5.7 Chief Paul Creek

Data Summary Sheet

✓	Yes	x	No	?	Unknown

HISTORY

✓	Was watershed logged prior to 1988?
x	Is watershed within a municipal boundary?
x	Have FRBC funds been spent on watershed?
?	Are FRBC applications pending for work on watershed?

FISHERIES INFORMATION

?	Have forest activities impacted fisheries resources?
?	Does the watercourse have existing fisheries values?
?	Does the watercourse have historical fisheries values?
?	Is the watercourse accessible to salmon?
?	Is the watercourse habitat suitable for salmon?
?	Are there enhancement opportunities for salmon?
?	Is the watercourse habitat suitable for trout and char?
?	Are there enhancement opportunities for trout and char?

WATER QUALITY

?	Does the watercourse have an adequate water quality?
	If not, can it be rehabilitated?
?	Does the watercourse have an adequate food supply?
x	If not, can it be restored?
x	Was periphyton community surveyed?
x	Was invertebrate community surveyed?
x	Was water chemistry surveyed?
x	Was sediment or intergravel habitat surveyed?

x	Have there been scientific surveys in the stream?
x	Have nutrient dosing pots been placed in the stream?

HYDROLOGICAL FACTORS

?	Are there forest-related activity impacts?
?	Are there existing Water Rights (domestic, power, community watershed)?
?	Is there year-round flow potential?
?	Are there any existing hydraulic structures (dams, wiers, bridges, etc.)?
?	Is there a debris-flow potential?

RIPARIAN ZONE

✓	Have forestry activities had negative impact on riparian vegetation?
x	Is there existing well-established riparian vegetation?
?	Are soil conditions amenable to re-vegetation?
✓	Is the channel morphology appropriate for re-vegetation?
✓	Are unrestricted reaches present?
?	Would re-vegetation be expected to benefit fish/wildlife habitat?

TERRESTRIAL PROCESS

✓	Have slopes >60% been logged?
✓	Are roads built on slopes >60%?
x	Is bedrock-geology of basin stable?
?	Has basin experienced landslides?
?	Have landslides entered mainstream?

H	High	M	Medium	L	Low	U	Unknown

CREEK RATING

L	Impacts by logging
U	Fish resources
L	Rehabilitation potential

5.7.1 Factors of Concern

Fisheries

MOELP studies report the presences of rainbow trout, Dolly Varden/bull trout, sculpins, and coho fry in Chief Paul Creek. Chief Paul Creek flows into the Lillooet river on the right bank, approximately 37 km upstream of Harrison Lake.

Hydrological

The Chief Paul Creek drainage was observed from the air reconnaissance. No water licenses currently exists on Chief Paul Creek. No further recommendations were made regarding this small drainage.

Water Quality

No water quality was conducted on this creek, nor was it monitored for basic physical or chemical parameters. If required, future monitoring should include water quality, periphyton, invertebrate and intergravel studies, together with a comparison of pH and nutrient values and community structures.

Riparian Zone

The channel of Chief Paul Creek is very braided and undefined. Clearcuts are present on adjacent slopes at high elevations where the establishment of newly planted trees is very slow. There is evidence from the air photos of siltation from surface runoff, particularly on the south (right) slope.

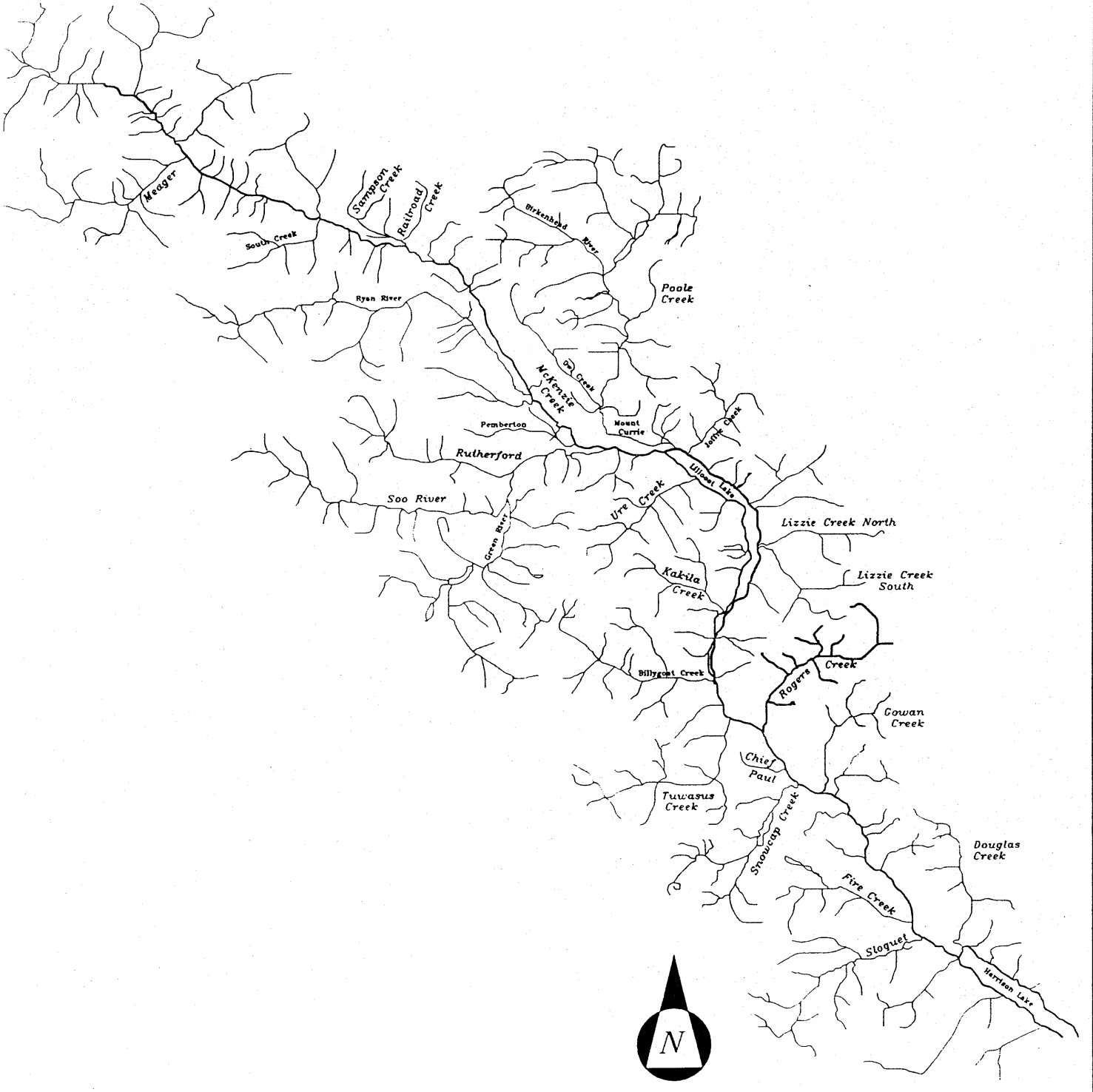
Logging History

A record of logging activities summarized from the Ministry of Forests Integrated Silviculture Information System follows:

Year	Total Area Logged (ha)
1977	6
1975	179
1963	64
1961	117
1960	38

Lillooet River Watershed

Rogers Creek



5.8 Rogers Creek

Data Summary Sheet

✓	Yes	x	No	?	Unknown

HISTORY

✓	Was watershed logged prior to 1988?
✓	Has logging impacted creeks?
x	Is watershed within a municipal boundary?
x	Have FRBC funds been spent on watershed?
?	Are FRBC applications pending for work on watershed?

FISHERIES INFORMATION

✓	Have forest activities impacted fisheries resources?
✓	Does the watercourse have existing fisheries values?
✓	Does the watercourse have historical fisheries values?
✓	Is the watercourse accessible to salmon?
✓	Is the watercourse habitat suitable for salmon?
✓	Are there enhancement opportunities for salmon?
✓	Is the watercourse habitat suitable for trout and char?
✓	Are there enhancement opportunities for trout and char?

WATER QUALITY

✓	Does the watercourse have an adequate water quality?
	If not, can it be rehabilitated?
?	Does the watercourse have an adequate food supply?
	If not, can it be restored?
x	Was periphyton community surveyed?
x	Was invertebrate community surveyed?
✓	Was water chemistry surveyed?

x	Was sediment or intergravel habitat surveyed?
✓	Have there been scientific surveys in the stream?
x	Have nutrient dosing pots been placed in the stream?

HYDROLOGICAL FACTORS

✓	Are there forest-related activity impacts?
✓	Are there existing Water Rights (domestic, power, community watershed)?
✓	Is there year-round flow potential?
✓	Are there any existing hydraulic structures (dams, wiers, bridges, etc.)?
✓	Is there a debris-flow potential?

RIPARIAN ZONE

✓	Have forestry activities had negative impact on riparian vegetation?
x	Is there existing well-established riparian vegetation?
✓	Are soil conditions amenable to re-vegetation?
✓	Is the channel morphology appropriate for re-vegetation?
✓	Are unrestricted reaches present?
✓	Would re-vegetation be expected to benefit fish/wildlife habitat?

TERRESTRIAL PROCESS

✓	Have slopes >60% been logged?
✓	Are roads built on slopes >60%?
✓	Is bedrock-geology of basin stable?
✓	Has basin experienced landslides?
?	Have landslides entered mainstream?

H	High	M	Medium	L	Low	U	Unknown

CREEK RATING

H	Impacts by logging
M,U	Fish resources
M	Rehabilitation potential

5.8.1 Factors of Concern

Fisheries

Region 2 fisheries section contains baseline data on lower portion of Rogers Creek. Helicopter reconnaissance revealed some potential for riparian habitat improvement in upper watershed. Further assessment is required to establish background data on habitat condition and fish distribution if restoration project proposed. Rogers Creek appears similar in character to Gowan and Lizzie Creeks.

This area is currently being logged. Baseline habitat and fish data is available through MOELP. Electroshocking done by the MOELP FISC studies did not catch any fish. However, the system needs further assessment of enhancement opportunities.

Hydrological

Rogers Creek is a moderately steep mountain creek with a watershed area of approximately 150 km^2, is a tributary to the Lillooet River at 38 km upstream of Harrison Lake. The watershed has a south to southwest aspect rising from an elevation about 150 m at its mouth to 2,300 m at its headwaters (on Tynemouth Mt.) over its 29 km channel length. The alluvial fan formed near its mouth provides about 1 km of mild sloped channel.

The Rogers Creek watershed was been clearcut logged extensively. There has been some regrowth however present clearcuts may increase sediment loading and peak flows in the creek. In addition, a BC Hydro ROW crosses the creek near its mouth.

Four creek crossings including 2 bridges have been identified. All crossings should be inspected by a Professional Engineer (Hydrological) to find out if the bridge or culvert can pass the 100 year peak flows and to make recommendations for any improvements including removal. There are at least 6 lakes within the watershed which may provide an opportunity to construct low dams to facilitate the augmentation of summer flows. Rogers Creek has existing water rights (Z102126) that may complicate future instream work.

The overall steep slope (average 8%) and existence of steep sidewalls (some clearcut) could feed material and sustain debris-laden floods under the right conditions. Numerous valley wall gulleys connect to the

creek providing a source of sediment. Prior to proceeding with instream works, a limited gulley and channel assessment should be carried out in the field.

Water Quality

This creek was surveyed for the basic parameters and some water chemistry was conducted. The creek has a moderate to low level of nutrients. Its turbidity was very low, indicating clear water. No detailed water quality was conducted on this creek, nor was it monitored for pH or dissolved oxygen. Future monitoring should include water quality, periphyton, invertebrate and DO and intergravel studies, together with a comparison of pH and nutrient values and community structures.

Riparian Zone

The flanks of the valley through which Rogers Creek flows have been extensively clear-cut, with cut-blocks extending into the subalpine elevations. At some locations the creek channel is unrestricted, allowing meandering and braiding. This presents good opportunities for enhancement of riparian vegetation, especially in those areas where no riparian leave strip was respected. Trees on some of the re-planted cut-blocks are growing well, a good predictor for the long-term stability of enhancement efforts.

Logging History

The Rogers Creek drainage has been logged extensively in the early 1960's and again in the mid 1980's. Total area logged per year is presented below as summarized from the Ministry of Forests Integrated Silviculture Information System.

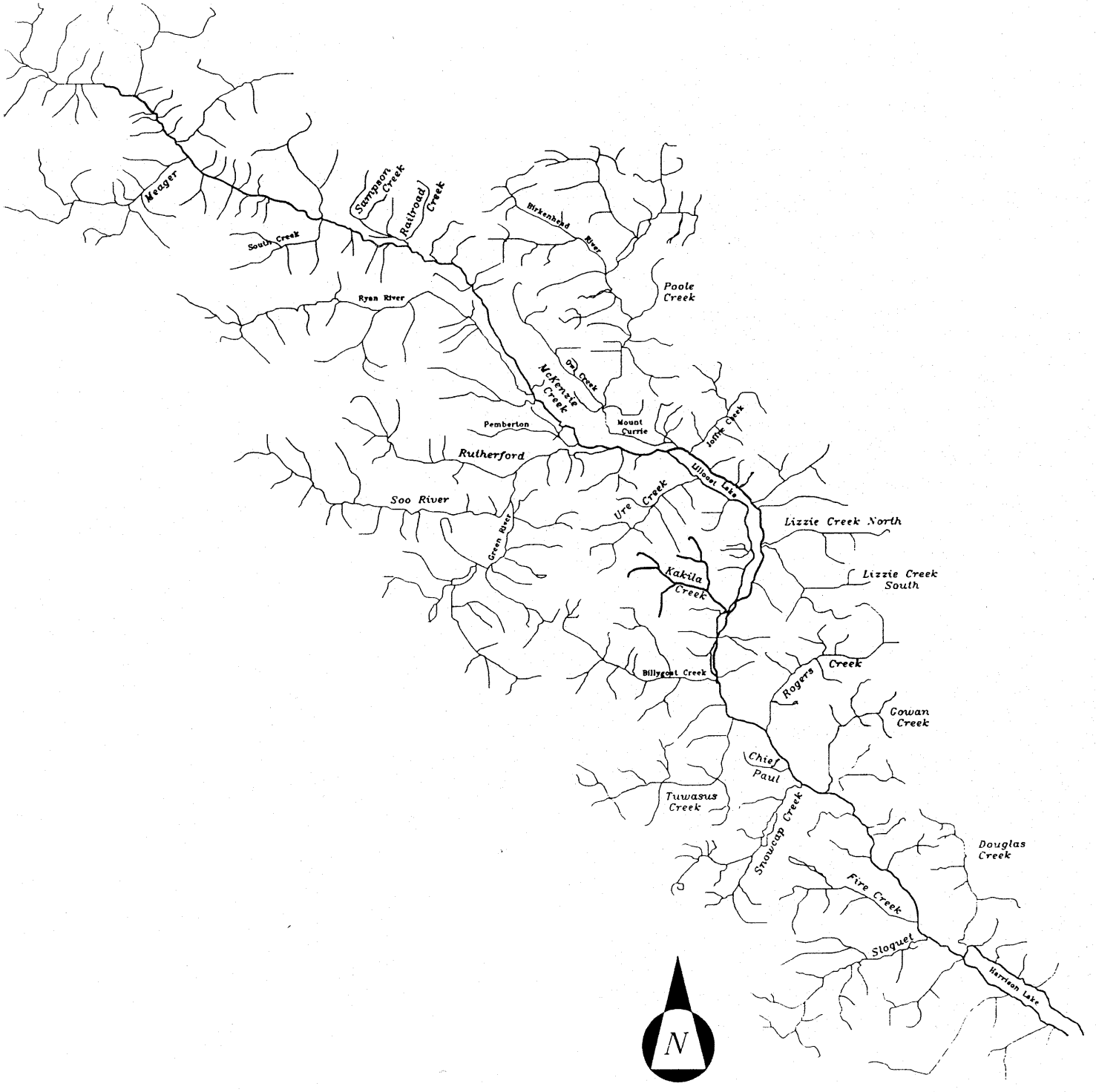
Year	**Total Area Logged (ha)**
1987	15
1986	98
1985	149
1984	191
1977	2
1965	24
1964	405
1962	131.6
1961	23

Watershed Assessment Report Sheet

	(1)	(2)
Watershed Name?	Rogers Creek	
Map units are in: (1=km. and sq.km.; 2=m. and ha.)	1	
Total watershed area (TA)	158.6	sq.km.
Peak Flow		
Area below 300 m.	1.2	sq.km.
Area between 300 and 800 m.	27.4	sq.km.
Area above 800 m.	130	sq.km.
Road length between 300 and 800 m. (not used)	29.9	km.
Surface Erosion		
Total road length	53	km.
Length of road on erodable soils?	3.8	km.
Roads within 100 m. of a stream?	11.6	km.
Number of active stream crossings?	42	
Riparian Buffer		
Total stream length?	228.7	km.
Length of stream logged?	14.1	km.
Total length of fish bearing streams?	179	km.
Length of fish bearing streams logged?	11.6	km.
Length of mainstem?	30.5	km.
Length of mainstem logged?	12.5	km.
Landslides		
Length of road on unstable terrain?	3.8	km.
Headwaters		
Length of headwater streams logged?	11.2	km.
Number of crossings on headwater streams?	98	

Lillooet River Watershed

Kakila Creek



5.9 Kakila Creek

Data Summary Sheet

✓	Yes	x	No	?	Unknown

HISTORY

✓	Was watershed logged prior to 1988?
x	Is watershed within a municipal boundary?
x	Have FRBC funds been spent on watershed?
?	Are FRBC applications pending for work on watershed?

FISHERIES INFORMATION

✓	Have forest activities impacted fisheries resources?
✓	Does the watercourse have existing fisheries values?
✓	Does the watercourse have historical fisheries values?
✓	Is the watercourse accessible to salmon?
✓	Is the watercourse habitat suitable for salmon?
?	Are there enhancement opportunities for salmon?
✓	Is the watercourse habitat suitable for trout and char?
?	Are there enhancement opportunities for trout and char?

WATER QUALITY

?	Does the watercourse have an adequate water quality?
	If not, can it be rehabilitated?
?	Does the watercourse have an adequate food supply?
	If not, can it be restored?
x	Was periphyton community surveyed?
x	Was invertebrate community surveyed?
x	Was water chemistry surveyed?
x	Was sediment or intergravel habitat surveyed?

x	Have there been scientific surveys in the stream?
x	Have nutrient dosing pots been placed in the stream?

HYDROLOGICAL FACTORS

✓	Are there forest-related activity impacts?
x	Are there existing Water Rights (domestic, power, community watershed)?
✓	Is there year-round flow potential?
✓	Are there any existing hydraulic structures (dams, wiers, bridges, etc.)?
✓	Is there a debris-flow potential?

RIPARIAN ZONE

✓	Have forestry activities had negative impact on riparian vegetation?
x	Is there existing well-established riparian vegetation?
✓	Are soil conditions amenable to re-vegetation?
✓	Is the channel morphology appropriate for re-vegetation?
✓	Are unrestricted reaches present?
✓	Would re-vegetation be expected to benefit fish/wildlife habitat?

TERRESTRIAL PROCESS

✓	Have slopes >60% been logged?
✓	Are roads built on slopes >60%?
x	Is bedrock-geology of basin stable?
?	Has basin experienced landslides?
?	Have landslides entered mainstream?

H	High	M	Medium	L	Low	U	Unknown

CREEK RATING

U	Impacts by logging
M,L	Fish resources
U	Rehabilitation potential

5.9.1 Factors of Concern

Fisheries

The MOELP has baseline habitat and fish data. Kakila requires further assessment to determine enhancement opportunities. MOELP FISC studies report the presence of Rocky Mountain whitefish, Dolly Varden/bull trout, coho, sculpins and other unidentified trout. Electroshocking and angling techniques were used.

Hydrological

Kakila Creek is a steep mountain creek with a watershed area of approximately 85 km^2, and is tributary to the northern end of Little Lillooet Lake. The watershed has a south to west to southwest aspect rising from an elevation about 200 m at its mouth on Little Lillooet Lake to 2,530 m at its headwaters on Mount Neal. The alluvial fan formed near its mouth provides about 1 km of mild sloped channel.

One creek crossings has been identified and should be inspected by a Professional Engineer (Hydrological) to find out if the bridge or culvert can pass the 100 year peak flows and to make recommendations for any improvements including removal.

There are at least 11 lakes within the watershed which may provide an opportunity to construct low dams to facilitate the augmentation of summer flows. Kakila Creek does not have any water rights and is not a designated community watershed.

The overall steep slope and existence of steep sidewalls could feed material and sustain debris-laden floods under the right conditions. Numerous valley wall gulleys connect to the creek providing a source of sediment. Prior to proceeding with instream works, a limited gulley and channel assessment should be carried out in the field.

Water Quality

No water quality was conducted on this creek, nor was it monitored for basic physical or chemical parameters. Future monitoring should include water quality, periphyton, invertebrate and intergravel studies, together with a comparison of pH and nutrient values and community structures.

Logging History

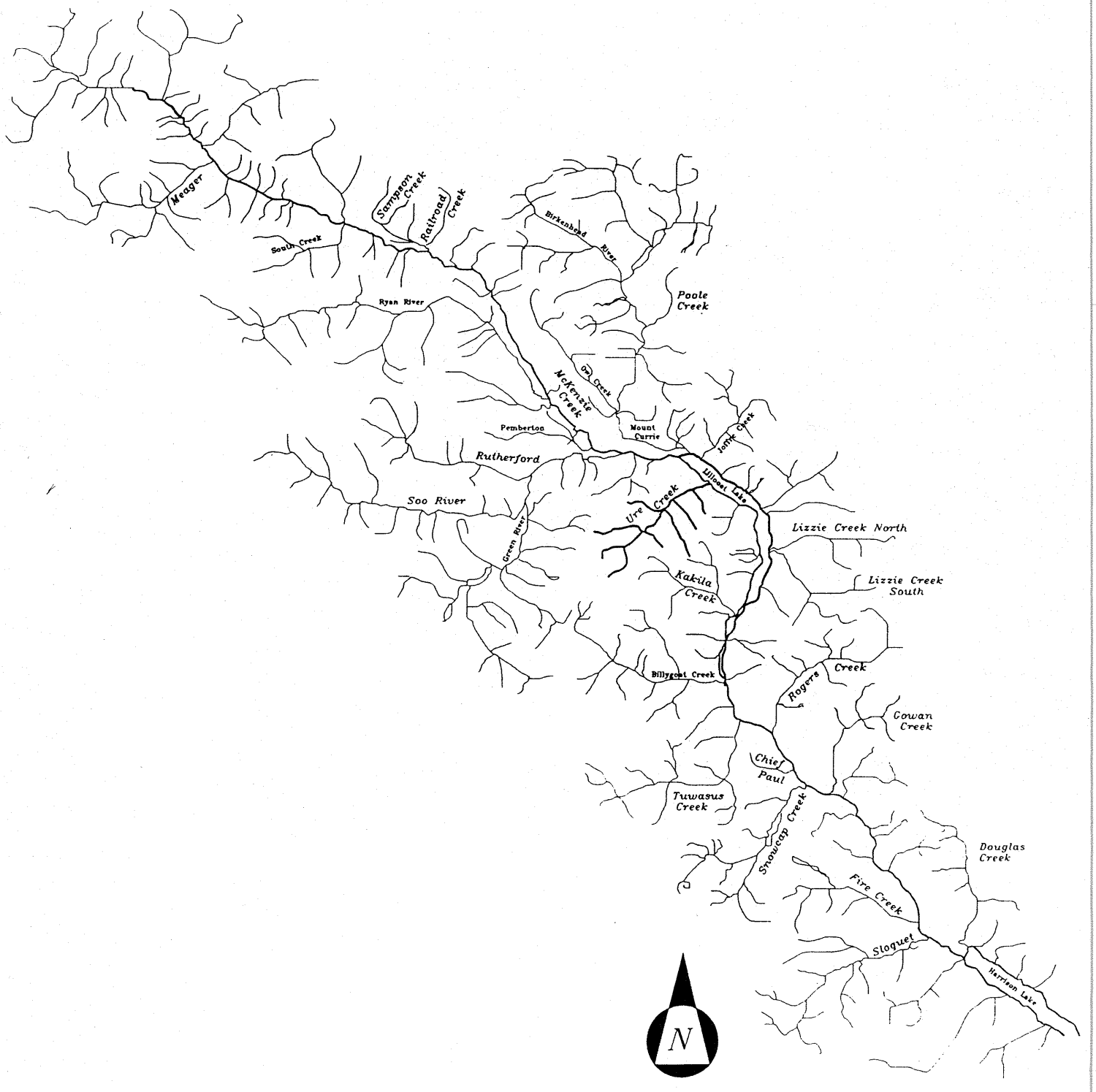
The Kakila Creek watershed was clearcut logged in the lower reaches and within the catchment area of an unnamed tributary (located about 3 km upstream of mouth of Kakila Creek).

Watershed Assessment Report Sheet

	(1)	(2)
Watershed Name?	Kakila Creek	
Map units are in: (1=km. and sq.km.; 2=m. and ha.)	1	
Total watershed area (TA)	85	sq.km.
Peak Flow		
Area below 300 m.	0.6	sq.km.
Area between 300 and 800 m.	5.3	sq.km.
Area above 800 m.	29.5	sq.km.
Road length between 300 and 800 m. (not used)	7.34	km.
Surface Erosion		
Total road length	14.04	km.
Length of road on erodable soils?	0.64	km.
Roads within 100 m. of a stream?	3.3	km.
Number of active stream crossings?	12	
Riparian Buffer		
Total stream length?	71.3	km.
Length of stream logged?	5.52	km.
Total length of fish bearing streams?	45.2	km.
Length of fish bearing streams logged?	4.9	km.
Length of mainstem?	6.7	km.
Landslides		
Length of road on unstable terrain?	0.64	km.
Headwaters		
Length of headwater streams logged?	3.54	km
Number of crossings on headwater streams?	0.17	

Lillooet River Watershed

Ure Creek



5.10 Ure Creek

Data Summary Sheet

✓	Yes	x	No	?	Unknown

HISTORY

✓	Was watershed logged prior to 1988?
x	Is watershed within a municipal boundary?
x	Have FRBC funds been spent on watershed?
?	Are FRBC applications pending for work on watershed?

FISHERIES INFORMATION

✓	Have forest activities impacted fisheries resources?
✓	Does the watercourse have existing fisheries values?
✓	Does the watercourse have historical fisheries values?
?	Is the watercourse accessible to salmon?
?	Is the watercourse habitat suitable for salmon?
?	Are there enhancement opportunities for salmon?
✓	Is the watercourse habitat suitable for trout and char?
?	Are there enhancement opportunities for trout and char?

WATER QUALITY

?	Does the watercourse have an adequate water quality?
	If not, can it be rehabilitated?
?	Does the watercourse have an adequate food supply?
	If not, can it be restored?
x	Was periphyton community surveyed?
x	Was invertebrate community surveyed?
x	Was water chemistry surveyed?
x	Was sediment or intergravel habitat surveyed?

x	Have there been scientific surveys in the stream?
x	Have nutrient dosing pots been placed in the stream?

HYDROLOGICAL FACTORS

✓	Are there forest-related activity impacts?
x	Are there existing Water Rights (domestic, power, community watershed)?
✓	Is there year-round flow potential?
x	Are there any existing hydraulic structures (dams, wiers, bridges, etc.)?
✓	Is there a debris-flow potential?

RIPARIAN ZONE

✓	Have forestry activities had negative impact on riparian vegetation?
✓	Is there existing well-established riparian vegetation?
✓	Are soil conditions amenable to re-vegetation?
✓	Is the channel morphology appropriate for re-vegetation?
✓	Are unrestricted reaches present?
✓	Would re-vegetation be expected to benefit fish/wildlife habitat?

TERRESTRIAL PROCESS

✓	Have slopes >60% been logged?
✓	Are roads built on slopes >60%?
x	Is bedrock-geology of basin stable?
?	Has basin experienced landslides?
?	Have landslides entered mainstream?

H	High	**M**	Medium	**L**	Low	**U**	Unknown

CREEK RATING

M	Impacts by logging
U	Fish resources
U	Rehabilitation potential

5.10.1 Factors of Concern

Fisheries

There is limited fisheries information available on Ure Creek. Helicopter reconnaissance revealed some potential for riparian habitat improvement in upper watershed.

Hydrological

Ure Creek is a moderately steep mountain creek with a watershed area of approximately 130 km^2, is a tributary to Lillooet Lake. The watershed has a northeast aspect rising from an elevation about 200 m at its mouth on Lillooet Lake to 2,900 m at its headwaters on Wedge Mountain, Mount Weart, Mount Moe, Eureka Mountain). The alluvial fan formed near its mouth provides about 1 km of mild sloped channel. The Ure Creek watershed was clearcut logged in the lower reaches (the upper reaches are within Garibaldi Provincial Park). No creek crossings have been identified.

There are at least 10 lakes within the watershed which may provide an opportunity to construct low dams to facilitate the augmentation of summer flows. Ure Creek does not have any water rights and is not a designated community watershed.

Water Quality

No water quality was conducted on this creek, nor was it monitored for basic physical or chemical parameters. Future monitoring should include water quality, periphyton, invertebrate and intergravel studies, together with a comparison of pH and nutrient values and community structures.

Riparian Zone

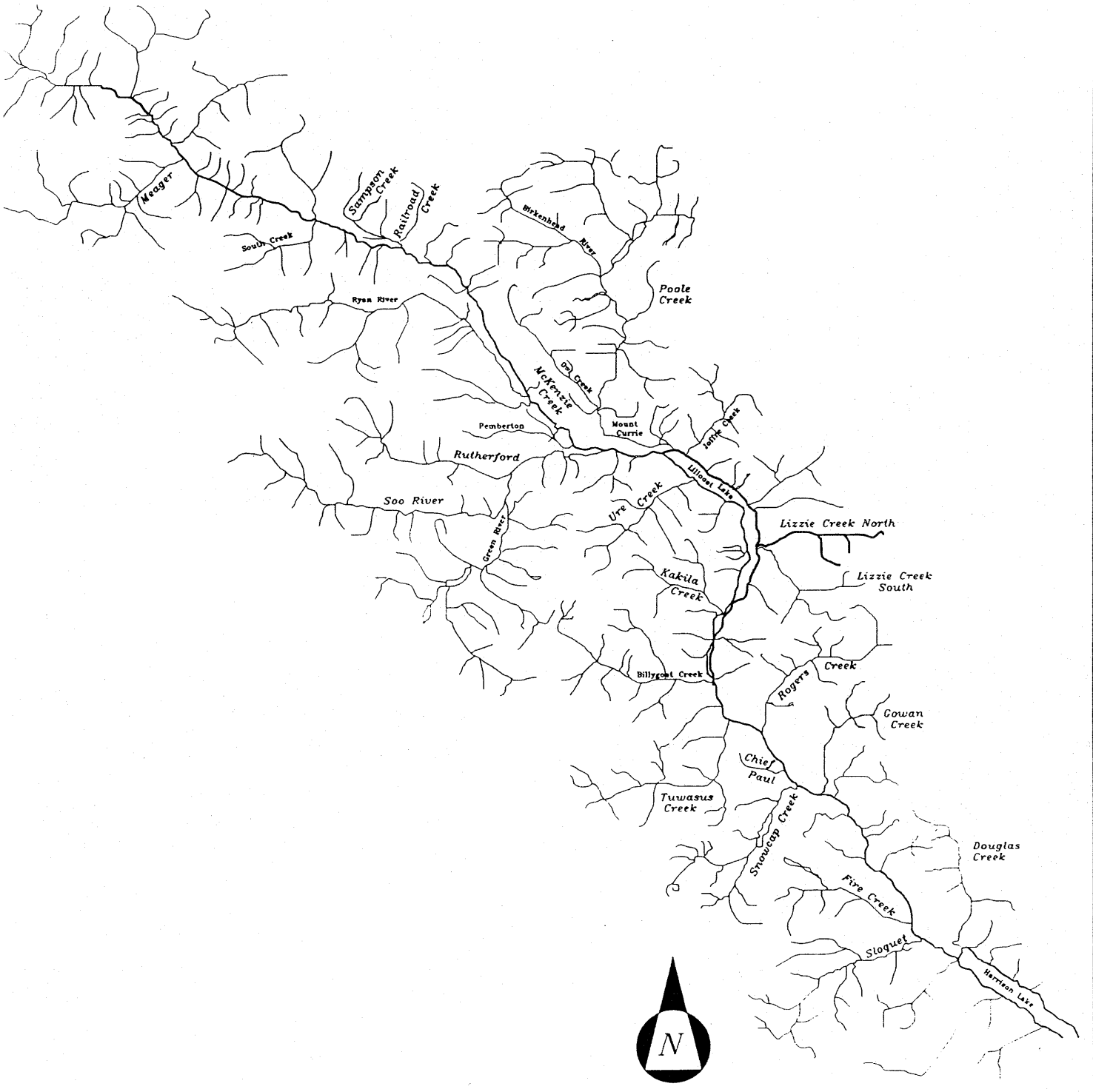
Ure Creek flows relatively unrestricted through a U-shaped valley. Forest growth is generally quite dense up to the creekbed. However, a badly eroding cut-block is found between 1.3 and 2.6 km upstream from Lillooet Lake. Here, only a very thin riparian strip remains on the right (south) bank. Avalanche tracks are numerous in the upslope areas along the valley. The unrestricted morphology of the creek-bed would be amenable to riparian enhancement; further field investigations will be necessary to determine whether such measures would be effective or desirable.

Logging History

158 ha of the Ure Creek drainage was logged in 1948 according to the Ministry of Forests Integrated Silviculture Information System Ecology Report.

Lillooet River Watershed

Lizzie Creek North



5.11 North Lizzie Creek

Data Summary Sheet

✓	Yes	x	No	?	Unknown

HISTORY

✓	Was watershed logged prior to 1988?
x	Is watershed within a municipal boundary?
x	Have FRBC funds been spent on watershed?
?	Are FRBC applications pending for work on watershed?

FISHERIES INFORMATION

✓	Have forest activities impacted fisheries resources?
✓	Does the watercourse have existing fisheries values?
✓	Does the watercourse have historical fisheries values?
✓	Is the watercourse accessible to salmon?
✓	Is the watercourse habitat suitable for salmon?
?	Are there enhancement opportunities for salmon?
✓	Is the watercourse habitat suitable for trout and char?
✓	Are there enhancement opportunities for trout and char?

WATER QUALITY

✓	Does the watercourse have an adequate water quality?
	If not, can it be rehabilitated?
?	Does the watercourse have an adequate food supply?
	If not, can it be restored?
x	Was periphyton community surveyed?
x	Was invertebrate community surveyed?
x	Was water chemistry surveyed?
x	Was sediment or intergravel habitat surveyed?

x	Have there been scientific surveys in the stream?
x	Have nutrient dosing pots been placed in the stream?

HYDROLOGICAL FACTORS

✓	Are there forest-related activity impacts?
x	Are there existing Water Rights (domestic, power, community watershed)?
✓	Is there year-round flow potential?
✓	Are there any existing hydraulic structures (dams, wiers, bridges, etc.)?
✓	Is there a debris-flow potential?

RIPARIAN ZONE

✓	Have forestry activities had negative impact on riparian vegetation?
x	Is there existing well-established riparian vegetation?
?	Are soil conditions amenable to re-vegetation?
✓	Is the channel morphology appropriate for re-vegetation?
x	Are unrestricted reaches present?
?	Would re-vegetation be expected to benefit fish/wildlife habitat?

TERRESTRIAL PROCESS

✓	Have slopes >60% been logged?
✓	Are roads built on slopes >60%?
✓	Is bedrock-geology of basin stable?
✓	Has basin experienced landslides?
?	Have landslides entered mainstream?

H	High	M	Medium	L	Low	U	Unknown

CREEK RATING

M	Impacts by logging
M	Fish resources
U	Rehabilitation potential

5.11.1 Factors of Concern

Fisheries

Region 2 fisheries section contains baseline data on this drainage. Fish utilize habitats to the headwaters of the eastern tributary, which has been logged right up to the stream banks. Helicopter reconnaissance revealed some potential for riparian habitat improvement in upper watershed. More assessment required to establish background data on habitat condition and fish distribution if a restoration project proposed. Limited area available to anadromous fish.

Hydrological

North Lizzie Creek is a moderately steep mountain creek with a watershed area of approximately 65 km^2, is tributary to the west side of Lillooet Lake. The watershed has a western aspect rising from an elevation about 210 m at its mouth to 2,570 m at its headwaters (Storm Peak, Brimstone Mt., Phacella Mt., and Meditation Mt.) over its 16 km channel length. The sizable alluvial fan, shared by South Lizzie Creek, formed near its mouth provides about 1 km of mild sloped channel. A BC Hydro ROW cuts across the alluvial fan. The North Lizzie Creek watershed was been clearcut logged extensively. There has been some regrowth however present clearcuts may increase sediment loading and peak flows in the creek.

North Lizzie Creek has five bridge crossings (Tim Napier, pers. comm.). These crossings should be inspected to determine if the bridge or culvert can pass the 100 year peak flows and to make recommendations for any improvements including removal.

There are at least eight lakes (including Battleship Lakes and Fried Egg Lake) within the watershed which may provide an opportunity to construct low dams to facilitate the augmentation of summer flows. The fact that South Lizzie Creek does not have any water rights and is not a designated community watershed reduces the complications of future instream work.

The overall steep slope (average 15%) and existence of steep sidewalls (some clearcut) could feed material and sustain debris-laden floods under the right conditions. Numerous valley wall gulleys connect to the creek providing a source of sediment. Prior to proceeding with instream works, a limited gulley and channel assessment should be carried out in the field.

Water Quality

This creek exhibits low nutrient loads and had good water clarity. No detailed water quality was conducted on this creek, nor was it monitored for basic physical or chemical parameters (pH or dissolved oxygen). Future monitoring should include water quality, periphyton, invertebrate and intergravel studies, together with a comparison of pH and nutrient values and community structures.

Riparian Zone

The Lizzie Creek system has been heavily impacted upon by clearcutting. Clearcuts extend right to the creek edge in many locations along both branches of Lizzie Creek and their tributaries. These creeks flow in moderately-restricted channels with steep gradients. Re-forestation efforts have had mixed results, with erosion extensive on some slopes. Field investigations will be necessary to determine the efficacy of riparian enhancement, specific measures, and specific locations. The aquatic environment would clearly benefit from measures taken to improve upslope stability and reduce the erosion potential.

Logging History

Logging activities within the North Lizzie Creek drainage basin are summarized from the Ministry of Forests Integrated Silviculture Information System.

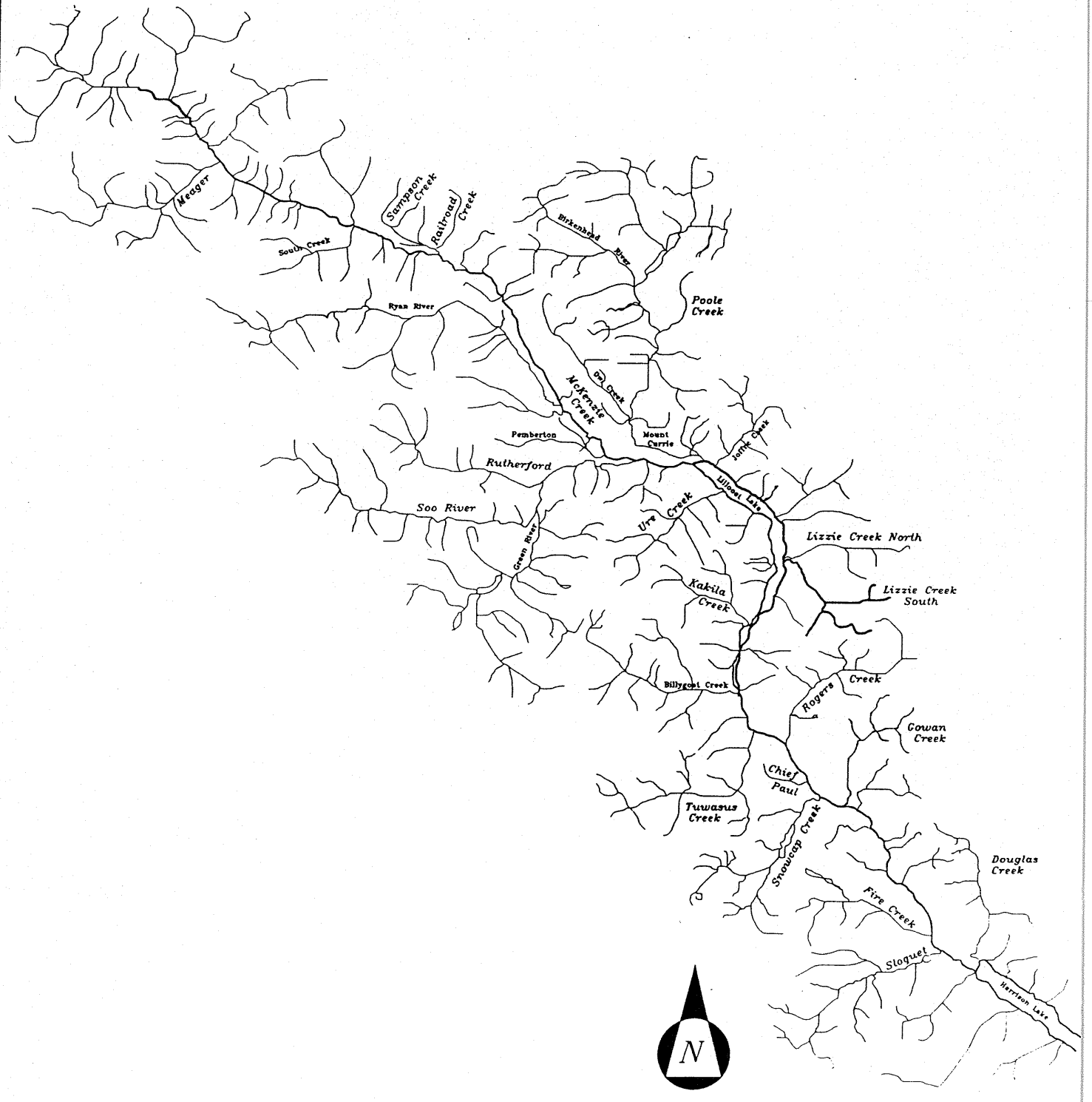
Year	Total Area Logged (ha)
1986	34
1985	21
1969	21

Watershed Assessment Report Sheet

	(1)	(2)
Watershed Name?	North Lizzie Creek	
Map units are in: (1=km. and sq.km.; 2=m. and ha.)	1	
Total watershed area (TA)	59.1	sq.km.
Peak Flow		
Area below 300 m.	0.5	sq.km.
Area between 300 and 800 m.	2.7	sq.km.
Area above 800 m.	55.9	sq.km.
Road length between 300 and 800 m. (not used)	3.4	km.
Surface Erosion		
Total road length	21	km.
Length of road on erodable soils?	2.1	km.
Roads within 100 m. of a stream?	7.1	km.
Number of active stream crossings?	20	
Riparian Buffer		
Total stream length?	80.8	km.
Length of stream logged?	9.4	km.
Total length of fish bearing streams?	31.1	km.
Length of fish bearing streams logged?	8.7	km.
Length of mainstem?	14.7	km.
Length of mainstem logged?	11.1	km.
Landslides		
Length of road on unstable terrain?	2.1	km.
Headwaters		
Length of headwater streams logged?	3.8	km.
Number of crossings on headwater streams?	50	

Lillooet River Watershed

Lizzie Creek South



5.12 South Lizzie Creek

Data Summary Sheet

✓	Yes	x	No	?	Unknown

HISTORY

✓	Was watershed logged prior to 1988?
x	Is watershed within a municipal boundary?
x	Have FRBC funds been spent on watershed?
?	Are FRBC applications pending for work on watershed?

FISHERIES INFORMATION

✓	Have forest activities impacted fisheries resources?
✓	Does the watercourse have existing fisheries values?
✓	Does the watercourse have historical fisheries values?
✓	Is the watercourse accessible to salmon?
✓	Is the watercourse habitat suitable for salmon?
?	Are there enhancement opportunities for salmon?
✓	Is the watercourse habitat suitable for trout and char?
✓	Are there enhancement opportunities for trout and char?

WATER QUALITY

✓	Does the watercourse have an adequate water quality?
	If not, can it be rehabilitated?
?	Does the watercourse have an adequate food supply?
	If not, can it be restored?
x	Was periphyton community surveyed?
x	Was invertebrate community surveyed?
✓	Was water chemistry surveyed?
x	Was sediment or intergravel habitat surveyed?

✓	Have there been scientific surveys in the stream?
x	Have nutrient dosing pots been placed in the stream?

HYDROLOGICAL FACTORS

✓	Are there forest-related activity impacts?
x	Are there existing Water Rights (domestic, power, community watershed)?
✓	Is there year-round flow potential?
✓	Are there any existing hydraulic structures (dams, wiers, bridges, etc.)?
✓	Is there a debris-flow potential?

RIPARIAN ZONE

✓	Have forestry activities had negative impact on riparian vegetation?
x	Is there existing well-established riparian vegetation?
?	Are soil conditions amenable to re-vegetation?
✓	Is the channel morphology appropriate for re-vegetation?
x	Are unrestricted reaches present?
?	Would re-vegetation be expected to benefit fish/wildlife habitat?

TERRESTRIAL PROCESS

✓	Have slopes >60% been logged?
✓	Are roads built on slopes >60%?
✓	Is bedrock-geology of basin stable?
✓	Has basin experienced landslides?
?	Have landslides entered mainstream?

H	High	M	Medium	L	Low	U	Unknown

CREEK RATING

M	Impacts by logging
M	Fish resources
U	Rehabilitation potential

5.12.1 Factors of Concern

Fisheries

Region 2 fisheries section has some baseline data on this drainage. Apparently, fish utilize habitats to the headwaters of the eastern tributary, which has been logged right up to the stream banks. Helicopter reconnaissance revealed some potential for riparian habitat improvement in upper watershed. More assessment is required to establish background data on habitat condition and fish distribution if restoration project proposed. Limited area available to anadromous fish.

Hydrological

South Lizzie Creek is a moderately steep mountain creek with a watershed area of approximately 70 km^2, is tributary to the west side of Lillooet Lake. The watershed has a western aspect rising from an elevation about 210 m at its mouth to 2,590 m at its headwaters (on Aurora and Tundra Peaks) over its 16 km channel length. The sizable alluvial fan formed near it's mouth provides about 1 km of mild sloped channel. A BC Hydro ROW cuts across the alluvial fan. South Lizzie Creek watershed was been clearcut logged extensively. There has been some regrowth however present clearcuts may increase sediment loading and peak flows in the creek.

Four creek crossings including one bridge have been identified. All crossings should be inspected by a Professional Engineer (Hydrological) to find out if the bridge or culvert can pass the 100 year peak flows and to make recommendations for any improvements including removal.

There are at least 16 lakes within the watershed which may provide an opportunity to construct low dams to facilitate the augmentation of summer flows. South Lizzie Creek does not have any water rights and is not a designated community watershed. The overall steep slope (average 15%) and existence of steep sidewalls could feed material and sustain debris-laden floods under the right conditions. Numerous valley wall gulleys connect to the creek providing a source of sediment. Prior to proceeding with instream works, a limited gulley and channel assessment should be carried out in the field.

Water Quality

This creek evidenced good water quality based upon the few measurements obtained. No detailed water quality was conducted on this creek, nor was it monitored for more than the basic physical or chemical parameters. Future monitoring should include water quality, periphyton, invertebrate and intergravel studies, together with a comparison of pH and nutrient values and community structures.

Riparian Zone

The Lizzie Creek system has been heavily impacted upon by clearcutting. Clearcuts extend right to the creek edge in many locations along both branches of Lizzie Creek and their tributaries. These creeks flow in moderately-restricted channels with steep gradients. Re-forestation efforts have had mixed results, with erosion extensive on some slopes.

Field investigations will be necessary to determine the efficacy of riparian enhancement, specific measures, and specific locations. The aquatic environment would clearly benefit from measures taken to improve upslope stability and reduce the erosion potential.

Logging History

South Lizzie Creek has been heavily impacted by logging. Logging activities within the South Lizzie Creek drainage basin are summarized from the Ministry of Forests Integrated Silviculture Information System.

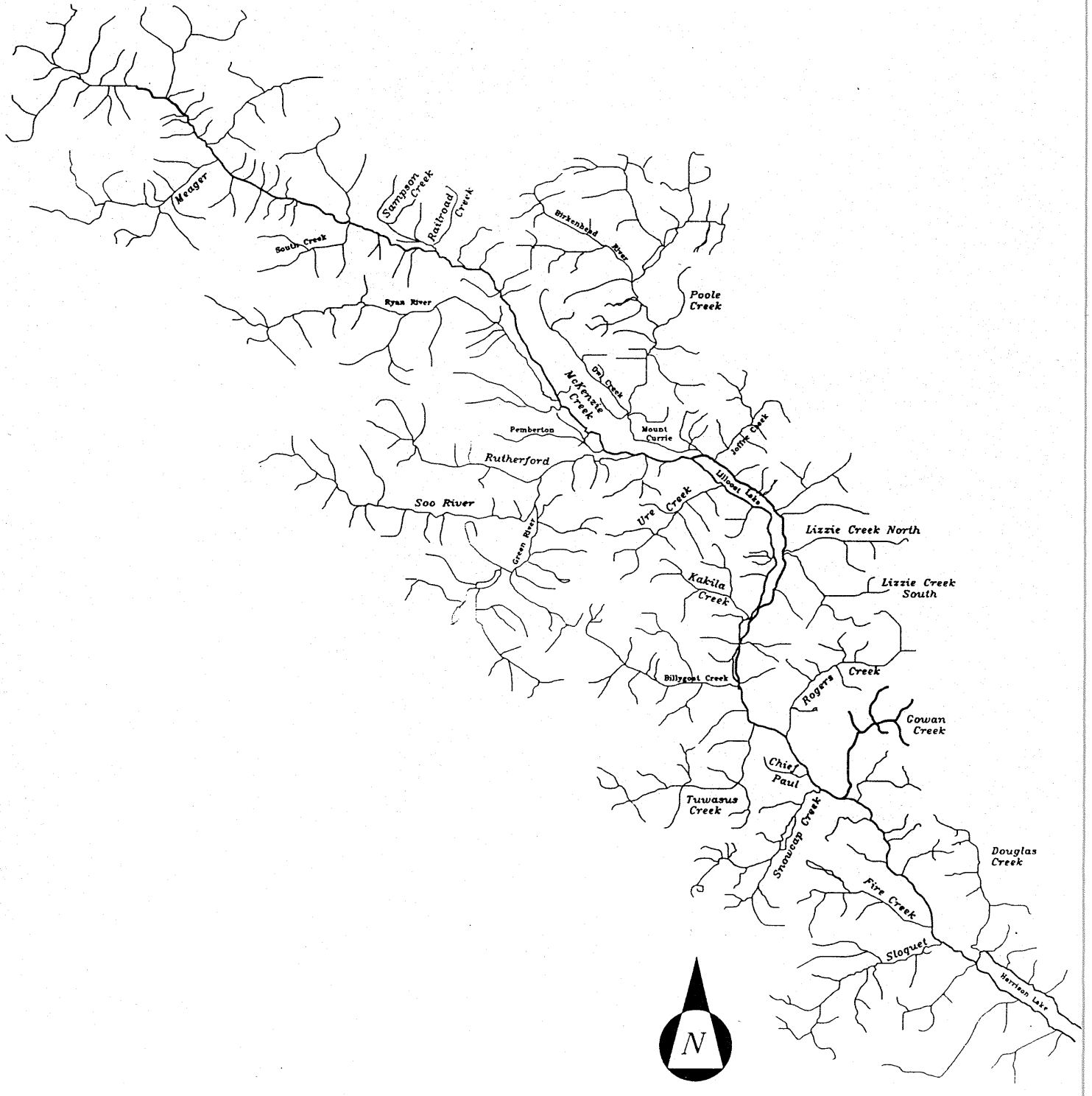
Year	Total Area Logged (ha)	Year	Total Area Logged (ha)
1987	31	1979	140
1986	76	1978	231
1985	77	1974	50
1983	79	1967	104
1982	113	1965	46
1981	7	1954	73
1980	99		

Watershed Assessment Report Sheet

	(1)	(2)
Watershed Name?	South Lizzie Creek	
Map units are in: (1=km. and sq.km.; 2=m. and ha.)	1	
Total watershed area (TA)	82.5	sq.km.
Peak Flow		
Area below 300 m.	0.6	sq.km.
Area between 300 and 800 m.	5	sq.km.
Area above 800 m.	77	sq.km.
Road length between 300 and 800 m. (not used)	14.1	km.
Surface Erosion		
Total road length	30.4	km.
Length of road on erodable soils?	18.8	km.
Roads within 100 m. of a stream?	20.4	km.
Number of active stream crossings?	50	
Riparian Buffer		
Total stream length?	126.7	km.
Length of stream logged?	22.2	km.
Total length of fish bearing streams?	126.7	km.
Length of fish bearing streams logged?	22.2	km.
Length of mainstem?	20.8	km.
Length of mainstem logged?	14.6	km.
Landslides		
Length of road on unstable terrain?	19.2	km.
Headwaters		
Length of headwater streams logged?	15.6	km.
Number of crossings on headwater streams?	9	

Lillooet River Watershed

Gowan Creek



5.13 Gowan Creek

Data Summary Sheet

✓	Yes	x	No	?	Unknown

HISTORY

✓	Was watershed logged prior to 1988?
x	Is watershed within a municipal boundary?
x	Have FRBC funds been spent on watershed?
?	Are FRBC applications pending for work on watershed?

FISHERIES INFORMATION

✓	Have forest activities impacted fisheries resources?
✓	Does the watercourse have existing fisheries values?
✓	Does the watercourse have historical fisheries values?
✓	Is the watercourse accessible to salmon?
✓	Is the watercourse habitat suitable for salmon?
?	Are there enhancement opportunities for salmon?
✓	Is the watercourse habitat suitable for trout and char?
✓	Are there enhancement opportunities for trout and char?

WATER QUALITY

?	Does the watercourse have an adequate water quality?
	If not, can it be rehabilitated?
?	Does the watercourse have an adequate food supply?
	If not, can it be restored?
x	Was periphyton community surveyed?
x	Was invertebrate community surveyed?
x	Was water chemistry surveyed?
x	Was sediment or intergravel habitat surveyed?

x	Have there been scientific surveys in the stream?
x	Have nutrient dosing pots been placed in the stream?

HYDROLOGICAL FACTORS

✓	Are there forest-related activity impacts?
x	Are there existing Water Rights (domestic, power, community watershed)?
✓	Is there year-round flow potential?
✓	Are there any existing hydraulic structures (dams, wiers, bridges, etc.)?
✓	Is there a debris-flow potential?

RIPARIAN ZONE

✓	Have forestry activities had negative impact on riparian vegetation?
x	Is there existing well-established riparian vegetation?
?	Are soil conditions amenable to re-vegetation?
	Is the channel morphology appropriate for re-vegetation?
✓	Are unrestricted reaches present?
?	Would re-vegetation be expected to benefit fish/wildlife habitat?

TERRESTRIAL PROCESS

✓	Have slopes >60% been logged?
✓	Are roads built on slopes >60%?
✓	Is bedrock-geology of basin stable?
✓	Has basin experienced landslides?
?	Have landslides entered mainstream?

H	High	M	Medium	L	Low	U	Unknown

CREEK RATING

H	Impacts by logging
M	Fish resources
M	Rehabilitation potential

5.13.1 Factors of Concern

Fisheries

Region 2 fisheries section contains some baseline data on lower portion (below barrier). Helicopter reconnaissance revealed some potential for riparian habitat improvement in upper watershed.

Further assessment is required to establish background data on habitat condition and fish distribution if restoration project proposed. Limited area available to anadromous fish.

Hydrological

Gowan Creek is a steep mountain creek with a watershed area of approximately 90 km^2, is tributary to the Lillooet River at 29 km upstream of Harrison Lake. The watershed has a south to southwest aspect rising from an elevation about 90 m at its mouth to 2,260 m at its headwaters over its 17 km channel length. The Gowan Creek watershed was been clearcut logged extensively. There has been some regrowth however present clearcuts may increase sediment loading and peak flows in the creek.

Four creek crossings including two bridges have been identified. All crossings should be inspected to determine if the bridge or culvert can pass the 100 year peak flows and to make recommendations for any improvements including removal.

There are about eight lakes within the watershed which may provide an opportunity to construct low dams to facilitate the augmentation of summer flows. Gowan Creek does not have any water rights and is not a designated community watershed.

The overall steep slope (average 13%) and existence of steep sidewalls (some clearcut) could feed material and sustain debris-laden floods under the right conditions. Numerous valley wall gulleys connect to the creek providing a source of sediment. Prior to proceeding with instream works, a limited gulley and channel assessment should be carried out in the field.

Water Quality

No water quality was conducted on this creek, nor was it monitored for basic physical or chemical parameters. Future monitoring should include water quality, periphyton, invertebrate and intergravel studies, together with a comparison of pH and nutrient values and community structures.

Riparian Zone

Gowan Creek flows southward approximately 10.5 km from its subalpine source to its mouth on the Lillooet River. The final 1.0 km reach is a well-vegetated braided channel within the Lillooet floodplain. The reach between 1.0 and 2.0 km is within a deep gorge of moderate gradient. The remainder of the creek flows through a generally restricted basin from the subalpine area. Extensive clearcutting has occurred along much of Gowan Creek. Particularly problematic is the cut-block between the two forks of Gowan Creek, which exhibits extensive erosion.

Field studies will be necessary to determine whether riparian enhancement is warranted in this creekbed. Some upslope stabilization and revegetation may be necessary before riparian restoration can be considered.

Logging History

Extensive clearcutting has occurred along much of Gowan Creek. The majority of logging activities along the basin occurred continuously from the mid 1970's to 1982. Logging activities within the Gowan Creek Creek drainage basin are summarized from the Ministry of Forests Integrated Silviculture Information System.

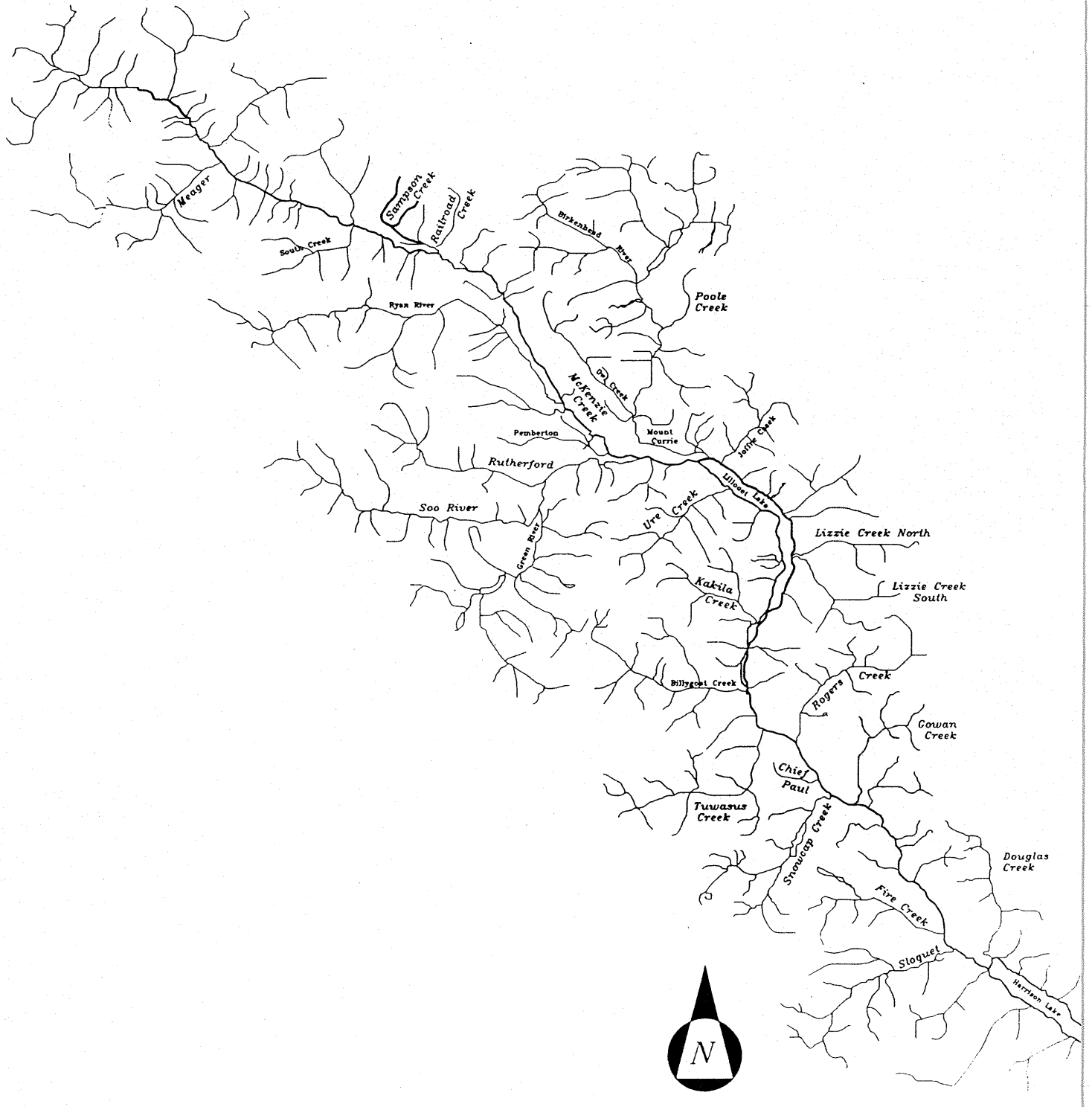
Year	Total Area Logged (ha)	Year	Total Area Logged (ha)
1982	3	1969	44
1981	53	1962	48
1980	134	1961	117
1979	68	1960	51
1978	59	1959	5
1977	121	1956	12
1976	98	1955	40
1975	139		

Watershed Assessment Report Sheet

	(1)	(2)
Watershed Name?	Gowan Creek	
Map units are in: (1=km. and sq.km.; 2=m. and ha.)	1	
Total watershed area (TA)	84.25	sq.km.
Peak Flow		
Area below 300 m.	1.68	sq.km.
Area between 300 and 800 m.	16.8	sq.km.
Area above 800 m.	65.8	sq.km.
Road length between 300 and 800 m. (not used)	9.46	km.
Surface Erosion		
Total road length	15.62	km.
Length of road on erodable soils?	1.84	km.
Roads within 100 m. of a stream?	6.18	km.
Number of active stream crossings?	20	
Riparian Buffer		
Total stream length?	147.9	km.
Length of stream logged?	8.64	km.
Total length of fish bearing streams?	123	km.
Length of fish bearing streams logged?	8.4	km.
Length of mainstem?	22.3	km.
Length of mainstem logged?		km.
Landslides		
Length of road on unstable terrain?	1.84	km.
Headwaters		
Length of headwater streams logged?	6.6	km.
Number of crossings on headwater streams?	0.26	

Lillooet River Watershed

Sampson Creek



5.14 Sampson Creek

Data Summary Sheet

✓	Yes	x	No	?	Unknown

HISTORY

✓	Was watershed logged prior to 1988?
x	Is watershed within a municipal boundary?
x	Have FRBC funds been spent on watershed?
?	Are FRBC applications pending for work on watershed?

FISHERIES INFORMATION

✓	Have forest activities impacted fisheries resources?
✓	Does the watercourse have existing fisheries values?
✓	Does the watercourse have historical fisheries values?
✓	Is the watercourse accessible to salmon?
✓	Is the watercourse habitat suitable for salmon?
✓	Are there enhancement opportunities for salmon?
✓	Is the watercourse habitat suitable for trout and char?
✓	Are there enhancement opportunities for trout and char?

WATER QUALITY

?	Does the watercourse have an adequate water quality?
	If not, can it be rehabilitated?
?	Does the watercourse have an adequate food supply?
	If not, can it be restored?
x	Was periphyton community surveyed?
x	Was invertebrate community surveyed?
x	Was water chemistry surveyed?
x	Was sediment or intergravel habitat surveyed?

x	Have there been scientific surveys in the stream?
x	Have nutrient dosing pots been placed in the stream?

HYDROLOGICAL FACTORS

✓	Are there forest-related activity impacts?
x	Are there existing Water Rights (domestic, power, community watershed)?
✓	Is there year-round flow potential?
✓	Are there any existing hydraulic structures (dams, wiers, bridges, etc.)?
✓	Is there a debris-flow potential?

RIPARIAN ZONE

?	Have forestry activities had negative impact on riparian vegetation?
✓	Is there existing well-established riparian vegetation?
✓	Are soil conditions amenable to re-vegetation?
✓	Is the channel morphology appropriate for re-vegetation?
✓	Are unrestricted reaches present?
✓	Would re-vegetation be expected to benefit fish/wildlife habitat?

TERRESTRIAL PROCESS

✓	Have slopes >60% been logged?
✓	Are roads built on slopes >60%?
✓	Is bedrock-geology of basin stable?
?	Has basin experienced landslides?
?	Have landslides entered mainstream?

H	High	M	Medium	L	Low	U	Unknown

CREEK RATING

M	Impacts by logging
H	Fish resources
H	Rehabilitation potential

5.14.1 Factors of Concern

Fisheries

Habitat assessment and fish sampling indicated there are high values for salmonids in Sampson Creek. Fish were found in any suitable habitat with sufficient instream cover. However, there were numerous areas with no instream cover and therefore, no fish captured. The stream appeared stable and is suspected to be well suited to LWD placement. Water quality data will confirm if this is a good candidate for a restoration project. High fish values were determined in 1995 including Coho, sockeye, cutthroat. High potential for in-stream complexing (i.e., LWD placement).

Hydrological

Sampson Creek is a steep mountain creek with a watershed area of approximately 40 km^2, is tributary to the Lillooet River. The watershed has a south to southwest aspect rising from an elevation about 270 m at its mouth to 2,390 m at its headwaters over its 11 km channel length. At the mouth of Sampson Creek a swampy area exists which is bisected by a road creating a barrier between the swampy area and the Lillooet River. The Sampson Creek watershed has undergone clearcut logging, however buffer zones along the creek are evident.

Two creek crossings including two bridges have been identified. All crossings should be inspected by a Professional Engineer (Hydrological) to find out if the bridge or culvert can pass the 100 year peak flows and to make recommendations for any improvements including removal. There is one headwater lake within the watershed which may provide an opportunity to construct a low dam to facilitate the augmentation of summer flows. Sampson Creek does not have any water rights and is not a designated community watershed.

The overall steep slope (average 19%) could sustain debris-laden floods under the right conditions. Prior to proceeding with instream works, a limited gulley and channel assessment should be carried out in the field.

Water Quality

Cursory water quality was conducted at Sampson Creek. Future monitoring should include water quality, periphyton, invertebrate and intergravel studies, together with a comparison of pH and nutrient values and community structures.

Riparian Zone

The upper 7.5 km portion of Sampson Creek flows through a moderately-sloping gorge from the source on the south flank of Sampson Mountain. No recent forestry impacts are evident from air photos in the sub-alpine area. At lower levels, very limited recent cutblocks are present, but damage to riparian areas appears negligible. The lower portion of Sampson Creek flows roughly parallel to the mainstem of the Lillooet River within the floodplain for a distance of approximately 5 km. The riparian zone vegetation consists of mixed successional forest, with tree species consisting mainly of red alder, willow, western red cedar, and western hemlock.

The riparian zone in the floodplain appears to be quite diverse and rich in composition. Field investigations may reveal opportunities for fish habitat enhancement measures such as planting of shrubs and placement of large woody debris.

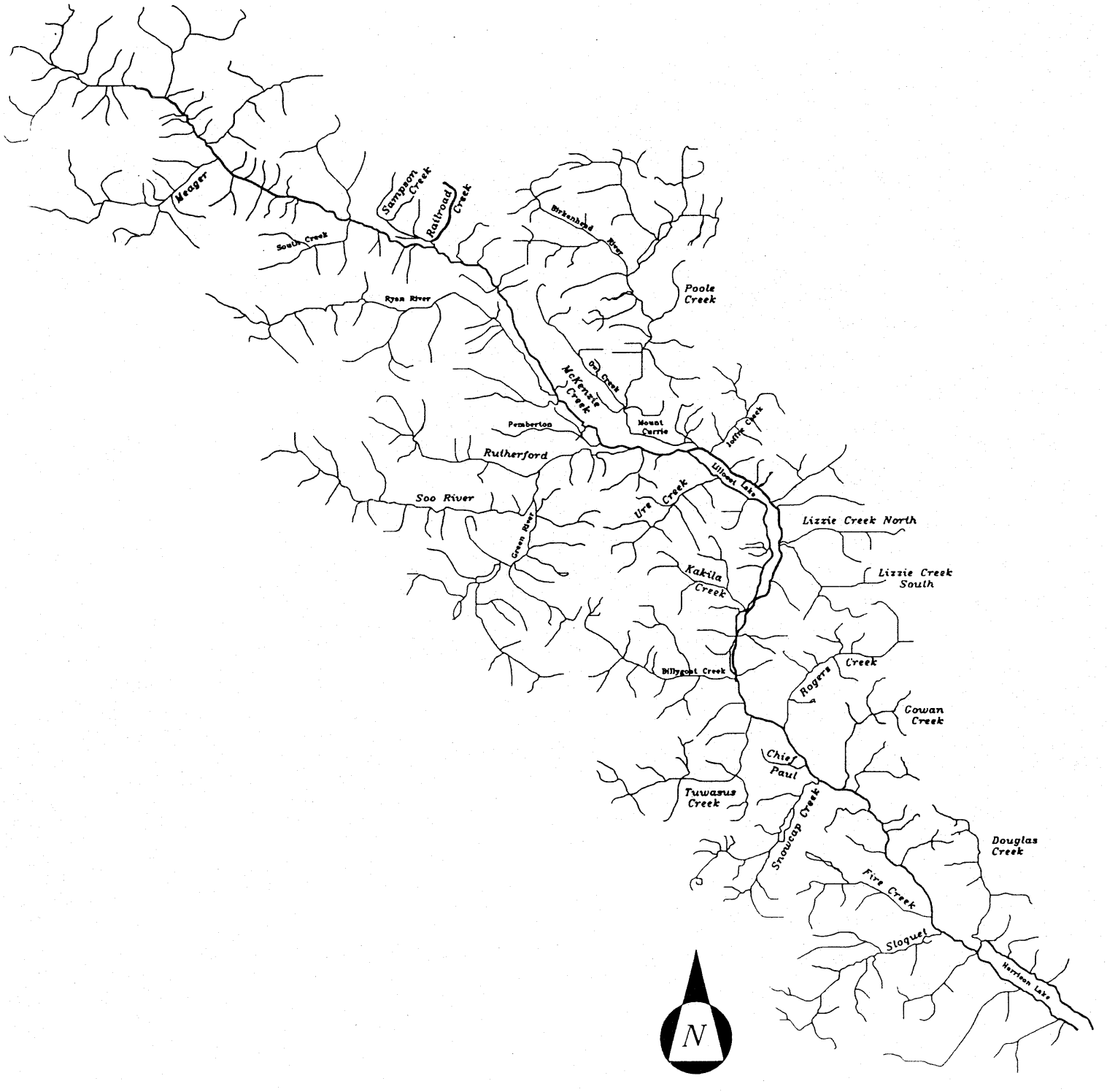
Logging History

Logging activities within the Sampson Creek drainage basin are summarized from the Ministry of Forests Integrated Silviculture Information System.

Year	Total Area Logged (ha)	Year	Total Area Logged (ha)
1987	102	1981	6
1986	27	1980	9
1983	32	1979	9
1982	13	1972	86

Lillooet River Watershed

Railroad Creek



5.15 Railroad Creek

Data Summary Sheet

✓	Yes	x	No	?	Unknown

HISTORY

✓	Was watershed logged prior to 1988?
x	Is watershed within a municipal boundary?
?	Have FRBC funds been spent on watershed?
?	Are FRBC applications pending for work on watershed?

FISHERIES INFORMATION

✓	Have forest activities impacted fisheries resources?
✓	Does the watercourse have existing fisheries values?
✓	Does the watercourse have historical fisheries values?
✓	Is the watercourse accessible to salmon?
✓	Is the watercourse habitat suitable for salmon?
✓	Are there enhancement opportunities for salmon?
✓	Is the watercourse habitat suitable for trout and char?
✓	Are there enhancement opportunities for trout and char?

WATER QUALITY

?	Does the watercourse have an adequate water quality?
	If not, can it be rehabilitated?
?	Does the watercourse have an adequate food supply?
	If not, can it be restored?
x	Was periphyton community surveyed?
x	Was invertebrate community surveyed?
x	Was water chemistry surveyed?
x	Was sediment or intergravel habitat surveyed?

x	Have there been scientific surveys in the stream?
x	Have nutrient dosing pots been placed in the stream?

HYDROLOGICAL FACTORS

✓	Are there forest-related activity impacts?
x	Are there existing Water Rights (domestic, power, community watershed)?
✓	Is there year-round flow potential?
x	Are there any existing hydraulic structures (dams, wiers, bridges, etc.)?
✓	Is there a debris-flow potential?

RIPARIAN ZONE

?	Have forestry activities had negative impact on riparian vegetation?
✓	Is there existing well-established riparian vegetation?
✓	Are soil conditions amenable to re-vegetation?
✓	Is the channel morphology appropriate for re-vegetation?
x	Are unrestricted reaches present?
✓	Would re-vegetation be expected to benefit fish/wildlife habitat?

TERRESTRIAL PROCESS

✓	Have slopes >60% been logged?
✓	Are roads built on slopes >60%?
✓	Is bedrock-geology of basin stable?
?	Has basin experienced landslides?
?	Have landslides entered mainstream?

H	High	**M**	Medium	**L**	Low	**U**	Unknown

CREEK RATING

M	Impacts by logging
H,M	Fish resources
L	Rehabilitation potential

5.15.1 Factors of Concern

Fisheries

Instream habitat and fish sampling of Railroad Creek indicated relatively high abundance of coho salmon and cutthroat trout in the lower watercourse. Enhancement potential is limited because there is a barrier in the lower portion of the creek and the stream gradient above the barrier is very steep. Limited distance to barrier precludes benefits of enhancement.

Hydrological

Railroad Creek is a steep mountain creek with a watershed area of approximately 28 km^2, is tributary to the Lillooet River. The watershed has a south to southwest aspect rising from an elevation about 270 m at its mouth to 1,810 m at its headwaters over its 10 km channel length.

There are a couple of lakes within the watershed which may provide an opportunity to construct low dams to facilitate the augmentation of summer flows. Railroad Creek does not have any water rights and is not a designated community watershed. The overall steep slope (average 15%) and existence of steep sidewalls could feed material and sustain debris-laden floods under the right conditions.

Water Quality

No water quality was conducted on this creek, nor was it monitored for basic physical or chemical parameters. Future monitoring should include water quality, periphyton, invertebrate and intergravel studies, together with a comparison of pH and nutrient values and community structures.

Riparian Zone

Railroad Creek flows approximately 5 km from its source on Railroad Mountain to its confluence with Sampson Creek. Most of its flow is within a narrow gorge with a steep gradient. Extensive clearcutting has been done on the lower flanks of the mountains adjacent to Railroad Creek, but regrowth has generally been successful. Effects on riparian vegetation along the stream appear from the air photos to be limited; however, field studies would confirm whether any riparian enhancement is warranted.

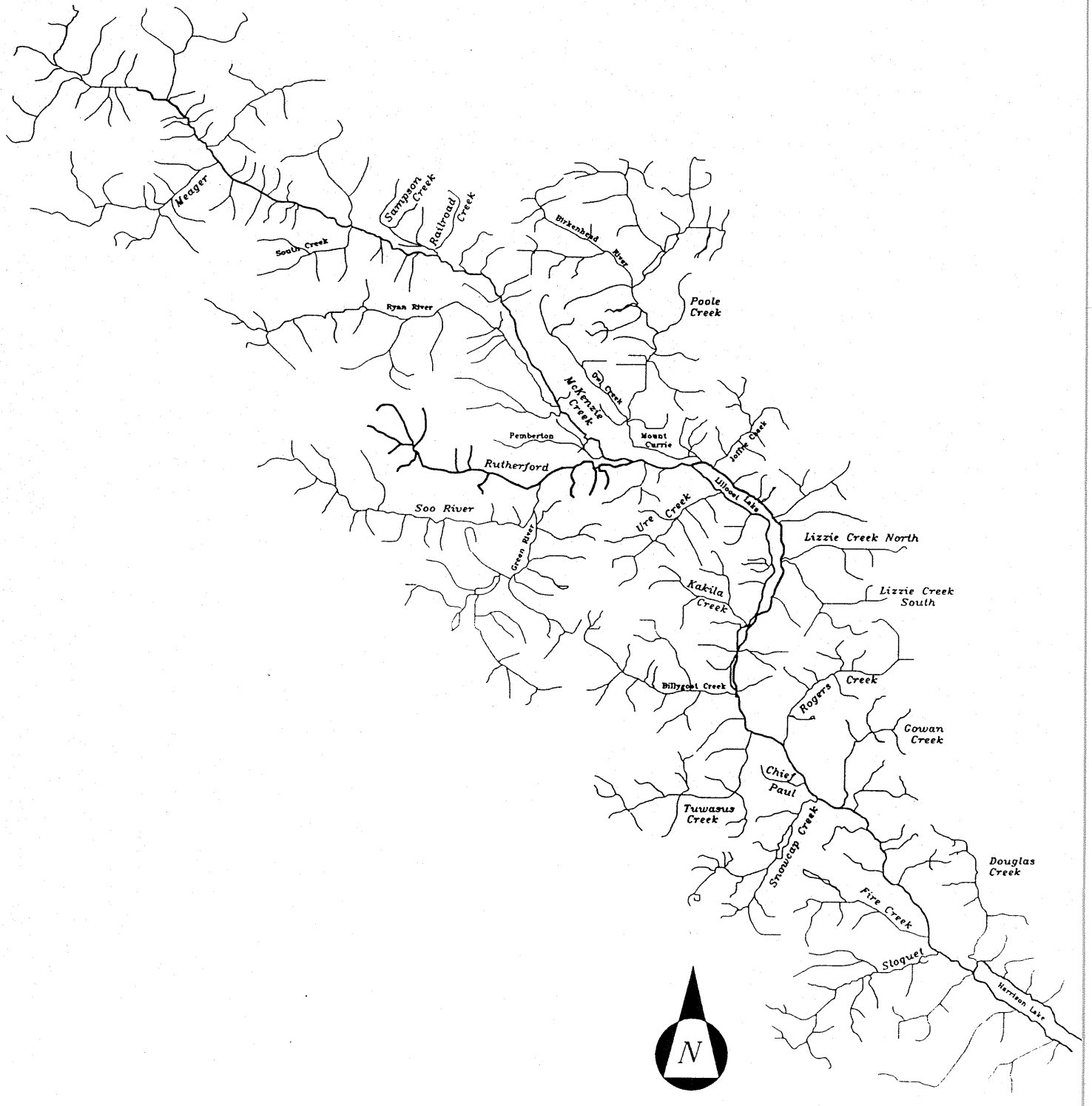
Logging History

Extensive clearcutting has occurred on the lower flanks of the mountain adjacent to Railroad Creek. The majority of the logging in the drainage occurred in the early 1970's. Logging history is presented as follows:

Year	Total Area Logged (ha)	Year	Total Area Logged (ha)
1994	7	1973	333.6
1991	9.7	1972	178
1978	14	1971	257
1975	9	1970	358
1974	18	1955	4

Lillooet River Watershed

Rutherford Creek



5.16 Rutherford Creek

Data Summary Sheet

✓	Yes	x	No	?	Unknown

HISTORY

✓	Was watershed logged prior to 1988?
x	Is watershed within a municipal boundary?
✓	Have FRBC funds been spent on watershed?
?	Are FRBC applications pending for work on watershed?

FISHERIES INFORMATION

✓	Have forest activities impacted fisheries resources?
✓	Does the watercourse have existing fisheries values?
✓	Does the watercourse have historical fisheries values?
x	Is the watercourse accessible to salmon?
x	Is the watercourse habitat suitable for salmon?
x	Are there enhancement opportunities for salmon?
✓	Is the watercourse habitat suitable for trout and char?
?	Are there enhancement opportunities for trout and char?

WATER QUALITY

?	Does the watercourse have an adequate water quality?
	If not, can it be rehabilitated?
?	Does the watercourse have an adequate food supply?
	If not, can it be restored?
x	Was periphyton community surveyed?
x	Was invertebrate community surveyed?
x	Was water chemistry surveyed?
x	Was sediment or intergravel habitat surveyed?

x	Have there been scientific surveys in the stream?
x	Have nutrient dosing pots been placed in the stream?

HYDROLOGICAL FACTORS

✓	Are there forest-related activity impacts?
✓	Are there existing Water Rights (domestic, power, community watershed)?
✓	Is there year-round flow potential?
✓	Are there any existing hydraulic structures (dams, wiers, bridges, etc.)?
✓	Is there a debris-flow potential?

RIPARIAN ZONE

✓	Have forestry activities had negative impact on riparian vegetation?
x	Is there existing well-established riparian vegetation?
✓	Are soil conditions amenable to re-vegetation?
✓	Is the channel morphology appropriate for re-vegetation?
✓	Are unrestricted reaches present?
✓	Would re-vegetation be expected to benefit fish/wildlife habitat?

TERRESTRIAL PROCESS

✓	Have slopes >60% been logged?
✓	Are roads built on slopes >60%?
x	Is bedrock-geology of basin stable?
?	Has basin experienced landslides?
?	Have landslides entered mainstream?

H	High	M	Medium	L	Low	U	Unknown

CREEK RATING

H	Impacts by logging
L	Fish resources
U	Rehabilitation potential

5.16.1 Factors of Concern

Fisheries

Helicopter reconnaissance revealed some potential for riparian habitat improvement in upper watershed. More assessment required to establish background data on habitat condition and fish distribution if restoration project proposed. Very little is known about this system.

Hydrological

Rutherford Creek is a moderately steep mountain creek with a watershed area of approximately 170 km^2 and is a tributary to the Green River which in turn is tributary to the Lillooet River. The watershed has a southwest aspect rising from an elevation about 530 m at its mouth to 2,140 m at its headwaters over its 26 km channel length. The Rutherford Creek watershed was been clearcut logged extensively. The present clearcuts may increase sediment loading and peak flows in the creek.

Nine creek crossings including three bridges have been identified. All crossings should be inspected by a Professional Engineer (Hydrological) to find out if the bridge or culvert can pass the 100 year peak flows and to make recommendations for any improvements including removal.

There are about two dozen lakes within the watershed which may provide an opportunity to construct low dams to facilitate the augmentation of summer flows. The fact that Rutherford Creek has existing water rights (Z103586 and C103580) for power generation purposes may complicate future instream work.

The overall steep slope (average 6%) and existence of steep sidewalls (some clearcut) could feed material and sustain debris-laden floods under the right conditions. Numerous valley wall gulleys connect to the creek providing a source of sediment. Prior to proceeding with instream works, a limited gulley and channel assessment should be carried out in the field.

Water Quality

No water quality was conducted on this creek, nor was it monitored for basic physical or chemical parameters. Future monitoring should include water quality, periphyton, invertebrate and intergravel studies, together with a comparison of pH and nutrient values and community structures.

Riparian Zone

Much of Rutherford Creek meanders in a braided channel within a U-shaped valley. Its basin has been extensively clearcut, and the success of reforestation has been mixed. Therefore, upslope stability is variable, and there is considerable erosion potential. The channel morphology is amenable to riparian vegetation enhancement, but stabilisation of upslope valley flanks will be necessary first. Field investigations will help target specific areas for these efforts.

Logging History

Extensive clearcutting has occurred continuously since 1960. Logging activities within the Rutherford Creek drainage basin are summarized from the Ministry of Forests Integrated Silviculture Information System.

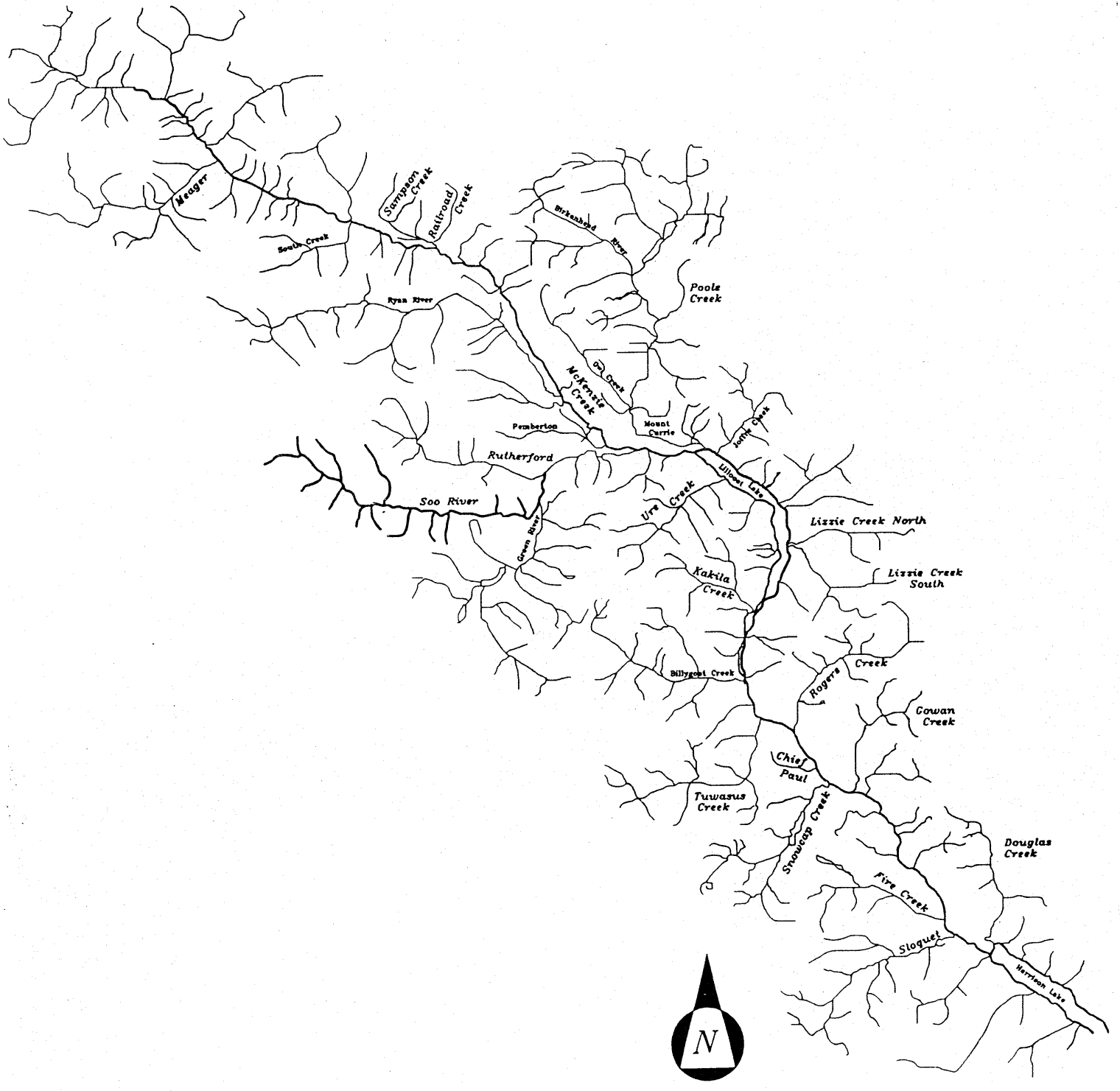
Year	Total Area Logged (ha)	Year	Total Area Logged (ha)
1987	43	1975	96
1986	9	1974	9
1985	158	1973	137
1984	116	1972	28
1983	210	1969	82
1982	78	1968	43
1981	40	1965	25
1980	134	1963	104
1979	120	1962	64
1978	106	1961	12
1977	86	1960	43
1976	322		

Watershed Assessment Report Sheet

	(1)	(2)
Watershed Name?	Rutherford Creek	
Map units are in: (1=km. and sq.km.; 2=m. and ha.)	1	
Total watershed area (TA)	164.3	sq.km.
Peak Flow		
Area below 300 m.	0	sq.km.
Area between 300 and 800 m.	11.9	sq.km.
Area above 800 m.	152.4	sq.km.
Road length between 300 and 800 m. (not used)	6.6	km.
Surface Erosion		
Total road length	87	km.
Length of road on erodable soils?	8.4	km.
Roads within 100 m. of a stream?	28	km.
Number of active stream crossings?	73	
Riparian Buffer		
Total stream length?	94.2	km.
Length of stream logged?	10	km.
Total length of fish bearing streams?		km.
Length of fish bearing streams logged?		km.
Length of mainstem?	23.2	
Length of mainstem logged?	9.5	km.
Landslides		
Length of road on unstable terrain?	8.4	km.
Area logged on unstable terrain?	12.205	sq.km
Headwaters		
Length of headwater streams logged?	2.8	km.
Number of crossings on headwater streams?	120.7	
Other Watershed Characteristics		
Percent area with erodable soils?	7.5	
Are glaciers present?	Yes	

Lillooet River Watershed

Soo River



5.17 Soo River

Data Summary Sheet

✓	Yes	x	No	?	Unknown

HISTORY

✓	Was watershed logged prior to 1988?
x	Is watershed within a municipal boundary?
✓	Have FRBC funds been spent on watershed?
?	Are FRBC applications pending for work on watershed?

FISHERIES INFORMATION

✓	Have forest activities impacted fisheries resources?
?	Does the watercourse have existing fisheries values?
?	Does the watercourse have historical fisheries values?
x	Is the watercourse accessible to salmon?
x	Is the watercourse habitat suitable for salmon?
x	Are there enhancement opportunities for salmon?
✓	Is the watercourse habitat suitable for trout and char?
?	Are there enhancement opportunities for trout and char?

WATER QUALITY

?	Does the watercourse have an adequate water quality?
	If not, can it be rehabilitated?
?	Does the watercourse have an adequate food supply?
	If not, can it be restored?
x	Was periphyton community surveyed?
x	Was invertebrate community surveyed?
x	Was water chemistry surveyed?

x	Was sediment or intergravel habitat surveyed?
x	Have there been scientific surveys in the stream?
x	Have nutrient dosing pots been placed in the stream?

HYDROLOGICAL FACTORS

✓	Are there forest-related activity impacts?
✓	Are there existing Water Rights (domestic, power, community watershed)?
✓	Is there year-round flow potential?
✓	Are there any existing hydraulic structures (dams, wiers, bridges, etc.)?
✓	Is there a debris-flow potential?

RIPARIAN ZONE

✓	Have forestry activities had negative impact on riparian vegetation?
✓	Is there existing well-established riparian vegetation?
✓	Are soil conditions amenable to re-vegetation?
✓	Is the channel morphology appropriate for re-vegetation?
✓	Are unrestricted reaches present?
✓	Would re-vegetation be expected to benefit fish/wildlife habitat?

TERRESTRIAL PROCESS

✓	Have slopes >60% been logged?
✓	Are roads built on slopes >60%?
✓	Is bedrock-geology of basin stable?
?	Has basin experienced landslides?
?	Have landslides entered mainstream?

H	High	M	Medium	L	Low	U	Unknown

CREEK RATING

H	Impacts by logging
L	Fish resources
U	Rehabilitation potential

5.17.1 Factors of Concern

Fisheries

Helicopter reconnaissance revealed some potential for riparian habitat improvement in upper watershed. More assessment required to establish background data on habitat condition and fish distribution if restoration project proposed. Two private fish surveys have been undertaken by Summit Power Corp. and Halray (Tim Napier, pers. comm.).

Hydrological

The Soo River is a mountain river system with a watershed area of approximately 240 km^2, is tributary to the Green River which in turn is tributary to the Lillooet River. The watershed has a west and southwest aspect rising from an elevation about 530 m at its mouth to 2260 m at its headwaters over its 40 km channel length. The Soo River watershed was been clearcut logged extensively in its lower half. Present clearcuts may increase sediment loading and peak flows in the creek.

Twelve river crossings including one bridge have been identified. All crossings should be inspected by a Professional Engineer (Hydrological) to find out if the bridge or culvert can pass the 100 year peak flows and to make recommendations for any improvements including removal.

There are over 40 lakes within the watershed which may provide an opportunity to construct low dams to facilitate the augmentation of summer flows. Summit Power Corp. has an active power project on the Soo, with a water diversion.

The moderate slope (average 4%) and existence of steep sidewalls (some clearcut) could feed material and sustain debris-laden floods under the right conditions. Numerous valley wall gulleys connect to the creek providing a source of sediment. Prior to proceeding with instream works, a limited gulley and channel assessment should be carried out in the field.

Water Quality

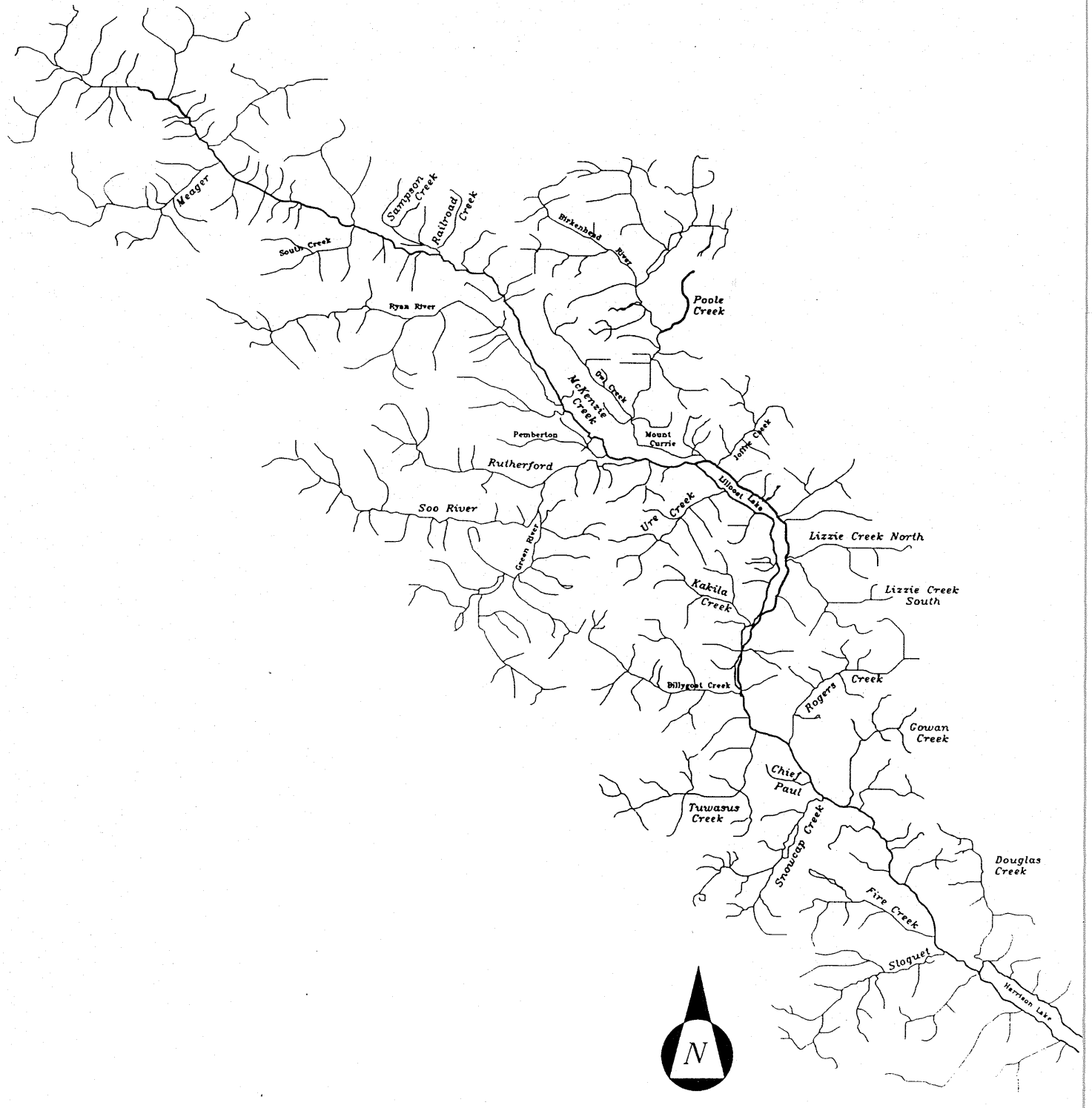
No water quality was conducted on this creek, nor was it monitored for basic physical or chemical parameters. Future monitoring should include water quality, periphyton, invertebrate and intergravel studies, together with a comparison of pH and nutrient values and community structures.

Riparian Zone

The Soo River flows in an unrestricted channel, with meandering and braiding present in several locations. In the middle reaches, extensive clearcutting in the valley bottom has eliminated much of the riparian vegetation. The replanting efforts appear successful, by and large. Good opportunities are presented along the Soo River for riparian enhancement. Further field investigations will be necessary to determine locations and specific measures.

Lillooet River Watershed

Poole Creek



5.18 Poole Creek

Data Summary Sheet

✓	Yes	x	No	?	Unknown

HISTORY

✓	Was watershed logged prior to 1988?
x	Is watershed within a municipal boundary?
x	Have FRBC funds been spent on watershed?
?	Are FRBC applications pending for work on watershed?

FISHERIES INFORMATION

✓	Have forest activities impacted fisheries resources?
✓	Does the watercourse have existing fisheries values?
✓	Does the watercourse have historical fisheries values?
✓	Is the watercourse accessible to salmon?
✓	Is the watercourse habitat suitable for salmon?
✓	Are there enhancement opportunities for salmon?
✓	Is the watercourse habitat suitable for trout and char?
✓	Are there enhancement opportunities for trout and char?

WATER QUALITY

✓	Does the watercourse have an adequate water quality?
	If not, can it be rehabilitated?
?	Does the watercourse have an adequate food supply?
	If not, can it be restored?
x	Was periphyton community surveyed?
x	Was invertebrate community surveyed?
✓	Was water chemistry surveyed?
x	Was sediment or intergravel habitat surveyed?

✓	Have there been scientific surveys in the stream?
✓	Have nutrient dosing pots been placed in the stream?

HYDROLOGICAL FACTORS

✓	Are there forest-related activity impacts?
✓	Are there existing Water Rights (domestic, power, community watershed)?
✓	Is there year-round flow potential?
✓	Are there any existing hydraulic structures (dams, wiers, bridges, etc.)?
✓	Is there a debris-flow potential?

RIPARIAN ZONE

✓	Have forestry activities had negative impact on riparian vegetation?
✓	Is there existing well-established riparian vegetation?
✓	Are soil conditions amenable to re-vegetation?
?	Is the channel morphology appropriate for re-vegetation?
✓	Are unrestricted reaches present?
✓	Would re-vegetation be expected to benefit fish/wildlife habitat?

TERRESTRIAL PROCESS

✓	Have slopes >60% been logged?
✓	Are roads built on slopes >60%?
✓	Is bedrock-geology of basin stable?
?	Has basin experienced landslides?
?	Have landslides entered mainstream?

H	High	M	Medium	L	Low	U	Unknown

CREEK RATING

M	Impacts by logging
H	Fish resources
H,M	Rehabilitation potential

5.18.1 Factors of Concern

Fisheries

The watercourse flows through the valley lands and provides an excellent opportunity for riparian and stream size enhancement and large organic debris placement.

Hydrological

Poole Creek is a steep mountain creek with a watershed area of approximately 33 km^2, is tributary to the Birkenhead River which in turn is tributary to the Lillooet River. The watershed has a southeast (upper)and southwest (lower) aspect rising from an elevation about 360 m at its mouth to about 2524 m (Birkenhead Peak) at its headwaters over its 12 km channel length. Poole Creek has a very mild slope from its mouth on the Birkenhead for about 6 km to the BC Rail ROW The upper portion of the Poole Creek watershed is located within the Birkenhead Lake Park.

Four creek crossings including one bridge have been identified. All crossings should be inspected by a Professional Engineer (Hydrological) to find out if the bridge or culvert can pass the 100 year peak flows and to make recommendations for any improvements including removal.

There are at least two significant headwater lakes within the watershed which may provide an opportunity to construct low dams to facilitate the augmentation of summer flows. Poole Creek has existing water rights (C042329, Z105198, C072728 and Z105184) for irrigation and domestic uses which may complicate future instream work.

Water Quality

This creek appears to have good water quality, although its nutrient concentrations and specific conductance indicate it is likely nutrient poor. Nutrient dosing pots were deployed, however, much of the data was lost when the creek level dropped, leaving the pots dry and exposed. pH and DO values were good. No turbidity data was obtained. The reach studied had extensive riparian cover overhanging the creek which could provide additional food for aquatic insects. Future monitoring should include water quality, periphyton, invertebrate and intergravel studies, together with a comparison of pH and nutrient values and community structures. This creek should be considered for nutrient supplements.

Riparian Zone

Poole Creek meanders through a broad valley, and is extensively braided, with many side channels. Riparian vegetation is highly variable: some sites support very large cottonwood, western red cedar, and Douglas fir trees, while other areas have been scoured by debris flows and shifting channels. Creek flow is restricted in some locations by railway, highway, and powerline rights-of-way. The surrounding landscape is dominated by agricultural uses, including orchards. No recent forestry impacts were observed. Because of the instability of the system, riparian enhancement would probably have limited effect. Further field investigations would confirm this.

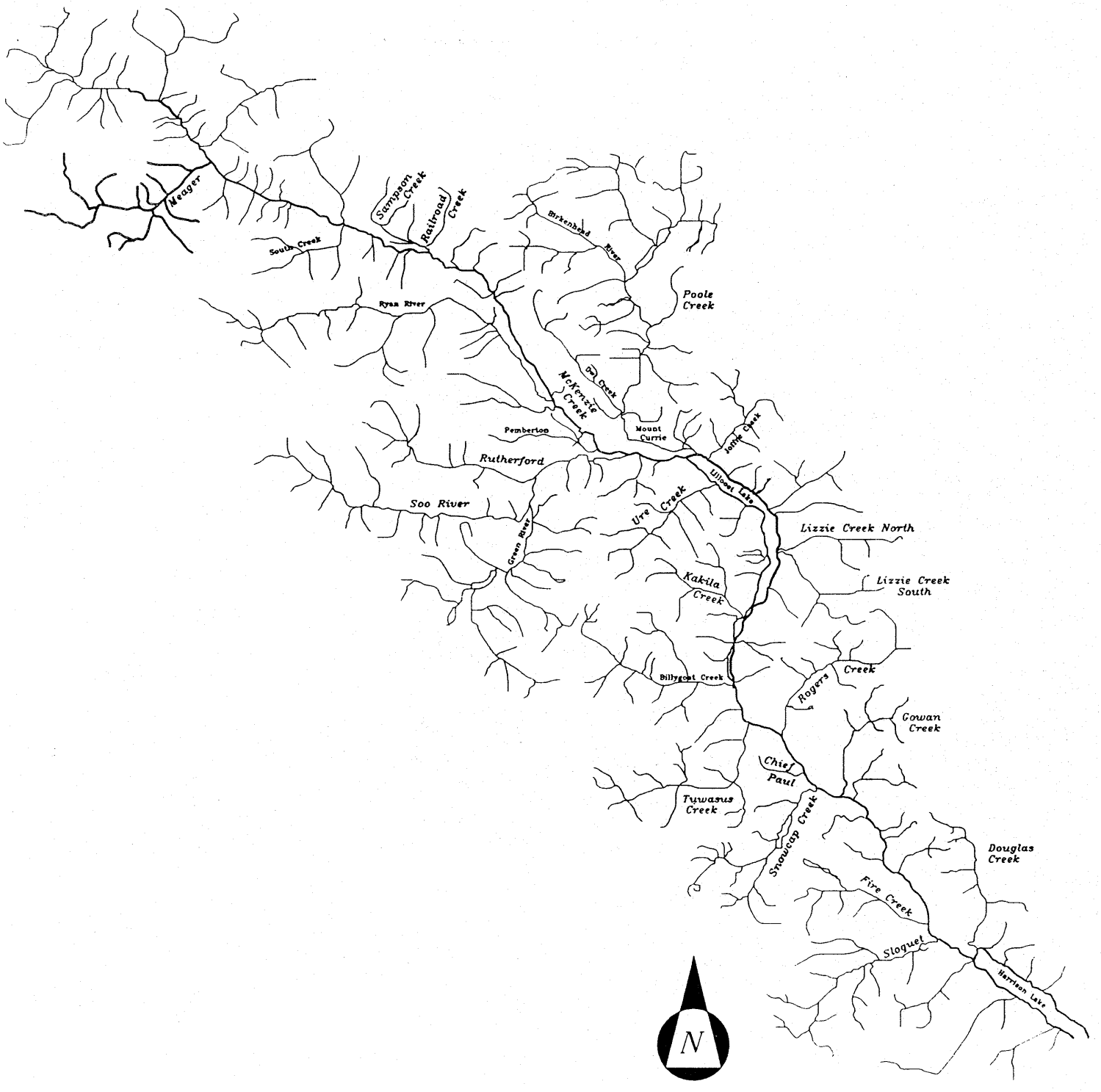
Logging History

Logging within the Poole Creek drainage has not been extensive. Logging disturbance history is presented below as summarized from the Ministry of Forests Integrated Silviculture Information System Ecology Report.

Year	Total Area Logged (ha)
1993	1.3
1987	12
1977	7
1975	9

Lillooet River Watershed

Meager Creek



5.19 Meager Creek

Data Summary Sheet

✓	Yes	x	No	?	Unknown

HISTORY

✓	Was watershed logged prior to 1988?
x	Is watershed within a municipal boundary?
x	Have FRBC funds been spent on watershed?
?	Are FRBC applications pending for work on watershed?

FISHERIES INFORMATION

✓	Have forest activities impacted fisheries resources?
✓	Does the watercourse have existing fisheries values?
✓	Does the watercourse have historical fisheries values?
✓	Is the watercourse accessible to salmon?
x	Is the watercourse habitat suitable for salmon?
✓	Are there enhancement opportunities for salmon?
x	Is the watercourse habitat suitable for trout and char?
✓	Are there enhancement opportunities for trout and char?

WATER QUALITY

?	Does the watercourse have an adequate water quality?
	If not, can it be rehabilitated?
?	Does the watercourse have an adequate food supply?
	If not, can it be restored?
x	Was periphyton community surveyed?
x	Was invertebrate community surveyed?
x	Was water chemistry surveyed?
x	Was sediment or intergravel habitat surveyed?

x	Have there been scientific surveys in the stream?
x	Have nutrient dosing pots been placed in the stream?

HYDROLOGICAL FACTORS

✓	Are there forest-related activity impacts?
✓	Are there existing Water Rights (domestic, power, community watershed)?
✓	Is there year-round flow potential?
✓	Are there any existing hydraulic structures (dams, wiers, bridges, etc.)?
✓	Is there a debris-flow potential?

RIPARIAN ZONE

✓	Have forestry activities had negative impact on riparian vegetation?
?	Is there existing well-established riparian vegetation?
?	Are soil conditions amenable to re-vegetation?
✓	Is the channel morphology appropriate for re-vegetation?
✓	Are unrestricted reaches present?
?	Would re-vegetation be expected to benefit fish/wildlife habitat?

TERRESTRIAL PROCESS

✓	Have slopes >60% been logged?
✓	Are roads built on slopes >60%?
x	Is bedrock-geology of basin stable?
✓	Has basin experienced landslides?
?	Have landslides entered mainstream?

H	High	**M**	Medium	**L**	Low	**U**	Unknown

CREEK RATING

H	Impacts by logging
L	Fish resources
L	Rehabilitation potential

5.19.1 Factors of Concern

Fisheries

Meager Creek has minimal fish resources and low enhancement potential due to instability of channels. The mainstem is not suitable for fish due to its unstable nature. However, pocket habitats may exist in the lower reaches of some tributaries.

Hydrological

Meager Creek is a moderately steep mountain creek with a watershed area of over 260 km^2, is tributary to the Lillooet River. The watershed has a generally western aspect rising from an elevation about 395 m at its mouth to 2,860 m at its headwaters on the Meager and Manatee Glaciers over its 30 km channel length. The Meager Creek watershed has hotsprings daylighting near its mouth. The watershed has been logged and has an extensive road network, therefore, sediment loading and peak flows may increase.

Six creek crossings have been identified. All crossings should be inspected by a Professional Engineer (Hydrological) to find out if the bridge or culvert can pass the 100 year peak flows and to make recommendations for any improvements including removal.

There over a dozen lakes within the watershed which may provide an opportunity to construct low dams to facilitate the augmentation of summer flows. The fact that Meager Creek does not have any water rights and is not a designated community watershed reduces the complications of future instream work. The overall steep slope (average 8%) and existence of steep sidewalls (some clearcut) could feed material and sustain debris-laden floods under the right conditions. Numerous valley wall gulleys connect to the creek providing a source of sediment. Prior to proceeding with instream works, a limited gulley and channel assessment should be carried out in the field.

Water Quality

No water quality was conducted on this creek, nor was it monitored for basic physical and chemical parameters. Future monitoring should include water quality, periphyton, invertebrate and intergravel studies, together with a comparison of pH and nutrient values and community structures.

Riparian Zone

Meager Creek is an extensive and varied system, approximately 20 km long from the alpine source to its confluence with the Lillooet River. High freshet flow volumes and a moderately restricted channel combine to make the system very energetic, with severe erosion and debris flows evident in some locations; eroding clearcut slopes have compounded natural processes to make the system even more unstable.

Because of the high seasonal flows and dynamism of Meager Creek, it is doubtful that riparian restoration would be cost-effective. However, if warranted as part of a fisheries enhancement project, field studies may reveal opportunities in some limited locations.

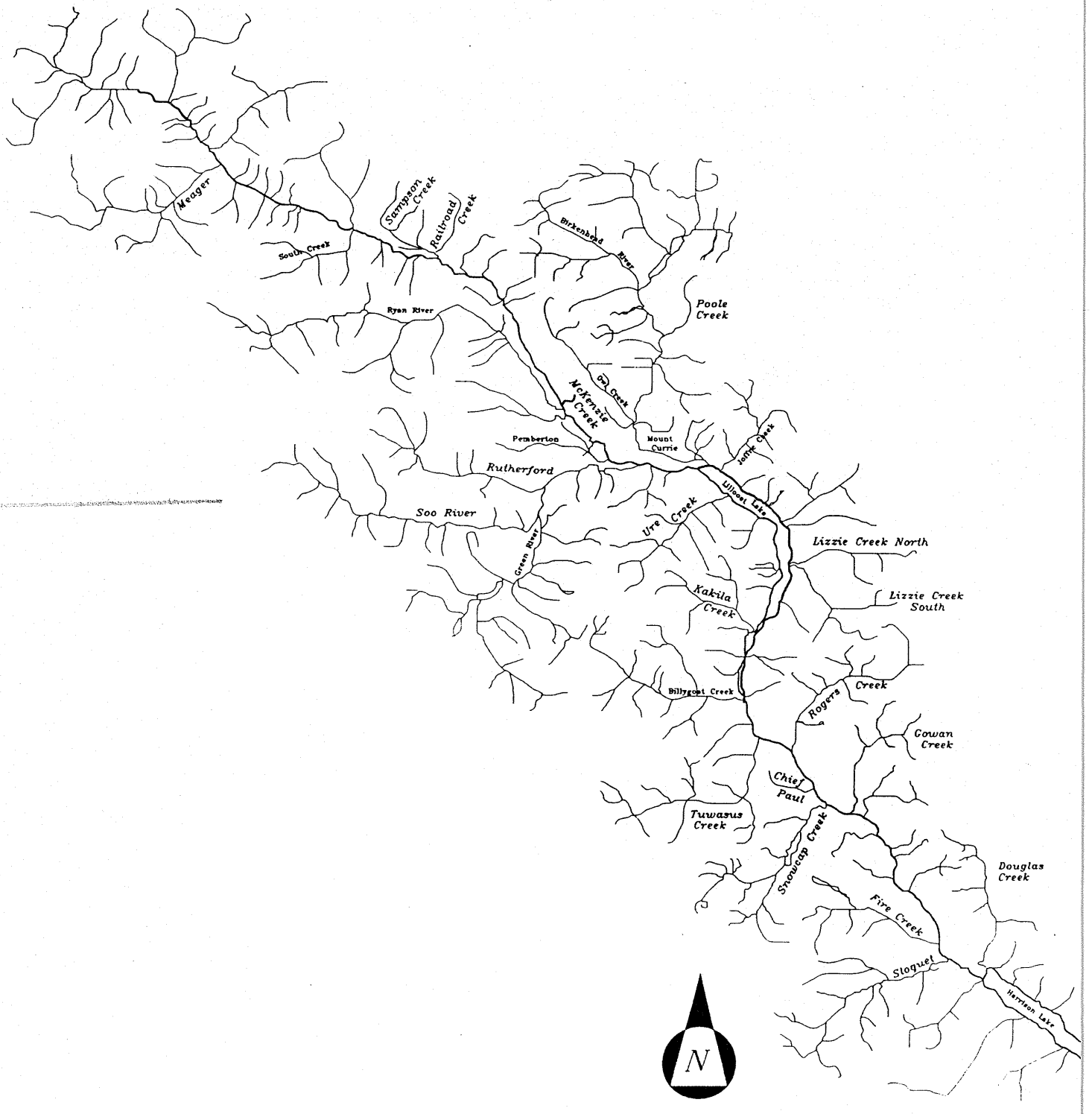
Logging History

The Meager Creek drainage has been logged extensively and has an extensive road network. Logging activities summarized from the Ministry of Forests Integrated Silviculture Information System Ecology Report are presented below:

Year	Total Area Logged (ha)
1980	140
1979	155
1978	279

Lillooet River Watershed

McKenzie Creek



5.20 McKenzie Creek

Data Summary Sheet

✓	Yes	x	No	?	Unknown

HISTORY

✓	Was watershed logged prior to 1988?
x	Is watershed within a municipal boundary?
x	Have FRBC funds been spent on watershed?
?	Are FRBC applications pending for work on watershed?

FISHERIES INFORMATION

✓	Have forest activities impacted fisheries resources?
✓	Does the watercourse have existing fisheries values?
✓	Does the watercourse have historical fisheries values?
✓	Is the watercourse accessible to salmon?
✓	Is the watercourse habitat suitable for salmon?
✓	Are there enhancement opportunities for salmon?
✓	Is the watercourse habitat suitable for trout and char?
✓	Are there enhancement opportunities for trout and char?

WATER QUALITY

?	Does the watercourse have an adequate water quality?
	If not, can it be rehabilitated?
?	Does the watercourse have an adequate food supply?
	If not, can it be restored?
x	Was periphyton community surveyed?
x	Was invertebrate community surveyed?
x	Was water chemistry surveyed?
x	Was sediment or intergravel habitat surveyed?

x	Have there been scientific surveys in the stream?
x	Have nutrient dosing pots been placed in the stream?

HYDROLOGICAL FACTORS

x	Are there forest-related activity impacts?
x	Are there existing Water Rights (domestic, power, community watershed)?
✓	Is there year-round flow potential?
x	Are there any existing hydraulic structures (dams, wiers, bridges, etc.)?
x	Is there a debris-flow potential?

RIPARIAN ZONE

?	Have forestry activities had negative impact on riparian vegetation?
✓	Is there existing well-established riparian vegetation?
✓	Are soil conditions amenable to re-vegetation?
✓	Is the channel morphology appropriate for re-vegetation?
✓	Are unrestricted reaches present?
?	Would re-vegetation be expected to benefit fish/wildlife habitat?

TERRESTRIAL PROCESS

x	Have slopes >60% been logged?
x	Are roads built on slopes >60%?
✓	Is bedrock-geology of basin stable?
x	Has basin experienced landslides?
x	Have landslides entered mainstream?

H	High	M	Medium	L	Low	U	Unknown

CREEK RATING

L	Impacts by logging
U	Fish resources
U	Rehabilitation potential

5.20.1 Factors of Concern

Fisheries

Helicopter reconnaissance indicated regenerated forest well established. There may be some opportunity for LWD placement in lake to improve overwintering habitat. Further assessment required to establish background data on habitat condition and fish distribution if restoration project proposed.

Hydrological

McKenzie Creek is a small mountain drainage with a watershed area of approximately 4 km^2 (hillslope drainage), is tributary to the Lillooet River. The watershed has a southeast aspect rising from an elevation about 245 m at its mouth to 1,650 m at its headwaters over its 3 km potential drainage path (no defined channel). No creek crossings have been identified.

There is a small pond at the headwaters of the creek, which appears to be within the floodplain of the Lillooet River. Flood levels of the Lillooet River should be investigated by a Professional Engineer prior to proceeding with enhancement work. The fact that MacKenzie Creek does not have any water rights and is not a designated community watershed reduces the complications of future instream work.

Water Quality

No water quality was conducted on this creek, nor was it monitored for basic physical or chemical parameters. Future monitoring should include water quality, periphyton, invertebrate and intergravel studies, together with a comparison of pH and nutrient values and community structures.

Riparian Zone

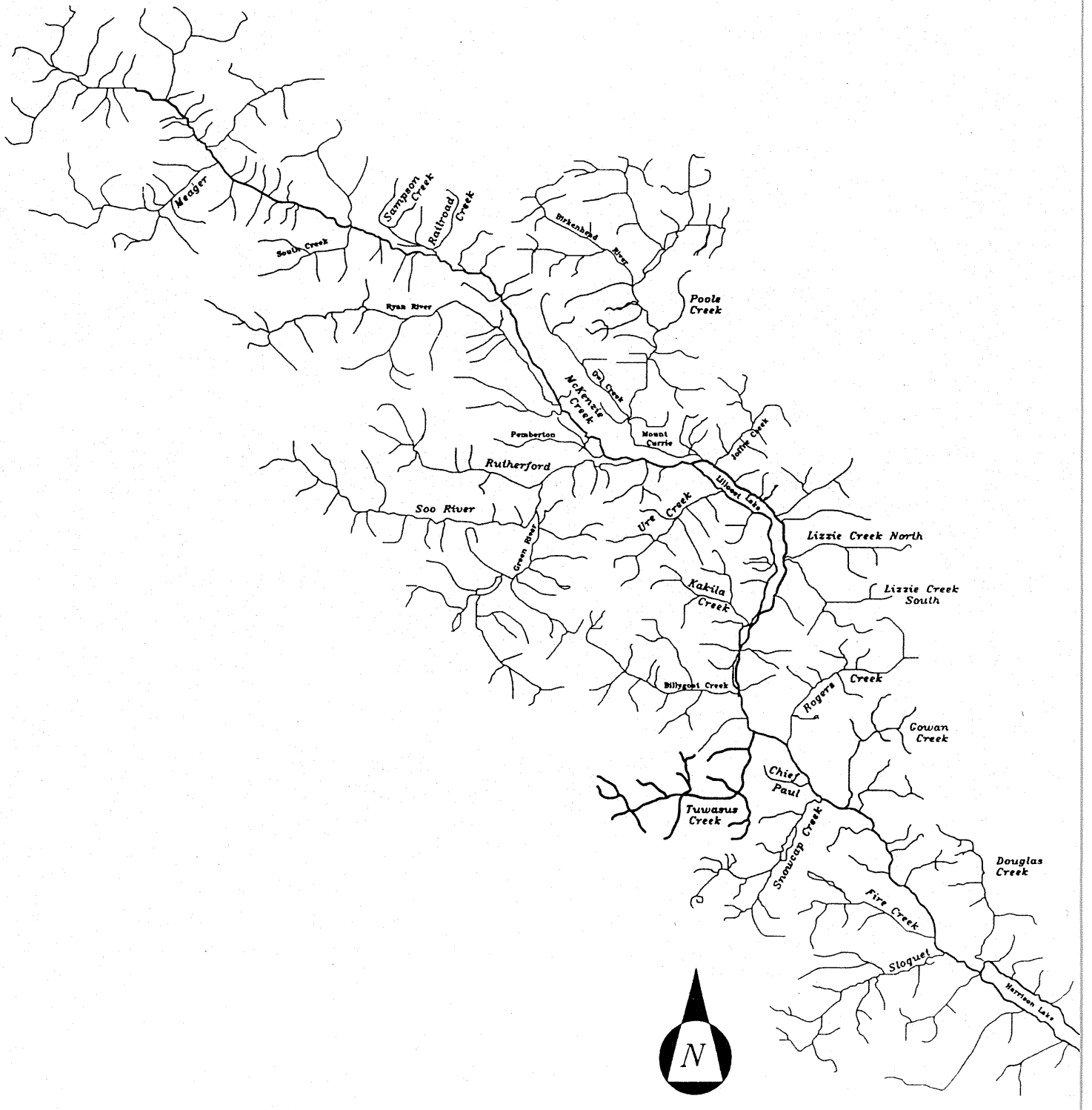
Starting at a small lake, the creek meanders from the toe of the slope to the Lillooet River within its floodplain. Some opportunities may exist for riparian zone enhancement because of disturbances caused by agricultural, residential, and recreational land-uses.

Logging History

The area was logged in the late 1960's (source: review comments, anonymous author).

Lillooet River Watershed

Tuwasus Creek



5.21 Tuwasus Creek

Data Summary Sheet

✓	Yes	x	No	?	Unknown

HISTORY

✓	Was watershed logged prior to 1988?
x	Is watershed within a municipal boundary?
x	Have FRBC funds been spent on watershed?
?	Are FRBC applications pending for work on watershed?

FISHERIES INFORMATION

?	Have forest activities impacted fisheries resources?
✓	Does the watercourse have existing fisheries values?
✓	Does the watercourse have historical fisheries values?
?	Is the watercourse accessible to salmon?
?	Is the watercourse habitat suitable for salmon?
?	Are there enhancement opportunities for salmon?
✓	Is the watercourse habitat suitable for trout and char?
?	Are there enhancement opportunities for trout and char?

WATER QUALITY

?	Does the watercourse have an adequate water quality?
	If not, can it be rehabilitated?
?	Does the watercourse have an adequate food supply?
	If not, can it be restored?
x	Was periphyton community surveyed?
x	Was invertebrate community surveyed?
x	Was water chemistry surveyed?
x	Was sediment or intergravel habitat surveyed?

x	Have there been scientific surveys in the stream?
x	Have nutrient dosing pots been placed in the stream?

HYDROLOGICAL FACTORS

✓	Are there forest-related activity impacts?
x	Are there existing Water Rights (domestic, power, community watershed)?
✓	Is there year-round flow potential?
✓	Are there any existing hydraulic structures (dams, wiers, bridges, etc.)?
✓	Is there a debris-flow potential?

RIPARIAN ZONE

✓	Have forestry activities had negative impact on riparian vegetation?
✓	Is there existing well-established riparian vegetation?
✓	Are soil conditions amenable to re-vegetation?
✓	Is the channel morphology appropriate for re-vegetation?
✓	Are unrestricted reaches present?
✓	Would re-vegetation be expected to benefit fish/wildlife habitat?

TERRESTRIAL PROCESS

✓	Have slopes >60% been logged?
✓	Are roads built on slopes >60%?
x	Is bedrock-geology of basin stable?
?	Has basin experienced landslides?
?	Have landslides entered mainstream?

H	High	M	Medium	L	Low	U	Unknown

CREEK RATING

M,H	Impacts by logging
M,L	Fish resources
U	Rehabilitation potential

5.21.1 Factors of Concern

Fisheries

Baseline habitat and fish data have been completed by MOELP using net-enclosed electrofishing. Dolly Varden and sculpins were captured in Tuwasus Creek. The creek requires further assessment to determine enhancement opportunities.

Hydrological

Tuwasus Creek, a moderately steep mountain creek with a watershed area of approximately 205 km^2, is tributary to the Lillooet River at 42 km upstream of Harrison Lake. The watershed has a east to northeast aspect rising from an elevation about 200 m at its mouth to 2,560 m at its headwaters (Mount Sir Richard, Tuwasus Mountain and Mount Pitt) over its 25 km channel length. Tuwasus Creek has several major tributaries including: North Tuwasus Creek, South Tuwasus Creek, and Helleborne Creek. The Tuwasus Creek watershed was been logged in the lower portions of the watershed. There has been some regrowth however present clearcuts may increase sediment loading and peak flows in the creek.

One crossing (a tributary to Tuwasus Creek) has been identified and should be inspected by a Professional Engineer (Hydrological) to find out if the bridge or culvert can pass the 100 year peak flows and to make recommendations for any improvements including removal.

There are about 27 lakes within the watershed which may provide an opportunity to construct low dams to facilitate the augmentation of summer flows. Tuwasus Creek does not have any water rights and is not a designated community watershed.

Water Quality

No water quality was conducted on this creek, nor was it monitored for basic physical or chemical parameters. Future monitoring should include water quality, periphyton, invertebrate and intergravel studies, together with a comparison of pH and nutrient values and community structures.

Riparian Zone

Tuwasus Creek flows westward from Golden Ears Park to the Lillooet River. The final 0.6 km of the creek is within the Lillooet floodplain. Just upstream, to about 1.7 km, the creek flows through a moderately steep gorge. Further upstream, to about 4.1 km, the valley bottom is wider, and the creek meanders in a braided channel. Upstream from there, the valley bottom narrows and the flows are restricted.

Clearcut blocks approximately 10 years old are extensive on the right (south) flank of the valley between approximately 0.9 and 4.1 km from the creek mouth. This area is where the valley bottom is widest, and the water flow the least restricted. Forest regrowth is quite vigourous and the potential for riparian enhancement appears quite high in this location.

Logging History

Logging activities within the Tuwasus Creek drainage are summarized from the Ministry of Forests Integrated Silviculture Information System Ecology Report.

Year	Total Area Logged (ha)	Year	Total Area Logged (ha)
1983	38	1973	22.1
1981	132	1970	53
1979	69.5	1967	62
1976	20	1963	158