ʔehdzo Got’ı̨nę Gotsę́ Nákedı – Sahtú Renewable Resources Board

Sahtú Environmental Research and Monitoring Forum

ACTIVITY REPORT 2015-2016

Contents

Background

The Sahtú Environmental Research and Monitoring Forum was originally created in November, 2013 with the impetus being the emerging shale oil play in the Tulít'a District. Sahtú organizations, Canada, the GNWT (led by ENR), and industry agreed to create a Forum that will support research and monitoring proponents and Sahtú organizations in sharing priorities, plans and proposals, providing feedback and guidance, coordinating objectives and activities. The aim is to support research and monitoring as a basis for decision-making in the Sahtú.

ENR's support, along with funding from a variety of research partners and collaborators, has enabled the Forum to address the following objectives in supporting environmental research and monitoring in the Sahtú region:

- identify regional priorities and research gaps
- build cross-cultural understanding
- support and protect traditional knowledge processes
- support research and regulatory decision-making
- identify opportunities for: collaborative research involving community; communications; information sharing; and cross-cultural interpretation of results.

Summary of Activities

Regular Teleconference Meetings

Nine teleconference meetings of the Sahtú ERM Forum were convened, usually about three hours in length, through which Forum members and invited guests shared updates on research and related initiatives so that synergies and efficiencies were identified and the effective engagement of Sahtú residents in projects was facilitated. Teleconference meetings were held on the following dates during the 2015-2016 fiscal year. Agendas for these meetings are appended, and detailed meeting notes for internal purposes have been distributed to participants.

May 8	September 3	November 20
June 4	October 8	December 11
August 27	October 26	January 15

In-Person Meeting

An in-person meeting in Yellowknife with members of the Forum and invited guests from regional, federal, and territorial governments, university partners and non-profit organizations. Approximately 40 people participated. On-going research initiatives were shared, research priorities were reviewed and the form and function of a regional research strategy were discussed.

Community Caucus In-Person Research Strategy Meeting

Sahtú resident Forum members met in Tulít'a to discuss how the Forum is facilitating and can further support ʔehdzo Got'ı̨nę (Renewable Resource Council) involvement in research and monitoring, and the regional Environmental Research and Monitoring Strategy. The focus was on ensuring that the strategy reflects Sahtú place-based priorities and Dene values and how to ensure all Sahtú organizations including First Nation governments, land corporations, Renewable Resources Councils and co-management Boards are effectively engaged in its development. The Caucus also reviewed the Forum's terms of reference to ensure they reflected Sahtú needs and priorities and the suggested changes were presented to the broader Forum for discussion during a subsequent teleconference call.

Research Cluster Meetings

The following four meetings of researchers and community Forum representatives were convened related to specific focal points of researchers to discuss coordination and synergies:

- Great Bear Lake contaminants and food security research cluster - September 4
- Social-ecological research cluster – November 13, November 27, February 5

Research Partnership Planning Meetings

Sahtú ERM Forum representatives participated in research partnership meetings including presentations about the Sahtú ERM Forum and the Sahtú research context, and discussions of future community-collaborative research prospects for the Sahtú Region, as follows:

- University of Alberta Mountain Centre of Excellence planning meeting – January 12
- NWT-Wilfrid Laurier University Partnership meeting – January 13-14
- Tsá Túé (Great Bear Lake) International Biosphere Reserve Research and Monitoring Program Planning Workshop – February 9-11

Research Licensing Process Review

The Sahtú ERM Forum undertook a preliminary review of the Sahtú research licensing process, as facilitated by the Aurora Research Institute within the terms of the Science Act. Work to date has elucidated concerns related to the process from the perspectives of Sahtú organizations reviewing applications as well as researchers submitting applications for review. Through initial discussions a work plan has been developed so that the Forum can facilitate a Sahtú wide discussion during the 2016-2017 fiscal year culminating in a series of recommendations to the Sahtú Secretariat and other Sahtú organizations by March, 2017.

Sahtú Research and Monitoring Strategy

A Table of Contents (with some sections) of a Sahtú Environmental Research and Monitoring Strategy was drafted as well as development of a work plan to involve all partner agencies, complete a draft strategy, conduct a period of review and finalize a strategy in early 2017. In light of the many Parties (industry, government and academia) conducting research in the Sahtú region and given that there are many pressing research questions in the face of possible future development and climate change scenarios, the need for a clear strategy to guide research has been identified and will be developed through a collaborative approach.

Cross-Cultural Research Camp

Planning, coordination and reporting for the second summer Cross-Cultural Research Camp at Sans Sault on the Mackenzie River on July 4-11, and planning for the third camp on Great Bear Lake, hosted by the Délı̨nę ʔehdzo Got'ı̨nę. The second of what the Forum hopes to be an annual event, these cross-cultural research camps present an opportunity for many parties involved in research in the Sahtú to learn from one another and strengthen their understanding of traditional knowledge and western science approaches.

List of Appendices

As further indication of progress made in the 2015-2016 year, the following are appended:

1. Agendas for regular teleconference meetings of the Sahtú ERM Forum

2. A draft Table of Contents and Work Plan for the Sahtú Environmental Research and Monitoring Strategy to be completed through the 2016-2017 fiscal year.

3. A preliminary briefing note reviewing the research licensing process in the Sahtú region and outlining a work plan through the 2016 to 2017 year, which will involve consultation of all Sahtú referral bodies and will culminate in a list of recommendations by March 2017.

4. An extensive report, outlining the Forum's achievements from its inception until March, 2016.

5. A draft revised Terms of Reference for the Forum (to be approved by the full Forum during the fall 2016 in-person meeting).

6. A report of the 2016-2017 SERM Forum Cross-Cultural Camp

Financial Summary

Note that this summary does not include costs for travel/labour related to research meetings at University of Alberta (January 12), Wilfrid Laurier University (January 13-14), and with Polar Canada/NASA (May 9-11). This information is available upon request.

Initiatives - Items	ENR (cash)	ENR in-kind (estimate)	Partner cash	Partner in-kind (estimate)	SRRB cash & in-kind (estimate)	Totals
1. In-person meeting, Yellowknife, January, 2016						
Sahtú participant travel (including per diems, accommodation and transportation)			$5,188.45		$4,000.00	**$9,188.45**
Sahtú participant honouraria			$5,400.00			**$5,400.00**
Consultant fees - coordination - Pearl Benyck	$2,241.85					**$2,241.85**
Consultant fees - coordination, co-facilitation, reporting - PlanIt North & SRRB in-kind	$12,248.75				$12,000.00	**$24,248.75**
Consultant fees (including travel) - integration of Board's regulatory and management role in identifying research priorities - NECA is Board consultant on regulatory files	$3,382.50					**$3,382.50**
Workshop costs - space rental and catering	$1,599.11		$2,608.62			**$4,207.73**
Participant travel - from Norman Wells or South to Yellowknife		$8,000.00		$40,000.00		**$48,000.00**
Subtotal, meeting, Yellowknife, January 2016	**$19,472.21**	**$8,000.00**	**$13,197.07**	**$40,000.00**	**$16,000.00**	**$96,669.28**
2. In-person community caucus, Tulít'a, March, 2016						
Sahtú participant travel (including per diems, accommodation and transportation)	$1,846.60		$2,906.76			**$4,753.36**
Sahtú participant honoraria			$5,017.32			**$5,017.32**
Coordination, co-facilitation, reporting - Consultant fees (PlanIt North) and SRRB in-kind	$6,254.91		$100.09		$10,500.00	**$16,855.00**
Consultant travel to Tulít'a for March meeting (PlanIt North)	$1,833.33					**$1,833.33**
Workshop refreshments (reimbursement PlanIt North)	$371.79					**$371.79**
Workshop costs - space rental and catering			$1,160.86			**$1,160.86**
Subtotal, community caucus, Tulít'a, March 2016	**$10,306.62**	**$0.00**	**$9,185.03**	**$0.00**	**$10,500.00**	**$29,991.65**

Initiatives - Items	ENR (cash)	ENR in-kind (estimate)	Partner cash	Partner in-kind (estimate)	SRRB cash & in-kind (estimate)	Totals
3. Monthly teleconferences						
Call hosting telephone fees		$2,500.00			2,500.00	**$5,000.00**
Coordination, facilitation, notes of meeting - Consultant fees (PlanIt North) and SRRB in-kind	$6,098.75				$6,000.00	**$12,098.75**
Honouraria - Sahtú Renewable Resource Councils, SSI and SRRB reps			$4,039.55			**$4,039.55**
Subtotal, monthly teleconferences	**$6,098.75**	**$5,000.00**	**$4,039.55**	**$0.00**	**$6,000.00**	**$21,138.30**
4. Forum special projects and communications						
Development to date of a regional environmental research and monitoring strategy - Consultant fees - PlanIt North	$14,022.32				$5,000.00	**$19,022.32**
Review to date of regional research licensing process	$6,900.10				$2,000.00	**$8,900.10**
Report and proposal writing - PlanIt North and SRRB in-kind	$6,000.00				$4,000.00	**$10,000.00**
Forum webpage administration and document repository	$200.00				$5,000.00	**$5,200.00**
Subtotal, Forum special projects and communications	**$27,122.42**	**$0.00**	**$0.00**	**$0.00**	**$16,000.00**	**$43,122.42**
5. Administrative support for all projects, co-facilitation, reporting - SRRB	**$7,000.00**				**$10,775.00**	**$17,775.00**
Totals	**$70,000.00**	**$13,000.00**	**$26,421.65**	**$40,000.00**	**$59,275.00**	**$208,696.65**

APPENDIX 1 - Teleconference Agendas

Detailed meeting notes available upon request.

Agendas for nine teleconference meetings on the following meeting dates during April 1, 2015-March 31, 2016 are provided below:

May 8	September 3	November 20
June 4	October 8	December 11
August 27	October 26	January 15

Sahtú ERM Forum Meeting AGENDA - May 8

- Presentations on proposed research
    - Mackenzie Mountains Earthscope project (Derek Schutt, Colorado State University)
    - Thrush and swallow migration research, Mile 222 area (Dr. Keith Hobson and Kevin Kardynal, Environment Canada)
    - Land-based Initiatives in Canada's North: Moving towards cross-cultural understanding of the importance and meaning of on-the-Land trips (Jenn Redvers, University of Calgary)
- New research: Our Land is Changing: Climate Change, Food Security and Health in Dýline (Andrew Spring, Wilfrid Laurier University)
- Cross-Cultural Research Camp – report recommendations from 2014 camp (as requested by James) and plans for 2015 camp (Shauna Morgan)
- Sahtú Youth Network update – March activities and plans for the coming year, including website (Joe Hanlon and Shauna)
- Sahtú Best of Both Worlds update and plans for the coming year, including website (Joe and Thom Stubbs)
- Review of preliminary report on March Forum meeting in Yellowknife, and research priorities analysis (Chris Wenman)
- Sahtú ERM Forum plans for 2015-2016 fiscal year, including: meeting routine, funding proposal to ENR, webpage.
- SRRB staffing update (Deb)
- Plans for liaising with RRCs over the coming months (J.Hanlon)

Sahtú ERM Forum Meeting AGENDA - June 4

- Opening prayer and introductions
  Community/regional caribou planning: Barren-ground caribou research and monitoring options (Micheline Manseau invited – to be confirmed)
- Waste Site Management Committee – Cindy Gilday
  Brief overviews of draft reports: Mercury Synthesis, Monitoring Framework, Research Results Workshop (Shelagh); Sahtú ERM Forum (Christine - unconfirmed)
- Summer research/monitoring updates, including: Water health (Krista Chin), Mackenzie River water monitoring (Laurel), bat monitoring (Catarina), harvest study completion (Janet Winbourne), human biomonitoring (Shelagh Montgomery and Brian Laird), Cross-Cultural Research Camp (Shauna Morgan)
- Research license applications (Catarina)
  Proposals for future research and monitoring
  Next meeting

Sahtú ERM Forum Meeting AGENDA - August 27

- Prayer by Leon Andrew
- Introductions and agenda
- Sahtú Harvest Study (Janet Winbourne)

Sahtú ERM Forum Meeting AGENDA - September 3

- Quick review of Harvest Study Special Meeting community engagement (Janet)
- Cross-Cultural Research Camp debrief (Shauna)
- Review of summer/current research activities (Derek Schutt, Brian Laird, Faun Rice, Audrey Giles, Shelagh Montgomery)
- Key topic – Research license referral process in the Sahtú Region (Christine and Deb)
- Key topic – Sahtú ERM Forum draft reports and research priority analysis (Christine and Deb)
- Tsá Túé Research and Monıtorıng Workshop, September 29-30, Deline
- CIMP Letters of Intent
- Other research proposals in the works
- Next meeting and longer term Forum plans

Sahtú ERM Forum Meeting AGENDA - October 8

- Prayer, welcome, introductions
- Ongoing CIMP research and new proposals (Julian Kanigan)
- Draft letter to ʔehdzo Got'ıne on formalizing Forum representative and role (Joe Hanlon)
- Sahtu ERM Forum pdf update, workshop report, and document funding proposal
- Research strategy and monitoring framework updates (Christine Wenman and Shelagh Montgomery)
- SSHRC Partnership – Stories and Language of the Land (Deborah Simmons)
- Proposed water safety initiative (Audrey Giles)
- Community tour update: pdf Harvest Study and Community Mapping Initiative
- Bluenose caribou update: Upcoming hearings (Deborah Simmons)
- pdf Traditional economy action plan update: request for feedback (Deborah Simmons)
- Délıne Tsá Túé Research and Monitorıng program meeting invitation (Michael Neyelle)
- Current research and monitoring programs
- Ecological and cultural research and monitoring plan
- Next meeting

Sahtú ERM Forum Meeting AGENDA - October 26

- Welcome and introductions
- CIMP Research Letters of Intent
    - Cumulative Impact Modelling – ALCES (Thom Stubbs and Brad Stelfox)
    - Developing environmental DNA as a tool to monitor fish distributions in the NWT (Karen Dunmall, Neil Mochnacz and Robert Bajno)
    - Exploring options for assessing barren-ground caribou status (Deb)
    - Understanding climate change in the Great Bear Lake watershed (Deb)
- Research and Monitoring Updates
    - Industry initiatives
        - Husky Energy - Jenica von Kuster
        - ConocoPhillips – Andrea Hansen
    - Community visits
        - Sahtú Harvest Study and Community Mapping Initiative (Fort Good Hope November 3-6, and Délıne November 9-12) – Janet Winbourne and Heidi Brown

        - Human Biomonitoring (Tulít'a and Délı̨nę, mid-November) – Brian Laird, University of Waterloo
        - Contaminated Sites (all communities) – Christine Wenman, PlanIT North
- Current research license application reviews (Joe Hanlon)
- Update on research license referral process review (Christine Wenman)
- Update on research strategy background work (Christine Wenman)
- Future meetings
    - Proposed Colville Lake in-person Forum meeting
    - Tsá Túé Research and Monitoring Meeting, February 9-11
    - November Forum teleconference
- Other meetings
    - Water Strategy conference, November 3-4, Dettah
    - Water and Wildlife Monitoring Workshop, November 3, Yellowknife
    - Yellowknife Geoscience Forum, November 24-26, 2015, http://www.nwtgeoscience.ca/yellowknife-geoscience-forum
- Community representatives internal discussion

Sahtú ERM Forum Meeting AGENDA - November 20

- Welcome and introductions
- Update on research activities
    - Moose and Caribou Health monitoring (Susan Kutz, University of Calgary)
    - Re/mediating Indigenous Environmental Justice: Resource Extraction, Divergent Risk Perception, and Economic Equality in the North (Alana Fletcher, Queen's University)
    - Community visits
        - Vet tour (Susan Kutz)
        - Contaminants mapping update – visit to Deline (Christine)
        - Community Mapping Initiative (Heidi Brown)
        - Human Contaminants Biomonitoring (Mylène Ratelle and/or Brian Laird)
        - Harvest Study completion (Deb)
- Research proposal update
    - CIMP Letters of intent submitted and proposals to be developed (Deb)
    - Sahtú ERM Forum proposal submitted (Christine)
- Research licenses approved and applications in the works (Joe Hanlon)
- Key agenda item: Research license referral process briefing note (Christine)
- Key agenda item: Case studies for regional research strategies (Christine)
- Update on January 26-28 meeting – decision re Colville Lake vs Yellowknife
- December teleconference date/time?
- Community Forum members internal discussion
    - Update on RRC formalized appointments

Sahtú ERM Forum Meeting AGENDA - December 11

- Introductions, review agenda
- Research activities updates
    - Re/mediating Indigenous Environmental Justice: Resource Extraction, Divergent Risk Perception, and Economic Equality in the North (Alana Fletcher, Queen'sU)
- Community visits updates
    - Community Mapping Initiative visits to Délı̨nę, Tulít'a and Norman Wells - Heidi Brown (see attached newsletter)
    - Christine Wenman, Contaminated Sites Mapping

    - Janet Winbourne, Harvest Study Completion (will be joining the call late due to travel requirements)
    - Délı̨nę and Colville/Fort Good Hope caribou initiatives
- Research Licensing review update and proposed next steps (Christine)
- Research strategy – overview of research to date (Christine)
- In-person meeting, January 26-28 – confirm location (Colville or YK)
- Community forum members internal discussion
    - Update on ʔehdzo Got'ı̨nę formal appointments

Sahtú ERM Forum Meeting AGENDA - January 15

- Introductions, review of agenda
- Community visit updates
- Heidi Brown - Community Mapping Initiative
- Janet Winbourne – Harvest Study Completion
- Christine Wenman - Sahtu waste sites mapping project
- Research updates
    - Research/monitoring and environmental and population health (Linna O'Hara, Jeremy Roberts, Darroch Vokey
    - Re/mediating Indigenous Environmental Justice: Resource Extraction, Divergent Risk Perception, and Economic Equality in the North (Alana Fletcher, Queen'sU)
    - Aboriginal Youth Stories of Culture, Identity, Community & Place: A Rural/Urban Educational Youth Exchange through Performing Arts & Technology (Diane Conrad, UAlberta)
- Proposal updates
    - NCP Contaminant - Human Bio-monitoring
    - CIMP full proposal – Sahtu Cumulative Effects Monitoring Forecasting (Thom Stubbs)
    - Fractured Relations? Understanding Indigenous Responses to Hydraulic Fracturing in Australia and Canada (Gabrielle Slowey, York University)
- Research license applications? (Joe)
- Research license referral process review (Christine)
- Towards a regional research strategy (Christine)
- In-person meeting planning - Yellowknife January 26, 27, 28
    - draft agenda
    - location, travel and other logistics

APPENDIX 2

Sahtú Regional Environmental Research and Monitoring Strategy Update – April, 2016

Background

The Sahtú Environmental Research and Monitoring Forum was established in 2013 to will take the lead in supporting environmental research and monitoring by providing a venue for discussing plans and accommodating the priorities and traditional knowledge of Sahtú communities. The Forum's objectives include:

- identify regional priorities and research gaps
- build cross-cultural understanding
- support and protect traditional knowledge processes
- support research and regulatory decision-making
- identify opportunities for: collaborative research involving community; communications; information sharing; and cross-cultural interpretation of results.

Dialogue among Forum members highlighted the need for a Sahtú Regional Environmental Research and Monitoring Strategy that could help to document regional priorities and research gaps as well guide how research is done in the region. To date the following objectives have been identified for a Regional Environmental Research and Monitoring Strategy:

- Generate expertise and resources necessary to protect and nourish the economic, physical, social, and spiritual well being of Sahtú people, lands, plants and animals;
- Inform research with a strong understanding of local context;
- Provide direction for research outcomes to influence decision-making;
- Communicate priorities to focus resources;
- Create community research and monitoring training opportunities through all research in the Sahtú;
- Maximize the use of community resources used in all research conducted in the Sahtú
- Foster the ability of Sahtú organizations, leaders and residents to be agents and leaders in research; and
- Foster collaboration and communication amongst research partners in the Sahtú.

A skeleton draft of a Sahtú Regional Research and Monitoring Strategy has been developed to provide a basis for constructive dialogue moving forward. It is intended to act as a "straw dog," that is, a draft intentionally put forward as a basis from which to build with the motive of inviting criticism, opposition or agreement.

To date, the draft has been developed through a review of a number of initiatives led by the Sahtú Environmental Research and Monitoring (SERM) Forum since its inception in the fall of 2013. In addition, documents associated with regional studies elsewhere in NWT (the Beaufort Delta Regional Environmental Assessment and the West Kitikmeot Slave Study) as well as various types of other NWT strategies, such as the NWT Research Agenda and the NWT Water Stewardship Strategy, have been reviewed for relevant structure and content. The on-going work to develop a research and monitoring strategy for the proposed Tsá Tué Biosphere Reserve (Great Bear Lake) as well as the draft Fort Good Hope State of the Knowledge report have been reviewed to better understand the state of pertinent knowledge related to wildlife, ecosystem integrity, fisheries, permafrost and karst and water quality and quantity.

Iterative drafts of this research strategy are being reviewed by members of the SERM Forum, which is a regional forum initiated to improve research and monitoring coordination throughout the Sahtú. The Forum provides a venue through which partners from Sahtú organizations, territorial and federal government agencies as well as industry and academic institutions can identify shared opportunities to explore research and monitoring directions in the region.

Since the Forum was initiated, its members have hosted or participated in two workshops at which research questions, themes and methodologies were specifically explored. In January, 2014 the Forum met for two days to hear presentations of research results and to discuss future directions at which point a list of research questions of interest to Forum members was generated. In September of that year, the list was reviewed through an initiative of the Cumulative Impact Monitoring Program so that research questions could be further developed and prioritized. The Forum has also met in person in March 2015 and January 2016 to learn about on-going and proposed research projects and to further discuss regional research priorities. In March, 2016, a community caucus of the Sahtú region was held over three days in Tulít'a in order to workshop the draft strategy and to discuss how to create a robust process that would facilitate the meaningful participation of all community

organizations and government, industry and academic partners in the development of the strategy.

A path forward was designed during the workshop and is presented here as a stepwise work plan emphasizing broad engagement throughout the Sahtú with the intent of completing a finalized draft by March, 2017. Although the draft is not yet ready to be shared and further work must be done to invite the meaningful participation of all Sahtú organizations (including First Nations, Land Corporations and co-management boards) the work plan and draft Table of Contents is provided within this backgrounder as an interim update.

Work plan - Towards a Sahtú regional environmental research and monitoring strategy

At the Forum's community caucus, held in Tulít'a on March 29, 30 and 31, Forum representatives discussed the steps needed to develop and finalize a Sahtú environmental research and monitoring strategy. The following steps were identified:

1. **Gain a mandate; engage all partners**. April, May, June, July, 2016
Although the Forum has broad and inclusive representation, not all partners necessary for the development of a strategy are represented on the Forum. For example, other community partners, such as First Nations, Land Corporations as well as co-management organizations (the Sahtú Land and Water Board, the Sahtú Land Use Planning Board) are not directly represented.

The following actions are currently planned:

- draft a briefing note outlining why a strategy is needed, what it hopes to achieve and the role of the Forum in developing it.
- Send a formal letter to the distribution list. The letter will formally invite participation, outline specific opportunities for engagement, and invite preliminary thoughts. The letter will be signed by the Forum Chair.
- Work with all partners to develop a comprehensive distribution list. This would include community organizations, Sahtú Secretariat, co-management boards, industry, academia, GNWT and federal government departments.
- Support Forum members in reaching out / reporting back to the organizations that

they represent.

- Better understand how each partner should be engaged. ENR has clarified that they will lead GNWT representation but that other departments' feedback will be sought through an interdepartmental research committee.
- The Renewable Resource Councils represent community interests on the Forum. Representatives have a role to play in engaging other community based organizations and the Forum resource people can help in planning community teleconference calls to introduce the idea of the strategy and seek preliminary direction.

2. **Complete a first draft**. May, June, July, August, 2016
    - Work with partners and information available through the literature to concisely summarize available information. The process will involve communications with academic, industry and government partners. Iterative drafts can be reviewed by Forum Members.
    - Workshop completed first draft in Forum meeting. Sept / Oct, 2016
    - Subsequently incorporate workshop feedback into a second draft.

3. **Distribute revised draft to broader partners and seek feedback**. Oct, 2016
    - A draft will be sent to all community, industry, academic, co-management and government partners. (the previously developed distribution list)

4. **Workshop draft in each Sahtú community (community meetings).** Nov, 2016
5. **Incorporate all feedback into a third draft**. December, 2016
6. **Circulate final draft to all partners for final comments**. January, 2017
7. **SERM Forum approval**. February, 2017
8. **Submit to SSI and GNWT for formal resolutions to adopt**. February, 2017

Draft Table of Contents

APPENDIX 3

Backgrounder: research licensing in the Sahtú region

Draft for discussion, April, 2016

Background

There is evidence to suggest that the way that research licenses are being handled in the Sahtú is more bureaucratic than desirable, and does not necessarily achieve intended outcomes. This briefing note outlines and identifies the challenges in the current system, with the hope of fostering constructive dialogue about how regional research goals can ultimately be better achieved. Any modifications to the current system will require a regional consensus with clear policy guidance for implementation.

Current research licensing in the NWT and Sahtú

All research conducted in the Northwest Territories requires a research license. Additional permits may be required for particular components of the research but at minimum, a researcher must apply for one of the three research permits:

1. **Wildlife research permit**
   Required for any research conducted on terrestrial vertebrates. The Department of Environment and Natural Resources is responsible for issuing wildlife research permits. Additional permits may be required if the researcher proposes to *handle* wildlife.

2. **Archaeologists research permit**
   Required for any archaeological research and issued by the Department of Education, Culture and Employment.

3. **Scientific research license**
   Required for all other kinds of research and issued by the Aurora Research Institute (ARI) with the powers created by the Scientists Act.

NWT's Scientific Research License is intended to promote regional and community engagement in research to ensure that research projects optimize positive outcomes for the region, while minimizing or avoiding negative consequences. The legal authority for issuing a scientific research permit arises from the Scientists Act. The Act does not detail how research licenses are implemented. Rather, research licensing in NWT follows both formal and informal policies set by the Aurora Research Institute (ARI), regional governments and land claim organizations and communities. Models are regionally specific and arise from individual land claims or from policy direction provided to ARI from regional governments and their bodies.

Currently in the Sahtú, when a research application is received by ARI, staff redirect the application to identified "referral bodies" by e-mail with a request for comment. If the research is determined to involve the Sahtú region generally, it will be sent to up to twenty-one referral bodies including: the Sahtú Secretariat, the Sahtú Renewable Resources Board,

each of the five Renewable Resources Council, each of the seven Sahtú Land Corporations, the three First Nations and four community governments.

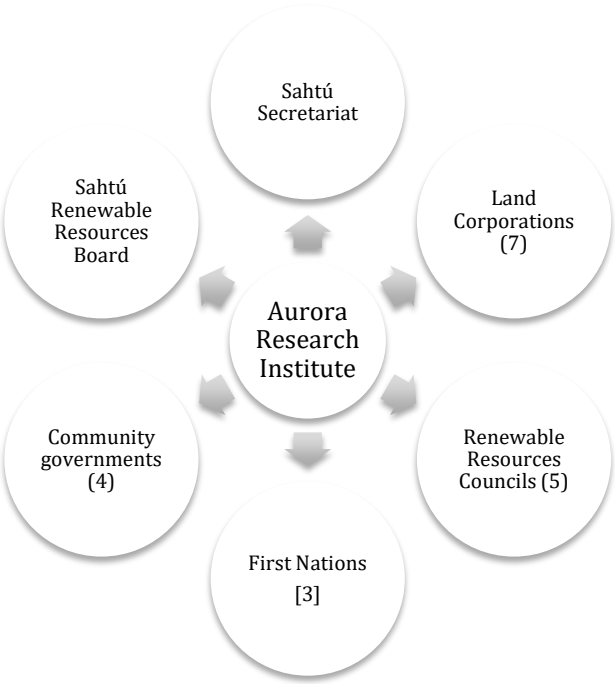

Figure 1: Sahtú referral bodies for ARI issued research permits.

The Sahtú Dene and Metis Comprehensive Claim Agreement and research

Although research is not addressed comprehensively within the Claim, some specific responsibilities for research are assigned to several bodies within the Sahtú region. The Sahtú Renewable Resources Board is the central body to participate in and, where not creating duplication, lead wildlife research within the Sahtú region. It is intended to have independent research capacity as well as capacity for data and document management. The Board also has specific roles in forestry management including related research. Both the Board and territorial and federal government departments are required to work closely with Renewable Resources Councils in all research that implicates wildlife. In turn, the Renewable Resources Councils are tasked with encouraging and promoting local involvement in any such research that occurs. The Sahtú Secretariat has rights over access to settlement lands, including the opportunity to grant or refuse access for research although the claim specifically protects access on water for purposes of research and water quantity and quality monitoring. Settlement Corporations are assigned optional responsibility to conduct or participate in research related to native studies, language, culture and justice.

In practice, the dichotomies between types of research within the Sahtú that are implied within the Claim, do not exist. In a place where language, lifestyles, economies and culture are so traditionally tied to land and where wildlife populations are inextricably linked to their habitat and its associated land uses, the intersections of research disciplines defy clean

compartmentalization.

Table 1: Research references from the Sahtú Dene and Metis Comprehensive Claim (emphases added)

Organization	Specific role of research specified in Claim
The Sahtú Renewable Resources Board	Advisory Powers 13 .8.32 Government may consult the Board on any matter which will likely impact on wildlife or wildlife habitat in the settlement area and shall seek the timely advice of the Board on the following matters: (a) draft legislation respecting wildlife or wildlife habitat; (b) land use policies or draft legislation which will likely impact on wildlife or wildlife habitat; (c) proposed inter-provincial or international agreements which will likely impact on wildlife, wildlife harvesting or wildlife habitat; (d) the establishment of new national parks and territorial parks; (e) plans for public education on wildlife, wildlife harvesting and wildlife habitat; (f) **policies respecting wildlife research and the evaluation of wildlife research in the settlement area;** Research and Harvesting Studies 13 .8.37 **It is intended that the Board and government departments and agencies work in close collaboration and exchange full information on their policies, programs and research**. 13 .8.38 The Board may participate in harvesting studies, in data collection and in the evaluation of wildlife research. **It is intended that the Board have an independent research capability, to the extent agreed by government and which does not duplicate research which is otherwise available to it.** 13 .8.39 **The Board shall establish and maintain a public file for reports, research papers and data received by the Board**. Any material furnished on a confidential basis shall not be made public without the consent of the originator. 14.1.10 Government may consult the Board on any matter which affects forestry and forest management and shall seek the timely advice of the Board on the following matters: (a) draft legislation respecting forestry and forest management including forest fire management; (b) land use policies or draft legislation which will likely impact on forestry or forest management; (c**) policies respecting forestry and forest management research and the evaluation of such research**; and (d) plans for training participants in forestry, forest management and lumbering.
Renewable Resources Councils	13 .8.40 **Wildlife research or harvesting studies conducted in the settlement area by government or by the Board or with government assistance shall directly involve Renewable Resources Councils and participant harvesters to the greatest extent possible.**

	13.9.1 There shall be a Renewable Resources Council in each Sahtú community **to encourage and promote local involvement in conservation, harvesting studies, research and wildlife management in the community**. National Park Management Committees 16.3.3 The Committee may advise the Minister or the Minister's designate, the Renewable Resources Board or agencies of government, as appropriate, with respect to the following matters: (a) all matters affecting the national park which lie within the Renewable Resources Board's powers and responsibilities; (b) interim management guidelines, park management plans and any amendments to them; (c) park employment, training plans and economic opportunities for participants associated with the development and operation of the park; (d) any proposed changes to park boundaries; (e) issuance of permits for cabins or camps which may be required for the exercise of the harvesting rights of the participants; (f) measures to give protection to sites, within the park, of cultural and spiritual significance to the participants and of archaeological significance; (g) information and interpretive programs to recognize participants traditional use of the park area; (h) **research and field work conducted by or for government in a national park**; and (i) any other matters which may be referred to the Committee by the Minister, the Renewable Resources Board or agencies of government.
Sahtú Secretariat Incorporated	21.2.4 With the agreement of the Sahtú Tribal Council, persons conducting research may enter, cross and stay on Sahtú (settlement) lands for a reasonable time to conduct research.
Settlement Corporations	The following are permitted activities of settlement corporations. Subject to 11 .3.2, it is not necessary for any or all of the permitted activities to be carried out by a settlement corporation. 1. EDUCATION AND TRAINING Funding or providing: (a) courses for non-native and native teachers and other instructors to enable them to conduct courses in native culture, language and similar areas; (b) training for native elders to enable them to participate in the delivery of native culture and language instructional programs; (c**) native studies, culture and language programs for participants and research relating thereto**; (d) scholarships for participants to enable them to attend educational institutions within and outside the Northwest Territories; (e) vocational training and similar programs for participants within and outside the Northwest Territories; (f) **native language and cultural teaching research programs**; and (g) **training for persons employed in connection with native justice programs and research related thereto**.

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Challenges in current implementation

The current process can be frustrating to participants on all sides. In discussions with Sahtú RRC and Land Corporation members as well as government and academic researchers to date, the following challenges are frequently encountered in the research license application and referral process. These are listed and discussed here:

1. Burden on community organizations

Several people interviewed within the RRCs and Land Corporations have expressed frustration at the burden created by the current process. In a single community, up to five organizations may be independently trying to respond to a single research application. The degree to which communities have procedures in place for that work and related resources to be shared among organizations is community dependent. In Délı̨nę, where the RRC and the Land Corporation share a single office, communications are more fluid, however overall coordination among community organizations has been identified as a challenge. Improving coordination may not be straightforward. Calling collective meetings requires a tremendous amount of time and carries a significant financial cost. When a single organization does call a meeting to review an application, those present may decide through discussions that other people representing other interests need to be consulted, further deferring the decision. It has been noted that in negotiating self-government agreements, the roles of organizations will be re-conceived.

2. Lack of transparency regarding how comments are incorporated

Several RRC members have commented that when concerns regarding research are submitted they are ignored and licenses are issued anyway. Adequate communication between the researcher and community members including interim and final reporting is a recurring challenge. It is not always clear that when recommendations have been made, they have been implemented. Generally, the responsibility of ARI staff to pass on the recommendations and subsequently the researchers to heed the recommendations is not clear, nor are there evident mechanisms for monitoring how and if such recommendations are implemented.

3. Challenges in interpreting the meaning and implications of proposed research

Applications for research deal with a wide range of topics and research methods. It is not particularly realistic to think that any single organization would hold the expertise to fully interpret and comment on the wide range of research presented to communities, let alone someone in each of the twenty-one referral bodies. There are many examples in which the intent of research has been misunderstood.

4. Insufficient opportunities to foster iterative and meaningful communications

For the most part, communications surrounding the research permitting process occur in written english. Though representatives of referral bodies are welcome to phone ARI staff with questions, this would first assume that the application is reasonably accessible such that questions can first be formulated. Several people have lamented that there is no opportunity for an in-person, verbal presentation of the research, which could be followed by a more constructive and iterative conversation. Recently, the Sahtú Environmental

Research and Monitoring Forum has provided opportunities for researchers to discuss their projects with representatives from several referral bodies at a time through frequent teleconferences (the Forum's membership includes representatives from SSI, the SRRB, and each of the five Renewable Resources Councils). While these in-person dialogues provide effective opportunities for Sahtú residents to better understand the process, they do not include representatives from all referral bodies. In addition, members still face a significant challenge in communicating back to their Boards, particularly about topics that are at times novel and technical.

5. Undermines relationship with the researcher

In some cases, research applications are a formality for projects that are on-going, are being done in collaboration with referral body organizations and that generally already have the active support of one or several referral bodies. The current permitting process requires that the research be communicated through the bureaucratic system that undermines current relationships rather than building upon them. Although existing relationships are often based on long-standing face-to-face contact and discussions, written approaches can instead appear bureaucratic, technical and alienating.

6. Creates unwanted barriers to good research

All of these challenges have created situations in which there are delays with research licensing. In some cases, this has meant that high quality research supported by Sahtú communities has not been completed because a particular field season window has been missed.

Towards an improved model

Based on discussions with SERM Forum members, as well as other RRC representatives and representatives of some Land Corporations, there appears to be an appetite to review how research is handled within the Sahtú region. Developing a new model will require building consensus among all Sahtú organizations about how to improve the process.

A renewed model would strive to achieve the following principles and objectives (to be further elucidated through continued discussions):

a) Foster more constructive communication by increasing opportunities to sit down and talk about research licenses and other identified approaches.
b) Foster a more comprehensive understanding of the research being proposed thereby reducing misunderstandings.
c) Reduce the burden to community organizations.
d) Ensure that delays in responses do not prevent important research from being completed.
e) Ensure that the roles of Sahtú bodies as defined in the Claim Agreement are respected
f) Foster community participation in research
g) Encourage partnerships through which community and regional organizations are drivers or agents of research

h) Ensure that research has the maximum possible value and outcome for future generations
i) Ensure that research responds to priorities identified by Sahtú community members and leaders.
j) Promote good research and its benefits as a basis for decision-making
k) Ensure that all those involved in the research are safe
l) Achieve consensus
m) Elevate the confidence that Sahtú residents have in the licensing system

A working list of questions for Sahtú organizations include the following:

a) What do you hope to achieve from the research license process?
b) (Referring to each previously stated objective) To what degree to you feel that the current research licensing process is achieving its goals?
c) What is working well within the current research licensing system?
d) What needs improvement?
e) How frequently is your organization reviewing and responding to the research license applications that are referred to it?
f) Which research topics are important to your organization?
g) Are there research topics about which your organization does not need to be consulted?
h) How can young people be involved in the process so as to build their leadership skills for future work?
i) Do you see opportunities to coordinate more among organizations within your community? How can this coordination be facilitated? What are the barriers to doing so?
j) Do you see opportunities to coordinate more among organizations within your region? How can this coordination be facilitated? What are the barriers to doing so?

By understanding what each organization hopes to achieve from the licensing process and by more closely examining the extent to which these objectives are being achieved through the current model, it is hoped that new and creative approaches can be identified with consensus ultimately built among all Sahtú organizations.

Next steps

This briefing note has incorporated perspectives from a number of discussions but further work is planned. The following work plan outlines the next steps in assessing the existing research licensing process in the Sahtú, and working towards development of a new model:

Step	Description of Work	Start and End Dates
Further discussions with Sahtú referral bodies and others involved in licensing process	Further discussions to elicit experiences and perspectives: a) Land Corporation Directors and staff b) Renewable Resources Councils Directors and staff c) Charter Communities and First Nations Directors and staff d) Researchers (government, academic and industry) e) Aurora Research Institute meeting The discussions are intended to better understand what each party would like to achieve from the research licensing process, the challenges currently encountered and explore creative opportunities for meeting the intended outcomes while addressing the unintended challenges.	Fall, 2016
Comparison with other jurisdictions	a) How are other NWT regions handling these challenges? b) How are these challenges handled in the Yukon or in Nunavut? c) What can be learned from the experiences of other jurisdictions?	Fall, 2016
Revise draft discussion paper	Following extensive phone interviews and review of processes in other jurisdictions, a draft discussion paper will be written and circulated for comment with responses incorporated into a final draft to be work-shopped.	Fall, 2016
Community workshops	Workshops to be held in each community involving each referral body to identify and discuss possible new or altered approaches.	Winter, 2017 pending funding
Development of a new model	Development of new research licensing policy and guidance for implementation.	Spring, 2017
Building buy-in and consensus for new model	a) SERM Forum Members engage other community organizations in reviewing the proposed approach b) Circulated iterative drafts. c) Sign-on by all referral bodies.	Summer, 2017

APPENDIX 4

Sahtú Environmental Research and Monitoring Forum 2013-2015 Update Report

Prepared for the Sahtú Renewable Resource Board
By Christine Wenman
PlanIt North, B.Sc. M.Sc.
June, 2015

Introduction and background

The Sahtú Environmental Research and Monitoring Forum was initiated in 2013 to support environmental research and monitoring by providing a venue for discussing plans and accommodating the priorities and traditional knowledge of Sahtú communities. Through fostering communications between forum members, which include community, regional, territorial and federal government representatives as well as industry representation, forum members hope to ensure that "environmental monitoring and research programs and projects in the Sahtú are coordinated and conducted in ways that reflect regional and community priorities, engage communities, value both western science and traditional knowledge, and support wise decision-making."[1]

The forum's objectives are to:

- Identify regional priorities and research gaps
- Build cross-cultural understanding
- Support and protect traditional knowledge processes
- Support regional and regulatory decision-making
- Identify opportunities for: collaborative research involving communities; communication; information-sharing; and cross-cultural interpretation of research results.

NWT's Sahtú region has the potential for substantial oil production from shale resources held within the Canol shale play of the Central Mackenzie Valley. From 2012-2014, three companies were actively exploring in the region – MGM, Husky and Conoco Phillips. With recent downturns in oil prices, exploration activities appear to be on hold; however challenges encountered during the short exploration *boom* highlight the need for proactive planning to ensure that research is coordinated, communications are effective, community members are prepared to benefit from economic spin-offs, and environmental and social concerns are addressed. The forum presents a venue through which Sahtú Beneficiaries can collaborate with government, industry and academics to pursue effective planning and communications.

Forum members include two youth delegates, an SSI delegate and five community delegates – one from each Sahtú community. The forum provides an opportunity for Sahtú representatives to meet with government, academic and industry representatives responsible for various aspects of environmental research and monitoring in the region in order to share knowledge and to plan for future projects. Though initiated within only the last two years, the Sahtú Environmental Research and Monitoring Forum has been productive since its inception. The forum has

[1] Sahtú Environmental Research and Monitoring Forum Terms of Reference

initiated and participated in a number of projects and workshops, including the following initiatives summarized here.

Achievements to Date

Description of specific initiatives

Environmental Research and Monitoring Coordination Workshop
Tulít'a, November 5-7, 2013

Forty-five participants gathered in Tulít'a to begin to find better ways to do research an monitoring in the region. The 45 participants included representatives from all five Sahtú communities, the Sahtú Renewable Resources Board, federal government agencies, territorial government agencies, Aurora College, and industry. The objectives of the workshop were: to build relationships, to share information, to figure out the best ways to coordinate environmental research and monitoring in the region, considering ideas like a working group; to outline goals, funding needs, and timelines for coordination of environmental research and monitoring; and to identify Sahtú individuals and organizations who are interested and motivated to take a lead on coordinating environmental research and monitoring. The workshop was an effective opportunity for participants to clarify and communicate their roles and responsibilities.

Research Results workshop - It's about our Survival
Keeping the Food and Water Safe in the Sahtú Region
Tulít'a, November 27-28, 2013

The three day workshop provided opportunities for forum members to understand some of the key research projects that are happening in the Sahtú region and to learn about key research programs that are run by federal and territorial government departments such as the Cumulative Impacts Monitoring Program and the Northern Contaminants Program as well as research and monitoring programs run by the Department of Fisheries and Oceans and GNWT – Environment and Natural Resources. In addition, a number of researchers explained projects exploring caribou genetic diversity and wildlife health. Through the three days of presentations and dialogue, forum participants were able to make recommendations for what should be studies, how research should e done and how resources can best be used to support good research. The presentations and the recommendations are summarized in the resulting report.

Best of Both Worlds
Sahtú Gonę́né T'áadets'enı tǫ
Depending on the Land in the Sahtú Region
Volume I – Discussion Document

Best of Both Worlds is a two-phase project to develop an Action Plan for promoting workforce readiness to support a healthy mixed economy. Phase 1 involved a literature review, a workshop, a focus group and interviews through which participants discussed their current realities and future visions with regards to having a strong mixed economy. Dialogue focused on recognizing aspects that support a strong mixed economy or that, conversely, present barriers. Participants further explored strengths and challenges in education and training for the mixed economy. In the phase 1 report, a number of recommended actions were identified for program development, education and training.

Staying Strong – Sahtú Youth and Elders Building Healthy Communities in the face of climate change
September, 2013 to May, 2014

Youth and elders explored aspects of their changing environment due to climate change and considered in a context of broader cumulative effects. A focus of the project was the development of youth leadership skills and core strengths, developed through on the land activities and opportunities to learn from their elders. The project was initiated with a planning workshop in September, 2103. In October, some Sahtú youth were able to attend the PowerShift BC conference held in Victoria BC, at which youth from across the country gather to build their knowledge, networks and leadership skills. The project also contained a substantial on-the-land component, with youth joining a fall hunt at Pıetł'ánejo (Caribou Flats), and a community spring hunt at K'áalǫ Túé (Willow Lake). The Climate Change and Community Health workshop was held in Tulít'a, November 5-7, 2013, with 10 elders and 12 youth from all five Sahtú communities, In addition, Eugene Boulanger, worked with Sahtǘ youth at the Sahtǘ Environmental Research Results Workshop in Tulít'a, Nov 27-28, 2013, focusing on youth engagement, facilitation and skill building, At this workshop and other project activities, youth frequently outlined a need for greater and more consistent engagement of youth at meetings. Encouraging their involvement and creating consistent, safe spaces for youth leadership development has consistently been identified as a priority for the forum.

Sahtú Environmental Monitoring and Research Forum results workshop & annual meeting
Yellowknife, January 9, 10, 2014

Forum members and a number of support people met to recap the results from the research and monitoring coordination workshop and to explore some research themes more deeply. Discussions included a facilitated dialogue about how risk is framed, assessed and communicated. Further discussions explored opportunities to support Dene youth in developing leadership skills and becoming prepared for their future role in self-government and community administration. Guest speakers presented about research that is being done in NWT to monitor mercury in fish and other wildlife.

Environmental Monitor Training Program
Tets'ehxe (Drum Lake), Sahtú
March 14 – 29, 2014

Blyth & Bathe were contracted to carry out the delivery of the BEAHR Environmental Monitor Training Program (EMTP). The program ran from March 14th to March 29th 2014 at Tets'ehxe (Drum Lake) and provided an intensive, condensed EMTP training to students from the Sahtú Region. Two Students were from Colville Lake, five from Tulít'a, one from Norman Wells and three from Fort Good Hope. Students were selected through an abnormally stringent selection process, which was carried out by a selection committee from the Aurora College Campus in Norman Wells.

Conducting the EMTP training entirely on the land was an innovative approach that proved to be unique and successful with the trainers suggesting that the format be a guiding model in the future.

At Home on the Land
The Sahtú Cross-Cultural Research Camp
July 12-19, 2014, Taalǝ Túé (Stewart Lake)

The Sahtú Cross-Cultural Research Camp, held at Taalǝ Túé (Stewart Lake) from July 12-19, 2014, was a forum for Dene/Métis knowledge holders and scientists to learn about each other's research questions and ways of learning about and monitoring wildlife, habitat, harvesting and water. The Camp served several purposes related to both knowledge sharing and knowledge gathering, including a contribution to the certification of local environmental monitors, and collection of baseline data in an area near the shale oil exploration play. Camp activities were centred around two Environmental Studies Research Fund programs – "Wildlife, Habitat and Harvesting", and "Surface Water and Groundwater" research.

The research camp provided opportunities for experiential learning in monitoring approaches and participants facilitated scientists in field research including conducting stream sampling and identifying songbirds and waterfowl. Participants included youth who had just completed an Environmental Monitoring Training

Program certification at Drum Lake, which provided a unique opportunity for immediate follow-up and continued education. The camp was extraordinarily well-received by all participants providing a venue through which shared understandings could be developed overcoming differences in cultural perceptions and language. The cross-cultural research camp will be held again in summer, 2015.

Sahtú Wildlife Cumulative Effects Monitoring Workshop
Summary Report
September 2-4, 2014

Sahtú Environmental Research and Monitoring Forum members met to review an existing list of 34 research questions that had been identified at previous SERM meetings. The questions were reviewed to identify whether progress had been made in addressing them and to ensure that they were still relevant questions. In addition, additional priorities were identified, creating a total of 62 research questions. Through facilitated dialogue and by identifying a number of criteria through which the research questions could be evaluated, the questions were prioritized in order to provide guidance for future research endeavors.

Annual Sahtú Environmental Research and Monitoring Forum meeting
Yellowknife, March 24-26, 2015

A full forum delegation came together for a three day in-person meeting in March 2015. As the meetings were situated in Yellowknife, it provided an opportunity for substantial guest participation and forum members received updates from several sources and were able to contribute perspectives to the development of some research projects. Research discussed and/or presented included archaeological research in the Sahtú mountains by Tom Andrews, GNWT Species-at-risk updates, Environment Canada's landbird monitoring project (Samuel Hache), a monitoring and research update from Diavik mine, and an update on the mercury research synthesis work conducted with NCP funding by Shelagh Montgomery. A full day was dedicated to understanding and discussing caribou management planning and associated research with presentations from GNWT. Constructive discussions were had with GNWT- ENR communications and education staff exploring regional priorities.

Other activities
The Sahtú Environmental Research and Monitoring Forum has met consistently by phone (nine times since its inception). These regular meetings provide an opportunity for forum members to stay up to date about regional research activities and strengthen relationships among academics working in the region and community members. For instance, the forum provides an opportunity for researchers seeking to develop research projects to discuss their approaches with

forum members prior to submitting research applications, therefore providing more genuine opportunities for iterative dialogue to build stronger research approaches with more community collaboration.

Date	*Summary or selection of topics covered*
September 4, 2015	Upcoming
June 4, 2015	
May 8, 2015	
January 8, 2015	Brian Laird (University of Waterloo) and Shelagh Montgomery (SENES Consultants) discussed a mercury biomonitoring project and Cindy Gilday provided updates about Gary Stern's Fort Good Hope Loche Monitoring project funded by the Northern Contaminants Program.
June 5, 2014	Various member updates, review of draft forum budget, discussion of ESRF funding and cross-cultural camp planning, SRRB intern introduction
May 8, 2014	James Hodson (GWNT) discussion planning for wildlife cumulative effects workshop
April 24, 2014	Tom Stubbs discussed the Central Mackenzie Valley Shale Oil Partnership; review of forum's annual work plan
Feb 25, 2014	Received planning advice for Fort Nelson speaking tour, updates on research proposal submitted to ENR for funding including caribou genetics research (J. Polfus), caribou and moose parasite research (S. Kutz), Sahtú biodiversity monitoring framework, harvest monitoring.
Dec 6, 2013	Discussed terms of reference, recapped research and monitoring workshop objectives
November 18, 2013	Debrief on the ERM Workshop in Tulít'a, November 5-7, Support Committee update, Review of Working Group membership, next steps

The forum has also developed a document repository and is in the process of developing a public web-page that will be housed within that of the Sahtú Renewable Resources Board's site. Such initiatives will build the profile of the forum both within the Sahtú region and more broadly in the NWT.

Future directions

Themes and directions

The model has proven to be effective in working towards the forum's stated objectives. Through on-going discussions, forum members have completed substantial work in identifying regional priorities and are making progress in understanding to which degree those priorities are being addressed by current projects and programs or to which degree gaps persist.

Through opportunities for in-person meetings and one-on-one dialogue, both the forum participants and the support group are better able to understand one another's perspectives and approaches. In addition to building understanding, knowledge, relationships and networks, the forum's work to date has also provided direction for future endeavors. The following directions have been identified from a thorough review of the recommendations that have emerged from the various forum initiatives to date and are presented according to the objectives specified in the forum's terms of reference.

Objective – Identify Regional Research Priorities and Research Gaps

- Continue the on-going work that has sought to list, thematize and prioritize research questions so as to inform future directions. On-going work is needed to ensure a comprehensive understanding of existing projects and programs so that a gaps analysis can be completed. The forum will work with government departments and academic partners to review the framework completed to date so as to identify which research priorities are already being addressed or partially addressed through past, present or planned research. Outstanding gaps will be highlighted.

- Develop a well-informed and clear perspective on regional study approaches that can be concisely communicated and advocated for by the forum
    - Clarify roles and responsibilities in initiating, funding, and overseeing a regional study
    - Better understand various types of regional studies including strategic environmental assessments in order to identify which approach best addresses the research needs identified by the Forum
    - Find and analyze examples of regional studies elsewhere that could inform work in the Sahtú
    - Identify mechanism for regional study work to inform policy, regulation, and decision-making
    - Identify potential partners and resources to support a regional study

- Develop a more robust socio-economic and socio-cultural research agenda that builds from traditional knowledge and addresses themes beyond the natural sciences.

Objective - Build cross-cultural understanding

- Continue to provide opportunities for dialogue between forum members and researchers for government and industry. Opportunities for semi-structured in-person discussions have proven invaluable in bridging understanding, developing shared language and strengthening partnerships.

Objective - Support and protect traditional knowledge processes

- Based on the research priorities identified and the gap analysis conducted, develop approaches to traditional knowledge research and identify appropriate sources of funding.

- Maintain an emphasis on-the-land experiential learning with intergenerational participation and teaching, building on the success of the first cross-cultural camp.

- Further support environmental monitors in on-going training opportunities and in connecting them to diverse and meaningful work opportunities.

- Develop additional on-the-land learning for youth with elders. These opportunities build confidence, leadership skills, and connection with elders and cultural identity.

- Continue to involve youth in forum activities. Additionally, provide parallel environments through which youth can build leadership in safe, encouraging and youth-directed environments.

Objective - Support regional and regulatory decision-making

Objective - Identify opportunities for: collaborative research involving communities; communication; information-sharing; and cross-cultural interpretation of research results.

- Build on the existing role of the Forum as a mechanism of communication between researchers and community members, in particular the Renewable Resource Councils (RRCs). Identify additional methods to facilitate RRCs in reviewing research licenses in a meaningful and efficient way so as to encourage better research approaches and so as to optimize available resources.

- Strengthen the focus on communications. Forum representatives have identified challenges in communicating what they are learning to their Renewable Resource Councils and broader communities. In addition, challenges are still evident in ensuring that research approaches and results are broadly communicated to those interested.

- Review the current process of research license referral and reviews so as to identify opportunities to increase community engagement while reducing the administrative burden to referral bodies.

Approach

In order to address the emerging themes and recommendations, the will continue to meet and to develop initiatives throughout the 2015-2016 year. Forum members are striving to meet approximately monthly by phone and have begun the fiscal year with two teleconference meetings already; approximately ten meetings are anticipated throughout the year.

Two in-person meetings are also planned as these provide the best venue to involve all participants in discussion and planning and to build relationships between Forum members and their research and monitoring partners. It is anticipated that one meeting will be held in a Sahtú community while another will be held in Yellowknife. Meeting in the Sahtú provides an opportunity for greater visibility and communications with Sahtú community members, while Yellowknife meetings ensure that the Forum can access the knowledge of many research partners.

In addition to the two Forum meetings, which provide an opportunity for continued education for Forum members and their support network as well as opportunities to plan for effective research and monitoring, support for Forum members to participate in two related workshops or training opportunities is being sought. For example, these external events may include one of the following or another identified learning and networking opportunity:

- Cumulative Impacts Monitoring Program annual research results workshop
- Regional Sahtú results workshop
- Cross Cultural on-the-land field research camp

As per its terms of reference, the Forum membership consists of 2 delegates, an SSI delegate and 5 community delegates. Requested support would cover their participation in Forum activities as well as their travel costs. In addition, the Forum is seeking funds to cover the costs of hiring additional support in rapporteur and reporting services for Forum meetings.

Objective	Task	Goal/why	Desired outcome / product	Achievement to date	Next steps (2015-2016)
Identify research priorities and research gaps	Review plans for the Sahtú ESRF Wildlife, Habitat and Harvesting	Promote Forum Research Priorities for future work to be funded by the new NWT version of ESRF.	Participate in the Experts Workshop	?	
Identify research priorities and research gaps	Assist in developing the Sahtú Monitoring Framework document. This is an SRRB initiative advised by the Sahtu Forum support group.	Promote Forum Research Priorities.	Participate in the Monitoring	Research lists and subsequent priorities were generated through two workshops.	Existing list (draft framework) needs to be compared past, current and planned research initiatives to identify gaps.
Identify research priorities and research gaps	Review and compile list of industry monitoring programs in the Sahtu Region.	To examine if and how Forum Research Priorities are being addressed.	Identify gaps between industry monitoring programs and	?	Surface and groundwater programs to be examined in more detail to make recommendations for future industry monitoring
Identify research priorities and research gaps	Provide input on approach to boreal caribou range planning.	Maintain awareness, gather information and promote Forum Objectives and Research Priorities.	Document link between range planning and Forum Objectives.		
Identify research priorities and research gaps	Review progress on 2011-2015 Barren-Ground Caribou strategy.	Maintain awareness, gather information and promote Forum Objectives and Research Priorities.	Document link between Barren-Ground Caribou Strategy, identify gaps (in relation to Forum Research Priorities) and establish a list of opportunities related		

			to the Strategy.		
Identify research priorities and research gaps	Review Sahtú Harvest Survey results.	Maintain awareness, gather information and promote Forum Objectives and Research Priorities.	Recommended approach for future harvest monitoring.		
Identify research priorities and research gaps	Review ʔehdzo Goťı̨nę Gots'ę́ Nákedı (Sahtú Renewable Resources Board) Research Agenda.	Maintain awareness, gather information and promote Forum Objectives and Research Priorities.	Make recommendations for research that will meet the Forum's Research Priorities and provide opportunities for collaboration.		
Identify research priorities and research gaps	Review plans for the Sahtú ESRF Surface Water and Groundwater program.	Maintain awareness, gather information and promote Forum Objectives and Research Priorities. Put forward priorities for future work to be funded by the new NWT version of ESRF.	Participate in the Experts Workshop		
Identify research priorities and research gaps	Review NWT Water Stewardship Strategy and Action Plan Activities, such as Community-Based Monitoring in the Sahtu.	Maintain awareness, gather information and promote Forum Objectives and Research Priorities.	Identify opportunities for collaboration.		
Identify research priorities and research gaps	Review DFO research agenda and activities in the Sahtu.	Maintain awareness, gather information and promote Forum Objectives and Research Priorities.	Identify opportunities for collaboration.		
Identify research	Review ENR draft	Maintain awareness,	Identify opportunities		

priorities and research gaps	multi-scale Cumulative Effects Monitoring Program for wildlife.	gather information and promote Forum Objectives and Research Priorities.	for collaboration.		
Identify research priorities and research gaps	Provide input on cumulative effects assessment and monitoring approach, including: Boreal Caribou Blueprint; Cumulative Impacts Monitoring Program (CIMP) Strategic Plan.	Maintain awareness, gather information and promote Forum Objectives and Research Priorities.	Identify opportunities for collaboration.		
Identify research priorities and research gaps	Review Sahtú-based CIMP and ENR Letters of Intent and proposals	Maintain awareness, gather information and promote Forum Objectives and Research Priorities.	Identify opportunities for collaboration.	Achieved	Task repeated for 2015-2016
Build cross-cultural understanding	Participate in Cross-Cultural Research Camp planned as part of the ESRF Wildlife, Habitat and Harvesting program.	Maintain awareness, gather information and promote Forum Objectives and Research Priorities.	Refine Forum Research	Cross-cultural camp was very well attended with rave reviews. Plans unfolding for summer 2015 2nd cross-cultural camp.	2015 summer cross cultural camp
Build cross-cultural understanding	Provide support and guidance for the new Sahtú Youth Network (Health and Climate Change project sponsored by the ʔehdzo Goťįnę Gots'ę́ Nákedı)	Maintain awareness, gather information and promote Forum Objectives and Research Priorities.	Refine Forum Research	Youth network participated in cross-cultural camp and a number of on-the – land hunts with elders as well as working groups and focus groups.	Further youth network participation in forum activities but an emphasis on youth-led independent activities and

					leadership strengthening opportunities
Build cross-cultural understanding	Engage in cross-cultural dialogue to support balancing of cultural approaches to the research and monitoring agendas identified under Objective 1.	Maintain awareness, gather information and promote Forum Objectives and Research Priorities.	Refine Forum Research Priority List and activities.	Forum communications (cross-cultural camp, teleconferences and in-person meetings are proving to provide substantial opportunities to build bridges in cross-cultural understanding	Four in-person meetings planned for 2015-2016 including a results workshop, a forum annual meeting, summer cross-cultural camp and forum participation in other research or education initatives
Support and protect traditional knowledge processes	Participate in Traditional Knowledge Guidelines Workshop	Maintain awareness, gather information and promote Forum Objectives and Research Priorities.	Participate in development of Sahtú Traditional Knowledge Guidelines.	?	
Support regional and regulatory decision-making	Participate in Research Results Workshop for 2014-2015.		Refine Forum Research Priority	Priority list achieved.	Gaps to be analyzed.
Support regional and regulatory decision-making	Present and discuss results of activities related to Objectives 1-3 at regional decision-making forums, including: Sahtú Secretariat Inc. Assembly; Sahtú Dene Council	Promote Forum and seek input to guide research priorities.	Refine Forum Research	?	

	Assembly; ʔehdzo Got'ı̨nę Gots'ę́ Nákedı meeting; Sahtú Partnership meeting; Sahtú Land and Water Board information sessions.				
Support regional and regulatory decision-making	Monitor Sahtu Land and Water Board Public Registry. Monitor changes in environmental legislation.	Stay up to date on Land Use Permit and Water Licence applications and activities and regulatory decision-making processes.	Information will be considered in Forum's activities.	?	
Identify opportunities for: collaborative research involving communities; communication; information-sharing; and cross-cultural interpretation of research results.	Present and discuss results of activities related to Objectives 1-3 at community forums, including ʔehdzo Got'ı̨nę meetings and Land Corporation meetings.	Promote Forum and seek input to guide research priorities.	Refine Forum Research	?	
Identify opportunities for: collaborative research involving communities; communication; information-sharing; and cross-cultural interpretation of research results.	Information Management.	Identify what we know.	Compile list of previous and current research in the Sahtu Region that falls within the Forum's Objective	?	Development of forum website hosted within SRRB website. Website will act both as repository of information, portal to research and on-going communication tool. Forum has also been

					using social media and will build its social media presence.

APPENDIX 5

Sahtú Environmental Research and Monitoring Forum

Terms of Reference

(last revised, April, 2016)

Background

Many environmental research and monitoring programs and projects are underway in the Sahtú Region. During a three-day meeting in November, 2013, representatives of Sahtú organisations, government and industry reached a consensus that such programs and projects should be well coordinated, with strong guidance from Sahtú communities. Community, regional, territorial and federal governments, as well as industry, require research that will target management decisions and support wise, evidence-based decision-making.

As a consequence, Sahtú organizations and the Government of the Northwest Territories (led by the Department of Environment and Natural Resources) agreed to create a Forum that will support research and monitoring proponents and Sahtú organisations in sharing priorities, plans and proposals, providing feedback and guidance, and coordinating objectives and activities. The aim is to more effectively address important issues in the Sahtú.

With climate change effects and potential cumulative impacts from future possible development scenarios, the need for this work is expanding. During a series of meetings in 2015-2016, Forum members agreed current low oil and commodity prices present an opportunity for coordinated planning and communications with the development of a strategic research and monitoring framework in preparation for possible development of the shale oil play in the Tulít'a District as well as other land uses in the region.

As Renewable Resource Councils in each Sahtú community have a special role in research in collaboration with the Sahtú Renewable Resources Board as mandated by the Sahtú Dene and Métis Comprehensive Land Claim Agreement, there is also a need to focus on supporting and resourcing Renewable Resource Councils as well as creating consistent opportunities for their collaboration.

Vision

Environmental monitoring and research programs and projects in the Sahtú are coordinated and conducted in ways that reflect regional and community priorities, engage communities, value both western science and traditional knowledge, and support wise decision-making.

Purpose

The Sahtú Environmental Research and Monitoring (ERM) Forum will take the lead in supporting environmental research and monitoring by providing a venue for discussing plans and accommodating the priorities and traditional knowledge of Sahtú communities.

Objectives

The Forum will address the following objectives in supporting environmental research and monitoring in the Sahtú Region:

- Identify regional priorities and research gaps
- Build cross-cultural understanding
- Respect, support and protect traditional knowledge processes
- Support regional and regulatory decision-making based on evidence from science and traditional knowledge
- Support youth leadership development
- Build local capacity in the Sahtú to collaborate in, coordinate and lead research
- Identify opportunities for: collaborative research involving communities; communication; information-sharing; and cross-cultural interpretation of research results.

Guiding Principles

The Forum is cross-cultural, and our processes are based on the following principles of mutual respect:

- All comments are important
- All members can openly share their opinions
- Decisions are made by consensus.
- Be open-minded/don't judge
- Information is plain language whether in Dene or English language, and shared with communities
- Stay focused on objectives
- Think past, present, and into the future

Forum Structure

The Forum is led by a Chairperson and supported by a Forum Resource Group.

Chairperson:

- The Forum is led by a Chairperson who is appointed by a consensus decision of the group.
- The appointment is reviewed annually.
- The Chairperson works with the Forum Support Group to set meeting agendas, and to facilitate meetings.

Forum Membership:

The Forum consists of representation from each of the five Renewable Resources Councils in

the Sahtú Region; youth representatives from each Sahtú community, the Sahtú Secretariat, the territorial and federal governments, industry, and the Sahtú Renewable Resources Board.

- The majority of the members are Sahtú beneficiaries.
- Alternates are delegated to ensure consistent membership and attendance.
- The Forum may identify additional delegates by consensus to participate as needed.

The membership should include people with a range of qualifications, including:

- Aboriginal harvesters
- Strong communicators
- Expertise in traditional knowledge and science
- Leadership abilities
- Action oriented
- Passionate

Forum Resource Group:

- The Forum Resource Group may consist of staff from the Sahtú Renewable Resources Board, Department of Environment and Natural Resources (ENR) and Industry, Tourism and Investment, Government of Northwest Territories, and the Central Mackenzie Explorers Group (CMEG).
- The Forum Resource Group assists the Chair in planning and organizing Forum activities, recording meeting notes, securing funding, administrating finances and delivering plain language and technical documents and reports.

Roles of Forum Members

Forum members assist in achieving the objectives of the Forum in the following ways:

- Attend meetings or send an alternate.
- Be prepared – read background material before each meeting.
- Review and provide feedback on documents distributed by email.
- Provide guidance to the Forum.
- Report back to communities or organizations.

Forum Activities

The Forum will meet its objectives through activities that will include, but may not be limited to:

1. Development of a five-year Sahtú research and monitoring strategy
2. Consistent updates from researchers with proposed projects or activities in progress
3. Discussions of research license applications under consideration and review by Forum members
4. Assessments of progress on Forum objectives, and updated Terms of Reference.

Meeting Frequency and Procedures

- An in-person meeting at least twice per year.
- A cross-cultural on the land camp once per year.
- At least six additional meetings by teleconference, with a frequencyto be determined according to workload. Teleconference agendas will be circulated at least a week in advance of meetings with notes circulated within a week following the meeting.
- Meeting locations will be determined by consensus of the Forum Membership with consideration of budget constraints.
- Plain language summaries of reports and important documents will be prepared.
- Summary documents will be used by Forum Members as support in their written and verbal communications back to the Organization that they represent.
- As required, representatives of Sahtú-based organisations will caucus by teleconference or in person, in order to develop inputs for consideration by the larger Forum, or to address Sahtú coordination and capacity building that is not directly applicable to other member organisations.

Reimbursement of Meeting Costs

Meeting costs including travel expenses and honoraria for Forum members, as required, will be reimbursed with administrative support from the Sahtu Renewable Resources Board as per the Government of the NWT funding guidelines.

APPENDIX 6

Building Environmental Leadership

2nd Annual Sahtú Cross-Cultural Research Camp
July 4-10, 2015, Sans Sault area, Mackenzie River

Funded by:

Government of the Northwest Territories – Environment and Natural Resources
Government of the Northwest Territories – Education, Culture and Employment
Government of the Northwest Territories – Municipal and Community Affairs
Tides Canada
ConocoPhillips Canada

Prepared by

Shauna Morgan

and the ʔehdzo Got'ı̨nę Gots'ę́ Nákedı (Sahtú Renewable Resources Board)

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Executive Summary

The 2nd Annual Sahtú Cross-Cultural Research Camp was held near the Sans Sault Rapids along the Mackenzie River from July 4-10, 2015, with a total of 38 participants, including local environmental monitors-in-training, traditional knowledge holders, researchers, and members of the Sahtú Environmental Research and Monitoring Forum. It was organized by the Ɂehdzo Got'ıné Gots'é Nákedı (Sahtú Renewable Resources Board, the Board) in collaboration with the Fort Good Hope Ɂehdzo Got'ıné (Renewable Resource Council) and the Sahtú Environmental Research and Monitoring Forum.

This year's camp built on the success of the 2014 Sahtú Cross-Cultural Research Camp held at Taalǝ́ Túé (Stewart Lake). The purpose of the 2015 Camp was to support the completion of the certification process and provide access to job opportunities for Sahtu environmental monitors trained at Tets'ehxe (Drum Lake) in March 2014 and the July 2014 camp. It also aimed to enhance cross-cultural learning and collaboration between community members (elders and youth), researchers, government representatives and monitors-in-training on important research and monitoring questions.

This report includes discussion of the following:

- *Background/Context* – including links with other programs, with a description of the Environmental Monitor Training Program.
- *Description of the Camp* – including objectives, values, a description of Sans Sault and Fa?fa Nilıne (Mountain River), profile of participants and the structure of the camp;
- *Analysis and Results* – analysis of extent to which the camp met its objectives and an overview of research- and monitoring-related activities and discussions;
- *Challenges and Lessons Learned* – reasons for changes to initial plans and unexpected learnings; and
- *Recommendations* – suggestions for future camps and related initiatives as recommended by camp participants and organizers.

Camp participants and organizers offer the following recommendations in order to further environmental research and monitoring in the Sahtú Region:

1. Hold Sahtú Cross-Cultural Research Camps on an annual basis.
2. Further emphasize environmental leadership development and Dene/Metis self-determination.
3. A Dene/Metis person should be the lead or co-facilitator.
4. Seek partnerships with other organizations and agencies (Parks Canada / Délıné Ɂehdzo Got'ıné in 2016).
5. Improve and formalize safety planning protocols.
6. Camp set-up should be partially completed in advance.
7. The camp location should be chosen carefully according to set criteria and a ground-check should be conducted up to a week prior to the camp.
8. Consider shifting the timing of the camp to earlier in the spring or later in the fall.
9. Investigate the feasibility of compiling traditional knowledge of plants into a Sahtu Ethnobotany book, potentially in conjunction with a Sahtu mapping project.
10. In future workshops and training, emphasize the links between environmental research/monitoring and Dene/Metis culture preservation.
11. Continue support for the Sahtú Environmental Research and Monitoring Forum.

Introduction

The 2nd Annual Sahtú Cross-Cultural Research Camp was held near the Sans Sault Rapids along the Mackenzie River from July 4-10, 2015, with a total of 38 participants (including 28 Sahtu Dene/Metis participants). It was organized by the ʔehdzo Got'ı̨nę Gots'ę́ Nákedı (Sahtú Renewable Resources Board, the Board) in collaboration with the Fort Good Hope ʔehdzo Got'ı̨nę (Renewable Resource Council), as well as with members of the Sahtú Environmental Research and Monitoring Forum, which includes representatives from each of the Sahtú communities, including youth.

The camp built on the success of the 2014 Sahtú Cross-Cultural Research Camp held at Taalǝ Túé (Stewart Lake). Both camps have been focused on supporting the advancement of Sahtu environmental monitors-in-training, including the eleven monitors who participated in the March 2014 BEAHR monitor training course at Tets'ehxe (Drum Lake). The camps have provided opportunities for monitors-in-training to: learn and solidify their required skills (including sampling methods and GPS), log time towards their required 1800 hours, learn Dene/Metis approaches to monitoring the land from traditional knowledge experts, and build relationships with researchers in order to gain access to employment opportunities.

More broadly, the camps have served to enhance cross-cultural learning and collaboration between community members (elders and youth), researchers, government representatives and monitors-in-training on important research and monitoring questions. The camps have also provided opportunities for the development of Sahtu Dene/Metis leadership—particularly during times of difficult weather and adversity, local participants have stepped up and offered valuable direction as on-the-land experts and teachers. Sahtu Dene/Metis organizations and individuals have also been involved as co-organizers and strengthened their understanding of scientific research/monitoring methods and regulatory processes, which will help them to assert greater control over the management of land and resources in their territory. Environmental leadership and self-determination are areas that participants have recommended receive greater focus in future initiatives.

Structure of this Report

This report contains six sections:

- *Background/Context* – including links with other programs, with a description of the Environmental Monitor Training Program.
- *Description of the Camp* – including objectives, values, a description of Sans Sault and Fa?fa Nilı̨ne (Mountain River), profile of participants and the structure of the camp;
- *Analysis and Results* – analysis of extent to which the camp met its objectives and an overview of research- and monitoring-related activities and discussions;
- *Challenges and Lessons Learned* – reasons for changes to initial plans and unexpected learnings;
- *Recommendations* – suggestions for future camps and related initiatives as recommended by camp participants and organizers; and

- *Conclusions*.

Throughout the report, quotes from Camp participants have been included in order to share their perspectives in their own words. These statements were all gathered with an audio-recorder during Camp sessions throughout the week.

Background and Context

Background

In the Sahtú Dene and Métis Comprehensive Land Claim Agreement, the Ɂehdzo Got'ıę Gots'ę́ Nákedı (Sahtú Renewable Resources Board) is tasked with a significant responsibility to support both environmental education and the development of a land-based economy for present and future generations, including environmental research and monitoring.

Last year the Board took a lead role in organizing the first Sahtú Cross-Cultural Research Camp, held at Taalɵ Túé (Stewart Lake) from July 12-19, 2014. Funded primarily by the Environmental Studies Research Fund (ESRF)[1] and the Government of the Northwest Territories (GNWT), the purpose of the 2014 camp was to provide a forum for Dene/Métis knowledge holders and scientists to learn about each other's research questions and ways of learning about and monitoring wildlife, habitat, harvesting and water. The camp was the first of its kind to be held in the Sahtú Region and was considered by participants and organizers to be a tremendous success.[2]

The first Sahtú regional on-the-land BEAHR (Building Environmental Aboriginal Human Resources) Environmental Monitor Training course was held at Tets'ehxe (Drum Lake) from March 14-29, 2014.[3] Eleven trainees from all five Sahtú communities participated, and six of these trainees later participated in the 2014 Cross-Cultural Camp to expand their training in both scientific and traditional knowledge research and monitoring methods and in summer season sampling. Another group of six trainees from the Drum Lake course participated in the 2015 Cross-Cultural Camp at Sans Sault. Three Sahtu trainees in total have participated in all three monitoring training opportunities in the Sahtu Region (the Drum Lake course, the 2014 camp and the 2015 camp). Another four trainees at the 2015 camp had previously participated in BEAHR training outside the Sahtu region.

The 2014 camp was designed in response to considerable concern from local community members about shale oil exploration, which was ramping up at the time. The focus of camp

[1]

[2] A photo-voice presentation about this 2014 camp at Taalɵ Túé can be found at the Board's website at: http://srrb.nt.ca/index.php?option=com_content&view=article&id=292:cross-cultural-research-camp&catid=9:uncategorised&Itemid=689.

[3] Sponsors and supporters of the March 2014 Drum Lake Environmental Monitor Training course included: Aurora College, Sahtú Secretariat Inc. ASETS (Aboriginal Skills and Employment Training Strategy), NWT Education, Culture and Employment, NWT Industry, Tourism and Investment, and ConocoPhillips Canada.

programming was learning how to monitor baseline and ongoing effects from industry. In 2015, the context was a recent withdrawal of all shale oil and gas exploration companies from the region, for an unknown period of time. At this year's camp, the main questions driving discussion were: "What else, besides oil and gas, could Sahtu people base the regional economy on? How could Sahtu people make a living being on the land, by gaining environmental science and monitoring skills?"

Unemployment is a major problem in the Sahtú Region, particularly amongst the younger population. In 2012, 39% of Sahtú residents were aged 24 and under. Across the region in 2009, 50.2% of Aboriginal people in the workforce were unemployed (compared to only 16.9% of non-Aboriginal people).

The Board's research on building a mixed regional economy[4] suggests that involvement in traditional or other land-based economy activities in combination with wage labour can mitigate the tendency of spikes in addictions during the expansion of the wage/industrial economy, reducing anomy, cultural dislocation, and social disintegration. It can also create more stability during the 'bust' periods of an extractive industries-based economy, which generally follows a 'boom and bust' pattern. Regional socio-cultural health and well-being and the long term sustainability of the Sahtú economy requires that the land-based/traditional economy remain vital. Moreover, involvement in environmental research and monitoring increases local awareness of and ability to monitor environmental and wildlife conditions and increases local people's ability to participate meaningfully in resource management decision-making, as intended by the land claim.

While the 2014 camp was planned in collaboration with several Sahtu community members, including representatives of the Environmental Research and Monitoring Forum (see below for details), the 2015 Sahtú Cross-Cultural Research Camp was designed and implemented in more formal collaboration with the Fort Good Hope ʔehdzo Got'ı̨nę (Renewable Resource Council). Members of the Sahtú Environmental Research and Monitoring Forum continued to play an advisory role.

Links with other programs

The Sahtú Environmental Research and Monitoring Forum was formed out of a workshop convened in Tulit'a in November 2013 by the Board, with the aim of ensuring better regional coordination and control over environmental research and monitoring. The Forum, which has been meeting regularly since its formation, includes representatives from Sahtú community organizations and youth (forming the majority), government and industry. The vision of the Forum is: "Environmental monitoring and research programs and projects in the Sahtú are coordinated and conducted in ways that reflect regional and community priorities, engage communities, value both western science and traditional knowledge, and support wise decision-making." [5] Forum members participated collaboratively in the design and

[4]

[5] Sahtú Environmental Research and Monitoring Forum, http://srrb.nt.ca/index.php?option=com_content&view=article&id=270&Itemid=843.

organization of both the 2014 and 2015 Camps. All Forum members were invited to participate in the Camp, and three attended in 2015.

In keeping with the vision of the Forum, the Camp was designed to create synergies with and build upon other programs underway in the region.

Two Research Results workshops have been held in the Sahtú Region, in November 2013 and January 2015, hosted by the Board. These were opportunities for researchers to explain what they are working on and why, and to gather input and feedback from Sahtú community members. Rather than being one-off consultation sessions, these workshops are intended to provide recurring opportunities for community members to build and sustain relationships and more effectively communicate with researchers face-to-face. Several researchers who attended the Research Results workshops also attended the 2014 and/or 2015 camps. The relationship-building process was greatly enhanced by the intense experience of living and working together in an on-the-land setting.

The Board has been working over the past several years with the Renewable Resource Councils (RRCs) and industry to develop an Environmental and Traditional Knowledge (TK) Monitoring Framework in order to address critical needs identified during shale oil exploration. Currently, a lack of standards and clear expectations in traditional knowledge research and monitoring protocols has led to difficulties in assessing industry applications and plans. Development of consensus around appropriate standards and protocols will form a better basis for knowledge-based development planning. Experiences and input gained from both the 2014 and 2015 camps will feed into the Monitoring Framework and TK Guidelines.[6]

The Board has also been working with the RRCs and Sahtú youth and elders to undertake regional action planning on health impacts of climate change, building on a series of previous Health Canada-funded, youth-led projects in Tulít'a, Délı̨nę and Fort Good Hope. Key components of the program are experiential trips out on the land, youth engagement with elders, and the development of a website and video-based communications materials. As part of this initiative, the Board supported the establishment of a Sahtú Youth Network, which provides a venue for youth from all five Sahtú communities to support each other in the pursuit of further knowledge, training and employment in environmental research and monitoring fields. The Camp provided an ideal venue for on-the-land observations, including the collection of video footage with GoPros. It also provided the opportunity for discussions about climate change to be held inside a wall tent or around a campfire, bringing together Sahtu youth and elders in an intimate setting relevant to the topic at hand. Facilitated youth caucus discussions at the Camp also furthered the action planning component and strengthened ties between Sahtu Youth Network members who rarely have the opportunity to meet face-to-face.

[6] See http://srrb.nt.ca/index.php?option=com_content&view=article&id=273&Itemid=842 and http://srrb.nt.ca/index.php?option=com_content&view=article&id=274&Itemid=856 for more details on these programs.

Environmental Monitor Training Program / Building Environmental Aboriginal Human Resources (BEAHR)

The Environmental Monitor Training Program (EMTP) is designed to help environmental monitors develop the skills to meaningfully assist environmental professionals in field-based settings, and serve as a foundation from which to build a career in the environmental sector. The EMTP curriculum is based on the National Occupational Standards for Environmental Monitors in the NWT.

The curriculum includes learning techniques for: water quality grab sampling, completing detailed field notes, utilizing GPS and digital cameras in the documentation process, following protocols, snow/ice depth measurements, use and layout of transects in sampling, wildlife survey, and the collection/documentation of local and traditional knowledge. In order to become certified environmental monitors, students must not only attend an intensive training course (such as the course held at Drum Lake in March 2014) but acquire 1800 work hours and complete a skills checklist approved by an employer or supervisor. The program recognizes the important for monitors to be trained in both scientific and traditional ways of knowing and monitoring the land. Hours spent on the land harvesting and working on traditional pursuits can be counted towards the required 1800 hours. The monitors-in-training could also count attendance at the Camp towards their required hours, and were able to have Camp organizers approve some of the skills they are required to demonstrate.

The training program is part of the Building Environmental Aboriginal Human Resources (BEAHR) initiative,[7] a joint initiative between ECO Canada (formerly CCHREI) and the Aboriginal Human Resources Development Council of Canada (AHRDCC) and funded by Human Resources and Skills Development Canada (HRSDC).

> *It's so confusing talking about this stuff. This week I was asking for the BEAHR monitoring students who want to become certified and some of the communities were trying to send bear monitors. I don't need bear monitors. Well, I probably do because there are bears, but people with guns aren't actually my concern. I want students who want to become professional monitors. When you are a monitoring professional and you've proven it, it gives a lot more weight behind your words, which is very useful. It teaches you how to communicate better, how to document things better, which is another way to strengthen your argument. It helps make a better case for whatever you're concerned about.*
>
> --Joe Hanlon, Board program coordinator and Camp co-organizer

> *When I become a professional, maybe someone will listen to me.*
>
> --Fred Vital, Camp participant and monitor-in-training

[7] See www.beahr.com.

Description of the Camp

Objectives

> *My name is Fred Vital from Déline. I like being outdoors like this. Most of the time I have worked for oil and gas companies and the mines. Thinking about it for the past couple of days, monitoring is something I would like to do more, working for the people in the Sahtu, and on Great Bear Lake. It's for the community and that's for us. What if the mines shut down? Monitoring is something I like, especially doing that in my backyard, along with hunting, fishing, and taking care of the water.*
>
> Fred Vital, Camp participant and monitor-in-training

The Sahtú Cross-Cultural Research Camp was designed and implemented in collaboration with the Fort Good Hope Ɂehdzo Got'ı̨nę (Renewable Resource Council), as well as with members of the Sahtú Environmental Research and Monitoring Forum, which includes representatives from each of the Sahtú communities, including youth. The agreed-upon objectives of the 2015 Camp were:

- Support the completion of the certification process for the 11 environmental monitors who participated in the March 2014 BEAHR monitor training course at Tets'ehxe (Drum Lake);
- Build and sustain personal relationships and connections between researchers and industry representatives from outside the region and Sahtú environmental monitors and community members, in order to facilitate access to employment opportunities and greater local involvement in environmental research and monitoring projects;
- Provide opportunities for cross-cultural learning and engagement on important research and monitoring questions associated with socio-ecological change, in order to build a more collaborative relationship between researchers and community members;
- Train young people to be cross-cultural brokers on environmental research and monitoring / resource management issues, helping to bridge understanding between scientists and resource managers and local community members; and
- Ensure appropriate understanding and engagement in research by residents of the Sahtú Region, including training in scientific and traditional knowledge research methods.

Expected benefits of the 2015 camp included:

- Sahtú participants will have greater employability in the environmental research and monitoring field;
- Sahtú participants will have greater confidence and connections to help them access employment or more advanced training in the environmental research and monitoring field;
- Sahtú participants will gain transferable skills to help them pursue opportunities in various aspects of the land-based/traditional economy;

- Sahtú participants will experience a greater sense of understanding and ownership over resource management decision-making in their region, contributing to the objectives of the land claim;
- Researchers and industry representatives will have greater success in recruiting field staff from a pool of trained community-based monitors; and
- Researchers and industry representatives will have a unique opportunity to understand and engage in interdisciplinary and cross-cultural research approaches.

An analysis of the extent to which the objectives were met is found in the fourth section below.

Values basis: relationship-building, power-sharing and indigenous self-governance

The camp objectives are rooted in the premise that relationship-building, power-sharing and indigenous self-governance are fundamental and necessary to the practice of monitoring and research in the Sahtu Region, rather than a 'bonus' or simply a political consideration. This principle is grounded in established research and in the experience of the Board, including the experience of the 2014 Sahtu Cross-Cultural Camp.

A case study of biological research on geese populations with Yup'ik communities in Alaska effectively illustrates the lesson that the relationships established between researchers and community members are just as important as the data being gathered, and to some extent determine.

> "Elders articulated a fundamental conflict between the Yup'ik view of geese as nonhuman persons and the non-Native view of geese as manageable wildlife, and they expressed deep resentment toward the nonlocal control that researchers and wildlife managers represent. Many feel that local control of their land and their lives is more in jeopardy than the geese. Moreover, respect for elders is as important as respect for animals in affecting management processes at the community level, creating potential conflict which younger Yup'ik men and women with training in biology find difficult to resolve. …Some biologists recognize that to gain general acceptance, work in southwestern Alaska must be founded on personal relations. Although discussions with the [joint Waterfowl Conservation Committee] can lay the groundwork for these relations, they are no substitute for biologists' establishing and maintaining direct contact with village councils and individuals in the communities in their study areas. If biologists want to change attitudes toward their work in the delta, they must start at the village level, building trust and respect from the inside out rather than from the outside in." [8]

At the 2014 camp, John Tobac, one of the Sahtu environmental monitors-in-training, voiced a similar sentiment to that of the Yup'ik elders:

[8] Ann Fienup-Riordan (1999), "Yaqulget qaillun pilartat (what the birds do): Yup'ik Eskimo understanding of geese and those who study them," *Arctic* 52(1):1 and 18.

Sometimes in Fort Good Hope, we get researchers in to do what they have to do. I can't always see the positive side of it. I always question them: 'Why do you do this? Why are you bothering things?'

Throughout the Camp, John urged facilitators to allow more time for personal relationship-building, and urged scientists to share their personal stories rather than just their professional histories and mandates. John's suggestions were followed both in the 2014 and 2015 Camps, and the learning environment became much richer.

Scholar and practitioner Paul Nadasdy contends that unequal and unexamined power relations are the main reason why, after so much talk and effort to integrate traditional ecological knowledge (TEK) and western science, there has been so little success. Many official accounts tend to blame technical or methodological difficulties in reconciling two different worldviews. However, Nadasdy found that, in informal conversation, both indigenous and non-indigenous practitioners usually point to power struggles and hidden agendas. He advocates for a shift in power relations, so that communities are driving decision-making processes, and scientists are acting as resources to them. Instead of viewing resource co-management as a technical process of 'integrating' both indigenous and scientific ways of knowing, we need to recognize it as a politically difficult task of cross-cultural negotiation and power-sharing.[9]

The active participation of everyone—including facilitators and researchers—in all Camp learning activities and chores helped to lessen the power imbalances generally found between researchers and students or subjects of research.[10]

Indigenous self-governance has been an important guiding principle of both the 2014 and 2015 camps, particularly given the recent ratification of the Déline Self-Government Agreement and ongoing self-government negotiations by other Sahtu communities. McGregor, Bayha and Simmons (2010) contrast conventional "TK research" with "Indigenous governance research":

> "[Rather than] a static compilation of documented 'traditional knowledge' compiled through social scientific procedures, [indigenous governance research] is the deliberate process of addressing questions and problems using Indigenous methods of learning the meaning of stories and renewing the stories through land-based practices that clearly reveal the nature of leadership and the basis for new decisions that need to be made."[11]

The camps have contributed to strengthening regional self-governance by building environmental leadership skills and confidence in Sahtu young people, through co-

[9] Paul Nadasdy, (1999), "The politics of TEK: Power and the "integration" of knowledge," *Arctic Anthropology*, 36(1-2): 15.

[10] McGregor, Bayha and Simmons (2010) noted that the active participation of facilitators in the talking circle process "alleviated the power imbalances often found between researchers and the researched." (110)

[11] "Our Responsibility to Keep the Land Alive: Voices of Northern Indigenous Researchers", 111.

organization with the ʔehdzo Got'ıné, and by connecting Sahtu residents with resource people and information that will help them make better decisions about land, water, and resources.

Participants

A total of 38 people participated in the Camp. The aim was to ensure that more than half of the participants were Sahtú Dene/Métis, and this was achieved with a total of 28 Sahtu Dene/Métis people participating, from all five Sahtú communities.

Camp participants included the following:

- Traditional knowledge holders familiar with the area of the camp (4)
- Sahtú Environmental Research and Monitoring (ERM) Forum members (3)
- Researchers involved in research and monitoring in the Sahtu Region (8)
- Students en route to certification in the BEAHR Environmental Monitor training program (10)
- Additional youth participants (1)
- Facilitation team, including two Sahtú Dene language specialists / interpreters (4)
- Camp staff: cooks, camp attendant, coordinator, administrator (6)

A complete list of participants is found in Appendix A.

The environmental monitors-in-training had been previously chosen through a stringent selection process, which was carried out by a committee from the Aurora College Campus in Norman Wells. Many of the students had previous on-the-land experience and knowledge to share, and several had worked within the oil and gas industry or as heavy equipment operators.[12]

The setting: Sans Sault Rapids

> *This place was really important a long time ago. It still is today. This used to be a big gathering place in the fall time and in the summer because everybody used to go up Carcajou River to hunt moose.*
>
> -Joe Orlias, elder and Camp participant, as translated by Dora Grandjambe

> *Since I was a child I have travelled by the river, by moose skin boat and by rat canoe. Water means a lot to us. It connects us all along the Mackenzie River.*
>
> --Leon Andrew, Sahtu language specialist and interpreter

The 2015 camp was held along the shore of the Deh Cho (Mackenzie River) near Sans Sault Rapids, within the K'asho Got'ine District (approximately __ kilometres south of Fort Good Hope). The campsite was located near the mouth of the Carcajou and Mountain Rivers. This

[12] Genevieve Cote and Adam Bathe, *Environmental Monitor Training Program: Tets'ehxe (Drum Lake), Sahtu; March 14th – March 29th 2014*; 2.

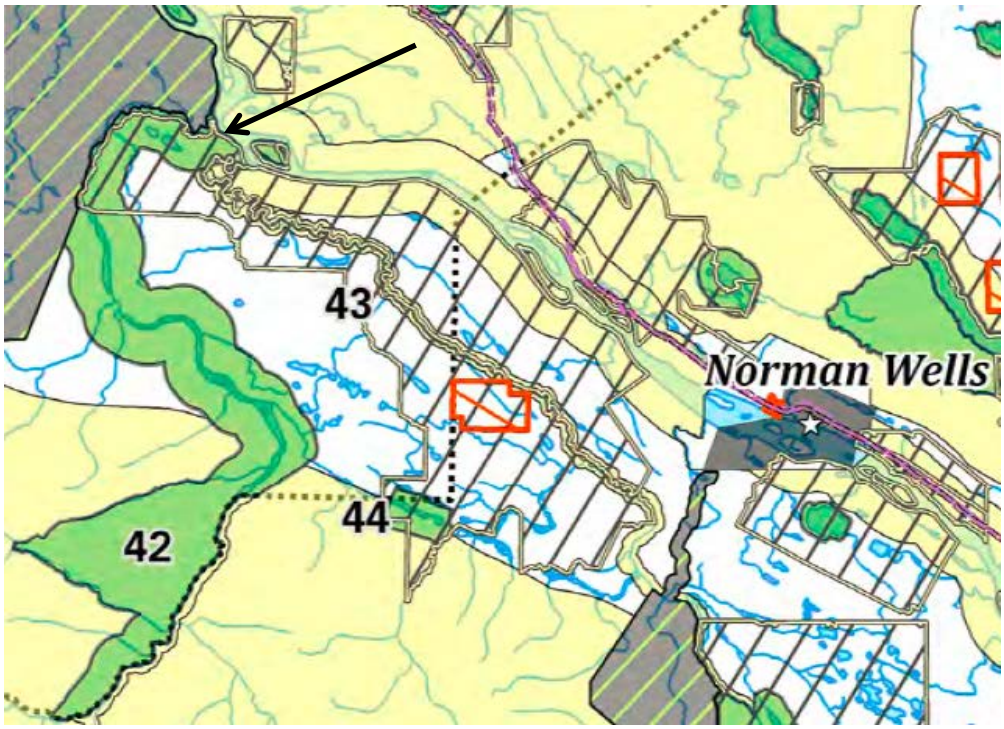
site for the camp was chosen by the Fort Good Hope ʔehdzo Got'ı̨nę because of its traditional role as a gathering place and gateway to harvesting areas (up the rivers), its accessibility by boat for several Sahtu communities, the availability of flat, clear space for a large group to camp, its proximity to streams suitable for aquatic sampling, and the history of oil and gas exploration in the immediate area in the 1980s (see below). The ʔehdzo Got'ı̨nę also requested that aquatic sampling be conducted in the area due to concern about upstream effects on the Carcajou River from shale oil exploration, including exploratory horizontal hydraulic fracturing, that has occurred across from Norman Wells between 2011 and early 2015.

During the camp, elder participants frequently shared stories about the history and importance of the Sans Sault area:

> *Lawrence Jackson's great grandmother was among the ones that came over the mountains from Stewart Crossing. There was Peter Mountain, my grandfather Heroki Masuzumi. They all came over from Mayo over the mountain. There were a lot of people. Then when the Hudson Bay Company was here, people couldn't buy as much as they wanted because the company had total control. So when people brought in their furs, they were only allowed to buy one pound of loose tea, or three pounds of sugar, or five or ten pounds of flour. So what people from Fort Good Hope used to do was go over to the Yukon, because at the time there was the Gold Rush. There was no restriction on anything. If you wanted to buy 100 pounds of flour, you bought 100 pounds of flour. They would go for months. They would go by dog team and then they would camp. They would make dry meat, stay so long in one place and then they would keep going until they would get over there. Then they would stay in the Yukon for a while, say in Mayo, and visit. They would get all of their supplies, as much as they needed and wanted, and then they would travel back over. It was about a month coming back.*
>
> --Dora Grandjambe, Sahtu language specialist and interpreter

> *There's a lot of history in this area. The families from Good Hope came through the mountains and down the river. They came down in moose skin boats to this area. A lot of them still reside in Good Hope, like Peter Mountain. There's a lot of history here. We do a lot of hunting on both sides of the river every year. We still come down in the fall time to this area. It is an important place, I would say.*
>
> -Lawrence Jackson, Camp participant and environmental monitor-in-training

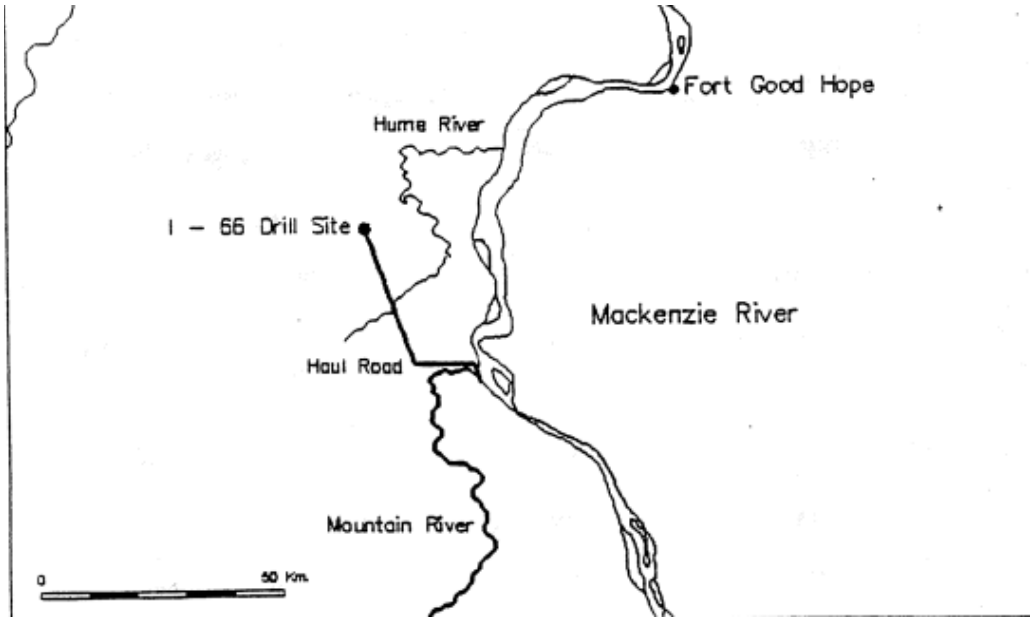
The Sahtu Land Use Plan (April 2013) designates Fa?fa Nilı̨ne (Mountain River) as Conservation Zone 42 (see map below). A five kilometre buffer is applied to the river from the Mackenzie Mountains all the way to its mouth on the Mackenzie River, near the site of the camp.



The following is an excerpt from p.143 of the 2013 Sahtú Land Use Plan:

> "**Reason for Establishment**
> The Mountain River was a traditional trail used by the Mountain Dene of Fort Good Hope. There are many named places, camping, hunting, fishing locations and stories associated with the river. It continues to be an important moose hunting area and is known as the shortest route to the highest mountains and sheep hunting areas.
>
> **Values to be Protected**: Archaeological, burial, cultural and historic sites.
>
> **Values to be Respected**: Moose use the tributary rivers and riparian areas along Mackenzie River. Harvesters say that in January, cold temperatures and deep snow cause moose to congregate along the major river valleys. Ice and flood action in fast-flowing river drainages keeps vegetation in an early successional stage, providing important food species such as willow and alder for moose in the winter time."

From 1987-1990, the area west of Sans Sault Rapids was the site of hydrocarbon exploration involving a joint venture between Chevron Canada Resources and the community of Fort Good Hope. Four exploratory wells were drilled and capped to the northwest of Sans Sault (see map below). A staging area, main camp, barge landing area, and airstrip was built at the mouth of the Mountain River. A haul road was built along existing cutlines from the mouth of the Mountain River to provide access to the drilling rigs.



Map sourced from: http://www.enr.gov.nt.ca/sites/default/files/43_manuscript.pdf (Paul Latour, 1992)

Several of the camp participants shared their experiences at the site as workers either with the oil and gas exploration camp or with government surveyors, and reflected on how that experience mixed with their traditional knowledge of the area and their desire for more environmental monitoring:

> *That's how we chose this place for the camp, from when it was the Chevron site. Back in the '80s, a few of us drove all the way back there, through the Carcajou. We have a well back there; it's not too far from where we pick berries. We did five wells at the time. There has been a lot of oil activity in there. We wanted to see if we could get some water samples, so that's one of the reasons we picked this area for this course.*
>
> --Lawrence Jackson, Camp participant and monitor-in-training

> *This is just like home for me. When I was eighteen years old I did a lot of work here with the government people. They did a surveying study on the rapids, three summers and three winters I worked here. I used to climb that hill and look at all the hills here. It makes me feel like I am right back home again. Thank you. I am glad to be here.*
>
> --Jimmy Dillon, Déline elder and Camp participant

Camp structure and format

> *Coming up here, I feel really good because when you go back on the land for a while it gives you healing. You feel really good with all that fresh air you breathe in. It cleans all your organs and makes you feel really good. It's really good to be out here, part of this workshop.*
>
> --Frederick Andrew, Tulit'a elder and Camp participant

I know one of the wonderful things about being on the land is being free to do what you want to do, and to do it your way. I hope that people felt free this week to do your thing. But I know we have also been encouraging or asking you to do the things we have on the agenda, like meetings that were scheduled. We are still trying to find that balance of having a schedule with formal activities, and just letting people feel free.

--Shauna Morgan, Camp facilitator

The camp was guided by a primary facilitator and a youth facilitator, in collaboration with two Dene language specialists and an organizing team from the Board and the ʔehdzo Got'ıne. While most participants attended the entire Camp, a few of the researchers could not afford to spend the entire week away from the office or their families. A boat shuttle in and out of Norman Wells was arranged for the Tuesday evening mid-way through the week, to take two of the researchers out and bring in two more. Another four researchers benefited from participating in the entire Camp experience. The Camp schedule was adjusted to reflect the specialties and projects of the researchers present.

Camp set-up was undertaken by all participants together under difficult conditions—thunder and rainstorms for the first two days—and involved collective problem-solving, informal leadership, and general deference to the expertise of Dene/Métis participants. Set-up tasks included: cutting poles for the kitchen tents, meeting tents, and personal wall tents (which some of the participants slept in); tying and securing all tents; erecting additional tarps; unpacking supplies and setting up the kitchen area; cutting and hauling firewood for cooking and staying warm; and collecting and laying down willows and spruce boughs as a 'floor' for the elders' tents and kitchen area. Many of these tasks continued in the form of ongoing chores to maintain the camp and gradually make the space more comfortable, which was an important enhancement to the learning environment and a lesson in Dene/Métis ways of being on the land.

While the Dene hosts chose not to hold an opening Feeding the Fire ceremony, visitors to the area were asked by Fort Good Hope elders to participate in an alternate ritual upon arrival, to show respect to the land, the river and its people. Visitors were shown how to cut a willow branch, clean off all the bark off with your teeth until the willow is white, and then feed it to the river (the Deh Cho).

While a tentative schedule was prepared ahead of time (based on learnings from the 2014 camp and advice from collaborating organizations and researchers), many adjustments and rearrangements were made based on weather conditions, challenges encountered, and the energy levels and ongoing advice of participants. Both the planned schedule and the actual Camp schedule are found in Appendix B.

Each day at camp included many kinds of learning that allow for the sharing of both scientific and traditional ways of knowing and doing things: doing chores together (including harvesting and processing food), eating together, sharing stories, holding meetings to discuss ongoing research in the region, conducting fieldwork to collect environmental data, learning monitoring techniques, going for walks to observe plants and animal tracks, and having fun together.

The daily rhythm that seemed to work best involved holding an opening prayer and talking circle after breakfast, followed by a short meeting to get organized, and then splitting up to tackle various chores for the remainder of the morning. Chores included: going in the boat to collect water from the creek; cutting and hauling of firewood; chopping firewood; regular fixing of tents (both meeting tents and elders' tents) that kept blowing over in the strong winds; and gathering spruce boughs and willows to refresh tent floors. These 'home-making' tasks would usually last until lunch, after which there would often be a short meeting and then the group would split up to conduct environmental fieldwork and hands-on learning throughout the afternoon (discussed below in more detail). The schedule was rearranged frequently in an attempt to avoid going out in the boats during the windiest times (either for fieldwork or chores), and to accommodate requests of participants. For example, upon request from elders we held an ad-hoc discussion about climate change observations and research in the region.

Participants expressed appreciation for having built-in flexibility in the agenda and schedule. It also worked well to have a mixture of hands-on fieldwork types of activity options and discussion types of activities available as back-up, since windy weather would sometimes force the group to stay in camp and elders in particular would tire of walking and prefer to stay in camp at times.

On several evenings, groups of harvesters went out until the early hours of the morning looking for moose and caribou up the nearby Carcajou and Mountain Rivers. While they met with limited success, another group from Fort Good Hope harvested a couple of moose nearby and shared some of their harvest with camp participants, which was much appreciated. We took the opportunity to practice wildlife health sampling kit procedures with the carcass and practised cleaning the animal and preparing dry-meat.

While fish nets were set and checked several times (usually as part of water-hauling expeditions), the catch was disappointing, so there was much less time spent cleaning and preparing dry-fish than during the 2014 camp.

Elder and Youth Caucuses

While one focus of the Camp was inter-generational learning, participants also appreciated meeting separately at times, in elder and youth caucuses. Over the past several years both in workshops and during the 2014 camp, the Board has found caucuses to be a useful way to encourage youth to speak more freely and produce recommendations they can take ownership of, while allowing elders to converse more comfortably in their first language without the constant interruption of an interpreter.

The youth used their caucus time to discuss environmental monitoring certification requirements as well as to further the work of the Sahtu Youth Network (SYN). The SYN has been focused since its inception on action planning for health and climate change adaptation, as well as on identifying educational opportunities and career paths for Sahtu youth to consider in the context of the region's mixed economy. Elders used their caucus time to share stories and to brainstorm about how they could best guide the Camp activities and guide the Dene youth.

Analysis and Results

Evaluation of measures of success

The following measures of success were identified prior to the camp and are evaluated here in terms of the extent to which they were achieved:

- Number of camp participants; at least half of the participants should be Sahtú Dene/Métis beneficiaries;
    - 38 people participated in the Camp; 28 (74%) were Sahtu Dene/Métis participants, from all five Sahtú communities.
- Number of Sahtú monitors-in-training who attend the camp;
    - 11 Sahtú monitors-in-training were in attendance; all but one (10) had previously completed the BEAHR course work
- Extent to which the monitors complete the Environmental Monitor certification;
    - The monitors-in-training counted learning hours spent at the camp towards their required 1800 hours and progressed on their skill checklists;
    - During the camp, the Board program coordinator (Joe Hanlon) interviewed each of the monitors-in-training to assess their progress, and two (2) were thought to be ready to take the certification test;
    - Others still need to log more work/practical hours and/or need to obtain certifications such as WHMIS, first aid, CPR, gun license
- Level of participation by ERM Forum members and community-based organizations in the planning and implementation of the Camp;
    - ERM Forum members participated in camp planning and contributed feedback and suggestions via at least three conference calls in the months leading up to the camp;
    - Three ERM Forum members attended the entire camp;
    - The camp was designed and implemented in collaboration with the Fort Good Hope Ɂehdzo Got'ı̨nę (Renewable Resource Council) through both in-person and skype meetings with Board staff and the camp facilitator. The Ɂehdzo Got'ı̨nę took a lead role in selection of the camp site, deciding the number and type of participants, advising on logistics and contributing equipment.
    - A camp coordinator based in Fort Good Hope was hired for a week to make logistical arrangements, coordinate the camp staff team (cooks and camp attendant), and coordinate the procurement and transportation of equipment and supplies.
- Number of camp participants who obtain employment (eg. as field assistants or environmental monitors) or pursue more advanced education in the field;
    - Two of the monitors-in-training were hired later in the summer of 2015 by the Cumulative Impact Monitoring Program's aquatic health monitoring project (led by Krista Chin) as field assistants.
    - ??

- Qualitative evaluation by camp participants – both oral and written reflections during and after the camp.
    - When asked to reflect about the camp at talking circles held during the camp, participants stated that they were thoroughly enjoying themselves and learning many useful skills. Some recommended changes or additions to programming, which was incorporated to the extent possible. Recommendations for future years are discussed below in the final section of this report.
    - Immediately after the camp, the facilitator spent a week in Fort Good Hope and conducted phone or in-person interviews with each of the researchers who attended the camp, the local coordinator, other camp staff, as well as several of the Good Hope-based participants. The overall feedback was that the camp was a positive and worthwhile experience. Comments and recommendations are incorporated below.
- Number of youth; gender breakdown
    - Eleven (11) of the camp participants (including camp staff) were Sahtu youth between the ages of 18 and 35;
    - Three of the eleven Sahtu youth participants were young women.

Training for Work in the Environmental Research and Monitoring Field

> *On Great Bear Lake, I think we need somebody monitoring out there all the time. Something could be happening right around the corner; people are flying with their planes all the time. Nowadays game wardens are just in their office. They are not on the land as they used to be. We need full-time monitors, at least in the summertime, on Great Bear Lake. There are issues like that, and I am glad I brought it up.*
>
> --Fred Vital, camp participant and monitor-in-training from Déline

The monitors-in-training met several times over the course of the camp to discuss the environmental monitoring certification process and prospects for obtaining employment and further training in the field.

SRRB Program Coordinator Joe Hanlon reviewed with the group of monitors-in-training: certification requirements, required practical skills, required hours and how they can be obtained, how the testing will work, how to get registered with GNWT-ECE, and how the Board can help at each step along the way. Joe also met with each of the monitors-in-training individually to help each one figure out how far along they may be within the certification process and what skills and/or hours they may still require. Joe offered to fax or scan to each monitor-in-training an application form for occupational certification, and to send a hard copy of coursebook materials to each community.

The monitor caucus discussed what it means to be a professional and brainstormed the following points:

- to know what you're doing
- to be your own boss

- to be taken seriously
- to have good communication skills – eg. documenting evidence, making a case

The monitors asked several questions about the Natural Resources Training Program (NRTP) program based in Fort Smith, including requirements to get in (eg. upgrading necessary), and how this additional training could enhance a career in environmental research and monitoring.

There was also considerable discussion amongst the larger group about the status of oil and gas projects and applications in the Sahtu region and associated monitoring programs, including Imperial Oil's reclamation and monitoring programs in Norman Wells. Amongst camp participants were Sahtu Land and Water Board regulatory officer Bonnie Bergsma and GNWT-ENR Regional Manager Heather Sayine-Crawford, who were able to share information and updates with the group.

The scientists and researchers who attended the camp promised to keep in touch with the Sahtú monitors-in-training, to help them access job opportunities as fieldwork assistants and to help guide them as they pursue further education. Two monitors from Tulít'a were hired later in the summer of 2015 by the Cumulative Impact Monitoring Program's aquatic health monitoring project (led by Krista Chin) as field assistants. Their main tasks were the collection and sorting of benthic invertebrates.

Overview of research- and monitoring-related activities and discussions

Activities at the camp contributed to a wide variety of types of research and monitoring in the Sahtu Region, and involved both hands-on learning and discussions. The research and monitoring-related activities conducted at the Camp can be categorized as one of five types:

- Baseline data that can be filed and used in the future to compare trends across space and time (eg. CABIN monitoring data, small mammal trapping and insect biodiversity monitoring);
- Preliminary collaborative work to gauge local interest in pursuing future research and monitoring programs and/or test technical feasibility (eg. community mapping projects, human biomonitoring, remote sensing to assess linear disturbances (drone), theatre-based cultural exchange);
- Skill-building practice to strengthen community-researcher relations and enhance ongoing research programs (recording wildlife tracks observed along beach);
- Discussion and sharing of traditional knowledge to enhance existing research (eg. health and climate change adaptation action planning, barrenground caribou research); and
- Experiential learning leading to potential research questions (eg. harvesting, moose health sampling kit, berry-picking, plant observation walks).

These activities are described briefly below; more detailed descriptions of the research projects are included in Appendices C to H.

Baseline data collection

One of the objectives of the camp was the collection of environmental baseline information, given that it is located in an area of historical and potential future oil and gas exploration, and its location downstream of both recent shale oil exploration and the Imperial Oil operation and reclamation in Norman Wells. While only limited data could be collected during the camp, and no definitive conclusions can be reached based on that data alone, it will contribute to larger projects that may begin to shed light on the health of wildlife and aquatic systems in the region.

CABIN aquatic health monitoring

(See Appendix C for more details)

The Cumulative Impact Monitoring Program, a program of the Government of the Northwest Territories-ENR, initiated a five-year aquatic health monitoring project in the Sahtu Region in 2012, based on the Canadian Aquatic Biomonitoring Network (CABIN) protocol (explained in Appendix C). The project was initially designed to test how shale oil exploration may be affecting aquatic health. The summer of 2015 was the third of five field seasons planned. During the camp, samples of benthic invertebrates (bugs) and sediments were collected from suitable streams near the campsite, with assistance from monitors-in-training.

Project lead Krista Chin attended the entire camp for the second year in a row. Here is her explanation to camp participants what the project is all about and how it has been evolving:

> *We look mostly at streams and the types and number of bugs that live in a stream. We look at how all the changes in the area have impacted the water quality and the entire aquatic system, including the types of bugs that live in there. Some bugs are really sensitive to pollution; others are not. So, if you find bugs that are really sensitive to pollution in a body of water, then the water is probably very clean. If you are finding the bugs that can only live in dirty water and find no other sensitive bugs, likely the water—the aquatic health—is not doing very well.*
>
> *During my first year up here, when we flew over the area, we realized that not only are there a lot of man-made disturbances like seismic lines and roads and camps and well pads, but we also saw that there are a lot of slumps, caused by permafrost degradation. It sinks the land, and it brings all this debris into the streams, making streams very dirty. Last year when we came up, there was a pretty big fire in the Husky block that burned across their 3-D seismic lines. So the project design has changed somewhat to test different types of habitat that are being impacted by all these different disturbances.*
>
> *Then I teamed up with a couple of other researchers from the University of Ottawa. One is looking at groundwater, and the other one is looking at hydrocarbons. Groundwater has certain signatures. The signature will tell them whether the water is actually from the ground, or whether it's from the surface, and how long the water has been underground. What the researcher is trying to figure out is, if something was to happen to your groundwater system through a fracking-related accident, how long would it stay*

underground? The second professor is looking at hydrocarbons. Joanne Krutko worked on the project last year. What we do for him is we collect all these bugs. He squishes up all the bugs then runs a test to see if there are any hydrocarbons in the bugs. If there are any high levels of hydrocarbons, he tries to see if they are from industry activities or if it is from natural seeps.

We know that Conoco-Phillips and Husky have developed monitoring programs, but they are very limited spatially; it is only where they are actively working. But nature works on watershed scales, so we are working on a much bigger scale. We are hoping that we will get a better understanding of what the aquatic system looks like on a regional watershed scale.

--Krista Chin, camp participant and researcher with Cumulative Impact Monitoring Program (GNWT)

Small mammal trapping

Everybody has been joking around this morning. I was asking people, which people are you, the mice trap people or the bug trap people?

-Camilla Rabisca, elder and camp participant from Fort Good Hope

Small mammal trapping (focused on voles, mice and shrews) is a longstanding program conducted by GNWT-ENR.[13] These studies are important because population trends of small mammal prey species strongly effect on the abundance of their predators (such as marten and lynx) a year and a half later. Furbearers such as marten and lynx are central to the trapping economy. The Sahtú Regional Office of GNWT-ENR has been conducting small mammal trapping near Norman Wells since 1990 and examining trends. During the camp, participants learned the protocol and practised live trapping of small mammals, in various habitat types across the river from the camp. To the disappointment of many of the 'mice trappers', the traps mostly remained empty.

Insect biodiversity monitoring

A Malaise Trap was set up near the campsite in order to increase participants' understanding of local biodiversity by sampling for insects — particularly flies, wasps, and true bugs. Because it can be deployed in a highly standardized way, the Malaise Trap can be used to track long-term biodiversity trends as well as the impacts of industrial activity or other disturbances on species diversity.[14] The ʔehdzo Got'ı̨nę Gots'ę́ Nákedı is considering expanding this program within the region. The insects were collected and examined several times throughout the week, stored in the freezer, and sent to GNWT-ENR in Yellowknife along with the GPS location and date of collection.

[13] See http://www.enr.gov.nt.ca/programs/small-mammal-and-hare-surveys/surveys

[14] For more details on the Malaise Trap, see: http://biodiversity.ca/malaise/resources/What%20is%20a%20Malaise%20Trap.pdf.

Preliminary collaborative work

The camp presented an exciting and rare opportunity for Sahtu participants to work collaboratively with several researchers at the very beginning stages of research projects, helping to determine the focus, objectives, scope, and methodology of these projects as they are being conceptualized and designed. The goal is for Sahtu participants to take ownership over these projects and ensure they primarily serve the needs of Sahtu communities. Some of the research and monitoring projects featured at the camp could be considered true "participatory research," (PR) as described by Conrad and Campbell (2008):

> "[Participatory Research] does not generate knowledge for the sake of knowledge, nor seek universal laws or scientific principles, rather, it produces reflective knowledge that helps people to 'name,' and, consequently, to change their world (Beder, 1991). As research 'for', 'with' and 'by' the people rather than 'on' the people, PR revisions the distinction between the researcher and researched – the subject/object relationship of traditional research – establishing in its place a subject/subject relationship (Fals-Borda, 1991). Ideally, participants are involved in the research process from beginning to end. Together they set the research agenda, pose questions for inquiry, participate in the collection and analysis of 'data', and decide the outcomes of the process – how the research will be used."[15]

Community mapping

(See Appendix D for more details)

> *I get a real kick out of this opportunity to be able to talk about the land and about mapping with the people who use the land, on the land.*
>
> --Heidi Brown, researcher and camp participant

The Board has heard clearly from ʔehdzo Got'ı̨nę (RRCs) that to effectively address concerns about development in the Sahtú region, they need access to mapped information, to validate mapped information, and to identify and address spatial information gaps. While the Board already has an online mapping initiative underway (the Sahtú Atlas project), it is also pursuing a new community-led mapping information initiative. Researcher Heidi Brown was hired to spearhead the process, and attended the entire camp.

The Board is inviting ʔehdzo Got'ı̨nę as well as TK researchers and Dene language specialists in each of the five Sahtú communities to partner in identifying appropriate

[15] Diane Conrad and Gail Campbell, "Participatory Research—An Empowering Methodology with Marginalized Populations," in *Knowing Differently: Arts-Based and Collaborative Research* (ed. P. Liamputtong and J. Rumbold), Nova Science Publishers (2008), 248.

community mapping-related research projects, to draft proposals, and then to undertake targeted research to help meet their regulatory and decision-making needs and goals.

> *We are so used to thinking of maps as just flat maps. These days with the computer it can hold so much information about that chunk of land where something might be found, like where you have certain medicine, certain vegetation.*
>
> — Heidi Brown, researcher and Camp participant

At the camp, Heidi met with each of the participants individually or in small focus groups to gather ideas and feedback on what kinds of community mapping projects would be most useful to Sahtu communities.

Heidi demonstrated how mapping might work by creating a map of camp activities. With participants' help, she recorded each of the activities that took place at the camp (who, what and where), entered this information into the computer, and showed how a digital map can be produced to illustrate and track this kind of information. Participants had the opportunity to watch as the map was created and learn about the computer's mapping capabilities.

The feedback included a strong recommendation that mapping be linked with experiential learning opportunities for youth out on the land, so they can see and understand places for themselves and link these experiences to the wisdom of their ancestors. The youth said that currently, they often just use Google Map and forge their own trails through the bush. This experience could be enhanced by creating a cell phone app or digital program that connects users to the trails of their ancestors, potentially including pictures and interviews with elders. There may also be a need for a hard copy version for areas where there is no cell service.

Human biomonitoring

(See Appendix E for more details)

University of Waterloo researcher Brian Laird attended the camp to get feedback on the idea of designing and launching a human biomonitoring research project in the Sahtu Region that would test levels of contaminants (such as mercury) in people's bodies and diets. A similar program has already been initiated in the Dehcho Region, where consultation took place between 2013 and 2015. The guiding principle of this research would be to promote country foods in a way that balances nutrient benefits and contaminant risks. At the camp, each of the participants filled out a dietary survey on tablets provided by Brian, so that the project team can get an idea of what could be some of the dietary sources of contaminants amongst Sahtu people.

Brian Laird explained the project to camp participants:

> *It sounds to me from the people I've talked to so far at the camp is that there is a general agreement that biomonitoring could be useful. It depends on making sure that the studies are done in such a way that they answer the questions that people have. It depends on coming back to talk about the results in a good way.*

We request people's hair and blood samples and we measure levels of contaminants in the hair and blood. Biomonitoring is strictly voluntary. Anyone who doesn't want to participate, doesn't have to participate. If a person wants to fill in the dietary survey and give blood because hair is sacred to them, they can do that. I try to give each individual a choice in how they want to participate. To me, that's about showing people respect.

The big questions I've heard from people, like Wilfred was saying today, is 'what is safe to eat?' and 'how much of that is safe to eat?' We can help answer those questions with biomonitoring. The other thing that Roger was talking about, is that we have to be clear where these contaminants came from. That speaks to what people can do about it.

When mercury biomonitoring happened in Tulit'a a few years ago, it was a good news story. When people got the results back, the mercury levels were low. People knew that they were okay for mercury and they could keep doing what they are doing. Many people from Deline, Fort Good Hope and Norman Wells can also get that type of information. Every person that provides a sample would get their results. They would find out how much mercury is in their body and anything else that they wanted measured. What's really important is that the information is given back to them in a way that they can understand.

That brings us to the next question: What should we measure? Mercury is at the top of the list because of all those advisories that were released by the government a couple of years ago. I think cadmium would be another one worth measuring.

I always work with biologists and ecologists because I know people are part of the environment. One of the people I work with in the Dehcho, for instance, she studies mercury in fish. What she's trying to figure out is why mercury in fish in one lake might be going up and in another nearby lake going down and another nearby lake staying the same. We usually work together. If I'm coming up here, I would be inviting her to do that type of work as well.

Some people yesterday were talking about uranium and people being exposed from their workplace. That's not one that I've measured before, but that will be one of the first things I do when I get back down south; find out how we can best measure people's uranium exposure. If it's possible, I'll include it because it sounds like it was a big issue up here.

--Brian Laird, camp participant and researcher from University of Waterloo

Other topics related to potential research design that were discussed at the camp include: monitoring of a range of contaminants including lead, selenium, PCBs and other chemicals; potential benefits and challenges of including children in the study; and how best to include traditional knowledge and elders. It was suggested that a Sahtu representative should be sent each year to attend the Northern Contaminants Program conference.

Remote sensing tools for mapping linear disturbances in Sahtu Region

(See Appendix F for more details)

Sarah Cole, a graduate student researcher from the University of Calgary, attended the camp to build collaborative relationships and to test the feasibility of a fieldwork project planned for August 2015, as part of a research program to develop remote sensing tools and protocols for mapping linear disturbance features in the Sahtu Region (funded in part by the GNWT's Cumulative Impact Monitoring Program). Linear disturbances include seismic lines, roads and pipeline rights-of-way. These are known to significantly impact wildlife, particularly caribou; however current maps may not accurately reflect the extent of linear disturbance, the width of clearings, or the level of vegetation regrowth.

Sarah brought a drone to test out at the nearby site where Chevron conducted exploration in the 1980s. The drone was very popular with camp participants and prompted lots of questions and interest. Sarah also received valuable feedback and advice from both Sahtu participants and other researchers on her upcoming fieldwork, including advice on logistics (where helicopters might land, etc), safety precautions and who to contact as local liaisons.

Theatre-based cultural exchange

Camp participant and researcher Diane Conrad from the University of Alberta explained her project to the group:

> *I use drama and the arts to do research with youth, and encourage youth to talk about their experiences and issues and about ways to make changes in their lives. Over the last three years, I have been coming up to Fort Good Hope to talk to people about the project. My colleague Dwayne Donald has also worked with the school in Edmonton and he also taught for many years on a reserve school in southern Alberta called Piikani Reserve. They are a Blood tribe. So we have these connections with three schools: Fort Good Hope, a First Nations school in Edmonton called Ben Calf Robe School (it's Cree), and a school on Piikani Reserve. What we want to do with this project is, in each community, to have someone working with the youth to create drama or other arts— maybe videos, maybe photographs. They can create stories about how they see themselves, how they see their culture, how they see their people, their place, their community and then share those through digital technology with the other two communities. So we will have this exchange between youth from three very different places and cultures. We hope that will encourage all of the youth to think more about themselves, who they are and see themselves in relationship to other people, other youth and other places. That's the goal of this project.*

Camp participants joined in an interactive theatre-based game, to get a sample of what youth research participants would be experiencing. The activity is intended to spark conversations about relationships, interactions between people and how we express and interpret them. Participants chose to focus the game on the theme of 'research,' in order to explore the interpersonal and power dynamics around research in the Sahtu Region.

While many Sahtu participants associated 'drama' with school plays based on pre-set scripts, it was noted that traditional Dene forms of storytelling are often dramatic productions in and of themselves. One suggestion was for Diane's project to explore ways to connect youth self-expression with their cultural heritage in storytelling.

Participants from other Sahtu communities, particularly Tulit'a, urged Diane to expand the research beyond Fort Good Hope and expressed interest in being involved.

Skill-building practice

Wildlife track surveys

(see Appendix G for more details)

This ongoing project, funded by the Cumulative Impact Monitoring Program, aims to build a long-term collaborative monitoring program for wildlife that involves Sahtu community members, government and oil and gas companies working together. The focus is on conducting surveys and recording wildlife tracks in the snow, to monitor patterns of relative abundance and distribution of many wildlife species across the land and over time.

James Hodson, researcher with GNWT-ENR, explained to camp participants the history and evolution of the project, which Sahtu monitors-in-training have been involved so far, as well as the methods being used:

> *The project I am working on with the SRRB and folks from Tulit'a is to monitor wildlife using surveys of tracks in the winter. In November of last year we had a meeting in Tulit'a, where we had some harvesters and some youth environmental monitors-in-training come together to talk about the project—the objectives, the methods we might use to collect the information, how to store it, and how we want to use the information. We wanted to start the project off by getting feedback from people about how they wanted the project to work. This past winter in March was the first time we tried out the surveys. I was working with four people from Tulit'a. William Hardisty was the harvester and our guide for the field trip. I also worked with Dion Lennie and Joanne Krutko. Jonathan Yakeleya was the other monitor that was working with us.*
>
> *The way we do the surveys is pretty simple. We just travel in our snowmobiles along seismic lines and trails and down the pipeline. Every time we see a track we stop and take a picture. We also take the coordinates of where we saw the track so we can add it to the map. We were using these data recorders; I will pass one around. They are like a really big heavy cell phone. When we get back to town the data gets transferred wirelessly into the database. Each person who participates gets their own account so they can look in and see the data they have collected, and they can decide if they want to share it or not. The data all goes to one central place. This winter we did four different routes twice, and we tried a fifth one on the last day. We are hoping that this winter we will hire two crews and try to do more survey routes. The long-term plan is to eventually get every community in the Sahtu doing this, so we are covering a much bigger area.*
>
> *Eventually we want to get the communities running the program themselves and then we will just be helping to coordinate and compile the data, and then interpret it at the end. The idea is to get a baseline, and then when industry comes back they could do the same surveys using the same approach so everyone's data could be put together. We want to*

have comparisons of areas where there is development and areas where there is no development to see what kind of impact development has on wildlife.

If you look at the map, there is a point everywhere we saw a marten track or a moose or a caribou track. If we do the same route every year, like if we do that trail out to Willow Lake every year, we can compare over time whether we see more or less marten tracks—which animals are going up or down. It's a way to track population trends.

We will do some outings later so people can try out the recorders, see how they work. You can take notes by making an audio recording. We were doing that sometimes to record place names, observations about animal behavior, to understand what the track we were looking at meant and what the animals were doing.

During the camp, participants practised using the data recorders and their GPS skills, recording locations and pictures of wildlife tracks they could identify along the beach near the camp.

Discussion-based contributions to existing research

Health and climate change adaptation

(see Appendix H for more details)

At the time of the camp, the ʔehdzo Got'ı̨nę Gots'ę́ Nákedı was finishing up its second year of Health Canada-funded research, led by Sahtu youth, on the health impacts of climate change and community-based adaptation. The 2014/15 project, *Sahtú Youth Network for a Regional Action Plan on Health Impacts of Climate Change*, expanded on previous Health Canada-funded, youth-led projects in Tulít'a, Délı̨nę and Fort Good Hope. The project involved the formation of a regional Sahtú Youth Network (SYN) whose members led the investigation and conducted interviews with Sahtú Elders and harvesters, as well as organizing on-the-land, experiential learning. The goals of the project included:

- identifying "environmental determinants of health" related to climate change in the Sahtú;
- mapping the connections between climate change and environmental and human health effects; and
- identifying priority actions that youth can work on or advocate for.

The Board, in partnership with the Délı̨nę ʔehdzo Got'ıı̨ę, has received Health Canada funding to continue its efforts through a 2015/16 project focused on food security. The insights brought forward at the camp will be a valuable contribution to this ongoing avenue of research.

While youth caucus discussions about regional climate change adaptation efforts by the Sahtu Youth Network were built into the camp schedule, an additional discussion about climate change was held with the full group, at the specific request of elder participants, so that elders could share their stories about changes they have experienced and how these have affected

Sahtu people and culture. Youth facilitator Daniel T'Seleie—originally from Fort Good Hope—agreed to facilitate this discussion given his extensive work on climate justice issues.

> *The work that I've done looks not just at the science around climate change, but at the actual human impact of that change. It looks at people like us—Dene people—who have a culture and language that's tied to the land. The impact is more severe for us when the land changes than for people who live in the city who don't have their culture and language tied to the land. Hearing from the elders is important because we hear about how it is to live on the land, and it helps us, especially the younger people like myself, understand how the impacts of climate change affect our culture. When you think about losing the language, you can't solve that problem with money. If you don't hear the birds anymore, you aren't going to talk about it. Someone like me who is still learning the language, who needs to hear the language, I can't learn the name of that bird because if it's not there you don't talk about it. If you don't see the same type of weather, the same type of ice, you don't talk about it, and you don't learn the language. To me that's one of the biggest impacts of climate change, and that can't be solved by spending more money on dealing with it.*
>
> --Daniel T'Seleie, youth facilitator at camp

Elders described specific ways the climate had changed since their childhood (wind, temperature, ice thickness, timing and nature of spring break-up), and how that related to cultural practices on the land changing. Changing cultural practices include: how and when people can travel across the land safely; when people catch fish; and how much fish and which species of fish they are catching. Elders (and scientists) believe the poorer health of the fish may be related to warmer water.

> *On the other side of the river from Good Hope there is a place called Fossil Lake. There is a creek that goes to it. About three years ago I went up that way, and we started noticing there were a lot of areas where the banks had just slid into the creek. Last year one of my brothers, Arthur, went up that way, but came back. He said he couldn't make it through because it was blocked off with all the ground. I checked it out for myself, and sure enough it was pretty well just willows and ground. In the springtime, it's a popular area for fishing and duck hunting. A lot of people used to go up there but I don't know if anybody can go up there now.*
>
> --John Tobac, monitor-in-training and camp participant from Fort Good Hope

Initially, camp organizers had hoped to hold a lengthy discussion and include experiential learning around fire ecology at the camp, but due to the busy fire season no representatives from the fire division at GNWT-ENR could attend. Instead, there was discussion about the unprecedented levels of forest fires in the NWT, potentially due to climate change, and its impact on wildlife and Sahtu culture. While it was recognized that the secondary growth that takes hold in burnt areas benefits some animals like moose, it creates dense underbrush and deadfall that blocks traditional trails and makes it harder for animals to travel across the land. There was particular concern expressed about caribou habitat being destroyed, given that it may take 40 to 60 years to regrow. Elders mentioned that caribou not only avoid burnt areas because of exposure to predators, they also do not like the smell of burnt areas.

Interwoven with the discussion of climate change was a discussion about language loss, supporting Daniel's suggestion that there is a very important link. Some memorable stories were shared about language loss and the need to practice traditional on-the-land activities in order to recover Dene languages.

> *All your kids, everybody speaks in English, and you are the one who was supposed to teach them their own language, but you didn't, and now your kids are stuck in English and it's embarrassing. That's what happens. It's your fault, so now you speak like your kids. Now you are ashamed to talk in your own language. That's what you do to yourself. I tell my kids: don't let your kids lose their language. Their language is their power, it's the power of the Dene. You speak it, and you are speaking power. Your own traditional life, it's your power too. If you lose that, how would you feel? You would feel kind of ashamed, losing your own stuff. The only place you can teach it is on the land. Our elders tell us that if you lose your language, the only way you can get it back is go back to the land, with your people and your family. When I retired from working in the diamond mine my kids didn't even know how to talk in their own language. So I took them out on the land, on the spring hunt. Once we got out there I told them: from today, nobody speaks English until we get back to the community and then you can speak English all you want. In a little over a week they were both speaking Slavey to one another. That's how quickly you get your language back.*
>
> --Gordon Yakeleya?, elder participant at camp from Tulit'a

> *I have been trapping pretty well every year for the past five years now. I grew up in the bush. I have seen a lot of changes in the weather over the years, like what elder Joe was talking about. A lot of the lakes below Good Hope, where you do muskrat hunting, those are all getting washed out now; it's getting dry in a lot of areas like that. Also, on the cutlines or trails the willows are growing up so fast, you can't even go on the cutlines anymore. Those days, we learned a lot of language when we went out on the land. They all had band radios, and people would get together and speak the language, so we picked up lots, off of that. We are losing language in Good Hope. That's what I see are the changes now compared to twenty years back.*
>
> --Lawrence Jackson, monitor-in-training and camp participant from Fort Good Hope

Contributions from this session have been incorporated into the 2014/15 research report summarizing the Sahtu Youth Network's regional action plan on health impacts of climate change. The transcript from this session will also be passed along to lead researchers working with the Délıŋę Ɂehdzo Got'ıŋę in 2015/16 on food security, health and climate change issues.

Barrenground caribou monitoring

Heather Sayine-Crawford, Regional Director with GNWT-ENR Sahtu Region, led a discussion during the camp about current and historical monitoring of barrenground caribou herds in the region. This is a very important issue for Sahtu Ɂehdzo Got'ıŋę and residents, given their

close relationship with caribou as a primary food source, so there were lots of questions and input as to future directions for barrenground caribou research and monitoring.

Heather explained the various monitoring methods, including when each is used, why and how. A radio collar was passed around while Heather explained that collaring provides important information on location, movement, mortality, calving, and how landscape disturbances affect movement. This is one of the more controversial monitoring methods, and elders at the camp reiterated their concern about collars causing hair to rub off the animals' necks, and collared females not being chosen to mate. Heather explained the efforts that had been taken to minimize harm to the collared animals (improved collar shape and protocols around tightness), and emphasized that only a very small percentage of the herd is collared.

Collars are also used to locate herds during aerial surveys. In the summer (July), insect harassment causes herds to bunch up, so researchers take aerial photos and then count each animal one by one on the computer later. Heather showed examples of these photos, with several thousand animals each. If conditions are not right for the herds to bunch up, a calving survey in June is done instead, where researchers fly transects and take aerial photos for counting purposes. GNWT-ENR Sahtu Region also conducts a recruitment survey in March near Colville Lake–to count how many calves have survived their first winter—and in the fall a survey is conducted to determine bull to cow ratio.

Camp participants' questions were focused on collaring methods, population trends, and how fire and climate change are affecting caribou. Suggestions for improved research and monitoring included:

- monitoring could contribute to more focused research on the effect of fire and other climate change-related effects on barrenground caribou; and
- increased monitoring of mountain caribou is a priority for some Shúhtagot'ıné (Mountain Dene people), since this population could be a good backup source of food if other barrenground or boreal caribou populations collapse.

Experiential learning

Participants learned how traditional knowledge experts understand and monitor the land and water, through daily camp activities such as hiking, observing wildlife tracks, hunting for moose, fishing and checking nets, making dry-meat, collecting spruce boughs, berry picking, harvesting wood and collecting water.

Traditional medicinal and food plants were identified and harvested, and the entire group was given a chance to sample or taste the plants while elders explained where they could be found and what they are used for. These included: 'Dene carrot' (*denetha* in Slavey), a wild root vegetable; blueberries (which were saved and offered as part of the breakfast fare); and spruce gum, which has medicinal and overall health-boosting qualities.

When a moose carcass was brought to the camp by harvesters, participants got the chance to practice collecting various samples that make up the wildlife health sampling kit.

These experiential observations may spark future research questions or enhance awareness of important aspects of the ecosystem or culture that should be monitored more closely.

Challenges and Lessons Learned

> *I like the weather; I think it's great. When we came here there was a big thunderstorm, big waves. That's the way it goes in life. Nothing comes easy, especially the weather. If you don't have the hard times you don't appreciate the good times. We have lots of hard times, lots of bad weather, and that's what toughens us up. I would just like to say thank you; I like being here.*
>
> -Roger Odgaard, camp participant and ERM Forum member from Norman Wells

Many challenges were encountered at this year's camp, which caused the planned itinerary to be changed significantly, but this also allowed for many unexpected and important learnings.

On the day of scheduled boat departures from Fort Good Hope, Tulit'a and Norman Wells (Saturday July 4th), a series of thunderstorms with high winds came up suddenly along the Mackenzie River. It was already a significant logistical challenge to arrange the transport of 38 people from three different locations via private motorboat or jetboat drivers (who could take between three to five passengers each), without satellite phone communication between each of the boats. The boat ride was several hours from Tulit'a to Norman Wells, plus another three to four hours from Norman Wells to Sans Sault; however, progress was slowed by the wind and waves. Several of the drivers were not staying at the camp, so they had to factor in time for a return trip to Norman Wells and were anxious to leave as early as possible. The original plan was to gather the participants departing from Tulit'a and Norman Wells together in Norman Wells and leave as a convoy. However, the dock in Norman Wells was too small to accommodate all of the boats, and some boats left earlier to make space for others to load. A sudden decline in weather conditions meant that the second set of boats was forced to wait several hours after the first few boats left for the storm to clear. Just when the final boat was about to leave—carrying the camp facilitator, two researchers and a youth monitor-in-training—a second storm came up suddenly, which prompted a decision to delay departure until the following day. Unfortunately, that boat driver was not available the following day, and the other drivers were too tired to make another trip after returning in the middle of the night, so an entire day was spent in Norman Wells trying to secure a new boat, driver, and gas (which was complicated by the gas station being closed on a Sunday). The facilitator and remaining participants finally arrived at the camp late Sunday evening, so the formal camp activities did not start until Monday morning.

Meanwhile, several boatloads containing the hosts and participants from Fort Good Hope were the first to arrive at Sans Sault on the Saturday afternoon, at which point the storm descended upon them. The host elder, Wilfred Jackson, arrived at the planned camp location (the old Chevron camp site) only to find that it was too shallow this year to land boats safely there, so he chose another location within the general vicinity, next to his son Michael Jackson's cabin. The other participants from Fort Good Hope joined him and began setting up camp in the rain and wind, and the cooks struggled to feed people with a makeshift kitchen. Most of the food supplies were yet to arrive from Norman Wells. One of the boat drivers from Norman Wells did not notice the new camp location and dropped off its passengers and supplies at the original location; those participants had to wait in the rain until they were

picked up by one of the boats from Fort Good Hope. Fortunately, all of the participants rose to the occasion and worked together well under these difficult conditions to get the camp set up, creating an opportunity for bonding and learning both new skills and resiliency.

Without the facilitator present, the camp was set up rather organically in a sprawling layout along the beach, which allowed for privacy and personal space, as well as multiple gathering spaces (campfires) for smaller groups to hang out. It is interesting that this seemed to be the most natural and preferred style of camp site for Dene participants. However, the layout made it difficult throughout the camp for the facilitator to round people up for full-group meetings and discussions. It was not possible to hold any of the formal evening storytelling sessions as planned, as people generally dispersed quickly after supper. More informal storytelling happened around each of the smaller campfires.

The new camp location along the beach was not ideal for several other reasons: it did not offer access to good quality drinking water (clear streams are much preferable to the muddy Mackenzie River); it did not have a supply of good dry firewood; it was not near a good place for setting fish nets; it was relatively far from streams identified for CABIN water sampling; the remote sensing drone had already been pre-programmed to conduct tests at the Chevron site and could not be re-programmed; and the new campsite was somewhat exposed to the wind. Many of these challenges could only be overcome by making more frequent and longer boat trips than planned during the camp. The camp ended up using more gas than expected in order to conduct these essential activities, requiring an extra trip to Norman Wells mid-week to resupply.

To make matters worse, strong winds continued throughout most of the week until the final day, preventing or inhibiting many activities that involved going out in a boat. These included both survival-related chores (collecting water and wood) and research-related activities (CABIN sampling, drone tests). The wind also blew down tents several times (both personal tents and the large canvas meeting tents), and caused parked boats to become dislodged, requiring meetings to be interrupted many times to deal with these emergencies.

Given limited windows of time when the weather cooperated, and limited space in the boats, the main chores such as hauling water and harvesting wood were mostly carried out by experienced Dene participants, along with some of the Dene youth. Ideally, there would be more participation by researchers and other visitors/non-Dene in order to maximize the cross-cultural learning and relationship building, but this was often not possible. Furthermore, research activities requiring boat travel (CABIN sampling, drone tests) were mainly limited to monitors-in-training, but ideally would have included more participation of other researchers and ERM Forum members, to enhance the inter-disciplinary learning.

These challenges reinforced a key lesson—that '**weather is the boss'—**and any schedule for on-the-land activities has to be flexible. There should be several back-up activity options that are less weather-dependent and can be accomplished without having to leave camp. Furthermore, good weather conditions cannot be taken for granted and participants should be ready to mobilize quickly to accomplish weather-dependent activities when the opportunity arises, even if it is earlier than scheduled. For example, participants broke down the camp and

travelled by boat back to the three communities on the sunny Friday evening instead of on Saturday July 11th as planned, due to uncertainty about weather the following day.

> *I like how it went yesterday. We had a bit of a break in the weather, so we had to get wood right away. Around here things happen really fast, especially the weather. So we learn to do what we did yesterday. If you get a chance to do something, do it right away because it can clear up and go bad again. People should know that.*
>
> --John Tobac, camp participant and monitor-in-training from Fort Good Hope

We also learned how important it is not only to carefully choose the camp site based on a range of factors, but to make at least one trip to the chosen site shortly before the camp is to begin (during the same season) to verify that conditions such as water depth are appropriate, since conditions can change dramatically year-to-year and seasonally. An ideal site would not require so much dependence on good weather to be able to accomplish essential tasks.

During post-camp debrief conversations, some of the researchers shared that they learned an important lesson around taking as many informal opportunities as possible to gather feedback and build relationships with the other participants, rather than relying on formal scheduled discussions or activities. In this way, researchers could ensure many of their objectives were accomplished regardless of scheduling complications and changes, through informal conversations and making the most of unexpected challenges/bonding opportunities.

Recommendations

The following recommendations were gathered from transcripts and notes taken during the camp as well as from post-camp debrief conversations with researchers, organizers, and camp participants. They do not include feedback and suggestions related to specific research projects, as these were discussed above. Most of the recommendations are related to future Sahtu Cross-Cultural Research Camps; however, there are three additional recommendations outlined at the end.

Recommendations for future Sahtu Cross-Cultural Research Camps:

1. Hold Sahtú Cross-Cultural Research Camps on an annual basis.

Participants and organizers recommended that this camp become an annual event, ideally with a steady funding source so planning can start much earlier in the year and the Board can devote less time and resources towards fundraising each year. Organizers should develop a multi-year plan that includes equipment and/or infrastructure needs, and invite partner agencies to contribute towards fulfilling those ongoing needs.

This would allow momentum to continue around the training and certification of environmental monitors in the Sahtu, and continue to provide members of the Sahtu Environmental Research and Monitoring Forum with an in-depth and experiential understanding of ongoing

research and monitoring projects. Holding the camp consistently would allow more meaningful relationship and trust-building between long-term researchers and Sahtu community members, monitors and ERM Forum members. Many important lessons have been learned over the course of the first two camps that can be built upon.

- The camp could establish a fixed location year-to-year similar to the Tundra Science Camp (and potentially build up infrastructure there), or it could continue to rotate locations around the three Sahtu districts. One advantage of establishing a fixed location would be the opportunity to collect consistent environmental baseline information that would be comparable over many years. Disadvantages include the imbalanced focus on only one part of the vast and diverse region, and the danger that the site would begin to feel more like 'town' than 'camp'.
- Regardless of whether the location is fixed, the camp could established a fixed function/program, or it could continue to feature a changing mix of research/monitoring projects and themes.

2. Further emphasize environmental leadership development and Dene/Metis self-determination.

Beyond professional training for work in the environmental field, the camp could go further towards developing environmental leaders in the Sahtu.

- *Structure of the camp*: instead of having a cross-cultural focus for the entire duration of the camp, it may be valuable to designate part of the camp as Dene/Metis participants only, with a Dene/Metis facilitator and potentially run by the ʔehdzo Got'ı̨nę. Logistically, it would work best to hold this part of the camp either at the beginning or end.
    - This would provide a literal and metaphorical space for Sahtu people to take more responsibility and ownership over the camp and to practise self-governance.
- *Content of the camp*: could include more critical discussion on why and how the profession of environmental monitoring evolved, and how environmental research and monitoring could link more holistically with community-based visioning, planning and self-government.
- *Theme of the camp*: could revolve around a specific project idea that allows Sahtu people to take back control and show leadership—such as a Sahtu organization learning to manage its own environmental monitoring operation for a certain location or industrial/reclamation initiative. Such an operation might specialize in traditional knowledge-based monitoring or integrate both scientific and TK approaches. Several Sahtu environmental monitors have expressed interest in managing an operation like this.
    - While the feasibility of such an operation is unclear, it would be a useful exercise to identify objectives, a timeframe, and what steps would be required to achieve the objectives. This would help monitors to understand *why* they are learning certain skills, and where it might take them. It may also inspire more Sahtu young people to pursue formal higher education in the environmental sciences.

- Camp organizers could investigate whether any other Aboriginal groups in Canada have successfully led or managed their own environmental monitoring and/or reclamation initiatives (potentially integrating a traditional knowledge-based approach), and perhaps invite representatives to share their experiences at the camp.
- Representatives from consulting firms and businesses that specialize in environmental monitoring and reclamation could be invited to the camp to explain how the business works, answer questions, and help participants expand their support network of resource people.

3. A Dene/Metis person should be the lead or co-facilitator.

Co-facilitation is ideal with a group as large as 30 to 40 people, and at least one of these co-facilitators should be Sahtu Dene/Metis. A gender balance would also be ideal—one woman and one man co-facilitating.

- Both co-facilitators should be involved in the organizing team from the beginning.
- While Sahtu Dene language experts were hired for both the 2014 and 2015 camps and offered certain co-facilitation roles, they were not fully involved in the conceptualization and organization of the camp. While language experts/interpreters have important advisory contributions, this is not the same as having a Sahtu Dene/Metis co-facilitator.
- Camp organizers and funders need to be prepared for a potential shift in the camp structure and feel with a Dene/Metis co-facilitator and be willing to re-negotiate objectives and expectations.

4. Seek partnerships with other organizations and agencies (Parks Canada / Délıné Ɂehdzo Got'ıné in 2016).

Partnerships would allow the camp to leverage additional resources and support people. On-the-land programs can be complex and expensive logistical undertakings, so it is essential to coordinate efforts and pool and channel resources towards common objectives. Moreover, the schedules of Sahtu organizations and monitors quickly fill up, especially during the summertime, so joint programs can ensure the maximum number of participants are available.

There is a strong request from the Délıné Ɂehdzo Got'ıné to host the 2016 camp, in conjunction with the fish and science camp it is planning to co-host with Parks Canada. Given the many overlapping objectives, this could be an ideal partnership.

Other partnerships to consider for future years include:

- Linking with GNWT-ENR's traditional economy / conservation education programs (eg. Take a Kid Trapping, fish camps). This might mean increased participation of youth under 18; however this would make planning considerably more difficult. Many important traditional economy-related skills could be shared with those over 18 years of age, including: harvesting safety, proper processing of wildlife that is harvested, hide tanning workshops, and how to collect samples and assess health of harvested species.

- Partner with GNWT's Public Works and Services to conduct a workshop and hands-on training related to an off-grid renewable energy installation at a cabin or camp.
- Partner with GNWT-ENR or Parks Canada to conduct a full ecosite classification exercise, which would take several days to go through all the components.

5. Improve and formalize safety planning protocols.

While no injuries or incidents have taken place at either the 2014 or 2015 camp, many opportunities for improved safety precautions were identified. These include: improved communication devices and protocols (more satellite phones and/or Iridium SPOT or InReach devices); better people tracking; and clearer lines of responsibility and communication.

- The camp could follow GNWT-ENR's safety planning tool, which covers safety, communications, and required equipment; it would also ensure liability coverage.
- The camp could also draw upon Parks Canada's safety planning templates, which have been used for many years by community-run camps out of Deline.

6. Camp set-up should be partially completed in advance.

The local hosts, coordinator and camp staff from Fort Good Hope, as well as other Sahtu participants, felt that the camp should have been set up ahead of time to avoid the stress associated with setting up during a storm, and having participants go hungry while the kitchen was set up. For community-run camps, they would normally send two to three people a few days ahead to cut poles, gather firewood and water, and set up the kitchen and gathering tents. This would also provide an opportunity to check the site to ensure conditions are suitable.

On the other hand, the visiting researchers and the youth facilitator felt that a cooperative set-up with the full group was an incredibly valuable learning and bonding experience. The group came together to tackle adversity in a non-scheduled way that allowed Dene/Metis participants to assume leadership, reinforcing their role as hosts and on-the-land experts. The visitors found they learned best by watching and doing. The experience helped to relax people's boundaries and allowed informal conversations and sharing to take place right from the beginning of the camp. Furthermore, the elders enjoyed seeing everyone pitch in and work together, particularly the young people.

A solution that could incorporate the best of both approaches may be to work with local organizers/camp staff to identify the essential bare-bones set-up or preparation that needs to be done ahead of time. A few people could be sent up to a week ahead of time to accomplish these minimal tasks and check the site for suitability. However, as many set-up tasks as possible would be left for participants to do once they arrive. The expectations need to be clear for what organizers and participants are supposed to do. Organizers also need to ensure that the necessary gear arrives by the time participants are ready to set up.

7. The camp location should be chosen carefully according to set criteria and a ground-check should be conducted up to a week prior to the camp.

Many aspects of the camp program/schedule, structure and feel depend on choosing a good campsite location. Since conditions can change seasonally and year-to-year, a scouting trip shortly before the camp is recommended to check the site's suitability—ensuring boats can land, streams are running, check for damage and erosion, etc. Very clear instructions—ideally maps with the route and spot marked—should be given to all boat drivers (or others transporting participants to the site).

The following criteria should be considered in choosing a good site:

- High quality drinking water, wood, and other basic necessities should all be accessible near the campsite without needing to travel by boat.
- Most of the research and monitoring activities should be able to take place near the camp without having to travel by boat, and ideally there should be a good place for setting fish nets nearby.
- It has been an asset both years of the camp to have a local person's cabin nearby where elders / local knowledge holders can feel comfortable and use as their home base. There should not be more than one or two cabins, however, or else the camp could start to feel like 'town' rather than 'bush'.
- The camp should be relatively sheltered from wind, waves, and blowing sand or dust; however, it helps to have enough wind to keep the bugs away.
- The camp should be close enough to town to ensure reasonable transportation expenses, but far enough to ensure that Sahtu participants are not tempted to keep travelling back and forth and the camp is not overwhelmed with unwelcome visitors. Visitors can be a welcome addition on one or two days of the camp without impacting the camp rhythm and schedule too much.
- The camp site should not sprawl across a large area, or else it becomes very difficult and time-consuming to round people up for meetings / activities and there is less group cohesiveness.

8. Consider shifting the timing of the camp to earlier in the spring or later in the fall.

Researchers who conduct fieldwork during the short summer season have found it very hectic to participate in camps held during July. Some could not attend due to conflicts with fieldwork that had already begun, and others were busy planning for fieldwork about to start.

If a primary goal of the camp is to collect usable baseline data, then it may be best to continue scheduling the camp during or just before prime field season time, and try to work with researchers at least six months ahead of time to incorporate the camp into their fieldwork schedule. However, if the purpose of the camp is more to demonstrate and give monitors-in-training practice in research methods, then it may work better to schedule the camp earlier in the spring or later in the fall. A spring camp would be preferable so that researchers can get to know monitors and potentially hire some of them as field assistants for the upcoming summer season (while those researchers conducting winter fieldwork, such as the winter track survey, may prefer a fall or winter camp).

Other recommendations

9. Investigate the feasibility of compiling traditional knowledge of plants into a Sahtu Ethnobotany book, potentially in conjunction with a Sahtu mapping project.

As part of the camp package, this year's participants received a book on Gwich'in Ethnobotany, which sparked a discussion initiated by Sahtu elders about whether Sahtu organizations could produce a similar book showcasing their own traditional knowledge about plants and their uses. Ethnobotany is the study of plants and their relationship to people, including how people have traditionally used plants throughout the years. Researcher Heidi Brown, who is working on several mapping projects with the Board, suggested that Sahtu ethnobotany could integrate well with a mapping initiative.

10. In future workshops and training, emphasize the links between environmental research/monitoring and Dene/Metis culture preservation.

The rationale for this recommendation was explained well by Daniel T'Seleie, youth facilitator at the camp:

> *Make the link so young people understand that it's not just about food, it's about culture. If there are contaminants in the animals, it's not just a problem with their food, it's a problem about being able to practice their culture. Elders can communicate that really well by telling them about how they grew up, how important fish were, how they harvest different animals and how they live off the land. When you make that link for kids to the culture, it's more relevant for them and it gets the kids more interested.*

11. Continue support for the Sahtú Environmental Research and Monitoring Forum.

Participants once again emphasized the importance of continued efforts by the Sahtú Environmental Research and Monitoring Forum, which aims to ensure better regional coordination and control over environmental research and monitoring, better reflection of community priorities, and better community engagement. The Forum should continue to play an important role in organizing future Cross-Cultural Camps in the region.

Conclusions

> *"I have spent the last three years in school, and I feel that I have learned more in this week. Every time I see somebody do something, I am looking over their shoulder to see what he is doing, what kind of knife he is using, what kind of knot he is tying. If people are talking, I am listening in to hear what they are talking about, who is related to who, and who came from where. Going up the creek over there, I felt like we were the luckiest*

people to be on this land. Then we stopped and got out and there was a rainbow behind us, and then another one right over it; it was just beautiful."

— Daniel T'Seleie, youth facilitator at the camp

The second Sahtú Cross-Cultural Research Camp, held from July 4-10, 2015, built on the success of the first camp in 2014 and provided many lessons learned that can be applied to future camps. One of the key recommendations from organizers and participants is for this camp to become an annual event, so that momentum can continue around building environmental leadership amongst Sahtu people. Environmental leadership includes not only training and certification of local environmental monitors, but enhanced Dene/Metis self-determination concerning the management of land and resources as well as research/monitoring.

The significant challenges encountered by this year's camp included stormy and windy weather, and having to use a non-ideal campsite where both essential tasks and research activities required the weather to cooperate. While this meant the camp itinerary had to be shortened and changed, it reinforced the important lesson that 'weather is the boss.' It also provided invaluable opportunities for cross-cultural bonding, learning and power-sharing. During times of adversity, Sahtu elders and youth stepped up and assumed leadership roles as on-the-land experts, demonstrating both good judgment about how to balance safety with meeting the camp's essential needs, and how to build and (frequently!) repair a camp using minimal equipment.

The research activities conducted at the Camp included: the collection of baseline data that can be filed and used in the future (particularly aquatic health data contributing to the assessment of impacts from oil and gas exploration); preliminary collaborative work to design new research programs; contributions of traditional knowledge to enhance existing research programs (notably, health and climate change adaptation action planning); and experiential learning from living on the land. It was exciting that several of the researchers were inviting Sahtu participants to co-design research projects from their very inception, following a true "participatory research" approach.

The camp achieved many of its objectives, with eleven monitors-in-training present and a very high percentage of Sahtu participants (including a balance of both men and women). While the camp was not able to complete the environmental monitor certification process as hoped, several Sahtu monitors are now ready to take their tests, and others have advanced in their progress.

All participants found the camp experience to be valuable and look forward to seeing this initiative continue to gain momentum and evolve.

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Appendix A. List of Camp Participants

Staff

Shauna Morgan – Facilitator
Daniel T'Seleie – Youth Facilitator
Joe Hanlon – SRRB Program Coordinator
Lori Ann Lennie – SRRB Administrator

Camp Staff

Brenda McNeely - Cook
Debbie McNeely - Cook
Desera Caesar – Cook assistant
Matthew Pierrot – Camp Attendant
Dora Grandjambe – Language Expert
Leon Andrew – Language Expert

Environmental Monitors in Training and Sahtu Youth

Brent MacCauley – Tulit'a
John Tobac – Fort Good Hope
Natanda Oudzi – Colville Lake
Charles Oudzi – Colville Lake
Lawrence Jackson – Fort Good Hope
Joseph Turo – Fort Good Hope
Joanne Krutko – Tulit'a
William Andrew – Tulit'a
Dion Lennie – Tulit'a
Fred Vital – Deline
Ethan Tobac – Fort Good Hope

Elders and Others

Wilfred Jackson – Fort Good Hope
Joe Orlias – Fort Good Hope
Edward Kelly – Fort Good Hope
Camilla Rabisca – Fort Good Hope
Jimmy Dillon – Deline
Archie Vital - Deline
Fred Andrew – Tulit'a
Gordon Yakeleya – Tulit'a
Roger Odgaard – Norman Wells

Researchers

Heidi Brown – Mapping (SRRB)
Brian Laird – Human Biomonitoring (U of Waterloo)
Krista Chin – Aquatic Health Monitoring (ENR)
James Hodson – Wildlife Monitoring (ENR)
Heather Sayine-Crawford – Sahtu Region ENR
Bonnie Bergsma – Sahtu Land and Water Board
Diane Conrad – Forum Theatre
Sarah Cole – Seismic Line Regeneration / Drone (U of Calgary)

Appendix B: Camp Schedules – planned and actual

a) Planned Camp Schedule

Day	Fri July 3rd	Sat 4th	Sun 5th	Mon 6th	Tues 7th
Morning 9-12	Travel to Norman Wells		Breakfast check-in Break from formal activities Chores - set fish net, small mammal traps, bug trap tent Scout out streams for CABIN sampling (with Krista)	(optional: early morning harvesting) Breakfast check-in Discussion about Mapping Project; Camp mapping activity with Heidi - Part 1 Chores (including checking fish nets, dry fish making)	(optional: early morning harvesting) Breakfast check-in Brief camp mapping activity with Heidi - Part 2 Discussion - research agenda for the Sahtu (review of ERM Forum work) Chores (including checking fish nets, dry fish making)
Afternoon 1-4 pm		Noon to 6 pm: Boat shuttles to Camp at Sans Sault Camp Set-Up- set up tents, tarps, set up meeting area, cut wood	Intro to various research projects (short blurb by each researcher) Split into groups of 5-10: -CABIN stream sampling (Krista) -Mapping of family areas (Heidi) -Human mercury biomonitoring focus group (Brian) -Walk to look for plants and animal signs / learn about	Discussion - Barrenground caribou monitoring - with Heather Rotate small groups - CABIN sampling (Krista) -Mapping of family areas (Heidi) -Mercury biomonitoring (Brian) -Plant/animal sign walk and track survey tablets (Bonnie, James)	Discussion - youth and elder caucuses (youth: action planning with Dan) Rotate small groups - CABIN sampling (Krista) -Mapping of family areas (Heidi) -Mercury biomonitoring (Brian) -Plant/animal sign walk and track survey tablets (Bonnie, James)
Evening 7-10 pm		Supper Feeding the Fire ceremony Opening Prayer, Facilitated Introduction Circle, Outline Schedule & expectations; Camp protocol and plan for working together Government rules and Dene laws that need to be respected	Supper - reflections Record activities in monitor logbooks Check small mammal traps Check bug trap tent (optional) Story telling - history of this place	Supper - reflections Record activities in monitor logbooks Check small mammal traps Check bug trap tent (optional) Story telling - fire and its relationship to land and people (historically)	Supper - reflections Monitor logbooks Check small mammal traps Check bug trap tent (optional) BOAT SHUTTLE TO NORMAN WELLS - James, Heather out, Sarah and Diane in Evening harvesting opportunity

Day	Wed 8th	Thurs 9th	Fri 10th	Sat 11th
Morning 9-12	(optional: early morning harvesting) Breakfast check-in Walk to observe fire ecology and forest regeneration Chores (including checking fish nets, dry fish making)	(optional: early morning harvesting) Breakfast check-in Performance and participatory research (Diane) Chores (including checking fish nets, dry fish making)	(optional: early morning harvesting) Breakfast check-in Discussion about human mercury biomonitoring project - next steps (Brian) Split into groups of 5-10: CABIN stream sampling / landslides; Seismic regeneration study - vegetation plotting and drones (Sarah); Human mercury biomonitoring focus group (Brian); Mapping of family areas (Heidi)	Pack up camp Boat shuttles back to Norman Wells
Afternoon 1-4 pm	Intro to seismic regeneration project Split into groups of 5-10: -CABIN stream sampling / landslide measurement (Krista) -Seismic regeneration study - vegetation plotting and drones (Sarah) -Human mercury biomonitoring focus group (Brian) -Mapping of family areas	Discussion about aquatic health project (Krista) Split into groups of 5-10: -CABIN stream sampling / landslides (Krista) -Seismic regeneration study - vegetation plotting and drones (Sarah) -Human mercury biomonitoring focus group (Brian) -Mapping of family areas (Heidi)	Practise for environmental monitor practical exam ERM Forum caucus	Northwright flights to Colville Lake and Deline 3:00 pm Canadian North flight from Norman Wells to YK
Evening 7-10 pm	Supper - reflections Monitor logbooks Check small mammal traps Check bug trap tent (optional) Youth caucus - action planning (Dan) Story telling - visioning the future for Sahtu land and people	Supper - reflections Practise for environmental monitor practical exam Hand games and fun activities	Supper - reflections Youth caucus - action planning (Dan) Social/wrap-up/closing feast, trivia challenge and festivities	

b) Actual Camp schedule

Day	Wed 8th	Thurs 9th	Fri 10th	Sat 11th
Morning 9-12	Breakfast New round of introductions; intro to research projects led by Diane and Sarah Discussion about history of the place (Sans Sault and surrounding travel routes) Discussion with monitors about certification process Youth and elder caucuses Chores (including checking fish nets, dry meat making)	Breakfast Performance and participatory research (Diane) Discussion about human mercury biomonitoring project - next steps (Brian) Chores	Breakfast Discussion of climate change and language loss (facilitated by Daniel) Discussion/feedback on seismic regeneration study project	
Afternoon 1-4 pm	Split into groups of 5-10: -CABIN stream sampling / landslide measurement (Krista) -Seismic regeneration study - vegetation plotting and drones (Sarah) -Human mercury biomonitoring focus group (Brian) -Mapping of family areas (Heidi)	Split into groups of 5-10: -CABIN stream sampling / landslides (Krista) -Seismic regeneration study - vegetation plotting and drones (Sarah) -Human mercury biomonitoring focus group (Brian) -Mapping of family areas (Heidi)	Final thoughts and reflections Pack-up camp	Northwright flights to Colville Lake and Deline 3:00 pm Canadian North flight from Norman Wells to YK
Evening 7-10 pm	Supper - reflections Monitor meetings with Joe (SRRB) Informal socializing around fire	Supper - reflections Informal socializing around fire Harvesting trip by boat	Supper - reflections Boat shuttles back to Norman Wells and Fort Good Hope	

Appendix C: Canadian Aquatic Biomonitoring Network (CABIN) program

The Canadian Aquatic Biomonitoring Network (CABIN) is a standardized aquatic biological monitoring program developed by Environment Canada to assess the health of freshwater ecosystems. Both biological (benthic macroinvertebrates, i.e., aquatic bugs) and physical data (e.g., stream width, water velocity, water chemistry) are collected at each site.

Why sample benthic macroinvertebrates?

- They are abundant and found in all streams
- They are important to the aquatic food web as other animals, such as fish and birdsfeed upon them
- They are relatively inexpensive and easy to sample (compared to fish sampling)
- We know a lot about how they respond to pollution
- They are relatively sedentary so are constantly being exposed to the effects of disturbance unlike collecting a water sample, which tells you what's in the water at that particular snapshot in time, the benthic macroinvertebrate community can tell you a more complete story. That is, the community that lives at a particular site reflects the impacts that they have been exposed to over time

General sampling procedures:

1. Site Description: this is a broad characterization of the site. It includes a site drawing, site coordinates, elevation and surround land use classification

2. Reach Characteristics: this is a description of the aquatic habitat types, canopy coverage, macrophyte (aquatic plant) coverage, streamside vegetation, and periphyton coverage

3. Water Chemistry: this includes measurements of certain physical-chemical water quality parameters at site. Water samples are also collected for laboratory analysis

4. Benthic Macroinvertebrate Sample: this is obtained using the standardized CABIN benthic macroinvertebrate collection method. A three minute travelling kick technique, with a kick net, is used to collect the sample

5. Substrate Characteristics: this includes the measurement of the stream substrate (the benthic macronivertebrate habitat). A 100 pebble count is used to characterize the substrate. Embeddedness of the substrate and the size of the surrounding material is also recorded

6. Channel Measurements: this is the characterization of the stream channel at present flow conditions. This includes measurements of channel bankful and wetted width, depth and velocity.

Appendix D: Community mapping projects

Recently, there were several inter-related initiatives involving the SRRB and regional, territorial, and community partners to identify, catalogue, and compile spatial (mapping) materials. The ʔehdzo Got'ıne (RRCs) have clearly identified that to effectively address concerns about development in the Sahtú region, they need opportunities to have access to mapped information, validate mapped information, as well as identify and address spatial information gaps.

The SRRB recognizes that community mapping information must be a community-led initiative. To this end, the SRRB is delighted to announce that in addition to its current online mapping initiative (the Sahtú Atlas*), a variety of community mapping projects will be soon be underway. A quick overview of current SRRB mapping projects follow:

Community Mapping Project

The SRRB will partner with each ʔehdzo Got'ıne to identify appropriate research projects, draft proposals, and then undertake targeted research to help meet their regulatory and decision-making needs and goals. TK researchers and Dene language specialists in each of the five Sahtú communities will also be involved in this collaborative initiative. It is likely that projects will fall under the following themes:

1. Barren-ground caribou (especially population and abundance trends, traditional ecological knowledge, migration/movement and harvest),

2. Species at risk (especially TK relating to biophysical and ecological information,

3. Identifying research gaps and priorities,

4. Development – mining, shale oil play, and

5. Family areas (the connection between wildlife/habitat and people, via mapping, to identify historical stewards and serve as the basis for dialogue about responsibility for habitats).

There are several key implications for future work stemming directly from this project: increased capacity (greater access to digital spatial datasets, additional data acquisition (including traditional ecological knowledge, wildlife data, ecology, habitat, changes through time, socio-ecological data, cultural data, and others), as well as further identification of data gaps so that they can be addressed and planned for.

Sahtú Atlas*

The Sahtú Atlas* is a collaborative initiative between the SRRB and the ʔehdzo Got'ıne, and is about to embark on its second year. Its aim is to assist each ʔehdzo Got'ıne in research, decision making, and education by offering an online, password protected mapping tool to house various spatial information. While last year's efforts focussed on identifying, purchasing, and operationalizing the system, this year's goal is to take it further: link and make available existing traditional knowledge materials (in various formats) and various spatial information for the ʔehdzo Got'ıne to use in their daily work.

*Please note that this is a temporary name: we are currently taking suggestions for a new, unique name that captures the Sahtú mapping spirit.

Appendix E: Human biomonitoring

Background

- Country foods are great sources of nutrients that are very important to one's health (e.g. omega-3 fatty acids, selenium)
- Research has shown that moose kidneys and some types of fish in the Northwest Territories can contain high levels of heavy metals (such as mercury and cadmium). Heavy metals can harm one's health.
- The contaminant risks from country foods in the Sahtú are not yet well known because:
- We don't know what the current levels of exposure are among people in the Sahtú Region
- The best way to learn about people's contaminant exposure is to measure those contaminants in people's blood, urine, or hair. This type of research is called human biomonitoring.
- Participation would be voluntary. People would only take part if they wanted to participate.
- Participants' personal information and privacy would be strictly protected.
- At least one year of consultation is required before any biomonitoring research would begin
- University of Waterloo researchers have begun a biomonitoring project in the Dehcho Region 2015-2016. Consultation in the Dehcho regarding this project took place between 2013 and 2015.
- The guiding principle of this research is to promote country foods in a way that balances nutrient benefits and contaminant risks
- We want to know if communities in the Sahtú also want to take part in this type of research.
- If so, we want to learn more about the concerns and priorities of people in the Sahtú so this work can answer the questions that community members want answered.

Next Steps Before Any Biomonitoring Research Takes Place in the Sahtú

- Continue consultations in the Sahtú to better learn about the priorities and concerns of community members in this region:
- Consultations began with phone meetings with the Sahtú ERM in January and June 2015.
- Consultations will continue at the upcoming Cross Cultural Camp (July 2015)
- Hold focus groups with Sahtú community members in order to evaluate and improve a dietary survey meant to measure people's country food use.
- We will hold focus groups at the upcoming Cross Cultural Camp (July 2015).
- This dietary survey could be included within future biomonitoring research in the Sahtú Region.

Benefits for the Sahtú First Nations

- Build capacity through local training opportunities.
- Ensure that contaminant advisories line up with current exposures in the Sahtú Region.
- Provide a snap-shot in time so that future research can determine if mercury levels/risks are increasing, decreasing, or staying the same.

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Appendix F: Remote sensing tools for mapping linear disturbances in Sahtu Region

Background and Relevance: Boreal forest regions across Canada are under increasing pressure from human development related to natural resource extraction. Roads, seismic lines, well sites, cut blocks, pipelines, and other elements of human disturbance exert cumulative environmental effects that can harm biodiversity, water quality, and the habitat of threatened species such as woodland caribou. The Sahtu region of the Northwest Territories has significant untapped opportunities for natural resource development, including shale oil and the proposed Mackenzie Gas Project. Territorial officials contemplating these scenarios require a comprehensive understanding of the environmental impacts of current and proposed future development. However, there is currently a lack of detailed information on the location, identity and vegetative state of human disturbance features related to petroleum development in the region. This in turn hinders the capacity to adequately assess the effects of these disturbances on woodland caribou, and make informed regulatory decisions on future resource development. Modern remote sensing tools have been shown to provide an effective foundation for mapping and characterizing linear disturbances, but have never been applied systematically in the Sahtu region.

Research Objectives: The primary goal of this research is to develop remote sensing tools and protocols for mapping linear disturbance features in a northern Boreal environment. In order to achieve this goal, three objectives have been identified: (i) compare the capacity of various remote sensing data sources to characterize linear disturbances, (ii) develop remote sensing protocols for mapping the occurrence and characterizing the attributes of linear disturbances that are suitable for use across large areas of Boreal forest, and (iii) produce map layers that accurately portray the location and physical attributes of linear disturbances in the Sahtu.

Methods: In order to analyze the capacity of the different remote sensing sources for characterizing linear features, a variety of image-based metrics will be developed. Spectral metrics (e.g., NDVI, texture transformations) will be extracted from high-resolution Quickbird, mid-resolution SPOT and low-resolution Landsat to provide visual patterns and structural metrics (e.g., average height of vegetation) will be extracted from high-density airborne LiDAR data. Field data on the location, type, physical dimensions (i.e., seismic line width), and various vegetative characteristics (i.e. successional stage) will be collected in order to calibrate and validate the remotely sensed data. Samples will be collected across gradients of land cover (forest type, upland, and wetland) and disturbance age to ensure that the sample features represent the maximum range of variability. A series of empirical models will be built using vegetation characteristics as dependent variables, and the various remote sensing metrics as the independent variables to determine which dataset provides the best foundation for mapping linear human disturbance features in this northern boreal environment.

Anticipated Contributions: The approaches developed here will enhance our capacity to map human disturbances in the Sahtu region, and support ongoing efforts to understand the environmental effects of resource extraction in Canada's north.

Appendix G: Multi-species monitoring using winter wildlife track surveys in the Sahtu Settlement Region

Team Members:
James Hodson, Environment and Natural Resources, GNWT
Joe Hanlon / Deb Simmons, SRRB
2015 Tulita Field Crew Members: William Horassi, Joanne Krutko, Dion Lennie, Jonathan Yakelaya

1. What research/monitoring question will this program address?

This project aims to build a long-term collaborative monitoring program for wildlife that involves Sahtu community members, government and oil and gas companies working together to try and cover the broadest area possible. Funding for the project was obtained from the Cumulative Impact Monitoring Program (CIMP).

Surveys of wildlife tracks in the snow during winter can allow us to monitor patterns of relative abundance and distribution of many different types of animals across the land.

Two key questions that these surveys can help to answer are:

(1) What is the relationship between where we find different types of animal tracks, the number of tracks, and the amount and type of natural and human disturbance on the landscape?
(2) How is the relative abundance of different wildlife species changing over time?

2. How was the community involved in the research?

Based on discussions with the SRRB, it was decided that the first year of the program should be a pilot study involving community members from Tulita. A workshop was held in Tulita in November 2014 with youth (environmental monitors in training), harvesters, elders from Tulita, SRRB staff, ENR staff and industry representatives (ConocoPhilips and Explor). The purpose of the workshop was to ensure community input was incorporated into the objectives, monitoring questions, survey methods and budget.

Wildlife snow track surveys were carried out during March 2015. One harvester and 3 environmental monitors in training from Tulita worked with the project lead in teams of 3-4 people to conduct the surveys by snow mobile.

3. What have we done so far?

This past winter we were able to survey 4 routes twice (see map on next page), and tried a new survey route on the last day of field work. A total distance of 98 km was surveyed (about 90 km of which was surveyed twice).

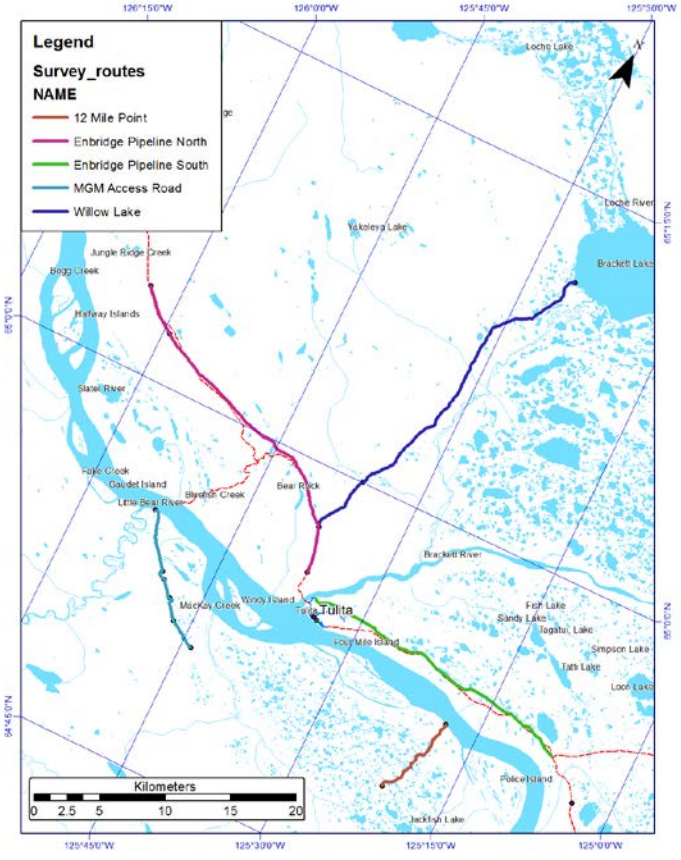
Each time fresh tracks were encountered we stopped to take geo-referenced photos of the tracks and surrounding habitat using 3 devices (Garmin Oregon GPS, Olympus TG3 camera

with integrated GPS, and Archer 2 rugged field computers). The Archer 2's also allowed us to record information about snow conditions, weather, habitat and other observations using the Trailmark Mobile Data Collection App.

Species detected:

We recorded tracks and sign from 10 different wildlife species. The table below indicates the number times that we stopped to record tracks or other sign (pellets, scat, antler rubs) of these species. Marten tracks were by far the most numerous of the species recorded. We did not record the tracks of snowshoe hare, ptarmigan/grouse, or red squirrel as they were too numerous to count; however, we did note whether tracks of these species were present in the area when we stopped to record tracks of the species listed in the table below.

Species	Number of detections
Caribou	11
Fox	25
Lynx	35
Marten	94
Mink	10
Moose	34
Otter	2
Weasel/Ermine	7
Wolf	7
Wolverine	3



Map of Winter 2015 Survey Routes

Appendix H: Sahtu Youth Network research on Health and Climate Change Adaptation

The 2014/15 project, *Sahtú Youth Network for a Regional Action Plan on Health Impacts of Climate Change*, is the latest step on a multi-year journey by Sahtú communities in the Northwest Territories to address the impacts of climate change on individual and community health, through the cultivation of youth leadership.

Expanding on previous Health Canada-funded, youth-led projects in Tulít'a, Délı̨nę and Fort Good Hope, this project adopted a fully regional lens for the first time. It involved the formation of a regional Sahtú Youth Network (SYN) whose members led the investigation and conducted interviews with Sahtú Elders and harvesters. Over the course of this project, with input and guidance from Elder advisors and the Project Team, SYN participants identified "environmental determinants of health" related to climate change in the Sahtú, mapped the connections between climate change and environmental and human health effects, and identified priority actions that youth can work on or advocate for. At the urging of the SYN members themselves, investigation methods were centred around on-the-land, experiential learning.

The project explored the following questions from a youth-centred perspective:

- What are 5-10 key "environmental determinants of health" as they relate to climate change (how changes in the land and water related to climate are affecting human health)?
- What health-related values are at risk due to those changes (including valued aspects of environmental, physical, social, cultural and spiritual health)?
- How severe would the impacts of those changes on health be over the short-term (5 years) and long term (50 years and over)?
- How likely to occur or how frequently occurring are the most severe impacts?
- What community resources or skills already exist to help lessen the health impacts of climate change (adaptive capacity)?
- What opportunities exist for Sahtú youth to influence or address those environmental determinants of health as they relate to climate change, in order to prevent or lessen the most severe and likely impacts on community health?

The short-term objectives for the project were:

1. Review and build on learnings from previous climate change and health adaptation projects in Tulít'a, Fort Good Hope and Délı̨nę, both in terms of the content and the methods used.

2. Strengthen action capacity, leadership and skills through creation of a Sahtú Youth Network for research and action planning on climate change and health.

3. Complete a vulnerability assessment for the Sahtú Region based on 5 to 10 key "environmental determinants of health" as they relate to climate change.

4. Test “environmental determinants of health” identified through the vulnerability assessment through on-the-land exercises involving cross-generational knowledge exchanges.

5. Complete a regional climate adaptation and health action and communications plan for the Sahtú.

6. Communicate the vulnerability assessment and action plan to regional leadership organisations and schools, and to the broader public.

The long-term objectives of this project were:

1. Create the basis for a self-sustaining Sahtú Youth Network that will continue to be active on health and climate change issues once the project is over.

2. Establish the foundation for more comprehensive climate change and health adaptation planning throughout the Sahtú Region that will be incorporated into local policy and decision-making.

3. Build relationships of mutual support between elders and youth, and amongst Sahtú youth, that are rooted in strong relationships with the land.

4. Give youth the tools to make healthy choices in their lives, to develop a healthy relationship with their land and culture, and to develop the knowledge and confidence needed to face a future of unprecedented climate change.

5. Increase youth understanding of the roles and responsibilities of governance and co-management organizations in the Sahtú Region and beyond, toward greater youth participation in decision-making processes that affect their land, culture, and health.

6. Further the efforts of Sahtú communities to be self-determining and resilient – both in environmental / resource management and in creating policies and strategies to promote health in the community.

Expected outcomes of the project include a self-sustaining Sahtú Youth Network engaged on health and climate change issues, empowered with the tools to make healthy choices in their lives, and with the knowledge and confidence needed to face a future of unprecedented climate change.

Lead Contacts

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