



Mackenzie Valley Environmental Impact Review Board

Box 938, 5102-50th Avenue, Yellowknife, NT X1A 2N7

From: Martin Haefele Fax: (867) 766-7074
Phone:
Date: July 3, 2003 Pages: 38 including this page
To: Distribution List Fax:
CC:
Re: **Northrock Summit Creek Environmental Assessment**
Additional Information and Request for Technical Analysis Reports

NOTES:

Attached are a letter and additional information for the Northrock Summit Creek Environmental Assessment. Apologies for the rather long fax. If you have any questions or concerns, please do not hesitate to contact me.

Regards

Martin Haefele

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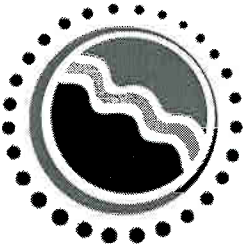
Todd Burlingame	Chair	(867) 766-7059TBurlingame@mveirb.nt.ca
Vern Christensen	Executive Director	(867) 766-7055VChristensen@mveirb.nt.ca
Djhanine Bautista	Administration Assistant (casual)	(867) 766-7050 Secretary@mveirb.nt.ca
Bridgette Larocque	Finance & Administration Officer	(867) 766-7054BLarocque@mveirb.nt.ca
Karen MacArthur	Traditional Knowledge Coordinator	(867) 766-7060KMacArthur@mveirb.nt.ca
Sherri Sian	Environmental Assessment Officer	(867) 766-7063SSian@mveirb.nt.ca
Martin Haefele	Environmental Assessment Officer	(867) 766-7053MHaefele@mveirb.nt.ca
Alan Ehrlich	Environmental Assessment Officer	(867) 766-7056AEhrlich@mveirb.nt.ca
Roland Semjanovs	Communications Officer	(867) 766-7051RSemjanovs@mveirb.nt.ca

URI: www.mveirb.nt.ca

Distribution List

North Rock Resources Ltd. , Summit Creek Drilling Program

Organization	Contact Person	Postion	Fax Number/e-mail address
Sahtu Land and Water Board	George Govier	Executive Director	867-598-2325
Sahtu Secretariat Inc.	Edwin Erutse	Chairperson	867-589-4908
Sahtu Land Use Planning Board	Kim Horrocks	Senior Planner	info@sahtulanduseplan.com
Sahtu Renewable Resource Board	Jody Shortland	Executive Director	director@srrb.nt.ca
Tulita District Land Corporation (and Tulita Land Corporation)	Gordon Yakeleya	President	867-588-4025
Fort Norman Metis Local # 60 Land Corporation	Eddy McPherson	President	867-588-3806
Tulita Band Council	Frank Andrew	Chief	867-588-3613
Fort Norman Renewable Resource Council	Wilfred Lennier.	President	867-588-3726
Ernie McDonald Land Corporation	Todd McCauley	President	867-587-2545
DIAND North Mackenzie District	Rudy Cockney	District Manager	867-777-2090
DIAND	Marie Adams		adamsm@inac.gc.ca
DIAND Norman Wells	Steve Deschene	Inspector	867-587-2928
National Energy Board	Terry Baker	Chief Conservation Officer	403-292-5876
Environment Canada	Wade Romanko		Wade.romanko@ec.gc.ca
Fisheries and Oceans	Pete Cott	Area Habitat Biologist	867-777-7501
RWED GNWT	Gavin More	EA Analyst	Gavin_More@gov.nt.ca
Prince of Wales Northern Heritage Centre	Emily Hawkins		Emily_hawkins@gov.nt.ca
CPAWS	Jennifer Morin	Conservation Coordinator	cpawsnwt@theedge.ca



Mackenzie Valley Environmental Impact Review Board

July 3, 2003

Distribution List

Dear Parties:

**Re: Northrock Summit Creek B-44 Environmental Assessment
Additional Information and Request for Technical Analysis Reports**

The MVEIRB issued several information requests for this assessment on its own motion and one information request proposed by the Canadian Parks and Wilderness Society. The information requests and the responses received from Northrock Resources, RWED and the Sahtu Renewable Resources Board are attached. This concludes the information gathering phase of the Environmental Assessment.

The next steps in the process is for the parties to review and analyze the available information and to provide the MVEIRB with a "Technical Analysis Report" if they wish to do so. There is no specific format to follow. Please submit your reports, or any other comments you might have by July 21, 2003.

If you have any questions regarding this Environmental Assessment, please do not hesitate to contact me at (867) 766-7053 or at mhaefele@mveirb.nt.ca.

Sincerely

A handwritten signature in blue ink, appearing to read "Martin Haefele".

Martin Haefele
Environmental Assessment Officer

Encl.:

- Information Requests
- Northrock's Responses to Information Requests
- SRRB response to Information Request
- RWED Response to Information Request

IR Number: 1.1.1

Source: Mackenzie Valley Environmental Impact Review Board

To: Northrock Resources Ltd.

DAR Section: Alternatives, E-1 Access

Terms of Reference Section: E. Alternatives, E-1. Access

Contrast environmental impacts of different access routes. Also include, where possible, alternatives to the proposed equipment

Preamble

The DAR contrasts the Keele River and Little Bear River access routes in general terms including total footprint, cost, access to water sources, water requirement, and possible future developments. At the community hearing on May 15, however, Tulita residents continued to argue strongly in favour of the Little Bear route. The main argument is that it would be better to use the existing route than opening up a new one.

Request

The MVEIRB asks Northrock to provide information separately for:

- the Keele River route up to the junction with the Little Bear Route,
- the Little Bear route proposed by Northrock to the junction with the Keele River route,
- the Little Bear route suggested by the community (i.e. the access used for the seismic project) to the junction with the Keele River route, and
- the remainder of the access to the well site.

Please provide the following numbers for each of the above segments:

- Total amount of water required to ice in the road;
- Length of route that requires widening;
- Length of route that requires re-opening old outlines (excluding lines used in the past 5 years); and,
- Total area involved.

IR Number: 1.1.2

Source: Mackenzie Valley Environmental Impact Review Board

To: Northrock Resources Ltd.

DAR Section: J. Cultural and Heritage Resources, J-1 Local Resources

Terms of Reference Section: J. Cultural and Heritage Resources,

J-1 Local Resources:

Identify archeological and other heritage resources as well as sites or areas of cultural significance in or near the project area.

J-2 Direct Impacts:

Describe potential direct impacts on sites or areas identified in I-1

Preamble

The DAR lists several archeological and historical sites and states that there will be no impacts to these sites. During the Community Hearing on May 15, 2003 in Tulita Northrock stated that the company plans to employ an archeologist to verify the locations and nature of the sites and to conduct a search for other possible sites along the route.

Request

The MVEIRB asks Northrock to provide the following information regarding archeological sites:

- For which portions of the project does Northrock propose to conduct an archaeological assessment, and why?
- What mitigation measures does Northrock propose in case this assessment identifies any sites that may be impacted by the project?

IR Number: 1.1.3

Source: Mackenzie Valley Environmental Impact Review Board

To: GNWT-RWED

DAR Section: I. Wildlife Harvesting

Terms of Reference Section: I. Wildlife Harvesting

Preamble

Northrock described in its DAR various mitigation measures it believes will minimize any impact on wildlife. The DAR does not specify which wildlife species might be present in the project area.

Request

The MVEIRB asks the Sahtu Regional Office of RWED to supply the following information, to the extent possible:

- What wildlife species are confirmed to be present in the project area, in particular along the two possible access routes (Keele River and Little Bear River routes)?
- What is the abundance of these species and, if available, how are they distributed along the access routes and in the project area in general?
- What other species can reasonably be expected in the area, with what abundance and distribution?
- Are any of these species particularly sensitive to disturbance? If possible rate the sensitivity of each species.
- What habitat types are encountered by each access route?

IR Number: 1.1.4

Source: Mackenzie Valley Environmental Impact Review Board

To: GNWT-RWED

DAR Section: I. Wildlife Harvesting

Terms of Reference Section: I. Wildlife Harvesting

Preamble

The DAR gives an overview of the effects the project may have on wildlife harvesting and concludes that there will be little net effect. For the Board to determine if a significant adverse effect on wildlife harvesting is likely, it requires a baseline of harvesting activity and information on the importance of harvesting to the local economy.

Request

The MVEIRB asks GNWT-RWED to supply any statistics it may have regarding harvest in the Tulita region over the past 5 years or longer. In addition to statistics on the level of harvesting, information on the total value of the harvest will be of interest. This would include value as food source. Lacking specific information on Tulita, statistics involving the Sahtu Settlement Area will be helpful.

IR Number: 1.1.5

Source: Mackenzie Valley Environmental Impact Review Board

To: Sahtu Renewable Resource Board

DAR Section: I. Wildlife Harvesting

Terms of Reference Section: I. Wildlife Harvesting

Preamble

Northrock Resources detailed its efforts to determine the level of harvesting activity in the project area in its DAR and provided information on harvested furs for the Tulita district. The Sahtu Dene and Metis Comprehensive Land Claim Agreement defines harvest to include gathering, hunting and fishing in addition to trapping. The SRRB conducted a harvest study for the Sahtu Settlement.

Request

The MVEIRB acknowledges the confidentiality of any information related to individual harvesters and does not request any information that could be traced back to an individual. Furthermore, the MVEIRB does not request any location specific information, but rather summaries for certain areas. The MVEIRB asks the SRRB to provide the following information from the ongoing harvest study to the extent possible:

- What species and in approximately what numbers were harvested since the study began in the area traversed by the Little Bear route to where it joins the Keele River route?
- What species and in approximately what numbers were harvested since the study began in the area traversed by the Keele River route to where it joins the Little Bear route?
- What species and in approximately what numbers were harvested since the study began in the area traversed by the access route from where the Keele and Little Bear routes meet to the well site.
- Does the available data show any trends towards an increase or decrease in harvesting levels for any of these areas?
- How accurately does this information from the harvest study reflect actual harvest?

Please include the width of the corridor along each route you choose for the analysis, as well as rationale for this choice.

IR #: 1.2.1

Source: Canadian Parks and Wilderness Society NWT Chapter

To: Northrock Resources Ltd. (Developer)

DAR Section: C. Development Description/ E. Alternatives

Terms of Reference Section: C. Development Description/ E. Alternatives

Preamble:

In these sections, the Developer describes timing, access road and well site, construction methods, operations, waste management, water use, and abandonment and restoration as well as alternatives to access, well site, waste management, and water use. In these descriptions, the Developer does not appear to have described in detail 'best practices', specific mitigation measures, or alternative access/drilling/operations methods to minimize environmental impacts (i.e. compaction of ground).

Request:

1. Has the Developer considered holding regular meetings to discuss/remind workers of the importance of avoiding damage to the organic mat and to permafrost?
2. What control measures will be taken by the Developer in areas prone to surface drainage or erosion?
3. Has the Developer considered lower-impact devices, such as crushers¹, as an alternative to bulldozers?
4. Has the Developer considered decreasing the width of rights-of-way at stream crossings to preserve riparian habitats?
5. Has the developer considered using oil drip pans on major equipment?
6. What training/instruction will the Developer's contractors and employees receive on wildlife awareness, wildlife avoidance, and garbage control?
7. Has the Developer considered instituting a system of performance-based incentives to promote best practices by contractors?²
8. What type of qualified environmental personnel will be on site to supervise drilling operations in environmentally sensitive areas?

¹ Crushers grind trees and stumps into mulch, promoting faster vegetation re-growth and reducing clean-up requirements.

² For example, under such a system the contractor would receive a penalty for surface damage, excessive clearing, and other environmentally harmful practices.



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June 2, 2003

Mackenzie Valley Environmental Impact Review Board
Box 938, 200 Scotia Centre, (5102-50th Avenue),
Yellowknife, NT. X1A 2N7

Attention: Martin Haefele

Dear Sir,

Re: Northrock Summit Creek Environmental Assessment – Information Requests

Please find below, the information that has been provided in response to Information Requests 1.1.1 and 1.1.2.

IR Number 1.1.1

Request:

Provide information separately for:

- the Keele River Route up to the junction with the Little Bear Route;
- the Little Bear Route proposed by Northrock up to the junction with the Keele River Route;
- the Little Bear Route suggested by the community to the junction with the Keele River Access Route.

Information required:

- Total amount of water required to ice in the road;
- Length of route that requires widening;
- Length of route that requires re-opening old cutlines (>5years old); and,
- Total area involved.

Response: The information requested is provided in the table below.

Comparison of Impacts	Keele River Access Route	Original Little Bear Access Route	Alternative Little Bear Access Route	Remainder of Access Route to Wellsite
Length of access	18.50km	83.75km	78.75km	55.16km
Water budget (100m ³ /km)	1850m ³	8,375m ³	7,875m ³	5,616m ³
Widening	18.50km	13.00km	78.75km	55.16km
Reopening cutlines > 5 years old	18.50km	0.0km	59.0km	Not required
Area	18.50ha	83.75ha	78.75ha	59.65ha*

*Note: Nominal access width is 10m. 8.99km of the *Remainder of Access Route to Wellsite* section will require widening to 15m.

**IR Number 1.1.2****Request:**

Provide information regarding archaeological sites:

- For which portions of the project does Northrock propose to conduct an archaeological assessment and why?
- What mitigation does Northrock propose in case this assessment identifies any sites that may be impacted by the project?

Response:**Archaeological Assessments**

Northrock was requested by the Prince of Wales Northern Heritage Centre to conduct an assessment of known archaeological sites along the Summit Creek B-44 access route. A number of catalogued sites have been identified on the south shore of Stewart Lake close to the existing access that will be used for this program. Although the access route will utilize existing trails and cutlines, some widening of the lines will be required as well as the clearing of detours on some steeper grades. Northrock has retained an archaeologist who will examine the known archaeological sites in the Stewart Lake area and will also survey the entire Keele River route and wellsite for evidence of other, non-catalogued sites. Northrock is prepared to undertake this expanded scope of study to ensure that both known and potential heritage resources along the project corridor are adequately assessed and, if need be, protected.

Mitigation Measures

In the event that the access route or wellsite is in conflict with a known or new archaeological find, Northrock will adjust the routing and or location of the wellsite accordingly. This may include detours around sites and/or the relocation of the wellsite to protect heritage resources.

I trust you find the information provided to be sufficient for your continuing assessment of the Summit Creek Project. If you require additional information, or wish to discuss further, please contact the undersigned at (403) 213-7441 or by email: LAW@northrock.ab.ca.

Sincerely,

NORTHROCK RESOURCES LTD.

Matt Law
Project Consultant



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June 12, 2003

Mackenzie Valley Environmental Impact Review Board
Box 938, 200 Scotia Centre, (5102-50th Avenue),
Yellowknife, NT. X1A 2N7

Attention: Martin Haefele

Dear Sir,

Re: Northrock Summit Creek Environmental Assessment – Information Requests

Please find below a supplement to the information that has been provided in response to Information Request 1.1.1. The following is a discussion of the two Little Bear route alternatives.

IR Number 1.1.1

The Little Bear Route was previously used by Northrock and AEC for access to the Tertiary Creek 2001 Seismic Program and the AEC G-18 well respectively. Although not ideally located, it was an extension to access already prepared for Northrock's McKay I-77 well. The Little Bear Route has hills which require bulldozer to tow wheeled vehicles up, and marginal or inadequate sources for water to use in road construction. Although Northrock utilized this route for its Tertiary Creek 2001 Seismic Program, no road preparation or widening was required, as all of the equipment was towed by bulldozers. With no wheeled used in the seismic operation, tow hills were not an issue, and water for road preparation was not required. Since the Little Bear Route was last used for wheeled access by AEC in 1999/2000, the water sources available to developers have been restricted by the Department of Fisheries and Oceans as a result of its new protocol. Northrock is concerned that the water sources utilized by AEC would not be available to Northrock due to those DFO restrictions. A lack of water for road construction would prevent Northrock from utilizing the original Little Bear Route.

The Alternate Little Bear Route to the east of the original Little Bear Route, has no tow hills and significantly better access to water. It follows existing cut lines which would have to be re-opened and widened. It would join the original Little Bear Route close to Tate Lake. Repeated use of the original Little Bear Route has the potential to increase the levels of compaction that may already be present from previous use. The use of an alternative access will result in less cumulative impact to the Little Bear Route and will increase the potential for natural re-growth on that route. Neither Little Bear Route would be utilized in development of a successful oil or gas find at Summit Creek.



Regardless, Northrock's inability to undertake drilling the Summit Creek B-44 well with any confidence that it could complete the operation in a single winter season, precludes utilization of either Little Bear Route. The additional 80 km of access required to utilize either Little Bear Route increases the access construction time by such an extent that there is a substantial and unacceptable risk (to Northrock) that Northrock would be unable to reach its drilling objective and demobilize the rig prior to the end of the drilling season. A two year operation, aside from being unacceptable financially to Northrock, requires the same amount of construction the second year as would be required to initially access the drill site. This would increase the cumulative environmental impact on the area.

I trust you find the information provided to be sufficient for your continuing assessment of the Summit Creek Project. If you require additional information, or wish to discuss further, please contact the undersigned at (403) 213-7441 or by email: LAW@northrock.ab.ca.

Sincerely,
NORTHROCK RESOURCES LTD.

Matt Law
Project Consultant



NORTHROCK RESOURCES LTD.
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July 3, 2003

Mackenzie Valley Environmental Impact Review Board
Box 938, 200 Scotia Centre, (5102-50th Avenue),
Yellowknife, NT. X1A 2N7

Attention: Martin Haefele

Dear Sir,

Re: Northrock Summit Creek Environmental Assessment – Information Requests

Please find below, the information that has been provided in response to Information Request 1.2.1.

IR Number 1.2.1

Request:

Provide information relating to “best practices”, specific mitigation measures, or alternatives to access/drilling operations methods to minimize environmental impacts.

Response: Answers to the eight questions of IR 1.2.1 have been provided below in the same order as they appear in the information request.

1. Northrock intends to hold daily safety meetings with all contractors and personnel during the life of the project. These meetings will be held to discuss the planned activity for each day, to discuss safety and environmental issues associated with the activity and to ensure the conditions of the land use permit and water licence are met.
2. Access construction will utilize water to freeze-in the road bed and snow will be used as a road surface. The ice and snow will provide protection for organic and mineral soils and will reduce the potential for erosion. The road will be maintained throughout the program with additional applications of water and snow to ensure a firm road bed and has the secondary effect of preventing erosion through rutting and damage to the organic mat.
3. While Northrock has indicated that some widening will be required along existing access routes, every effort will be made to use the existing trail and cutline widths. Where widening is required, clearing with bulldozers has been selected as

the method of choice. Under frozen ground conditions, most trees will snap off at ground level and the exposure of mineral soil and damage to the vegetative mat is not a serious issue. There are few areas along the access route where widening will result in the clearing of large diameter trees. Where this is the case, and if trees are being uprooted rather than snapping off, chain saws will be used to fell the trees. Similar cold weather operations conducted by Northrock have shown that clearing with bulldozers can be performed with minimal disturbance to the ground cover.

4. The access route follows existing cut lines and trails. There are no plans to widen the trails at any stream crossings. Streams will be crossed using ice bridging techniques and/or clean snowfills. Damage to riparian habitats is not anticipated.
5. The use of drip pans and/or absorbent blankets to catch oil drips from heavy equipment is a standard operating procedure for Northrock.
6. As discussed in Response #1., daily safety meetings will be held to discuss issues relating to the project activity and safety and environmental concerns. These meetings will include discussions and directives relating to wildlife awareness/avoidance and garbage control.
7. Northrock has not considered performance-based incentives to promote "best practices" by contractors. Rather, Northrock intends to rely on experienced construction supervisors that are familiar with both the area and "best practices" to supervise the access construction.
8. Northrock will retain the services of a qualified environmental monitor for the components of the project that may be deemed sensitive (eg. access widening and lease construction).

I trust you find the information provided to be sufficient for your continuing assessment of the Summit Creek Project. If you require additional information, or wish to discuss further, please contact the undersigned at (403) 213-7441 or by e-mail: LAW@northrock.ab.ca.

Sincerely,
NORTHROCK RESOURCES LTD.

for 
Matt Law
Project Consultant



NORTHROCK RESOURCES LTD.



Mackenzie Valley Environmental Impact Review Board
Information Request No. 1.1.5
Northrock Summit Creek Environmental Assessment
DAR Section I. Wildlife Harvesting

The Sahtu Settlement Harvest Study is an important project required under the Sahtu Dene and Metis Comprehensive Land Claim Agreement (13.5.6). The Study records the number of animals, fish, and birds harvested by Sahtu Dene and Metis hunters, trappers, and fishers throughout a five-year period (1998–2003). The Study is confidential; harvester names will not be released and information collected cannot be used to prosecute harvesters. The communities of Colville Lake, Fort Good Hope, Norman Wells, and Tulita began participating in April 1998. The community of Deline began participating in January 1999.

Harvest data is collected on a monthly basis by community field-workers using a census approach, i.e., interview every eligible harvester in the Sahtu. An eligible harvester must meet ALL the following conditions: 1) is a Sahtu Dene, Metis or non-participant of the claim who provides for their Sahtu Dene-Metis family, 2) currently living in the Sahtu Settlement Area, 3) is an adult who is 16 years of age or over, and 4) must currently do one or more of the following harvesting activities: hunt, fish, and/or trap. The intent of this study is to interview every eligible harvester in the Sahtu Region. However, not all eligible harvesters are interviewed each month because they are out of town, out on the Land or have refused to participate in the study. Therefore, a participation rate is calculated to show the number of harvesters that participate relative to the number of eligible harvesters. The regional participation rate for the period of April 1998 to June 2002 is approximately 74%.

All data collected is entered in the Harvest Study Database. Once data collection is completed, the database will be used as a tool by the SRRB to do two main things: 1) make effective management decisions regarding the Land and natural resources in the Sahtu and 2) determine the Sahtu Basic Needs Level, which is the number of animals required to feed all Sahtu households each year, of the Dene and Metis so that their harvesting traditions can be protected.

As per the Mackenzie Valley Environmental Impact Review Board's request, the following harvest study data lists the type and number of species harvested* for the period of April 1998 to June 2002 by route**:

Little Bear Route

Fish Harvested	Total
Arctic Grayling	14
Cisco (Herring)	60

Lake Whitefish	25
Northern Pike	30
Sucker (Longnose or White)	20

Small Mammals Harvested	Total
Beaver	4
Hare Species***	80
Muskrat	3
Porcupine	2
Snowshoe Hare	183
Wolf	1

Large Mammals Harvested	Total
Black Bear	2
Moose	57
Woodland Caribou	4

Birds Harvested	Total
American Widgeon	28
Black Scoter	18
Brant Goose	7
Canada Goose	154
Duck Species***	30
Goose Species***	88
Grouse Species***	26
Mallard	362
Northern Pintail	60
Ptarmigan Species***	5
Scoter Species***	38
Snow Goose	14
Surf Scoter	31
Trumpeter Swan	3

Keele River Route

Fish Harvested

- No data recorded

Small Mammals Harvested	Total
Fox Species***	2

Large Mammals Harvested	Total
Moose	35
Woodland Caribou	3

Birds Harvested	Total
Brant Goose	2
Canada Goose	15
Mallard	5

Access Route

Fish Harvested	Total
Burbot	20
Lake Trout	300
Lake Whitefish	300
Northern Pike	20

Small Mammals Harvested	Total
Snowshoe Hare	5

Large Mammals Harvested	Total
Moose	1

Birds Harvested
- No data recorded

* Harvest study data does not include resident or non-resident harvest in the Sahtu Region.

** Harvest study data is collected in 10km x 10km grid blocks. Therefore, rather than using a corridor, the Little Bear, Keele River and Access routes were overlaid on the harvest study maps and the grid blocks that were intersected by the routes were used to present the requested information.

*** Several categories (Fox spp, Hare spp, Grouse spp, Ptarmigan spp, Scoter spp, Duck spp, Goose spp) were created to accommodate harvesters who could not recall the species of small mammals or birds they harvested.

The available data shows that the harvesting levels for the Little Bear, Keele River and Access routes have remained consistent over the five-year period for birds, fish, small & large mammals. One noted decline along all routes was in the number of hares harvested since 1999; however, one may suggest that this is simply due to a low in the life cycle.

For further information or clarification, please do not hesitate to contact our office at (867) 588-4040 or director@srrb.nt.ca.

Northrock Resources Ltd. SUMMIT CREEK B-44 Drilling Program

INFORMATION REQUEST RESPONSE

19 June 2003

Prepared For: Mackenzie Valley Environmental Impact Review Board

Prepared By: Alasdair M. Veitch, P.Biol., Certified Wildlife Biologist
Supervisor, Wildlife Management

Chris Baker,
Regional Petroleum Business Manager

James Auld,
GIS Technician

Resources, Wildlife & Economic Development
Government of the Northwest Territories
P.O. Box 130, Norman Wells, NT X0E 0V0
Ph: 867-587-2786; Fx: 867-587-2359
email: Alasdair_Veitch@gov.nt.ca

Northrock Resources Ltd. SUMMIT CREEK B-44 Drilling Program

Information Request Response

IR No: 1.1.3

Source: Mackenzie Valley Environmental Impact Review Board–

To: GNWT/RWED

DAR Section: I Wildlife Harvesting

ToR Section: I Wildlife Harvesting

Question 1a: What wildlife species are confirmed to be present in the project area, in particular along the two possible access routes (Keele River and Little Bear routes)?

Question 1b: What is the abundance of these species and, if available, how are they distributed along the access routes and in the project area in general?

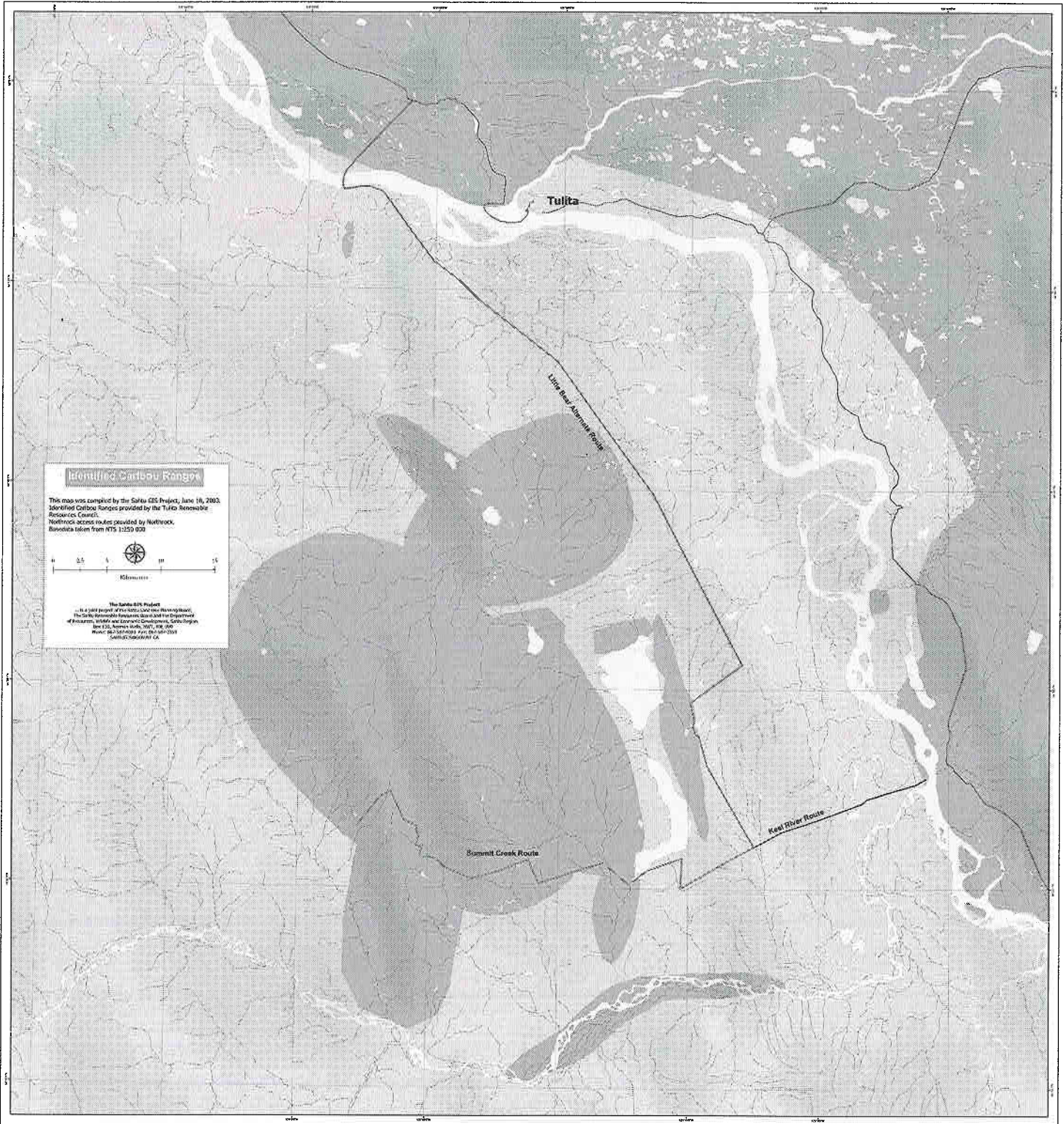
RESPONSE:

A) Mammals

Black and grizzly bear – likely low density, with density of grizzly bear being lower than that of black bear. Within the boreal forest, unlikely that black bear density exceeds 10 bears per 100 km² and grizzly density is likely to be ≤ 1 bear per 100 km². Both species may den within the project area and den disturbance by equipment or human disturbance during winter is a possibility. Grizzly bears in the NWT are listed as a 'vulnerable' species by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Any human-related mortality of grizzly bears is considered to be additive to natural mortality.

Boreal woodland caribou – low density, but could occur throughout the project area (Figure 1). Listed as a Threatened Species by COSEWIC and any disturbances, habitat loss, or mortalities are of considerable concern as a result. Habitat preference for areas of old-growth conifer forest, particularly during winter. A TK study of boreal caribou distribution (10 Tulita residents interviewed March 2001) indicates that neither the Keele-Stewart Lake or Little Bear River route would traverse currently known boreal caribou range. West of Stewart Lake, the access road would bisect known caribou range from the south end of Stewart Lake to the well site at Summit Creek.

Mountain woodland caribou – distribution likely limited to extreme west side of project area, including the Flintstone Range. Not expected to occur within the project area during winter.



Moose – likely the most abundant ungulate in the project area (Figure 2). Occur throughout the project area; in winter are generally more likely to be found along major river courses, particularly in areas of fire regeneration or where ice, etc. maintain dense stands of willow, dogwood, and other favoured browse species.

From aerial surveys for moose in the Tulita area in 1993 and 1999 (Figure 3 and Figure 4), we estimated that moose density in individual survey blocks (average size approximately 20 km²) ranged from a low of 0 to 5 moose per 100 km² to a high of over 150 moose per 100 km² depending on habitat – densities tend to be particularly high in riparian stands of taller deciduous shrubs and in burns that are 10 to 30 years post-fire.

Moose are the most well-studied wildlife species within the general project area – government biologists began aerial surveys for moose in the ‘Tulita area’ in 1993 using a standard aerial survey technique devised in Alaska and used across the range of moose in North America. This technique is a stratified random block survey done during winter (November to February) when moose tend to aggregate along major river valleys. Details of the study are given in: *Swallow, M., R. Popko, and A. Veitch. 2003. Tulita area moose survey, January 1999. Manuscript Report No. 151, Dept. of Resources, Wildlife & Economic Development, Norman Wells, NT. 20 pp.*

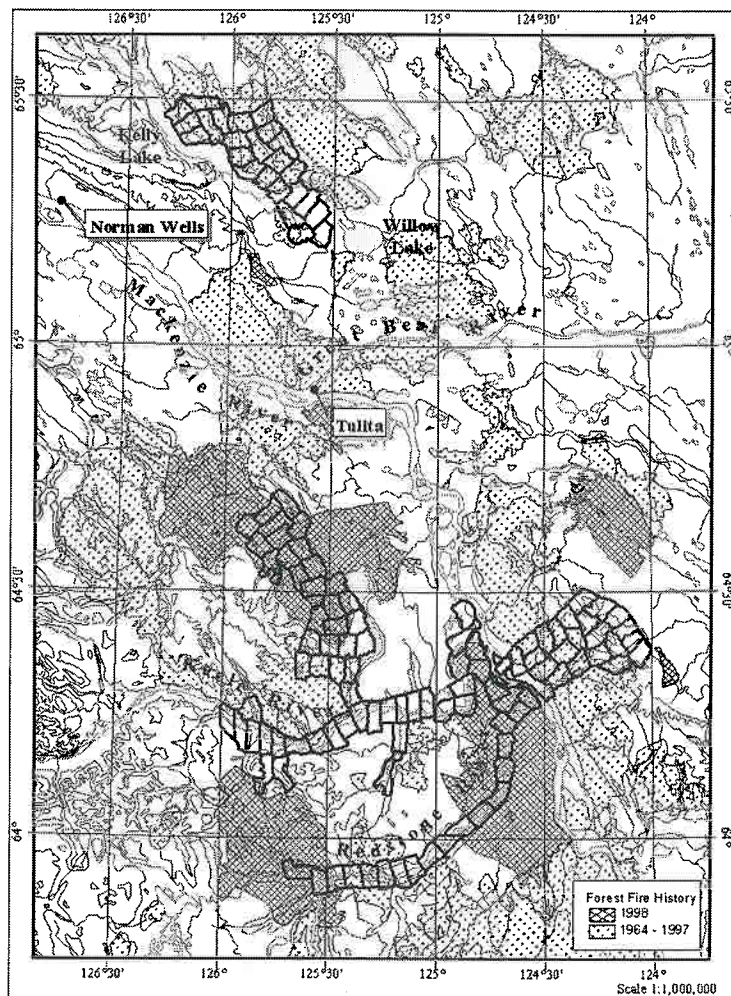


Figure 2. Study area for moose in the Tulita area November 1993 and January 1999.

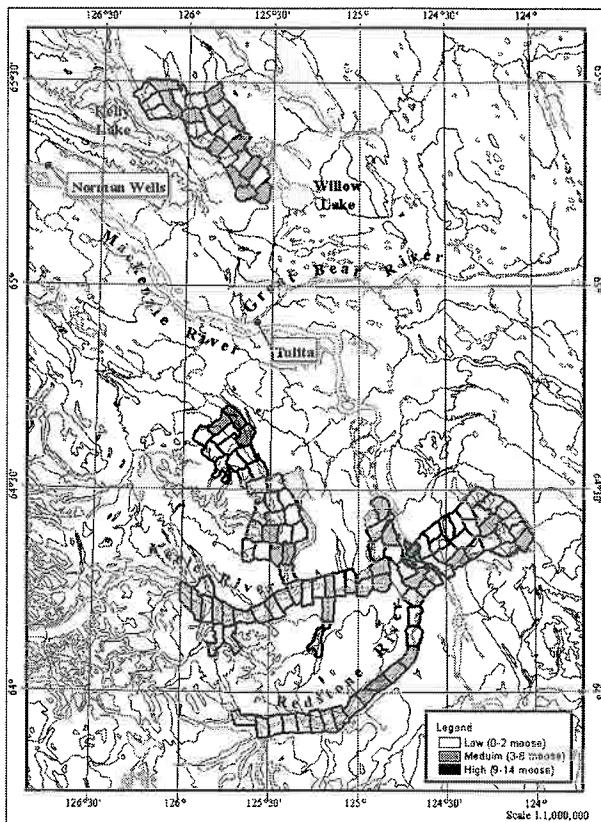


Figure 3. Distribution of moose within the Tulita moose study area as determined by aerial fixed-wing survey January 1999.

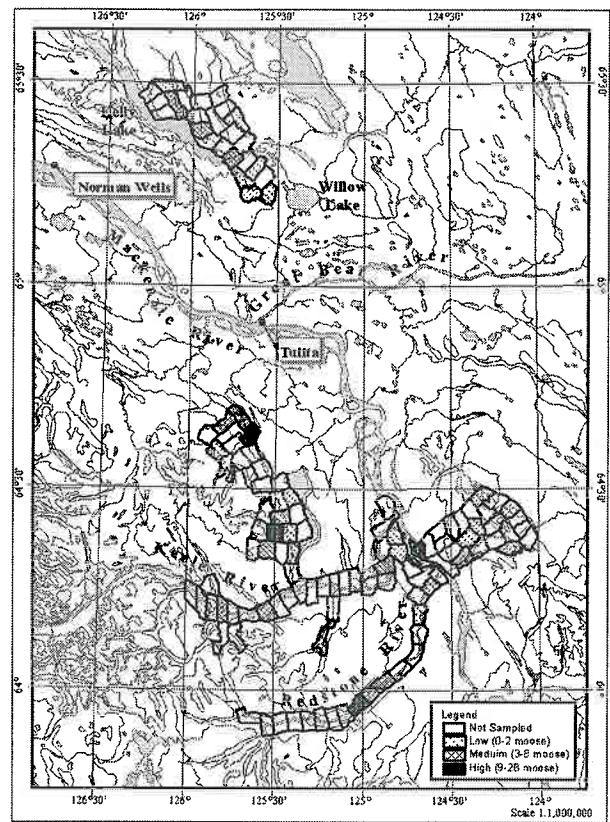


Figure 4. Moose density as determined by helicopter survey within the Tulita moose study area, January 1999.

Willow flats along the lower Keele River are an important area for moose, particularly during winter. In the January 1999 survey, a survey unit across from the mouth of the Keele River/Mackenzie River confluence had the highest density of moose documented during that survey – 197 moose per 100 km². The overall average density of moose for the study area was 11 moose per 100 km².

Beaver - Associated with wetlands. Density likely fairly low in project area but high in wetlands east of the proposed 'Little Bear route'. Beavers have not been surveyed within the project area, but were surveyed at Willow Lake northeast of Tulita in 1989, 1997, and 2001. These aerial surveys in what must be considered prime beaver habitat, determined densities of active lodges to be 50 per 100 km² in 1989, 69 per 100 km² in 1997, and 41 per 100 km² in 2001. There was a high density of inactive lodges in the 2001 survey (42 inactive lodges per 100 km²), which was thought to be a result of overpopulation of beavers and subsequent habitat deterioration.

Beavers could be affected by water withdrawals from small lakes in which they have constructed houses – lowered water levels under ice could influence access to food/food piles during winter.

Muskrat - associated with wetlands. Density likely fairly low in project area – rough estimate of 10 to 50 muskrats per 100 km².

Muskrats could be affected by water withdrawals from small lakes in which they have constructed houses/pushups – lowered water levels under ice could influence access to food/food piles during winter.

Mink – occur mostly along creeks and rivers. Low density but numbers unknown.

Marten - Densities within the study area and within the Sahtu are unknown, but the species can be considered 'common'.

Prime habitat is associated with old-growth conifer forest; however, marten also use burns and other habitats in search of voles and snowshoe hares – their main prey species.

Wolverine – very low density throughout the study area.

Red Squirrel - occur throughout the project area, especially in areas of older growth conifer forest. Likely one of the more abundant mammal species in the project area – much higher density than most other small-medium mammals (other than snowshoe hares and voles).

Red Fox, Wolf, and Lynx – all will occur within the study area but at very low densities. Lynx densities within the project area will fluctuate in a roughly 10-year cycle governed by snowshoe hare cyclic abundance.

Porcupine – occur throughout the project area at low density.

Snowshoe Hare – occur throughout the project area, especially in areas with stands of willow, alder, and other shrubs favoured for feeding/browsing. Populations undergo a very significant ca. 10-year cycle where densities may fluctuate between 10 and 100 fold. Based on information from annual snowshoe hare surveys at Norman Wells, densities are currently declining from peaks in 2000-2001.

B) Birds

The following species of birds have been recorded in the Sahtu Settlement Area. Original data are on file with Canadian Wildlife Service (Yellowknife). Most data are taken from *NWT-Nunavut Bird Checklist Forms* and the annual Breeding Bird Survey done on one day during late June on BBS Route #43012, a 40 km registered line on the Norman Wells-Tulita winter road right-of-way. We do not have information on their abundance or specific likelihood of occurrence along the two proposed routes on the Keele and Little Bear Rivers.

Confirmed Breeding – Species which have been observed nest building or adults carrying nesting material; distraction displays or injury feigning; used nest or egg shells found; recently fledged or downy young observed; occupied nest observed; adult observed incubating; adult seen carrying food or faecal sac of young; nests with eggs or nests with young.

Those species that also might be expected to occur within the proposed study areas in winter (November-March) are highlighted in bold.

<i>Pacific loon</i>	<i>American golden plover</i>	<i>Tree swallow</i>
<i>Common loon</i>	<i>Killdeer</i>	<i>Bank swallow</i>
<i>Yellow-billed loon</i>	<i>Lesser yellowlegs</i>	<i>Cliff swallow</i>
<i>Horned grebe</i>	<i>Solitary sandpiper</i>	<i>Barn swallow</i>
<i>Trumpeter swan</i>	<i>Spotted sandpiper</i>	<i>Boreal chickadee</i>
<i>Canada goose</i>	<i>Upland sandpiper</i>	<i>Ruby-crowned kinglet</i>
<i>Green-winged teal</i>	<i>Common snipe</i>	<i>Mountain bluebird</i>
<i>Mallard</i>	<i>Parasitic jaeger</i>	<i>Townsend's solitaire</i>
<i>Northern pintail</i>	<i>Long-tailed jaeger</i>	<i>Swainson's thrush</i>
<i>Blue-winged teal</i>	<i>Mew gull</i>	<i>American robin</i>
<i>Northern shoveler</i>	<i>Herring gull</i>	<i>Varied thrush</i>
<i>American wigeon</i>	<i>Arctic tern</i>	<i>Orange-crowned warbler</i>
<i>Greater scaup</i>	<i>Black tern</i>	<i>Yellow warbler</i>
<i>Lesser scaup</i>	<i>Great horned owl</i>	<i>Yellow-rumped warbler</i>
<i>Harlequin duck</i>	<i>Short-eared owl</i>	<i>Palm warbler</i>
<i>Bufflehead</i>	<i>Boreal owl</i>	<i>Blackpoll warbler</i>
<i>Osprey</i>	<i>Common nighthawk</i>	<i>Northern waterthrush</i>
<i>Bald eagle</i>	<i>Belted kingfisher</i>	<i>Common yellowthroat</i>
<i>Golden eagle</i>	<i>Three-toed woodpecker</i>	<i>American redstart</i>
<i>Northern harrier</i>	<i>Black-backed woodpecker</i>	<i>American tree sparrow</i>
<i>Northern goshawk</i>	<i>Northern flicker</i>	<i>Chipping sparrow</i>
<i>Red-tailed hawk</i>	<i>Olive-sided flycatcher</i>	<i>Clay-coloured sparrow</i>
<i>American kestrel</i>	<i>Yellow-bellied flycatcher</i>	<i>Savannah sparrow</i>
<i>Peregrine falcon</i>	<i>Alder flycatcher</i>	<i>Fox sparrow</i>
<i>Gyr falcon</i>	<i>Least flycatcher</i>	<i>Lincoln's sparrow</i>
<i>Spruce grouse</i>	<i>Eastern phoebe</i>	<i>Swamp sparrow</i>
<i>Willow ptarmigan</i>	<i>Says' phoebe</i>	<i>White-crowned sparrow</i>
<i>Rock ptarmigan</i>	<i>Eastern kingbird</i>	<i>Dark-eyed junco</i>
<i>Ruffed grouse</i>	<i>Warbling vireo</i>	<i>Red-winged blackbird</i>
<i>Sharp-tailed grouse</i>	<i>Gray jay</i>	<i>Rusty blackbird</i>
<i>Sora</i>	<i>Black-billed magpie</i>	<i>Gray-crowned rosy finch</i>
<i>American coot</i>	<i>Common raven</i>	<i>Common redpoll</i>
<i>Sandhill crane</i>	<i>Horned lark</i>	

Probable Breeding: pairs observed in suitable nesting habitat; courtship behaviour observed; territory presumed through territorial nesting behaviour at same location on at least two occasions a week or more apart; visiting probably nest site without other evidence.

Those species that also might be expected to occur within the proposed study areas in winter (November-March) are highlighted in bold.

<i>Red-throated loon</i>	<i>Ring-necked duck</i>	<i>Common goldeneye</i>
<i>Red-necked grebe</i>	<i>Surf scoter</i>	<i>Barrow's goldeneye</i>
<i>Canvasback</i>	<i>White-winged scoter</i>	<i>Common merganser</i>

Red-breasted merganser
Sharp-shinned hawk
Merlin
White-tailed ptarmigan
Semipalmated plover
Wandering tattler
Bonaparte's gull
Northern hawk owl
Great gray owl
Long-eared owl

Yellow-bellied sapsucker
Downy woodpecker
Hairy woodpecker
Blue-headed vireo
Red-eyed vireo
Black-capped chickadee
American dipper
Hermit thrush
American pipit
Bohemian waxwing

Magnolia warbler
Black-and-white warbler
Wilson's warbler
White-throated sparrow
Harris' sparrow
Lapland longspur
Brown-headed cowbird
Pine grosbeak
White-winged crossbill

Question 2: What other species can reasonably be expected in the area, with what abundance, and distribution?

RESPONSE:

The lists above are fairly comprehensive and should cover most bird and mammals that should occur within the project area.

Question 3: Are any of these species particularly sensitive to disturbance? If possible, rate the sensitivity of each species.

RESPONSE:

The species about which we have the greatest degrees of concern are:

Boreal woodland caribou – COSEWIC-designated species (Threatened). Considered a disturbance-sensitive species.

Mountain woodland caribou – COSEWIC-designated species (Special Concern). Considered a disturbance-sensitive species.

Grizzly bear – COSEWIC-designated species (Special Concern). Considered a disturbance-sensitive species.

Wolverine – COSEWIC-designated species (Special Concern). Considered a disturbance-sensitive species.

Peregrine falcon – COSEWIC-designated species (Threatened). Considered a disturbance-sensitive species.

Moose – high level of importance as a subsistence harvest species. Not known to be particularly sensitive to disturbance. The two proposed barge staging areas (Keele River and Little Bear) could keep moose away from those areas due to disturbance, noise, traffic, etc. These two areas are high density wintering areas and are also very important harvesting areas for moose by people from Tulita.

Marten – high level of importance as a subsistence harvest species. Not known to be particularly sensitive to disturbance.

Question 4: What Habitat Types are encountered by each access route.

RESPONSE:

The Sahtu GIS Project has prepared a map of vegetation classes based on GNWT Forest Management data (Figure 5). A fire history for fires occurring between 1970 and 2000 is included as Figure 6).

Vegetation Classes Along Proposed Summit Creek Routes

This map was compiled by the Saitu GIS Project, June 17, 2003.
Vegetation coverage created by G.N.W.T. Forest Management
Division, Department of Resources, Wildlife and Economic
Development, Fort Smith HQ, NT.
Northwest access routes provided by Northwest.
Base data taken from NTS 1:250 000



Predominant Vegetation

- cloud or rock shadow
- clouds
- deciduous
- fire regeneration/low shrubland open
- herbaceous
- jackpine
- lichen dominant
- low shrubland
- mixed forest
- no data
- non-vegetated
- sphagnum moss
- spruce/lichen forest
- tall shrubland and/or immature deciduous
- water
- wetlands
- white spruce

The Saitu GIS Project
...is a joint project of the Saitu Land Use Planning Board,
The Saitu Forestry Resource Board and the Department
of Resources, Wildlife and Economic Development, Saitu Region.
Box 136, Norman Wells, NT, X0A 0A0
Phone: (867) 541-4000 Fax: (867) 541-2398
SAITU@SITU.NW.ca

Fire History Along Proposed Summit Creek Routes

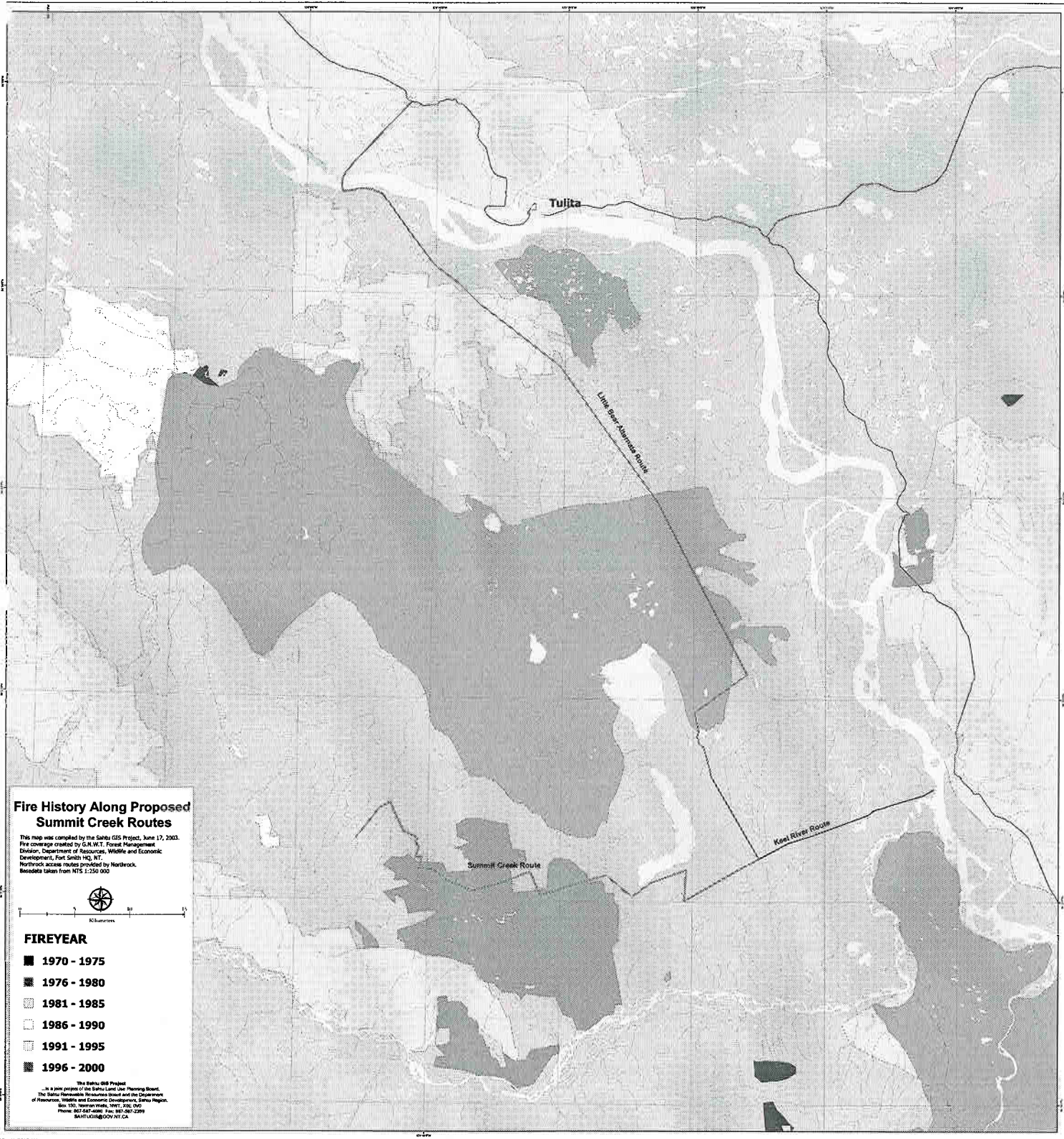
This map was compiled by the Sahu GIS Project, June 17, 2003.
 Fire coverage created by G.H.W.T. Forest Management
 Division, Department of Resources, Wildlife and Economic
 Development, Fort Smith HQ, NT.
 North arrow and scale provided by Nordrock.
 Base data taken from NTS 1:250 000



FIREYEAR

- 1970 - 1975
- 1976 - 1980
- 1981 - 1985
- 1986 - 1990
- 1991 - 1995
- 1996 - 2000

The Sahu GIS Project
 is a joint project of the Sahu Land Use Planning Board,
 The Sahu Renewable Resources Board and the Department
 of Resources, Wildlife and Economic Development, Sahu Region.
 Box 100, Terrace, NT, Y8T 1B5
 Phone: (867) 547-4444 Fax: (867) 547-2299
 SAHUGIS@GOV.NT.CA



Northrock Resources Ltd. SUMMIT CREEK B-44 Drilling Program

Information Request Response

IR No: 1.1.4

Source: Mackenzie Valley Environmental Impact Review Board–

To: GNWT/RWED

DAR Section: I Wildlife Harvesting

ToR Section: I Wildlife Harvesting

Question 1a: Supply any statistics regarding harvest in the Tulita region (or if unavailable the Sahtu Settlement Area) over the past 5 years or longer.

Question 1b: Supply any statistics regarding the total value of the harvest in the Tulita region (or if unavailable the Sahtu Settlement Area); including value as food source.

RESPONSE:

Boreal Woodland Caribou - Harvest of boreal woodland caribou is limited due to their relative scarcity (particularly in comparison to barren-ground and mountain caribou), their 'secretive nature', and people's access to moose along the Mackenzie River Valley. Boreal woodland caribou harvest documented by the Sahtu Harvest Study was highest at two 10x10 km grid cells along the Keele River, including the grid cell that includes the confluence of the Keele and Mackenzie – 3 caribou have been reported harvested within that cell for the period 1998-2001 (Figure 7). Two caribou were also reported harvested in the vicinity of Stewart Lake and one in the vicinity of Tate Lake adjacent to the proposed Little Bear access road.

Moose - The species of highest importance for subsistence food harvest by people from Tulita. Harvest of moose is highest at two specific sites within the proposed project areas: the mouth of the Keele River and the mouth of the Little Bear River. The four 10 x 10 km harvest study grid cells in the vicinity of the Keele-Mackenzie confluence accounted for 55 moose harvested during 1998-2001, which represents 18.2% of all moose harvested by Tulita residents during that time period (Figure 8). A combined moose and caribou harvest study grid cell is shown as Figure 9. Similarly, harvests were high for the mouth of the Little Bear River and vicinity – 71 moose were harvested in 3 10 x 10 km grid cells, which is 23.5% of all moose harvested by Tulita residents 1998-2001. Moose were also reported harvested in grid cells adjacent to the Little Bear access route, particularly in the Tate and Stewart Lake areas; however, the harvest was light in comparison to the lower Little Bear and Keele River moose harvests.

The average edible weight of a moose is estimated to be 180 to 200 kg. Assuming a 'meat replacement value' of \$x/kg, we can estimate the 'value' of a moose for subsistence harvest. Meat replacement value means that if moose were not available, then people would have to purchase meat (e.g., beef, pork, chicken) at a local grocery store instead. The current average value for meat

products in local stores is approximately \$20/kg. Therefore, a moose can be considered to be 'worth' at least \$3,600 to \$4,000 for subsistence harvesters.

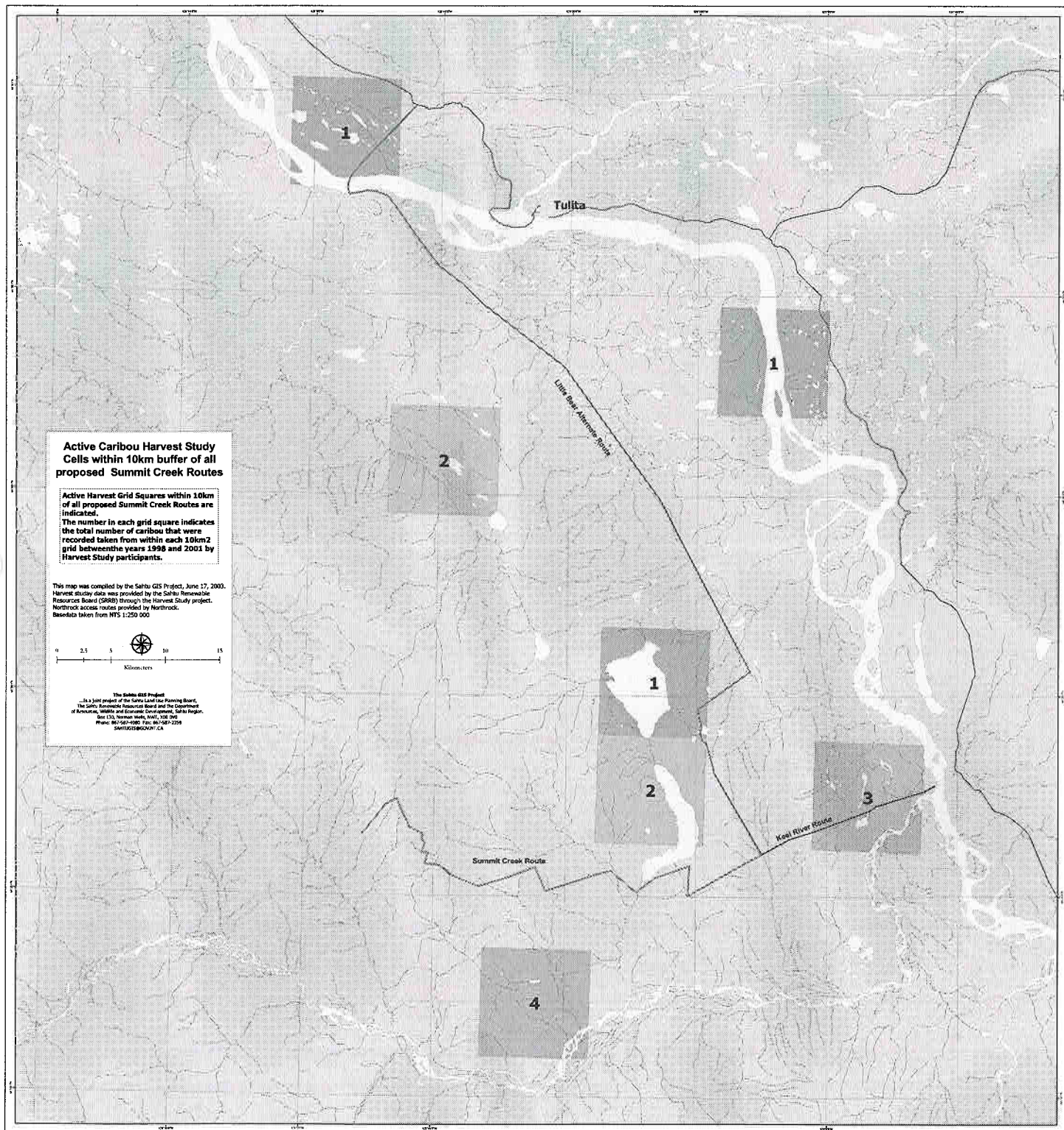
Active Caribou Harvest Study Cells within 10km buffer of all proposed Summit Creek Routes

Active Harvest Grid Squares within 10km
of all proposed Summit Creek Routes are
indicated.
The number in each grid square indicates
the total number of caribou that were
recorded taken from within each 10km²
grid between the years 1998 and 2001 by
Harvest Study participants.

This map was compiled by the Siskiyou GIS Project, June 17, 2003.
Harvest study data was provided by the Siskiyou Renewable
Resources Board (SRRB) through the Harvest Study project.
Northbrook access routes provided by Northbrook.
Base data taken from NTS 1:250 000



The Siskiyou GIS Project
...is a joint project of the Siskiyou Land Use Planning Board,
The Siskiyou Renewable Resources Board and the Department
of Forestry, Wildlife and Economic Development, Siskiyou Region.
Box 113, Tulelake Falls, WA 97557, USA
Phone: 509-545-1980 Fax: 509-545-2258
SISKIYOU@SISKIYOU.CA



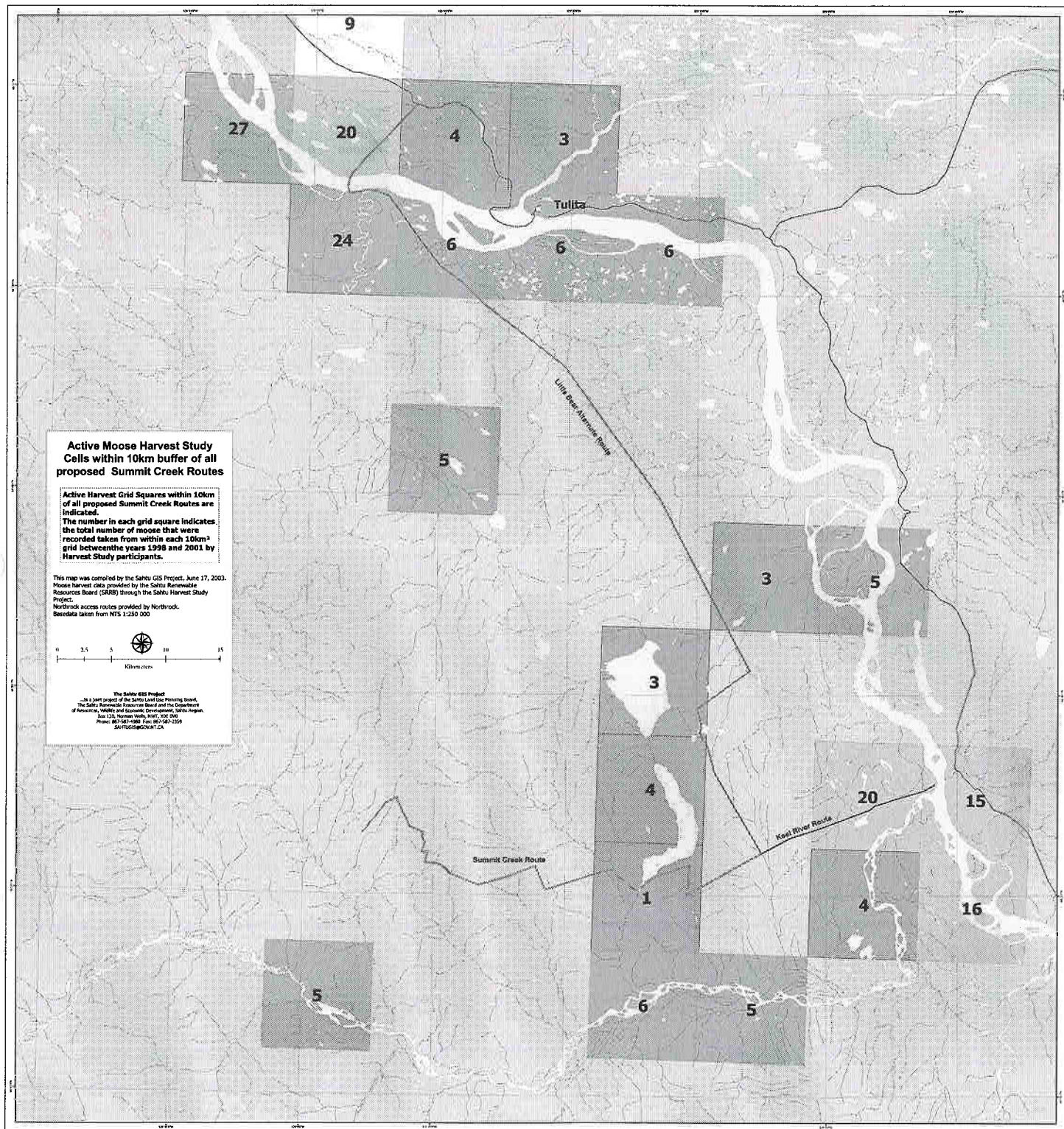
Active Moose Harvest Study Cells within 10km buffer of all proposed Summit Creek Routes

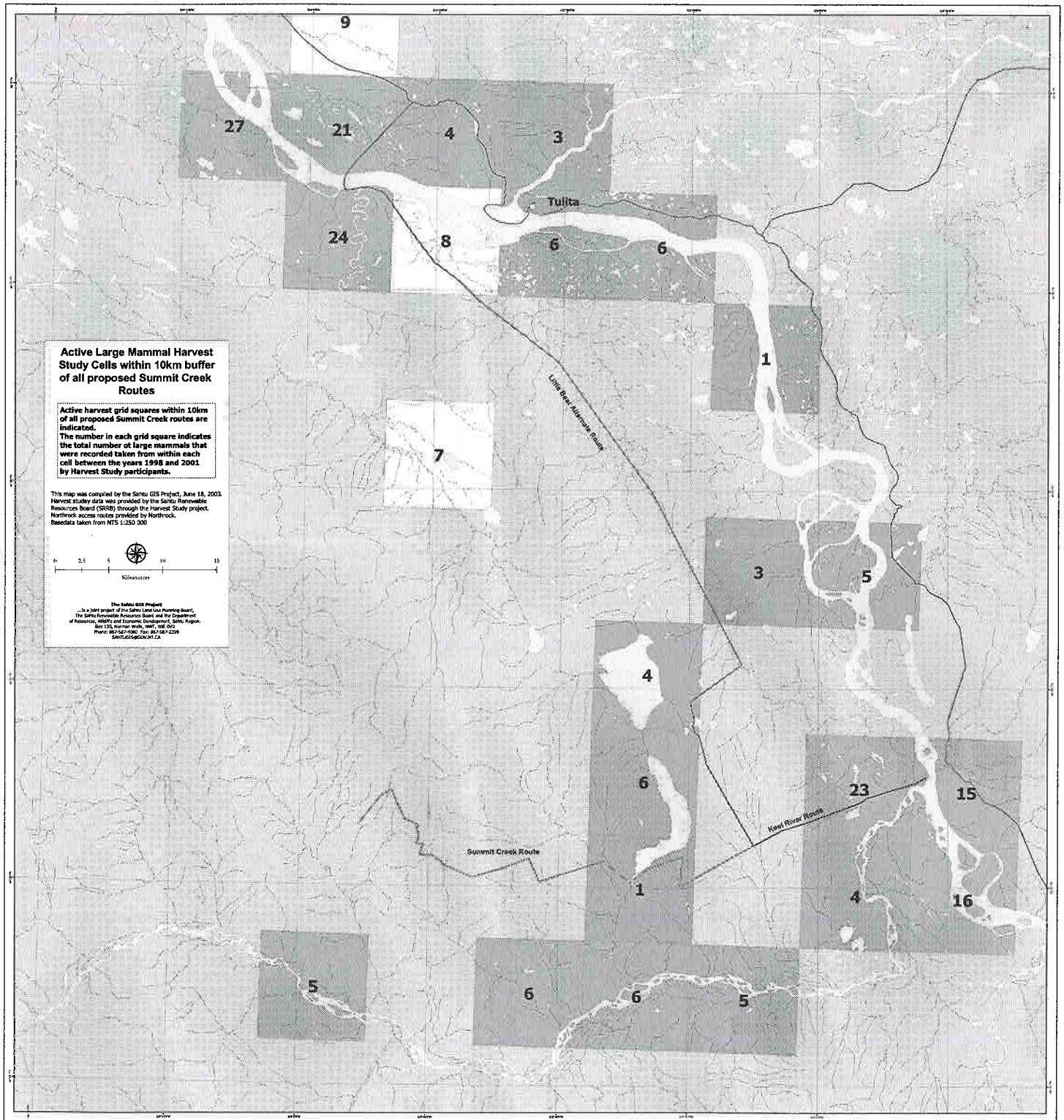
Active Harvest Grid Squares within 10km of all proposed Summit Creek Routes are indicated.
The number in each grid square indicates the total number of moose that were recorded taken from within each 10km² grid between the years 1998 and 2001 by Harvest Study participants.

This map was compiled by the Saithe GIS Project, June 17, 2003.
Moose harvest data provided by the Saithe Renewable Resources Board (SRRB) through the Saithe Harvest Study Project.
Northwest access routes provided by Northbrook.
Base data taken from NTS 1:250 000.



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...is a joint project of the Saithe Land Use Planning Board,
The Saithe Renewable Resources Board and the Department
of Forestry, Wildlife and Economic Development, Yukon-Canada
Joint Task Force, Yukon-Canada Joint Task Force
Project: 801-542-2266 Fax: 801-542-2266
SAITHE@YUKON.CA





Beaver – Important furbearer and subsistence food source. The most harvested furbearer by Tulita harvesters included in the Sahtu Harvest Study is beaver (Table 1 and Figure 10). For the 4 year period 1998-2001, an average of 116 beavers per year were taken by Tulita harvesters. This represents 33% of the total harvest for the Sahtu Settlement Area during that same time period.

Muskrat - Limited importance as a furbearer. A total of 307 muskrats were reported harvested from 1998 to 2001 by harvesters from Tulita (annual average of 77 muskrats/year; range 20 to 201) (Figure 10).

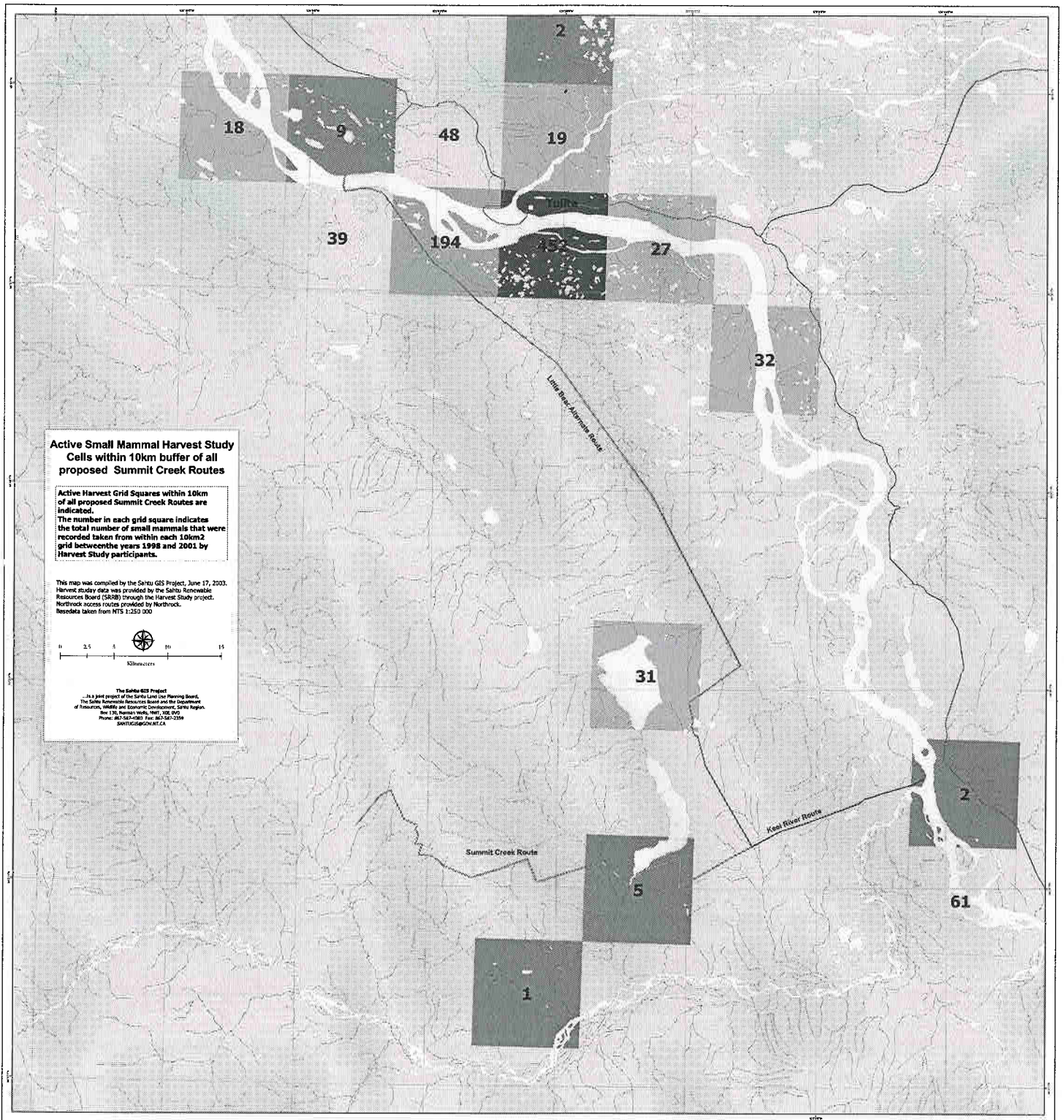
Mink - Very limited importance as a furbearer for trappers from Tulita.

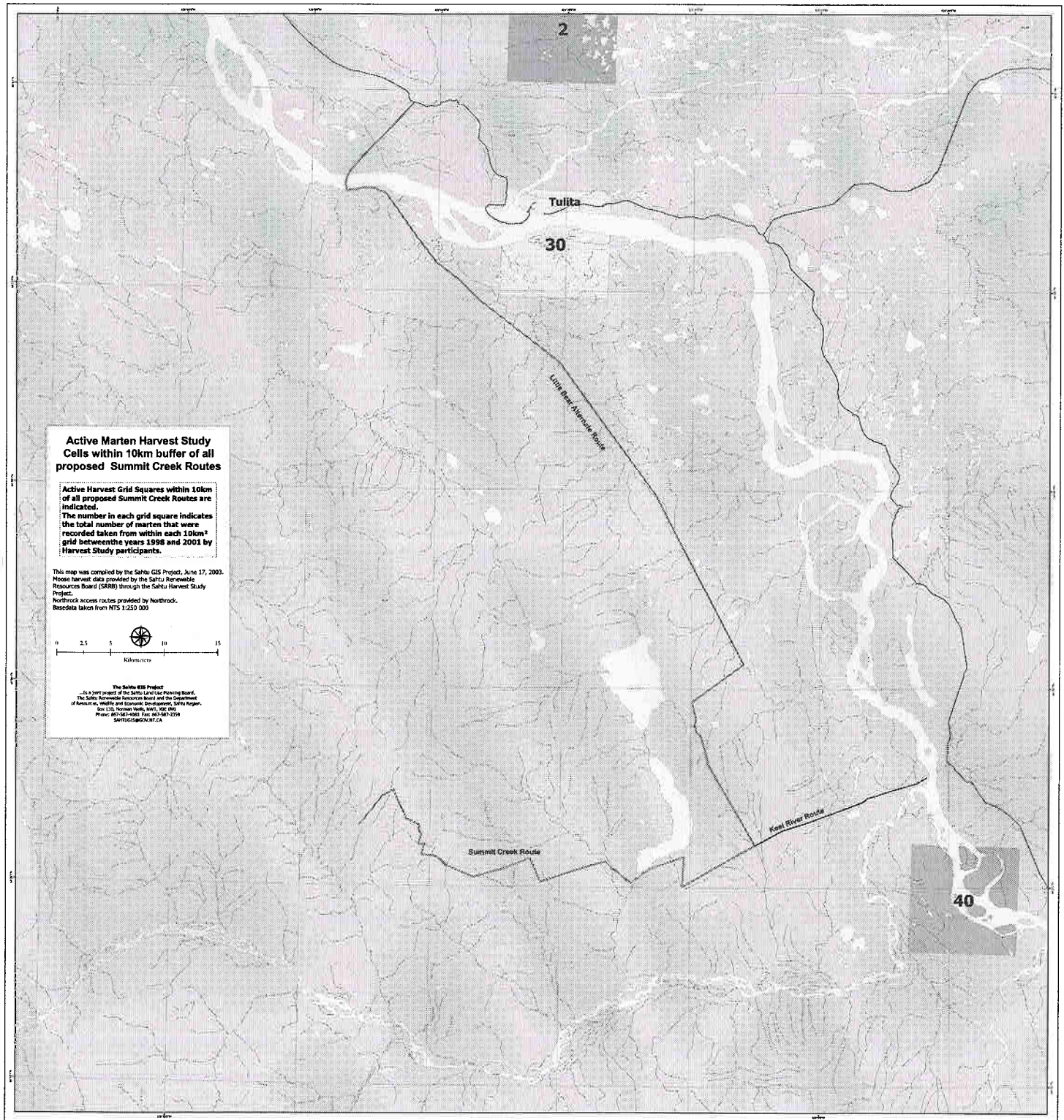
Marten – The most important furbearer in the Sahtu for trappers is marten; however, Tulita harvest of marten is small in comparison to other communities within the Settlement Area (Figure 11). Of 5,183 marten reported harvested by all communities during the Sahtu Harvest Study (1999-2001), only 143 (2.8%) were reported by harvesters from Tulita.

Red Fox, Wolf, and Lynx – These have low importance as furbearers. Only 1 fox, 1 lynx, and 8 wolves were reported in the Sahtu Harvest Study by Tulita harvesters for the 4-year period 1998-2001 (Figure 10).

Porcupine – This species has limited importance as a subsistence food species and quills used for some crafts. Only 2 porcupines reported harvested by Tulita harvesters for 1998-2001 (Figure 10).

Birds – A variety of waterfowl and upland game birds are hunted for subsistence food (Figure 12).





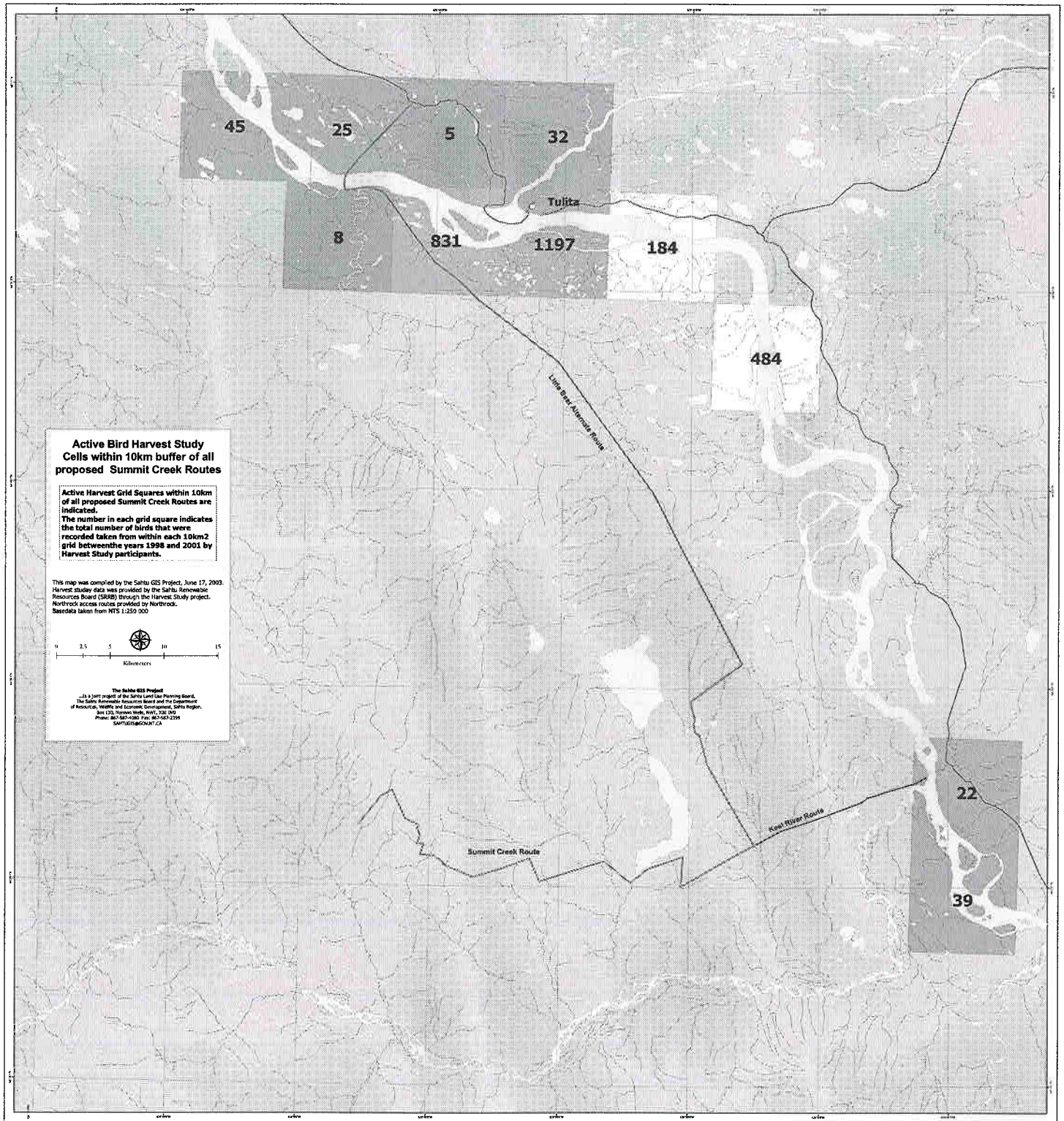


Table 1. Fur Harvest Records, Tulita District, Sahtu Settlement Area - 1999 - 2003.

Species	1999 (16 Trappers)		2000 (17 Trappers)		2001 (16 Trappers)		2002 (16 Trappers)		2003 (10 Trappers)	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Beaver	56	\$1,012.24	133	\$2,742.25	118	\$2,686.86	91	1,800.12	11	\$277.58
Fox, Cross					1	\$21.75			1	\$78.44
Fox, Red	2	\$59.68	4	\$140.07	3	\$120.00	1	43.68		
Fox, White (Arctic)							1	28.08		
Lynx	1	\$101.32	8	\$492.66	6	\$376.50	13	1,230.10	3	\$333.00
Marten	103	\$4,697.74	247	\$14,149.56	138	\$6,571.88	140	9,900.31	228	\$14,372.50
Mink	9	\$200.76	7	\$127.33	4	\$54.63	6	124.30	6	\$142.08
Muskrat	199	\$272.05	85	\$189.66	3	\$5.04	71	153.71		
Wolf, Boreal	1	\$89.40			1	\$127.50				
Wolverine	2	\$566.20			3	\$1,165.80	2	519.60		
Weasel									1	\$1.48
TOTAL	373	\$6,999.39	484	\$17,841.53	277	\$11,129.96	325	\$13,799.90	250	\$15,205.08

Source: Sahtu Region - Resources, Wildlife and Economic Development, Government of the Northwest Territories,

 *** MULTI TX/RX REPORT ***

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 Ernie MacD Land

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M/ 7.4.4.2003



Mackenzie Valley Environmental Impact Review Board

Box 938 , 5102-50th Avenue, Yellowknife, NT X1A 2N7

From: Martin Haeefele Fax: (867) 766-7074
 Phone:
 Date: July 3, 2003 Pages: 38 including this page
 To: Distribution List Fax:
 CC:
 Re: Northrock Summit Creek Environmental Assessment
 Additional Information and Request for Technical Analysis Reports

NOTES:

Attached are a letter and additional information for the Northrock Summit Creek Environmental Assessment. Apologies for the rather long fax. If you have any questions or concerns, please do not hesitate to contact me.

Regards

Martin Haeefele