

WATERSHED PLANNING PROFILE

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Nechako River	17

Nechako River

GENERAL WATERSHED INFORMATION:

Watershed:	<i>Nechako River</i>	SISS Code:	08-0000
Physiographic Area(s):	Fraser and Nechako Plateaus/Nechako Plain/ Quanchus, Tahatsa and Kitimat Ranges		
Drainage Area (ha):	5,190,000	Biogeoclimatic Zone(s):	Sub-Boreal Spruce/ Sub-Boreal Pine Spruce/ Engelmann Spruce-Subalpine Fir/ Alpine Tundra
HMA:	Nechako		

WATERSHED HYDROLOGY:

Stream Flows:	Mean Annual	Mean Flood	Mean 7-day low flow			
			Winter		Summer	
(m ³ /s)	244.65	561.90	97.62	Dec/Mar	144.67	NA
Comments:	Reference for above data is the stream mouth. See Reference #8, p. 12, Table 7 and Appendix B.					

SALMON ESCAPEMENT:

Species	Historical Max. (yr)	1981-92 Ave.	1981-92 Max.	1969-80 Ave.	Population trend	Rebuilding potential
Sockeye	1,030 (NA)	208	1,030	2	Increasing	Medium
Chinook	2,915 (NA)	1,986	2,915	1,269	Increasing	Medium

NB. Does not include escapement to tributaries, e.g. Chilako, Stuart, and Nautley watersheds. A small run of pink and coho rearing occurs as well.

DEVELOPMENT ACTIVITY:

Type	Level of Concern	Comments	Ref.*
<i>Forestry</i>	<i>Low</i>		6
-percent logging	Low	3% on average, 1% above the Nautley confluence and 13% below.	8
- ECA status	Low		6
- riparian condition/ stream length impacted	Low		6

Nechako River

DEVELOPMENT ACTIVITY (continued):

Type	Level of Concern	Comments	Ref.*
<i>Agriculture</i>	<i>High</i>	From Kenney Dam downstream	6
- extent	High	Concentrated in Nautley to Stuart River reach	6
- riparian condition/ stream length impacted	High	Extensive riparian impacts from agriculture throughout mainstem and tributaries	6
- water withdrawal	High	Current (July 1995) limit on licenses	6
- water quality	Low	Not assessed	6
<i>Urbanization</i>	<i>Low</i>		6
- population level	Low		6
- extent	Low	Throughout, but concentrated in Vanderhoof, Prince George, Fort Fraser	6
- riparian condition/ stream length impacted	Low	Localized impacts	6, 8
- water withdrawal	Low	Heavy withdrawal at Prince George	6
- water quality	Low		6
<i>Placer Mining</i>	<i>Low</i>		6
- extent	Low	None	6
- water quality	Low		6
- riparian condition/ stream length impacted	Low		6
<i>Other Mining</i>	<i>Low</i>		6
- extent	Low	None	6
- water quality	Low		6
<i>Industrial Development</i>	<i>High</i>	Lumber mills, proposed pulp mill at Vanderhoof	6
- extent	Low	Concentrated - Vanderhoof, Isle Pierre, Prince George	6
- water quality	Low	License application on file for pulp mill	6

DEVELOPMENT ACTIVITY (continued):

Type	Level of Concern	Comments	Ref.*
- stream/riparian impacts	Low		6
Linear Development	Low		6
- extent	Low	CNR and highway rights-of-way and crossings	6
- stream/riparian impacts	Low	Localized - CNR right-of-way - Prince George - Fort Fraser	6, 8
Hydro Development	High	Kemano Development - Kenney Dam on Nechako River	6, 8
- extent	High	Downstream flows regulated since 1952	8
- stream/riparian impacts	High	Impacts to channel/riparian zone	6
Other Development	Low		
- extent	Low	Localized recreational concerns	6
- stream/riparian impacts	Low		

CUMULATIVE DEVELOPMENT ACTIVITY:

Cumulative Development	High	Agriculture, Urbanization, Hydro Development/Diversion, Forestry	6
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BIOPHYSICAL CONDITIONS:

Type	Level of Concern	Comments	Ref.*
Soils	Low	Sediment from tributary downcutting entering mainstem	8
- types		Valley floor primarily glaciofluvial sand and gravel or alluvial deposits, some glaciolacustrine sediments as well	8
Terrain	Low	Downcutting or degrading of the lower reaches of tributaries because of (regulated) low spring and summer Nechako flows	8

BIOPHYSICAL CONDITIONS (continued):

Type	Level of Concern	Comments	Ref.*
- type		Nechako Plateau is primarily low relief and expanses of flat or gently rolling terrain. of Nechako Valley is well-incised below the Nechako Plateau.	8
<i>Resistance to Change</i>	<i>High</i>	Regulated/diverted flow at Kenney Dam, large water extraction primarily for urban and industrial use, some agriculture	8
<i>Hydrology</i>	<i>High</i>	Regulated/diverted flow at Kenney Dam, large water extraction	8
<i>Channel Stability</i>	<i>Low</i>	Regulated flow	8
- type			
<i>Significant Environmental Variables</i>	<i>High</i>	Water temperature and flow regime concerns	6

SENSITIVE WATERSHED FEATURES:

Type	Present	Comments	Ref.*
<i>Sensitive Physical Features</i>			
<i>Sensitive Biological Features</i>	✓	Water temperature and flow regime concerns	6
<i>Unique Features</i>	✓	Kenney Dam diverts significant portion of stream flow	6

* See report section 6.0 References Cited

SPECIAL CONSIDERATIONS:

Type	Present	Comments	Ref.*
<i>Stock Management</i>	✓		
<i>Enhancement Activity/Opportunity</i>	✓	Nechako Fisheries Conservation Program (NFCP)	6, 8
<i>Restoration Activity</i>	✓	NFCP	6, 8
<i>Native Fishery</i>	✓	Occurs in Fraser and Nechako Rivers	6
<i>Recreational Fishery</i>	✓	Ocean sport fishery	
<i>Commercial Fishery</i>	✓	Ocean fishery	

RECENT WATERSHED PLANNING/PROJECT INITIATIVES:

Type	Comments	Ref.*
NFCP	Nechako Fisheries Conservation Program underway	6, 8
WMP	Water Management Plan proposed by DFO/MOELP	6
	Foreshore mapping of Nechako and Fraser by Envirowest Consultants	6

* See report section 6.0 References Cited

SUMMARY OF HABITAT CONCERNS (no. of high ratings):

Salmon Present	Development Concerns	Biophysical Concerns	Sensitive Watershed Features	Special Considerations
✓	✓(4)	✓(3)	✓(2)	✓(6)

SPECIFIC OBJECTIVES AND STRATEGIES:

Specific Objectives	Specific Strategies
<ul style="list-style-type: none"> • Follow the terms of the Kemano Settlement Agreement and Nechako Fisheries Conservation Program. • Maintain the structural and functional integrity of riparian areas. • Maintain slope stability. • Maintain or improve water quality. • Protect stream channels and floodplains from influences of development activities. • Ensure the protection of headwater, ephemeral and intermittent channels; recognizing their influence on watershed stability, hydrology and water quality. • Ensure protection of critical aquatic habitats including: floodplain, off-channel sites, non-natal tributaries and other areas of biological significance. • Ensure that the intensity of development activities does not negatively impact the natural watershed ecological processes through site specific or cumulative development. • Ensure the inventory, assessment and implementation of stream restoration and enhancement programs. • Improve inventories of aquatic resources. • Support existing fisheries enhancement programs and activities. • Improve fish passage in the watershed. 	<ul style="list-style-type: none"> • Apply the Nechako Fisheries Conservation Program strategies. • Apply the Watershed Assessment Procedures (WAP) to assess past and potential for future impacts of lands use activities on the tributaries. • Apply the Land Development Guidelines to residential and industrial developments. • Conduct detailed stream channel stability assessment on tributaries. • Conduct and maintain fisheries, habitat (critical) and enhancement inventories. Identify limiting factors. • Conduct detailed gully assessments in tributaries for specified sensitive channels identified in development plans. • Conduct foreshore inventory and classification of Nechako mainstem for delineation of fisheries sensitive zones (FSZ) prior to development. • Design high elevation forest cutblocks to optimize snow accumulation and retention similar to unharvested or undisturbed areas. • Develop Access Management Plans (AMP) for review and direction. • Develop a detailed riparian management plan (RMP) from Nautley to Prince George identifying areas requiring site specific prescriptions (urban/agriculture). • Develop a riparian management plan to protect and restore tributary stream habitat in cooperation with agricultural and ranching communities. • Develop a Water Management Plan (WMP) that includes a determination of water demand, fisheries/ minimum low flow of water storage opportunities and potential impacts of water extraction. • Distribute timber harvesting opportunities throughout the available range in elevation to maintain natural hydrologic conditions in tributaries.

SPECIFIC OBJECTIVES AND STRATEGIES (continued):

Specific Objectives	Specific Strategies
	<ul style="list-style-type: none"> • Document, map and assess tributary terrain and soils conditions and their hazard risk. • Ensure that rate of development in the tributaries (forestry, urban, agriculture, etc.) is balanced against hydrologic recovery to maintain cumulative ECA at or below 25% • Maintain designated "NO STAKING PLACER RESERVES" for placer mining where identified. • Implement a water drainage management plan for sensitive soils, stream crossings or other areas specified in development plans. • Initiate a watershed restoration assessment and inventory for development of a Watershed Restoration Plan. • Implement watershed restoration plan recommendations from assessment and inventory reports. • Initiate restoration, revegetation and stabilization measures on linear developments. • Provide Streamside Management Plans (SMP) for harvesting areas identified in the annual forest development plan update. • Restrict or control development within or along tributary confluences, alluvial fans, floodplains or areas of slope instability (e.g. valley walls). • Retain riparian reserves along specified S4-S6 (FPC riparian class) stream channel reaches in high sensitivity areas or channels identified as having stream temperature concerns. • Review and document potential habitat improvement, habitat development and habitat restoration opportunities. • Review resource development plans for compatibility with sensitive habitats in terms of hydrology, water quality, channel stability and riparian condition.

WATERSHED PLANNING PROFILE

Stream Name	Page
Chilako River	25

Chilako River

GENERAL WATERSHED INFORMATION:

Watershed:	<i>Chilako River</i>	SISS Code:	08-0500
Physiographic Area(s):	Fraser/Nechako Plateau		
Drainage Area (ha):	357,800	Biogeoclimatic Zone(s):	Sub-Boreal Spruce
HMA:	Nechako		

WATERSHED HYDROLOGY:

Stream Flows:	Mean Annual	Mean Flood	Mean 7-day low flow			
			Winter		Summer	
(m ³ /s)	12.30	80.2	4.91	Dec/Jan	5.35	Aug
Comments:	Reference for above data is the stream mouth. See Reference # 8, p. 12, Table 7 and Appendix B.					

SALMON ESCAPEMENT:

Species	Historical Max. (yr)	1981-92 Ave.	1981-92 Max.	1969-80 Ave.	Population trend	Rebuilding potential
Chinook	425 (1990)	171	425	143	Static	Medium

DEVELOPMENT ACTIVITY:

Type	Level of Concern	Comments	Ref.*
<i>Forestry</i>	<i>High</i>		6
- percent logging	High	nearly 20 % on average, some tributaries more heavily logged	10
- ECA status	High	Rate-of cut review requested by DFO	6
- riparian condition/ stream length impacted	Low	Some impacts (including loss of vegetation) from forestry	6, 10
<i>Agriculture</i>	<i>High</i>		6
- extent	High	Extensive from around Punchaw to mouth	6

Chilako River

DEVELOPMENT ACTIVITY (continued):

Type	Level of Concern	Comments	Ref.*
- riparian condition/ stream length impacted	High	Extensive riparian impacts from agriculture (e.g. range cattle damage in lower reaches)	6, 10
- water withdrawal	High	Review of water licences required	6
- water quality	Low	Review of agriculture use required	6
Urbanization	Low		6
- population level	Low		6
- extent	Low	Rural agricultural community	6
- riparian condition/ stream length impacted	Low		6
- water withdrawal	Low		6
- water quality	Low		6
Placer Mining	Low		6
- extent	Low		6
-water quality	Low		6
Other Mining	Low		6
- extent	Low	None	6
- water quality	Low		6
Industrial Development	Low		6
- extent	Low	None	6
- water quality	Low		6
- stream/riparian impacts	Low		6
Linear Development	High		6
- extent	High	Extensive logging roads, CNR and highway rights-of-way and crossings	6
- stream/riparian impacts	Low	Localized to crossing areas	6
Hydro Development	Low		6

DEVELOPMENT ACTIVITY (continued):

Type	Level of Concern	Comments	Ref.*
- extent	Low	None	6
- stream/riparian impacts	Low		6
<i>Other Development</i>	<i>Low</i>		6
- extent	Low	None	6
- stream/riparian impacts	Low		6

CUMULATIVE DEVELOPMENT ACTIVITY:

<i>Cumulative Development</i>	<i>High</i>	Logging, agriculture, and to a lesser degree linear development	6
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BIOPHYSICAL CONDITIONS:

Type	Level of Concern	Comments	Ref.*
<i>Soils</i>	<i>Low</i>		6
- types		Fraser till, typically clayey, is most abundant	6, 10
<i>Terrain</i>	<i>Low</i>		6
- type		Low relief and expanses of flat or gently rolling terrain, low hills separated by broad, flat valleys	6, 10
<i>Resistance to Change</i>	<i>High</i>	Low gradient, susceptible to sedimentation, especially in lower reaches due to erosion of lacustrine deposits and low flows	6
<i>Hydrology</i>	<i>Low</i>	Large watershed, low water yield, low gradient, beaver dams	6
<i>Channel Stability</i>	<i>High</i>	Tortuous meanders, particularly in lower reaches; low gradient	6
- type			
<i>Significant Environmental Variables</i>	<i>High</i>	Water temperature and sedimentation concerns	6

SENSITIVE WATERSHED FEATURES:

Type	Present	Comments	Ref.*
<i>Sensitive Physical Features</i>	✓	Lower reaches lacustrine deposits	6
<i>Sensitive Biological Features</i>	✓	Mainstem chinook spawning and rearing and tributary rearing	6, 10
<i>Unique Features</i>			

SPECIAL CONSIDERATIONS:

Type	Present	Comments	Ref.*
<i>Stock Management</i>	✓		
<i>Enhancement Activity/Opportunity</i>	✓	SEP project at Hutda Lake	6
<i>Restoration Activity</i>			
<i>Native Fishery</i>	✓	Occurs in Fraser and Nechako Rivers	6
<i>Recreational Fishery</i>	✓	Ocean sport fishery	
<i>Commercial Fishery</i>	✓	Ocean fishery	

RECENT WATERSHED PLANNING/PROJECT INITIATIVES:

Type	Comments	Ref.*
WAP review	Watershed Assessment Procedure requested by DFO	6, 10
Agriculture review	Reconnaissance level study under way by Prince George DFO	6

* See report section 6.0 References Cited

SUMMARY OF HABITAT CONCERNS (no. of high ratings):

Salmon Present	Development Concerns	Biophysical Concerns	Sensitive Watershed Features	Special Considerations
✓	✓(4)	✓(3)	✓(2)	✓(5)

SPECIFIC OBJECTIVES AND STRATEGIES:

Specific Objectives	Specific Strategies
<ul style="list-style-type: none"> • Maintain natural watershed hydrologic characteristics and stream flow regime. • Maintain the natural stream temperature regime. • Maintain the structural and functional integrity of riparian areas. • Maintain slope stability. • Maintain or improve water quality. • Protect stream channels and floodplains from influences of development activities. • Ensure the protection of headwater, ephemeral and intermittent channels; recognizing their influence on watershed stability, hydrology and water quality. • Ensure protection of critical aquatic habitats including: floodplain, off-channel sites, non-natal tributaries and other areas of biological significance. • Ensure that the intensity of development activities does not negatively impact the natural watershed ecological processes through site specific or cumulative development. • Ensure the inventory, assessment and implementation of stream restoration and enhancement programs. • Improve inventories of aquatic resources. • Support existing fisheries enhancement programs and activities. • Improve fish passage in the watershed. 	<ul style="list-style-type: none"> • Apply FPC riparian guidelines to agricultural and range use of crown land. • Apply riparian guidelines for new placer mines that are consistent with FPC standards. • Apply the Watershed Assessment Procedures (WAP) to assess past and potential for future impacts of lands use activities. • Apply the Land Development Guidelines to residential and industrial developments. • Conduct a stream channel assessment to identify potential barriers to fish migration and remove or facilitate access where appropriate. • Conduct and maintain fisheries, habitat(critical) and enhancement inventories. • Conduct detailed gully assessments for specified sensitive channels identified in development plans. • Conduct minimum flow study. • Develop a Water Management Plan (WMP) that includes a determination of water demand, fisheries/ minimum low flow of water storage opportunities and potential impacts of water extraction. • Develop a detailed riparian management plan (RMP) for the Chilako watershed identifying areas requiring site specific prescriptions. • Develop a riparian management plan to protect and restore stream habitat in cooperation with agricultural and ranching communities. • Ensure that rate of development (forestry, urban, agriculture, etc.) is balanced against hydrologic recovery to maintain cumulative ECA at or below 25% (total watershed drainage area). • Maintain designated "NO STAKING PLACER RESERVES" for placer mining where identified. • Initiate restoration, revegetation and stabilization measures on linear developments.

SPECIFIC OBJECTIVES AND STRATEGIES (continued):

Specific Objectives	Specific Strategies
	<ul style="list-style-type: none"> • Implement a water drainage management plan for sensitive soils, stream crossings or other areas specified in development plans. • Initiate a watershed restoration assessment and inventory for development of a Watershed Restoration Plan. • Implement watershed restoration plan recommendations from assessment and inventory reports. • Provide Streamside Management Plans (SMP) for harvesting areas identified in the annual forest development plan update. • Restrict or control development within or along tributary confluences, alluvial fans, floodplains or areas of slope instability (e.g. valley walls). • Retain riparian reserves along specified S4-S6 (FPC riparian class) stream channel reaches in high sensitivity areas or channels identified as having stream temperature concerns. • Review and document potential habitat improvement, habitat development and habitat restoration opportunities. • Review resource development plans for compatibility with sensitive habitats in terms of hydrology, water quality, channel stability and riparian condition.

WATERSHED PLANNING PROFILE

Stream Name	Page
Nautley River	32

Nautley River

GENERAL WATERSHED INFORMATION:

Watershed:	<i>Nautley River</i>	SISS Code:	NA
Physiographic Area(s):	Nechako Plateau		
Drainage Area (ha):	603,000	Biogeoclimatic Zone(s):	Sub-Boreal Spruce
HMA:	Nechako		

WATERSHED HYDROLOGY:

Stream Flows:	Mean Annual	Mean Flood	Mean 7-day low flow			
			Winter		Summer	
(m ³ /s)	21.88	76.0	6.23	NA	12.13	NA
Comments:	See Reference # 8, p. 12, Table 7 and Appendix B					

SALMON ESCAPEMENT:

Species	Historical Max. (yr)	1981-92 Ave.	1981-92 Max.	1969-80 Ave.	Population trend	Rebuilding potential
Sockeye	NA	NA	NA	NA	NA	NA
Chinook	NA	NA	NA	NA	NA	NA

DEVELOPMENT ACTIVITY:

Type	Level of Concern	Comments	Ref.*
<i>Forestry</i>	<i>Low</i>		6
-percent logging	Low		6
- ECA status	Low		6
- riparian condition/ stream length impacted	Low		6
<i>Agriculture</i>	<i>Low</i>		6
- extent	Low		6

Nautley River

DEVELOPMENT ACTIVITY (continued):

Type	Level of Concern	Comments	Ref.*
- riparian condition/stream length impacted	Low		6
- water withdrawal	Low		6
- water quality	Low		6
Urbanization	High	Nadleh Whut'en First Nation	6
- population level	Low		6
- extent	High		6
- riparian condition/stream length impacted	Low		6
- water withdrawal	Low		6
- water quality	Low	Sewage field adjacent community	6
Placer Mining	Low		6
- extent	Low		6
- water quality	Low		6
- riparian condition/stream length impacted	Low		6
Other Mining	Low		6
- extent	Low		6
- water quality	Low		6
Industrial Development	Low		6
- extent	Low		6
- water quality	Low		6
- stream/riparian impacts	Low		6
Linear Development	Low	Bridge crossing, water line, hydro	6
- extent	Low	Concentrated at road bridge	6
- stream/riparian impacts	Low	Some localized riparian impact	6

DEVELOPMENT ACTIVITY (continued):

Type	Level of Concern	Comments	Ref.*
<i>Hydro Development</i>	<i>Low</i>		6
- extent	Low		6
- stream/riparian impacts	Low	Construction of Kenney Dam has reduced water levels in Nechako River	6
<i>Other Development</i>	<i>Low</i>	Rock weir at outlet of Fraser Lake to maintain Fraser Lake levels	6
- extent	Low		6
- stream/riparian impacts	Low		6

CUMULATIVE DEVELOPMENT ACTIVITY:

<i>Cumulative Development</i>	Low		
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BIOPHYSICAL CONDITIONS:

Type	Level of Concern	Comments	Ref.*
<i>Soils</i>	<i>Low</i>		6
- types			
<i>Terrain</i>	<i>Low</i>		6
- type			
<i>Resistance to Change</i>	<i>Low</i>		6
<i>Hydrology</i>	<i>Low</i>	Short river, lake headed	6
<i>Channel Stability</i>	<i>Low</i>		6
- type			
<i>Significant Environmental Variables</i>	<i>Low</i>		6

Nautley River

SENSITIVE WATERSHED FEATURES:

Type	Present	Comments	Ref.*
<i>Sensitive Physical Features</i>			
<i>Sensitive Biological Features</i>	✓	Moderate aquatic weed growth at outlet of Fraser Lake	6
<i>Unique Features</i>	✓	Manmade weir at outlet Fraser Lake, entire stream within Nadleh Whut'en reserve	6

SPECIAL CONSIDERATIONS:

Type	Present	Comments	Ref.*
<i>Stock Management</i>	✓		6
<i>Enhancement Activity/Opportunity</i>		Monitor weir at outlet of Fraser Lake	6
<i>Restoration Activity</i>			
<i>Native Fishery</i>	✓		6
<i>Recreational Fishery</i>			
<i>Commercial Fishery</i>			

RECENT WATERSHED PLANNING/PROJECT INITIATIVES:

Type	Comments	Ref.*
	None	

* See report section 6.0 References Cited

SUMMARY OF HABITAT CONCERNS (no. of high ratings):

Salmon Present	Development Concerns	Biophysical Concerns	Sensitive Watershed Features	Special Considerations
migration only	✓(1)		✓(2)	✓(1)

SPECIFIC OBJECTIVES AND STRATEGIES:

Specific Objectives	Specific Strategies
<ul style="list-style-type: none"> • Maintain natural watershed hydrologic characteristics and stream flow regime. • Maintain the natural stream temperature regime. • Maintain the structural and functional integrity of riparian areas. • Maintain slope stability. • Maintain or improve water quality. • Protect stream channels and floodplains from influences of development activities. • Ensure that the intensity of development activities does not negatively impact the natural watershed ecological processes through site specific or cumulative development. • Ensure adequate stream flows are present to maintain fisheries productive capacity. • Improve fish passage in the watershed. 	<ul style="list-style-type: none"> • Apply the Land Development Guidelines to residential and industrial developments. • Conduct a stream channel assessment to identify potential barriers to fish migration and remove or facilitate access where appropriate. • Conduct and maintain fisheries, habitat (critical) and enhancement inventories. • Develop a riparian management plan to protect and restore mainstem stream habitat in cooperation with community. • Maintain designated "NO STAKING PLACER RESERVES" for placer mining where identified. • Initiate restoration, revegetation and stabilization measures on linear developments. • Restrict or control development within or along tributary confluences, alluvial fans, floodplains or areas of slope instability (e.g. valley walls).

WATERSHED PLANNING PROFILE

Stream Name	Page
Stellako River	38

GENERAL WATERSHED INFORMATION:

Watershed:	Stellako River	SISS Code:	08-2700
Physiographic Area(s):	Nechako Plateau		
Drainage Area (ha):	3,600 (Corridor)	Biogeoclimatic Zone(s):	Sub-Boreal Spruce
HMA:	Nechako		

WATERSHED HYDROLOGY:

Stream Flows:	Mean Annual	Mean Flood	Mean 7-day low flow			
			Winter		Summer	
(m ³ /s)	15.75	47.7	4.48	Dec	6.78	NA
Comments:	Reference for above data is the stream mouth at Fraser Lake. See Reference #8, p. 11, Table 7 and Appendix B.					

SALMON ESCAPEMENT:

Species	Historical Max. (yr)	1981-92 Ave.	1981-92 Max.	1969-80 Ave.	Population trend	Rebuilding potential
Sockeye	367,700 (1988)	108,533	367,700	84,735	Increasing	Medium
Chinook	1,500 (1958)	29	75 (1986)	74	Decreasing	High

NB. Above escapement data for mainstem Stellako River only.

DEVELOPMENT ACTIVITY:

Type	Level of Concern	Comments	Ref.*
<i>Forestry</i>	<i>Low</i>		6
-percent logging	High	25 % logged - extensive past logging on hillsides.	8
- ECA status	Low		6
- riparian condition/ stream length impacted	Low		6

DEVELOPMENT ACTIVITY (continued):

Type	Level of Concern	Comments	Ref.*
<i>Agriculture</i>	<i>Low</i>		6
- extent	Low		6
- riparian condition/ stream length impacted	Low		6
- water withdrawal	Low		6
- water quality	Low		6
<i>Urbanization</i>	<i>Low</i>		6
- population level	Low		6
- extent	Low	Lodge at outlet of François Lake. Reserve on lower reaches.	6
- riparian condition/ stream length impacted	Low	Localized	6
- water withdrawal	Low		6
- water quality	Low		6
<i>Placer Mining</i>	<i>Low</i>		6
- extent	Low	None	6
- water quality	Low		6
- riparian condition/ stream length impacted	Low		6
<i>Other Mining</i>	<i>Low</i>		6
- extent	Low	None	6
- water quality	Low		6
<i>Industrial Development</i>	<i>Low</i>		6
- extent	Low	None	6
- water quality	Low		6
- stream/riparian impacts	Low		6
<i>Linear Development</i>	<i>Low</i>		6

DEVELOPMENT ACTIVITY (continued):

Type	Level of Concern	Comments	Ref.*
- extent	Low	Highway 16 and CNR rights-of-way	6
- stream/riparian impacts	Low	Lower river was diverted and confluence with Endako River re-channelized years ago	8
Hydro Development	Low		6
- extent	Low	None	6
- stream/riparian impacts	Low		6
Other Development	Low		6
- extent	Low	None	6
- stream/riparian impacts	Low		6

CUMULATIVE DEVELOPMENT ACTIVITY:

Cumulative Development	Low		6
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BIOPHYSICAL CONDITIONS:

Type	Level of Concern	Comments	Ref.*
Soils	Low		6
- types		Fraser till (typically clayey) most abundant surface soil type, thick layer of glacial drift.	8
Terrain	Low	Low relief and expanses of flat or gently	6
- type		rolling terrain	8
Resistance to Change	Low	Large lake (François)	6
Hydrology	Low	Large lake (François)	6
Channel Stability	Low	Stable flows	6
- type			
Significant Environmental Variables	Low		6

SENSITIVE WATERSHED FEATURES:

Type	Present	Comments	Ref.*
<i>Sensitive Physical Features</i>			
<i>Sensitive Biological Features</i>	✓	Weed growth from the lagoon (confluence of Endako River) to the mouth is a concern	6, 8
<i>Unique Features</i>	✓	Upper portion of Stellako river protected by Habitat Conservation Fund reserve.	8

SPECIAL CONSIDERATIONS:

Type	Present	Comments	Ref.*
<i>Stock Management</i>	✓		
<i>Enhancement Activity/Opportunity</i>	✓	Gravel placement in upper reaches for sockeye spawning and ongoing study of egg to fry survival	6
<i>Restoration Activity</i>			
<i>Native Fishery</i>	✓	Occurs in Fraser Lake and Nechako and Fraser Rivers	6
<i>Recreational Fishery</i>	✓	Regionally significant trout fishery - high Provincial priority as well as ocean sport fishery	6
<i>Commercial Fishery</i>	✓	Ocean fishery	

RECENT WATERSHED PLANNING/PROJECT INITIATIVES:

Type	Comments	Ref.*
	None	6

* See report section 6.0 References Cited

SUMMARY OF HABITAT CONCERNS (no. of high ratings):

Salmon Present	Development Concerns	Biophysical Concerns	Sensitive Watershed Features	Special Considerations
✓			✓(2)	✓(5)

SPECIFIC OBJECTIVES AND STRATEGIES:

Specific Objectives	Specific Strategies
<ul style="list-style-type: none"> • Maintain natural watershed hydrologic characteristics and stream flow regime. • Maintain the natural stream temperature regime. • Maintain the structural and functional integrity of riparian areas. • Maintain slope stability. • Maintain or improve water quality. • Protect stream channels and floodplains from influences of development activities. • Ensure the protection of headwater, ephemeral and intermittent channels; recognizing their influence on watershed stability, hydrology and water quality. • Ensure that the intensity of development activities does not negatively impact the natural watershed ecological processes through site specific or cumulative development. • Ensure the inventory, assessment and implementation of stream restoration and enhancement programs. • Ensure adequate stream flows are present to maintain fisheries productive capacity. • Improve inventories of aquatic resources. • Support existing fisheries enhancement programs and activities. 	<ul style="list-style-type: none"> • Apply FPC riparian guidelines to agricultural and range use of crown land. • Apply the Land Development Guidelines to residential and industrial developments. • Conduct and maintain fisheries, habitat (critical) and enhancement inventories. • Conduct detailed gully assessments for specified sensitive channels identified in development plans. • Document, map and assess watershed terrain and soils conditions and their hazard risk. • Maintain designated "NO STAKING PLACER RESERVES" for placer mining where identified. • Implement a water drainage management plan for sensitive soils, stream crossings or other areas specified in development plans. • Initiate a watershed restoration assessment and inventory for development of a Watershed Restoration Plan. • Provide Streamside Management Plans (SMP) for harvesting areas identified in the annual forest development plan update. • Restrict or control development within or along tributary confluences, alluvial fans, floodplains or areas of slope instability (e.g. valley walls). • Retain riparian reserves along specified S4-S6 (FPC riparian class) stream channel reaches in high sensitivity areas or channels identified as having stream temperature concerns. • Review and document potential habitat improvement, habitat development and habitat restoration opportunities. • Review resource development plans for compatibility with sensitive habitats in terms of hydrology, water quality, channel stability and riparian condition

WATERSHED PLANNING PROFILE

Stream Name	Page
Ormond Creek.	44

Ormond Creek

GENERAL WATERSHED INFORMATION:

Watershed:	Ormond Creek	SISS Code:	08-2700-080
Physiographic Area(s):	Nechako Plateau		
Drainage Area (ha):	2,510	Biogeoclimatic Zone(s):	Sub-Boreal Spruce
HMA:	Nechako		

WATERSHED HYDROLOGY:

Stream Flows:	Mean Annual	Mean Flood	Mean 7-day low flow			
			Winter		Summer	
(m ³ /s)	1.10	5.3	0.33	NA	0.43	NA
Comments:	NB. Reference for above data is the stream mouth. See Reference # 8 Table 7 and Appendix B.					

SALMON ESCAPEMENT:

Species	Historical Max. (yr)	1981-92 Ave.	1981-92 Max.	1969-80 Ave.	Population trend	Rebuilding potential
Sockeye	1,165 (1953)	0	0	8	Unknown	NA
Chinook	25 (1977)	0	0	7	Unknown	NA

DEVELOPMENT ACTIVITY:

Type	Level of Concern	Comments	Ref.*
Forestry	<i>Low</i>		6
-percent logging	Low	4%	6
- ECA status	Low	NA	6
- riparian condition/ stream length impacted	Low		6
Agriculture	<i>Low</i>		6
- extent	Low		6

Ormond Creek

DEVELOPMENT ACTIVITY (continued):

Type	Level of Concern	Comments	Ref.*
- riparian condition/ stream length impacted	Low		6
- water withdrawal	Low	Not assessed	6
- water quality	Low		16
Urbanization	Low		6
- population level	Low		6
- extent	Low		6
- riparian condition/ stream length impacted	Low		6
- water withdrawal	Low		6
- water quality	Low		1
Placer Mining	Low		6
- extent	Low		6
- water quality	Low		6
- riparian condition/ stream length impacted	Low		6
Other Mining	Low		6
- extent	Low		6
- water quality	Low		6
Industrial Development	Low		6
- extent	Low	None	6
- water quality	Low		6
- stream/riparian impacts	Low		6
Linear Development	Low		6
- extent	Low	Gas pipeline & forestry road	6
- stream/riparian impacts	Low	Localized at crossing	6

DEVELOPMENT ACTIVITY (continued):

Type	Level of Concern	Comments	Ref.*
<i>Hydro Development</i>	<i>Low</i>		
- extent	Low	None	6
- stream/riparian impacts	Low		
<i>Other Development</i>	<i>Low</i>		
- extent	Low	Forestry campsite and trail along lower reaches	6
- stream/riparian impacts	Low		

CUMULATIVE DEVELOPMENT ACTIVITY:

<i>Cumulative Development</i>	<i>Low</i>		6
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BIOPHYSICAL CONDITIONS:

Type	Level of Concern	Comments	Ref.*
<i>Soils</i>	<i>Low</i>		6
- types		Fraser till (typically clayey) most abundant soil type, thick layer of glacial drift	8
<i>Terrain</i>	<i>Low</i>		6
- type		Low relief and expanses of flat or gently rolling terrain	8
<i>Resistance to Change</i>	<i>Low</i>		6
<i>Hydrology</i>	<i>Low</i>	Low flow and beaver dams impede migration	6,8
<i>Channel Stability</i>	<i>Low</i>	Sediment deposits at mouth impede migration	6,8
- type			
<i>Significant Environmental Variables</i>	<i>Low</i>		6

Ormond Creek

SENSITIVE WATERSHED FEATURES:

Type	Present	Comments	Ref.*
<i>Sensitive Physical Features</i>			
<i>Sensitive Biological Features</i>			
<i>Unique Features</i>			

SPECIAL CONSIDERATIONS:

Type	Present	Comments	Ref.*
<i>Stock Management</i>	✓		
<i>Enhancement Activity/Opportunity</i>	✓	Ormond Creek enhancement project through Aboriginal Fisheries Strategy (AFS) program	6
<i>Restoration Activity</i>			
<i>Native Fishery</i>	✓	Occurs in Nechako River and Fraser Lake	6
<i>Recreational Fishery</i>	✓	Ocean sport fishery	
<i>Commercial Fishery</i>	✓	Ocean fishery	

RECENT WATERSHED PLANNING/PROJECT INITIATIVES:

Type	Comments	Ref.*
AFS enhancement	Ormond Creek biophysical and fisheries survey by Aquatic Resources Ltd. underway (1995).	6

* See report section 6.0 References Cited

SUMMARY OF HABITAT CONCERNS (no. of high ratings):

Salmon Present	Development Concerns	Biophysical Concerns	Sensitive Watershed Features	Special Considerations
✓				✓(5)

SPECIFIC OBJECTIVES AND STRATEGIES:

Specific Objectives	Specific Strategies
<ul style="list-style-type: none"> • Maintain natural watershed hydrologic characteristics and stream flow regime. • Maintain the natural stream temperature regime in tributaries.. • Maintain the structural and functional integrity of riparian areas. • Maintain slope stability. • Maintain or improve water quality. • Protect stream channels and floodplains from influences of development activities. • Ensure the protection of headwater, ephemeral and intermittent channels; recognizing their influence on watershed stability, hydrology and water quality. • Ensure protection of critical aquatic habitats including: floodplain, off-channel sites, non-natal tributaries and other areas of biological significance. • Ensure that the intensity of development activities does not negatively impact the natural watershed ecological processes through site specific or cumulative development. • Ensure the inventory, assessment and implementation of stream restoration and enhancement programs. • Improve inventories of aquatic resources. • Ensure compatibility of Fraser Lake foreshore developments with salmon utilization. • Support existing fisheries enhancement programs and activities. • Improve fish passage in the watershed. 	<ul style="list-style-type: none"> • Apply FPC riparian guidelines to agricultural and range use of crown land. • Apply the Land Development Guidelines to residential and industrial developments. • Conduct a stream channel assessment to identify potential barriers to fish migration & remove or facilitate access where appropriate. • Conduct and maintain fisheries, habitat (critical) and enhancement inventories. • Conduct foreshore inventory and classification of Fraser Lake for delineation of fisheries sensitive zones (FSZ) prior to development. • Ensure that the rate of development (forestry, urban, agriculture, etc.) is balanced against hydrologic recovery to maintain cumulative ECA at or below 25% (total watershed drainage area). • Maintain designated "NO STAKING PLACER RESERVES" for placer mining where identified. • Initiate a watershed restoration assessment and inventory for development of a Watershed Restoration Plan. • Restrict or control development within or along tributary confluences, alluvial fans, floodplains or areas of slope instability (e.g. valley walls). • Review and document potential habitat improvement, habitat development and habitat restoration opportunities. • Review resource development plans for compatibility with sensitive habitats in terms of hydrology, water quality, channel stability and riparian condition.

WATERSHED PLANNING PROFILE

Stream Name	Page
Endako River	50

Endako River

GENERAL WATERSHED INFORMATION:

Watershed:	<i>Endako River</i>	SISS Code:	08-2700-140
Physiographic Area(s):	Nechako Plateau		
Drainage Area (ha):	203,300	Biogeoclimatic Zone(s):	Sub-Boreal Spruce/ Engelmann Spruce- Subalpine Fir
HMA:	Nechako		

WATERSHED HYDROLOGY:

Stream Flows:	Mean Annual	Mean Flood	Mean 7-day low flow			
			Winter		Summer	
(m ³ /s)	6.13	43.1	1.33	NA	1.43	NA
Comments:	Reference for above data is the stream mouth. See Reference #8, p. 11, Table 7 and Appendix B.					

SALMON ESCAPEMENT:

Species	Historical Max. (yr)	1981-92 Ave.	1981-92 Max.	1969-80 Ave.	Population trend	Rebuilding potential
Sockeye	2,540 (1963)	149	1,000 (1987)	158	Static	High
Chinook	500 (1987)	194	500 (1987)	31	Increasing	Medium

DEVELOPMENT ACTIVITY:

Type	Level of Concern	Comments	Ref.*
<i>Forestry</i>	<i>Low</i>	Large portion deciduous, lower reaches deciduous/conifer mix	6
-percent logging	Low	4% on average	8
- ECA status	Low		6
- riparian condition/ stream length impacted	Low		6

Endako River

DEVELOPMENT ACTIVITY (continued):

Type	Level of Concern	Comments	Ref.*
<i>Agriculture</i>	<i>High</i>		6
- extent	High	Throughout	6
- riparian condition/ stream length impacted	High	Localized impacts	6
- water withdrawal	High	High licensed demand for summer irrigation and industrial demand all year	6
- water quality	Low	Not assessed, believed to be the primary nutrient (phosphorus) supplier to Fraser Lake.	1
<i>Urbanization</i>	<i>Low</i>	Concentrated on lakes - Burns, Decker, Fraser Lakes	6
- population level	Low		6
- extent	Low	Burns Lake, Endako and Stellako reserve	6
- riparian condition/ stream length impacted	Low		6
- water withdrawal	Low		6
- water quality	Low		6
<i>Placer Mining</i>	<i>Low</i>		6
- extent	Low	None	6
- water quality	Low		6
- riparian condition/ stream length impacted	Low		6
<i>Other Mining</i>	<i>Low</i>		6
- extent	Low	Molybdenum mine at Endako	6
- water quality	Low	Discharge permit - no concern noted	6
<i>Industrial Development</i>	<i>Low</i>	Babine Forest Products mill at Sheraton Creek	6
- extent	Low		6

Endako River

DEVELOPMENT ACTIVITY (continued):

Type	Level of Concern	Comments	Ref.*
- water quality	High	wood waste at Sheraton Creek.	6
- stream/riparian impacts	Low		6
Linear Development	High		6
- extent	High	CNR and Highway 16 rights-of-way and crossings through Endako floodplain	8
- stream/riparian impacts	High	Impacts at many crossings, encroachments and channelization,	6
Hydro Development	Low		
- extent	Low	None	6
- stream/riparian impacts	Low		
Other Development	Low		
- extent	Low	Proposed golf course and subdivision at Shovel Creek	6
- stream/riparian impacts	Low		

CUMULATIVE DEVELOPMENT ACTIVITY:

Cumulative Development	High	linear, agriculture, forestry, industrial	6
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BIOPHYSICAL CONDITIONS:

Type	Level of Concern	Comments	Ref.*
Soils	Low		6
- types		Fraser till (typically clayey) most abundant surface soil type, thick layer of glacial drift	8
Terrain	Low		6

BIOPHYSICAL CONDITIONS (continued):

Type	Level of Concern	Comments	Ref.*
- type		Low relief, expanses of flat or gently rolling terrain, low hills separated by broad, flat valleys	8
<i>Resistance to Change</i>	<i>Low</i>	Stable lake headed, low gradient	6
<i>Hydrology</i>	<i>Low</i>	Large lake headed, but low winter and summer flows	6, 8
<i>Channel Stability</i>	<i>Low</i>		6
- type		Tortuous meanders, low gradient. Portion of stream banks heavily fortified	
<i>Significant Environmental Variables</i>	<i>High</i>	Nutrient status unknown-suspect eutrophic system	6

SENSITIVE WATERSHED FEATURES:

Type	Present	Comments	Ref.*
<i>Sensitive Physical Features</i>	✓	low flows	6
<i>Sensitive Biological Features</i>	✓	Heavy aquatic weed/algae production, beaver dam, spawning in Shovel Creek and downstream to Savory	6
<i>Unique Features</i>			

SPECIAL CONSIDERATIONS:

Type	Present	Comments	Ref.*
<i>Stock Management</i>	✓		
<i>Enhancement Activity/Opportunity</i>	✓	Carrier Sekani Tribal Council Aboriginal Fisheries Strategy stream gauging project and beaver dam removal	6
<i>Restoration Activity</i>			
<i>Native Fishery</i>	✓	Occurs in Stellako River	6
<i>Recreational Fishery</i>	✓	Ocean sport fishery	
<i>Commercial Fishery</i>	✓	Ocean fishery	

RECENT WATERSHED PLANNING/PROJECT INITIATIVES:

Type	Comments	Ref.*
AFS	CSTC-AFS project	6

* See report section 6.0 References Cited

SUMMARY OF HABITAT CONCERNS (no. of high ratings):

Salmon Present	Development Concerns	Biophysical Concerns	Sensitive Watershed Features	Special Considerations
✓	✓(3)	✓	✓(2)	✓(5)

SPECIFIC OBJECTIVES AND STRATEGIES:

Specific Objectives	Specific Strategies
<ul style="list-style-type: none"> • Maintain natural watershed hydrologic characteristics and stream flow regime. • Maintain the natural stream temperature regime. • Maintain the structural and functional integrity of riparian areas. • Maintain slope stability. • Maintain or improve water quality. • Protect stream channels and floodplains from influences of development activities. • Ensure the protection of headwater, ephemeral and intermittent channels; recognizing their influence on watershed stability, hydrology and water quality. • Ensure protection of critical aquatic habitats including: floodplain, off-channel sites, non-natal tributaries and other areas of biological significance. • Ensure that the intensity of development activities does not negatively impact the natural watershed ecological processes through site specific or cumulative development. 	<ul style="list-style-type: none"> • Apply FPC riparian guidelines to agricultural and range use of crown land. • Apply the Land Development Guidelines to residential and industrial developments. • Conduct a stream channel assessment to identify potential barriers to fish migration and remove or facilitate access where appropriate. • Conduct and maintain fisheries, habitat (critical) and enhancement inventories. • Conduct detailed gully assessments for specified sensitive channels identified in development plans. • Conduct minimum flow study. • Design high elevation forest cutblocks to optimize snow accumulation and retention similar to unharvested or undisturbed areas. • Develop Access Management Plans (AMP) for review and direction. • Develop a riparian management plan to protect and restore mainstem stream habitat in cooperation with agricultural and ranching communities.

SPECIFIC OBJECTIVES AND STRATEGIES (continued):

Specific Objectives	Specific Strategies
<ul style="list-style-type: none"> • Ensure the inventory, assessment and implementation of stream restoration and enhancement programs. • Ensure adequate stream flows are present to maintain fisheries productive capacity. • Improve inventories of aquatic resources. • Support existing fisheries enhancement programs and activities. • Improve fish passage in the watershed. 	<ul style="list-style-type: none"> • Develop a Water Management Plan (WMP) that includes a determination of water demand, fisheries/ minimum low flow of water storage opportunities and potential impacts of water extraction. • Distribute timber harvesting opportunities throughout the available range in elevation to maintain natural hydrologic conditions. • Document, map and assess watershed terrain and soils conditions and their hazard risk. • Ensure that rate of development (forestry, urban, agriculture, etc.) is balanced against hydrologic recovery to maintain cumulative ECA at or below 25% (total watershed drainage area). • Maintain designated "NO STAKING PLACER RESERVES" for placer mining where identified. • Implement a water drainage management plan for sensitive soils, stream crossings or other areas specified in development plans. • Initiate a watershed restoration assessment & inventory to develop a Watershed Restoration Plan. • Implement watershed restoration plan recommendations from assessment and inventory reports. • Initiate restoration, revegetation and stabilization measures on linear developments. • Provide Streamside Management Plans (SMP) for harvesting areas identified in the annual forest development plan update. • Restrict or control development within or along tributary confluences, alluvial fans, floodplains or areas of slope instability (e.g. valley walls). • Retain riparian reserves along specified S4-S6 (FPC riparian class) stream channel reaches in high sensitivity areas or channels identified as having stream temperature concerns.

Endako River

SPECIFIC OBJECTIVES AND STRATEGIES (continued):

Specific Objectives	Specific Strategies
	<ul style="list-style-type: none">• Review and document potential habitat improvement, habitat development and habitat restoration opportunities.• Review resource development plans for compatibility with sensitive habitats in terms of hydrology, water quality, channel stability and riparian condition.

Shovel Creek

SISS 08-2700-140-170

Shovel Creek is a tributary of the Endako River and has a basin area of 371 km². It has had 30.2 km² of its area logged; 5.5 km² of which is recent forestry activity. Mean 7-day flow in the summer is 0.63 m³/s and in winter is 0.48 m³/s. Shovel Creek is an important source of gravel recruitment for Endako River spawning areas and the major concentration of spawning activity takes place immediately downstream from here. Planning objectives and strategies pertinent to Endako River relate also to Shovel Creek.

WATERSHED PLANNING PROFILE

Stream Name	Page
Nithi River	58

Nithi River

GENERAL WATERSHED INFORMATION:

Watershed:	<i>Nithi River</i>	SISS Code:	08-2700-190
Physiographic Area(s):	Nechako Plateau		
Drainage Area (ha):	32,200	Biogeoclimatic Zone(s):	Sub-Boreal Spruce/ Engelmann Spruce- Subalpine Fir
HMA:	Nechako		

WATERSHED HYDROLOGY:

Stream Flows:	Mean Annual	Mean Flood	Mean 7-day low flow			
			Winter		Summer	
(m ³ /s)	1.41	6.8	0.42	NA	0.55	NA
Comments:	Reference for the above data is the stream mouth. See Reference #8 Table 7.					

SALMON ESCAPEMENT:

Species	Historical Max. (yr)	1981-92 Ave.	1981-92 Max.	1969-80 Ave.	Population trend	Rebuilding index
Sockeye	1796 (NA)	109	990 (1983)	470	NA	NA

DEVELOPMENT ACTIVITY:

Type	Level of Concern	Comments	Ref.*
<i>Forestry</i>	<i>High</i>		6
-percent logging	High	15%	8
- ECA status	High		6
- riparian condition/ stream length impacted	Low	Not assessed	6
<i>Agriculture</i>	<i>Low</i>		6
- extent	Low	Localized in lower reaches	6
- riparian condition/ stream length impacted	Low		6

Nithi River

DEVELOPMENT ACTIVITY (continued):

Type	Level of Concern	Comments	Ref.*
- water withdrawal	Low	small existing water demand from irrigation licenses	8
- water quality	Low		6
Urbanization	Low		6
- population level	Low		6
- extent	Low	Some residences at mouth and lower reaches	6
- riparian condition/ stream length impacted	Low		6
- water withdrawal	Low		6
- water quality	Low		6
Placer Mining	Low		6
- extent	Low	None	6
- water quality	Low		6
- riparian condition/ stream length impacted	Low		6
Other Mining	Low		6
- extent	Low		6
- water quality	Low		6
Industrial Development	Low		6
- extent	Low	None	6
- water quality	Low		6
- stream/riparian impacts	Low		6
Linear Development	Low		6
- extent	Low	Road rights-of-way and crossings	6
- stream/riparian impacts	Low		6
Hydro Development	Low		6

Nithi River

DEVELOPMENT ACTIVITY (continued):

Type	Level of Concern	Comments	Ref.*
- extent	Low	None	6
- stream/riparian impacts	Low		6
<i>Other Development</i>	<i>Low</i>		6
- extent	Low	None	6
- stream/riparian impacts	Low		6

CUMULATIVE DEVELOPMENT ACTIVITY:

<i>Cumulative Development</i>	<i>Low</i>		6
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BIOPHYSICAL CONDITIONS:

Type	Level of Concern	Comments	Ref.*
<i>Soils</i>	<i>Low</i>		6
- types		Fraser till (typically clayey) most abundant surface sediment, thick layer of glacial drift	8
<i>Terrain</i>	<i>Low</i>		6
- type		Low relief and expanses of flat or gently rolling terrain, low hills separated by broad, flat valleys	8
<i>Resistance to Change</i>	<i>Low</i>		6
<i>Hydrology</i>	<i>Low</i>	Nithi River (which enters François Lake from the south near the lake outlet) has low flow and aquatic weed concerns. Lower reaches of the south branch often dewater.	8
<i>Channel Stability</i>	<i>Low</i>		6
- type			
<i>Significant Environmental Variables</i>	<i>Low</i>		6

Nithi River

SENSITIVE WATERSHED FEATURES:

Type	Present	Comments	Ref.*
<i>Sensitive Physical Features</i>			
<i>Sensitive Biological Features</i>	✓	Rearing/spawning François Lake rainbow trout stock	6
<i>Unique Features</i>			

SPECIAL CONSIDERATIONS:

Type	Present	Comments	Ref.*
<i>Stock Management</i>	✓		
<i>Enhancement Activity/Opportunity</i>	✓	Nithi River flow control/storage proposed	8
<i>Restoration Activity</i>	✓	Nithi River weed clearance at mouth	8
<i>Native Fishery</i>	✓	Occurs in Stellako River	6
<i>Recreational Fishery</i>	✓	Ocean sport fishery	
<i>Commercial Fishery</i>	✓	Ocean fishery	

RECENT WATERSHED PLANNING/PROJECT INITIATIVES:

Type	Comments	Ref.*
	None	

* See report section 6.0 References Cited

SUMMARY OF HABITAT CONCERNS (no. of high ratings):

Salmon Present	Development Concerns	Biophysical Concerns	Sensitive Watershed Features	Special Considerations
✓			✓	✓(6)

SPECIFIC OBJECTIVES AND STRATEGIES:

Specific Objectives	Specific Strategies
<ul style="list-style-type: none"> • Maintain natural watershed hydrologic characteristics and stream flow regime. • Maintain the natural stream temperature regime. • Maintain the structural and functional integrity of riparian areas. • Maintain slope stability. • Protect stream channels and floodplains from influences of development activities. • Ensure the protection of headwater, ephemeral and intermittent channels; recognizing their influence on watershed stability, hydrology and water quality. • Ensure that the intensity of development activities does not negatively impact the natural watershed ecological processes through site specific or cumulative development. • Ensure the inventory, assessment and implementation of stream restoration and enhancement programs. • Ensure adequate stream flows are present to maintain fisheries productive capacity. • Improve inventories of aquatic resources. • Ensure compatibility of lake foreshore developments with salmon utilization. • Support existing fisheries enhancement programs and activities. • Improve fish passage in the watershed. 	<ul style="list-style-type: none"> • Apply FPC riparian guidelines to agricultural and range use of crown land. • Apply the Land Development Guidelines to residential and industrial developments. • Conduct a stream channel assessment of tributaries to identify potential barriers to fish migration and remove or facilitate access where appropriate. • Conduct and maintain fisheries, habitat (critical) and enhancement inventories. • Conduct detailed gully assessments for specified sensitive channels identified in development plans. • Conduct a minimum flow study. • Develop a Water Management Plan (WMP) that includes a determination of water demand, fisheries/minimum low flow of water storage opportunities and potential impacts of water extraction. • Maintain designated "NO STAKING PLACER RESERVES" for placer mining where identified. • Initiate a watershed restoration assessment and inventory for development of a Watershed Restoration Plan. • Implement watershed restoration plan recommendations from assessment and inventory reports. • Restrict or control development within or along tributary confluences, alluvial fans, floodplains or areas of slope instability (e.g. valley walls). • Review and document potential habitat improvement, habitat development and habitat restoration opportunities. • Review resource development plans for compatibility with sensitive habitats in terms of hydrology, water quality, channel stability and riparian condition.

WATERSHED PLANNING PROFILE

Stream Name	Page
Uncha Creek.	64

Uncha Creek

GENERAL WATERSHED INFORMATION:

Watershed:	<i>Uncha Creek</i>	SISS Code:	08-2700-410
Physiographic Area(s):	Nechako Plateau		
Drainage Area (ha):	61,400	Biogeoclimatic Zone(s):	Sub-Boreal Spruce/ Engelmann Spruce- Subalpine Fir
HMA:	Nechako		

WATERSHED HYDROLOGY:

Stream Flows:	Mean Annual	Mean Flood	Mean 7-day low flow			
			Winter		Summer	
(m ³ /s)	2.68	13.0	0.8	NA	1.04	NA
Comments:	Reference for the above data is the stream mouth. See Reference #8 Table 7.					

SALMON ESCAPEMENT:

Species	Historical Max. (yr)	1981-92 Ave.	1981-92 Max.	1969-80 Ave.	Population trend	Rebuilding index
Sockeye	209(NA)	0	0	0	NA	NA

DEVELOPMENT ACTIVITY:

Type	Level of Concern	Comments	Ref.*
<i>Forestry</i>	<i>High</i>		6
-percent logging	High	approximately 21%	8
- ECA status	High		6
- riparian condition/ stream length impacted	Low	Not assessed	6
<i>Agriculture</i>	<i>Low</i>		6
- extent	Low	Not assessed	6
- riparian condition/ stream length impacted	Low		6

DEVELOPMENT ACTIVITY (continued):

Type	Level of Concern	Comments	Ref.*
- water withdrawal	Low		6
- water quality	Low		6
Urbanization	Low		6
- population level	Low		6
- extent	Low	Not assessed	6
- riparian condition/ stream length impacted	Low		6
- water withdrawal	Low		6
- water quality	Low		6
Placer Mining	Low		6
- extent	Low	None	6
- water quality	Low		6
- riparian condition/ stream length impacted	Low		6
Other Mining	Low	Not assessed	6
- extent	Low		6
- water quality	Low		6
Industrial Development	Low		6
- extent	Low	Not assessed	6
- water quality	Low		6
- stream/riparian impacts	Low		6
Linear Development	Low		6
- extent	Low	Forestry road rights-of-way and crossings	6
- stream/riparian impacts	Low		6
Hydro Development	Low		6
- extent	Low	None	6

DEVELOPMENT ACTIVITY (continued):

Type	Level of Concern	Comments	Ref.*
- stream/riparian impacts	Low		6
<i>Other Development</i>	<i>Low</i>		6
- extent	Low	None	6
- stream/riparian impacts	Low		6

CUMULATIVE DEVELOPMENT ACTIVITY:

<i>Cumulative Development</i>	<i>Low</i>		6
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BIOPHYSICAL CONDITIONS:

Type	Level of Concern	Comments	Ref.*
<i>Soils</i>	<i>Low</i>		6
- types		Fraser till (typically clayey) most abundant surface sediment, thick layer of glacial drift	8
<i>Terrain</i>	<i>Low</i>		6
- type		Low relief and expanses of flat or gently rolling terrain, low hills separated by broad, flat valleys	8
<i>Resistance to Change</i>	<i>Low</i>		6
<i>Hydrology</i>	<i>Low</i>		8
<i>Channel Stability</i>	<i>Low</i>		6
- type			
<i>Significant Environmental Variables</i>	<i>Low</i>		6

SENSITIVE WATERSHED FEATURES:

Type	Present	Comments	Ref.*
<i>Sensitive Physical Features</i>			
<i>Sensitive Biological Features</i>	✓	Rearing/Spawning François Lake rainbow trout stock	6
<i>Unique Features</i>			

SPECIAL CONSIDERATIONS:

Type	Present	Comments	Ref.*
<i>Stock Management</i>	✓		
<i>Enhancement Activity/Opportunity</i>		Not assessed	
<i>Restoration Activity</i>		Not assessed	
<i>Native Fishery</i>	✓	Occurs in Stellako River	6
<i>Recreational Fishery</i>	✓	Ocean sport fishery	
<i>Commercial Fishery</i>	✓	Ocean fishery	

RECENT WATERSHED PLANNING/PROJECT INITIATIVES:

Type	Comments	Ref.*
	None	

* See report section 6.0 References Cited

SUMMARY OF HABITAT CONCERNS (no. of high ratings):

Salmon Present	Development Concerns	Biophysical Concerns	Sensitive Watershed Features	Special Considerations
✓	✓		✓	✓(4)

SPECIFIC OBJECTIVES AND STRATEGIES:

Specific Objectives	Specific Strategies
<ul style="list-style-type: none"> • Maintain natural watershed hydrologic characteristics and stream flow regime. • Maintain the natural stream temperature regime. • Maintain the structural and functional integrity of riparian areas. • Maintain slope stability. • Protect stream channels and floodplains from influences of development activities. • Ensure the protection of headwater, ephemeral and intermittent channels; recognizing their influence on watershed stability, hydrology and water quality. • Ensure that the intensity of development activities does not negatively impact the natural watershed ecological processes through site specific or cumulative development. • Ensure the inventory, assessment and implementation of stream restoration and enhancement programs. • Ensure adequate stream flows are present to maintain fisheries productive capacity. • Improve inventories of aquatic resources. • Ensure compatibility of lake foreshore developments with salmon utilization. • Support existing fisheries enhancement programs and activities. • Improve fish passage in the watershed. 	<ul style="list-style-type: none"> • Apply FPC riparian guidelines to agricultural and range use of crown land. • Apply the Land Development Guidelines to residential and industrial developments. • Conduct a stream channel assessment of tributaries to identify potential barriers to fish migration and remove or facilitate access where appropriate. • Conduct and maintain fisheries, habitat (critical) and enhancement inventories. • Conduct detailed gully assessments for specified sensitive channels identified in development plans. • Maintain designated "NO STAKING PLACER RESERVES" for placer mining where identified. • Initiate a watershed restoration assessment and inventory for development of a Watershed Restoration Plan. • Implement watershed restoration plan recommendations from assessment and inventory reports. • Restrict or control development within or along tributary confluences, alluvial fans, floodplains or areas of slope instability (e.g. valley walls). • Review and document potential habitat improvement, habitat development and habitat restoration opportunities. • Review resource development plans for compatibility with sensitive habitats in terms of hydrology, water quality, channel stability and riparian condition.

WATERSHED PLANNING PROFILE

Stream Name	Page
Nadina River	70

Nadina River

GENERAL WATERSHED INFORMATION:

Watershed:	<i>Nadina River</i>	SISS Code:	08-2700-990
Physiographic Area(s):	Nechako Plateau/ Sibola Range		
Drainage Area (ha):	109,300	Biogeoclimatic Zone(s):	Sub-Boreal Spruce/ Engelmann Spruce- Subalpine Fir/Alpine Tundra
HMA:	Nechako		

WATERSHED HYDROLOGY:

Stream Flows:	Mean Annual	Mean Flood	Mean 7-day low flow			
			Winter		Summer	
(m³/s)	8.27	83.8	1.62	Apr	2.04	Oct
Comments:	Reference for data is the stream mouth. See Reference # 3, p. 11, Table 7 and Appendix B. Low flow months for upper Nadina.					

SALMON ESCAPEMENT:

Species	Historical Max. (yr)	1981-92 Ave.	1981-92 Max.	1969-80 Ave.	Population trend	Rebuilding potential
Sockeye	61,074	16,916	61,074	15,207	Static	Medium
Chinook	25(1962)	4	15(1988)	NA	Unknown	High

DEVELOPMENT ACTIVITY:

Type	Level of Concern	Comments	Ref.*
<i>Forestry</i>	<i>High</i>		2
- percent logging	High	23 % on average over the total drainage. Lower Nadina (below Nadina Lake) most heavily logged to date.	4
- ECA status	High	Logging managed under Local Resource Use Plan	3
- riparian condition /stream length impacted	High	High summer water temperature concerns on mainstem and some tributaries	1, 2, 3

DEVELOPMENT ACTIVITY (continued):

Type	Level of Concern	Comments	Ref.*
<i>Agriculture</i>	<i>Low</i>		2
- extent	Low	None	2
- riparian condition/ stream length impacted	Low		2, 4
- water withdrawal	Low		2
- water quality	Low		2
<i>Urbanization</i>	<i>Low</i>		2
- population level	Low		2
- extent	Low	None	2
- riparian condition/ stream length impacted	Low		2
- water withdrawal	Low		2
- water quality	Low		2
<i>Placer Mining</i>	<i>Low</i>		2
- extent	Low	None	2
-water quality	Low		2
- riparian condition/ stream length impacted	Low		2
<i>Other Mining</i>	<i>Low</i>		2
- extent	Low	Some known deposits and ongoing exploration.	2, 3
- water quality	Low		2
<i>Industrial Development</i>	<i>Low</i>		2
- extent	Low	None	2
- water quality	Low		2
- stream/riparian impacts	Low		2
<i>Linear Development</i>	<i>High</i>		2

Nadina River

DEVELOPMENT ACTIVITY (continued):

Type	Level of Concern	Comments	Ref.*
- extent	High	Extensive forestry roads and crossings	2
- stream/riparian impacts	Low		2
Hydro Development	Low		
- extent	Low	None	2
- stream/riparian impacts	Low		
Other Development	Low		
- extent	Low	None	2
- stream/riparian impacts	Low		

CUMULATIVE DEVELOPMENT ACTIVITY:

Cumulative Development	Low		2
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BIOPHYSICAL CONDITIONS:

Type	Level of Concern	Comments	Ref.*
Soils	Low		2
- types		Fraser till, typically clayey, is the most abundant soil type	2, 4
Terrain	Low		2
- type		Low relief and expanses of flat or gently rolling terrain in lower reaches, upper reaches in mountainous u-shaped valley, glaciofluvial deposits	2, 4
Resistance to Change	Low	Lake headed system, large lakes	2
Hydrology	High	Low winter and summer flows, peak flows buffered by lakes except for Shelford and Gates creeks	4, 5

BIOPHYSICAL CONDITIONS(continued):

Type	Level of Concern	Comments	Ref.*
<i>Channel Stability</i>	<i>Low</i>		2
- type		Stable channel	2, 5
<i>Significant Environmental Variables</i>	<i>High</i>	Elevated summer water temperatures in mainstem and Poplar Creek	2, 3

SENSITIVE WATERSHED FEATURES:

Type	Present	Comments	Ref.*
<i>Sensitive Physical Features</i>	✓	Tributaries to lower river provide cooling flows	2
<i>Sensitive Biological Features</i>	✓	Early sockeye run-warm water concern	2
<i>Unique Features</i>			2

SPECIAL CONSIDERATIONS:

Type	Present	Comments	Ref.*
<i>Stock Management</i>	✓	Early run sockeye possibly extinct. Escapements being increased by controlling commercial fishery	1
<i>Enhancement Activity/Opportunity</i>	✓	Water temperature and Fish/Forestry research, sockeye spawning channel at outlet of Nadina Lake, instream gravel placement	2, 3
<i>Restoration Activity</i>			
<i>Native Fishery</i>	✓	Occurs in Stellako, Nechako and Fraser rivers	2
<i>Recreational Fishery</i>	✓	Ocean sport fishery	
<i>Commercial Fishery</i>	✓	Ocean fishery	

Nadina River

RECENT WATERSHED PLANNING/PROJECT INITIATIVES:

Type	Comments	Ref.*
LRUP completed	Nadina River Watershed Local Resource Use Plan completed June, 1993	3
DFO study	Ongoing (1994-) water temperature monitoring by DFO Science Branch	2

* See report section 6.0 References Cited

SUMMARY OF HABITAT CONCERNS (no. of high ratings):

Salmon Present	Development Concerns	Biophysical Concerns	Sensitive Watershed Features	Special Considerations
✓	✓(2)	✓(2)	✓	✓(5)

SPECIFIC OBJECTIVES AND STRATEGIES:

Specific Objectives	Specific Strategies
<ul style="list-style-type: none"> • Maintain natural watershed hydrologic characteristics and stream flow regime. • Maintain the natural stream temperature regime. • Maintain the structural and functional integrity of riparian areas. • Maintain slope stability. • Maintain or improve water quality. • Protect stream channels and floodplains from influences of development activities. • Ensure the protection of headwater, ephemeral and intermittent channels; recognizing their influence on watershed stability, hydrology and water quality. • Ensure protection of critical aquatic habitats including: floodplain, off-channel sites, non-natal tributaries and other areas of biological significance. 	<ul style="list-style-type: none"> • Apply the Watershed Assessment Procedures (WAP) to assess past and potential for future impacts of lands use activities. • Conduct and maintain fisheries, habitat(critical) and enhancement inventories. • Develop a Water Management Plan (WMP) that includes a determination of water demand, fisheries/ minimum low flow of water storage opportunities and potential impacts of water extraction. • Develop a detailed riparian management plan (RMP) for the Nadina River watershed identifying areas requiring site specific prescriptions. • Develop a Water Management Plan (WMP) that includes a determination of water demand, fisheries/minimum low flow of water storage opportunities and potential impacts of water extraction. • Distribute timber harvesting opportunities throughout the available range in elevation to maintain natural hydrologic conditions.

SPECIFIC OBJECTIVES AND STRATEGIES (continued):

Specific Objectives	Specific Strategies
<ul style="list-style-type: none"> • Ensure that the intensity of development activities does not negatively impact the natural watershed ecological processes through site specific or cumulative development. • Ensure the inventory, assessment and implementation of stream restoration and enhancement programs. • Improve inventories of aquatic resources. • Support existing fisheries enhancement programs and activities. 	<ul style="list-style-type: none"> • Document, map and assess watershed terrain and soils conditions and their hazard risk for upper Nadina. • Ensure that rate of development (forestry, urban, agriculture, etc.) is balanced against hydrologic recovery to maintain cumulative ECA at or below 25% (total watershed drainage area). • Maintain designated "NO STAKING PLACER RESERVES" for placer mining where identified. • Implement a water drainage management plan for sensitive soils, stream crossings or other areas specified in development plans. • Implement watershed restoration plan recommendations from assessment and inventory reports. • Initiate a watershed restoration assessment and inventory for development of a Watershed Restoration Plan. • Initiate restoration, revegetation and stabilization measures on linear developments. • Provide Streamside Management Plans (SMP) for harvesting areas identified in the annual forest development plan update. • Restrict or control development within or along tributary confluences, alluvial fans, floodplains or areas of slope instability (e.g. valley walls). • Retain riparian reserves along specified S4-S6 (FPC riparian class) stream channel reaches in high sensitivity areas or channels identified as having stream temperature concerns. • Review and document potential habitat improvement, habitat development and habitat restoration opportunities. • Review resource development plans for compatibility with sensitive habitats in terms of hydrology, water quality, channel stability and riparian condition.

Nadina River

Tagetochlain Creek

SISS 08-2700-990-250

Tagetochlain Creek is a tributary of Nadina River and has a basin area of 176 km² at its mouth. Forest harvesting is the prime concern in this region with the majority of the 53.1 km² of logging having taken place between 1982 and 1991. The area has been 40% logged in total. Mean 7-day flow in the summer is 0.30 m³/s and in winter is 0.23 m³/s. Planning objectives and strategies pertinent to Nadina River relate also to Tagetochlain Creek.

List of Relevant Environmental Guidelines*

1. Environmental Guidelines for Beef Producers in British Columbia. B.C. Ministry of Agriculture, Fisheries and Food, B.C. Association of Cattle Feeders, B.C. Cattlemen's Association, and B.C. Federation of Agriculture. 1992.
2. Why Keep Livestock out of Watercourses? B.C. Ministry of Agriculture, Fisheries and Food. 1990.
3. Placer Mining Regulations and Guidelines for the Protection of Fisheries Resources in British Columbia. Department of Fisheries and Oceans. 1982.
4. Guide to Legislation and Approvals in Placer Mining. Ministry of Energy, Mines and Petroleum Resources. 1986.
5. Guidelines for Mineral Exploration: Environmental, Reclamation and Approval Requirements. Ministry of Energy, Mines and Petroleum Resources. 1992.
6. Environmental Objectives and Procedures for Water Crossings. B.C. Ministry of Environment. 1984.
7. Culvert Guidelines: Recommendations for the Design and Installation of Culverts in British Columbia to Avoid Conflict with Anadromous Fish. Department of Fisheries and Oceans. 1978.
8. Fact Sheets Prepared for B.C. Ministry of Transportation and Highways - Seminars on Highway Maintenance. Ministry of Transportation and Highways. 1989.
9. Guidelines for the Protection of Fish and Fish Habitat During Bridge Maintenance Operations in British Columbia. Department of Fisheries and Oceans. 1991.
10. Guidelines for the use of Explosives in Canadian Fisheries Waters. Department of Fisheries and Oceans. 1994 (Draft).
11. Land Development Guidelines for the Protection of Aquatic Habitat. Department of Fisheries and Oceans and Ministry of Environment, Lands and Parks. 1993.
12. A Handbook for Fish Habitat Protection on Forest Lands in B.C. Department of Fisheries and Oceans. 1981.
13. A Handbook for Forest Roadside Erosion Control in B.C. Ministry of Forests. 1980.
14. Guidelines for the Protection of Fish and Fish Habitat at Small Hydro Developments. Triton Environmental Consultants Ltd. for Department of Fisheries and Oceans. 1991.
15. A Guide for Management of Landslide-Prone Terrain in the Pacific Northwest. Ministry of Forests. 1991.
16. Forest Practices Code of B.C. Act, Regulations, Standards and Guidebooks. Ministry of Forests. 1995.
17. Stream Stewardship. A guide for planners and developers. Department of Fisheries and Oceans and Ministry of Environment, Lands and Parks. 1993.

* Please Note: This is not intended to be an exhaustive list. However, it highlights the principal operational and habitat protection guidelines presently in use.