



First Nation Stewardship: Southern Lakes Caribou Monitoring Program

Final Report – April 2017

PROJECT DESCRIPTION

This project will develop and test a ground-based monitoring program of Southern Lakes caribou herds between TTC, C/TFN, and TRTFN over the next year, for the purposes of filling current data gaps, validation of scientific data, and increased community confidence in the full suite of information being used to make management decisions. The three Inland Tlingit Nations and YG will collaboratively build the program, train field staff, implement data collection, and review the program for continued data collection.

Data collection protocols will be developed with consideration to local and traditional knowledge, regional capacity and relevance, literature reviews, existing ground-based monitoring programs in Yukon, and with guidance from the Southern Lakes regional biologist. The three parties will review existing and scheduled scientific data collection to ensure that the data gathering from all approaches are complementary and standardized where appropriate.

PROJECT OBJECTIVES

1. Develop ground-based monitoring program between C/TFN, TTC, and TRTFN
2. Develop protocols collaboratively among Inland Tlingit Nations and YG
3. Build data forms and database for tablet-based data collection
4. Train Inland Tlingit field staff in program data collection
5. Implement program data collection
6. Review year one and develop next steps for continued data collection and program growth

PROJECT ACTIVITIES

1. Protocol development

Three study questions, as agreed upon at the 2015 monitoring workshop, were outlined to guide program development. These were subject to modification as the program was developed and refined:

1. What is the status of the SLCH, assessed annually
2. What habitat types and corridors are the SLCH using, assessed annually
3. What is the assessable level of human activity within the SLCH range

The project began with a literature review of existing ground-based monitoring programs, and relevant studies on caribou health, movement, and disturbance monitoring and research. Draft monitoring components, variables, and accompanying protocols, within the scope of the study questions, were created over a number of conference calls and through correspondence among the Inland Tlingit Nations. These were distributed to the YG regional biologist, Lars Jessup, and the BC Skeena Region senior biologist, Conrad Thiessen, for their review and input. The priority level, methodology, and relevance of potential monitoring components were discussed among all parties,

with the goal of identifying a small number of core data gathering components that would complement and/or supplement existing monitoring programs.

Three small, targeted data collection components were agreed upon by the Inland Tlingit Nations; these components contribute to answering the study questions and filling existing data gaps, are well-suited for tablet-based data collection, and benefit from a broader, landscape scale of data collection:

1. **Snow-track survey:** snow depth, track counts, and habitat classification to identify corridors and high quality habitat where they intersect with accessible or developed areas. TRTFN has been implementing snow track data collection around Atlin for a number of years, and given that the program is well-established and contributes to filling data gaps that were identified in the collaborative workshop, this other Inland Tlingit Nations agreed to adopt the methodology for implementation in other areas.
2. **Trails:** annual, as needed, mapping and classifying of trails and roads by age, size, seasonality, frequency of use, etc. to assess human disturbance footprint and changes in this disturbance over time.
3. **Sightings (incl. mortalities):** incidental sighting and mortality observations for the purposes of monitoring herd health and presence of diseases (through gathering of samples, observations of body condition, etc.).

2. Forms/database development

TTC staff established the ODK shared database and set up tablets with necessary security measures and functionalities for a shared platform. Digital forms for use on the tablets were coded in Excel; these were designed to be user friendly and to adhere to standardized data inputs, two of the primary benefits of digital data collection with the ODK application. Form functionality testing was carried out on the tablets by technical staff, and formatting consultations with field staff were conducted to ensure the flow and function of the forms accommodated the realities of gathering data in the field.

list_name	name	label
crust	A	No crust
crust	B	Some crust
crust	C	Crust would hold caribou
quality		1 Poor
quality		2 Fair
quality		3 Good
quality		4 High
quality		5 Excellent
observation	S	Sighting
observation	T	Track
observation	C	Carcass
species	Ca	Caribou
species	Mo	Moose
species	Wo	Wolf
weather		1 Sunny
weather		2 Some clouds
weather		3 Clear
weather		4 Overcast
weather		5 Light snow
weather		6 Heavy Snow
weather		7 Rain
weather		8 Windy

type	name	label
begin_group	group_details	Transect Details
text	text	Transect name
dateTime	date_time	Date and Time
text	name	Surveyor Name(s)
end_group	group_details	
begin_group	group_weather	Weather
date	date	Last snow ended:
select_multiple weather	dd_weather	Weather since last snow:
end_group	group_weather	
time	time	Start time
begin_group	group_snow1	Beginning snow depth

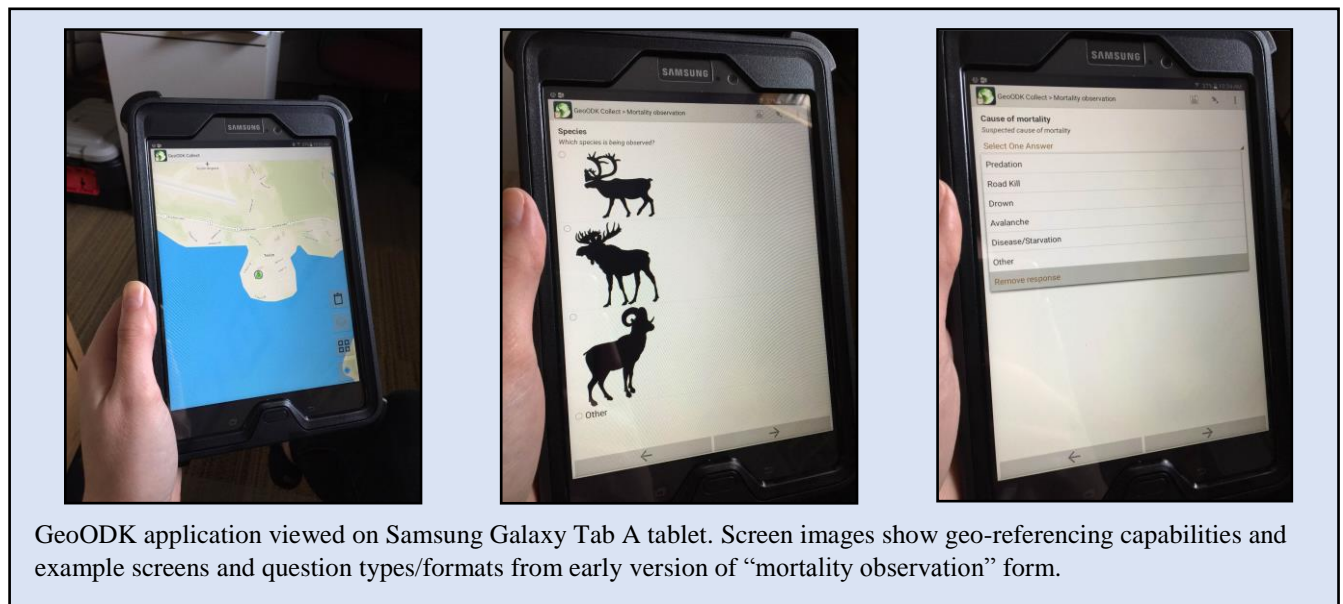
Examples of Excel code used for form development. Fixed data entry options ensures standardization, and eliminates data entry errors.

TTC Game Guardians were sent into the field with tablets for a number of trial events. These included testing the endurance of the tablet model that was proposed to be used with the program, and conducting trial data collection with test forms.

A Samsung Galaxy Tab A model tablet, housed in Otterbox case, was tested for durability and suitability in the early stages of the program. This model is very affordable, and was found to maintain excellent battery life in all conditions, withstand rough handling in the field (stored under snowmobile seats on long-haul trips), and be highly tolerant of freezing. These tablets are equipped with unassisted and assisted GPS, allowing for geo-referencing outside of Wi-Fi zones to a suitable accuracy for the data being collected (<5m).

Feedback from field staff regarding ease of use, form formatting, types of data being collected, and other field-based considerations was invaluable to the development of additional forms and to understanding the potential for and limitations of other data collection components and variables. Data input was efficient, and TTC Game Guardians found that integrating the collection of data, photos, and geo-referencing into the same device and carried out by the digital form, to streamline data collection and provide confidence that data was being collected correctly. Forms are easily adapted to feedback, and are expected to improve with field-staff experience over time.

Data collected in trial events automatically uploaded to the shared database, confirming functionality and providing mock data for exploring ODK data output options, and ensuring that data inputs were properly formatted.

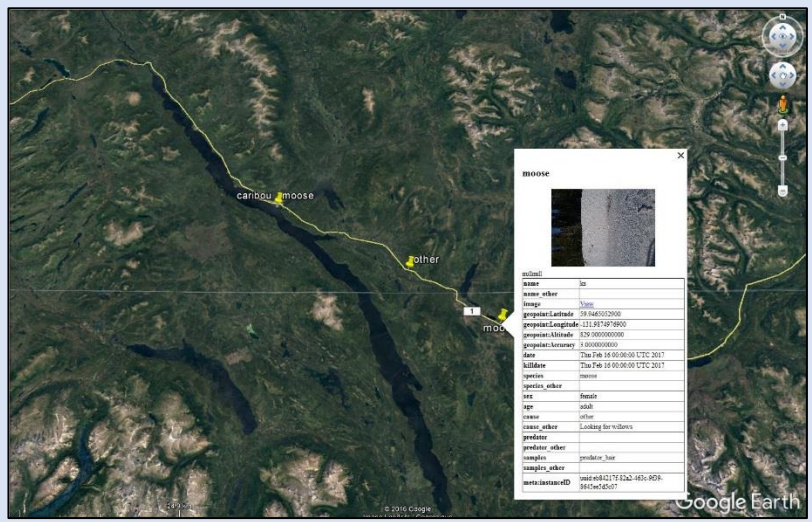


Data, once in the database, can be easily exported by technical staff to ArcGIS software for high-power analysis, and/or to Google Earth for quick display of data points with linked data also viewable.

name	name_other	image	video	geopoint Latitude	geopoint Longitude	geopoint Altitude	geopoint Accuracy	date	killdate	species	species_other	sex	age	cause	cause_other	predator	predator_other	samples	sample
gr				60.16394557	-132.72759044	683.0	5.0	Nov 02 30 UTC UTC 2016 2016		moose		unknown	adult	predation		wolf		hair jaw other	Li
gr				60.16399645	-132.72717618	698.0	3.0	Nov 02 27 UTC UTC 2016 2016		caribou		female	calv	roadkill				femur	
ks				60.04083201	-132.2764857	765.0	5.0	Thu Feb 16 16 UTC UTC 2017 2017		other		female	adult	predation		other	ice	tissue	
ks				59.94650529	-131.98749709	829.0	3.0	Thu Feb 16 16 UTC UTC 2017 2017		moose		female	adult	other	Looking for willows			predator_hair	
dd								Mon Fri Mar 06 03 UTC UTC 2017 2017		moose		male	yearling	roadkill				hair	

Screenshot of shared database with mock data collected in field trials being viewed.

Mock data points displayed in Google Earth. Selecting data points allows data, including images, related to that point to be quickly viewed.



4. Program status meeting

Program leads for each of Inland Tlingit Nations met in Atlin to discuss the progress of the program, and to provide further direction to TTC technical staff on monitoring components and form development. Three tablets were purchased, set up, and distributed to the three programs for further testing of forms and uploading functionality, and for each of the programs to familiarize themselves with tablet use.

5. Staff training

Training of field and technical staff is done in-house by peers, and is generally hands-on in the field. More training events are planned throughout the summer of 2017 to provide opportunities for staff to continue to learn from the experiences of each of the Inland Tlingit programs implementing this program. As additional monitoring components are added to the program, more training will be carried out as required. Joint patrols are conducted by the Inland Tlingit Stewardship programs throughout the year, which support the success and efficiency of joint training on a regular basis for the maintenance of the program.

SUCSESSES AND CHALLENGES

How did the project activities contribute to your goals and objectives? Note variances to objectives or work plan and explain why they occurred. What would you do differently?

Project Objectives

1. Develop ground-based monitoring program between C/TFN, TTC, and TRTFN
 - a. *Successes:* By following the strategies for effective collaboration, as described in the *2013 Southern Lakes Fish and Wildlife Monitoring – Collaborative Practices Workshop*, the Inland Tlingit Nations remain fully committed to this monitoring partnership, and have experienced great progress in working out capacity, administrative, and scheduling challenges. While currently slow-moving, progress has continued at a level that supports to ongoing participation of all parties.
 - b. *Challenges:* Capacity and staff turnover continues to be a challenge. Other staff were able to effectively step into the project where required, but some delays in the project work plan were experienced, as all parties were essential to the development phase.

2013 Southern Lakes Fish and Wildlife Monitoring – Collaborative Practices Workshop

Strategies for effective collaboration:

- Start with **small, targeted projects**
- Build **collaboration into new projects and funding proposals.**
- **Develop compatible data collection and storage formats and approaches** to allow for easier sharing of information between governments.
- **Maintain buy-in and momentum for collaboration** in monitoring that was started through the SLWCC's report. Schedule regular follow-up meetings with Southern Lakes governments, keep up communications in between meetings, and seek support from managers for collaboration.
- **Be proactive instead of waiting for a crisis.**

2. Develop protocols collaboratively among Inland Tlingit Nations and YG
 - a. *Successes:* All parties to this program remained supportive and generally engaged throughout the life of the project, and provided essential input and considerations to the development of the protocols. Protocols have been largely finalized, and meet regional needs for data collection, are standardized, and complement existing survey/monitoring programs in Yukon.
 - b. *Challenges:* Protocol development was a much lengthier process than expected. The time required to meaningfully collaborate on data collection methodology with a number of parties, and at a fine level of detail resulted in further shifts in the project work plan. Scheduling and capacity challenges were ongoing.
3. Build data forms and database for tablet-based data collection
 - a. *Successes:* The shared database was successfully established, and a number of forms have been developed and continue to be refined. The in-house capacity and technical expertise required for form development and database management is minimal after the initial start-up work. The shared database and standardization of data collection will assist with capacity challenges over time, as the need for data entry will be eliminated,

and the coordination of data collection and database management can be shared amongst technical staff in all involved First Nations. Database and form maintenance is minimal, and forms can be created and/or modified at any time as the program grows.

- b. Challenges:* Form development has a steep learning curve and lengthy time investment initially, but this tapers off significantly as technical staff gain experience in programming.
4. Train Inland Tlingit field staff in program data collection
 - a. Successes:* Staff have all been highly supportive of the transition to digital data collection, and all those who have carried out data collection to date have picked up on the use of the tablets with ease.
 - b. Challenges:* Coordinating schedules remains a challenge, but will become less cumbersome on the program over time. Technical staff will need to ensure that sufficient time is allotted to keep current with the program, and ensure new staff are trained quickly.
5. Implement program data collection
 - a. Successes:* Data collection testing was successfully completed, and trail mapping and classification is expected to be rolled out over summer and fall 2017.
 - b. Challenges:* While snow-track survey methodology was already defined, weather conditions and shifts in the project work plan meant that the program was not prepared in time to implement data collection this year.
6. Review year one and develop next steps for continued data collection and program growth
 - a. Successes:* Next steps have been agreed-upon by the Inland Tlingit Nations, including timelines for further field staff training for the various monitoring components. Trail mapping can be carried out over the course of the summer, and will be used to practice efficient collaboration while carrying out basic data collection. Other small, targeted projects being led by individual FNs (eg. community surveys), and that are well-suited for tablet-based data gathering, may provide other opportunities for developing these powerful digital tools and building staff experience and capacity.
 - b. Lessons learned:* Over-reaching can cause progress to stall out. Keeping milestones small and manageable is the single most important factor for the long-term success of this program. Provided that new aspects of the program are only added once existing components are smoothly operating, capacity, resources, and experience can be shared amongst the Inland Tlingit Nations to ensure program continuity into the future.

NEXT STEPS

<p>Year 2 (2017-18)</p>	<ol style="list-style-type: none">1. Implement trail mapping and classification monitoring component.2. Ongoing training of technical and field staff, and refinement of data collection tools and approaches.3. Explore opportunities for converting existing paper-based data collection in Inland Tlingit Nations to tablet-based forms to reduce data input errors and improve capacity for data collection, storage, protection, and analysis.4. Identify small, targeted projects that may benefit from tablet-based data collection, in order to provide opportunities for staff to gain experience.
<p>Year 3 (2018-19)</p>	<ol style="list-style-type: none">1. Expand data collection to other species, collaboratively where relevant, ensuring standardization among programs where possible/relevant.2. Expand program to other SL stewardship programs as capacity allows3. Continue to seek opportunities to fill data gaps being identified throughout Southern Lakes Caribou Management Planning process