prince George Forest Region. These units include the Stuart Dry Warm Sub-Boreal Spruce sub-zone (SBSdw3), and the Mossvale Moist Cool Sub-Boreal Spruce sub-zone (SBSmk1) (DeLong et al. 1993).

According to the updated FISS data (1995), no fish species have been documented in Watershed 182-5941-711. Nonetheless, this system flows into Nahounli Lake and, therefore, has the potential to support fish (BC Environment 1995).

Canfor together with BC Environment have created Wildlife Movement Corridors (WMC) to be included in Canfor's five year development plans. These WMC's provide cover and allow animals to travel through non-logged areas. WMC's are not located within Watershed 182-5941-711 (Canfor 1996).

Since this watershed lies within a portion of Canfor's Necoslie Operating Area, linear development is common throughout the area (Ministry of Forests 1995; Canfor 1996). The major gravel road located in this watershed is the Teardrop FSR and its adjoining sideroads (Canfor 1996).

Figure 5. Location of Watershed 182-5941-711 within the Stuart Lake Watershed Group



Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-5941-711
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/8
TRIM Map	93K050
Cutting Permit	015
Cutblock Number	033
Operating Area	Necoslie
Development Type	Cutblock
Survey Date	30-May-95
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	11.5
Stream Width (m)	2.6
Length Surveyed (m)	1200
Habitat Type	Stream
Stream Order (1:20,000)	2
Forest Practices Code Stream Classification	S-3
Fish Species Identified	RB - Rainbow Trout
Description: This low gradient (2%) reach is located along the northern boundary of the proposed cutblock and flows in a westerly direction into an unnamed lake. Total cover was 10% with the majority being L.O.D. (55%), overhanging vegetation (20%) and undercut banks (25%). The bed material was dominated by fines (60%) and gravels (30%). The lower limit of this reach began at a beaver dam, however, it did not appear to impede fish movement. Fish sampling was conducted for 187 sec. Two rainbow trout were caught. Since this reach contains regionally significant fish, it was classified as S-3 under the Forest Practices Code.	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-5941-711-000-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-5941-711-000-000-000-000-000-000-000	Reach No.:	1	Reach Length (km):	1.20000 Method: MW
Location:	15-33 Necoslie	Site No.:	0	Length surveyed (m):	1200.0 Method: MW
		Fish Card:	N	Field:	Yes Historical: No
Date: 5/30/95	Time: 11:00	Agency: EDI	Survey Crew: RV \ \ \ \ \	Photos:	2: 7 Air Photos:

Channel Characteristics

Av. Chan. Width (m):	2.6	Method Av. Chan. Width (m):	TF
Av. Wet. Width (m):	2.0	Method Av. Wet. Width (m):	TF
Av. Max. Rif. Depth (cm):	20	Av. Max. Riffle Depth (cm):	TF
Av. Max. Pool Depth (cm):	40	Av. Max. Pool Depth (cm):	20
Gradient (%):	2.0	Method Gradient:	CL
% Pool: 50	% Riffle: 25	% Run: 25	% Other: 0
		Method: GE	
% Side Channel:	0	Method Side Channel:	GE
% Debris Area:	0-10	Method Debris Area:	GE

Specific Data						
2.6	3.0	2.7	2.6	2.2	2.5	
2.0	2.5	2.0	1.5	1.5	2.5	

Bed Material

% Fines (<2mm):	60	% Fines (<2mm):	60
% Gravels:	30	Small (2-16mm):	25
		Large (16-64mm):	5
% Larges:	10	Small cobble (64-128mm):	5
		Large cobble (128-256mm):	5
		Boulder cobble (>256mm):	0
% Bedrock:	0	% Bedrock:	0
D90 (cm):		Compaction:	High

Cover

Cover Total % :	10	Method Cover Total %:	GE
Dp Pool: 5 L.O.D.:	55	Boulder: 0	In Veg.: 0
Crown Closure % :	15	Method Crown Closure:	GE
		Aspect: W	Method Aspect: C

Discharge

Wetted Width (m):	Method Wetted Width (m):
Mean Depth (m):	Method Mean Depth (m):
Mean Velocity (m/s):	Method Mean Velocity (m/s)
Discharge (m3/s):	Method Discharge (m3/s):

Specific Data

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) (Bed Material)

Banks

Height (m):	0.4	% Unstable:	10
Textures Fines:	Yes	Gravel: No	Larges: No
Confinement:	2	Bedrock:	No
Valley: Chan. Ratio:			
Stage:	M		
Flood Signs Ht(m):		Method Flood Signs:	
Braided:	N	Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	11.5	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-5941-711-000-000-000-000-000-000-000-000

Fish Summary

Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method(s) & Date(s)
RB	2	66-135	J	R			EL

Obstructions

Comments

C1

Film 2: 7 w/s.

Fish sampling was conducted for 187 seconds. Two rainbow trout were captured.

This reach was given a S-3 classification under the Forest Practices Code.



Photo 6. Upstream view of Stream 182-5941-711 at Reach 1

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-5941-711
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/8
TRIM Map	93K050
Cutting Permit	015
Cutblock Number	035
Operating Area	Necoslie
Development Type	Cutblock
Survey Date	30-May-95
Reach Number	A
Site Number	Not Applicable
Water Temperature (°C)	7
Stream Width (m)	1.6
Length Surveyed (m)	300
Habitat Type	Stream
Stream Order (1:20,000)	3
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This small stream is located near the southwestern corner of the cutblock and flows in a northerly direction. This low gradient (3%) reach is confined and it is characterized by 50% run, 30% riffle and 20% pool. The 30% total cover was dominated by 70% overhanging vegetation. Bed material consisted of 60% fines, and 40% gravels. At the lower limit of this reach, 3.6 km upstream from the confluence with Nehounli Lake, is a series of beaver dams which would impede fish movement, and minimize access to the upper area for smaller fish. One beaver dam completely blocked the stream flow, and the stream channel becomes undefined. Fish sampling (electroshocking) was conducted for 680 sec. No fish were captured or observed. Due to the minimal access and impediments created by the beaver dams, this reach was classified as S-6 under the Forest Practices Code. Recommendation: Further sampling is required downstream of this system to determine the upper limit of fish distribution.	

DFO/MoELP Stream Survey Form

17-Dec-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-5941-711-000-000-000-000-000-000-000

Header Information

Stream Name: Unnamed

Stream "Local": N/A

Access:

FT

Watershed Code: 182-5941-711-000-000-000-000-000-000-000-000

Reach No.:

999

Reach Length (km):

0.30000

Method:

MW

Location: 015-035 Necoslie

Map #: 93K/8

Site No.:

0

Length surveyed (m):

300.0

Method:

MW

U.T.M.: 10.430990.6032150

Fish Card:

N

Field: Yes

Historical:

No

Date: 5/30/95

Time: 11:00

Agency: EDI

Survey Crew: SC\EL\ \ \ \ \ \

Photos:

3: 8

Air Photos:

Channel Characteristics

Av. Chan. Width (m):	1.6	Method Av. Chan. Width (m):	TF	
Av. Wet. Width (m):	1.4	Method Av. Wet. Width (m):	TF	
Av. Max. Rif. Depth (cm):	6	Av. Max. Riffle Depth (cm):	TF	
Av. Max. Pool Depth (cm):	15	Av. Max. Pool Depth (cm):	6	
Gradient (%):	3.0	Method Gradient:	CL	
% Pool: 20	% Riffle: 30	% Run: 50	% Other: 0	Method: GE
% Side Channel:	Method Side Channel:			
% Debris Area:	10-40	Method Debris Area:	GE	

Specific Data

1.4	1.9	1.5	1.8	1.1	1.8
-----	-----	-----	-----	-----	-----

Bed Material

% Fines (<2mm):	60	% Fines (<2mm):	60
% Gravels:	40	Small (2-16mm):	20
		Large (16-64mm):	20
% Larges:	0	Small cobble (64-128mm):	0
		Large cobble (128-256mm):	0
		Boulder cobble (>256mm):	0
% Bedrock:	0	% Bedrock:	0
D90 (cm):	15	Compaction:	High

Cover

Cover Total % :	60	Method Cover Total %:	GE		
Dp Pool : 0 L.O.D.:	25	Boulder: 0	In Veg.: 0	Over Veg: 70	Cutbank: 5
Crown Closure % :	30	Method Crown Closure:	GE	Aspect : N	Method Aspect: C

Discharge

Wetted Width (m) :	1.0	Method Wetted Width (m) :	TF
Mean Depth (m) :	0.1	Method Mean Depth (m) :	TF
Mean Velocity (m/s) :	0.08	Method Mean Velocity (m/s)	F
Discharge (m3/s) :	0.01	Method Discharge (m3/s) :	f

Specific Data

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope)

(Bed Material)

Banks

Height (m):	40.0	% Unstable:	20	
Textures Fines:	Yes	Gravel: No	Larges: No	Bedrock: No
Confinement:	2			
Valley: Chan. Ratio:				
Stage:	M			
Flood Signs Ht(m):		Method Flood Signs:		
Braided:		Method Braided:		
Bars (%):		Method Bars:		
pH:		Method pH:		
O2 (ppm):		Method Dissolved Oxygen:		
Water Temp. (°C):	7.0	Method Temperature:		HT
Turb. (cm):		Method Turbidity:		
Cond. (µmhos):		Method Conductivity:		

DFO/MoELP Stream Survey Form

17-Dec-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-5941-711-000-000-000-000-000-000-000

Fish Summary

Obstructions

Obstruction #/m	Type	Location
1	BD	3.0

Comments

- C1

Film 3: 8 d/s.

Note: Reach '999' should read Reach 'A'.

Fish sampling (electroshocking) was conducted for 680 seconds. No fish were captured or observed.

This section of stream was classifiedm as a S-6 under the Forest Practices Code.
- C2

Location. This beaver dam is 3.6 km upstream of its confluence with Nahounli Lake.



Photo 7. Upstream view of Stream 182-5941-711 at Reach A.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-5941-711
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/8
TRIM Map	93K050
Cutting Permit	Nec
Cutblock Number	051
Operating Area	Necoslie
Development Type	Cutblock
Survey Date	19-Jun-96
Reach Number	B
Site Number	Not Applicable
Water Temperature (°C)	7
Stream Width (m)	0.87
Length Surveyed (m)	450
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This mid-gradient (7%) reach is located outside of the northwestern boundary of the proposed cutblock, flowing in a northerly direction. Total cover is 20% primarily due to large organic debris (45%). Bed material is dominated by fines (55%). Fish sampling (electroshocking) was conducted for 129 sec. No fish were captured or observed. Since the reach is lacking in fisheries potential, and due to the impassable series of beaver dams located downstream (3.6 km upstream of the confluence with Nehounli Lake), it has been classified as S-6 under the Forest Practices Code.	

23-Feb-98

Stream: Unnamed

Watershed Code:

182-5941-711-000-000-000-000-000-000-000

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-5941-711-000-000-000-000-000-000-000	Reach No.:	998	Reach Length (km):	0.45 Method: MW
Location:	Nec 51	Map #:	93K/18	Site No.:	0 Length surveyed (m): 450.0 Method: MW
		U.T.M. :	10.431030.6030330	Fish Card:	N Field: Yes Historical: No
Date: 96/06/19	Time: 15:20	Agency: EDI	Survey Crew: STURDA \ \ \ \ \	Photos:	#15:1,2,&3 Air Photos:

Av. Chan. Width (m):	0.9	Method Av. Chan. Width (m):	MS
Av. Wet. Width (m):	0.8	Method Av. Wet. Width (m):	MS
Av. Max. Rif. Depth (cm):	5	Av. Max. Riffle Depth (cm):	MS
Av. Max. Pool Depth (cm):	25	Av. Max. Pool Depth (cm):	5
Gradient (%):	7.0	Method Gradient:	CL
% Pool: 20	% Riffle: 20	% Run: 60	% Other: 0
% Side Channel:	0-10	Method Side Channel:	GE
% Debris Area:	>40	Method Debris Area:	GE

Method: GE

Cover Total % :	20	Method Cover Total %:	GE				
Dp Pool: 20 L.O.D.:	40	Boulder: 5	In Veg.: 0	Over Veg: 20	Cutbank:		15
Crown Closure % :	5	Method Crown Closure:	GE	Aspect : N	Method Aspect:		C

Wetted Width (m) :	0.9	Method Wetted Width (m) :	
Mean Depth (m) :	0.1	Method Mean Depth (m) :	
Mean Velocity (m/s) :	0.40	Method Mean Velocity (m/s)	
Discharge (m ³ /s) :	0.03	Method Discharge (m ³ /s) :	

Specific Data

(Fish)

(Width, Valley: Channel, Slope)	(Bed Material)
1000 ft wide, 100 ft deep, 1:1 slope	Gravel
500 ft wide, 50 ft deep, 1:1 slope	Sand
250 ft wide, 25 ft deep, 1:1 slope	Silt
125 ft wide, 12.5 ft deep, 1:1 slope	Clay
62.5 ft wide, 6.25 ft deep, 1:1 slope	Gravel
31.25 ft wide, 3.125 ft deep, 1:1 slope	Sand
15.625 ft wide, 1.5625 ft deep, 1:1 slope	Silt
7.8125 ft wide, 0.78125 ft deep, 1:1 slope	Clay

% Fines (<2mm):	55	% Fines (<2mm):	55
% Gravels:	30	Small (2-16mm):	10
		Large (16-64mm):	20
% Larges:	15	Small cobble (64-128mm):	5
		Large cobble (128-256mm):	5
		Boulder cobble (>256mm):	5
% Bedrock:	0	% Bedrock:	0
D90 (cm):	10	Compaction:	High

Height (m):	0.3	% Unstable:	10		
Textures Fines:	Yes	Gravel: No	Larges: No	Bedrock:	No
Confinement:	4				
Valley: Chan. Ratio:					
Stage:	M				
Flood Signs Ht(m):	0.2	Method Flood Signs:			MS
Braided:	Y	Method Braided:			
Bars (%):		Method Bars:			
pH:		Method pH:			
02 (ppm):		Method Dissolved Oxygen:			
Water Temp. (°C):	7.0	Method Temperature:			HT
Turb. (cm):		Method Turbidity:			
Cond. (umhos):		Method Conductivity:			

DFO/MoELP Stream Survey Form

23-Feb-98

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-5941-711-000-000-000-000-000-000-000

Fish Summary

Obstructions

Comments

C1

Film 15: 1 and 2 u/s, 3 d/s.

Note: Reach '998' should read Reach 'B'.

Fish sampling (electroshocking) was conducted for 129 seconds. No fish were captured or observed.

There is a series of impassable beaver dams located downstream of this reach and 3.6 km upstream of the confluence with Nehounli Lake. This stream has a S-6 classification.

4.1.4.1 Stream EDI-575

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	575
Nearest Downstream Watershed Code	182-5941-711
NTS Map (1:50,000)	93K/8
TRIM Map	93K050
Cutting Permit	015
Cutblock Number	035
Operating Area	Necoslie
Development Type	Cutblock
Survey Date	23-Jun-96
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	12
Stream Width (m)	1.5
Length Surveyed (m)	200
Habitat Type	Stream
Stream Order (1:20,000)	2
Forest Practices Code Stream Classification	S-3*
Fish Species Identified	None
Description: This moderately sized stream is located along the eastern boundary of the cutblock and flows north. This low gradient (2%) reach was unconfined and was characterized by 80% run and 20% pool habitat. The 20% total cover was basically evenly distributed between deep pools, LOD, overhanging vegetation and undercut banks. The bed material was dominated by fines (95%) and a small percentage of gravels (5%). This reach is bordered by beaver dams at its lower and upper limits. The beaver dam at the upper limit, 200 m upstream of the confluence, could be a barrier to upstream fish migration. It was approximately 25 m across and 1.7 m high. A cut channel was to observed through this beaver dam, however, flooding prevented a close examination. The beaver dam at the lower limit has been breached and is not a fish obstruction. Survey continued downstream of the lower beaver dam and wetland area, although no stream card was completed. The fish habitat in this area improved as it contained spawning gravels, pools for rearing, and LOD provided habitat diversity. Fish sampling (electroshocking) was conducted for 42 sec and no fish were captured or observed. This reach contained marginal spawning and rearing habitat. However, due to the fact that rainbow trout were captured downstream on this system it has been defaulted to a S-3* under the Forest Practices Code. Note: This stream (EDI-575) is not present on the NTS map. The upstream section of this stream has the watershed code 182-5941-711-544. The field survey found that EDI-575 is actually the same stream as 182-5941-711-544. It also found that 182-5941-711-544 does not flow west and enter 182-5941-711 as indicated on the Watershed Atlas. It actually flows north and enters 182-5941-711 west of cutblock Nec 15-33. Recommendation: If the presence/absence of fish needs to be confirmed in this reach further sampling may be required.	

DFO/MoELP Stream Survey Form

23-Feb-98 Stream: Unnamed

Watershed Code: 182-5941-711-999-000-000-000-000-000-000

Stream Survey Report

Header Information

Stream Name:	Unnamed	Stream "Local":	EDI-575	Access:	FT
Watershed Code:	182-5941-711-999-000-000-000-000-000-000-000	Reach No.:	1	Reach Length (km):	0.20000 Method: MW
Location:	ND/WSC: 182-5941-711; 015-035 Necoslie	Site No.:	0	Length surveyed (m):	200.0 Method: MW
		Map #:	93K/8	Fish Card:	N Field: Yes Historical: No
		U.T.M. :	10.431670.6033120	Photos:	41: 15, 16 Air Photos:
Date: 96/06/23	Time: 14:00	Agency: EDI	Survey Crew: RM\MS\ \ \ \ \ \ \		

Channel Characteristics

Av. Chan. Width (m):	1.5	Method Av. Chan. Width (m):	MS
Av. Wet. Width (m):	1.3	Method Av. Wet. Width (m):	MS
Av. Max. Rif. Depth (cm):	0	Av. Max. Riffle Depth (cm):	MS
Av. Max. Pool Depth (cm):	23	Av. Max. Pool Depth (cm):	0
Gradient (%):	2.0	Method Gradient:	CL
% Pool: 20	% Riffle: 0	% Run: 80	% Other: 8 Method: GE
% Side Channel:	0	Method Side Channel:	GE
% Debris Area:	10-40	Method Debris Area:	GE

Specific Data					
1.6	1.1	1.6	1.6	1.6	1.5

Bed Material

% Fines (<2mm):	95	% Fines (<2mm):	95
% Gravels:	5	Small (2-16mm):	5
		Large (16-64mm):	0
% Larges:	0	Small cobble (64-128mm):	0
		Large cobble (128-256mm):	0
		Boulder cobble (>256mm):	0
% Bedrock:	0	% Bedrock:	0
D90 (cm):		Compaction:	High

Cover

Cover Total % :	20	Method Cover Total %:	GE
Dp Pool : 20 L.O.D.:	30	Boulder: 0 In Veg.: 0	Over Veg: 20 Cutbank: 30
Crown Closure % :	5	Method Crown Closure:	GE Aspect : S Method Aspect: GE

Discharge

Wetted Width (m) :	1.4	Method Wetted Width (m) :	MS
Mean Depth (m) :	20.0	Method Mean Depth (m) :	MS
Mean Velocity (m/s) :	0.13	Method Mean Velocity (m/s)	F
Discharge (m3/s) :		Method Discharge (m3/s) :	

Specific Data					

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) (Bed Material)

Banks

Height (m):	0.1	% Unstable:	15
Textures Fines:	Yes	Gravel: No Larges: No	Bedrock: No
Confinement:	5		
Valley: Chan. Ratio:			
Stage:	M		
Flood Signs Ht(m):		Method Flood Signs:	
Braided:	N	Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	12.0	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

Fish Summary

Obstructions

Obstruction H(m)	Type	Location
2	BD	1.0

Comments

- C2

Note: Average. Max. Riffle Depth was marked N/A on the stream survey form.

Location 1: At the upper limit of this reach, 200 m upstream of the confluence, there is a 1.7 m high beaver dam which may be a barrier to fish migration.
- C1

Film 41: 15 d/s, 16 u/s.

Fish sampling (electroshocking) was conducted for 42 seconds. No fish were captured or observed.

This section of stream was defaulted to a S-3 classification under the Forest Practices Code.



Photo 8. Upstream view of Stream EDI-575 at Reach 1.



Photo 9. Downstream view of Stream EDI-575 at Reach 1.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	575
Nearest Downstream Watershed Code	182-5941-711
NTS Map (1:50,000)	93K/8
TRIM Map	93K050
Cutting Permit	015
Cutblock Number	035
Operating Area	Necoslie
Development Type	Cutblock
Survey Date	23-Jun-96
Reach Number	2
Site Number	Not Applicable
Water Temperature (°C)	8.0
Stream Width (m)	1.8
Length Surveyed (m)	600
Habitat Type	Stream
Stream Order (1:20,000)	2
Forest Practices Code Stream Classification	S-3*
Fish Species Identified	None
Description: This moderately sized reach is located along the eastern boundary of the cutblock and flows north. This low gradient (2%) reach was occasionally confined and was characterized by 40% run, 30% pool, and 25% riffle habitat. The 40% total cover was dominated by undercut banks (40%) and deep pools (25%). The remaining cover was evenly distributed between LOD, boulders, and overhanging vegetation. The bed material consisted of 60% gravels, 25% larges and 15% fines. The upper limit of this reach is a wetland area. Fish sampling (electroshocking) was conducted for 1173 sec. No fish were captured or observed. This reach contained excellent fish habitat for both rearing and spawning. Spawning gravels are clean and are not heavily compacted with fines. Rearing habitat is above average with many pools and undercut banks. As this reach contains excellent fish habitat and rainbow trout were captured further downstream on this system, it has been defaulted to a S-3* under the Forest Practices Code. Note: This stream (EDI-575) is not present on the NTS map. The upstream section of this stream has the watershed code 182-5941-711-544. The field survey found that EDI-575 is actually the same stream as 182-5941-711-544. It also found that 182-5941-711-544 does not flow west and enter 182-5941-711 as indicated on the Watershed Atlas. It actually flows north and enters 182-7941-711 west of cutblock Nec 15-33. Recommendation: Further sampling may be required to confirm fish presence or absence.	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-5941-711-999-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	EDI-575	Access:	FT
Watershed Code:	182-5941-711-999-000-000-000-000-000-000-000	Reach No.:	2	Reach Length (km):	0.60000 Method: MW
Location:	NDWSC: 182-5941-711; 015-035 Necoslie	Map #:	93K/8	Site No.:	0 Length surveyed (m): 600.0 Method: MW
		U.T.M.:	10.431840.6032490	Fish Card:	N Field: Yes Historical: No
Date:	6/23/96	Time:	09:30	Agency:	EDI
		Survey Crew:	RM\MS\ \ \ \ \ \	Photos:	41: 10, 11
				Air Photos:	

Channel Characteristics

Av. Chan. Width (m):	1.8	Method Av. Chan. Width (m):	TF	Specific Data					
Av. Wet. Width (m):	1.6	Method Av. Wet. Width (m):	TF	1.8	1.6	1.6	1.6	2.1	2.3
Av. Max. Rif. Depth (cm):	18	Av. Max. Riffle Depth (cm):	MS						
Av. Max. Pool Depth (cm):	35	Av. Max. Pool Depth (cm):	18						
Gradient (%):	2.0	Method Gradient:	CL						
% Pool:	30	% Riffle:	25	% Run:	40	% Other:	5	Method: GE	
% Side Channel:	0	Method Side Channel:	GE						
% Debris Area:	10-40	Method Debris Area:	GE						

Cover

Cover Total % :	40	Method Cover Total %:	GE								
Dp Pool :	25	L.O.D.:	10	Boulder:	10	In Veg.:	0	Over Veg:	15	Cutbank:	40
Crown Closure % :	10	Method Crown Closure:	GE	Aspect :	NE	Method Aspect:	C				

Discharge

Wetted Width (m) :	1.6	Method Wetted Width (m) :	TF	Specific Data			
Mean Depth (m) :	0.2	Method Mean Depth (m) :	MS				
Mean Velocity (m/s) :	0.78	Method Mean Velocity (m/s)	F				
Discharge (m3/s) :		Method Discharge (m3/s) :					

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) (Bed Material)

Bed Material

% Fines (<2mm):	15	% Fines (<2mm):	15
% Gravels:	60	Small (2-16mm):	40
		Large (16-64mm):	20
% Larges:	25	Small cobble (64-128mm):	15
		Large cobble (128-256mm):	5
		Boulder cobble (>256mm):	5
% Bedrock:	0	% Bedrock:	0
D90 (cm):		Compaction:	High

Banks

Height (m):	0.3	% Unstable:	5				
Textures Fines:	Yes	Gravel:	No	Larges:	No	Bedrock:	No
Confinement:	4						
Valley: Chan. Ratio:							
Stage:	M						
Flood Signs Ht(m):		Method Flood Signs:					
Braided:	N	Method Braided:					
Bars (%):		Method Bars:					
pH:		Method pH:					
O2 (ppm):		Method Dissolved Oxygen:					
Water Temp. (°C):	8.0	Method Temperature:		HT			
Turb. (cm):		Method Turbidity:					
Cond. (µmhos):		Method Conductivity:					

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-5941-7111-999-000-000-000-000-000-000-000

Fish Summary

Obstructions

Comments

C1 Film 41: 10 d/s, 11 u/s

Fish sampling (electroshocking) was conducted for 1173 seconds. No fish were captured or observed.

This section of stream was defaulted to an S-3 classification under the Forest Practices Code.



Photo 10. Upstream view of Stream EDI-575 at Reach 2.



Photo 11. Downstream view of Stream EDI-575 at Reach 2.

4.1.4.2 Stream EDI-549

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	549
Nearest Downstream Watershed Code	182-5941-711
NTS Map (1:50,000)	93K/8
TRIM Map	93K050
Cutting Permit	015
Cutblock Number	035
Operating Area	Necoslie
Development Type	Cutblock
Survey Date	30-May-95
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	6.0
Stream Width (m)	0.80
Length Surveyed (m)	500
Habitat Type	Stream
Stream Order (1:20,000)	1~
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This small stream is located along the eastern boundary of the cutblock and flows in a northerly direction. The source for this low gradient stream (5%) reach is a natural spring. This reach was characterized by 60% run, 30% riffle and 10% pool. Total cover (50%) was provided by large organic debris (50%), and overhanging vegetation (40%). Bed material consisted of 80% fines and 20% gravels. This stream had minimal flow and sections of undefined channel. Fish sampling (electroshocking) was conducted at the site sample within this reach for 1173 sec. No fish were caught or observed. This reach has low quality habitat and has minimal flow. It has, therefore, been classified as S-6 under the Forest Practices Code. Note: '~' means that this stream was not indicated on the TRIM based map.	

DFO/MoELP Stream Survey Form

02-Apr-98

Stream: Unnamed

Stream Survey Report

Watershed Code:

182-5941-711-999-000-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	EDI-549	Access:	FT				
Watershed Code:	182-5941-711-999-000-000-000-000-000-000-000	Reach No.:	1	Reach Length (km):	0.5	Method:	MW		
Location:	ND/WSC:182-5941-711; Nec 15-35	Site No.:	0	Length surveyed (m):	500.0	Method:	MW		
		Map #:	93K/8	Fish Card:	N	Field:	Yes	Historical:	No
		U.T.M.:	10.431970.6032400	Photos:	#3:9	Air Photos:			
Date:	95/05/30	Time:	13:20	Agency:	EDI	Survey Crew:	SC\EL\ \ \ \ \ \ \ \		

Channel Characteristics

Av. Chan. Width (m):	0.8	Method Av. Chan. Width (m):	MS	Specific Data					
Av. Wet. Width (m):	0.7	Method Av. Wet. Width (m):	MS	0.7	1.1	1.0	0.6	0.5	0.8
Av. Max. Rif. Depth (cm):	2	Av. Max. Riffle Depth (cm):	MS						
Av. Max. Pool Depth (cm):	9	Av. Max. Pool Depth (cm):	2						
Gradient (%):	4.0	Method Gradient:	CL						
% Pool: 10	% Riffle: 30	% Run: 60	% Other: 0	Method: GE					
% Side Channel:	0	Method Side Channel:	GE						
% Debris Area:	10-40	Method Debris Area:	GE						

Cover

Cover Total % :	50	Method Cover Total %:	GE				
Dp Pool : 0	L.O.D.: 50	Boulder: 0	In Veg.: 0	Over Veg: 40	Cutbank:	10	
Crown Closure % :	75	Method Crown Closure:	GE	Aspect : N	Method Aspect:	C	

Discharge

Wetted Width (m) :	0.6	Method Wetted Width (m) :	MS	Specific Data					
Mean Depth (m) :	0.0	Method Mean Depth (m) :	MS						
Mean Velocity (m/s) :	0.13	Method Mean Velocity (m/s)	F						
Discharge (m3/s) :	0.02	Method Discharge (m3/s) :	F						

Reach Symbol

(Fish)	
(Width, Valley: Channel, Slope)	(Bed Material)

Bed Material

% Fines (<2mm):	80	% Fines (<2mm):	80
% Gravels:	20	Small (2-16mm):	20
		Large (16-64mm):	
% Larges:	0	Small cobble (64-128mm):	0
		Large cobble (128-256mm):	
		Boulder cobble (>256mm):	
% Bedrock:	0	% Bedrock:	0
D90 (cm):	8	Compaction:	High

Banks

Height (m):	0.3	% Unstable:	10		
Textures Fines:	Yes	Gravel: No	Larges: No	Bedrock:	No
Confinement:	2				
Valley: Chan. Ratio:					
Stage:	M				
Flood Signs Ht(m):		Method Flood Signs:			
Braided:		Method Braided:			
Bars (%):		Method Bars:			
pH:		Method pH:			
02 (ppm):		Method Dissolved Oxygen:			
Water Temp. (°C):	6.0	Method Temperature:	HT		
Turb. (cm):		Method Turbidity:			
Cond. (umhos):		Method Conductivity:			

DFO/MoELP Stream Survey Form

23-Feb-98

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-5941-711-999-000-000-000-000-000-000-000

Fish Summary

Obstructions

Comments

C1

Film: 3: 9

Fish sampling (electroshocking) was conducted, but not recorded. No fish were caught or observed.

This stream had no fisheries potential as the habitat was poor and was classified as a S-6 under the Forest Practices Code



Photo 12. Upstream view of Stream EDI-549 at Reach 1

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	549
Nearest Downstream Watershed Code	182-5941-711
NTS Map (1:50,000)	93K/8
TRIM Map	93K050
Cutting Permit	015
Cutblock Number	035
Operating Area	Necoslie
Development Type	Cutblock
Survey Date	23-Jun-96
Reach Number	1
Site Number	1
Water Temperature (°C)	6.5
Stream Width (m)	0.49
Length Surveyed (m)	100
Habitat Type	Stream
Stream Order (1:20,000)	1~
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This small stream is located along the eastern boundary of the cutblock and flows in a northerly direction. The source for this low gradient stream (5%) is a natural spring. This site was characterized by 45% run, 40% riffle and 10% pool. At this frequently confined site, the total cover (60%) was provided by overhanging vegetation (80%). Bed material consisted of 40% fines and 45% gravels. Fish sampling (electroshocking) was conducted at the site sample for 1173 sec. No fish were caught or observed. This site card was completed within a reach classified as a S-6 under the Forest Practices code. Note: '~' means that this stream was not indicated on the TRIM based map.	

Header Information

Stream Name:	Unnamed	Stream "Local":	EDI 549	Access:	FT
Watershed Code:	182-5941-711-999-000-000-000-000-000-000-000	Reach No.:	0	Reach Length (km):	0.5 Method: MW
Location:	ND/WSC: 182-5941-711; 015-035 Necoslie	Site No.:	1	Length surveyed (m):	500.0 Method: MW
		Fish Card:	N	Field:	Yes Historical: No
Date: 5/30/95	Time: 11:00	Agency:	EDI	Photos:	41: 12, 13
		Survey Crew:	RM\MS\ \ \ \ \ \ \	Air Photos:	

Channel Characteristics

Av. Chan. Width (m):	0.5	Method Av. Chan. Width (m):	MS
Av. Wet. Width (m):	0.5	Method Av. Wet. Width (m):	MS
Av. Max. Rif. Depth (cm):	8	Av. Max. Riffle Depth (cm):	MS
Av. Max. Pool Depth (cm):	14	Av. Max. Pool Depth (cm):	8
Gradient (%):	5.0	Method Gradient:	CL
% Pool:	10	% Riffle:	40
% Side Channel:	0	Method Side Channel:	GE
% Debris Area:	0-10	Method Debris Area:	GE

% Run:	45	% Other:	5	Method:	GE
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Specific Data					
0.5	0.6	0.6	0.6	0.3	0.5

Bed Material

% Fines (<2mm):	40	% Fines (<2mm):	40
% Gravels:	45	Small (2-16mm):	35
		Large (16-64mm):	10
% Larges:	15	Small cobble (64-128mm):	10
		Large cobble (128-256mm):	5
		Boulder cobble (>256mm):	0
% Bedrock:	0	% Bedrock:	0
D90 (cm):		Compaction:	Medium

Cover

Cover Total % :	60	Method Cover Total %:	GE
Dp Pool :	5	L.O.D.:	10
Crown Closure % :	10	Method Crown Closure:	GE

Boulder:	0	In Veg.:	0	Over Veg:	80	Cutbank:	5
Aspect :	NW	Method Aspect:	C				

Discharge

Wetted Width (m) :	Method Wetted Width (m) :
Mean Depth (m) :	Method Mean Depth (m) :
Mean Velocity (m/s) :	Method Mean Velocity (m/s) :
Discharge (m3/s) :	Method Discharge (m3/s) :

Specific Data					

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope)

(Bed Material)

Banks

Height (m):	0.5	% Unstable:	5
Textures Fines:	Yes	Gravel:	No
Confinement:	3	Larges:	No
Valley: Chan. Ratio:		Bedrock:	No
Stage:	M		
Flood Signs Ht(m):		Method Flood Signs:	
Braided:	N	Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	6.5	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

DFO/MoELP Stream Survey Form

12-Dec-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-5941-711-999-000-000-000-000-000-000-000

Fish Summary

Obstructions

Comments

C1 Film 41: 12 u/s, 13 d/s.

Fish sampling (electroshocking) was conducted and no fish were captured or observed.

This site is within a reach that has been classified as a S-6 under the Forest Practices Code.



Photo 13. Downstream view of Stream EDI-549 at Site 1.

4.1.4.3 Stream 182-5941-711-544

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-5941-711-544
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/8
TRIM Map	93K050
Cutting Permit	Nec
Cutblock Number	049
Operating Area	Necoslie
Development Type	Cutblock
Survey Date	22-May-96
Reach Number	A
Site Number	Not Applicable
Water Temperature (°C)	2.0
Stream Width (m)	1.46
Length Surveyed (m)	400
Habitat Type	Stream
Stream Order (1:20,000)	2
Forest Practices Code Stream Classification	S-4*
Fish Species Identified	None
Description: This low gradient (5%) reach is located along the southwestern boundary of cutblock Nec-40 flowing in a northeasterly direction. Total cover was high (55%) primarily due to overhanging vegetation (35%) and undercut banks (30%). Bed materials were dominated by fines (50%) and gravels (40%). Fish sampling (electroshocking) was conducted for 253 sec. No fish were captured or observed. This reach provides good rearing potential as it contains deep pools and high cover, as well as some rearing potential. It has, therefore, been defaulted to a S-4* classification under the Forest Practices Code. Note: The ground survey found that this main system (182-5941-711-544) is not consistent with the Watershed Atlas. Its confluence is incorrectly depicted on the NTS map, and therefore its watershed code is incorrect. It has been used as an identifier until it can be changed.	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-5941-711-544-000-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-5941-711-544-000-000-000-000-000-000-000	Reach No.:	999	Reach Length (km):	0.40000 Method: MW
Location:	Nec 40	Site No.:	0	Length surveyed (m):	400.0 Method: MW
		Map #:	93K/8	Fish Card:	N Field: Yes Historical: No
		U.T.M.:	10.432530.6030620	Photos:	#16: 8,9 Air Photos:
Date:	5/22/96	Time:	09:45	Agency:	EDI
		Survey Crew:	LL\WD\BC\ \ \ \ \ \		

Channel Characteristics

Av. Chan. Width (m):	1.5	Method Av. Chan. Width (m):	TF
Av. Wet. Width (m):	1.3	Method Av. Wet. Width (m):	TF
Av. Max. Rif. Depth (cm):	10	Av. Max. Riffle Depth (cm):	MS
Av. Max. Pool Depth (cm):	75	Av. Max. Pool Depth (cm):	10
Gradient (%):	5.0	Method Gradient:	CL
% Pool: 20	% Riffle: 5	% Run: 75	% Other: 0
Method: GE			
% Side Channel:	0	Method Side Channel:	GE
% Debris Area:	0-10	Method Debris Area:	GE

Specific Data

1.3	1.1	1.0	1.6	2.0	1.8
-----	-----	-----	-----	-----	-----

Bed Material

% Fines (<2mm):	50	% Fines (<2mm):	50
% Gravels:	40	Small (2-16mm):	25
		Large (16-64mm):	15
% Larges:	10	Small cobble (64-128mm):	0
		Large cobble (128-256mm):	5
		Boulder cobble (>256mm):	5
% Bedrock:	0	% Bedrock:	0
D90 (cm):	15	Compaction:	High

Cover

Cover Total %:	55	Method Cover Total %:	GE
Dp Pool: 20	L.O.D.: 10	Boulder: 5	In Veg.: 0
		Over Veg: 35	Cutbank: 30
Crown Closure %:	25	Method Crown Closure:	GE
		Aspect: NW	Method Aspect: C

Discharge

Wetted Width (m):	1.3	Method Wetted Width (m):	TF
Mean Depth (m):	0.4	Method Mean Depth (m):	MS
Mean Velocity (m/s):	0.66	Method Mean Velocity (m/s):	F
Discharge (m3/s):	0.34	Method Discharge (m3/s):	F

Specific Data

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope)	(Bed Material)
---------------------------------	----------------

Banks

Height (m):	0.2	% Unstable:	5
Textures Fines:	Yes	Gravel: No	Larges: No
Confinement:	3	Bedrock:	No
Valley: Chan. Ratio:			
Stage:	H		
Flood Signs Ht(m):		Method Flood Signs:	
Braided:	N	Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	2.0	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-5941-711-544-000-000-000-000-000-000-000

Fish Summary

Obstructions

Comments

C1

Film 16: 8 u/s, 9 d/s.

Note: Reach '999' should read Reach 'A'.

Fish sampling (electroshocking) was conducted for 253 seconds and no fish were caught or observed.

This stream was defaulted to an S-4 classification under the Forest Practices Code because it has excellent spawning and rearing habitat. Low temperature may be responsible for fish absence.



Photo 14. Upstream view of Stream 182-5941-711-544 at Reach A.



Photo 15. Downstream view of Stream 182-5941-711-544 at Reach A.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-5941-711-544
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/8
TRIM Map	93K050
Cutting Permit	Nec
Cutblock Number	042
Operating Area	Necoslie
Development Type	Cutblock
Survey Date	22-May-96
Reach Number	B
Site Number	Not Applicable
Water Temperature (°C)	5.0
Stream Width (m)	1.41
Length Surveyed (m)	600
Habitat Type	Stream
Stream Order (1:20,000)	1,2
Forest Practices Code Stream Classification	S-4*
Fish Species Identified	None
Description: This low gradient (1.5%) reach is located along the northeastern boundary of cutblock Nec-42 flowing in a northerly direction. Total cover (55%) is primarily provided by large organic debris (40%) and overhanging vegetation (30%). Bed material is dominated by fines (90%). The upper limit ends as a wetland/pond area, directly north of a road. Upstream of the road (south side), 100 m upstream of where 182-5941-711-544-842 joins this stream, the stream is backed up due to a log debris jam in the culvert. Fish sampling (electroshocking) was conducted for 105 sec. No fish were captured or observed. This reach provides good fisheries habitat and has, therefore, been defaulted to S-4* classification under the Forest Practices Code. Note: The ground survey found that this main system (182-5941-711-544) is not consistent with the Watershed Atlas. Its confluence is incorrectly depicted on the NTS map, and therefore its watershed code is incorrect. It has been used as an identifier until it can be changed. Recommendation: Since regionally significant fish were captured numerous kilometers downstream on this system, further surveying is required to determine the upper limit of fish distribution. Also, the culvert above this reach should be cleared of debris, so the road fill does not fail and cause extensive siltation in lower reaches of the stream.	

DFO/MoELP Stream Survey Form

18-Dec-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-5941-711-544-000-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-5941-711-544-000-000-000-000-000-000-000	Reach No.:	998	Reach Length (km):	0.60000 Method: MW
Location:	Nec 42	Site No.:	0	Length surveyed (m):	600.0 Method: MW
		Fish Card:	N	Field:	Yes Historical: No
Date: 5/22/96	Time: 13:00	Agency: EDI	Survey Crew: LL\WD\BC\ \ \ \ \ \	Photos:	#16: 13, 14 Air Photos:
		Map #:	93K/8		
		U.T.M. :	10.432570.6030110		

Channel Characteristics

Av. Chan. Width (m):	1.4	Method Av. Chan. Width (m):	TF	Specific Data					
Av. Wet. Width (m):	1.1	Method Av. Wet. Width (m):	TF	1.2	1.6	1.4	1.6	1.4	1.3
Av. Max. Rif. Depth (cm):	12	Av. Max. Riffle Depth (cm):	MS						
Av. Max. Pool Depth (cm):	50	Av. Max. Pool Depth (cm):	12						
Gradient (%):	1.5	Method Gradient:	CL						
% Pool:	20	% Riffle:	10	% Run:	70	% Other:	0	Method:	GE
% Side Channel:	0	Method Side Channel:	GE						
% Debris Area:	10-40	Method Debris Area:	GE						

Cover

Cover Total % :	55	Method Cover Total %:	GE								
Dp Pool :	10	L.O.D.:	40	Boulder:	5	In Veg.:	5	Over Veg:	30	Cutbank:	10
Crown Closure % :	0	Method Crown Closure:	GE	Aspect :	N	Method Aspect:	C				

Discharge

Wetted Width (m) :	1.1	Method Wetted Width (m) :	TF	Specific Data					
Mean Depth (m) :	0.3	Method Mean Depth (m) :	MS						
Mean Velocity (m/s) :	0.66	Method Mean Velocity (m/s)	F						
Discharge (m3/s) :	0.25	Method Discharge (m3/s) :	f						

Reach Symbol

(Fish)	
(Width, Valley: Channel, Slope)	(Bed Material)

Bed Material

% Fines (<2mm):	90	% Fines (<2mm):	90
% Gravels:	10	Small (2-16mm):	5
		Large (16-64mm):	5
% Larges:	0	Small cobble (64-128mm):	0
		Large cobble (128-256mm):	0
		Boulder cobble (>256mm):	0
% Bedrock:	0	% Bedrock:	0
D90 (cm):	0	Compaction:	High

Banks

Height (m):	0.2	% Unstable:	0				
Textures Fines:	Yes	Gravel:	No	Larges:	No	Bedrock:	No
Confinement:	4						
Valley: Chan. Ratio:							
Stage:	H						
Flood Signs Ht(m):	0.2	Method Flood Signs:	MS				
Braided:	N	Method Braided:					
Bars (%):		Method Bars:					
pH:		Method pH:					
O2 (ppm):		Method Dissolved Oxygen:					
Water Temp. (°C):	5.0	Method Temperature:	HT				
Turb. (cm):		Method Turbidity:					
Cond. (µmhos):		Method Conductivity:					

DFO/MoELP Stream Survey Form

18-Dec-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-5941-711-544-000-000-000-000-000-000

Fish Summary

Obstructions

Comments

- C1
- Film 16: 13 d/s, 14 u/s.
Note: Reach '998' should read Reach 'B'.
Fish sampling (electroshocking) was conducted for 105 seconds and no fish were caught or observed.
This stream was defaulted to an S-4 stream under the Forest Practices Code because it contained good rearing habitat and no impasses were observed.

C2



Photo 16. Upstream view of Stream 182-5941-711-544 at Reach B.



Photo 17. Downstream view of Stream 182-5941-711-544 at Reach B.

4.1.4.4 Stream EDI-788

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	788
Nearest Downstream Watershed Code	182-5941-711-544
NTS Map (1:50,000)	93K/08
TRIM Map	93K050
Cutting Permit	015
Cutblock Number	041
Operating Area	Necoslie
Development Type	Cutblock
Survey Date	17-May-96
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	2.0
Stream Width (m)	0.73
Length Surveyed (m)	900
Habitat Type	Stream
Stream Order (1:20,000)	1~
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This small reach is located along the western boundary of the cutblock and flows northwesterly. The 40% total cover was dominated by overhanging vegetation (60%) and large organic debris (30%). Bed material consisted of fines (30%), gravels (40%) and larges (30%). Fish sampling (electroshocking) was not conducted in this stream. However, electroshocking was conducted for 130 sec in the system (182-5941-711) that this stream flows into, and no fish were captured or observed. As this stream did not provide potential fisheries habitat, it was classified as S-6 under the Forest Practices Code. Note: '~' means that this stream is not indicated on the TRIM base map, but was discovered during the ground survey.	

Fish Summary

Obstructions

Comments

- C2

Note: Gradient was not recorded in the field.
- C1

Film 54: 8 d/s.

Fish sampling (electroshocking) was conducted for 130 seconds in the stream into which this stream flows. No fish were captured or observed.

This stream was given a S-6 classification under the Forest Practices Code.



Photo 18. Upstream view of Stream EDI-788 at Reach 1.

4.1.4.5 Stream 182-5941-711-544-513

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-5941-711-544-513
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/08
TRIM Map	93K050
Cutting Permit	Nec
Cutblock Number	040
Operating Area	Necoslie
Development Type	Cutblock
Survey Date	21-May-96
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	2
Stream Width (m)	0.68
Length Surveyed (m)	100
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This mid-gradient (11%) reach is located outside of the western boundary of the proposed cutblock flowing north. Total cover was high (50%), primarily due to overhanging vegetation (60%). Bed material was dominated by fines (90%). Water periodically flows over moss and the stream is probably ephemeral. The upper limit of the reach is a wetland which lacks definable banks and alluvial substrates. Fish sampling (electroshocking) was conducted for 10 sec. No fish were caught or observed. This reach does not possess any fisheries habitat and has been classified as S-6 under the Forest Practices Code.	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Stream Survey Report

Watershed Code:

182-5941-711-544-513-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-5941-711-544-513-000-000-000-000-000-000-000	Reach No.:	1	Reach Length (km):	0.05000 Method: MW
Location:	Nec 40	Site No.:	0	Length surveyed (m):	100.0 Method: MW
		Map #: 93K/8		Fish Card:	N Field: Yes Historical: No
		U.T.M. : 10.432320.6030760		Photos:	#16: 5,6 Air Photos:
Date: 5/21/96	Time: 16:00	Agency: EDI	Survey Crew: LL \BC\ \ \ \ \ \ \		

Channel Characteristics

Av. Chan. Width (m):	0.7	Method Av. Chan. Width (m):	TF
Av. Wet. Width (m):	0.7	Method Av. Wet. Width (m):	TF
Av. Max. Rlf. Depth (cm):	3	Av. Max. Riffle Depth (cm):	MS
Av. Max. Pool Depth (cm):	28	Av. Max. Pool Depth (cm):	3
Gradient (%):	11.0	Method Gradient:	CL
% Pool: 5	% Riffle: 5	% Run: 90	% Other: 0 Method: GE
% Side Channel:	0	Method Side Channel:	GE
% Debris Area:	10-40	Method Debris Area:	GE

Specific Data					
0.8	0.6	0.5	0.8	0.9	0.5

Cover

Cover Total % :	50	Method Cover Total %:	GE
Dp Pool : 5 L.O.D.:	25	Boulder: 5 In Veg.: 5	Over Veg: 60 Cutbank: 0
Crown Closure % :	5	Method Crown Closure:	GE Aspect : N Method Aspect: C

Discharge

Wetted Width (m) :	0.7	Method Wetted Width (m) :	TF
Mean Depth (m) :	0.1	Method Mean Depth (m) :	TF
Mean Velocity (m/s) :	1.00	Method Mean Velocity (m/s)	F
Discharge (m3/s) :	0.08	Method Discharge (m3/s) :	F

Specific Data					

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope)	(Bed Material)
---------------------------------	----------------

Bed Material

% Fines (<2mm):	90	% Fines (<2mm):	90
% Gravels:	10	Small (2-16mm):	5
		Large (16-64mm):	5
% Larges:	0	Small cobble (64-128mm):	0
		Large cobble (128-256mm):	0
		Boulder cobble (>256mm):	0
% Bedrock:	0	% Bedrock:	0
D90 (cm):	0	Compaction:	High

Banks

Height (m):	0.3	% Unstable:	0
Textures Fines:	Yes	Gravel: No	Larges: No Bedrock: No
Confinement:	2		
Valley: Chan. Ratio:			
Stage:	H		
Flood Signs Ht(m):		Method Flood Signs:	
Braided:	N	Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	2.0	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

Fish Summary

Obstructions

Comments

C1

Film 16: 5 u/s, 6 d/s.

Fish sampling (electroshocking) was conducted for 10 seconds. No fish were caught or observed.

This stream was classified an S-6 under the Forest Practices Code because it contains poor quality fish habitat.



Photo 19. Upstream view of Stream 182-5941-711-544-513 at Reach 1.



Photo 20. Downstream view of Stream 182-5941-711-544-513 at Reach 1.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-5941-711-544-513
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/8
TRIM Map	93K050
Cutting Permit	Nec
Cutblock Number	040
Operating Area	Necoslie
Development Type	Cutblock
Survey Date	21-May-96
Reach Number	2
Site Number	Not Applicable
Water Temperature (°C)	3.0
Stream Width (m)	0.87
Length Surveyed (m)	150
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This low gradient (3.5%) reach is located outside of the western boundary of the proposed cutblock flowing northeasterly. Total cover (80%) was provided by overhanging vegetation (50%) and large organic debris (30%). Bed materials were dominated by fines (80%). The upper limit of this reach ends in a 350 m long seepage. Fish sampling (electroshocking) was conducted for 11 sec. No fish were captured or observed. This reach did not provide any fisheries habitat and was, therefore, classified as S-6 under the Forest Practices Code. Note: The ground survey indicates that the main system (WSC: 182-5941-711-544) to which this stream (182-5941-711-544-513) is a tributary is not consistent with the Watershed Atlas. The main system's confluence is incorrect on the NTS map, and, therefore, its watershed code is incorrect. Although the watershed code for this tributary (182-5941-711-544-513) is incorrect, it been used as an identifier until it is changed.	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Stream Survey Report

Watershed Code:

182-5941-711-544-513-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-5941-711-544-513-000-000-000-000-000-000	Reach No.:	2	Reach Length (km):	0.15000 Method: MW
Location:	Nec 40	Site No.:	0	Length surveyed (m):	150.0 Method: MW
		Map #:	93K/8	Fish Card:	N
		U.T.M.:	10.432240.6030670	Field:	Yes
Date: 5/21/96	Time: 14:45	Agency:	EDI	Historical:	No
		Survey Crew:	LL \BC\ \ \ \ \ \ \	Photos:	#16: 3, 4
				Air Photos:	

Channel Characteristics

Av. Chan. Width (m):	0.9	Method Av. Chan. Width (m):	TF	Specific Data			
Av. Wet. Width (m):	0.8	Method Av. Wet. Width (m):	TF	0.9	0.6	1.1	1.1
Av. Max. Rif. Depth (cm):	3	Av. Max. Riffle Depth (cm):	TF	0.7	0.7		
Av. Max. Pool Depth (cm):	34	Av. Max. Pool Depth (cm):	3				
Gradient (%):	3.5	Method Gradient:	CL				
% Pool:	15	% Riffle:	75	% Run:	10	% Other:	0
% Side Channel:	0-10	Method Side Channel:	GE	Method: GE			
% Debris Area:	10-40	Method Debris Area:	GE				

Cover

Cover Total % :	80	Method Cover Total %:	GE				
Dp Pool :	5	L.O.D.:	30	Boulder:	5	In Veg.:	5
Crown Closure % :	5	Method Crown Closure:	GE	Over Veg:	50	Cutbank:	5
				Aspect :	N	Method Aspect:	C

Discharge

Wetted Width (m) :	0.8	Method Wetted Width (m) :	TF	Specific Data			
Mean Depth (m) :	0.2	Method Mean Depth (m) :	TF				
Mean Velocity (m/s) :	0.50	Method Mean Velocity (m/s)	F				
Discharge (m3/s) :	0.07	Method Discharge (m3/s) :	F				

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope)	(Bed Material)
---------------------------------	----------------

Bed Material

% Fines (<2mm):	80	% Fines (<2mm):	80
% Gravels:	10	Small (2-16mm):	5
		Large (16-64mm):	5
% Larges:	10	Small cobble (64-128mm):	5
		Large cobble (128-256mm):	5
		Boulder cobble (>256mm):	0
% Bedrock:	0	% Bedrock:	0
D90 (cm):	8	Compaction:	High

Banks

Height (m):	0.3	% Unstable:	5
Textures Fines:	Yes	Gravel:	No
Confinement:	3	Larges:	No
Valley: Chan. Ratio:		Bedrock:	No
Stage:	H		
Flood Signs Ht(m):		Method Flood Signs:	
Braided:	N	Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	3.0	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-5941-711-544-513-000-000-000-000-000-000

Fish Summary***Obstructions***

Comments

CI Film 16: 3 u/s, 4 d/s.

Fish sampling (electroshocking) was conducted for 11 seconds and no fish were caught or observed.

This reach was given an S-6 classification under the Forest Practices Code because it contained low quality fish habitat.



Photo 21. Upstream view of Stream 182-5941-711-544-513 at Reach 2.



Photo 22. Downstream view of Stream 182-5941-711-544-513 at Reach 2.

4.1.4.6. Stream EDI-545

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	545
Nearest Downstream Watershed Code	182-5941-711-544
NTS Map (1:50,000)	93K/8
TRIM Map	93K050
Cutting Permit	Nec
Cutblock Number	040
Operating Area	Necoslie
Development Type	Cutblock
Survey Date	22-May-96
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	4.0
Stream Width (m)	0.58
Length Surveyed (m)	200
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This mid-gradient (10%) reach is located along the southern boundary of the propped cutblock flowing westerly. Total cover was high with the majority being overhanging vegetation (60%) and large organic debris (25%). Bed materials were dominated by fines (80%). The upper limit of this reach ends in seepage. Fish sampling not conducted. No fish were observed. This reach does not provide good fisheries habitat due to the lack of spawning substrates and inadequate rearing habitat. It has, therefore, been classified as S-6 under the Forest Practices Code. Note: The ground survey indicates that the main system (WSC: 182-5941-711-544) to which this stream (EDI-545) is a tributary is not consistent with the Watershed Atlas. The main system's confluence is incorrect on the NTS map, and therefore its watershed code is incorrect. Although the watershed code for this tributary (182-5941-711-544-513) is incorrect, it been used as an identifier until it is changed. Recommendations: Caution should be taken during logging to avoid siltation of this stream's confluence with the defaulted S-4* stream.	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Stream Survey Report

Watershed Code:

182-5941-711-544-999-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	EDI 545	Access:	FT
Watershed Code:	182-5941-711-544-999-000-000-000-000-000	Reach No.:	1	Reach Length (km):	0.20000 Method: MW
Location:	ND/WSC: 182-5941-711-544; 40 Necoslie	Site No.:	0	Length surveyed (m):	200.0 Method: MW
		Map #:	93K/8	Fish Card:	N
		U.T.M.:	10.432720.6030440	Field:	Yes
Date:	5/22/96	Time:	11:15	Historical:	No
Agency:	EDI	Survey Crew:	WC\LL\BC\ \ \ \ \	Photos:	16: 10, 11, 12
				Air Photos:	

Channel Characteristics

Av. Chan. Width (m):	0.6	Method Av. Chan. Width (m):	TF
Av. Wet. Width (m):	0.5	Method Av. Wet. Width (m):	TF
Av. Max. Rif. Depth (cm):	10	Av. Max. Riffle Depth (cm):	MS
Av. Max. Pool Depth (cm):	15	Av. Max. Pool Depth (cm):	10
Gradient (%):	10.0	Method Gradient:	CF
% Pool:	10	% Riffle:	5
% Side Channel:	0	% Run:	85
% Debris Area:	>40	% Other:	0
		Method:	GE
		Method Side Channel:	GE
		Method Debris Area:	GE

Cover

Cover Total % :	60	Method Cover Total %:	GE
Dp Pool :	5	L.O.D.:	25
Crown Closure % :	0	Boulder:	5
		In Veg.:	5
		Over Veg:	60
		Cutbank:	0
		Aspect :	W
		Method Aspect:	C

Discharge

Wetted Width (m) :	0.5	Method Wetted Width (m) :	TF
Mean Depth (m) :	0.1	Method Mean Depth (m) :	MS
Mean Velocity (m/s) :		Method Mean Velocity (m/s)	
Discharge (m3/s) :		Method Discharge (m3/s) :	

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope)

(Bed Material)

Bed Material

% Fines (<2mm):	80	% Fines (<2mm):	80
% Gravels:	15	Small (2-16mm):	10
		Large (16-64mm):	5
% Larges:	5	Small cobble (64-128mm):	0
		Large cobble (128-256mm):	0
		Boulder cobble (>256mm):	5
% Bedrock:	0	% Bedrock:	0
D90 (cm):		Compaction:	High

Banks

Height (m):	0.1	% Unstable:	5
Textures Fines:	Yes	Gravel:	No
Confinement:	3	Larges:	No
Valley: Chan. Ratio:		Bedrock:	No
Stage:	H		
Flood Signs Ht(m):		Method Flood Signs:	
Braided:	N	Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	4.0	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-5941-711-544-999-000-000-000-000-000-000

Fish Summary***Obstructions***

Comments

C1

Film 16: 10 u/s, 11 d/s, 12 u/s.

Fish sampling was not conducted. No fish were captured or observed.

This reach has been given a S-6 classification under the Forest Practices Code.



Photo 23. Upstream view of Stream EDI-545 at Reach 1.



Photo 24. Downstream view of Stream EDI-545 at Reach 1.

4.1.4.7. Stream 182-5941-711-544-808

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-5941-711-544-808
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/08
TRIM Map	93K050
Cutting Permit	Nec
Cutblock Number	042
Operating Area	Necoslie
Development Type	Cutblock
Survey Date	21-May-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	200
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage is located in the middle of the proposed cutblock, draining northeasterly into a defaulted S-4* stream. The first 50 m upstream of the confluence contains a gradient of 21%. Vegetation consisted of elderberry and twinberry. Water drains over moss and organic substrate. This area lacked a definable channel and alluvial substrate. Fish sampling was not conducted. No fish were observed. Since this area is seepage, it does not require stream classification under the Forest Practices Code. Note: The ground survey found that the main system (WSC: 182-5941-711-544) to which this system (182-5974-711-544-808) is a tributary, is not consistent with the Watershed Atlas. Therefore the watershed code of the main system is incorrect. Although the watershed code for this tributary (182-5941-711-544-808) is incorrect, it been used as an identifier until it can be changed.	

4.1.4.8. Stream 182-5941-711-544-842

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-5941-711-544-842
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/08
TRIM Map	93K050
Cutting Permit	Nec
Cutblock Number	042
Operating Area	Necoslie
Development Type	Cutblock
Survey Date	17-May-96
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	Not Recorded
Stream Width (m)	0.51
Length Surveyed (m)	175
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None

Description:

This mid-gradient (7%) reach is located at the centre of the proposed cutblock flowing northeasterly. Total cover is high (55%), primarily due to overhanging vegetation (35%) and cutbanks (30%). Substrates is dominated by fines (90%). The upper limit ended at a 400 mm diameter culvert with a 0.25 m drop which may impede fish movement.

Fish sampling (electroshocking) was conducted for 42 sec. No fish were captured or observed.

Since this reach does not contain good fish habitat, it has classified as S-6 under the Forest Practices Code.

Note: The ground survey found that the main system (182-5941-711-544) to which this system (182-5974-711-544-842) is a tributary, is not consistent with the Watershed Atlas. The confluence of stream 182-5941-711-544 is incorrect on the NTS map, and therefore its watershed code is incorrect. Although the watershed code for this tributary (182-5941-711-544-842) is incorrect, it been used as an identifier until it is changed.

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Stream Survey Report

Watershed Code:

182-5941-711-544-842-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-5941-711-544-842-000-000-000-000-000-000	Reach No.:	1	Reach Length (km):	0.175 Method: MW
Location:	Nec 42	Site No.:	0	Length surveyed (m):	175.0 Method: MW
		Fish Card:	N	Field:	Yes Historical: No
Date: 5/17/96	Time: 09:20	Agency: EDI	Survey Crew: LL \BC \ \ \ \ \ \	Photos:	#WT: 15 Air Photos:
		Map #:	93K/8		
		U.T.M.:	10.432480.6029630		

Channel Characteristics

Av. Chan. Width (m):	0.5	Method Av. Chan. Width (m):	TF				
Av. Wet. Width (m):	0.6	Method Av. Wet. Width (m):	TF				
Av. Max. Rif. Depth (cm):	5	Av. Max. Riffle Depth (cm):	MS				
Av. Max. Pool Depth (cm):	25	Av. Max. Pool Depth (cm):	5				
Gradient (%):	11.0	Method Gradient:	CL				
% Pool: 20	% Riffle: 20	% Run: 60	% Other: 0	Method: GE			
% Side Channel:	0	Method Side Channel:	GE				
% Debris Area:	10-40	Method Debris Area:	GE				

Specific Data						
0.5	0.3	0.6	0.5	0.3	1.0	

Bed Material

% Fines (<2mm):	90	% Fines (<2mm):	90
% Gravels:	5	Small (2-16mm):	5
		Large (16-64mm):	0
% Larges:	5	Small cobble (64-128mm):	0
		Large cobble (128-256mm):	0
		Boulder cobble (>256mm):	5
% Bedrock:	0	% Bedrock:	0
D90 (cm):	0	Compaction:	High

Cover

Cover Total % :	50	Method Cover Total %:	GE				
Dp Pool : 10 L.O.D.:	20	Boulder: 5	In Veg.: 5	Over Veg: 55	Cutbank:	5	
Crown Closure % :	5	Method Crown Closure:	GE	Aspect :	N	Method Aspect:	C

Discharge

Wetted Width (m) :	0.6	Method Wetted Width (m) :	TF				
Mean Depth (m) :	0.3	Method Mean Depth (m) :	MS				
Mean Velocity (m/s) :	0.30	Method Mean Velocity (m/s)	F				
Discharge (m3/s) :	0.03	Method Discharge (m3/s) :	F				

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) (Bed Material)

Banks

Height (m):	0.2	% Unstable:	5	
Textures Fines:	Yes	Gravel: No	Larges: No	Bedrock: No
Confinement:	2			
Valley: Chan. Ratio:				
Stage:	H			
Flood Signs Ht(m):		Method Flood Signs:		
Braided:	N	Method Braided:		
Bars (%):		Method Bars:		
pH:		Method pH:		
O2 (ppm):		Method Dissolved Oxygen:		
Water Temp. (°C):	0.0	Method Temperature:		HT
Turb. (cm):		Method Turbidity:		
Cond. (µmhos):		Method Conductivity:		

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-5941-711-544-842-000-000-000-000-000-000-000

Fish Summary

Obstructions

Comments

C1 White tab film: 15 d/s.

Fish sampling (electroshocking) was conducted from the confluence to 75m upstream. No fish were captured or observed.

The stream seems to be seasonal and contains low quality fish habitat and hence was given an S-6 stream classification under the Forest Practices Code. Upstream end of reach contains a 400cm culvert with a 250mm drop which could be a possible fish impasse.



Photo 25. Downstream view of Stream 182-5941-711-544-842 at Reach 1.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-5941-711-544-842
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/8
TRIM Map	93K050
Cutting Permit	Nec
Cutblock Number	042
Operating Area	Necoslie
Development Type	Cutblock
Survey Date	17-May-96
Reach Number	2
Site Number	Not Applicable
Water Temperature (°C)	Not Recorded
Stream Width (m)	0.83
Length Surveyed (m)	200
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This low gradient (1.5%) reach is located at the centre of the proposed cutblock flowing northeasterly. Total cover is high (55%), primarily due to overhanging vegetation (70%). Substrates is dominated by fines. The upper limit ends as a seepage. Fish sampling was not conducted. No fish were captured or observed. Since this reach does not contain good fish habitat, it has been classified as S-6 under the Forest Practices Code. Note: The ground survey found that the main system (182-5941-711-544) to which this system (182-5974-711-544-842) is a tributary, is not consistent with the Watershed Atlas. The confluence of stream 182-5941-711-544 is incorrect on the NTS map, and therefore its watershed code is incorrect. Although the watershed code for this tributary (182-5941-711-544-842) is incorrect, it been used as an identifier until it is changed. Recommendation: A wetland/pond area has been created on the lower limit of this reach from an improperly installed culvert. Restoration is not required for fish passage as this reach is a S-6, however, this culvert should be revisited from a maintenance perspective in order to prevent road erosion during high waters.	

DFO/MoELP Stream Survey Form

18-Dec-97

Stream: Unnamed

Stream Survey Report

Watershed Code:

182-5941-711-544-842-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT		
Watershed Code:	182-5941-711-544-842-000-000-000-000-000-000	Reach No.:	2	Reach Length (km):	0.20000	Method:	MW
Location:	Nec 42	Site No.:	0	Length surveyed (m):	200.0	Method:	MW
		Fish Card:	N	Field:	Yes	Historical:	No
Date:	5/17/96	Time:	10:45	Photos:	#WT: 17	Air Photos:	
Agency:	EDI	Map #:	93K/8				
Survey Crew:	LL\BR\BC\ \ \ \ \ \	U.T.M. :	10.432290.6029510				

Channel Characteristics

Av. Chan. Width (m):	0.8	Method Av. Chan. Width (m):	TF						
Av. Wet. Width (m):	0.8	Method Av. Wet. Width (m):	TF						
Av. Max. Rif. Depth (cm):	18	Av. Max. Riffle Depth (cm):	MS						
Av. Max. Pool Depth (cm):	37	Av. Max. Pool Depth (cm):	18						
Gradient (%):	1.5	Method Gradient:	CL						
% Pool:	20	% Riffle:	10	% Run:	70	% Other:	0	Method:	GE
% Side Channel:	0	Method Side Channel:	GE						
% Debris Area:	10-40	Method Debris Area:	GE						

Specific Data					
0.8	1.0	0.9	0.6	0.9	0.8

Bed Material

% Fines (<2mm):	100	% Fines (<2mm):	100
% Gravels:	0	Small (2-16mm):	0
		Large (16-64mm):	0
% Larges:	0	Small cobble (64-128mm):	0
		Large cobble (128-256mm):	0
		Boulder cobble (>256mm):	0
% Bedrock:	0	% Bedrock:	0
D90 (cm):	0	Compaction:	High

Cover

Cover Total % :	55	Method Cover Total %:	GE								
Dp Pool :	10	L.O.D.:	15	Boulder:	0	In Veg.:	0	Over Veg:	70	Cutbank:	5
Crown Closure % :	10	Method Crown Closure:	GE	Aspect :	NE	Method Aspect:	C				

Discharge

Wetted Width (m) :	0.8	Method Wetted Width (m) :	TF
Mean Depth (m) :	0.2	Method Mean Depth (m) :	TF
Mean Velocity (m/s) :	7.00	Method Mean Velocity (m/s)	F
Discharge (m3/s) :	0.94	Method Discharge (m3/s) :	F

Specific Data					

Reach Symbol

(Fish)	
(Width, Valley: Channel, Slope)	(Bed Material)

Banks

Height (m):	0.1	% Unstable:	0				
Textures Fines:	Yes	Gravel:	No	Larges:	No	Bedrock:	No
Confinement:	4						
Valley: Chan. Ratio:							
Stage:	H						
Flood Signs Ht(m):		Method Flood Signs:					
Braided:	N	Method Braided:					
Bars (%):		Method Bars:					
pH:		Method pH:					
O2 (ppm):		Method Dissolved Oxygen:					
Water Temp. (°C):	0.0	Method Temperature:	HT				
Turb. (cm):		Method Turbidity:					
Cond. (µmhos):		Method Conductivity:					

Stream Survey Report

182-5941-711-544-842-000-000-000-000-000-000-000

Obstructions

Comments

C1	White tag film: 17. This reach was not shocked. No fish were observed. Forest Practices Code.	Since this stream appears to be seasonal and contains poor fish habitat, it was classified as an S-6 stream under the
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Photo 26. Upstream view of Stream 182-5941-711-544-842 at Reach 2.

4.1.4.9. Stream EDI-544

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	544
Nearest Downstream Watershed Code	182-5941-711
NTS Map (1:50,000)	93K/8
TRIM Map	93K050
Cutting Permit	015
Cutblock Number	035
Operating Area	Necoslie
Development Type	Cutblock
Survey Date	30-May-95
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	500
Habitat Type	Wetland
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This wetland is located along the western boundary of the cutblock and drains southwest. There is a section with a defined channel but it is not continuous. The wetland was dominated by low lying wet areas which contained little flow. Fish sampling was not conducted and fish were not observed. This wetland does not require a stream classification under the Forest Practices Code.	

4.1.4.10. Stream 182-5941-711-544-659

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-5941-711-544-659
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/08
TRIM Map	93K050
Cutting Permit	Nec
Cutblock Number	042
Operating Area	Necoslie
Development Type	Cutblock
Survey Date	17-May-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	300
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage is located along the northwestern boundary of the proposed cutblock draining northwesterly. This area lacks a definable channel and alluvial substrates. Fish sampling was not conducted. No fish were observed. Since this is a seepage, stream classification is not required under the Forest Practices Code.	

4.1.5 Nielsp Creek Watershed 182-6350-570

Nielsp Creek Watershed (182-6350-570) is located within BC Environment Management Unit 7-25 (BC Ministry of Environment, Lands and Parks 1993), and is situated in the southern portion of the Stuart Lake Watershed Group, encompassing Nielsp Creek and its minor tributaries (Fig. 6). Nielsp Creek flows into Sowchea Creek which flows into Stuart Lake. Occupying 6,772 ha of the Stuart Lake Provincial Forest, the geographical relief ranges from approximately 880 m, at the confluence of Nielsp and Sowchea creeks, to approximately 1,310 m in the northern headwaters (BC Environment 1995; Department of Energy, Mines and Resources 1977). Scattered sections throughout the Nielsp Watershed 182-6350-570 were inventoried by *Environmental Dynamics* in 1995 and 1996.

This watershed is dominated by two sub-zones/variants according to the biogeoclimatic units of the Prince George Forest Region. These units include; the Stuart Dry Warm Sub-Boreal Spruce sub-zone (SBSdw3), and the Babine Moist Cold Sub-Boreal Spruce sub-zone (SBSmc2) (DeLong et al. 1993).

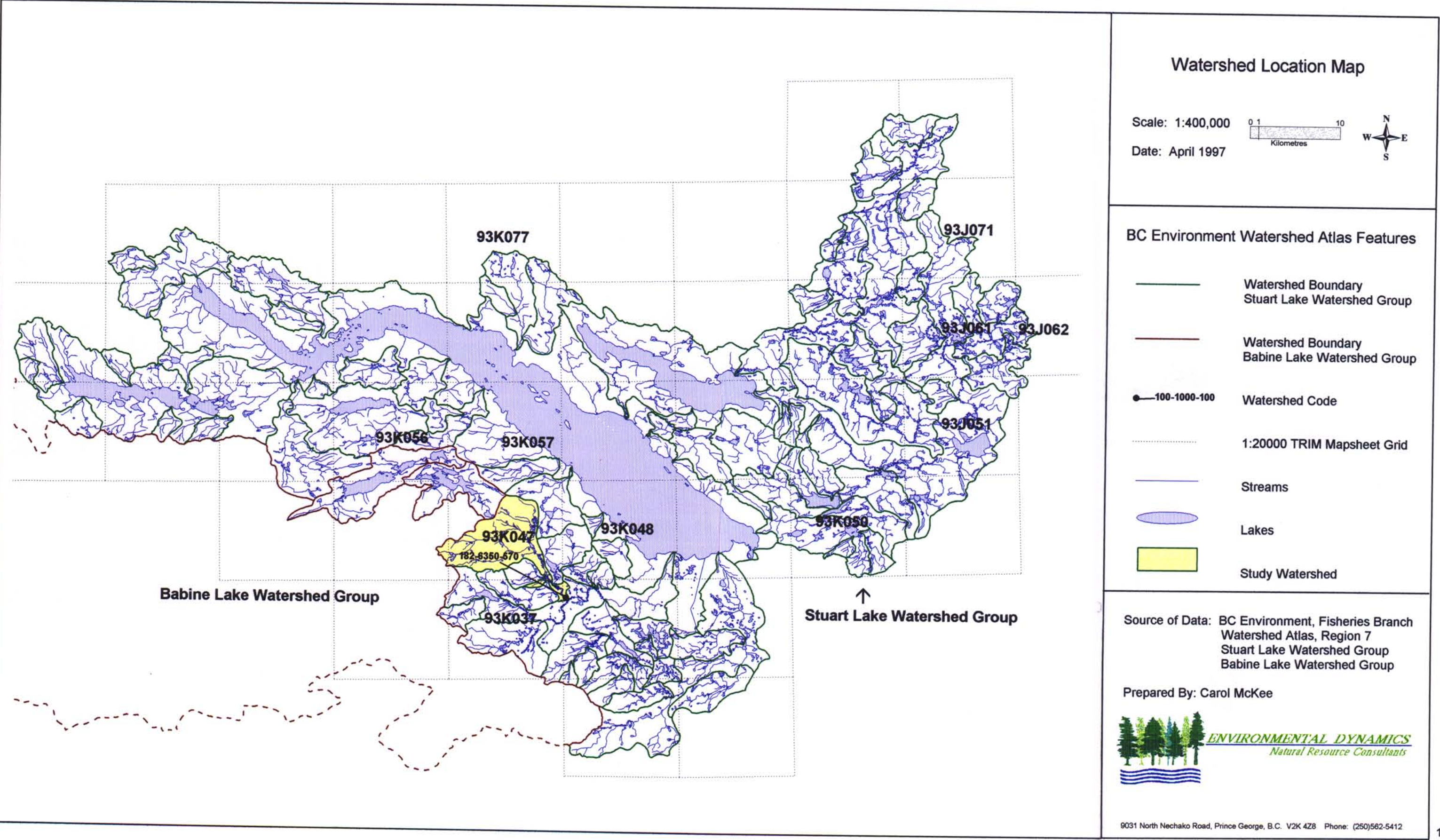
According to the updated FISS data (1995), no fish species have been documented in Watershed 182-6350-570. However, Nielsp Creek flows directly into Sowchea Creek which contains: Dolly Varden¹, speckled dace, sockeye salmon, kokanee, dace, whitefish and sucker (BC Environment 1995).

Canfor together with BC Environment have created Wildlife Movement Corridors (WMC) to be included in Canfor's five year development plans. These WMC's provide cover and allow animals to travel through non-logged areas. WMC's are not located within Watershed 182-6350-570 (Canfor 1996).

Since this watershed lies within a portion of Canfor's Karena Operating Area, linear development is common throughout the area (Ministry of Forests 1995; Canfor 1996). The major gravel roads located in this watershed are the Cunningham FSR and its adjoining sideroads (Canfor 1996).

¹The species identified as Dolly Varden (*Salvelinus malma*), in the Fisheries Information Summary System is, in all probability, bull trout (*Salvelinus confluentus*), as indicated by population distribution studies conducted by Haas and McPhail (1991).

Figure 6. Location of Nielsp Creek Watershed (182-6350-570) within the Stuart Lake Watershed Group



Gazetted Stream Name	Nielsp Creek
Local Stream Name	Not Applicable
Watershed Code	182-6350-570
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	030
Cutblock Number	044
Operating Area	Karena
Development Type	Cutblock
Survey Date	05-Jun-95
Reach Number	A
Site Number	Not Applicable
Water Temperature (°C)	10.0
Stream Width (m)	7.50
Length Surveyed (m)	1500
Habitat Type	Stream
Stream Order (1:20,000)	5
Forest Practices Code Stream Classification	S-2*
Fish Species Identified	None
Description: This reach is located along the western and southern boundary of the proposed cutblock. Flowing southeasterly, it has a low gradient of 2%. The reach is characterized by 90% run and 10% pool. Total cover was 10% with the majority being overhanging vegetation 35% and undercut banks 25%. Substrates were dominated by fines at 90%, followed by 5% gravels and 5% larges. The upper limit of this reach contained a beaver dam, extending 200 m across the entire valley floor. Water flows through this dam and does not impede fish movement. Fish sampling (minnow trapping) was conducted. Three traps were left to fish for approximately 24 hrs. No fish were caught or observed. The water level was too high for safe electroshocking. As this reach provides potential rearing habitat, it was defaulted to a S-2* stream classification under the Forest Practices Code. Recommendation: Further survey is recommended to determine fish presence and to determine an upper limit of fish distribution.	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Nielsp Creek

Stream Survey Report

Watershed Code:

182-6350-570-000-000-000-000-000-000-000

Header Information

Stream Name:	Nielsp Creek	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-6350-570-000-000-000-000-000-000-000	Reach No.:	999	Reach Length (km):	1.5 Method: MW
Location:	030-44 Karena	Site No.:	0	Length surveyed (m):	1500.0 Method: MW
		Fish Card:	N	Field: Yes	Historical: No
Date: 6/5/95	Time: 12:00	Agency: EDI	Survey Crew: RV\SC \ \ \ \ \ \	Photos:	2: 13, 14
		Map #:	93K/7	Air Photos:	
		U.T.M. :	10.393213.6032201		

Channel Characteristics

Av. Chan. Width (m):	7.5	Method Av. Chan. Width (m):	TF
Av. Wet. Width (m):	14.4	Method Av. Wet. Width (m):	TF
Av. Max. Rif. Depth (cm):		Av. Max. Riffle Depth (cm):	
Av. Max. Pool Depth (cm):		Av. Max. Pool Depth (cm):	
Gradient (%):	2.0	Method Gradient:	CL
% Pool: 10	% Riffle: 0	% Run: 90	% Other: 0
% Side Channel:	0-10	Method Side Channel:	GE
% Debris Area:	0-10	Method Debris Area:	GE

Specific Data				
6.2	10.3	6.7	6.2	8.3
10.3	30.0	14.0	7.3	10.2

Bed Material

% Fines (<2mm):	90	% Fines (<2mm):	90
% Gravels:	5	Small (2-16mm):	5
		Large (16-64mm):	0
% Larges:	5	Small cobble (64-128mm):	0
		Large cobble (128-256mm):	5
		Boulder cobble (>256mm):	0
% Bedrock:	0	% Bedrock:	0
D90 (cm):		Compaction:	Medium

Cover

Cover Total % :	10	Method Cover Total %:	GE
Dp Pool : 10	L.O.D.: 20	Boulder: 0	In Veg.: 10
Crown Closure % :	5	Method Crown Closure:	GE
		Aspect : SE	Method Aspect: C
		Over Veg: 35	Cutbank: 25

Discharge

Wetted Width (m) :	6.3	Method Wetted Width (m) :	MS
Mean Depth (m) :	1.2	Method Mean Depth (m) :	MS
Mean Velocity (m/s) :	0.85	Method Mean Velocity (m/s)	F
Discharge (m3/s) :		Method Discharge (m3/s) :	

Specific Data

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope)	(Bed Material)
---------------------------------	----------------

Banks

Height (m):	% Unstable:						
Textures Fines:	Yes	Gravel:	No	Larges:	No	Bedrock:	No
Confinement:	2						
Valley: Chan. Ratio:							
Stage:	Flood						
Flood Signs Ht(m):		Method Flood Signs:					
Braided:	N	Method Braided:					
Bars (%):		Method Bars:					
pH:		Method pH:					
O2 (ppm):		Method Dissolved Oxygen:					
Water Temp. (°C):	10.0	Method Temperature:					HT
Turb. (cm):		Method Turbidity:					
Cond. (µmhos):		Method Conductivity:					

DFO/MoELP Stream Survey Form*18-Aug-97***Stream:** Nielsp Creek**Watershed Code:****Stream Survey Report**

182-6350-570-000-000-000-000-000-000-000

Fish Summary***Obstructions***

Comments

-
- | | |
|----|--|
| C2 | Substrate composition estimated from visible bed material near the shore. |
| C3 | The banks were submerged under flood waters. |
| C1 | Film 2: 13 w/s, 14 d/s.

Note: Reach '999' should read Reach 'A'.

Fish sampling (minnow trapping) was conducted. Three traps were left for approximately 24 hours. No fish were captured.

This reach has been assigned a defaulted S-2 classification under the Forest Practices Code. |
-



Photo 27. Upstream view of Nielsp Creek (182-6350-570) at Reach A.



Photo 28. Downstream view of Nielsp Creek (182-6350-570) at Reach A.

Gazetted Stream Name	Nielsp Creek
Local Stream Name	Not Applicable
Watershed Code	182-6350-570
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	742
Cutblock Number	057
Operating Area	Karena
Development Type	Cutblock
Survey Date	06-Jun-95
Reach Number	B
Site Number	Not Applicable
Water Temperature (°C)	5
Stream Width (m)	2.96
Length Surveyed (m)	650
Habitat Type	Seepage
Stream Order (1:20,000)	3
Forest Practices Code Stream Classification	S-3*
Fish Species Identified	None
Description: This reach of Nielsp Creek is along the northern boundary of cutblock 742-57, flowing easterly with a low gradient of 4%. The stream consisted of 60% riffle, 30% run and 10% pool. Total cover is 15% with the majority divided between large organic debris (45%) and overhanging vegetation (45). Bed material is dominated by gravels 70%, with 20% fines and 10% larges. At the time of survey flow was fast due the recent rainfall. Fish sampling (electroshocking) was conducted for 1022 sec. No fish were captured or observed in this reach. This reach contains potential spawning habitat for salmonids and good rearing habitat. This reach was, therefore, classified by default as S-3* under the Forest Practices Code. Recommendation: Further survey is recommended to determine fish presence and to locate the upper limit of fish distribution.	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Nielsp Creek

Watershed Code:

Stream Survey Report

182-6350-570-000-000-000-000-000-000-000

Header Information

Stream Name:	Nielsp Creek	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-6350-570-000-000-000-000-000-000-000	Reach No.:	998	Reach Length (km):	0.65 Method: MW
Location:	742-57 Karena	Site No.:	0	Length surveyed (m):	650.0 Method: MW
		Fish Card:	N	Field:	Yes Historical: No
Date: 6/6/95	Time: 10:05	Agency: EDI	Survey Crew: EL \SC\ \ \ \ \ \	Photos:	4: 9 Air Photos:

Channel Characteristics

Av. Chan. Width (m):	3.0	Method Av. Chan. Width (m):	MS						
Av. Wet. Width (m):	2.8	Method Av. Wet. Width (m):	MS						
Av. Max. Rif. Depth (cm):	30	Av. Max. Riffle Depth (cm):	MS						
Av. Max. Pool Depth (cm):	80	Av. Max. Pool Depth (cm):	30						
Gradient (%):	4.0	Method Gradient:	CL						
% Pool:	10	% Riffle:	60	% Run:	30	% Other:	0	Method:	GE
% Side Channel:	0	Method Side Channel:	GE						
% Debris Area:	10-40	Method Debris Area:	GE						

Specific Data						
2.8	3.1	2.7	2.4	2.6	4.2	

Bed Material

% Fines (<2mm):	20	% Fines (<2mm):	20
% Gravels:	70	Small (2-16mm):	35
		Large (16-64mm):	35
% Larges:	10	Small cobble (64-128mm):	0
		Large cobble (128-256mm):	10
		Boulder cobble (>256mm):	0
% Bedrock:	0	% Bedrock:	0
D90 (cm):	100	Compaction:	Medium

Cover

Cover Total % :	15	Method Cover Total %:	GE				
Dp Pool :	0	L.O.D.:	45	Boulder:	0	In Veg.:	0
Crown Closure % :	10	Method Crown Closure:	GE	Over Veg:	45	Cutbank:	10
				Aspect :	E	Method Aspect:	C

Discharge

Wetted Width (m) :	2.3	Method Wetted Width (m) :	MS			
Mean Depth (m) :	0.3	Method Mean Depth (m) :	MS			
Mean Velocity (m/s) :	1.00	Method Mean Velocity (m/s)	F			
Discharge (m3/s) :	0.60	Method Discharge (m3/s) :				

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) | (Bed Material)

Banks

Height (m):	0.3	% Unstable:	10
Textures Fines:	Yes	Gravel:	No
Confinement:	2	Larges:	No
Valley: Chan. Ratio:		Bedrock:	No
Stage:	H		
Flood Signs Ht(m):		Method Flood Signs:	
Braided:	N	Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
02 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	5.0	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Nielsp Creek

Watershed Code:

Stream Survey Report

182-6350-570-000-000-000-000-000-000-000

Fish Summary***Obstructions***

Comments

C1

Film 4: 9 u/s.

Note: Reach '998' should read Reach 'B'.

Fish sampling (electroshocking) was conducted for 1022 seconds. No fish were captured or observed.

This reach has been assigned a defaulted S-3 classification under the Forest Practices Code.



Photo 29. Upstream view of Nielsp Creek (182-6350-570) at Reach B.

Gazetted Stream Name	Nielsp Creek
Local Stream Name	Not Applicable
Watershed Code	182-6350-570
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	KAR
Cutblock Number	109
Operating Area	Karena
Development Type	Cutblock
Survey Date	19-Jun-96
Reach Number	C
Site Number	Not Applicable
Water Temperature (°C)	4.0
Stream Width (m)	1.90
Length Surveyed (m)	200
Habitat Type	Stream
Stream Order (1:20,000)	3
Forest Practices Code Stream Classification	S-3*
Fish Species Identified	None
Description: This reach is located outside of the southeastern boundary of the proposed block flowing northeasterly with a low gradient of 6%. Total cover was 20% with the majority being L.O.D. (30%) and undercut banks (25%). Substrates were dominated by larges (50%) with a smaller component of gravels (30%) and fines (20%). Fish sampling (electroshocking) was conducted for 190 sec. No fish were captured or observed. This section of Nielsp Creek provided abundant cover producing good quality rearing habitat and gravels for potential spawning. Nielsp Creek is a known fish bearing creek therefore this reach was defaulted to S-3* under the Forest Practices Code. Recommendation: Further survey is recommended to determine fish presence and to locate an upper limit of fish distribution within the system.	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Nielsp Crk

Stream Survey Report

Watershed Code:

182-6350-570-000-000-000-000-000-000-000

Header Information

Stream Name:	Nielsp Crk	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-6350-570-000-000-000-000-000-000-000	Reach No.:	997	Reach Length (km):	0.20000 Method: MW
Location:	Kar 109	Site No.:	0	Length surveyed (m):	200.0 Method:
		Map #: 93K/16		Fish Card:	N Field: Yes Historical: No
		U.T.M. : 10.386231.6033822		Photos:	#5:22,23 Air Photos:
Date: 6/19/96	Time: 14:20	Agency: EDI	Survey Crew: LL\RV\ \ \ \ \ \		

Channel Characteristics

Av. Chan. Width (m):	1.9	Method Av. Chan. Width (m):	MS	Specific Data					
Av. Wet. Width (m):	1.5	Method Av. Wet. Width (m):	MS	1.6	1.7	1.8	2.3	2.4	1.8
Av. Max. Rif. Depth (cm):	10	Av. Max. Riffle Depth (cm):	MS						
Av. Max. Pool Depth (cm):	40	Av. Max. Pool Depth (cm):	10						
Gradient (%):	6.0	Method Gradient:	CL						
% Pool: 15	% Riffle: 50	% Run: 35	% Other: 0	Method: GE					
% Side Channel:	0	Method Side Channel:	GE						
% Debris Area:	10-40	Method Debris Area:	GE						

Cover

Cover Total % :	20	Method Cover Total %:	GE				
Dp Pool : 15 L.O.D.:	30	Boulder: 10	In Veg.: 0	Over Veg: 20	Cutbank:	25	
Crown Closure % :	10	Method Crown Closure:	GE	Aspect : NE	Method Aspect:	C	

Discharge

Wetted Width (m) :	1.5	Method Wetted Width (m) :	MS	Specific Data	
Mean Depth (m) :	0.3	Method Mean Depth (m) :	MS		
Mean Velocity (m/s) :	1.25	Method Mean Velocity (m/s)	F		
Discharge (m3/s) :	0.47	Method Discharge (m3/s) :	f		

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope)	(Bed Material)
---------------------------------	----------------

Bed Material

% Fines (<2mm):	20	% Fines (<2mm):	20
% Gravels:	30	Small (2-16mm):	10
		Large (16-64mm):	20
% Larges:	50	Small cobble (64-128mm):	20
		Large cobble (128-256mm):	20
		Boulder cobble (>256mm):	10
% Bedrock:	0	% Bedrock:	0
D90 (cm):	20	Compaction:	Medium

Banks

Height (m):	0.3	% Unstable:	5
Textures Fines:	Yes	Gravel: No	Larges: No Bedrock: No
Confinement:	3		
Valley: Chan. Ratio:			
Stage:	M		
Flood Signs Ht(m):	0.1	Method Flood Signs:	MS
Braided:		Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	4.0	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (umhos):		Method Conductivity:	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Nielsp Crk

Watershed Code:

Stream Survey Report

182-6350-570-000-000-000-000-000-000-000

Fish Summary***Obstructions***

Comments

C1

Film 5:22 d/s, 23 u/s

Note: Reach '997' should read Reach 'C'.

Fish sampling (electroshocking) was conducted for 190 seconds. No fish were captured.

This reach has been assigned a defaulted S-3 classification under the Forest Practices Code.

4.1.5.1. Stream EDI-499

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	499
Nearest Downstream Watershed Code	182-6350-570
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	030
Cutblock Number	044
Operating Area	Karena
Development Type	Cutblock
Survey Date	05-Jun-95
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Recorded
Stream Width (m)	Not Recorded
Length Surveyed (m)	600
Habitat Type	Stream/Wetland
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This wetland is located outside of the southern cutblock boundary, draining westerly into Nielsp Creek. At the confluence of Nielsp Creek, a small channel was located with a low gradient of 1-2%. The area dispersed into a flooded, marsh area. Fish sampling was not conducted. No fish were observed. This channel located in a wetland was classified as S-6 under the Forest Practices Code. The wetland should be protected accordingly.	

4.1.5.2. Stream 182-6350-570-365

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-365
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	KAR
Cutblock Number	051
Operating Area	Karena
Development Type	Cutblock
Survey Date	19-Jun-96
Reach Number	A
Site Number	Not Applicable
Water Temperature (°C)	8.0
Stream Width (m)	0.92
Length Surveyed (m)	500
Habitat Type	Stream
Stream Order (1:20,000)	2
Forest Practices Code Stream Classification	S-4*
Fish Species Identified	None
Description: This reach is located outside of the eastern boundary of the proposed cutblock flowing easterly with a low gradient of 2%. Total cover was 25% with the majority being overhanging vegetation (45%). Bed material was dominated by fines (40%) with a smaller component of gravels (35%). Fish sampling (electroshocking) was conducted for 80 sec. No fish were captured or observed. This reach provided potential spawning and rearing habitat. The water level was low, however, it contained good flow. The reach was classified by default as S-4* under the Forest Practices Code. Recommendation: Further survey is recommended to determine fish presence and to locate an upper limit of fish distribution within the system.	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-365-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-6350-570-365-000-000-000-000-000-000-000	Reach No.:	999	Reach Length (km):	0.5 Method: MW
Location:	51 Karna	Site No.:	0	Length surveyed (m):	500.0 Method: MW
		Map #: 93K/7		Field: Yes	Historical: No
		U.T.M.: 10.390250.6031370			
Date: 6/19/96	Time: 12:30	Agency: EDI	Survey Crew: RMNHPA \ \ \ \ \	Photos: 6: 10, 11	Air Photos:

Channel Characteristics

Av. Chan. Width (m):	0.9	Method Av. Chan. Width (m):	MS
Av. Wet. Width (m):	0.8	Method Av. Wet. Width (m):	MS
Av. Max. Rlf. Depth (cm):	10	Av. Max. Riffle Depth (cm):	MS
Av. Max. Pool Depth (cm):	40	Av. Max. Pool Depth (cm):	10
Gradient (%):	2.0	Method Gradient:	CL
% Pool: 20	% Riffle: 20	% Run: 55	% Other: 5
Method: GE			
% Side Channel:	0-10	Method Side Channel:	GE
% Debris Area:	>40	Method Debris Area:	GE

Specific Data					
0.8	0.6	1.0	0.9	1.0	1.2

Cover

Cover Total % :	25	Method Cover Total %:	GE
Dp Pool : 20 L.O.D.:	20	Boulder: 5	In Veg.: 0
Crown Closure % :	5	Method Crown Closure:	GE
Over Veg: 35	Cutbank: 20	Aspect : E	Method Aspect: C

Discharge

Wetted Width (m) :	Method Wetted Width (m) :
Mean Depth (m) :	Method Mean Depth (m) :
Mean Velocity (m/s) :	Method Mean Velocity (m/s)
Discharge (m3/s) :	Method Discharge (m3/s) :

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope)	(Bed Material)
---------------------------------	----------------

Bed Material

% Fines (<2mm):	40	% Fines (<2mm):	40
% Gravels:	35	Small (2-16mm):	25
		Large (16-64mm):	10
% Larges:	25	Small cobble (64-128mm):	10
		Large cobble (128-256mm):	10
		Boulder cobble (>256mm):	5
% Bedrock:	0	% Bedrock:	0
D90 (cm):	10	Compaction:	High

Banks

Height (m):	0.5	% Unstable:	10
Textures Fines:	Yes	Gravel: No	Larges: No
Confinement:	5	Bedrock:	No
Valley: Chan. Ratio:			
Stage:	M		
Flood Signs Ht(m):		Method Flood Signs:	
Braided:		Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	8.0	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-365-000-000-000-000-000-000-000

Fish Summary

Obstructions

Comments

C1 Film 6: 10 u/s, 11 d/s.

Note: Reach '999' should read Reach 'A'.

Fish sampling (electroshocking) was conducted for 80 seconds. No fish were captured or observed.

This section of stream was given a defaulted S-4 classification under the Forest Practices Code.



Photo 30. Upstream view of Stream 182-6350-570-365 at Reach A.



Photo 31. Downstream view of Stream 182-6350-570-365 at Reach A.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-365
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	KAR
Cutblock Number	051
Operating Area	Karena
Development Type	Cutblock
Survey Date	19-Jun-96
Reach Number	B
Site Number	Not Applicable
Water Temperature (°C)	8.5
Stream Width (m)	0.72
Length Surveyed (m)	100
Habitat Type	Stream
Stream Order (1:20,000)	2
Forest Practices Code Stream Classification	S-4*
Fish Species Identified	None

Description:

This reach is located outside of the eastern boundary of the proposed cutblock flowing easterly with a low gradient of 1.5%. Total cover is 15% with the majority divided between deep pools (30%) and undercut bank (30%). Bed material was dominated by fines 80%, with a smaller component of gravels 20%. The upper limit of this reach ends in a large seepage/wetland area approximately 150 m long. The seepage area lacked a definable channel and alluvial substrates.

Fish sampling (electroshocking) was conducted for an unknown amount of time. No fish were captured or observed.

Deep pools and undercut banks provided potential rearing habitat for regionally significant fish. This reach was classified by default as S-4* under the Forest Practices Code.

Recommendation: Further survey is recommended to determine fish presence and to locate an upper limit of fish distribution.

DFO/MoELP Stream Survey Form

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Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-365-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-6350-570-365-000-000-000-000-000-000	Reach No.:	998	Reach Length (km):	0.10000 Method: MW
Location:	51 Karena	Site No.:	0	Length surveyed (m):	100.0 Method: MW
		Fish Card:	N	Field:	Yes Historical: No
Date: 6/19/96	Time: 13:10	Agency: EDI	Survey Crew: RM/NHPA \ \ \ \ \	Photos:	6: 12, 13 Air Photos:

Channel Characteristics

Av. Chan. Width (m):	0.7	Method Av. Chan. Width (m):	MS						
Av. Wet. Width (m):	0.7	Method Av. Wet. Width (m):	MS						
Av. Max. Riff. Depth (cm):		Av. Max. Riffle Depth (cm):	MS						
Av. Max. Pool Depth (cm):	35	Av. Max. Pool Depth (cm):							
Gradient (%):	1.5	Method Gradient:	GE						
% Pool:	30	% Riffle:	0	% Run:	70	% Other:	0	Method:	GE
% Side Channel:	0	Method Side Channel:	GE						
% Debris Area:	>40	Method Debris Area:	GE						

Cover

Cover Total % :	15	Method Cover Total %:	GE								
Dp Pool:	30	L.O.D.:	20	Boulder:	0	In Veg.:	10	Over Veg:	10	Cutbank:	30
Crown Closure % :	5	Method Crown Closure:	GE	Aspect :	NE	Method Aspect:	C				

Discharge

Wetted Width (m) :		Method Wetted Width (m) :							
Mean Depth (m) :		Method Mean Depth (m) :							
Mean Velocity (m/s) :		Method Mean Velocity (m/s)							
Discharge (m3/s) :		Method Discharge (m3/s) :							

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) (Bed Material)

Bed Material

% Fines (<2mm):	80	% Fines (<2mm):	80
% Gravels:	20	Small (2-16mm):	20
		Large (16-64mm):	0
% Larges:	0	Small cobble (64-128mm):	0
		Large cobble (128-256mm):	0
		Boulder cobble (>256mm):	0
% Bedrock:	0	% Bedrock:	0
D90 (cm):		Compaction:	High

Banks

Height (m):	0.1	% Unstable:	5
Textures Fines:	Yes	Gravel:	No
Confinement:	5	Larges:	No
Valley: Chan. Ratio:		Bedrock:	No
Stage:	M		
Flood Signs Ht(m):		Method Flood Signs:	
Braided:	N	Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	8.5	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-365-000-000-000-000-000-000-000

Fish Summary

Obstructions

Comments

C1

Film 6: 12 u/s, 13 d/s

Note: Reach '998' should read Reach 'B'.

Fish sampling (electroshocking) was conducted but not recorded. No fish were captured or observed.

This reach was given a defaulted S-4 classification under the Forest Practices Code.



Photo 32. Upstream view of Stream 182-6350-570-365 at Reach B.



Photo 33. Downstream view of Stream 182-6350-570-365 at Reach B.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-365
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	KAR
Cutblock Number	051
Operating Area	Karena
Development Type	Cutblock
Survey Date	19-Jun-96
Reach Number	C
Site Number	Not Applicable
Water Temperature (°C)	5.0
Stream Width (m)	0.68
Length Surveyed (m)	350
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This reach is located along the northern boundary of the proposed cutblock, flowing northeasterly with a low gradient of 5.5%. Total cover was 15% with the majority being overhanging vegetation (50%), and undercut banks (30%). Bed materials are dominated by gravels (40%) and fines (35%). The lower limit began at the seepage with the channel flowing down a road before angling off into the proposed cutblock. Fish sampling (electroshocking) was conducted for 30 sec. No fish were captured or observed. This reach did not provide fisheries habitat and was classified as S-6 under the Forest Practices Code. Recommendation: As the stream follows the road for 75 m, restoration on the lower limit is recommended prior to road use to avoid further siltation of fish bearing waters downstream.	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Stream Survey Report

Watershed Code:

182-6350-570-365-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-6350-570-365-000-000-000-000-000-000	Map #:	93K/7	Reach No.:	997
Location:	51 Karena	U.T.M.:	10.389570.6031310	Site No.:	0
Date:	6/19/96	Agency:	EDI	Fish Card:	N
Time:	14:45	Survey Crew:	RMNHP \ \ \ \ \	Field:	Yes
				Historical:	No
				Photos:	6: 14, 15
				Air Photos:	

Channel Characteristics

Av. Chan. Width (m):	0.7	Method Av. Chan. Width (m):	MS						
Av. Wet. Width (m):	0.6	Method Av. Wet. Width (m):	MS						
Av. Max. Rif. Depth (cm):	5	Av. Max. Riffle Depth (cm):	MS						
Av. Max. Pool Depth (cm):	15	Av. Max. Pool Depth (cm):	5						
Gradient (%):	5.5	Method Gradient:	CL						
% Pool:	10	% Riffle:	40	% Run:	50	% Other:	0	Method:	GE
% Side Channel:	0	Method Side Channel:	GE						
% Debris Area:	10-40	Method Debris Area:	GE						

Cover

Cover Total % :	15	Method Cover Total %:	GE						
Dp Pool :	5	L.O.D.:	10	Boulder:	5	In Veg.:	0	Over Veg:	50
Crown Closure % :	5	Method Crown Closure:	GE	Aspect :	NE	Method Aspect:	C	Cutbank:	30

Discharge

Wetted Width (m) :	0.9	Method Wetted Width (m) :	MS						
Mean Depth (m) :	0.1	Method Mean Depth (m) :	MS						
Mean Velocity (m/s) :	0.42	Method Mean Velocity (m/s)	F						
Discharge (m3/s) :	0.03	Method Discharge (m3/s) :	f						

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) (Bed Material)

Bed Material

% Fines (<2mm):	35	% Fines (<2mm):	35
% Gravels:	40	Small (2-16mm):	30
		Large (16-64mm):	10
% Larges:	25	Small cobble (64-128mm):	10
		Large cobble (128-256mm):	10
		Boulder cobble (>256mm):	5
% Bedrock:	0	% Bedrock:	0
D90 (cm):		Compaction:	Medium

Banks

Height (m):	5.0	% Unstable:	10
Textures Fines:	Yes	Gravel:	No
Confinement:	4	Larges:	No
Valley: Chan. Ratio:		Bedrock:	No
Stage:	M		
Flood Signs Ht(m):		Method Flood Signs:	
Braided:	N	Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	5.0	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

DFO/MoELP Stream Survey Form*18-Aug-97*

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-365-000-000-000-000-000-000-000

Fish Summary***Obstructions***

Comments

C1

Film 6: 14 u/s, 15 d/s.

Note: Reach '997' should read Reach 'C'.

Fish sampling (electroshocking) was conducted for 30 seconds. No fish were captured or observed.

This reach was given a S-6 classification under the Forest Practices Code.



Photo 34. Upstream view of Stream 182-6350-570-365 at Reach C.



Photo 35. Downstream view of Stream 182-6350-570-365 at Reach C.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-365
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	KAR
Cutblock Number	051
Operating Area	Karena
Development Type	Cutblock
Survey Date	19-Jun-96
Reach Number	D
Site Number	Not Applicable
Water Temperature (°C)	4.5
Stream Width (m)	0.65
Length Surveyed (m)	600
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This reach is located inside the northern boundary of the proposed cutblock. Total cover was 35% with the majority being overhanging vegetation (40%) and undercut banks (30%). Bed material was dominated by fines (65%), and gravels (20%). The upper limit of this reach ended in seepage. The reach will probably dry up by late summer. Fish sampling (electroshocking) was conducted, however, the time was not recorded. No fish were captured or observed This reach did not provide fisheries habitat and the reach was classified as S-6 under the Forest Practices Code.	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-365-000-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-6350-570-365-000-000-000-000-000-000-000	Reach No.:	996	Reach Length (km):	0.60000 Method: MW
Location:	51 Karna	Site No.:	0	Length surveyed (m):	600.0 Method: MW
		Fish Card:	N	Field:	Yes Historical: No
Date:	6/19/96	Photos:	6: 16, 17	Air Photos:	
Time:	15:18	U.T.M.:	10.389010.6031040		
Agency:	EDI	Map #:	93K/7		
Survey Crew:	RM/NHP \ \ \ \ \				

Channel Characteristics

Av. Chan. Width (m):	0.6	Method Av. Chan. Width (m):	MS	Specific Data					
Av. Wet. Width (m):	0.6	Method Av. Wet. Width (m):	MS	0.7	0.7	0.7	0.7	0.8	0.5
Av. Max. Rif. Depth (cm):	5	Av. Max. Riffle Depth (cm):	MS						
Av. Max. Pool Depth (cm):	10	Av. Max. Pool Depth (cm):	5						
Gradient (%):	0.0	Method Gradient:							
% Pool:	15	% Riffle:	20	% Run:	60	% Other:	5	Method:	GE
% Side Channel:	0-10	Method Side Channel:	GE						
% Debris Area:	>40	Method Debris Area:	GE						

Cover

Cover Total % :	35	Method Cover Total %:	GE								
Dp Pool :	10	L.O.D.:	15	Boulder:	5	In Veg.:	0	Over Veg:	40	Cutbank:	30
Crown Closure % :	5	Method Crown Closure:	GE	Aspect :	E	Method Aspect:	C				

Discharge

Wetted Width (m) :		Method Wetted Width (m) :		Specific Data					
Mean Depth (m) :		Method Mean Depth (m) :							
Mean Velocity (m/s) :		Method Mean Velocity (m/s)							
Discharge (m3/s) :		Method Discharge (m3/s) :							

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) (Bed Material)

Bed Material

% Fines (<2mm):	65	% Fines (<2mm):	65
% Gravels:	20	Small (2-16mm):	15
		Large (16-64mm):	5
% Larges:	15	Small cobble (64-128mm):	5
		Large cobble (128-256mm):	5
		Boulder cobble (>256mm):	5
% Bedrock:	0	% Bedrock:	0
D90 (cm):	11	Compaction:	Medium

Banks

Height (m):	0.1	% Unstable:	10				
Textures Fines:	Yes	Gravel:	No	Larges:	No	Bedrock:	No
Confinement:	5						
Valley: Chan. Ratio:	5						
Stage:	M						
Flood Signs Ht(m):	0.1	Method Flood Signs:	MS				
Braided:	N	Method Braided:					
Bars (%):		Method Bars:					
pH:		Method pH:					
O2 (ppm):		Method Dissolved Oxygen:					
Water Temp. (°C):	4.5	Method Temperature:	HT				
Turb. (cm):		Method Turbidity:					
Cond. (µmhos):		Method Conductivity:					

DFO/MoELP Stream Survey Form*18-Aug-97*

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-365-000-000-000-000-000-000-000

Fish Summary***Obstructions***

Comments

C2 Note: Gradient was not recorded in the field.

C1 Film 6: 16 u/s, 17 d/s.

Note: Reach '996' should read Reach 'D'.

Fish sampling (electroshocking) was conducted but not recorded. No fish were captured or observed.

This reach was given a S-6 classification under the Forest Practices Code.



Photo 36. Upstream view of Stream 182-6350-570-365 at Reach D



Photo 37. Downstream view of Stream 182-6350-570-365 at Reach D.

4.1.5.3. Stream EDI-520

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Applicable
EDI-Code	520
Nearest Downstream Watershed Code	182-6350-570-365
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	KAR
Cutblock Number	051
Operating Area	Karena
Development Type	Cutblock
Survey Date	19-Jun-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	400
Habitat Type	Seepage
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage is located along the southeastern boundary of the proposed cutblock, draining northeasterly. This area lacked a definable channel and alluvial substrates. Vegetation in the area was dominated by twinberry. Fish sampling was not conducted. No fish were observed. Since this area is a seepage, a stream classification is not required under the Forest Practices Code.	

4.1.5.4. Stream EDI-519

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Applicable
EDI-Code	519
Nearest Downstream Watershed Code	182-6350-570-365
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	KAR
Cutblock Number	051
Operating Area	Karena
Development Type	Cutblock
Survey Date	19-Jun-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	600
Habitat Type	Seepage
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage is located in the middle of the proposed block draining northeasterly. This area lacked a definable channel and alluvial substrates. Pooling was present and flow was minimal. Fish sampling was not conducted. No fish were observed. Since this is a seepage, a stream classification is not required under the Forest Practices Code.	

4.1.5.5 Stream 182-6350-570-401

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-401
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	742
Cutblock Number	053
Operating Area	Karena
Development Type	Cutblock
Survey Date	12-Jun-95
Reach Number	A
Site Number	Not Applicable
Water Temperature (°C)	8.0
Stream Width (m)	3.30
Length Surveyed (m)	1500
Habitat Type	Stream
Stream Order (1:20,000)	3
Forest Practices Code Stream Classification	S-3*
Fish Species Identified	None
Description: This reach is located along the eastern boundary of the cutblock, flowing northeasterly with a varying gradient of 3-10%. The gradient increases at the lower limit near its confluence with stream 182-6350-570. Total cover was 15% and was provided by overhanging vegetation (30%), deep pools (30%), undercut banks (25%), and L.O.D. (15%). Bed materials were dominated by gravels (70%), with a smaller component of fines (20%) and larges (10%). This reach is protected by a 20 m buffer zone as the cutblock has previously been logged. A 50 cm high water fall with no jump pool would make passage difficult for juvenile salmonids and course fish, however, should not impede movement of adult salmonids. Fish sampling (electroshocking) was conducted for 386 sec. No fish were captured or observed. As this reach provided good potential spawning habitat and good quality rearing habitat, it was classified by default as S-3* under the Forest Practices Code. Recommendation: Further survey is recommended to determine fish presence and to locate an upper limit of fish distribution within this system.	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Stream Survey Report

Watershed Code:

182-6350-570-401-000-000-000-000-000-000-000

Header Information

Stream Name: Unnamed Stream "Local": N/A
Watershed Code: 182-6350-570-401-000-000-000-000-000-000-000
Location: 742-53 Karena Map #: 93K/7
Date: 6/12/95 Time: 16:00 Agency: EDI Survey Crew: RV \ \ \ \ \ \ \ \ \ \ U.T.M.: 10.390022.6032620
Reach No.: 999 Access: FT
Site No.: 0 Reach Length (km): 1.5 Method: MW
Fish Card: N Length surveyed (m): 1500.0 Method: MW
Photos: 2: 17 Field: Yes Historical: No
Air Photos:

Channel Characteristics

		Specific Data							
Av. Chan. Width (m):	3.3	Method Av. Chan. Width (m):	TF	2.7	4.2	5.2	2.8	2.3	2.5
Av. Wet. Width (m):	2.5	Method Av. Wet. Width (m):	TF	2.7	2.3	2.6	2.6	2.2	2.4
Av. Max. Rif. Depth (cm):	7	Av. Max. Riffle Depth (cm):	MS						
Av. Max. Pool Depth (cm):	40	Av. Max. Pool Depth (cm):	7						
Gradient (%):	3.0	Method Gradient:	CL						
% Pool: 20	% Riffle: 40	% Run: 40	% Other: 0	Method: GE					
% Side Channel:	0	Method Side Channel:	GE						
% Debris Area:	0-10	Method Debris Area:	GE						

Cover

Cover Total % : 15 Method Cover Total %: GE
Dp Pool : 30 L.O.D.: 15 Boulder: 0 In Veg.: 0 Over Veg: 30 Cutbank: 25
Crown Closure % : 20 Method Crown Closure: GE Aspect : E Method Aspect: C

Discharge

		Specific Data	
Wetted Width (m) :	2.0	Method Wetted Width (m) :	MS
Mean Depth (m) :	0.1	Method Mean Depth (m) :	MS
Mean Velocity (m/s) :	0.65	Method Mean Velocity (m/s)	F
Discharge (m3/s) :		Method Discharge (m3/s) :	

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) (Bed Material)

Bed Material

% Fines (<2mm):	20	% Fines (<2mm):	20
% Gravels:	70	Small (2-16mm):	40
		Large (16-64mm):	30
% Larges:	10	Small cobble (64-128mm):	0
		Large cobble (128-256mm):	10
		Boulder cobble (>256mm):	0
% Bedrock:	0	% Bedrock:	0
D90 (cm):		Compaction:	Low

Banks

Height (m):	0.3	% Unstable:	10	
Textures Fines:	Yes	Gravel: No	Larges: No	Bedrock: No
Confinement:	2			
Valley: Chan. Ratio:				
Stage:	M			
Flood Signs Ht(m):		Method Flood Signs:		
Braided:	N	Method Braided:		
Bars (%):		Method Bars:		
pH:		Method pH:		
O2 (ppm):		Method Dissolved Oxygen:		
Water Temp. (°C):	2.0	Method Temperature:		HT
Turb. (cm):		Method Turbidity:		
Cond. (µmhos):		Method Conductivity:		

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-401-000-000-000-000-000-000-000

Fish Summary

Obstructions

Comments

C1 Film 2: 17 w/s.

Note: Reach '999' should read Reach 'A'.

Fish sampling (electroshocking) was conducted for 386 seconds. No fish were captured or observed.

This reach has been assigned a defaulted S-3 classification under the Forest Practices Code.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-401
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	KAR
Cutblock Number	028
Operating Area	Karena
Development Type	Right-of-way
Survey Date	11-Jun-96
Reach Number	B
Site Number	1
Water Temperature (°C)	4.5
Stream Width (m)	4.00
Length Surveyed (m)	100
Habitat Type	Stream
Stream Order (1:20,000)	3
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This site is located outside of the northeastern boundary of the proposed cutblock, flowing easterly with a mid-gradient of 9.5%. Total cover was 40% with the majority being boulders (35%), L.O.D. (30%), and deep pools (20%). Bed material was dominated by larges (70%). Fish sampling (electroshocking) was conducted for 104 sec. No fish were captured or observed. This site contains good potential rearing habitat. The site card was completed within a reach classified by default as S-3* under the Forest Practices Code. Recommendation: Further survey is recommended to determine fish presence within this system and to determined an upper limit of fish distribution.	

DFO/MoELP Stream Survey Form

13-Dec-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-401-000-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-6350-570-401-000-000-000-000-000-000-000	Reach No.:	0	Reach Length (km):	Method:
Location:	Kar 28	Site No.:	1	Length surveyed (m):	100.0 Method: MW
		Map #:	39K/7	Fish Card:	N
		U.T.M.:	10.388650.6031580	Field:	Yes
				Historical:	No
Date: 6/11/96	Time: 09:21	Agency: EDI	Survey Crew: NHP\PT\RM \ \ \ \ \	Photos:	#51:23, #9:1
				Air Photos:	

Channel Characteristics

Av. Chan. Width (m):	4.0	Method Av. Chan. Width (m):	TF						
Av. Wet. Width (m):	4.0	Method Av. Wet. Width (m):	TF						
Av. Max. Rif. Depth (cm):	12	Av. Max. Riffle Depth (cm):	MS						
Av. Max. Pool Depth (cm):	45	Av. Max. Pool Depth (cm):	12						
Gradient (%):	9.5	Method Gradient:	CL						
% Pool: 20	% Riffle: 30	% Run: 40	% Other: 10	Method:	GE				
% Side Channel:	0	Method Side Channel:	GE						
% Debris Area:	>40	Method Debris Area:	GE						

Cover

Cover Total % :	40	Method Cover Total %:	GE						
Dp Pool : 20	L.O.D.: 30	Boulder: 35	In Veg.: 5	Over Veg: 5	Cutbank: 5				
Crown Closure % :	1	Method Crown Closure:	GE	Aspect : NE	Method Aspect: C				

Discharge

Wetted Width (m) :	4.0	Method Wetted Width (m) :							
Mean Depth (m) :	0.3	Method Mean Depth (m) :							
Mean Velocity (m/s) :	0.50	Method Mean Velocity (m/s)							
Discharge (m3/s) :	0.40	Method Discharge (m3/s) :							

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope)	(Bed Material)
---------------------------------	----------------

Bed Material

% Fines (<2mm):	10	% Fines (<2mm):	10
% Gravels:	20	Small (2-16mm):	10
		Large (16-64mm):	10
% Larges:	70	Small cobble (64-128mm):	15
		Large cobble (128-256mm):	20
		Boulder cobble (>256mm):	35
% Bedrock:	0	% Bedrock:	0
D90 (cm):	40	Compaction:	Medium

Banks

Height (m):	0.5	% Unstable:	15
Textures Fines:	Yes	Gravel: Yes	Larges: No
Confinement:	5	Bedrock:	No
Valley: Chan. Ratio:			
Stage:	M		
Flood Signs Ht(m):	0.4	Method Flood Signs:	MS
Braided:		Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	4.5	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

Fish Summary

Obstructions

Comments

C1

Film 51: 23 u/s 9-1 d/s.

Fish sampling (electroshocking) was conducted for 104seconds. No fish were captured or observed.

This site was completed within a reach that was given a defaulted S-3 classification.



Photo 38. Upstream view of Stream 182-6350-570-401 at Site 1.



Photo 39. Downstream view of Stream 182-6350-570-401 at Site 1.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-401
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	KAR
Cutblock Number	028
Operating Area	Karena
Development Type	Cutblock
Survey Date	11-Jun-96
Reach Number	B
Site Number	Not Applicable
Water Temperature (°C)	3.5
Stream Width (m)	2.40
Length Surveyed (m)	2000
Habitat Type	Stream
Stream Order (1:20,000)	3
Forest Practices Code Stream Classification	S-3*
Fish Species Identified	None
Description: This reach is located outside of the northeastern boundary of the proposed cutblock, flowing easterly with a mid gradient of 8.5%. Total cover was 25% with the majority being deep pools (35%) and boulders (25%). Bed material was dominated by larges (50%) and gravels (40%). Fish sampling (electroshocking) was conducted for 280 sec. No fish were captured or observed. This reach provided good potential spawning and rearing habitat. It was classified by default as S-3* stream under the Forest Practices Code. Recommendation: Further survey is recommended to determine fish disturbance and to locate an upper limit of fish distribution within the system.	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-401-000-000-000-000-000-000-000

Header Information

Stream Name: Unnamed Stream "Local": N/A Access: FT
Watershed Code: 182-6350-570-401-000-000-000-000-000-000-000 Reach No.: 998 Reach Length (km): 2 Method: MW
Location: Kar 28 Map #: 39K/7 Site No.: 0 Length surveyed (m): 2000.0 Method: MW
U.T.M.: 10.388440.6031510 Fish Card: N Field: Yes Historical: No
Date: 6/11/96 Time: 10:30 Agency: EDI Survey Crew: NHP/PT URM \ \ \ \ \ Photos: #9:2,3 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 2.4 Method Av. Chan. Width (m):
Av. Wet. Width (m): 2.4 Method Av. Wet. Width (m):
Av. Max. Rif. Depth (cm): 15 Av. Max. Riffle Depth (cm):
Av. Max. Pool Depth (cm): 42 Av. Max. Pool Depth (cm): 15
Gradient (%): 8.5 Method Gradient:
% Pool: 15 % Riffle: 20 % Run: 60 % Other: 5 Method:
% Side Channel: 0 Method Side Channel:
% Debris Area: 10-40 Method Debris Area:

Specific Data

2.1 2.0 2.5 2.8 2.5 2.5

Bed Material

% Fines (<2mm): 10 % Fines (<2mm): 10
% Gravels: 40 Small (2-16mm): 15
Large (16-64mm): 25
% Larges: 50 Small cobble (64-128mm): 20
Large cobble (128-256mm): 15
Boulder cobble (>256mm): 15
% Bedrock: 0 % Bedrock: 0
D90 (cm): 16 Compaction: Medium

Cover

Cover Total % : 25 Method Cover Total %: GE
Dp Pool: 35 L.O.D.: 15 Boulder: 25 In Veg.: 0 Over Veg: 15 Cutbank: 10
Crown Closure % : 5 Method Crown Closure: GE Aspect: E Method Aspect: C

Discharge

Wetted Width (m) : 2.0 Method Wetted Width (m) :
Mean Depth (m) : 0.3 Method Mean Depth (m) :
Mean Velocity (m/s) : 0.70 Method Mean Velocity (m/s)
Discharge (m3/s) : 0.37 Method Discharge (m3/s) :

Specific Data

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) (Bed Material)

Banks

Height (m): 0.3 % Unstable: 15
Textures Fines: Yes Gravel: No Larges: No Bedrock: No
Confinement: 4
Valley: Chan. Ratio:
Stage: M
Flood Signs Ht(m): Method Flood Signs:
Braided: Method Braided:
Bars (%): Method Bars:
pH: Method pH:
O2 (ppm): Method Dissolved Oxygen:
Water Temp. (°C): 3.5 Method Temperature: HT
Turb. (cm): Method Turbidity:
Cond. (µmhos): Method Conductivity:

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-401-000-000-000-000-000-000-000

Fish Summary

Obstructions

Comments

- C1

Film 9: 2 u/s, 3 d/s.

Note: Reach '998' should be read as Reach 'B'.

Fish sampling (electroshocking) was conducted for 280 seconds. No fish were captured or observed.

This stream has been defaulted to a S-3 classification.
- C2

The 'OTHER' is 5% cascade.



Photo 40. Upstream view of Stream 182-6350-570-401 at Reach B.



Photo 41. Downstream view of Stream 182-6350-570-401 at Reach B.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-401
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	KAR
Cutblock Number	028
Operating Area	Karena
Development Type	Cutblock
Survey Date	11-Jun-96
Reach Number	C
Site Number	Not Applicable
Water Temperature (°C)	4.0
Stream Width (m)	2.01
Length Surveyed (m)	200
Habitat Type	Stream
Stream Order (1:20,000)	3
Forest Practices Code Stream Classification	S-3*
Fish Species Identified	None
Description: This reach is located along the northern boundary of the proposed cutblock, flowing easterly with a low gradient of 3.5%. Total cover was 25% with the majority being deep pools (30%) and undercut banks (30%). Bed material was dominated by gravels and larges evenly, both at 35% and followed by fines at 30%. A beaver dam was located approximately 200 m upstream from the lower limit and does not pose as an impediment to fish movement. Fish sampling (electroshocking) was conducted for 60 sec. No fish were captured or observed. This reach contained adequate pools and undercut banks for good potential rearing and adequate gravels for potential spawning. Therefore, this reach was classified by default as S-3* under the Forest Practices Code. Recommendation: further survey is recommended to determine fish presence and to locate an upper limit of fish distribution within this system.	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Stream A

Stream Survey Report

Watershed Code:

182-6350-570-401-000-000-000-000-000-000-000

Header Information

Stream Name:	Stream A	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-6350-570-401-000-000-000-000-000-000-000	Reach No.:	997	Reach Length (km):	0.20000 Method: MW
Location:	Kar 28	Site No.:	0	Length surveyed (m):	200.0 Method: MW
		Fish Card:	N	Field:	Yes Historical: No
Date: 6/11/96	Time: 13:45	Agency: EDI	Survey Crew: NHPAPT\RM \ \ \ \ \	Photos:	#9:6,7 Air Photos:

Channel Characteristics

Av. Chan. Width (m):	2.1	Method Av. Chan. Width (m):	TF
Av. Wet. Width (m):	2.3	Method Av. Wet. Width (m):	TF
Av. Max. Rif. Depth (cm):	20	Av. Max. Riffle Depth (cm):	MS
Av. Max. Pool Depth (cm):	55	Av. Max. Pool Depth (cm):	20
Gradient (%):	3.5	Method Gradient:	CL
% Pool: 35	% Riffle: 15	% Run: 45	% Other: 5 Method: GE
% Side Channel:	0	Method Side Channel:	GE
% Debris Area:	10-40	Method Debris Area:	GE

Specific Data						
1.2	2.1	2.5	1.8	2.1	3.0	

Cover

Cover Total % :	25	Method Cover Total %:	GE		
Dp Pool : 30 L.O.D.:	15	Boulder: 10	In Veg.: 0	Over Veg: 15	Cutbank: 30
Crown Closure % :	10	Method Crown Closure:	GE	Aspect : E	Method Aspect: C

Discharge

Wetted Width (m) :	1.0	Method Wetted Width (m) :	
Mean Depth (m) :	0.4	Method Mean Depth (m) :	
Mean Velocity (m/s) :	0.50	Method Mean Velocity (m/s)	
Discharge (m3/s) :	0.15	Method Discharge (m3/s) :	

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) (Bed Material)

Bed Material

% Fines (<2mm):	30	% Fines (<2mm):	30
% Gravels:	35	Small (2-16mm):	15
		Large (16-64mm):	20
% Larges:	35	Small cobble (64-128mm):	15
		Large cobble (128-256mm):	10
		Boulder cobble (>256mm):	10
% Bedrock:	0	% Bedrock:	0
D90 (cm):	12	Compaction:	Medium

Banks

Height (m):	0.1	% Unstable:	10
Textures Fines:	Yes	Gravel: No	Larges: No Bedrock: No
Confinement:	4		
Valley: Chan. Ratio:			
Stage:	M		
Flood Signs Ht(m):		Method Flood Signs:	
Braided:		Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	4.0	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Stream A

Watershed Code:

Stream Survey Report

182-6350-570-401-000-000-000-000-000-000-000

Fish Summary

Obstructions

Comments

C1 Film 9: 6 d/s, 7 u/s.
Note: Reach '997' should read Reach 'C'.
Fish sampling (electroshocking) was conducted for 60 seconds. No fish were captured.
This stream was assigned a defaulted S-3 classification under the Forest Practices Code.



Photo 42. Upstream view of Stream 182-6350-570-401 at Reach C.



Photo 43. Downstream view of Stream 182-6350-570-401 at Reach C.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-401
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	KAR
Cutblock Number	028
Operating Area	Karena
Development Type	Cutblock
Survey Date	11-Jun-96
Reach Number	D
Site Number	Not Applicable
Water Temperature (°C)	3.5
Stream Width (m)	2.13
Length Surveyed (m)	500
Habitat Type	Stream
Stream Order (1:20,000)	3
Forest Practices Code Stream Classification	S-3*
Fish Species Identified	none
Description: This reach is located along the northern boundary of the proposed cutblock, flowing easterly at a low gradient of 3%. Total cover was 15% with the majority being undercut banks (45%) and deep pools (40%). Bed material was dominated by gravels (60%), with a smaller component of fines (25%) and larges (15%). This reach originates from a black spruce bog/wetland. The wetland extends 200 m in length with a beaver dam at its lower limit. The beaver dam does not impede fish movement. This wetland should be considered a Fisheries Sensitive Zone, because ponds within the wetland provide good rearing habitat. Fish sampling (electroshocking) was conducted for 65 sec. No fish were captured or observed. The black spruce bog/wetland above the upper reach break does not require a stream classification, however, a wetland classification is needed. The reach provides good spawning and rearing habitat potential. For this reason, this reach has been classified by default as S-3* under the Forest Practices Code. Recommendation: Further survey is recommended to determine fish presence and an upper limit of fish distribution within the system.	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-401-000-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-6350-570-401-000-000-000-000-000-000-000	Reach No.:	996	Reach Length (km):	0.5 Method: MW
Location:	Kar 28	Site No.:	0	Length surveyed (m):	500.0 Method: MW
		Fish Card:	N	Field:	Yes Historical: No
Date: 6/11/96	Time: 12:30	Agency: EDI	Survey Crew: NHPPT \RM \ \ \ \ \	Photos:	#9: 4, 5 Air Photos:
		Map #:	39K/16		
		U.T.M.:	10.387590.6031530		

Channel Characteristics

Av. Chan. Width (m):	2.1	Method Av. Chan. Width (m):	TF	
Av. Wet. Width (m):	2.2	Method Av. Wet. Width (m):	TF	
Av. Max. Rif. Depth (cm):	10	Av. Max. Riffle Depth (cm):	MS	
Av. Max. Pool Depth (cm):	60	Av. Max. Pool Depth (cm):	10	
Gradient (%):	3.0	Method Gradient:	CL	
% Pool: 30	% Riffle: 30	% Run: 40	% Other: 0	Method: GE
% Side Channel:	0	Method Side Channel:	GE	
% Debris Area:	0-10	Method Debris Area:	GE	

Specific Data					
1.8	2.0	2.5	2.3	2.5	1.8

Bed Material

% Fines (<2mm):	25	% Fines (<2mm):	25
% Gravels:	60	Small (2-16mm):	40
		Large (16-64mm):	20
% Larges:	15	Small cobble (64-128mm):	5
		Large cobble (128-256mm):	5
		Boulder cobble (>256mm):	5
% Bedrock:	0	% Bedrock:	0
D90 (cm):	12	Compaction:	High

Cover

Cover Total % :	15	Method Cover Total %:	GE		
Dp Pool: 40	L.O.D.: 5	Boulder: 5	In Veg.: 0	Over Veg: 5	Cutbank: 45
Crown Closure % :	10	Method Crown Closure:	GE	Aspect: E	Method Aspect: C

Discharge

Wetted Width (m) :	2.0	Method Wetted Width (m) :	
Mean Depth (m) :	0.3	Method Mean Depth (m) :	
Mean Velocity (m/s) :	0.63	Method Mean Velocity (m/s)	
Discharge (m3/s) :	0.24	Method Discharge (m3/s) :	

Specific Data					

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) (Bed Material)

Banks

Height (m):	0.6	% Unstable:	5	
Textures Fines:	Yes	Gravel: No	Larges: No	Bedrock: No
Confinement:	4			
Valley: Chan. Ratio:				
Stage:	M			
Flood Signs Ht(m):		Method Flood Signs:		
Braided:		Method Braided:		
Bars (%):		Method Bars:		
pH:		Method pH:		
O2 (ppm):		Method Dissolved Oxygen:		
Water Temp. (°C):	3.5	Method Temperature:		
Turb. (cm):		Method Turbidity:		
Cond. (µmhos):		Method Conductivity:		

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-401-000-000-000-000-000-000

Fish Summary

Obstructions

Comments

C1 Film 9: 4 w/s, 5d/s.

Note: Reach '996' should read Reach 'D'.

Fish sampling (electroshocking) was conducted for 65 seconds. No fish were captured or observed.

This stream has been defaulted to a S-3 classification. There is a wetland upstream of the upper limit, and should be considered a Fisheries Sensitive Zone.



Photo 44. Upstream view of Stream 182-6350-570-401 at Reach D.



Photo 45. Downstream view of Stream 182-6350-570-401 at Reach D.

4.1.5.6. Stream 182-6350-570-401-205

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-401-205
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	742
Cutblock Number	053
Operating Area	Karena
Development Type	Cutblock
Survey Date	13-Jun-95
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	8.5
Stream Width (m)	1.10
Length Surveyed (m)	1250
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-4*
Fish Species Identified	None
Description: This reach is located outside of the eastern boundary of the cutblock, flowing easterly with a low gradient of 5%. Total cover was 15% with the majority being deep pools (50%) and undercut banks (20%). Substrates were dominated by fines (75%), with a smaller component of larges (15%) and gravels (10%). The cutblock was already logged prior to the survey. Some logging was done up the edge of the reach, however, the streambank was not affected. On the western boundary of the cutblock, the stream channel had been completely logged over which diverted the channel into a drainage ditch. There is a 50 cm falls at the confluence of this stream with 182-6350-570-401. No jump pool has developed beneath the falls therefore this is likely a barrier to upstream migration for juvenile salmonids. Fish sampling (electroshocking) was conducted in the reach for 128 sec. No fish were captured or observed. As regionally significant fish could access this area from Nielsp Creek, the reach was classified by default as S-4* under the Forest Practices Code. Recommendation: Stream restoration is recommended along the western boundary of the cutblock as the channel was diverted into a drainage ditch during logging. The upper limit of fish distribution should be located within the system as well.	

DFO/MoELP Stream Survey Form

17-Dec-97

Stream: Unnamed

Stream Survey Report

Watershed Code:

182-6350-570-401-205-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT				
Watershed Code:	182-6350-570-401-205-000-000-000-000-000-000	Reach No.:	1	Reach Length (km):	1.25	Method:	MW		
Location:	742-53 Karena	Site No.:	0	Length surveyed (m):	1250.0	Method:	MW		
		Map #:	93K/7	Fish Card:	N	Field:	Yes	Historical:	No
		U.T.M. :	10.390230.6032659	Photos:	2: 18	Air Photos:			
Date:	6/13/95	Time:	11:00	Agency:	EDI	Survey Crew:	RV \ \ \ \ \ \ \ \		

Channel Characteristics

Av. Chan. Width (m):	1.1	Method Av. Chan. Width (m):	MS	Specific Data					
Av. Wet. Width (m):	1.2	Method Av. Wet. Width (m):	MS	0.8	1.3	2.2	0.6	0.9	0.9
Av. Max. Rif. Depth (cm):	8	Av. Max. Riffle Depth (cm):	MS	1.3	1.5	2.2	0.6	1.0	0.8
Av. Max. Pool Depth (cm):	30	Av. Max. Pool Depth (cm):	8						
Gradient (%):	5.0	Method Gradient:	CL						
% Pool:	20	% Riffle:	10	% Run:	70	% Other:	0	Method:	GE
% Side Channel:	0	Method Side Channel:	GE						
% Debris Area:	0-10	Method Debris Area:	GE						

Cover

Cover Total % :	15	Method Cover Total %:	GE								
Dp Pool :	50	L.O.D.:	10	Boulder:	10	In Veg.:	0	Over Veg:	10	Cutbank:	20
Crown Closure % :	5	Method Crown Closure:	GE	Aspect :	E	Method Aspect:	C				

Discharge

Wetted Width (m) :	1.4	Method Wetted Width (m) :	MS	Specific Data					
Mean Depth (m) :	0.2	Method Mean Depth (m) :	MS						
Mean Velocity (m/s) :	0.60	Method Mean Velocity (m/s)	F						
Discharge (m3/s) :	Method Discharge (m3/s) :								

Reach Symbol

(Fish)	
(Width, Valley: Channel, Slope)	(Bed Material)

Bed Material

% Fines (<2mm):	75	% Fines (<2mm):	75
% Gravels:	10	Small (2-16mm):	5
		Large (16-64mm):	5
% Larges:	15	Small cobble (64-128mm):	5
		Large cobble (128-256mm):	5
		Boulder cobble (>256mm):	5
% Bedrock:	0	% Bedrock:	0
D90 (cm):		Compaction:	Low

Banks

Height (m):	0.4	% Unstable:	10				
Textures Fines:	Yes	Gravel:	No	Larges:	No	Bedrock:	No
Confinement:	2						
Valley: Chan. Ratio:							
Stage:	M						
Flood Signs Ht(m):		Method Flood Signs:					
Braided:	N	Method Braided:					
Bars (%):		Method Bars:					
pH:		Method pH:					
O2 (ppm):		Method Dissolved Oxygen:					
Water Temp. (°C):	8.5	Method Temperature:	HT				
Turb. (cm):		Method Turbidity:					
Cond. (µmhos):		Method Conductivity:					

DFO/MoELP Stream Survey Form

17-Dec-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-401-205-000-000-000-000-000-000

Fish Summary

Obstructions

Obstruction #	Form	Type	Location
1		F	1.0

Comments

- C1

Film 2: 18 u/s.

Fish sampling (electroshocking) was conducted for 128 seconds. No fish were captured or observed.

This reach has been assigned a defaulted S-4 classification under the Forest Practices Code.
- C2

Location 1: There is a 50 cm falls at the confluence of this stream with 182-6350-570-401. No jump pool has developed beneath the falls. Therefore this is likely a barrier to upstream migration for juvenile salmonids.



Photo 46. Upstream view of Stream 182-6350-570-401-205 at Reach 1.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-401-205
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	KAR
Cutblock Number	095
Operating Area	Karena
Development Type	Cutblock
Survey Date	06-Jun-95
Reach Number	2
Site Number	Not Applicable
Water Temperature (°C)	8.5
Stream Width (m)	1.83
Length Surveyed (m)	400
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-3*
Fish Species Identified	None
Description: This site is located outside of the southern boundary of the proposed cutblock, flowing south-easterly with a low gradient of 1%. Total cover was 60% with the majority being overhanging vegetation (75%), and L.O.D. (25%). Substrates were dominated by fines (90%) with a smaller component of gravels (5%), and larges (5%). Fish sampling (electroshocking) was conducted for 217 sec. No fish were captured or observed. Since this reach provides potential rearing habitat, it has been classified by default as S-3* under the Forest Practices Code. Recommendation: Further survey is recommended to determine fish presence and to locate an upper limit of fish distribution within the system	

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-401-205-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT						
Watershed Code:	182-6350-570-401-205-000-000-000-000-000-000			Reach No.:	2	Reach Length (km):	0.40000	Method:	MW		
Location:	95 Karena	Map #:	93K/7	Site No.:	0	Length surveyed (m):	400.0	Method:	MW		
		U.T.M.:	10.389692.6033145	Fish Card:	N	Field:	Yes	Historical:	No		
Date:	6/6/95	Time:	13:30	Agency:	EDI	Survey Crew:	EL\SC\ \ \ \ \ \	Photos:	5: 10	Air Photos:	

Channel Characteristics

Av. Chan. Width (m):	1.8	Method Av. Chan. Width (m):	MS	Specific Data					
Av. Wet. Width (m):	1.6	Method Av. Wet. Width (m):	MS	1.9	1.9	1.5	1.9	1.9	1.9
Av. Max. Rlf. Depth (cm):	15	Av. Max. Riffle Depth (cm):	MS						
Av. Max. Pool Depth (cm):	50	Av. Max. Pool Depth (cm):	15						
Gradient (%):	1.0	Method Gradient:	GE						
% Pool: 10	% Riffle: 10	% Run: 80	% Other: 0	Method: GE					
% Side Channel:	0	Method Side Channel:	GE						
% Debris Area:	10-40	Method Debris Area:	GE						

Cover

Cover Total % :	60	Method Cover Total %:	GE				
Dp Pool : 0	L.O.D.: 25	Boulder: 0	In Veg.: 0	Over Veg: 75	Cutbank:	0	
Crown Closure % :	20	Method Crown Closure:	GE	Aspect :	E	Method Aspect: C	

Discharge

Wetted Width (m) :	1.6	Method Wetted Width (m) :	MS	Specific Data	
Mean Depth (m) :	0.3	Method Mean Depth (m) :	MS		
Mean Velocity (m/s) :	0.29	Method Mean Velocity (m/s)	F		
Discharge (m3/s) :	0.11	Method Discharge (m3/s) :	f		

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) (Bed Material)

Bed Material

% Fines (<2mm):	90	% Fines (<2mm):	90
% Gravels:	5	Small (2-16mm):	5
		Large (16-64mm):	0
% Larges:	5	Small cobble (64-128mm):	0
		Large cobble (128-256mm):	5
		Boulder cobble (>256mm):	0
% Bedrock:	0	% Bedrock:	0
D90 (cm):	34	Compaction:	High

Banks

Height (m):		% Unstable:		
Textures Fines:	Yes	Gravel: No	Larges: No	Bedrock: No
Confinement:	2			
Valley: Chan. Ratio:				
Stage:	H			
Flood Signs Ht(m):		Method Flood Signs:		
Braided:	N	Method Braided:		
Bars (%):		Method Bars:		
pH:		Method pH:		
O2 (ppm):		Method Dissolved Oxygen:		
Water Temp. (°C):	8.5	Method Temperature:		HT
Turb. (cm):		Method Turbidity:		
Cond. (µmhos):		Method Conductivity:		

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-401-205-000-000-000-000-000-000

Fish Summary***Obstructions***

Comments

C1

Film 5: 10

Fish sampling (electroshocking) was conducted for 217 seconds. No fish were captured or observed.

This site has been given a defaulted S-3 classification under the Forest Practices Code.



Photo 47. Upstream view of Stream 182-6350-570-401-205 at Reach 2.

4.1.5.7. Stream EDI-506

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	506
Nearest Downstream Watershed Code	182-6350-570-401-205
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	742
Cutblock Number	053
Operating Area	Karena
Development Type	Cutblock
Survey Date	12-Jun-95
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Recorded
Stream Width (m)	Not Recorded
Length Surveyed (m)	1600
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This stream was located along the northern boundary of the cutblock flowing easterly. A card was not completed on the stream as the cutblock has already been logged and had destroyed the entire channel. At the time of survey, the stream flow is braided and substantial flow was present. Fish sampling was not conducted. No fish were observed. A stream classification could not be assigned to this stream since the original banks were no longer evident. Recommendation: Further survey is recommended to determine if fish could exist in this system and to determine if stream rehabilitation is required pending the results downstream. A stream classification will also be required on this system under the Forest Practices Code.	

4.1.5.8. Stream EDI-528

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	528
Nearest Downstream Watershed Code	182-6350-570-401
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	KAR
Cutblock Number	028
Operating Area	Karena
Development Type	Cutblock
Survey Date	11-Jun-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	600
Habitat Type	Seepage
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage is located along the eastern boundary of the proposed cutblock draining northeasterly. This area lacks definable banks and flows over moss and organic vegetation. Fish sampling was not conducted. No fish were observed. Since this area is seepage, a stream classification is not required under the Forest Practices Code. Recommendation: Caution should be taken to avoid siltation of the tributary downstream.	

4.1.5.9. Stream EDI-529

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	529
Nearest Downstream Watershed Code	182-6350-570-401
NTS Map (1:50,000)	93K/16
TRIM Map	93K047
Cutting Permit	KAR
Cutblock Number	028
Operating Area	Karena
Development Type	Cutblock
Survey Date	11-Jun-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	500
Habitat Type	Seepage
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage is located outside of the western boundary of the proposed cutblock, draining in a northeasterly direction. This area lacks a definable channel and alluvial substrates. Flow was present at the time of survey, presumably from snowmelt. Fish sampling was not conducted. No fish were observed. This area is seepage and does not require a stream classification under the Forest Practices Code. The last 50 m of the lower limit should be considered a Fisheries Sensitive Zone as fish may access this area from the wetland. Recommendation: Caution should be taken during logging to maintain the quality of the water entering the wetland.	

4.1.5.10. Stream EDI-500

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	500
Nearest Downstream Watershed Code	182-6350-570
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	030
Cutblock Number	044
Operating Area	Karena
Development Type	Cutblock
Survey Date	05-Jun-95
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	Not Recorded
Stream Width (m)	0.30
Length Surveyed (m)	700
Habitat Type	Stream
Stream Order (1:20,000)	
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This reach is located along the northern boundary of the proposed cutblock, draining southwesterly into Nielsp Creek. The area surveyed was in a gully running through an aspen and spruce stand. The channel was discontinuous and flowing water was not detected. Where channel exists, the average width is 0.30 m. Fish sampling was not conducted. No fish were observed. This reach had seepage like characteristics, however, it was classified as S-6 under the Forest Practices Code as channeling was present. This stream did not provide fish habitat.	

4.1.5.11. Stream 182-6350-570-438

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-438
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	030
Cutblock Number	012
Operating Area	Karena
Development Type	Cutblock
Survey Date	05-Jun-95
Reach Number	A
Site Number	Not Applicable
Water Temperature (°C)	11.0
Stream Width (m)	3.00
Length Surveyed (m)	1100
Habitat Type	Stream
Stream Order (1:20,000)	4
Forest Practices Code Stream Classification	S-3
Fish Species Identified	RB-Rainbow Trout
Description: This reach is located outside of the southern boundary of the proposed cutblock flowing southwesterly with a low gradient of 2%. Total cover was 20% and was provided by overhanging vegetation (55%), deep pools (20%), L.O.D. (10%), and instream vegetation (5%). Substrates were dominated by fines at 95% and followed by larges 5%. There is beaver dam located at the lower reach break for this reach and 13 km upstream of the confluence with 182-6350. This likely acts as a barrier to fish passage. Fish sampling (electroshocking) was conducted for 326 sec. One rainbow trout was captured. Since this reach contains regionally significant fish it has been given a S-3 fish stream classification under the Forest Practices Code.	

DFO/MoELP Stream Survey Form

17-Dec-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-438-000-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-6350-570-438-000-000-000-000-000-000-000	Reach No.:	999	Reach Length (km):	1.10000 Method: MW
Location:	030-12 Karena	Site No.:	0	Length surveyed (m):	1100.0 Method: MW
		Fish Card:	N	Field:	Yes Historical: No
Date:	6/5/95	U.T.M. :	10.392727.6033976	Photos:	2: 15 Air Photos:
Time:	14:15	Agency:	EDI		
		Survey Crew:	RV\ SC\ \ \ \ \ \		

Channel Characteristics

Av. Chan. Width (m):	3.0	Method Av. Chan. Width (m):	TF	Specific Data					
Av. Wet. Width (m):	3.0	Method Av. Wet. Width (m):	TF	2.0	3.1	3.3	3.4	3.4	2.8
Av. Max. Rif. Depth (cm):		Av. Max. Riffle Depth (cm):	MS	2.0	3.1	3.3	3.4	3.4	2.8
Av. Max. Pool Depth (cm):	35	Av. Max. Pool Depth (cm):							
Gradient (%):	2.0	Method Gradient:	CL						
% Pool:	70	% Riffle:	0	% Run:	30	% Other:	0	Method:	GE
% Side Channel:	0	Method Side Channel:	GE						
% Debris Area:	10-40	Method Debris Area:	GE						

Cover

Cover Total % :	20	Method Cover Total %:	GE								
Dp Pool :	30	L.O.D.:	10	Boulder:	0	In Veg.:	5	Over Veg:	55	Cutbank:	0
Crown Closure % :	5	Method Crown Closure:	GE	Aspect :	SW	Method Aspect:	C				

Discharge

Wetted Width (m) :	3.2	Method Wetted Width (m) :	TF	Specific Data					
Mean Depth (m) :	0.3	Method Mean Depth (m) :	MS						
Mean Velocity (m/s) :	0.10	Method Mean Velocity (m/s) :	F						
Discharge (m3/s) :		Method Discharge (m3/s) :							

Reach Symbol

(Fish)	
(Width, Valley: Channel, Slope)	(Bed Material)

Bed Material

% Fines (<2mm):	95	% Fines (<2mm):	95
% Gravels:	0	Small (2-16mm):	0
		Large (16-64mm):	0
% Larges:	5	Small cobble (64-128mm):	0
		Large cobble (128-256mm):	0
		Boulder cobble (>256mm):	5
% Bedrock:	0	% Bedrock:	0
D90 (cm):		Compaction:	High

Banks

Height (m):	0.3	% Unstable:	5				
Textures Fines:	Yes	Gravel:	No	Larges:	No	Bedrock:	No
Confinement:	2						
Valley: Chan. Ratio:							
Stage:	H						
Flood Signs Ht(m):		Method Flood Sigus:					
Braided:	N	Method Braided:					
Bars (%):		Method Bars:					
pH:		Method pH:					
O2 (ppm):		Method Dissolved Oxygen:					
Water Temp. (°C):	11.0	Method Temperature:	HT				
Turb. (cm):		Method Turbidity:					
Cond. (µmhos):		Method Conductivity:					

DFO/MoELP Stream Survey Form

17-Dec-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-438-000-000-000-000-000-000-000

Fish Summary

Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method/Remarks
RB	1	110.0	J	R			EL

Obstructions

Obstruction ID	Type	Location
1	BD	1.0

Comments

- C1

Film 2: 15 w/s.

Note: Reach '999' should read Reach 'A'.

Fish sampling (electroshocking) was conducted for 326 seconds. One rainbow trout was captured.

This reach has been assigned a S-3 classification under the Forest Practices Code.
- C2

Location 1: The beaver dam located at the lower reach break for this reach and 13 km upstream of the confluence with 182-6350, is a possible barrier to fish passage.



Photo 48. Upstream view of Stream 182-6350-570-438 at Reach A

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-438
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	073
Cutblock Number	011
Operating Area	Karena
Development Type	Cutblock
Survey Date	06-Jun-95
Reach Number	B
Site Number	Not Applicable
Water Temperature (°C)	8.0
Stream Width (m)	1.10
Length Surveyed (m)	300
Habitat Type	Stream
Stream Order (1:20,000)	1~
Forest Practices Code Stream Classification	S-4*
Fish Species Identified	None

Description:

This reach is located along the northern boundary of the proposed cutblock, flowing easterly with a low gradient of 5%. Total cover was 25% with the majority being overhanging vegetation (30%) and undercut banks (25%). Substrates were dominated by fines at 60%, and were followed by larges (25%) and gravels (20%).

Fish sampling (electroshocking) was conducted for approximately 300 - 400 sec. No fish were captured or observed.

This reach provides potential spawning and good rearing habitat. Since regionally significant fish are known to inhabit the lower tributaries, this reach has been classified by default as S-4* under the Forest Practices Code.

Recommendation: Further survey is recommended to verify the presence of fish and to locate an upper limit of fish distribution.

Note: ~ means that the stream was not indicated on the TRIM base map.

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-438-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-6350-570-438-000-000-000-000-000-000	Reach No.:	998	Reach Length (km):	0.30000 Method: MW
Location:	073-11 Karena	Site No.:	0	Length surveyed (m):	300.0 Method: MW
		Map #:	93K/7	Fish Card:	N Field: Yes Historical: No
		U.T.M.:	10.392059.6035891	Photos:	2: 16 Air Photos:
Date: 6/6/95	Time: 11:30	Agency: EDI	Survey Crew: RV \ SC \ \ \ \ \ \ \		

Channel Characteristics

Av. Chan. Width (m):	1.1	Method Av. Chan. Width (m):	MS	Specific Data					
Av. Wet. Width (m):	1.1	Method Av. Wet. Width (m):	MS	1.3	1.0	0.5	0.8	1.8	1.1
Av. Max. Rif. Depth (cm):	14	Av. Max. Riffle Depth (cm):	MS	1.3	1.0	0.5	0.8	1.8	1.1
Av. Max. Pool Depth (cm):	35	Av. Max. Pool Depth (cm):	14						
Gradient (%):	5.0	Method Gradient:	CL						
% Pool: 20	% Riffle: 10	% Run: 70	% Other: 0	Method: GE					
% Side Channel:	0-10	Method Side Channel:	GE						
% Debris Area:	0-10	Method Debris Area:	GE						

Cover

Cover Total % :	25	Method Cover Total %:	GE				
Dp Pool : 20 L.O.D.:	20	Boulder: 0	In Veg.: 5	Over Veg: 30	Cutbank:	25	
Crown Closure % :	5	Method Crown Closure:	GE	Aspect : E	Method Aspect:	C	

Discharge

Wetted Width (m) :	0.7	Method Wetted Width (m) :	MS	Specific Data					
Mean Depth (m) :	0.1	Method Mean Depth (m) :	MS						
Mean Velocity (m/s) :	0.50	Method Mean Velocity (m/s)	F						
Discharge (m3/s) :	Method Discharge (m3/s) :								

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) (Bed Material)

Bed Material

% Fines (<2mm):	60	% Fines (<2mm):	60
% Gravels:	20	Small (2-16mm):	10
		Large (16-64mm):	10
% Larges:	20	Small cobble (64-128mm):	10
		Large cobble (128-256mm):	5
		Boulder cobble (>256mm):	5
% Bedrock:	0	% Bedrock:	0
D90 (cm):		Compaction:	Medium

Banks

Height (m):	0.2	% Unstable:	10	
Textures Fines:	Yes	Gravel: No	Larges: No	Bedrock: No
Confinement:	2			
Valley: Chan. Ratio:				
Stage:	H			
Flood Signs Ht(m):		Method Flood Signs:		
Braided:	N	Method Braided:		
Bars (%):		Method Bars:		
pH:		Method pH:		
O2 (ppm):		Method Dissolved Oxygen:		
Water Temp. (°C):	8.0	Method Temperature:		HT
Turb. (cm):		Method Turbidity:		
Cond. (µmhos):		Method Conductivity:		

DFO/MoELP Stream Survey Form

18-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-438-000-000-000-000-000-000-000

Fish Summary

Obstructions

Comments

C1 Film 2: 16 w/s.

Note: Reach '998' should read Reach 'B'.

Fish sampling (electroshocking) was conducted for approximately 300-400 seconds. No fish were captured or observed.

This reach has been assigned a defaulted S-4 classification under the Forest Practices Code.



Photo 49. Upstream view of Stream 182-6350-570-438 at Reach B.

4.1.5.12. Stream EDI-503

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	503
Nearest Downstream Watershed Code	182-6350-570-438
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	073
Cutblock Number	011
Operating Area	Karena
Development Type	Cutblock
Survey Date	06-Jun-95
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	500
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage is located in the middle of the proposed cutblock draining in an easterly direction. The area surveyed lack definable channels and alluvial substrates. Fish sampling was not conducted. No fish were observed. Since this area is a seepage, a stream classification is not required under the Forest Practices Code	

4.1.5.13. Stream EDI-501

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	501
Nearest Downstream Watershed Code	182-6350-570
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	073
Cutblock Number	011
Operating Area	Karena
Development Type	Cutblock
Survey Date	06-Jun-95
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	250
Habitat Type	Dry Gully
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This dry gully is located in the southern boundary of the proposed cutblock. This area contained no alluvial substrates and lacked a definable channel. The gully is presumably used as a drainage system during the snowmelt and high run off periods. Fish sampling was not conducted. No fish were observed. Since this area is a dry gully, a stream classification is not required under the Forest Practices Code.	

4.1.5.14. Stream EDI-504

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	504
Nearest Downstream Watershed Code	182-6350-570
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	073
Cutblock Number	011
Operating Area	Karena
Development Type	Cutblock
Survey Date	06-Jun-95
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	400
Habitat Type	Dry Gully
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	N/A
Fish Species Identified	None
Description: This dry gully is located in the southern boundary of the proposed cutblock. This area contained no alluvial substrates and lacked a definable channel. This gully is presumably used as a drainage system for snowmelt and during high run off periods. Fish sampling was not conducted. No fish were observed. Since this area is a dry gully, a stream classification is not required under the Forest Practices Code.	

4.1.5.15. Stream EDI-509

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	509
Nearest Downstream Watershed Code	182-6350-570-627
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	313
Cutblock Number	003
Operating Area	Karena
Development Type	Cutblock
Survey Date	23-Sept-96
Reach Number	A
Site Number	Not Applicable
Water Temperature (°C)	3.0
Stream Width (m)	0.87
Length Surveyed (m)	1200
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-4*
Fish Species Identified	None
Description: This reach is located outside of the northeastern boundary flowing southeasterly into Nielsp Creek with a low gradient of 2%. Total cover was 15% with the majority being undercut banks (30%), boulders (25%) and deep pools (20%). Bed material was dominated by larges (60%) followed by fines (25%). The upper limit of this reach ended in a 100 m long seepage area. The lower limit spread out into a marsh with a pond. Fish sampling (electroshocking) was conducted for 224 sec. No fish were captured or observed. Fish would be able to access the lower limit of the reach from the beaver pond area and utilize the potential rearing habitat. This reach has, therefore, been classified by default as S-4* under the Forest Practices Code. Recommendation: The last 400 m of marsh and pond to the confluence of Nielsp Creek should be surveyed for fish presence and an upper limit of fish distribution.	

DFO/MoELP Stream Survey Form

19-Aug-97

Stream: Unnamed

Stream Survey Report

Watershed Code:

182-6350-570-627-999-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	EDI-509	Access:	FT
Watershed Code:	182-6350-570-627-999-000-000-000-000-000-000			Reach No.:	999
Location:	ND/WSC: 182-6350-570-627; 313-3 Karena	Map #:	93K/7	Site No.:	0
		U.T.M.:	10.389054.6034660	Fish Card:	N
Date: 23/09/96	Time: 10:20	Agency: EDI	Survey Crew: DT\ SM\ \ \ \ \ \	Photos:	100: 8, 9
				Air Photos:	

Channel Characteristics

Av. Chan. Width (m):	0.9	Method Av. Chan. Width (m):	MS
Av. Wet. Width (m):	0.6	Method Av. Wet. Width (m):	MS
Av. Max. Rif. Depth (cm):	2	Av. Max. Riffle Depth (cm):	MS
Av. Max. Pool Depth (cm):	18	Av. Max. Pool Depth (cm):	2
Gradient (%):	1.0	Method Gradient:	CL
% Pool: 40	% Riffle: 15	% Run: 10	% Other: 35
% Side Channel:	0-10	Method Side Channel:	GE
% Debris Area:	0-10	Method Debris Area:	GE

Cover

Cover Total % :	15	Method Cover Total %:	GE
Dp Pool : 20 L.O.D.:	15	Boulder: 25	In Veg.: 0
Crown Closure % :	10	Method Crown Closure:	GE

Discharge

Wetted Width (m) :	Method Wetted Width (m) :
Mean Depth (m) :	Method Mean Depth (m) :
Mean Velocity (m/s) :	Method Mean Velocity (m/s)
Discharge (m3/s) :	Method Discharge (m3/s) :

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) (Bed Material)

Specific Data

1.3	0.7	0.8	0.8	0.8	0.8
-----	-----	-----	-----	-----	-----

Bed Material

% Fines (<2mm):	25	% Fines (<2mm):	25
% Gravels:	15	Small (2-16mm):	5
		Large (16-64mm):	10
% Larges:	60	Small cobble (64-128mm):	15
		Large cobble (128-256mm):	20
		Boulder cobble (>256mm):	25
% Bedrock:	0	% Bedrock:	0
D90 (cm):	65	Compaction:	Medium

Banks

Height (m):	0.4	% Unstable:	
Textures Fines:	Yes	Gravel: No	Larges: Yes
Confinement:	4	Bedrock: No	
Valley: Chan. Ratio:			
Stage:	L		
Flood Signs Ht(m):		Method Flood Signs:	
Braided:	N	Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	3.0	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

DFO/MoELP Stream Survey Form

19-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-627-999-000-000-000-000-000-000

Fish Summary

Obstructions

Comments

C1 Film 100: 8 u/s, 9 d/s.

Note: Reach '999' should read Reach 'A'.

Fish sampling (electroshocking) was conducted for 224 seconds. No fish were captured or observed.

This section of stream was defaulted to a S-4 classification under the Forest Practices Code.



Photo 50. Upstream view of Stream EDI-509 at Reach A.



Photo 51. Downstream view of Stream EDI-509 at Reach A.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	509
Nearest Downstream Watershed Code	182-6350-570-627
0NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	313
Cutblock Number	003
Operating Area	Karena
Development Type	Cutblock
Survey Date	23-Sept-96
Reach Number	B
Site Number	Not Applicable
Water Temperature (°C)	3.0
Stream Width (m)	1.16
Length Surveyed (m)	400
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This reach is located along the northern boundary of the proposed cutblock, flowing easterly into Nielsp Creek with a low gradient of 2%. Total cover was 25% with the majority being undercut banks (35%) and L.O.D. (20%). Bed material was dominated by larges (45%) and fines (40%). Beyond both upper and lower limits of this reach, seepage was present. The lower limit seepage lasts approximately 100 m before forming a channel downstream. The upper reach seepage extended for 500 m to a FSR. Fish sampling (electroshocking) was conducted for 119 sec. No fish were captured or observed. This reach is not accessible to fish as it begins and ends in seepages. Therefore, it has been classified as S-6 under the Forest Practices Code.	

DFO/MoELP Stream Survey Form

19-Aug-97

Stream: Unnamed

Stream Survey Report

Watershed Code:

182-6350-570-627-999-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	EDI - 509	Access:	FT
Watershed Code:	182-6350-570-627-999-000-000-000-000-000-000			Reach No.:	998
Location:	ND/WSC: 182-6350-570-627; 313-3 Karena	Map #:	93K/7	Reach Length (km):	0.40000
		U.T.M.:	10.388043.6035247	Length surveyed (m):	400.0
Date: 23/09/96	Time: 13:00	Agency: EDI	Survey Crew: SM\DT\ \ \ \ \ \	Field:	Yes
				Historical:	No
				Photos:	100: 5, 6
				Air Photos:	

Channel Characteristics

Av. Chan. Width (m):	1.2	Method Av. Chan. Width (m):	MS
Av. Wet. Width (m):	1.1	Method Av. Wet. Width (m):	MS
Av. Max. Rif. Depth (cm):	2	Av. Max. Riffle Depth (cm):	MS
Av. Max. Pool Depth (cm):	7	Av. Max. Pool Depth (cm):	2
Gradient (%):	2.0	Method Gradient:	CL
% Pool: 35	% Riffle: 15	% Run: 50	% Other: 0
% Side Channel:	0-10	Method Side Channel:	GE
% Debris Area:	0-10	Method Debris Area:	GE

Cover

Cover Total % :	25	Method Cover Total %:	GE
Dp Pool: 15	L.O.D.: 20	Boulder: 15	In Veg.: 0
Crown Closure % :	10	Method Crown Closure:	GE
		Aspect :	SE
		Method Aspect:	C

Discharge

Wetted Width (m) :	Method Wetted Width (m) :
Mean Depth (m) :	Method Mean Depth (m) :
Mean Velocity (m/s) :	Method Mean Velocity (m/s)
Discharge (m3/s) :	Method Discharge (m3/s) :

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) (Bed Material)

Bed Material

% Fines (<2mm):	40	% Fines (<2mm):	40
% Gravels:	15	Small (2-16mm):	5
		Large (16-64mm):	10
% Larges:	45	Small cobble (64-128mm):	15
		Large cobble (128-256mm):	20
		Boulder cobble (>256mm):	10
% Bedrock:	0	% Bedrock:	0
D90 (cm):	58	Compaction:	Medium

Banks

Height (m):	0.3	% Unstable:	5
Textures Fines:	Yes	Gravel: No	Larges: Yes
Confinement:	5	Bedrock:	No
Valley: Chan. Ratio:			
Stage:	L		
Flood Signs Ht(m):		Method Flood Signs:	
Braided:	N	Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	3.0	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

DFO/MoELP Stream Survey Form

19-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-627-999-000-000-000-000-000-000

Fish Summary

Obstructions

Comments

C1 Film 100: 5 u/s, 6 d/s.

Note: Reach '998' should read Reach 'B'.

Fish sampling (electroshocking) was conducted for 119 seconds. No fish were captured or observed.

This reach has been classified as a S-6 under the Forest Practices Code.



Photo 52. Upstream view of Stream EDI-509 at Reach B.



Photo 53. Downstream view of Stream EDI-509 at Reach B.

4.1.5.16 Stream EDI-533

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	533
Nearest Downstream Watershed Code	182-6350-570-627
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	313
Cutblock Number	003
Operating Area	Karena
Development Type	Cutblock
Survey Date	24-Sept-96
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	4.0
Stream Width (m)	0.72
Length Surveyed (m)	600
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This reach is located inside the southern boundary of the proposed cutblock, flowing easterly with a low gradient, varying between 4-6%. Total cover was 10% with the majority being boulders (35%) and undercut banks (25%). Bed material was dominated by larges (65%). The first 900 m of stream B began as Seepage before turning into this reach. Water flowed subsurface for 60% of the reach without obstructions. Soil in this area is very shallow and most of the flow was under the top layer of soil. Fish sampling (electroshocking) was conducted for 73 sec. No fish were captured or observed. Fish would not be able to access this reach from Nielsp Creek. The reach lacked any spawning habitat and rearing habitat was poor. This reach has been classified as S-6 under the Forest Practices Code Note: The main stream channel examined in the field was found to be inconsistent with the watershed atlas. To avoid confusion in reporting and mapping, the entire length of the stream was denoted EDI-533. Beginning at the confluence of EDI-509 and EDI-533, EDI-533 consisted of i) the first 1200 m of EDI-533 has a watershed code of 182-6350-570-627 and ii) the remaining 300 m of EDI-533 did not have a watershed code.	

Header Information

Stream Name: Unnamed

Watershed Code: 182-6350-570-627-999-000-000-000-000-000-000

Location: ND\WSC: 182-6350-570-627; WHFsh 313-03

Stream "Local": EDI-533

Map #: 93K/7

U.T.M. : 10.387350.6034700

Date: 96/09/24

Time: 17:00

Agency: EDI

Survey Crew: DT\JM\ \ \ \ \ \

Reach No.: 1

Site No.: 0

Fish Card: N

Photos: 100: 10, 11

Access: FT

Reach Length (km): 0.60000

Length surveyed (m): 600.0

Field: Yes

Air Photos:

Method: MW

Method: MW

Historical: No

Channel Characteristics

Av. Chan. Width (m): 0.7

Method Av. Chan. Width (m): MS

Av. Wet. Width (m): 0.0

Method Av. Wet. Width (m):

Av. Max. Rif. Depth (cm): 1

Av. Max. Riffle Depth (cm): MS

Av. Max. Pool Depth (cm): 16

Av. Max. Pool Depth (cm): 1

Gradient (%): 5.0

Method Gradient: CL

% Pool: 20

% Riffle: 45

% Run: 35

% Other: 0

Method: GE

% Side Channel: 0

Method Side Channel: GE

% Debris Area: 0-10

Method Debris Area: GE

Specific Data

0.6

1.2

0.9

0.8

0.5

0.4

Cover

Cover Total % : 10

Method Cover Total %: GE

Dp Pool : 5

L.O.D.: 15

Boulder: 35

In Veg.: 0

Over Veg: 20

Cutbank: 25

Crown Closure % : 5

Method Crown Closure: GE

Aspect : W

Method Aspect: C

Discharge

Wetted Width (m) :

Method Wetted Width (m) :

Mean Depth (m) :

Method Mean Depth (m) :

Mean Velocity (m/s) :

Method Mean Velocity (m/s)

Discharge (m3/s) :

Method Discharge (m3/s) :

Specific Data

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope)

(Bed Material)

Bed Material

% Fines (<2mm): 20

% Fines (<2mm): 20

% Gravels: 15

Small (2-16mm): 5

Large (16-64mm): 10

% Larges: 65

Small cobble (64-128mm): 25

Large cobble (128-256mm): 20

Boulder cobble (>256mm): 20

% Bedrock: 0

% Bedrock: 0

D90 (cm): 130

Compaction: Medium

Banks

Height (m): 0.3

% Unstable:

Textures Fines: Yes

Gravel: No

Larges: Yes

Bedrock: No

Confinement: 4

Valley: Chan. Ratio:

Stage: M

Flood Signs Ht(m):

Method Flood Signs:

Braided: N

Method Braided:

Bars (%):

Method Bars:

pH:

Method pH:

02 (ppm):

Method Dissolved Oxygen:

Water Temp. (°C): 4.0

Method Temperature: HT

Turb. (cm):

Method Turbidity:

Cond. (µmhos):

Method Conductivity:

DFO/MoELP Stream Survey Form

19-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-627-999-000-000-000-000-000-000

Fish Summary***Obstructions***

Comments

C2 Note: Field stage was not filled out on the stream survey card.

C1 Film 100: 10 u/s, 11 d/s.

Fish sampling (electroshocking) was conducted for 73 seconds. No fish were captured or observed.

This reach has been classified as a S-6 under the Forest Practices Code.



Photo 54. Upstream view of Stream EDI-533 at Reach 1.



Photo 55. Downstream view of Stream EDI-533 at Reach 1.

4.1.5.17 Stream EDI-534

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	534
Nearest Downstream Watershed Code	182-6350-570-627
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	KAR
Cutblock Number	107
Operating Area	Karena
Development Type	Cutblock
Survey Date	11-Jun-96
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	3.0
Stream Width (m)	0.41
Length Surveyed (m)	250
Habitat Type	Stream
Stream Order (1:20,000)	1~
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This reach is located inside the eastern boundary of the proposed cutblock, flowing easterly with a high gradient of 15%. Total cover was 15% with the majority being overhanging vegetation (80%). Bed materials were dominated by fines (70%). Beyond both upper and lower limits of this reach, seepages were present. The lower limit seepage extended 400 m to the confluence and the upper limit seepage extended 250 m terminating in EDI-534. Fish sampling (electroshocking) was conducted, however, time was not recorded. No fish were captured or observed. This reach lacked cover for rearing and lacked gravel for spawning. This reach is also inaccessible to fish as it begins and ends in seepage. Therefore, it has been classified as S-6 under the Forest Practices Code. Note: The main stream channel examined in the field was found to be inconsistent with the watershed atlas. To avoid confusion in reporting and mapping, the entire length of the stream was denoted as EDI-534. The length of EDI-534 (800 m) is part of watershed code 182-6350-570-627. Note ~ means stream was not indicated on the TRIM base map.	

DFO/MoELP Stream Survey Form

19-Aug-97

Stream: Unnamed

Stream Survey Report

Watershed Code:

182-6350-570-627-999-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	EDI-534	Access:	FT
Watershed Code:	182-6350-570-627-999-000-000-000-000-000-000			Reach No.:	1
Location:	ND/WSC: 182-6350-570-627; Kar 107	Map #:	93K/16	Reach Length (km):	0.25
		U.T.M.:	10.387060.6034820	Length surveyed (m):	250.0
Date:	11/06/96	Agency:	EDI	Fish Card:	N
Time:	10:00	Survey Crew:	RV \NC \WC \ \ \ \ \	Field:	Yes
				Historical:	No
				Photos:	#5:12,13
				Air Photos:	

Channel Characteristics

Av. Chan. Width (m):	0.4	Method Av. Chan. Width (m):	MS	Specific Data					
Av. Wet. Width (m):	0.3	Method Av. Wet. Width (m):	MS	0.3	0.3	0.4	0.6	0.5	0.4
Av. Max. Rif. Depth (cm):	4	Av. Max. Riffle Depth (cm):	MS						
Av. Max. Pool Depth (cm):	15	Av. Max. Pool Depth (cm):	4						
Gradient (%):	15.0	Method Gradient:	CL						
% Pool:	10	% Riffle:	60	% Run:	20	% Other:	10	Method:	GE
% Side Channel:	0-10	Method Side Channel:	GE						
% Debris Area:	10-40	Method Debris Area:	GE						

Cover

Cover Total % :	15	Method Cover Total %:	GE						
Dp Pool :	0	L.O.D.:	10	Boulder:	0	In Veg.:	0	Over Veg:	80
Crown Closure % :	10	Method Crown Closure:	GE	Aspect :	E	Method Aspect:	C	Cutbank:	10

Discharge

Wetted Width (m) :	Method Wetted Width (m) :	Specific Data							
Mean Depth (m) :	Method Mean Depth (m) :								
Mean Velocity (m/s) :	Method Mean Velocity (m/s)								
Discharge (m3/s) :	Method Discharge (m3/s) :								

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) (Bed Material)

Bed Material

% Fines (<2mm):	70	% Fines (<2mm):	70
% Gravels:	10	Small (2-16mm):	5
		Large (16-64mm):	5
% Larges:	20	Small cobble (64-128mm):	5
		Large cobble (128-256mm):	10
		Boulder cobble (>256mm):	5
% Bedrock:	0	% Bedrock:	0
D90 (cm):	12	Compaction:	Medium

Banks

Height (m):	0.1	% Unstable:	10
Textures Fines:	Yes	Gravel:	No
Confinement:	3	Larges:	No
Valley: Chan. Ratio:		Bedrock:	No
Stage:	M		
Flood Signs Ht(m):		Method Flood Signs:	
Braided:		Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	3.0	Method Temperature:	
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

DFO/MoELP Stream Survey Form

19-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-627-999-000-000-000-000-000-000

Fish Summary

Obstructions

Comments

- | | |
|----|--|
| C1 | Film 5: 12 u/s, 13d/s.

Fish sampling was conducted. No fish were captured or observed.

This stream has a S-6 classification. Above its upper limit there is seepage. |
| C2 | 'Other' is subsurface area. |
| C3 | Discharge was not conducted for this reach. |



Photo 56. Upstream view of Stream EDI-534 at Reach 1.



Photo 57. Downstream view of Stream EDI-534 at Reach 1.

4.1.5.18 Stream EDI-535

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	535
Nearest Downstream Watershed Code	182-6350-570-627-326
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	313
Cutblock Number	003
Operating Area	Karena
Development Type	Cutblock
Survey Date	24-Sept-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	200
Habitat Type	Seepage
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage is located outside of the eastern boundary of the proposed cutblock, flowing south. This area lacks a definable channel and alluvial substrates. Pooling was evident within isolated areas of the seepage/ Fish sampling was not conducted in this area. No fish were observed. Since this area is seepage and not a stream, it does not require a stream classification under the Forest Practices Code. Note: EDI-535 (seepage) was examined in the field and found to be inconsistent with the watershed atlas. To avoid confusion in reporting and mapping, the entire length of the seepage has been denoted to EDI-535. The entire length of EDI-535 is part of watershed code 182-6350-570-627-326.	

4.1.5.19 Stream EDI-497

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	497
Nearest Downstream Watershed Code	182-6350-570
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	742
Cutblock Number	057
Operating Area	Karena
Development Type	Cutblock
Survey Date	06-Jun-95
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	400
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage is located inside the northern boundary of the proposed cutblock, draining easterly. The headwaters provide some water, however, there were no defined bank, and flow was intermittent. The headwaters resembled a swamp. Fish sampling (electroshocking) was conducted. No fish were captured or observed. Since this area is a seepage, stream classification is not required under the Forest Practices Code.	

4.1.5.20 Stream EDI-510

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	510
Nearest Downstream Watershed Code	182-6350-570
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	313
Cutblock Number	003
Operating Area	Karena
Development Type	Cutblock
Survey Date	24-Sept-95
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	1300
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage is located along the southeastern boundary of the proposed cutblock draining easterly into Nielsp Creek. The first 1000 m did not exist in the vicinity of Nielsp Creek. The remaining 400 m was wet ground with alder patches. Water periodically pooled under roots and moss covered L.O.D. This area lacked a definable channel and alluvial substrates. Fish sampling was not conducted. No fish were observed. Since this is not a stream but a seepage, a fish stream classification is not required under the Forest Practices Code.	

4.1.5.21 Stream EDI-498

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	498
Nearest Downstream Watershed Code	182-6350-570
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	742
Cutblock Number	057
Operating Area	Karena
Development Type	Cutblock
Survey Date	06-Jun-95
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	300
Habitat Type	Not Applicable
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description:	
The tributary was not located during the survey of this cutblock. The stream indicated on TRIM does not exist.	

4.1.5.22 Stream EDI-541

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	541
Nearest Downstream Watershed Code	182-6350-570
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	KAR
Cutblock Number	107
Operating Area	Karena
Development Type	Cutblock
Survey Date	21-Jun-96
Reach Number	A
Site Number	Not Applicable
Water Temperature (°C)	5.0
Stream Width (m)	0.63
Length Surveyed (m)	400
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This reach is located along the southern boundary of the proposed cutblock flowing southeasterly with a low gradient of 6%. Total cover was 10% with the majority consisting of L.O.D. (50%). Fish access is restricted by sub-surface flow and seepage areas. The upper limit of this reach ended in seepage which was surveyed for 400 m. The seepage lacked a definable channel and alluvial substrates. Fish sampling (electroshocking) was conducted, however, time was not recorded. No fish were captured or observed. Poor fisheries habitat due to seepage areas and periodic sub-surface flow restricting fish access has classified this reach as S-6 under the Forest Practices Code. Recommendation: Further survey is recommended below this reach to find the confluence with Nielsp Creek, as the ground survey indicated the stream flows in a different direction than indicated on the TRIM base map.	

Header Information

Stream Name: Unnamed

Watershed Code: 182-6350-570-999-000-000-000-000-000-000-000

Location: ND/WSC: 182-6350-570; Kar 107

Date: 96/06/21

Time: 10:55

Agency: EDI

Survey Crew: LL RV \ \ \ \ \ \ \ \

Stream "Local": EDI-541

Map #: 93K/7

U.T.M.: 10.386490.6034325

Access: FT

Reach No.: 999

Site No.: 0

Fish Card: N

Photos: #23;1,2

Reach Length (km): 0.40000

Length surveyed (m): 400.0

Field: Yes

Historical: No

Method: MW

Method: MW

Air Photos:

Channel Characteristics

Av. Chan. Width (m): 0.6

Method Av. Chan. Width (m): MS

Av. Wet. Width (m): 0.6

Method Av. Wet. Width (m): MS

Av. Max. Rif. Depth (cm): 5

Av. Max. Riffle Depth (cm): MS

Av. Max. Pool Depth (cm): 30

Av. Max. Pool Depth (cm): 5

Gradient (%): 6.0

Method Gradient: CL

% Pool: 35

% Riffle: 40

% Run: 25

% Other: 0

Method: GE

% Side Channel: 0

Method Side Channel: GE

% Debris Area: 10-40

Method Debris Area: GE

Specific Data

0.8

0.3

0.7

0.6

0.8

0.6

Cover

Cover Total % : 5

Method Cover Total %: GE

Dp Pool : 0

L.O.D.: 10

Boulder: 0

In Veg.: 0

Over Veg: 80

Cutbank: 10

Crown Closure % : 10

Method Crown Closure: GE

Aspect : E

Method Aspect: C

Discharge

Wetted Width (m) : 0.6

Method Wetted Width (m) :

Mean Depth (m) : 0.1

Method Mean Depth (m) :

Mean Velocity (m/s) : 0.39

Method Mean Velocity (m/s)

Discharge (m3/s) : 0.02

Method Discharge (m3/s) :

Specific Data

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope)

(Bed Material)

Bed Material

% Fines (<2mm): 70

% Fines (<2mm): 70

% Gravels: 10

Small (2-16mm): 5

Large (16-64mm): 5

% Larges: 20

Small cobble (64-128mm): 5

Large cobble (128-256mm): 10

Boulder cobble (>256mm): 5

% Bedrock: 0

% Bedrock: 0

D90 (cm): 12

Compaction: Medium

Banks

Height (m): 0.1

% Unstable: 10

Textures Fines: Yes

Gravel: No

Larges: No

Bedrock: No

Confinement: 3

Valley: Chan. Ratio:

Stage: M

Flood Signs Ht(m):

Method Flood Signs:

Braided:

Method Braided:

Bars (%):

Method Bars:

pH:

Method pH:

O2 (ppm):

Method Dissolved Oxygen:

Water Temp. (°C): 5.0

Method Temperature: HT

Turb. (cm):

Method Turbidity:

Cond. (µmhos):

Method Conductivity:

DFO/MoELP Stream Survey Form

19-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-627-999-000-000-000-000-000-000

Fish Summary

Obstructions

Comments

C1 Film 23: 1 d/s, 2 w/s.

Note: Reach '999' should read Reach 'A'.

Fish sampling (electroshocking) was conducted but not recorded. No fish were captured or observed.

This stream has been given as a S-6 classification under the Forest Practices Code.



Photo 58. Upstream view of Stream EDI-541 at Reach A.



Photo 59. Downstream view of Stream EDI-541 at Reach A.

4.1.5.23 Stream 182-6350-570-765

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-765
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	KAR
Cutblock Number	109
Operating Area	Karena
Development Type	Cutblock
Survey Date	19-Jun-96
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	3.0
Stream Width (m)	1.60
Length Surveyed (m)	1400
Habitat Type	Stream
Stream Order (1:20,000)	2
Forest Practices Code Stream Classification	S-3*
Fish Species Identified	None
Description: This reach is located along the northern and eastern boundaries of the proposed cutblock flowing easterly into Nielsp Creek with a low gradient of 4%. Total cover was 20% with the majority being L.O.D. (50%) and undercut banks (20%). Substrates were divided between gravels and larges (both at 40%) and fines (20%). The upper limit ended at a spruce bog/wetland area. Fish sampling (electroshocking) was conducted for 296 sec. No fish were captured or observed. Since this reach provides good potential spawning and rearing habitat it has been classified by default as S-3* under the Forest Practices Code. Recommendation: Further survey is recommended to determine fish presence and to locate an upper limit of fish distribution on this system.	

DFO/MoELP Stream Survey Form

19-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-765-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-6350-570-765-000-000-000-000-000-000-000	Map #:	93K/7	Reach No.:	1
Location:	Kar 109	U.T.M.:	10.386371.6033989	Site No.:	0
Date:	19/06/96	Agency:	EDI	Fish Card:	N
Time:	10:20	Survey Crew:	LL\RV\ \ \ \ \ \	Photos:	#5: 20,21
				Reach Length (km):	1.4
				Length surveyed (m):	1400.0
				Field:	Yes
				Historical:	No
				Air Photos:	

Channel Characteristics

Av. Chan. Width (m):	1.6	Method Av. Chan. Width (m):	MS
Av. Wet. Width (m):	1.7	Method Av. Wet. Width (m):	MS
Av. Max. Rif. Depth (cm):	10	Av. Max. Riffle Depth (cm):	MS
Av. Max. Pool Depth (cm):	40	Av. Max. Pool Depth (cm):	10
Gradient (%):	4.0	Method Gradient:	CL
% Pool:	20	% Riffle:	40
% Side Channel:	0	% Run:	40
% Debris Area:	10-40	% Other:	0
		Method:	GE
		Method Side Channel:	GE
		Method Debris Area:	GE

Cover

Cover Total % :	20	Method Cover Total %:	GE
Dp Pool :	10	L.O.D.:	50
Crown Closure % :	10	Boulder:	10
		In Veg.:	0
		Over Veg:	10
		Cutbank:	20
		Aspect :	SE
		Method Aspect:	C

Discharge

Wetted Width (m) :	2.0	Method Wetted Width (m) :	
Mean Depth (m) :	0.1	Method Mean Depth (m) :	
Mean Velocity (m/s) :	1.25	Method Mean Velocity (m/s)	
Discharge (m3/s) :	0.38	Method Discharge (m3/s) :	

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) (Bed Material)

Bed Material

% Fines (<2mm):	20	% Fines (<2mm):	20
% Gravels:	40	Small (2-16mm):	10
		Large (16-64mm):	30
% Larges:	40	Small cobble (64-128mm):	25
		Large cobble (128-256mm):	10
		Boulder cobble (>256mm):	5
% Bedrock:	0	% Bedrock:	0
D90 (cm):	23	Compaction:	Medium

Banks

Height (m):	0.2	% Unstable:	5
Textures Fines:	Yes	Gravel:	No
Confinement:	3	Larges:	No
Valley: Chan. Ratio:		Bedrock:	No
Stage:	M		
Flood Signs Ht(m):	0.2	Method Flood Signs:	MS
Braided:		Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	3.0	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

DFO/MoELP Stream Survey Form

19-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-765-000-000-000-000-000-000-000

Fish Summary***Obstructions***

Comments

C1

Film 5: 20 d/s, 21 u/s

Fish sampling (electroshocking) was conducted for 296 seconds. No fish were captured.

This stream has been assigned a defaulted S-3 classification under the Forest Practices Code.



Photo 60. Downstream view of Stream 182-6350-570-765 at Reach 1.

4.1.5.24 Stream 182-6350-570-780

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-780
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	KAR
Cutblock Number	109
Operating Area	Karena
Development Type	Cutblock
Survey Date	20-Jun-96
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	4.0
Stream Width (m)	0.88
Length Surveyed (m)	900
Habitat Type	Stream
Stream Order (1:20,000)	3
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This reach is located outside of the southern boundary of the proposed cutblock flowing easterly with a low gradient of 0.5%. Total cover was 10% with the majority being L.O.D. (40%). Substrates were dominated by gravels (50%) followed by larges (30%) and fines (20%). Parts of this reach flowed sub-surface and pooled water indicated obstructed flow. Fish sampling (electroshocking) was conducted for 146 sec. No fish were captured or observed. This reach lacked fisheries habitat as cover was poor and pooling water indicated poor accessibility to fish. This reach was classified as S-6 under the Forest Practices Code.	

DFO/MoELP Stream Survey Form

19-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-780-000-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-6350-570-780-000-000-000-000-000-000-000	Reach No.:	1	Reach Length (km):	0.9 Method: MW
Location:	Kar 109	Site No.:	0	Length surveyed (m):	900.0 Method: MW
		Map #:	93K/7	Fish Card:	N Field: Yes Historical: No
		U.T.M.:	10.386124.6033786	Photos:	#5: 24 Air Photos:
Date:	20/06/96	Time:	09:35	Agency:	EDI
		Survey Crew:	LL\RV\ \ \ \ \ \		

Channel Characteristics

Av. Chan. Width (m):	0.9	Method Av. Chan. Width (m):	MS
Av. Wet. Width (m):	0.7	Method Av. Wet. Width (m):	MS
Av. Max. Rif. Depth (cm):	10	Av. Max. Riffle Depth (cm):	MS
Av. Max. Pool Depth (cm):	25	Av. Max. Pool Depth (cm):	10
Gradient (%):	5.0	Method Gradient:	CL
% Pool: 5	% Riffle: 80	% Run: 15	% Other: 0 Method: GE
% Side Channel:	0	Method Side Channel:	GE
% Debris Area:	10-40	Method Debris Area:	GE

Cover

Cover Total % :	10	Method Cover Total %:	GE
Dp Pool : 0 L.O.D.:	40	Boulder: 0	In Veg.: 0
Crown Closure % :	10	Method Crown Closure:	GE
		Aspect :	E Method Aspect:
			C

Discharge

Wetted Width (m) :	0.7	Method Wetted Width (m) :	
Mean Depth (m) :	0.1	Method Mean Depth (m) :	
Mean Velocity (m/s) :	0.66	Method Mean Velocity (m/s)	
Discharge (m3/s) :	0.07	Method Discharge (m3/s) :	

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) (Bed Material)

Bed Material

% Fines (<2mm):	15	% Fines (<2mm):	15
% Gravels:	55	Small (2-16mm):	15
		Large (16-64mm):	40
% Larges:	30	Small cobble (64-128mm):	20
		Large cobble (128-256mm):	5
		Boulder cobble (>256mm):	5
% Bedrock:	0	% Bedrock:	0
D90 (cm):	12	Compaction:	Medium

Banks

Height (m):	0.3	% Unstable:	5
Textures Fines:	Yes	Gravel: No	Larges: No Bedrock: No
Confinement:	2		
Valley: Chan. Ratio:			
Stage:	M		
Flood Signs Ht(m):		Method Flood Signs:	
Braided:		Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	4.0	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

DFO/MoELP Stream Survey Form

19-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-780-000-000-000-000-000-000-000

Fish Summary

Obstructions

Comments

C1 Film 5: 24 w/s

Fish sampling (electroshocking) was conducted for 146 seconds. No fish were captured or observed.

This stream is classified as a S-6 stream under the Forest Practices Code.

4.1.6 Watershed 182-6350-570-145

Watershed 182-6350-570-145 is located within BC Environment Management Unit 7-25 (BC Ministry of Environment, Lands and Parks 1993) within the central portion of the Stuart Lake Watershed Group (Fig. 7). The main system flows into Nielsp Creek and eventually into Stuart Lake. It is bounded by Nielsp Creek to the south, Watershed 182-6350-423 to the east and watersheds 182-6621 and 182-7154 to the north. Occupying 2,372 ha of the Stuart Lake Provincial Forest, the geographical relief ranges from approximately 870 m, at the confluence of Stream 182-6350-570-145 and Sowchea Creek, to approximately 1,070 m in the northern headwaters (BC Environment 1995; Department of Energy, Mines and Resources 1977).

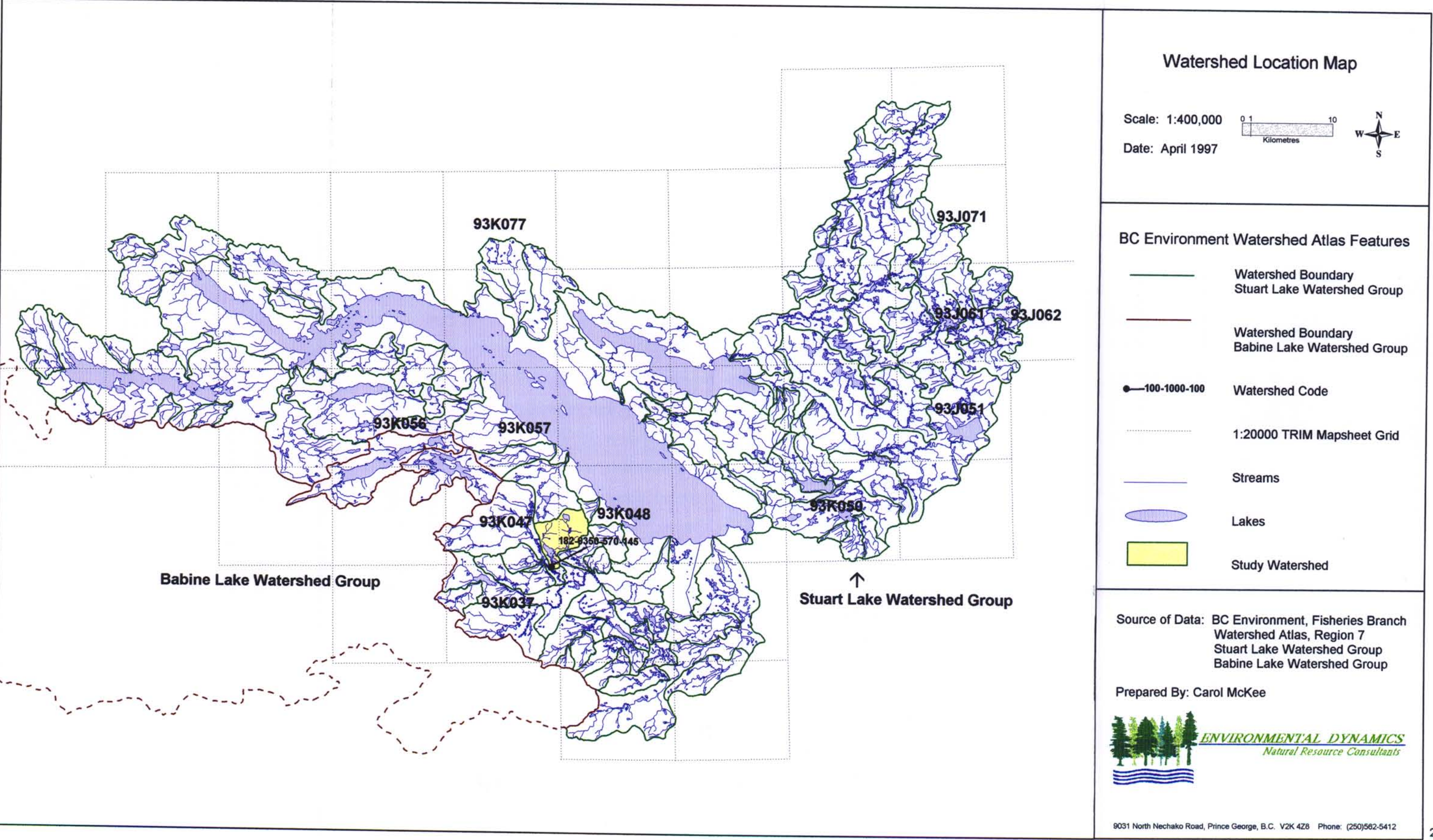
This watershed is dominated by two sub-zones/variants according to the biogeoclimatic units of the Prince George Forest Region. These units include: the Stuart Dry Warm Sub-Boreal Spruce sub-zone (SBSdw3), and the Babine Moist Cold Sub-Boreal Spruce sub-zone (SBSmc2) (DeLong et al. 1993).

According to BC Environment lake inventory files (1970-1996), the following fish species have been documented within this watershed: longnose sucker, largescale sucker, redbelt shiner and northern redbelly dace (BC Environment 1997b). As this system indirectly drains into Sowchea Creek it may have potential to contain: Dolly Varden¹, rainbow trout, speckled dace, sockeye salmon, kokanee, dace, whitefish and sucker (BC Environment 1995).

Canfor together with BC Environment have created Wildlife Movement Corridors (WMC) to be included in Canfor's five year development plans. These WMC's provide cover and allow animals to travel through non-logged areas. There are no WMC's located within Watershed 182-6350-570-145 (Canfor 1996).

Since this watershed lies within a portion of Canfor's Karena Operating Area, linear development is common throughout the area (Ministry of Forests 1995; Canfor 1996). The major gravel roads located in this watershed are the Cunningham FSR and its adjoining sideroads (Canfor 1996).

Figure 7. Location of Watershed 182-6350-570-145 within the Stuart Lake Watershed Group



Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-145
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	313
Cutblock Number	002
Operating Area	Karena
Development Type	Cutblock
Survey Date	3-Oct-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	700
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage is located in the northwestern boundary of cutblock 313-2, draining southwesterly. Supporting devil's club, horsetail, ferns and spruce, it lacks alluvial substrates and a definable channel. Fish sampling was not conducted. No fish were observed. Since this is seepage and not a stream, it does not require a stream classification under the Forest Practices Code.	

4.1.6.1 Stream EDI-760

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	760
Nearest Downstream Watershed Code	182-6350-570-145-378
NTS Map (1:50,000)	93K/7
TRIM Map	93K048
Cutting Permit	Kar
Cutblock Number	041
Operating Area	Karena
Development Type	Right-of-Way
Survey Date	21-Aug-96
Reach Number	A
Site Number	Not Applicable
Water Temperature (°C)	12.0
Stream Width (m)	2.15
Length Surveyed (m)	500
Habitat Type	Stream
Stream Order (1:20,000)	4
Forest Practices Code Stream Classification	S-3
Fish Species Identified	RB - Rainbow Trout
Description: This reach is located along the main system draining south out of Dawn Lake below the 3.5 m high impassable waterfall with a low gradient of 4.5%. Total cover was 55% with the majority being deep pools (35%), overhanging vegetation (25%) and undercut banks (25%). Bed material was dominated by gravels (40%), followed by fines (35%). Fish sampling (electroshocking) was conducted for 97 sec. Eleven rainbow trout were caught. This reach possesses excellent rearing habitat and good spawning potential. Since this reach contained regionally significant fish it was classified as S-3 under the Forest Practices Code. According to the NTS map, this system drains into Karena Lake (WSC 182-6350-570-145-01). However, according to the TRIM map, this stream flows east into a tributary to Nilan Lake (alias Camp Lake). Therefore, this stream was given a unique identifier (EDI-760) which was placed at the actual confluence of the stream on the project map.	

DFO/MoELP Stream Survey Form

19-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-145-378-999-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	EDI-760	Access:	FT
Watershed Code:	182-6350-570-145-378-999-000-000-000-000-000	Reach No.:	999	Reach Length (km):	0.5 Method: MW
Location:	ND/WSC: 182-6350-570-145-378; KAR 41	Site No.:	0	Length surveyed (m):	500.0 Method: MW
		Map #:	93K/07	Fish Card:	N Field: Yes Historical: No
		U.T.M.:	10.397260.6031340	Photos:	#A: 7,8 Air Photos:
Date: 21/08/96	Time: 10:00	Agency: EDI	Survey Crew: RM \MS \ \ \ \ \ \ \		

Channel Characteristics

Av. Chan. Width (m):	2.2	Method Av. Chan. Width (m):	T	
Av. Wet. Width (m):	2.0	Method Av. Wet. Width (m):	T	
Av. Max. Rif. Depth (cm):	10	Av. Max. Riffle Depth (cm):	MS	
Av. Max. Pool Depth (cm):	50	Av. Max. Pool Depth (cm):	10	
Gradient (%):	4.5	Method Gradient:	CL	
% Pool: 35	% Riffle: 20	% Run: 25	% Other: 20	Method: GE
% Side Channel:	0	Method Side Channel:	GE	
% Debris Area:	0-10	Method Debris Area:	GE	

Cover

Cover Total % :	55	Method Cover Total %:	GE		
Dp Pool: 35	L.O.D.: 10	Boulder: 5	In Veg.: 0	Over Veg: 25	Cutbank: 25
Crown Closure % :	5	Method Crown Closure:	GE	Aspect: S	Method Aspect: C

Discharge

Wetted Width (m) :	Method Wetted Width (m) :
Mean Depth (m) :	Method Mean Depth (m) :
Mean Velocity (m/s) :	Method Mean Velocity (m/s)
Discharge (m3/s) :	Method Discharge (m3/s) :

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) (Bed Material)

Specific Data

2.6	2.1	2.0	2.3	2.0	1.8
-----	-----	-----	-----	-----	-----

Bed Material

% Fines (<2mm):	35	% Fines (<2mm):	35
% Gravels:	40	Small (2-16mm):	25
		Large (16-64mm):	15
% Larges:	25	Small cobble (64-128mm):	10
		Large cobble (128-256mm):	10
		Boulder cobble (>256mm):	5
% Bedrock:	0	% Bedrock:	0
D90 (cm):	38	Compaction:	High

Banks

Height (m):	0.5	% Unstable:	10	
Textures Fines:	Yes	Gravel: No	Larges: No	Bedrock: No
Confinement:	3			
Valley: Chan. Ratio:				
Stage:	M			
Flood Signs Ht(m):		Method Flood Signs:		
Braided:	N	Method Braided:		
Bars (%):		Method Bars:		
pH:		Method pH:		
O2 (ppm):		Method Dissolved Oxygen:		
Water Temp. (°C):	12.0	Method Temperature:		HT
Turb. (cm):		Method Turbidity:		
Cond. (µmhos):		Method Conductivity:		

DFO/MoELP Stream Survey Form

19-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-145-378-999-000-000-000-000-000

Fish Summary

Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method/Reference
RB	6	30.0	F	R			EL
RB	5	50-100	J	R			EL

Obstructions

Comments

C1

Film A: 7 d/s, 8 u/s.

Note: Reach '999' should read Reach 'A'.

Fish sampling (electroshocking) conducted for 97 seconds. Rainbow trout were captured.

This reach was classified as S-3 under the Forest Practices Code.

C2

Too much brush in wetted area to measure discharge accurately.



Photo 61. Upstream view of Stream EDI-760 at Reach A.



Photo 62. Downstream view of Stream EDI-760 at Reach A.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	760
Nearest Downstream Watershed Code	182-6350-570-145-378
NTS Map (1:50,000)	93K/7
TRIM Map	93K048
Cutting Permit	Kar
Cutblock Number	041
Operating Area	Karena
Development Type	Right-of-Way
Survey Date	21-Aug-96
Reach Number	B
Site Number	Not Applicable
Water Temperature (°C)	12.0
Stream Width (m)	2.85
Length Surveyed (m)	150
Habitat Type	Stream
Stream Order (1:20,000)	4
Forest Practices Code Stream Classification	S-3
Fish Species Identified	RB - Rainbow Trout
Description: This reach is located along the main system draining out of Dawn Lake below the 3.5 m high waterfalls and flows south with a mid-gradient of 11%. Total cover is 50% with the majority being deep pools (40%) and boulders (30%). Bed material was dominated by gravels (50%) and larges (40%). Fish sampling (electroshocking) was conducted for 85 sec. Seventeen rainbow trout were captured. This reach possessed excellent rearing habitat and potentially good spawning habitat. Since regionally significant fish were caught in this reach, it was classified as a S-3 under the Forest Practices Code. This reach is the upper limit of fisheries distribution, as there are 2 impassable falls (~3.0 m high each). According to the NTS map, this system drains into Karena Lake (WSC 182-6350-570-145-01). However, according to the TRIM map, this stream flows east into a tributary to Nilan Lake (alias Camp Lake). Therefore, this stream was given a unique identifier (EDI-760) which was placed at the actual confluence of the stream on the project map.	

DFO/MoELP Stream Survey Form

23-Feb-98

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-145-378-999-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	EDI-760	Access:	FT
Watershed Code:	182-6350-570-145-378-999-000-000-000-000-000-000	Reach No.:	998	Reach Length (km):	0.15000 Method: MW
Location:	ND/WSC: 182-6350-570-145-378; KAR 41	Site No.:	0	Length surveyed (m):	150.0 Method: MW
		Map #:	93K/07	Fish Card:	N Field: Yes Historical: No
		U.T.M. :	10.397350.6031650	Photos:	#A: 9,10 Air Photos:
Date: 96/08/21	Time: 10:30	Agency: EDI	Survey Crew: RM \MS\ \ \ \ \ \ \ \		

Channel Characteristics

Av. Chan. Width (m):	2.9	Method Av. Chan. Width (m):	T	Specific Data					
Av. Wet. Width (m):	2.5	Method Av. Wet. Width (m):	T	2.9	2.7	3.2	3.8	2.2	2.4
Av. Max. Rif. Depth (cm):	15	Av. Max. Riffle Depth (cm):	MS						
Av. Max. Pool Depth (cm):	40	Av. Max. Pool Depth (cm):	15						
Gradient (%):	12.0	Method Gradient:	CL						
% Pool: 30	% Riffle: 10	% Run: 35	% Other: 25	Method: GE					
% Side Channel:	0	Method Side Channel:	GE						
% Debris Area:	0-10	Method Debris Area:	GE						

Bed Material

% Fines (<2mm):	10	% Fines (<2mm):	10
% Gravels:	50	Small (2-16mm):	35
		Large (16-64mm):	15
% Larges:	40	Small cobble (64-128mm):	10
		Large cobble (128-256mm):	10
		Boulder cobble (>256mm):	20
% Bedrock:	0	% Bedrock:	0
D90 (cm):	68	Compaction:	High

Cover

Cover Total % :	50	Method Cover Total %:	GE			
Dp Pool : 40 L.O.D.:	5	Boulder: 30	In Veg.: 0	Over Veg: 15	Cutbank:	10
Crown Closure % :	5	Method Crown Closure:	GE	Aspect :	S	Method Aspect: C

Banks

Height (m):	0.4	% Unstable:	10		
Textures Fines:	Yes	Gravel: No	Larges: Yes	Bedrock:	No
Confinement:	2				
Valley: Chan. Ratio:					
Stage:	M				
Flood Signs Ht(m):		Method Flood Signs:			
Braided:	N	Method Braided:			
Bars (%):		Method Bars:			
pH:		Method pH:			
O2 (ppm):		Method Dissolved Oxygen:			
Water Temp. (°C):	12.0	Method Temperature:			HT
Turb. (cm):		Method Turbidity:			
Cond. (µmhos):		Method Conductivity:			

Discharge

Wetted Width (m) :	1.5	Method Wetted Width (m) :	T	Specific Data					
Mean Depth (m) :	0.2	Method Mean Depth (m) :	MS						
Mean Velocity (m/s) :	0.28	Method Mean Velocity (m/s)	F						
Discharge (m3/s) :	0.07	Method Discharge (m3/s) :	F						

Reach Symbol

(Fish)	
(Width, Valley: Channel, Slope)	(Bed Material)

DFO/MoELP Stream Survey Form

23-Feb-98

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-145-378-999-000-000-000-000-000

Fish Summary

Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method/Reference
RB	5	30.0	F	R			EL
RB	12	70-150	J	R			EL

Obstructions

Comments

- C1

Film A: 9 u/s, 10 d/s.

Note: Reach '998' should read Reach 'B'.

Fish sampling (electroshocking) conducted for 85 seconds. Rainbow trout were captured.

This reach was classified as S-3 under the Forest Practices Code.
- C2

'Other' representscascade.

A 3.5 m waterfall is located at the upper limit of this reach, 800 m upstream from the confluence of EDI 760 with EDI 819.



Photo 63. Upstream view of Stream EDI-760 at Reach B.



Photo 64. Downstream view of Stream EDI-760 at Reach B.



Photo 65. Upstream view of waterfall on Stream EDI-760 at Reach B.



Photo 66. Upstream view of waterfall on Stream EDI-760 at Reach B.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	760
Nearest Downstream Watershed Code	182-6350-570-145-378
NTS Map (1:50,000)	93K/7
TRIM Map	93K048
Cutting Permit	Kar
Cutblock Number	041
Operating Area	Karena
Development Type	Right-of-Way
Survey Date	21-Aug-96
Reach Number	C
Site Number	Not Applicable
Water Temperature (°C)	12.0
Stream Width (m)	1.90
Length Surveyed (m)	1000
Habitat Type	Stream
Stream Order (1:20,000)	4
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This reach was located on the main system draining from Dawn Lake above two waterfalls which are barriers to fish movement and flows south with a low gradient of 4%. Total cover was 30% with the majority being overhanging vegetation (35%), undercut banks (20%), and deep pools (20%). Bed material was dominated by gravels (40%), followed by fines and larges, both at 30%. The waterfalls range between 3 - 3.5 m in height. Fish sampling (electroshocking) was conducted for 554 sec. No fish were captured or observed. Due to the barrier to fish movement, located at the lower limit, this reach has been classified as a S-6 under the Forest Practices Code. Dawn Lake was surveyed for fish and it was found to be barren.	

DFO/MoELP Stream Survey Form

17-Dec-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-145-378-999-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	EDI-760	Access:	FT
Watershed Code:	182-6350-570-145-378-999-000-000-000-000-000	Reach No.:	997	Reach Length (km):	1 Method: MW
Location:	ND/WSC: 182-6350-570-145-378; KAR 41	Site No.:	0	Length surveyed (m):	1000.0 Method: MW
		Fish Card:	N	Field: Yes	Historical: No
		U.T.M. :	10.397472.6032156	Photos:	#A: 13,14 Air Photos:
Date: 8/21/96	Time: 11:30	Agency: EDI	Survey Crew: RM \MS \ \ \ \ \ \ \		

Channel Characteristics

Av. Chan. Width (m):	1.9	Method Av. Chan. Width (m):	MS	
Av. Wet. Width (m):	1.2	Method Av. Wet. Width (m):	MS	
Av. Max. Rif. Depth (cm):	9	Av. Max. Riffle Depth (cm):	MS	
Av. Max. Pool Depth (cm):	15	Av. Max. Pool Depth (cm):	9	
Gradient (%):	4.0	Method Gradient:	CL	
% Pool: 20	% Riffle: 10	% Run: 60	% Other: 10	Method: GE
% Side Channel:	0	Method Side Channel:	GE	
% Debris Area:	0-10	Method Debris Area:	GE	

Specific Data					
1.1	1.8	2.0	2.4	2.3	1.8

Bed Material

% Fines (<2mm):	30	% Fines (<2mm):	30
% Gravels:	40	Small (2-16mm):	25
		Large (16-64mm):	15
% Larges:	30	Small cobble (64-128mm):	15
		Large cobble (128-256mm):	10
		Boulder cobble (>256mm):	5
% Bedrock:	0	% Bedrock:	0
D90 (cm):	14	Compaction:	High

Cover

Cover Total % :	30	Method Cover Total %:	GE		
Dp Pool : 20 L.O.D.:	5	Boulder: 5	In Veg.: 15	Over Veg: 35	Cutbank: 20
Crown Closure % :	2	Method Crown Closure:	GE	Aspect : S	Method Aspect: C

Discharge

Wetted Width (m) :	1.2	Method Wetted Width (m) :	MS
Mean Depth (m) :	0.1	Method Mean Depth (m) :	MS
Mean Velocity (m/s) :	0.28	Method Mean Velocity (m/s)	F
Discharge (m3/s) :	0.04	Method Discharge (m3/s) :	F

Specific Data					

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) (Bed Material)

Banks

Height (m):	0.3	% Unstable:	15	
Textures Fines:	Yes	Gravel: No	Larges: No	Bedrock: No
Confinement:	3			
Valley: Chan. Ratio:				
Stage:	M			
Flood Signs Ht(m):		Method Flood Signs:		
Braided:	N	Method Braided:		
Bars (%):		Method Bars:		
pH:		Method pH:		
O2 (ppm):		Method Dissolved Oxygen:		
Water Temp. (°C):	12.0	Method Temperature:	HT	
Turb. (cm):		Method Turbidity:		
Cond. (µmhos):		Method Conductivity:		

DFO/MoELP Stream Survey Form

17-Dec-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-145-378-999-000-000-000-000-000

Fish Summary

Obstructions

Obstruction #	Type	Location
4	F	1.3

Comments

- C1

Film A: 13 d/s, 14 u/s.

Note: Reach '997' should read Reach 'C'.

Fish sampling (electroshocking) was conducted for 554 seconds. No fish were captured.

This reach was classified as S-6 under the Forest Practices Code due to the presence of an impassable waterfall located downstream.
- C2

Note: The height of the falls is actually 3.5m and the computer rounds the number up to 4.

The falls are located 600 m u/s from the confluence of EDI-760 and EDI-819.



Photo 67. Upstream view of Stream EDI-760 at Reach C.



Photo 68. Downstream view of Stream EDI-760 at Reach C.

4.1.6.2 Stream 182-6350-570-145-378-606

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-145-378-606
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K048
Cutting Permit	313
Cutblock Number	003
Operating Area	Karena
Development Type	None
Survey Date	1-Oct-96
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	Not Recorded
Stream Width (m)	0.66
Length Surveyed (m)	150
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This reach is located outside of cutblock 313-2, flowing east with a mid-gradient of 11%. Total cover was 20% with the majority being overhanging vegetation (45%) and L.O.D. (35%). Bed materials were dominated by larges at 60% followed by fines 40%. Parts of this reach flowed sub-surface, or were dry with only isolated pools of water evident. Beyond the lower limit no sign of any drainage was observed. This reach does not join any other tributary above ground. The upper limit of this reach ends in seepage at a clearing. Moose activity was observed in this open area. No channel or alluvial substrates were present past the upper limit. Fish sampling was not conducted. No fish were observed. As this reach is inaccessible to fish it has been classified as a S-6 under the Forest Practices Code. Note: This stream was assigned a watershed code according to the Watershed Atlas. However, according to the TRIM map, this stream is part of a different system and it is a tributary to the system 182-6350-432.	

DFO/MoELP Stream Survey Form

20-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-145-378-606-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-6350-570-145-378-606-000-000-000-000-000	Reach No.:	1	Reach Length (km):	0.15000 Method: MW
Location:	313-2 Karena	Site No.:	0	Length surveyed (m):	150.0 Method: MW
		Map #:	93K/7	Fish Card:	N
		U.T.M.:	10.397210.6032880	Field:	Yes
Date: 01/10/96	Time: 15:20	Agency:	EDI	Historical:	No
		Survey Crew:	NHP\DT\ \ \ \ \ \	Photos:	95: 15, 16
				Air Photos:	

Channel Characteristics

Av. Chan. Width (m):	0.7	Method Av. Chan. Width (m):	MS
Av. Wet. Width (m):	0.0	Method Av. Wet. Width (m):	
Av. Max. Rif. Depth (cm):	0	Av. Max. Riffle Depth (cm):	
Av. Max. Pool Depth (cm):	0	Av. Max. Pool Depth (cm):	0
Gradient (%):	11.0	Method Gradient:	
% Pool: 0	% Riffle: 0	% Run: 0	% Other: 0
% Side Channel: 0	Method Side Channel:		
% Debris Area:	>40	Method Debris Area:	GE

Specific Data					
0.8	0.8	0.5	0.4	0.9	0.6

Cover

Cover Total % :	20	Method Cover Total %:	GE
Dp Pool : 0 L.O.D.:	35	Boulder: 0	In Veg.: 0
Crown Closure % :	20	Method Crown Closure:	GE
		Aspect :	E
		Method Aspect:	C

Discharge

Wetted Width (m) :	Method Wetted Width (m) :
Mean Depth (m) :	Method Mean Depth (m) :
Mean Velocity (m/s) :	Method Mean Velocity (m/s)
Discharge (m3/s) :	Method Discharge (m3/s) :

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope)	(Bed Material)
---------------------------------	----------------

Bed Material

% Fines (<2mm):	40	% Fines (<2mm):	40
% Gravels:	0	Small (2-16mm):	0
		Large (16-64mm):	0
% Larges:	60	Small cobble (64-128mm):	35
		Large cobble (128-256mm):	25
		Boulder cobble (>256mm):	0
% Bedrock:	0	% Bedrock:	0
D90 (cm):	10	Compaction:	High

Banks

Height (m):	25.0	% Unstable:	
Textures Fines:	Yes	Gravel: No	Larges: No
Confinement:	4	Bedrock:	No
Valley: Chan. Ratio:	5		
Stage:	Dry		
Flood Signs Ht(m):		Method Flood Signs:	
Braided:		Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):		Method Temperature:	
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

DFO/MoELP Stream Survey Form

20-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-145-378-606-000-000-000-000-000

Fish Summary***Obstructions***

Comments

C2

Note: Wet. Width, Riffle depth, Pool depth, pool% etc. and side channel % were not recorded in the field.

C1

Film 93: 15 d/s, 16 u/s.

Fish sampling was not conducted. No fish were observed.

This section of stream has been given a S-6 classification under the Forest Practices Code.



Photo 69. Upstream view of Stream 182-6350-570-145-378-606 at Reach 1.



Photo 70. Downstream view of Stream 182-6350-570-145-378-606 at Reach 1.

4.1.6.3 Stream 182-6350-570-145-378-622

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-145-378-622
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K048
Cutting Permit	Kar
Cutblock Number	041
Operating Area	Karena
Development Type	Right-of-Way
Survey Date	20-Aug-96
Reach Number	2
Site Number	Not Applicable
Water Temperature (°C)	8.5
Stream Width (m)	0.85
Length Surveyed (m)	100
Habitat Type	Stream
Stream Order (1:20,000)	2
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This reach is located approximately 1 km south of cutblock Kar-41. The stream flows west with a varying gradient of 1.5% - 21%. Total cover was 10% with the majority being L.O.D. (55%) and overhanging vegetation (30%). Bed materials were dominated by fines (100%). Fish sampling (electroshocking) was conducted for 141 sec. No fish were caught or observed. Two waterfalls 3 - 3.5 m in height, present a barrier to fish from the adjoining tributary (stream EDI-760) downstream. Therefore, this reach has been classified as S-6 under the Forest Practices Code. This stream was assigned a watershed code based on the Watershed Atlas. However, according to the TRIM map, this stream is part of a different system that has the watershed code 182-6350-432.	

DFO/MoELP Stream Survey Form

31-Dec-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-145-378-622-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-6350-570-145-378-622-000-000-000-000-000	Reach No.:	2	Reach Length (km):	0.9 Method: MW
Location:	KAR 41	Site No.:	0	Length surveyed (m):	100.0 Method: MW
		Fish Card:	N	Field:	Yes Historical: No
		Photos:	# 71: 25	Air Photos:	
Date:	8/20/96	Time:	14:15	Agency:	EDI
		Survey Crew:	RM VMS \ \ \ \ \ \ \		
		Map #:	93K/07		
		U.T.M.:	10.398010.6032910		

Channel Characteristics

Av. Chan. Width (m):	0.8	Method Av. Chan. Width (m):	MS
Av. Wet. Width (m):	0.6	Method Av. Wet. Width (m):	MS
Av. Max. Rif. Depth (cm):		Av. Max. Riffle Depth (cm):	MS
Av. Max. Pool Depth (cm):	22	Av. Max. Pool Depth (cm):	
Gradient (%):	1.5	Method Gradient:	CL
% Pool:	90	% Riffle:	0
% Side Channel:	0	% Run:	0
% Debris Area:	>40	% Other:	10
		Method:	GE
		Method Side Channel:	GE
		Method Debris Area:	GE

Specific Data					
0.6	0.5	1.6	0.8	0.8	0.8

Bed Material

% Fines (<2mm):	100	% Fines (<2mm):	100
% Gravels:	0	Small (2-16mm):	0
		Large (16-64mm):	0
% Larges:	0	Small cobble (64-128mm):	0
		Large cobble (128-256mm):	0
		Boulder cobble (>256mm):	0
% Bedrock:	0	% Bedrock:	0
D90 (cm):		Compaction:	High

Cover

Cover Total % :	10	Method Cover Total %:	GE
Dp Pool :	10	L.O.D.:	55
Crown Closure % :	5	Method Crown Closure:	GE
		Boulder:	0
		In Veg.:	0
		Over Veg.:	30
		Cutbank:	5
		Aspect :	
		Method Aspect:	

Discharge

Wetted Width (m) :		Method Wetted Width (m) :	
Mean Depth (m) :		Method Mean Depth (m) :	
Mean Velocity (m/s) :		Method Mean Velocity (m/s) :	
Discharge (m3/s) :		Method Discharge (m3/s) :	

Specific Data					

Reach Symbol

(Fish)	
(Width, Valley: Channel, Slope)	(Bed Material)

Banks

Height (m):	0.1	% Unstable:	5
Textures Fines:	Yes	Gravel:	No
Confinement:	3	Larges:	No
Valley: Chan. Ratio:		Bedrock:	No
Stage:	L		
Flood Signs Ht(m):		Method Flood Signs:	
Braided:	N	Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	8.5	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

DFO/MoELP Stream Survey Form

31-Dec-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-145-378-622-000-000-000-000-000

Fish Summary

Obstructions

Comments

- C1

Film 71: 25 w/s.

Fish sampling (electroshocking) conducted for 141 seconds. No fish were captured.

This reach was classified as S-6 due to an impassable water fall located downstream.
- C2

No riffle present at site.
- C3

Velocity too slow to calculate discharge.



Photo 71. Upstream view of Stream 182-6350-570-145-378-622 at Reach 2.

4.1.6.4 Stream EDI-552

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	552
Nearest Downstream Watershed Code	182-6350-570-145-378
NTS Map (1:50,000)	93K/7
TRIM Map	93K048
Cutting Permit	313
Cutblock Number	002
Operating Area	Karena
Development Type	None
Survey Date	1-Oct-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	150
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage is located outside of the cutblock and drains east into a small lake. There was a small (15 m) area of channeling upstream of the road. Area was surveyed for 150 m upstream of the road and channelling was not observed. There was a damaged culvert at the road crossing. Fish sampling was not conducted. No fish were observed. Since this area is a seepage and not a stream, it does not require a stream classification under the Forest Practices Code This stream's watershed code was assigned according to the Watershed Atlas. However, according to the TRIM map (and ground survey), this stream is part of a different system. This stream is a tributary to the system 182-6350-432. Recommendation: Further survey is recommended to assess water flow during high runoff periods. The culvert at the road crossing may need to be repaired before erosion becomes a concern.	

4.1.6.5 Stream 182-6350-570-145-378-657

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-145-378-657
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K048
Cutting Permit	Kar
Cutblock Number	041
Operating Area	Karena
Development Type	Right-of-Way
Survey Date	20-Aug-96
Reach Number	2
Site Number	Not Applicable
Water Temperature (°C)	7.5
Stream Width (m)	1.00
Length Surveyed (m)	100
Habitat Type	Stream
Stream Order (1:20,000)	2
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This ROW is located outside of the southwestern boundary of cutblock Kar 41. The water flows southwesterly with a high gradient of 23%. Total cover was 10% with the majority being L.O.D. (60%). Bed materials were dominated by fines (60%). Fish sampling was not conducted. No fish were observed. Due to the high gradient impass located in this site and since stream EDI-760 contains a 3.5 m high waterfall impass, this reach remains classified as S-6 under the Forest Practices Code. Recommendation: Caution should be taken during road construction to avoid siltation of the lower tributaries, and to maintain the viability of a possible stocking program within Dawn Lake. Note: This stream was assigned a watershed code according to the Watershed Atlas. However, according to the TRIM map, this stream is part of a different system, stream 182-6350-432.	

DFO/MoELP Stream Survey Form

31-Dec-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-145-378-657-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-6350-570-145-378-657-000-000-000-000-000	Reach No.:	2	Reach Length (km):	0.40000 Method:
Location:	KAR 41	Site No.:	0	Length surveyed (m):	100.0 Method: MW
		Fish Card:	N	Field:	Yes Historical: No
		Photos:	#71: 20,21	Air Photos:	
Date: 8/20/96	Time: 11:45	Agency: EDI	Survey Crew: MS\RM\ \ \ \ \ \ \ \		

Channel Characteristics

Av. Chan. Width (m):	1.0	Method Av. Chan. Width (m):	MS
Av. Wet. Width (m):	0.7	Method Av. Wet. Width (m):	MS
Av. Max. Rif. Depth (cm):	5	Av. Max. Riffle Depth (cm):	MS
Av. Max. Pool Depth (cm):	15	Av. Max. Pool Depth (cm):	5
Gradient (%):	23.0	Method Gradient:	CL
% Pool:	20	% Riffle:	10
% Side Channel:	0	% Run:	70
% Debris Area:	0-10	% Other:	0
		Method:	GE
		Method Side Channel:	GE
		Method Debris Area:	GE

Specific Data					
1.1	0.6	1.2	1.2	0.8	1.0

Bed Material

% Fines (<2mm):	60	% Fines (<2mm):	60
% Gravels:	25	Small (2-16mm):	20
		Large (16-64mm):	5
% Larges:	15	Small cobble (64-128mm):	5
		Large cobble (128-256mm):	5
		Boulder cobble (>256mm):	5
% Bedrock:	0	% Bedrock:	0
D90 (cm):	26	Compaction:	Medium

Cover

Cover Total % :	10	Method Cover Total %:	GE
Dp Pool :	15	L.O.D.:	60
Crown Closure % :	45	Boulder:	10
		In Veg.:	0
		Over Veg:	10
		Cutbank:	5
		Aspect :	S
		Method Aspect:	C

Discharge

Wetted Width (m) :	Method Wetted Width (m) :
Mean Depth (m) :	Method Mean Depth (m) :
Mean Velocity (m/s) :	Method Mean Velocity (m/s) :
Discharge (m3/s) :	Method Discharge (m3/s) :

Specific Data					

Reach Symbol

(Fish)	
(Width, Valley: Channel, Slope)	(Bed Material)

Banks

Height (m):	0.1	% Unstable:	25
Textures Fines:	Yes	Gravel: Yes	Larges: No
Confinement:	2	Bedrock:	No
Valley: Chan. Ratio:			
Stage:	M		
Flood Signs Ht(m):	0.2	Method Flood Signs:	MS
Braided:	N	Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	7.5	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

DFO/MoELP Stream Survey Form

31-Dec-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-145-378-657-000-000-000-000-000

Fish Summary

Obstructions

Comments

- C1

Film 71: 20 d/s, 21 u/s.

Fish sampling was not conducted at this site.

This stream was classified as S-6 under the Forest Practices Code due to an impassable water fall downstream and after an inventory of Dawn Lake showed no fish to be present.
- C2

Too little flow to calculate discharge.



Photo 72. Upstream view of Stream 182-6350-570-145-378-657 at Reach 2.



Photo 73. Downstream view of Stream 182-6350-570-145-378-657 at Reach 2.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-145-378-657
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K048
Cutting Permit	Kar
Cutblock Number	041
Operating Area	Karena
Development Type	Cutblock
Survey Date	11-Jun-96
Reach Number	3
Site Number	Not Applicable
Water Temperature (°C)	7.0
Stream Width (m)	1.03
Length Surveyed (m)	1000
Habitat Type	Stream
Stream Order (1:20,000)	2, 1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This reach occurs through the middle of the proposed cutblock and flowing southwesterly with a low gradient of 2%. Total cover was 20% with the majority being overhanging vegetation (55%) and L.O.D. (30%). Bed materials were dominated by fines (85%). The stream meandered throughout the reach and braiding was present. Fish sampling (electroshocking) was conducted for 150 sec. No fish were captured or observed. This system possess a fish barrier downstream located in EDI-760, Reach C. This reach is inaccessible to fish and has been classified as S-6 under the Forest Practices Code. This stream was assigned a watershed code according to the Watershed Atlas. However, according to the TRIM map, this stream is part of a different system, 182-6350-432.	

DFO/MoELP Stream Survey Form

31-Dec-97

Stream: Unnamed

Stream Survey Report

Watershed Code:

182-6350-570-145-378-657-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-6350-570-145-378-657-000-000-000-000-000	Reach No.:	3	Reach Length (km):	1 Method: MW
Location:	KAR 41	Site No.:	0	Length surveyed (m):	1000.0 Method: MW
		Fish Card:	N	Field:	Yes Historical: No
Date: 6/11/96	Time: 11:00	Agency: EDI	Survey Crew: LL \MS \ \ \ \ \ \ \	Photos:	#1: 13,14 Air Photos:
Map #:	93K/07	U.T.M. :	10.397820.6034270		

Channel Characteristics

Av. Chan. Width (m):	1.0	Method	Av. Chan. Width (m):	T					
Av. Wet. Width (m):	0.8	Method	Av. Wet. Width (m):	T					
Av. Max. Rif. Depth (cm):	15	Av. Max. Riffle Depth (cm):	MS						
Av. Max. Pool Depth (cm):	23	Av. Max. Pool Depth (cm):	15						
Gradient (%):	2.0	Method Gradient:	CL						
% Pool:	10	% Riffle:	15	% Run:	75	% Other:	0	Method:	GE
% Side Channel:	0	Method Side Channel:	GE						
% Debris Area:	0-10	Method Debris Area:	GE						

Specific Data					
1.3	1.1	0.8	1.1	1.0	0.9

Bed Material

% Fines (<2mm):	85	% Fines (<2mm):	85
% Gravels:	15	Small (2-16mm):	10
		Large (16-64mm):	5
% Larges:	0	Small cobble (64-128mm):	0
		Large cobble (128-256mm):	0
		Boulder cobble (>256mm):	0
% Bedrock:	0	% Bedrock:	0
D90 (cm):		Compaction:	High

Cover

Cover Total % :	20	Method Cover Total %:	GE			
Dp Pool : 5 L.O.D.:	30	Boulder: 0	In Veg.: 0	Over Veg: 55	Cutbank:	10
Crown Closure % :	5	Method Crown Closure:	GE	Aspect : SW	Method Aspect:	C

Discharge

Wetted Width (m) :	0.8	Method Wetted Width (m) :	
Mean Depth (m) :	0.2	Method Mean Depth (m) :	
Mean Velocity (m/s) :	0.40	Method Mean Velocity (m/s)	
Discharge (m3/s) :	0.04	Method Discharge (m3/s) :	

Specific Data					

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope)

(Bed Material)

Banks

Height (m):	0.1	% Unstable:	5	
Textures Fines:	Yes	Gravel: No	Larges: No	Bedrock: No
Confinement:				
Valley: Chan. Ratio:				
Stage:	M			
Flood Signs Ht(m):		Method Flood Signs:		
Braided:	Y	Method Braided:		
Bars (%):		Method Bars:		
pH:		Method pH:		
02 (ppm):		Method Dissolved Oxygen:		
Water Temp. (°C):	7.0	Method Temperature:	HT	
Turb. (cm):		Method Turbidity:		
Cond. (µmhos):		Method Conductivity:		

DFO/MoELP Stream Survey Form

31-Dec-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-145-378-657-000-000-000-000-000

Fish Summary

Obstructions

Comments

C1

Film 1: 13 d/s, 14 u/s.

Fish sampling (electroshocking) was conducted for 150 seconds. No fish were captured.

This reach was classified as S-6 under the Forest Practices Code due to an impassable waterfall located downstream.



Photo 74. Upstream view of Stream 182-6350-570-145-378-657 at Reach 3.



Photo 75. Downstream view of Stream 182-6350-570-145-378-657 at Reach 3.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-145-378-657
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K048
Cutting Permit	Kar
Cutblock Number	041
Operating Area	Karena
Development Type	Cutblock
Survey Date	11-Jun-96
Reach Number	4
Site Number	Not Applicable
Water Temperature (°C)	7.0
Stream Width (m)	0.89
Length Surveyed (m)	300
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This reach is located along the northeastern boundary of the proposed cutblock, flowing southwesterly with a mid-gradient of 11%. Total cover was 25% with the majority being overhanging vegetation (45%) and L.O.D. (40%). Bed materials were dominated by larges (50%). This reach became confined and the gradient gradually increased. Fish sampling (electroshocking) was conducted for 60 sec. No fish were captured or observed. Due to the lack of cover for rearing and gravel for spawning, this reach provide poor fisheries habitat. It was, therefore, classified as S-6 under the Forest Practices Code. In addition, this system possess a fisheries barrier downstream located in EDI 760, Reach C. This reach is inaccessible to fish. This stream was assigned a watershed code according to the Watershed Atlas. However, according to the TRIM map this stream is part of a different system, WSC 182-6350-432.	

DFO/MoELP Stream Survey Form

31-Dec-97

Stream: Unnamed

Stream Survey Report

Watershed Code:

182-6350-570-145-378-657-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-6350-570-145-378-657-000-000-000-000-000-000	Reach No.:	4	Reach Length (km):	0.60000 Method: MW
Location:	KAR 41	Site No.:	0	Length surveyed (m):	300.0 Method: MW
		Fish Card:	N	Field:	Yes Historical: No
		Photos:	#1: 11,12	Air Photos:	
Date:	6/11/96	Time:	10:30	Agency:	EDI
		Survey Crew:	LL VMS \ \ \ \ \ \ \ \		

Channel Characteristics

Av. Chan. Width (m):	0.9	Method Av. Chan. Width (m):	T	Specific Data					
Av. Wet. Width (m):	0.8	Method Av. Wet. Width (m):	T	0.8	0.8	1.1	1.1	0.7	1.0
Av. Max. Rif. Depth (cm):	18	Av. Max. Riffle Depth (cm):	MS						
Av. Max. Pool Depth (cm):	25	Av. Max. Pool Depth (cm):	18						
Gradient (%):	11.0	Method Gradient:	CL						
% Pool:	15	% Riffle:	70	% Run:	15	% Other:	0	Method:	GE
% Side Channel:	0	Method Side Channel:	GE						
% Debris Area:	10-40	Method Debris Area:	GE						

Cover

Cover Total % :	25	Method Cover Total %:	GE						
Dp Pool :	0	L.O.D.:	40	Boulder:	5	In Veg.:	0	Over Veg:	45
Crown Closure % :	10	Method Crown Closure:	GE	Aspect :	SW	Method Aspect:	C	Cutbank:	10

Discharge

Wetted Width (m) :	0.8	Method Wetted Width (m) :	T	Specific Data					
Mean Depth (m) :	0.2	Method Mean Depth (m) :	MS						
Mean Velocity (m/s) :	1.00	Method Mean Velocity (m/s)	F						
Discharge (m3/s) :	0.12	Method Discharge (m3/s) :	F						

Reach Symbol

(Fish)	
(Width, Valley: Channel, Slope)	(Bed Material)

Bed Material

% Fines (<2mm):	15	% Fines (<2mm):	15
% Gravels:	35	Small (2-16mm):	15
		Large (16-64mm):	20
% Larges:	50	Small cobble (64-128mm):	10
		Large cobble (128-256mm):	30
		Boulder cobble (>256mm):	10
% Bedrock:	0	% Bedrock:	0
D90 (cm):	16	Compaction:	Medium

Banks

Height (m):	0.1	% Unstable:	5
Textures Fines:	Yes	Gravel:	No
Confinement:	2	Larges:	No
Valley: Chan. Ratio:		Bedrock:	No
Stage:	H		
Flood Signs Ht(m):	0.2	Method Flood Signs:	MS
Braided:	N	Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	7.0	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

DFO/MoELP Stream Survey Form

31-Dec-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-145-378-657-000-000-000-000-000

Fish Summary

Obstructions

Comments

C1 Film #1: 11 u/s, 12 d/s.

Fish sampling (electroshocking) was conducted for 60 seconds. No fish were captured.

This reach was classified as S-6 under the Forest Practices Code due to an impassable waterfall located downstream.



Photo 76. Upstream view of Stream 182-6350-570-145-378-657 at Reach 4.



Photo 77. Downstream view of Stream 182-6350-570-145-378-657 at Reach 4.

4.1.6.6. Stream EDI-570

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	570
Nearest Downstream Watershed Code	182-6350-570-145-378-657
NTS Map (1:50,000)	93K/7
TRIM Map	93K048
Cutting Permit	Kar
Cutblock Number	041
Operating Area	Karena
Development Type	Right-of-Way
Survey Date	20-Aug-96
Reach Number	2
Site Number	Not Applicable
Water Temperature (°C)	8.0
Stream Width (m)	1.45
Length Surveyed (m)	100
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This ROW is located south of cutblock Kar-41. The stream flows west with a high gradient of 39%. Total cover was 10% with the majority being L.O.D. (80%). Bed material was dominated by fines (70%). The channel flows over a gradient of 25 - 39% downstream of the road and levels out to between 2 - 3% upstream of the road. Fish sampling (electroshocking) was conducted for 144 sec. No fish were captured or observed. Since this reach contains a high gradient impass, it has been classified as S-6 under the Forest Practices Code as it is inaccessible to fish. The watershed code of this stream was assigned according to the Watershed Atlas. However, according to the TRIM map, this stream goes into a different system, WSC 182-6350-432. Recommendation: Caution should be taken during road construction to avoid siltation of the lower tributaries, and to maintain the viability of a possible stocking program within Dawn Lake.	

Header Information

Stream Name: Unnamed

Watershed Code: 182-6350-570-145-378-657-999-000-000-000-000

Location: Karena rd crossing

Date: 7/24/97

Stream "Local": EDI-570

Map #: 93K/07

U.T.M.: 10.397770.6033650

Time: 12:15

Agency: EDI

Survey Crew: RM\MS\ \ \ \ \ \

Reach No.: 2

Site No.: 0

Fish Card: N

Photos: 71:22,23

Access: FT

Reach Length (km): 0.10000

Length surveyed (m): 100.0

Field: Yes

Air Photos:

Method: MW

Method: No

Channel Characteristics

Av. Chan. Width (m): 1.5

Av. Wet. Width (m): 0.8

Av. Max. Rif. Depth (cm): 5

Av. Max. Pool Depth (cm): 20

Gradient (%): 39.0

% Pool: 10

% Side Channel: 0

% Debris Area: 0-10

Method Av. Chan. Width (m): MS

Method Av. Wet. Width (m): MS

Av. Max. Riffle Depth (cm): MS

Av. Max. Pool Depth (cm): 5

Method Gradient: CL

% Riffle: 10

Method Side Channel: GE

Method Debris Area: GE

MS

MS

MS

5

CL

70

GE

GE

Method: GE

Specific Data

0.8

1.4

1.9

2.0

2.1

0.5

Bed Material

% Fines (<2mm): 70

% Gravels: 20

% Larges: 10

% Bedrock: 0

D90 (cm): 10

% Fines (<2mm): 70

Small (2-16mm): 10

Large (16-64mm): 10

Small cobble (64-128mm): 10

Large cobble (128-256mm): 0

Boulder cobble (>256mm): 0

% Bedrock: 0

Compaction: Medium

Cover

Cover Total % : 10

Dp Pool : 15

Crown Closure % : 20

Method Cover Total %: GE

Boulder: 0

Method Crown Closure: GE

GE

0

GE

In Veg.: 0

Over Veg: 5

Aspect : SW

0

Cutbank: 0

Method Aspect: C

Discharge

Wetted Width (m) : 1.4

Mean Depth (m) : 0.1

Mean Velocity (m/s) : 0.10

Discharge (m3/s) : 0.01

Method Wetted Width (m) : MS

Method Mean Depth (m) : MS

Method Mean Velocity (m/s) : F

Method Discharge (m3/s) : F

MS

MS

F

F

Specific Data

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope)

(Bed Material)

Banks

Height (m): 1.0

Textures Fines: Yes

Confinement: 2

Valley: Chan. Ratio:

Stage: M

Flood Signs Ht(m):

Braided: N

Bars (%):

pH:

O2 (ppm):

Water Temp. (°C): 8.0

Turb. (cm):

Cond. (µmhos):

% Unstable: 15

Gravel: Yes

Larges: No

Bedrock: No

Method Flood Signs:

Method Braided:

Method Bars:

Method pH:

Method Dissolved Oxygen:

Method Temperature: HT

Method Turbidity:

Method Conductivity:

Fish Summary

Obstructions

Comments

- C1

Film 71: 22 d/s, 23 u/s

Fish sampling (electroshocking) was conducted for 144 sec. No fish were captured or observed.

This reach has been classified as a S-6 under the forest Practices Code.
- C2

The section of high gradient (39%) was directly below the ROW



Photo 78. Downstream view of Stream EDI-570 at Reach 2.

4.1.6.7 Stream EDI-571

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	571
Nearest Downstream Watershed Code	182-6350-570-145-378-657
NTS Map (1:50,000)	93K/7
TRIM Map	93K048
Cutting Permit	Kar
Cutblock Number	041
Operating Area	Karena
Development Type	Right-of-Way
Survey Date	20-Aug-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	100
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This site is located approximately 500 m south of cutblock Kar-41. It is not a stream but a seepage. Evidence of water was observed from moist soil but, no channel was located. Fish sampling was not conducted. No fish were observed. Since this area is seepage, a stream classification is not required under the Forest Practices Code. The watershed code of this stream was assigned according to the Watershed Atlas. However, according to the TRIM map, this stream is part of a different system, 182-6350-432.	

4.1.6.8 Stream EDI-560

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	560
Nearest Downstream Watershed Code	182-6350-570-145-378-657
NTS Map (1:50,000)	93K/7
TRIM Map	93K048
Cutting Permit	Kar
Cutblock Number	041
Operating Area	Karena
Development Type	Cutblock
Survey Date	11-Jun-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	500
Habitat Type	Not Applicable
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	Not Applicable
Description: The north side of the cutblock KAR-41 was surveyed and no streams were found. The watershed code was assigned according to the Watershed Atlas. However, according the TRIM map, this stream is part of a different system, 182-6350-432.	

4.1.6.9 Stream EDI-559

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	559
Nearest Downstream Watershed Code	182-6350-570-145-378-657
NTS Map (1:50,000)	93K/7
TRIM Map	93K048
Cutting Permit	Kar
Cutblock Number	041
Operating Area	Karena
Development Type	Cutblock
Survey Date	11-Jun-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	500
Habitat Type	Not Applicable
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	Not Applicable
Description: The northeast side of cutblock KAR-41 was surveyed and no streams were found. The nearest downstream watershed code was assigned according to the Watershed Atlas. However, according to the TRIM map this system is connected to a different system, 182-6350-432.	

4.1.6.10 Stream EDI-546

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	546
Nearest Downstream Watershed Code	182-6350-570-145-378
NTS Map (1:50,000)	93K/7
TRIM Map	93K048
Cutting Permit	313
Cutblock Number	002
Operating Area	Karena
Development Type	Cutblock
Survey Date	1-Oct-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	500
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage is located outside of the eastern boundary of cutblock 313-2, and drains in a northeasterly direction. When this area was first surveyed on 10-Jun-96, water was present on the road. Patches of alder were present with some areas of standing water. Alluvial substrates and channelling were absent. During the 1-Oct-96 survey, this area was completely dry and no signs of any type of drainage were present. Fish sampling was not conducted. No fish were observed. Since this area is seepage and not a stream, a stream classification is not required under the Forest Practices Code The watershed code was assigned according to the Watershed Atlas. However, according to the TRIM map, this stream is part of a different system, 182-6350-432.	

4.1.6.11 Stream EDI-547

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	547
Nearest Downstream Watershed Code	182-6350-570-145-378
NTS Map (1:50,000)	93K/7
TRIM Map	93K048
Cutting Permit	313
Cutblock Number	002
Operating Area	Karena
Development Type	Cutblock
Survey Date	1-Oct-96
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	6.0
Stream Width (m)	0.60
Length Surveyed (m)	150
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This reach is located outside of the eastern boundary of cutblock 313-2 and flows east with a mid gradient of 10%. Total cover was 40% with the majority being undercut banks (50%). Bed material was dominated by fines 90%. The channel at the lower limit of this reach disappeared for 100 m and did not connect with the adjoining lake. The upper limit ended in seepage, terminating the stream. Fish sampling was conducted for 55 sec. No fish were captured or observed. Since this reach was inaccessible to fish, it has been classified as a S-6 under the Forest Practices Code.	

DFO/MoELP Stream Survey Form

20-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-145-378-999-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	EDI-547	Access:	FT
Watershed Code:	182-6350-570-145-378-999-000-000-000-000-000	Reach No.:	1	Reach Length (km):	0.15000 Method: MW
Location:	ND/WSC: 182-6350-570-145-378; 313-2 Karena	Site No.:	0	Length surveyed (m):	150.0 Method: MW
		Map #:	93K/7	Fish Card:	N Field: Yes Historical: No
		U.T.M.:	10.397110.6033570	Photos:	95: 13, 14 Air Photos:
Date: 09/10/96	Time: 12:15	Agency: EDI	Survey Crew: NHP\DT\ \ \ \ \ \		

Channel Characteristics

Av. Chan. Width (m):	0.6	Method Av. Chan. Width (m):	MS	
Av. Wet. Width (m):	0.5	Method Av. Wet. Width (m):	MS	
Av. Max. Rif. Depth (cm):		Av. Max. Riffle Depth (cm):	MS	
Av. Max. Pool Depth (cm):	5	Av. Max. Pool Depth (cm):		
Gradient (%):	10.0	Method Gradient:	CL	
% Pool: 100	% Riffle: 0	% Run: 0	% Other: 0	Method: GE
% Side Channel:	0-10	Method Side Channel:	GE	
% Debris Area:	10-40	Method Debris Area:	GE	

Specific Data

Bed Material

% Fines (<2mm):	90	% Fines (<2mm):	90
% Gravels:	0	Small (2-16mm):	0
		Large (16-64mm):	0
% Larges:	10	Small cobble (64-128mm):	10
		Large cobble (128-256mm):	0
		Boulder cobble (>256mm):	0
% Bedrock:	0	% Bedrock:	0
D90 (cm):		Compaction:	High

Cover

Cover Total %:	40	Method Cover Total %:	GE		
Dp Pool: 10 L.O.D.: 15	Boulder: 0	In Veg.: 0	Over Veg: 25	Cutbank: 50	
Crown Closure %:	15	Method Crown Closure:	GE	Aspect: SE	Method Aspect: C

Discharge

Wetted Width (m):	Method Wetted Width (m):
Mean Depth (m):	Method Mean Depth (m):
Mean Velocity (m/s):	Method Mean Velocity (m/s)
Discharge (m3/s):	Method Discharge (m3/s):

Specific Data

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) (Bed Material)

Banks

Height (m):	0.2	% Unstable:		
Textures Fines:	Yes	Gravel: No	Larges: No	Bedrock: No
Confinement:	5			
Valley: Chan. Ratio:	5			
Stage:	L			
Flood Signs Ht(m):		Method Flood Signs:		
Braided:	N	Method Braided:		
Bars (%):		Method Bars:		
pH:		Method pH:		
O2 (ppm):		Method Dissolved Oxygen:		
Water Temp. (°C):	6.0	Method Temperature:		HT
Turb. (cm):		Method Turbidity:		
Cond. (µmhos):		Method Conductivity:		

DFO/MoELP Stream Survey Form

20-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report
182-6350-570-145-378-999-000-000-000-000-000

Fish Summary

Obstructions

Comments

C1 Film 93: 13, 14

Fish sampling (electroshocking) was conducted for 55 seconds. No fish were captured or observed.

This reach has been assigned a S-6 classification under the Forest Practices Code.



Photo 79. Upstream view of Stream EDI-547 at Reach 1.



Photo 80. Downstream view of Stream EDI-547 at Reach 1.

4.1.6.12. Stream EDI-548

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	548
Nearest Downstream Watershed Code	182-6350-570-145-378
NTS Map (1:50,000)	93K/7
TRIM Map	93K048
Cutting Permit	313
Cutblock Number	002
Operating Area	Karena
Development Type	Cutblock
Survey Date	1-Oct-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	850
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage is located in the eastern boundary of cutblock 313-2, and drains east. When the area was first surveyed on 10-Jun-96, ponding was evident with little flow. Water was flowing over organics, lacking a definable channel. During the 1-Oct-96 survey, this area was completely dry and no signs of any type of drainage were located. Fish sampling was not conducted. No fish were observed. Since this area is a seepage and not a stream, no stream classification is required under the Forest Practices Code.	

4.1.6.13 Stream EDI-561

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	561
Nearest Downstream Watershed Code	182-6350-570-145-378
NTS Map (1:50,000)	93K/7
TRIM Map	93K048
Cutting Permit	Kar
Cutblock Number	041
Operating Area	Karena
Development Type	Cutblock
Survey Date	11-Jun-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	500
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage is located along the northwestern boundary of the proposed cutblock draining west into Dawn Lake. Flow was present over organic substrate without a definable channel. Flow persisted for 10 m before terminating in pools. Fish sampling was not conducted. No fish were observed. Due to the fact this is a seepage, a stream classification is not required under the Forest Practices Code The watershed code was assigned according to the Watershed Atlas. However, according to the TRIM map, this stream is part of a different system, 182-6350-432.	

4.1.6.14 Stream EDI-819

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	819
Nearest Downstream Watershed Code	182-6350-570-145-378
NTS Map (1:50,000)	93K/7
TRIM Map	93K048
Cutting Permit	Kar
Cutblock Number	041
Operating Area	Karena
Development Type	Right-of-Way
Survey Date	21-Aug-96
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	9.5
Stream Width (m)	1.25
Length Surveyed (m)	100
Habitat Type	Stream
Stream Order (1:20,000)	2
Forest Practices Code Stream Classification	S-4*
Fish Species Identified	None
Description: This site was located approximately 3 km south of cutblock Kar-41. The stream flows west with a low gradient of 5%. Total cover was 25% with the majority being overhanging vegetation (70%). Bed materials were dominated by fines at 100%. Fish sampling (electroshocking) was conducted for 59 sec. No fish were captured or observed. Although there was minimal fish habitat, this reach has been defaulted to a S-4* under the Forest Practices Code as the system is within close proximity to a fish bearing stream (EDI-760). According to NTS map, this stream drains into Karena Lake (182-6350-570-14501). Also according to the TRIM map, this stream flows east into a tributary of Nilan Lake (alias Camp Lake). Therefore, this stream was given a unique identifier (EDI-819) which was placed at the actual confluence of the stream on the project map. Also the NTS map shows this stream is the same system as EDI-760. However, according to TRIM, these two streams are separate. Recommendation: Further survey is recommended to determine fish presence and to locate an upper limit of fish distribution within this system.	

DFO/MoELP Stream Survey Form

12-Dec-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-145-378-999-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	EDI 819	Access:	FT
Watershed Code:	182-6350-570-145-378-999-000-000-000-000-000	Reach No.:	1	Reach Length (km):	0.10000 Method:
Location:	ND/WSC: 182-6350-570-145-378; KAR 41	Site No.:	0	Length surveyed (m):	100.0 Method: MW
		Map #:	93K/07	Fish Card:	N Field: Yes Historical: No
		U.T.M. :	10.397240.6031040	Photos:	#A: 2,3 Air Photos:
Date: 8/21/96	Time: 07:00	Agency: EDI	Survey Crew: RM\MS\ \ \ \ \ \ \		

Channel Characteristics

Av. Chan. Width (m):	1.3	Method Av. Chan. Width (m):	MS	Specific Data					
Av. Wet. Width (m):	0.4	Method Av. Wet. Width (m):	MS	0.8	1.6	1.8	1.4	0.8	1.2
Av. Max. Rif. Depth (cm):		Av. Max. Riffle Depth (cm):	MS						
Av. Max. Pool Depth (cm):	10	Av. Max. Pool Depth (cm):							
Gradient (%):	0.5	Method Gradient:	CL						
% Pool: 30	% Riffle: 0	% Run: 10	% Other: 60	Method: GE					
% Side Channel:	0-10	Method Side Channel:	GE						
% Debris Area:	>40	Method Debris Area:	GE						

Cover

Cover Total % :	25	Method Cover Total %:	GE				
Dp Pool : 5 L.O.D.:	20	Boulder: 0	In Veg.: 0	Over Veg: 70	Cutbank:	5	
Crown Closure % :	20	Method Crown Closure:	GE	Aspect : SE	Method Aspect:	C	

Discharge

Wetted Width (m) :	Method Wetted Width (m) :	Specific Data			
Mean Depth (m) :	Method Mean Depth (m) :				
Mean Velocity (m/s) :	Method Mean Velocity (m/s)				
Discharge (m3/s) :	Method Discharge (m3/s) :				

Reach Symbol

(Fish)	
(Width, Valley: Channel, Slope)	(Bed Material)

Bed Material

% Fines (<2mm):	100	% Fines (<2mm):	100
% Gravels:	0	Small (2-16mm):	0
		Large (16-64mm):	0
% Larges:	0	Small cobble (64-128mm):	0
		Large cobble (128-256mm):	0
		Boulder cobble (>256mm):	0
% Bedrock:	0	% Bedrock:	0
D90 (cm):		Compaction:	High

Banks

Height (m):	0.3	% Unstable:	10
Textures Fines:	Yes	Gravel: No	Larges: No Bedrock: No
Confinement:	5		
Valley: Chan. Ratio:			
Stage:	L		
Flood Signs Ht(m):		Method Flood Signs:	
Braided:	N	Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	9.5	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

Fish Summary

Obstructions

Comments

- C1

Film A: 2 d/s, 3 u/s.

Fish sampling (electroshocking) conducted for 59 seconds. No fish were captured.

This reach was classified as a defaulted S-4 under the Forest Practices Code.
- C2

Insufficient water to calculate discharge.



Photo 81. Upstream view of Stream EDI-819 at Reach 1.



Photo 82. Downstream view of Stream EDI-819 at Reach 1.

4.1.6.15. Stream 182-6350-570-145-378-278

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-145-378-278
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K048
Cutting Permit	313
Cutblock Number	001
Operating Area	Karena
Development Type	None
Survey Date	30-Sept-96
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	5.0
Stream Width (m)	0.90
Length Surveyed (m)	400
Habitat Type	Stream
Stream Order (1:20,000)	1, 2
Forest Practices Code Stream Classification	S-4*
Fish Species Identified	None
Description: This reach is located outside the eastern boundary of the proposed cutblock and flows south into a small lake. Gradient was low at 1%. Total cover was 25% with the majority being undercut banks (60%). Bed material was dominated by fines (10%). Fish sampling (electroshocking) was conducted for 192 sec. No fish were captured or observed. This reach is accessible from a lake which could provide overwintering habitat. This reach has good potential rearing habitat and has been classified by default as a S-4* under the Forest Practices Code. This stream was assigned a watershed code according to the Watershed Atlas. However, according to the TRIM map (and ground survey), this stream does not flow in this direction. According to TRIM this stream drains into Nilan Lake (alias Camp Lake) and should be a tributary to the stream 182-6350-432. Recommendation: The lake this stream flows into should be inventoried to determine fish presence or absence.	

DFO/MoELP Stream Survey Form

20-Aug-97

Stream: Unnamed

Stream Survey Report

Watershed Code:

182-6350-570-145-378-278-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT				
Watershed Code:	182-6350-570-145-378-278-000-000-000-000-000-000	Map #:	93K/7	Reach No.:	1	Reach Length (km):	0.40000	Method:	MW
Location:	313-1 Karena	U.T.M. :	10.397028.6031310	Site No.:	0	Length surveyed (m):	400.0	Method:	MW
Date:	30/09/96	Time:	12:30	Fish Card:	N	Field:	Yes	Historical:	No
Agency:	EDI	Survey Crew:	NHP\DT\ \ \ \ \ \	Photos:	93: 10, 11	Air Photos:			

Channel Characteristics

Av. Chan. Width (m):	0.9	Method Av. Chan. Width (m):	MS	Specific Data					
Av. Wet. Width (m):	0.7	Method Av. Wet. Width (m):	MS	1.0	1.0	0.6	0.9	1.3	0.7
Av. Max. Rif. Depth (cm):	1	Av. Max. Riffle Depth (cm):	MS						
Av. Max. Pool Depth (cm):	22	Av. Max. Pool Depth (cm):	1						
Gradient (%):	1.0	Method Gradient:	CL						
% Pool:	5	% Riffle:	10	% Run:	0	% Other:	85	Method:	GE
% Side Channel:	0-10	Method Side Channel:	GE						
% Debris Area:	>40	Method Debris Area:	GE						

Cover

Cover Total % :	25	Method Cover Total %:	GE								
Dp Pool :	5	L.O.D.:	20	Boulder:	0	In Veg.:	0	Over Veg:	15	Cutbank:	60
Crown Closure % :		Method Crown Closure:		Aspect :	SE	Method Aspect:	C				

Discharge

Wetted Width (m) :		Method Wetted Width (m) :		Specific Data					
Mean Depth (m) :		Method Mean Depth (m) :							
Mean Velocity (m/s) :		Method Mean Velocity (m/s)							
Discharge (m3/s) :		Method Discharge (m3/s) :							

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) (Bed Material)

Bed Material

% Fines (<2mm):	100	% Fines (<2mm):	100
% Gravels:	0	Small (2-16mm):	0
		Large (16-64mm):	0
% Larges:	0	Small cobble (64-128mm):	0
		Large cobble (128-256mm):	0
		Boulder cobble (>256mm):	0
% Bedrock:	0	% Bedrock:	0
D90 (cm):		Compaction:	High

Banks

Height (m):	0.5	% Unstable:	20				
Textures Fines:	Yes	Gravel:	No	Larges:	No	Bedrock:	No
Confinement:	5						
Valley: Chan. Ratio:							
Stage:	L						
Flood Signs Ht(m):		Method Flood Signs:					
Braided:		Method Braided:					
Bars (%):		Method Bars:					
pH:		Method pH:					
O2 (ppm):		Method Dissolved Oxygen:					
Water Temp. (°C):	5.0	Method Temperature:	HT				
Turb. (cm):		Method Turbidity:					
Cond. (µmhos):		Method Conductivity:					

DFO/MoELP Stream Survey Form

20-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-145-378-278-000-000-000-000-000-000

Fish Summary

Obstructions

Comments

C1 Film 93: 10 w/s, 11 d/s.

Fish sampling (electroshocking) was conducted for 192 seconds. No fish were captured or observed.

This reach has been defaulted to a S-4 classification under the Forest Practices Code.



Photo 83. Upstream view of Stream 182-6350-570-145-378-278 at Reach 1.



Photo 84. Downstream view of Stream 182-6350-570-145-378-278 at Reach 1.

4.1.6.16 Stream EDI-553

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	553
Nearest Downstream Watershed Code	182-6350-570-145-378-278
NTS Map (1:50,000)	93K/7
TRIM Map	93K048
Cutting Permit	313
Cutblock Number	001
Operating Area	Karena
Development Type	None
Survey Date	30-Spt-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	500
Habitat Type	Not Applicable
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	Not Applicable
Description: No stream was found at the location indicated on the 1:10,000 block map. This stream does not exist. This stream was assigned a watershed code according to the Watershed Atlas. However, according to the TRIM map, this system does not flow in this direction. According to TRIM this stream drains into the system 182-6350-432.	

4.1.6.17 Stream EDI-820

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	820
Nearest Downstream Watershed Code	182-6350-570-145-378
NTS Map (1:50,000)	93K/7
TRIM Map	93K048
Cutting Permit	313
Cutblock Number	001
Operating Area	Karena
Development Type	None
Survey Date	30-Sept-96
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	3.0
Stream Width (m)	1.10
Length Surveyed (m)	200
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This small stream is located outside of the eastern boundary of the cutblock and flows east into the wetland that fringes a small lake. A channel exists within the wetland area for approximately 50 m. The stream begins above this area and was occasionally confined. This low gradient reach was characterized by 100% glide which had a thin layer of ice in some sections. The 15% total cover consisted of 70% L.O.D. and 30% overhanging vegetation. Bed material consisted of 100% fines and organics. The stream's upper limit is a seepage area which extends for 200 m. It had sections of pooled water, but had no continuous banks or channel. Fish sampling (electroshocking) was conducted for 138 sec and no fish were captured or observed. This stream contained low quality fish habitat. It provides little cover, and has no spawning habitat. It was classified as S-6 under the Forest Practices Code. According to the NTS map, this system drains into Karena Lake (WSC 182-6350-570-145-01). However, according to the TRIM map (and ground survey) this stream flows east into a tributary of Nilan Lake (alias Camp Lake). Therefore, this stream was given a unique identifier (EDI-820), which was placed at the confluence of the stream on the project map.	

DFO/MoELP Stream Survey Form

20-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-145-378-999-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	EDI 820	Access:	FT
Watershed Code:	182-6350-570-145-378-999-000-000-000-000-000	Reach No.:	1	Reach Length (km):	0.20000 Method: MW
Location:	ND/WSC: 182-6350-570-145-378; 313-1 Karena	Site No.:	0	Length surveyed (m):	200.0 Method: MW
		Map #:	93K/7	Fish Card:	N
		U.T.M.:	10.396820.6031030	Field:	Yes
Date: 30/09/96	Time: 17:30	Agency:	EDI	Historical:	No
		Survey Crew:	NHP\DT\ \ \ \ \ \	Photos:	93: 17, 18
				Air Photos:	

Channel Characteristics

Av. Chan. Width (m):	1.1	Method Av. Chan. Width (m):	MS
Av. Wet. Width (m):	0.4	Method Av. Wet. Width (m):	MS
Av. Max. Rif. Depth (cm):		Av. Max. Riffle Depth (cm):	MS
Av. Max. Pool Depth (cm):	20	Av. Max. Pool Depth (cm):	
Gradient (%):	1.0	Method Gradient:	CL
% Pool: 0	% Riffle: 0	% Run: 0	% Other: 100
% Side Channel:	0	Method Side Channel:	GE
% Debris Area:	10-40	Method Debris Area:	GE

Specific Data

0.9	0.8	1.2	1.0	1.4	1.4
-----	-----	-----	-----	-----	-----

Bed Material

% Fines (<2mm):	100	% Fines (<2mm):	100
% Gravels:	0	Small (2-16mm):	0
		Large (16-64mm):	0
% Larges:	0	Small cobble (64-128mm):	0
		Large cobble (128-256mm):	0
		Boulder cobble (>256mm):	0
% Bedrock:	0	% Bedrock:	0
D90 (cm):		Compaction:	High

Cover

Cover Total % :	15	Method Cover Total %:	GE
Dp Pool: 0	L.O.D.: 70	Boulder: 0	In Veg.: 0
Crown Closure % :	15	Method Crown Closure:	GE
		Aspect :	E
		Method Aspect:	C

Discharge

Wetted Width (m) :	Method Wetted Width (m) :
Mean Depth (m) :	Method Mean Depth (m) :
Mean Velocity (m/s) :	Method Mean Velocity (m/s)
Discharge (m3/s) :	Method Discharge (m3/s) :

Specific Data

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope)	(Bed Material)
---------------------------------	----------------

Banks

Height (m):	10.0	% Unstable:	25
Textures Fines:	Yes	Gravel: No	Larges: No
Confinement:	4	Bedrock:	No
Valley: Chan. Ratio:			
Stage:	L		
Flood Signs Ht(m):		Method Flood Signs:	
Braided:		Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	3.0	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

DFO/MoELP Stream Survey Form

20-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-145-378-999-000-000-000-000-000

Fish Summary

Obstructions

Comments

C1 Film 93: 17 u/s, 18 d/s.

Fish sampling (electroshocking) was conducted for 138 seconds. No fish were captured or observed.

This section of stream was assigned a S-6 classification under the Forest Practices Code.



Photo 85. Upstream view of Stream EDI-820 at Reach 1.



Photo 86. Downstream view of Stream EDI-820 at Reach 1.

4.1.6.18 Stream 182-6350-570-145-807

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-145-807
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	Kar
Cutblock Number	054
Operating Area	Karena
Development Type	Cutblock
Survey Date	10-Jun-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	1200
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage is located in the middle of cutblock 313-2 and drains south. It is only apparent in the lower 100 m of the cutblock. This area lacks alluvial substrates and definable banks. Fish sampling was not conducted. No fish were observed. As this is a seepage and not a stream, a stream classification is not required under the Forest Practices Code.	

4.1.6.19. Stream EDI-554

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	554
Nearest Downstream Watershed Code	182-6350-570-145
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	313
Cutblock Number	003
Operating Area	Karena
Development Type	Cutblock
Survey Date	3-Oct-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	700
Habitat Type	Not Applicable
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: The southwest corner of cutblock 313-2 was surveyed for EDI 554. A channel was not located. The indicated stream does not exist. The nearest downstream watershed code was assigned according to the Watershed Atlas. However, according to the TRIM map, this stream is part of a different system and it is a tributary to the system 182-6350-432.	

4.1.7 Watershed 182-6350-570-189

This watershed is located within BC Environment Management Unit 7-25 (BC Ministry of Environment, Lands and Parks 1993), in the southern portion of the Stuart Lake Watershed Group (Fig. 8). The main system flows into Nielsp Creek and eventually into Stuart Lake. It is bounded by McKnab Lake to the west, Sowchea Creek to the south, Nielsp Creek to the east and Watershed 182-6350-570-220 to the north. Occupying 1,958 ha of the Stuart Lake Provincial Forest, the geographical relief ranges from approximately 850 m at the confluence of Stream 182-6350-570-189 and Nielsp Creek, to approximately 1,220 m in the headwaters near Mount Beals (BC Environment 1995; Department of Energy, Mines and Resources 1977).

This watershed is dominated by two sub-zones/variants according to the biogeoclimatic units of the Prince George Forest Region. These units include: the Stuart Dry Warm Sub-Boreal Spruce sub-zone (SBSdw3), and the Babine Moist Cold Sub-Boreal Spruce sub-zone (SBSmc2) (DeLong et al. 1993).

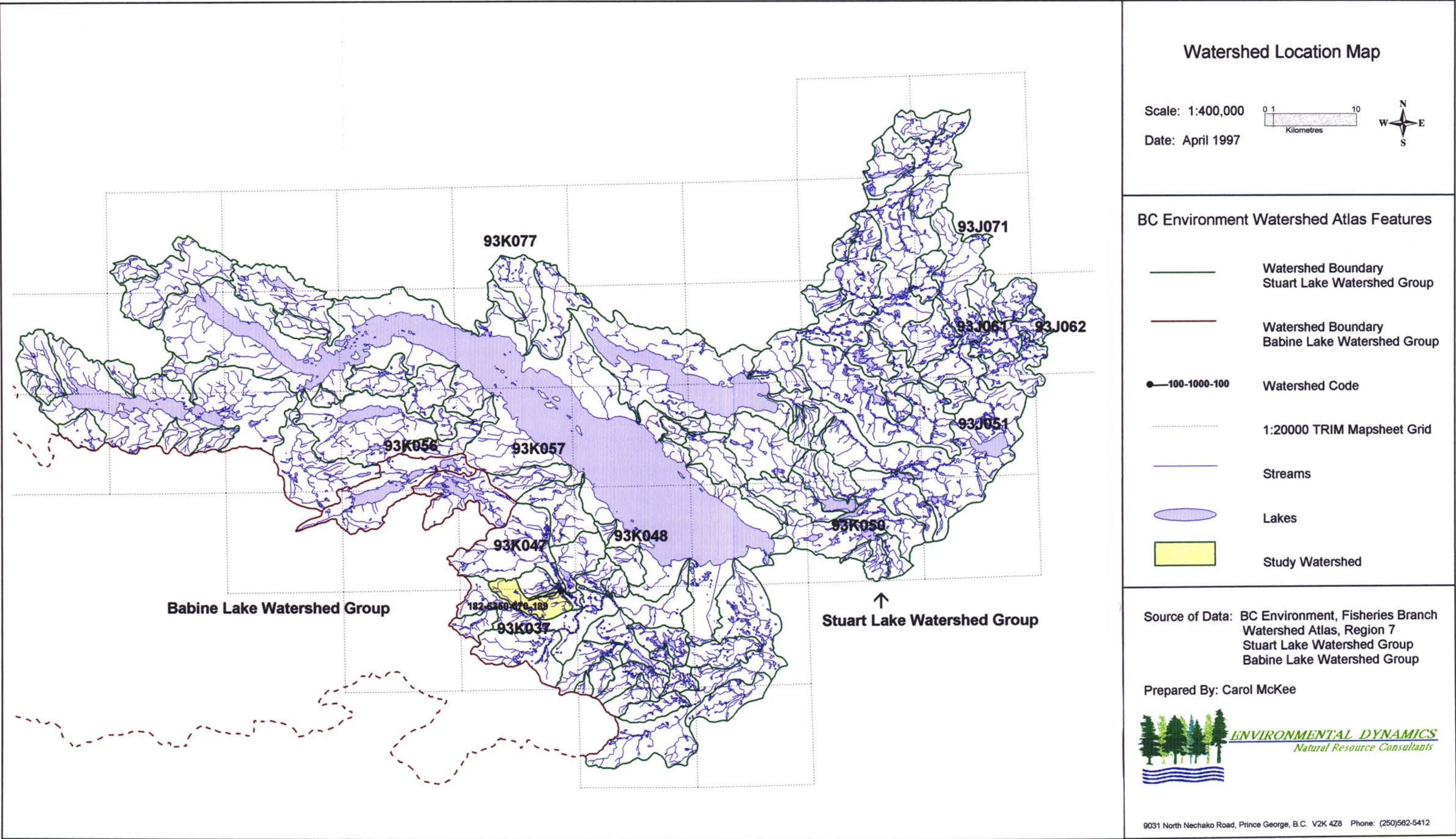
According to the updated FISS data (1995), no fish species have been documented in Watershed 182-6350-570-189 (BC Environment 1995). However, the system indirectly drains into Sowchea Creek, which is known to contain: Dolly Varden¹, rainbow trout, speckled dace, sockeye salmon, kokanee, dace, whitefish and suckers (BC Environment 1995).

Canfor together with BC Environment have created Wildlife Movement Corridors (WMC) to be included in Canfor's five year development plans. These WMC's provide cover and allow animals to travel through non-logged areas. There are no WMC's located within Watershed 182-6350-570-189 (Canfor 1996).

Since this watershed lies within a portion of Canfor's Karena Operating Area, linear development is common throughout the area (Ministry of Forests 1995; Canfor 1996). The major gravel roads located in this watershed are the Cunningham FSR and its adjoining sideroads (Canfor 1996).

¹The species identified as Dolly Varden (*Salvelinus malma*), in the Fisheries Information Summary System is, in all probability, bull trout (*Salvelinus confluentus*), as indicated by population distribution studies conducted by Haas and McPhail (1991).

Figure 8. Location of Watershed 182-6350-570-189 within the Stuart Lake Watershed Group



Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-189
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K037
Cutting Permit	098
Cutblock Number	004
Operating Area	McKnab
Development Type	Cutblock
Survey Date	18-Jul-96
Reach Number	A
Site Number	Not Applicable
Water Temperature (°C)	11
Stream Width (m)	2.4
Length Surveyed (m)	800
Habitat Type	Stream
Stream Order (1:20,000)	3
Forest Practices Code Stream Classification	S-3
Fish Species Identified	RB - Rainbow Trout
Description: This low gradient (1.5%) reach is located along the western boundary of the cutblock, and flows north. A total cover of 40% is comprised of 25% deep pool, 20% boulder and overhanging vegetation, and 15% undercut bank and LOD. Bed materials of this occasionally confined reach are made up of larges and fines (40% each), and gravels (20%). Fish sampling (electroshocking) was conducted for 921 sec. One rainbow trout was captured and two were observed. This reach provides excellent rearing habitat and some potentially good spawning areas. Since regionally significant fish were captured within this reach, it was classified as S-3 under the Forest Practices Code.	

DFO/MoELP Stream Survey Form

20-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-189-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-6350-570-189-000-000-000-000-000-000-000	Reach No.:	999	Reach Length (km):	0.80000 Method: MW
Location:	098-04 McKnab	Map #:	93K/7	Site No.:	0 Length surveyed (m): 800.0 Method: MW
		U.T.M.:	10.392920.6028060	Fish Card:	N Field: Yes Historical: No
Date: 18/07/96	Time: 14:00	Agency: EDI	Survey Crew: RVS\RM\ \ \ \ \ \	Photos:	#4: 22, 23 Air Photos:

Channel Characteristics

Av. Chan. Width (m):	2.4	Method Av. Chan. Width (m):	TF
Av. Wet. Width (m):	2.4	Method Av. Wet. Width (m):	TF
Av. Max. Rif. Depth (cm):	10	Av. Max. Riffle Depth (cm):	MS
Av. Max. Pool Depth (cm):	50	Av. Max. Pool Depth (cm):	10
Gradient (%):	1.5	Method Gradient:	CL
% Pool: 25	% Riffle: 25	% Run: 50	% Other: 0 Method: GE
% Side Channel:	0	Method Side Channel:	GE
% Debris Area:	0-10	Method Debris Area:	GE

Specific Data

2.4	2.2	2.8	2.3	2.4	2.5
-----	-----	-----	-----	-----	-----

Bed Material

% Fines (<2mm):	40	% Fines (<2mm):	40
% Gravels:	20	Small (2-16mm):	10
		Large (16-64mm):	10
% Larges:	40	Small cobble (64-128mm):	10
		Large cobble (128-256mm):	15
		Boulder cobble (>256mm):	15
% Bedrock:	0	% Bedrock:	0
D90 (cm):	40	Compaction:	Medium

Cover

Cover Total % :	40	Method Cover Total %:	GE
Dp Pool: 25 L.O.D.:	15	Boulder: 20	In Veg.: 5
		Over Veg: 20	Cutbank: 15
Crown Closure % :	5	Method Crown Closure:	GE
		Aspect : N	Method Aspect: C

Discharge

Wetted Width (m) :	2.5	Method Wetted Width (m) :	TF
Mean Depth (m) :	0.3	Method Mean Depth (m) :	MS
Mean Velocity (m/s) :	0.67	Method Mean Velocity (m/s)	F
Discharge (m3/s) :	0.50	Method Discharge (m3/s) :	F

Specific Data

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope)	(Bed Material)
---------------------------------	----------------

Banks

Height (m):	0.4	% Unstable:	10
Textures Fines:	No	Gravel: No	Larges: No
Confinement:	4	Bedrock:	No
Valley: Chan. Ratio:			
Stage:	M		
Flood Signs Ht(m):		Method Flood Signs:	
Braided:	N	Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	11.0	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (umhos):		Method Conductivity:	

DFO/MoELP Stream Survey Form

20-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-189-000-000-000-000-000-000

Fish Summary

Species	Number	Size Range (mm)	Life Phase	Reach 1	Reach 2	Reach 3	Method/Reference
RB	2	100.0	J	R			EL
RB	1	300.0	A	R			VO

Obstructions

Comments

C1 Film 4: 22 w/s, 23 d/s.

Note: Reach '999' should read reach 'A'.

Fish sampling (electroshocking) was conducted for 921 seconds and 3 rainbow trout were caught.

Due to the presence of regionally significant fish, this stream was classed as an S-3 under the Forest Practices Code.



Photo 87. Upstream view of Stream 182-6350-570-189 at Reach A.



Photo 88. Upstream view of Stream 182-6350-570-189 at Reach A.

4.1.7.1. Stream EDI-511

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	511
Nearest Downstream Watershed Code	182-6350-570-189
NTS Map (1:50,000)	93K/7
TRIM Map	93K037
Cutting Permit	098
Cutblock Number	004
Operating Area	McKnab
Development Type	Right-of-Way and Cutblock
Survey Date	18-Jul-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	800
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage is located in the northern portion of the cutblock, and drains east. Some flowing water existed in the area, but a definable channel was not located. Some pooling of water was also evident throughout the survey site. Fish sampling was not conducted in this seepage area and no fish were observed. Since this is a seepage and not a stream, it does not require a stream classification under the Forest Practices Code.	

4.1.7.2 Stream EDI-512

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	512
Nearest Downstream Watershed Code	182-6350-570-189
NTS Map (1:50,000)	93K/7
TRIM Map	93K037
Cutting Permit	098
Cutblock Number	004
Operating Area	McKnab
Development Type	Right-of-Way and Cutblock
Survey Date	18-Jul-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	700
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage is located in the middle portion of the cutblock, and drains west. Some flowing water existed in this area, but a definable channel was not located. Some pooling of water was also evident throughout the survey site. Fish sampling was not conducted in this seepage area and no fish were observed. Since this is a seepage and not a stream, it does not require a stream classification under the Forest Practices Code.	

4.1.7.3 Stream EDI-513

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	513
Nearest Downstream Watershed Code	182-6350-570-189
NTS Map (1:50,000)	93K/7
TRIM Map	93K037
Cutting Permit	098
Cutblock Number	004
Operating Area	McKnab
Development Type	Right-of-Way and Cutblock
Survey Date	18-Jul-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	500
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage is located in the middle portion of the cutblock, and drains east. Some flowing water existed in this area, but a definable channel was not located. Some pooling of water was also evident throughout the survey site. Fish sampling was not conducted in this seepage area and no fish were observed. Since this is a seepage and not a stream, it does not require a stream classification under the Forest Practices Code.	

4.1.7.4 Stream EDI-514

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	514
Nearest Downstream Watershed Code	182-6350-570-189
NTS Map (1:50,000)	93K/7
TRIM Map	93K037
Cutting Permit	098
Cutblock Number	004
Operating Area	McKnab
Development Type	Right-of-Way and Cutblock
Survey Date	18-Jul-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	400
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage is located in the southern portion of the cutblock, and drains east. Some flowing water existed in this area, but a definable channel was not located. Some pooling of water was also evident throughout the survey site. Fish sampling was not conducted in this seepage area and no fish were observed. Since this is a seepage and not a stream, it does not require a stream classification under the Forest Practices Code.	

4.1.8 Watershed 182-6350-570-220

Watershed 182-6350-570-220 is located within BC Environment Management Unit 7-25 (BC Ministry of Environment, Lands and Parks 1993), in the southern portion of the Stuart Lake Watershed Group (Fig. 9). The main system flows into Nielsp Creek and eventually into Stuart Lake. This watershed is surrounded by Watershed 182-6350-570-189 in the southern half and Watershed 182-6350-570 in the northern half. Occupying 958 ha of the Stuart Lake Provincial Forest, the geographical relief ranges from approximately 850 m at the confluence of Stream 182-6350-570-220 and Nielsp Creek, to approximately 1,010 m in the headwaters (BC Environment 1995; Department of Energy, Mines and Resources 1977).

This watershed is dominated by two sub-zones/variants according to the biogeoclimatic units of the Prince George Forest Region. These units include: the Stuart Dry Warm Sub-Boreal Spruce sub-zone (SBSdw3), and the Babine Moist Cold Sub-Boreal Spruce sub-zone (SBSmc2) (DeLong et al. 1993).

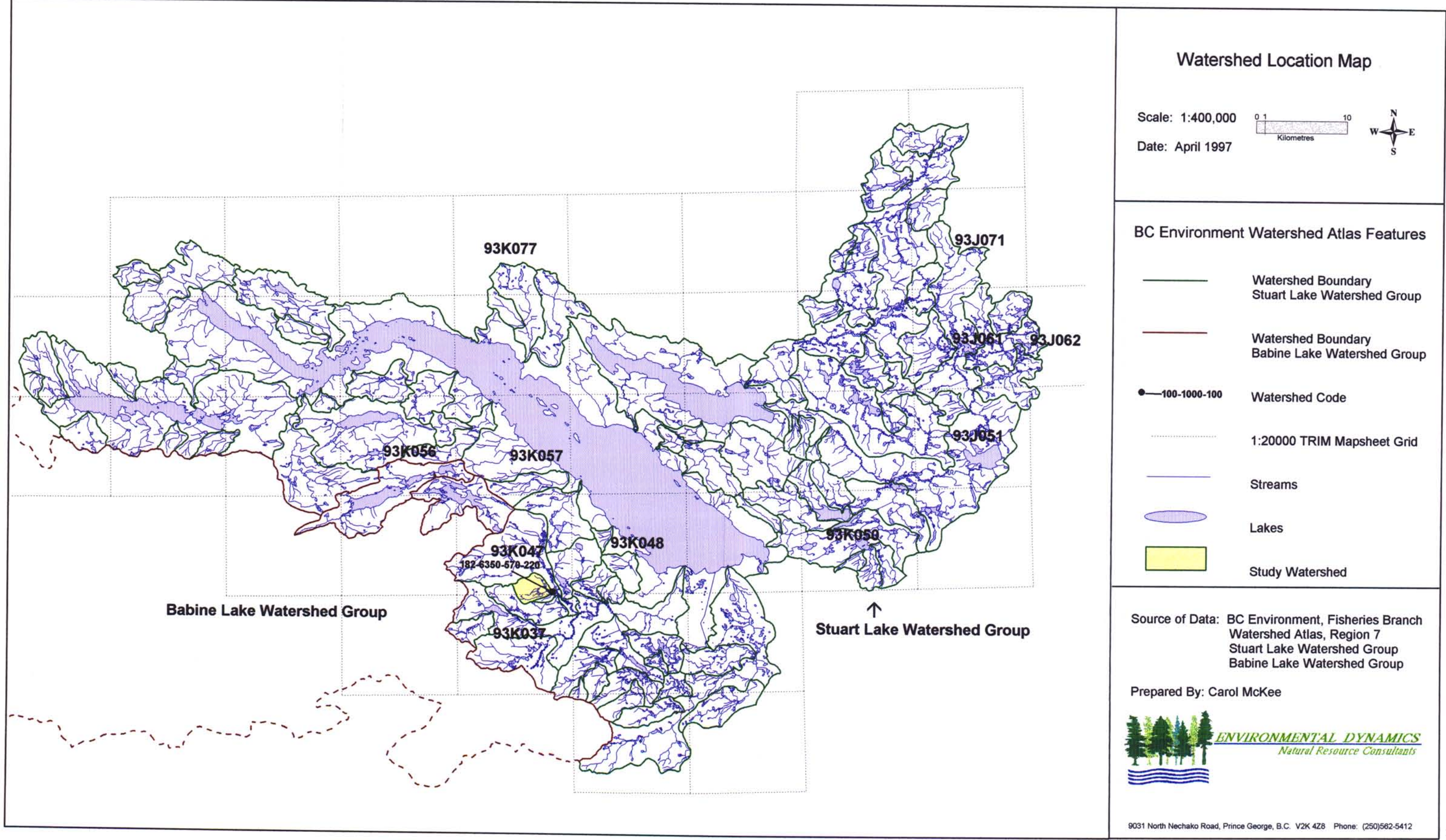
According to the updated FISS data (1995), no fish species have been documented in Watershed 182-6350-570-220 (BC Environment 1995). However, this system indirectly drains into Sowchea Creek, which is known to contain: Dolly Varden¹, rainbow trout, speckled dace, sockeye salmon, kokanee, dace, whitefish and suckers (BC Environment 1995).

Canfor together with BC Environment have created Wildlife Movement Corridors (WMC) to be included in Canfor's five year development plans. These WMC's provide cover and allow animals to travel through non-logged areas. There are no WMC's located within Watershed 182-6350-570-220 (Canfor 1996).

Since this watershed lies within a portion of Canfor's Karena Operating Area, linear development is common throughout the area (Ministry of Forests 1995; Canfor 1996). The major gravel roads located in this watershed are the Cunningham FSR and its adjoining sideroads (Canfor 1996).

¹The species identified as Dolly Varden (*Salvelinus malma*), in the Fisheries Information Summary System is, in all probability, bull trout (*Salvelinus confluentus*), as indicated by population distribution studies conducted by Haas and McPhail (1991).

Figure 9. Location of Watershed 182-6350-570-220 within the Stuart Lake Watershed Group



Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-220
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	073
Cutblock Number	046
Operating Area	Karena
Development Type	Cutblock
Survey Date	12-Jun-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	200
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage area is located along the southern boundary of the cutblock, and drains east. A definable channel or flowing water was not located in this survey site. Some pooling water existed throughout portions of the seepage area. Fish sampling was not conducted in this seepage, and no fish were observed. Since this is a seepage area and not a stream, a stream classification is not required under the Forest Practices Code.	

4.1.8.1 Stream 182-6350-570-220-143

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-220-143
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	098
Cutblock Number	003
Operating Area	McKnab
Development Type	Cutblock
Survey Date	17-Jun-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	800
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage area is located east of the cutblock, and drains east. A definable channel or flowing water was not found in this area. The substrate was dominated by organic fines and the vegetation consisted of alder, twinberry, and horsetail. Fish sampling was not conducted. No fish were observed. Since this is seepage and not a stream, it does not require a stream classification under the Forest Practices Code.	

4.1.8.2 Stream EDI-523

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	523
Nearest Downstream Watershed Code	182-6350-570-220-143
NTS Map (1:50,000)	93K/7
TRIM Map	93K037
Cutting Permit	098
Cutblock Number	003
Operating Area	McKnab
Development Type	Cutblock
Survey Date	17-Jun-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	600
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage area was located along the southeastern boundary of the cutblock, and drains northeast. The entire length of this seepage consisted of a massive wet area. Within this wet area, a definable channel or flowing water was not found. Dominant vegetation consisted of alder, horsetail, cranberry and twinberry. Fish sampling was not conducted. No fish were observed. Since this is a seepage and not a stream, no stream classification is required under the Forest Practices Code.	

4.1.8.3 Stream EDI-522

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	522
Nearest Downstream Watershed Code	182-6350-570-220-143
NTS Map (1:50,000)	93K/7
TRIM Map	93K037
Cutting Permit	098
Cutblock Number	003
Operating Area	McKnab
Development Type	Cutblock and Right-of-Way
Survey Date	17-Jul-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	500
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage is located in the southern portion of the cutblock, and drains northeast. The area lacked a definable channel, and alluvial substrates. The only water present consisted of standing pools. Vegetation of this area was dominated by alder, twinberry, horsetail and cranberry. Fish sampling was not conducted in this seepage, and no fish were observed. Since this is seepage and not a stream, it does not require a stream classification under the Forest Practices Code.	

4.1.8.4 Stream 182-6350-570-220-274

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-220-274
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	098
Cutblock Number	003
Operating Area	McKnab
Development Type	Cutblock/ROW
Survey Date	18-Jul-96
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	9.0
Stream Width (m)	0.90
Length Surveyed (m)	400
Habitat Type	Stream
Stream Order (1:20,000)	1~
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This small, mid-gradient (8.0%) reach is located northeast of the cutblock, and flows northeast. A total cover of 30% is comprised of 60% overhanging vegetation, and 10% deep pool, L.O.D., boulder and undercut banks. Bed materials of this occasionally confined reach are made up of fines (55%), larges (25%), and gravels (20%). The upper limit is a seepage area which extends for approximately 400 m through the middle of the cutblock. The middle section of the block is riddled with blowdown, thus altering the channel and spreading it out into a seepage/wetland. Fish sampling (electroshocking) was conducted for 241 sec, however, no fish were captured or observed. This reach provides low quality fish habitat and is bound by a wetland and seepage. Since no regionally significant fish were captured, this reach was classified as S-6 under the Forest Practices Code. Note: ~ means stream was not indicated on the TRIM base map.	

DFO/MoELP Stream Survey Form

23-Feb-98

Stream: Unnamed

Stream Survey Report

Watershed Code:

182-6350-570-220-274-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-6350-570-220-274-000-000-000-000-000-000	Reach No.:	1	Reach Length (km):	0.40000 Method: MW
Location:	098-003 McKnab	Site No.:	0	Length surveyed (m):	400.0 Method: MW
		Map #:	93K/7	Fish Card:	N
		U.T.M. :	10.392900.6029480	Field:	Yes
				Historical:	No
Date:	96/07/18	Time:	17:10	Photos:	11: 10, 11, 12
Agency:	EDI	Survey Crew:	PT\RD\ \ \ \ \ \	Air Photos:	

Channel Characteristics

Av. Chan. Width (m):	0.9	Method Av. Chan. Width (m):	MS
Av. Wet. Width (m):	0.7	Method Av. Wet. Width (m):	MS
Av. Max. Rif. Depth (cm):	7	Av. Max. Riffle Depth (cm):	MS
Av. Max. Pool Depth (cm):	20	Av. Max. Pool Depth (cm):	7
Gradient (%):	8.0	Method Gradient:	CL
% Pool:	20	% Riffle:	30
% Side Channel:	0-10	% Run:	50
% Debris Area:	0-10	% Other:	0
		Method:	GE
		Method Side Channel:	GE
		Method Debris Area:	GE

Specific Data						
0.9	1.1	1.0	0.8	0.7	0.9	

Cover

Cover Total % :	30	Method Cover Total %:	GE
Dp Pool :	10	L.O.D.:	10
Crown Closure % :	15	Boulder:	10
		In Veg.:	0
		Over Veg:	60
		Cutbank:	10
		Aspect :	N
		Method Aspect:	C

Discharge

Wetted Width (m) :	0.7	Method Wetted Width (m) :	MS
Mean Depth (m) :	0.1	Method Mean Depth (m) :	MS
Mean Velocity (m/s) :	0.20	Method Mean Velocity (m/s)	F
Discharge (m3/s) :	0.02	Method Discharge (m3/s) :	

Specific Data						

Reach Symbol

(Fish)	
(Width, Valley: Channel, Slope)	(Bed Material)

Bed Material

% Fines (<2mm):	55	% Fines (<2mm):	55
% Gravels:	20	Small (2-16mm):	15
		Large (16-64mm):	5
% Larges:	25	Small cobble (64-128mm):	5
		Large cobble (128-256mm):	15
		Boulder cobble (>256mm):	5
% Bedrock:	0	% Bedrock:	0
D90 (cm):	16	Compaction:	Medium

Banks

Height (m):	0.3	% Unstable:	10
Textures Fines:	Yes	Gravel:	No
Confinement:	4	Larges:	No
Valley: Chan. Ratio:		Bedrock:	No
Stage:	H		
Flood Signs Ht(m):	0.4	Method Flood Signs:	
Braided:	N	Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	9.0	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (umhos):		Method Conductivity:	

DFO/MoELP Stream Survey Form

23-Feb-98

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-220-274-000-000-000-000-000-000

Fish Summary

Obstructions

Comments

C1 Film 11: 10 w/s, 11 u/s, 12 d/s.
Fish sampling (electroshocking) was conducted for 241 seconds. No fish were captured or observed.
This reach was assigned a S-6 classification under the Forest Practices Code.



Photo 89. Upstream view of Stream 182-6350-570-220-274 at Reach 1.



Photo 90. Downstream view of Stream 182-6350-570-220-274 at Reach 1.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-220-274
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K037
Cutting Permit	098
Cutblock Number	003
Operating Area	McKnab
Development Type	Cutblock and Right-of Way
Survey Date	18-Jul-96
Reach Number	2
Site Number	Not Applicable
Water Temperature (°C)	9.0
Stream Width (m)	0.90
Length Surveyed (m)	700
Habitat Type	Stream
Stream Order (1:20,000)	1~
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This small, low gradient (3.0%) reach is located near the western boundary of the cutblock, and flows east. A total cover of 30% is comprised of 30% overhanging vegetation, and 30% deep pool, and (20%) undercut banks. Bed materials of this occasionally confined reach are made up of fines (65%), larges (25%), and gravels (10%). The lower limit is a wetland/seepage containing a large amount of blow down. It is quite likely that this wetland area impedes fish migration. Fish sampling (electroshocking) was conducted for 208 sec, however, no fish were captured or observed. Although this reach provides potential rearing habitat, it is not likely accessible to fish due to the downstream impassable wetland. Since no fish were captured or observed in this reach it was classified as S-6 under the Forest Practices Code. Note: ~ means stream was not indicated on the TRIM based map.	

DFO/MoELP Stream Survey Form

20-Aug-97

Stream: Unnamed

Stream Survey Report

Watershed Code:

182-6350-570-220-274-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-6350-570-220-274-000-000-000-000-000-000	Reach No.:	2	Reach Length (km):	0.40000 Method: MW
Location:	098-003 McKnab	Site No.:	0	Length surveyed (m):	400.0 Method: MW
		Map #:	93K/7	Fish Card:	N
		U.T.M. :	10.392190.6029050	Field:	Yes
Date: 11/06/96	Time: 13:00	Agency:	EDI	Historical:	No
		Survey Crew:	BR\RD\ \ \ \ \ \	Air Photos:	
				Photos:	2: 20, 21

Channel Characteristics

Av. Chan. Width (m):	0.8	Method Av. Chan. Width (m):	MS
Av. Wet. Width (m):	0.7	Method Av. Wet. Width (m):	MS
Av. Max. Rif. Depth (cm):	10	Av. Max. Riffle Depth (cm):	MS
Av. Max. Pool Depth (cm):	30	Av. Max. Pool Depth (cm):	10
Gradient (%):	4.0	Method Gradient:	CL
% Pool:	30	% Riffle:	15
% Side Channel:	0-10	% Run:	55
% Debris Area:	0-10	% Other:	0
		Method:	GE
		Method Side Channel:	GE
		Method Debris Area:	GE

Specific Data					
0.9	0.9	1.2	0.9	0.4	0.6

Cover

Cover Total % :	30	Method Cover Total %:	GE
Dp Pool :	30	L.O.D.:	10
Crown Closure % :	5	Boulder:	10
		In Veg.:	0
		Over Veg:	30
		Cutbank:	20
		Method Crown Closure:	GE
		Aspect :	E
		Method Aspect:	C

Discharge

Wetted Width (m) :	0.7	Method Wetted Width (m) :	MS
Mean Depth (m) :	0.1	Method Mean Depth (m) :	MS
Mean Velocity (m/s) :	0.30	Method Mean Velocity (m/s)	F
Discharge (m3/s) :	0.02	Method Discharge (m3/s) :	

Specific Data					

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope)	(Bed Material)
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Bed Material

% Fines (<2mm):	65	% Fines (<2mm):	65
% Gravels:	10	Small (2-16mm):	5
		Large (16-64mm):	5
% Larges:	25	Small cobble (64-128mm):	5
		Large cobble (128-256mm):	5
		Boulder cobble (>256mm):	15
% Bedrock:	0	% Bedrock:	0
D90 (cm):	30	Compaction:	High

Banks

Height (m):	15.0	% Unstable:	10
Textures Fines:	Yes	Gravel:	No
Confinement:	4	Larges:	No
Valley: Chan. Ratio:		Bedrock:	No
Stage:	M		
Flood Signs Ht(m):	0.15	Method Flood Signs:	
Braided:	Y	Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	6.0	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

DFO/MoELP Stream Survey Form

20-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-220-274-000-000-000-000-000-000

Fish Summary

Obstructions

Comments

C1 Film 2: 20 d/s, 21 u/s.

Fish sampling (electroshocking) was conducted for 208 seconds. No fish were captured or observed.

This reach was given a S-6 classification under the Forest Practices Code.



Photo 91. Upstream view of Stream 182-6350-570-220-274 at Reach 2.



Photo 92. Downstream view of Stream 182-6350-570-220-274 at Reach 2.

4.1.8.5 Stream EDI-518

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	518
Nearest Downstream Watershed Code	182-6350-570-220
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	098
Cutblock Number	002
Operating Area	McKnab
Development Type	Cutblock and Right-of-Way
Survey Date	17-Jul-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	500
Habitat Type	Wetland
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This wetland is located in the middle of the cutblock, and drains north. The upper limit of this wetland is located at the southern boundary of the cutblock. At this point, seepage prevails. The lower limit of the wetland was located just north of the cutblock. At this point, the wetland characteristics disappear and no water exists. This wetland contained no definable channel or flowing water. Some standing pools of water were located throughout it. Fish sampling was not conducted in this wetland and no fish were observed. Wetlands do not require a stream classification under the Forest Practices Code.	

4.1.8.6 Stream EDI-517

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	517
Nearest Downstream Watershed Code	182-6350-570-220
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	098
Cutblock Number	001
Operating Area	McKnab
Development Type	Cutblock and Right-of-Way
Survey Date	17-Jul-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	500
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage was located in the southern portion of the cutblock, and drains northeast This was a wet area within a shallow gully. Some flowing water over moss existed, but no definable channel was found. Fish sampling was not conducted in this seepage area, and no fish were observed. Since this is a seepage and not a stream, it does not require classification under the Forest Practices Code	

4.1.8.7 Stream 182-6350-570-220-400

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-6350-570-220-400
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	098
Cutblock Number	001
Operating Area	McKnab
Development Type	Cutblock and Right-of-Way
Survey Date	17-Jul-96
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	9.5
Stream Width (m)	0.90
Length Surveyed (m)	900
Habitat Type	Stream
Stream Order (1:20,000)	2
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This reach was located along the northern boundary of the cutblock, and flows northeast. A total cover of 40% was comprised of 80% overhanging vegetation and 10% deep pool. Bed material of this occasionally confined reach are made up of fines (65%), larges (20%) and gravels (15%). The lower limit of this reach was seepage which extended approximately 250 m east of the cutblock. The upper limit ended in seepage and extended to the northwestern corner of the proposed cutblock. Fish sampling (electroshocking) was conducted for 97 sec, however, no fish were captured or observed. The seepage located downstream of this reach did not contain a definable channel or flowing water and would likely be an impass to fish migration. This reach was classified as S-6 under the Forest Practices Code	

DFO/MoELP Stream Survey Form

20-Aug-97

Stream: Unnamed

Watershed Code:

Stream Survey Report

182-6350-570-220-400-000-000-000-000-000-000

Header Information

Stream Name:	Unnamed	Stream "Local":	N/A	Access:	FT
Watershed Code:	182-6350-570-220-400-000-000-000-000-000-000	Reach No.:	1	Reach Length (km):	0.9 Method: MW
Location:	098-1 Mcknab	Site No.:	0	Length surveyed (m):	900.0 Method: MW
		Map #: 93K/7		Fish Card:	N
		U.T.M. : 10.392000.6030350		Field:	Yes
				Historical:	No
Date: 17/07/96	Time: 15:20	Agency: EDI	Survey Crew: RV\RM \ \ \ \ \ \	Photos:	#Y: 19,20
				Air Photos:	

Channel Characteristics

Av. Chan. Width (m):	0.9	Method Av. Chan. Width (m):	MS
Av. Wet. Width (m):	0.8	Method Av. Wet. Width (m):	MS
Av. Max. Rif. Depth (cm):	4	Av. Max. Riffle Depth (cm):	MS
Av. Max. Pool Depth (cm):	15	Av. Max. Pool Depth (cm):	4
Gradient (%):	5.0	Method Gradient:	CL
% Pool: 30	% Riffle: 20	% Run: 50	% Other: 0
Method: GE			
% Side Channel:	0	Method Side Channel:	GE
% Debris Area:	10-40	Method Debris Area:	GE

Specific Data					
0.9	1.0	0.9	0.8	1.1	0.7

Cover

Cover Total % :	40	Method Cover Total %:	GE
Dp Pool : 0 L.O.D.:	10	Boulder: 5	In Veg.: 0
Crown Closure % :	10	Method Crown Closure:	GE
		Aspect : NE	Method Aspect: C

Discharge

Wetted Width (m) :	Method Wetted Width (m) :
Mean Depth (m) :	Method Mean Depth (m) :
Mean Velocity (m/s) :	Method Mean Velocity (m/s)
Discharge (m3/s) :	Method Discharge (m3/s) :

Specific Data					

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) (Bed Material)

Bed Material

% Fines (<2mm):	65	% Fines (<2mm):	65
% Gravels:	15	Small (2-16mm):	5
		Large (16-64mm):	10
% Larges:	20	Small cobble (64-128mm):	10
		Large cobble (128-256mm):	5
		Boulder cobble (>256mm):	5
% Bedrock:	0	% Bedrock:	0
D90 (cm):	30	Compaction:	High

Banks

Height (m):	0.3	% Unstable:	20
Textures Fines:	Yes	Gravel: No	Larges: No
Confinement:	4	Bedrock:	No
Valley: Chan. Ratio:			
Stage:	M		
Flood Signs Ht(m):		Method Flood Signs:	
Braided:		Method Braided:	
Bars (%):		Method Bars:	
pH:		Method pH:	
O2 (ppm):		Method Dissolved Oxygen:	
Water Temp. (°C):	9.5	Method Temperature:	HT
Turb. (cm):		Method Turbidity:	
Cond. (µmhos):		Method Conductivity:	

Fish Summary

Obstructions

Comments

C1	Film Y: 19 u/s, 20 d/s. Fish sampling (electroshocking) was conducted for 97 seconds. No fish were captured or observed. This stream has a S-6 classification. It has seepage below and above its limits.
C2	Discharge was not calculated.



Photo 93. Upstream view of Stream 182-6350-570-220-400 at Reach 1.



Photo 94. Downstream view of Stream 182-6350-570-220-400 at Reach 1.

4.1.8.8 Stream EDI-516

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	516
Nearest Downstream Watershed Code	182-6350-570-220
NTS Map (1:50,000)	93K/7
TRIM Map	93K047
Cutting Permit	073
Cutblock Number	046
Operating Area	Karena
Development Type	Cutblock
Survey Date	12-Jun-95
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	200
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage area is located in the southern portion of the cutblock, and drains east. A definable channel or flowing water was not located in this survey site. Some pooling water existed throughout portions of seepage area. Fish sampling was not conducted in this seepage, and no fish were observed. Since this is a seepage area and not a stream, a classification is not required under the Forest Practices Code.	