Dehcho Moose Programs

Mackenzie Valley moose survey

Liard Valley moose survey

Biological sampling

Proposed population monitoring program

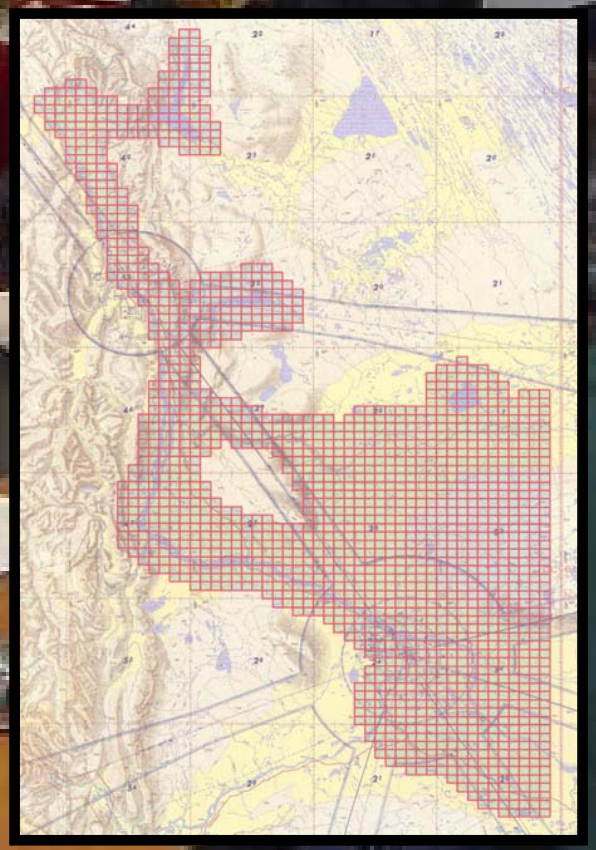
Moose Survey along the Mackenzie Valley

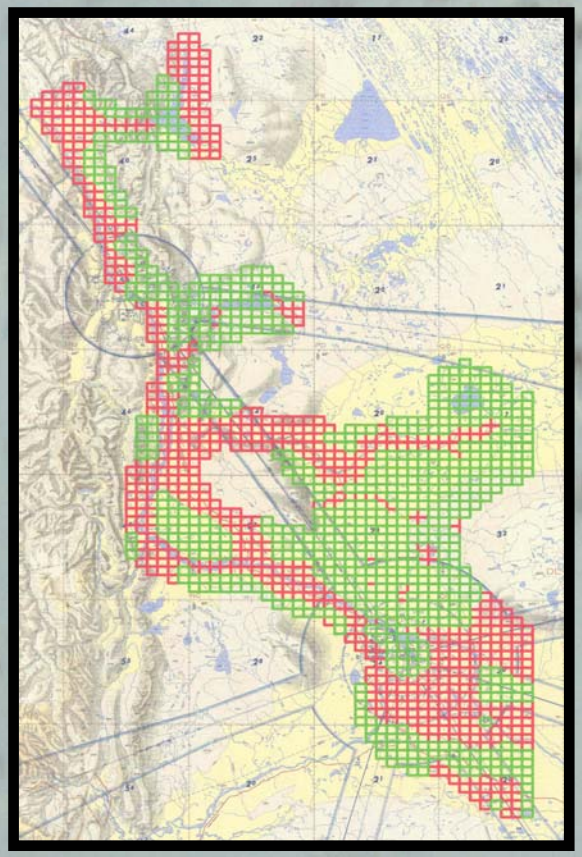
November 10-16, 2003

During First Nation consultations in August, RWED described the pros, cons, and costs of various aerial survey techniques and a decision was made and approved to use the new geospatial technique to survey moose. This technique has been used extensively in Alaska and the Yukon Territory.

Delineate Survey Area

- In August 2003, RWED requested PKFN, LKFN, JMRFN and Ft. Simpson Métis to indicate traditional areas they wanted surveyed for moose.
- All the areas identified were pooled together, digitized, and a map produced.
- A grid of ~16km² (2 minutes latitude by 5 minutes longitude) was overlaid to include the entire study area.
- The map was circulated amongst the First Nations to finalize the survey area.
- Map produced of the survey area grid.



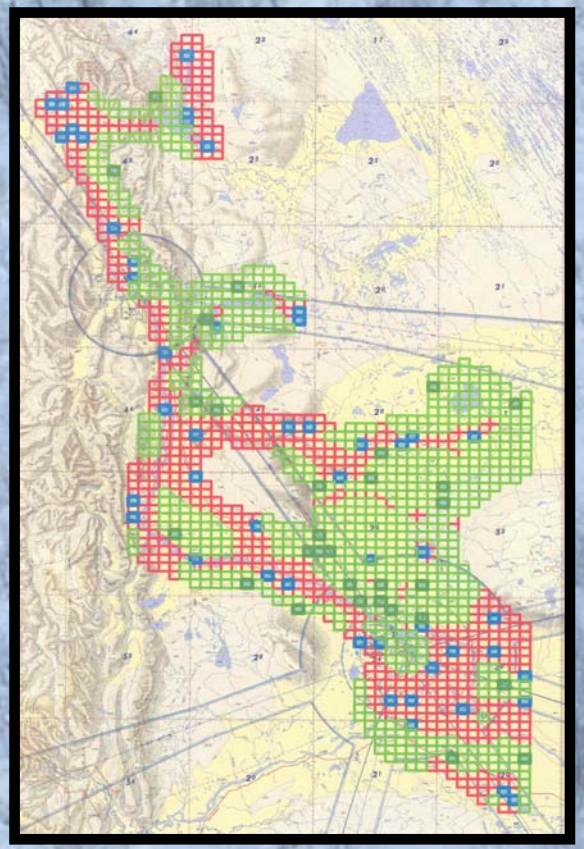


Stratify Sample Units

- Consulted with local harvesters from Wrigley, Ft. Simpson, and Jean Marie River to partition sample units into high or low expectation of finding moose.
- In areas unfamiliar to local harvesters we used previous survey and habitat data to assist in stratification.
- Tried to keep low strata areas as clean as possible.
- The Horn Plateau and Ebbutt Hills were removed from the survey area because they were not considered suitable moose habitat.
- Produced a map of the stratification.

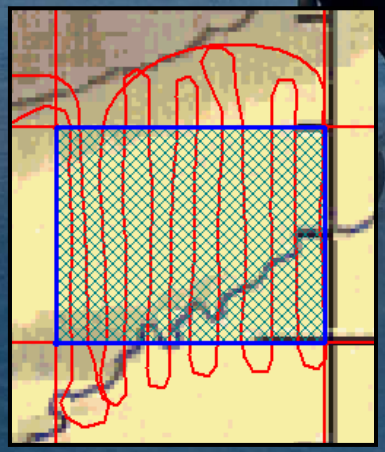
Select Sample Units

- Planned to survey 100 of the 1459 sample units (6.9% coverage).
- Because almost 50:50 split of low/high strata advised to select 60 high strata and 40 low strata sample units to survey.
- Randomly selected 80% of the units (50 high and 30 low).
- Through consultation with ADF&G personnel chose the remaining units (13 high, 7 low) ensuring that sampled units covered entire survey area.
- Produced map of the selected units.



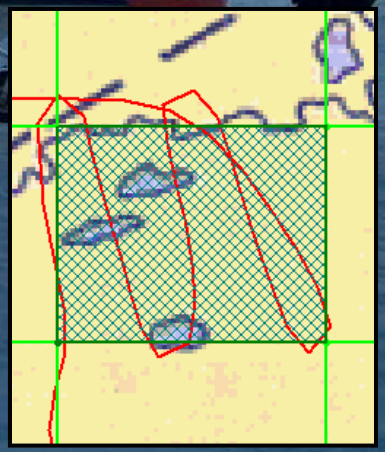
Flying Sample Units

- 2 aircraft were used for the survey; one based out of Wrigley (November 10-15) and the other was based out of Fort Simpson (November 10-16).
- Flight plans were determined to most efficiently cover all of the selected sampling units.
- Used pre-programmed GPS units to locate sample units and track coverage.
- Each selected sampling unit was flown with a Cessna 185 at 100% coverage with the assistance of 1 or 2 local observers.
- Animals were counted, classified (cow, calf, bull) and recorded within each sample unit; we recorded any animals observed between sample units.
- Depending on vegetation and topography some sample units had to be flown at higher coverage.



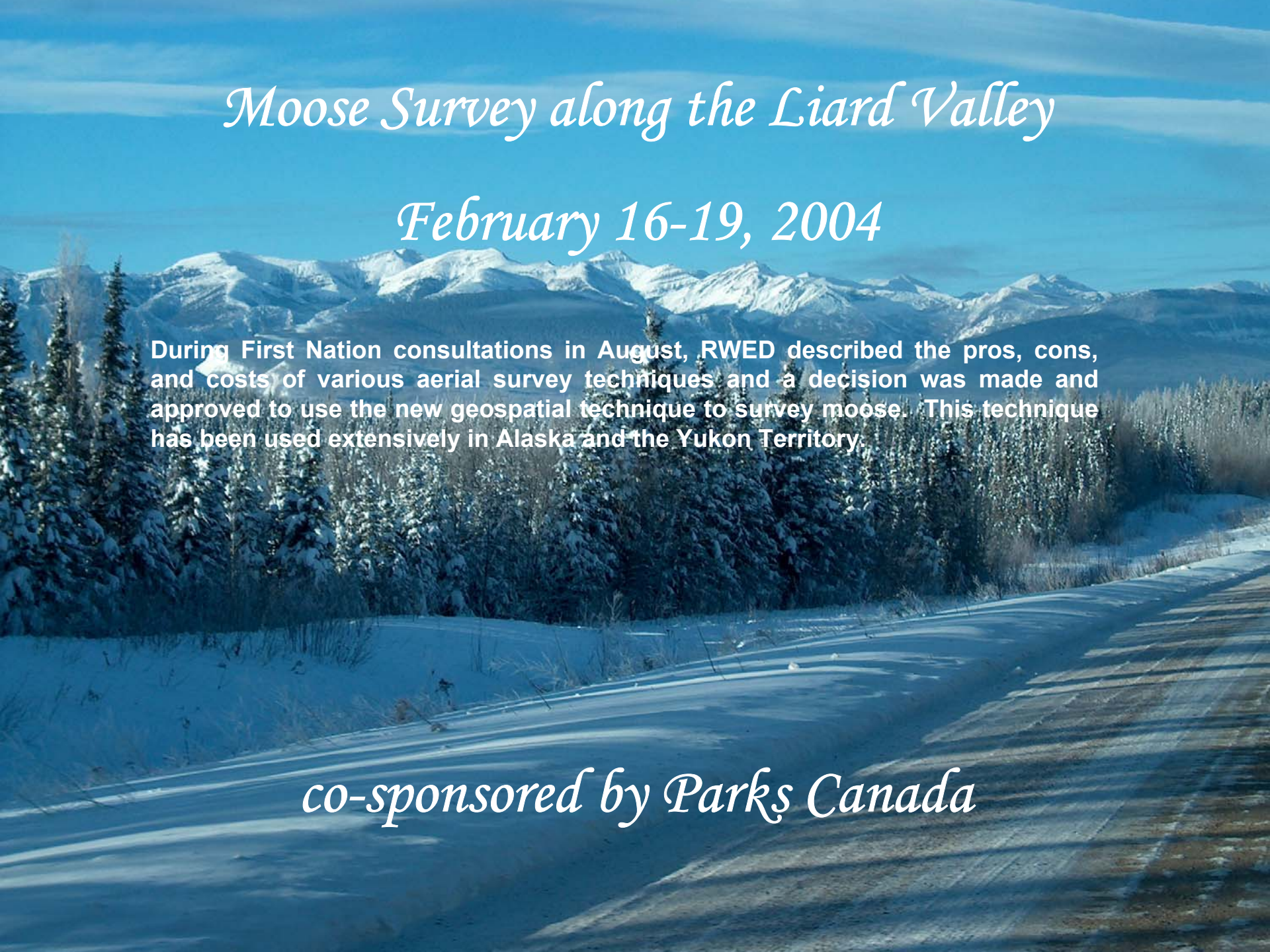
High strata sample unit

Low strata sample unit



Results

- We surveyed 100 sample units of ~16km² (6.9% coverage).
- Late freeze-up resulted in some high density sample units being unfrozen and few moose being found there.
- We saw 140 moose, 51 caribou and 1 wolverine during the survey; 74 moose were observed within the sample units.
- We estimated a density of 4.4 moose/100km² and a calf:cow ratio of 32.1:100 females in the *ca*. 23,300km² Mackenzie Valley survey area.



Moose Survey along the Liard Valley

February 16-19, 2004

During First Nation consultations in August, RWED described the pros, cons, and costs of various aerial survey techniques and a decision was made and approved to use the new geospatial technique to survey moose. This technique has been used extensively in Alaska and the Yukon Territory.

co-sponsored by Parks Canada

Delineate Survey Area

- In October 2003, RWED requested that Ft. Liard Métis, Acho Dene Koe and Nahanni Butte Dene Bands indicate traditional areas they wanted surveyed for moose.
- All the areas indicated were pooled together, digitized and a map was made.
- A grid of ~16km² (2 minutes latitude by 5 minutes longitude) was overlaid to include the entire survey area.
- The map was circulated amongst the First Nations to finalize the survey area.
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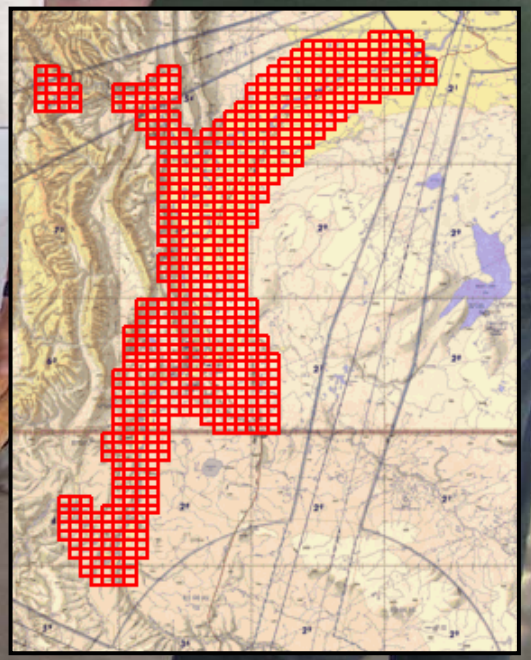


Stratify Sample Units

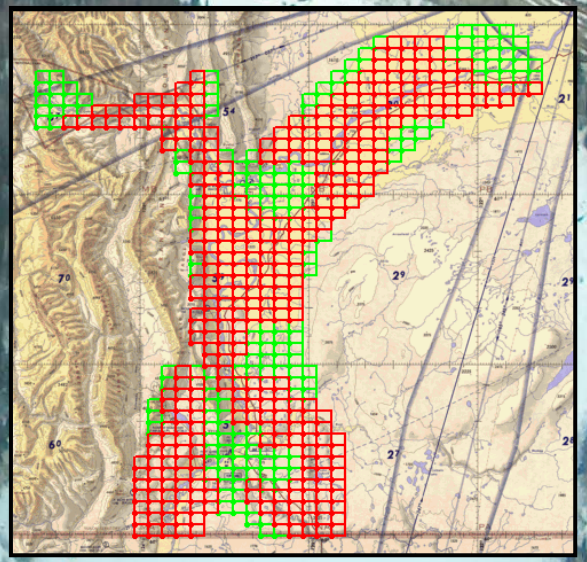
- Consulted with local harvesters from Ft. Liard and Nahanni Butte to partition sample units into high or low expectation of finding moose.

- In areas unfamiliar to local harvesters we used previous survey and habitat data to assist in stratification.

- Tried to keep low strata areas as clean as possible.

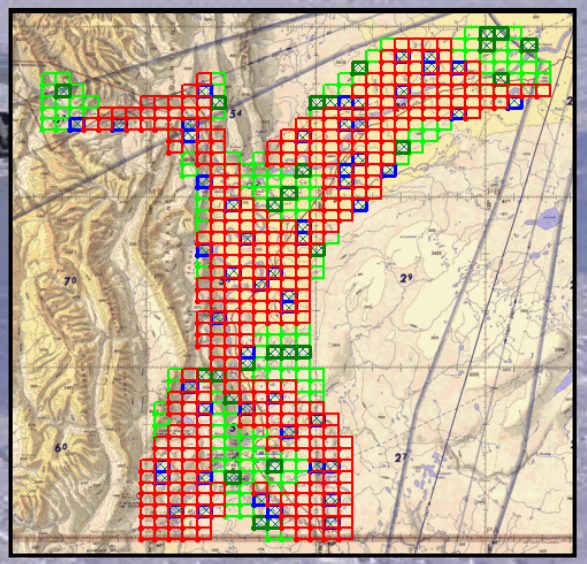
- The area in NE BC south to the Nelson Forks was removed from the survey area at BC's request; the eastern end of Nahanni National Park Reserve was added at the request of Parks Canada.

- Produced a map of the stratification.



Select Sample Units

- Planned to survey 80 of the 569 sample units (13.7% coverage).
- Because almost 40:60 split of low/high strata advised to select 53 high strata and 27 low strata sample units to survey.
- Randomly selected 80% of the units (42 high and 20 low).
- Through consultation with ADF&G personnel chose the remaining units (11 high, 7 low) ensuring that sample units covered entire survey area.
- Produced map of the selected units.



Flying Sample Units

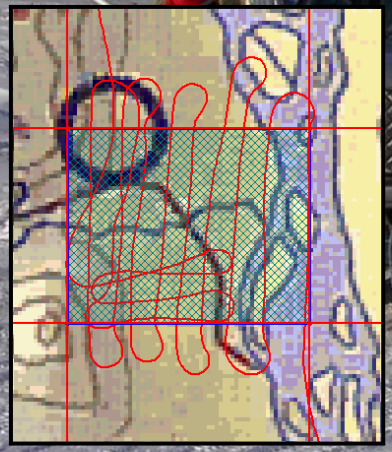
- 2 aircraft were used for the survey; one based out of Fort Liard (February 16-19) and the other was based out of Nahanni Butte (February 16-17).

- Used pre-programmed GPS units to determine flight paths, locate sample units and track coverage.

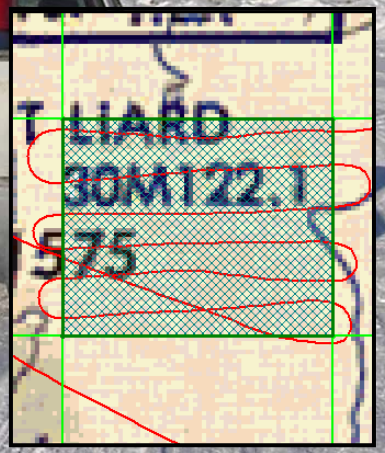
- Each selected sampling unit was flown with a Cessna 185 at 100% coverage with the assistance of 1 local observer.

- Animals were counted, classified (cow, calf, bull) and recorded within each sample unit; we recorded any animals observed between sample units.

- Depending on vegetation and topography some sample units had to be flown at higher coverage.



High strata sample unit



Low strata sample unit

Results

- Because of unforeseen trouble with aircraft and observer air sickness we completed 78 of the 80 planned sample units.

- We saw 90 moose, 53 bison, and 13 boreal caribou during the survey, 65 moose were observed in the sample units.

- We estimated a density of 4.9 moose/100km^2 and a cow:calf ratio of 44.0:100 females in the *ca.* 9600km^2 Liard Valley survey area.

- Because of the difficulty of sexing adults from the air in February the calf:cow may be somewhat high.

- Because we conducted surveys in November and February we could compare surveying conditions.

November

Example of 100 Km²

Trade-offs for surveys in November vs February

- Less daylight in November but animals more active, in larger groups and more open habitats.
- Males have antlers making aerial sex classifications more accurate.
- Late freeze-up may affect results. In future preliminary aerial reconnaissance could assess freeze-up conditions.

February

Fisherman Lake

Example of 100 Km²

Trade-offs for surveys in February vs November

- **February has longer day length, but animals are less active, in smaller groups and found in denser habitats.**
- **Males are antlerless and bells are present on both males and females which makes it difficult to accurately classify the sex of adults; this will inflate cow:calf ratios.**

Stable Moose Populations?

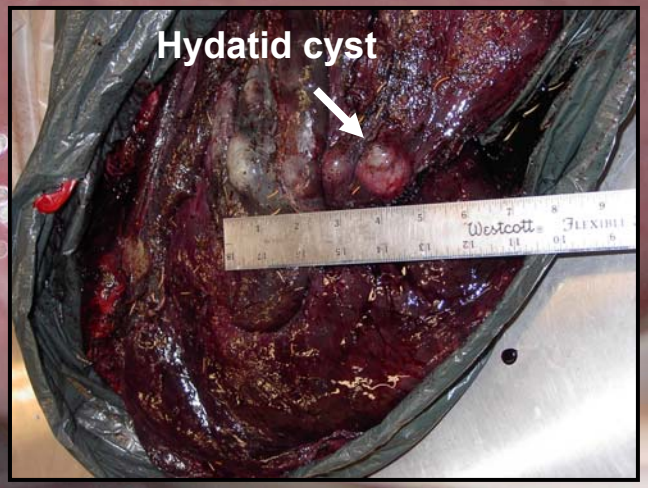
- Densities of 4.4 and 4.9 moose/100km^2 are higher than those of 4.0 and 2.9 reported in areas adjacent to the north arm of Great Slave Lake but are lower than the 7-8/100km^2 estimated across northern Canada.

- Surveys occurred after major fall moose harvest which may make up for the difference; accurate harvest data would be required to assess this.

- Calf:cow ratios < 30:100 indicate the potential for population decline; we reported 32.1 and 44.6:100 but again this is after the harvest so our values could be inflated.

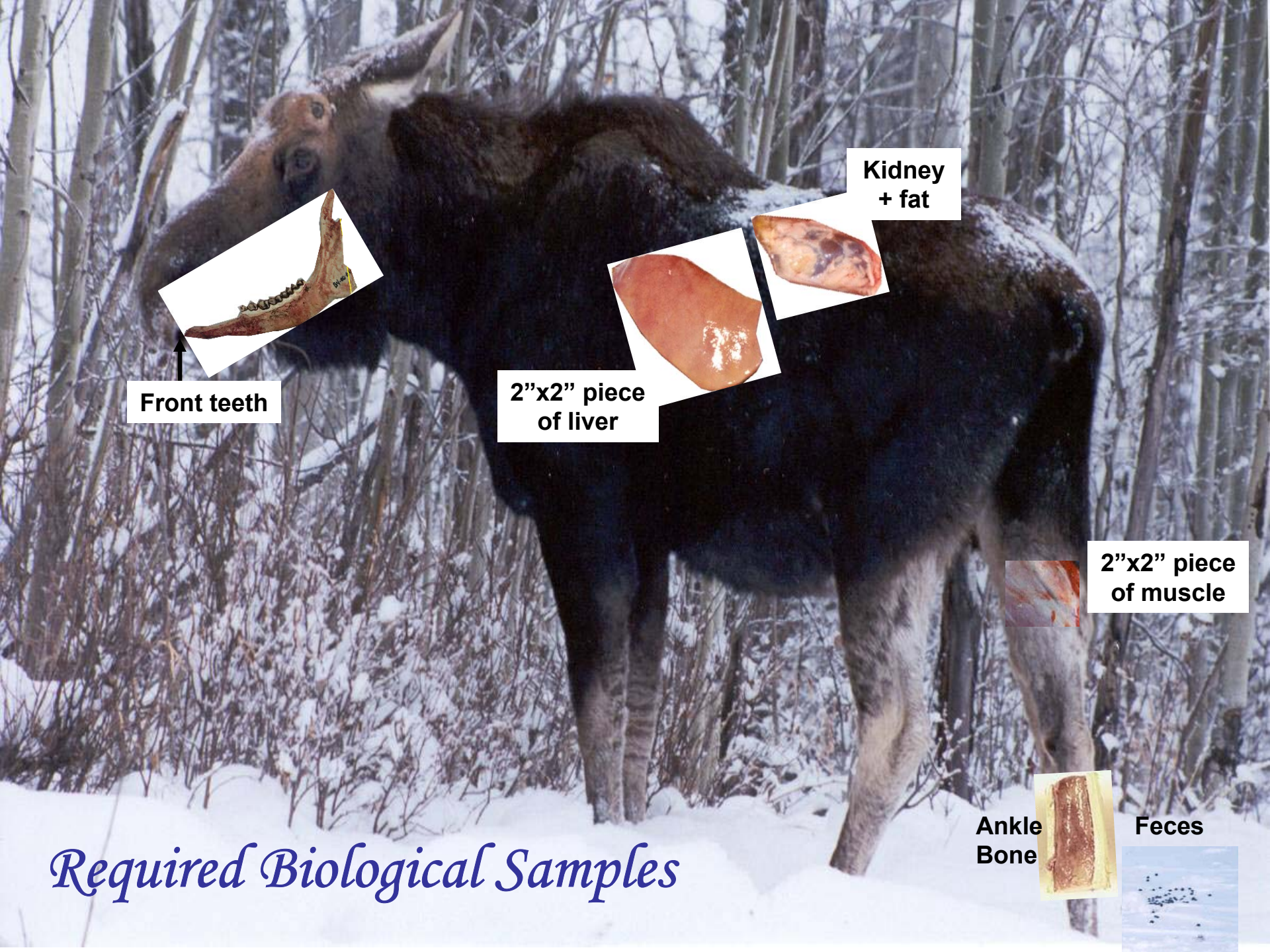
Biological Samples

- **RWED accepts a variety of biological samples from harvested moose; most are submitted to diagnose abnormalities.**
- **Samples are forwarded to the Western College of Veterinary Medicine if diagnoses cannot be made locally, or if confirmation is requested; teeth are forwarded for aging.**
- **Moose warts (papillomas) and hydatid tapeworm cysts have been diagnosed in the region; these are common moose afflictions.**
- **Observations of "ghost" moose, a condition caused by ticks, have been rare in this region.**



Monitoring Moose Population & Health

- **This was a topic of discussion at Wildlife Workshop, 2002, and has subsequently been discussed at meetings in Wrigley, Fort Simpson, Jean Marie River, Nahanni Butte, and Fort Liard.**
- **RWED proposes to begin annual monitoring of moose density, distribution and cow:calf ratios during winter in the Mackenzie and Liard Valleys, by conducting annual small scale aerial surveys from each community; the same blocks used in the 2003-04 geospatial surveys will be used for the monitoring program.**
- **RWED also proposes to collect biological samples from 5 harvested moose from each First Nation in these communities; local harvesters will be reimbursed for providing these samples.**
- **The Wildlife Research Permit Application for this proposal has been approved by PKFN, JMRFN, LKFN and the Fort Simpson Métis.**



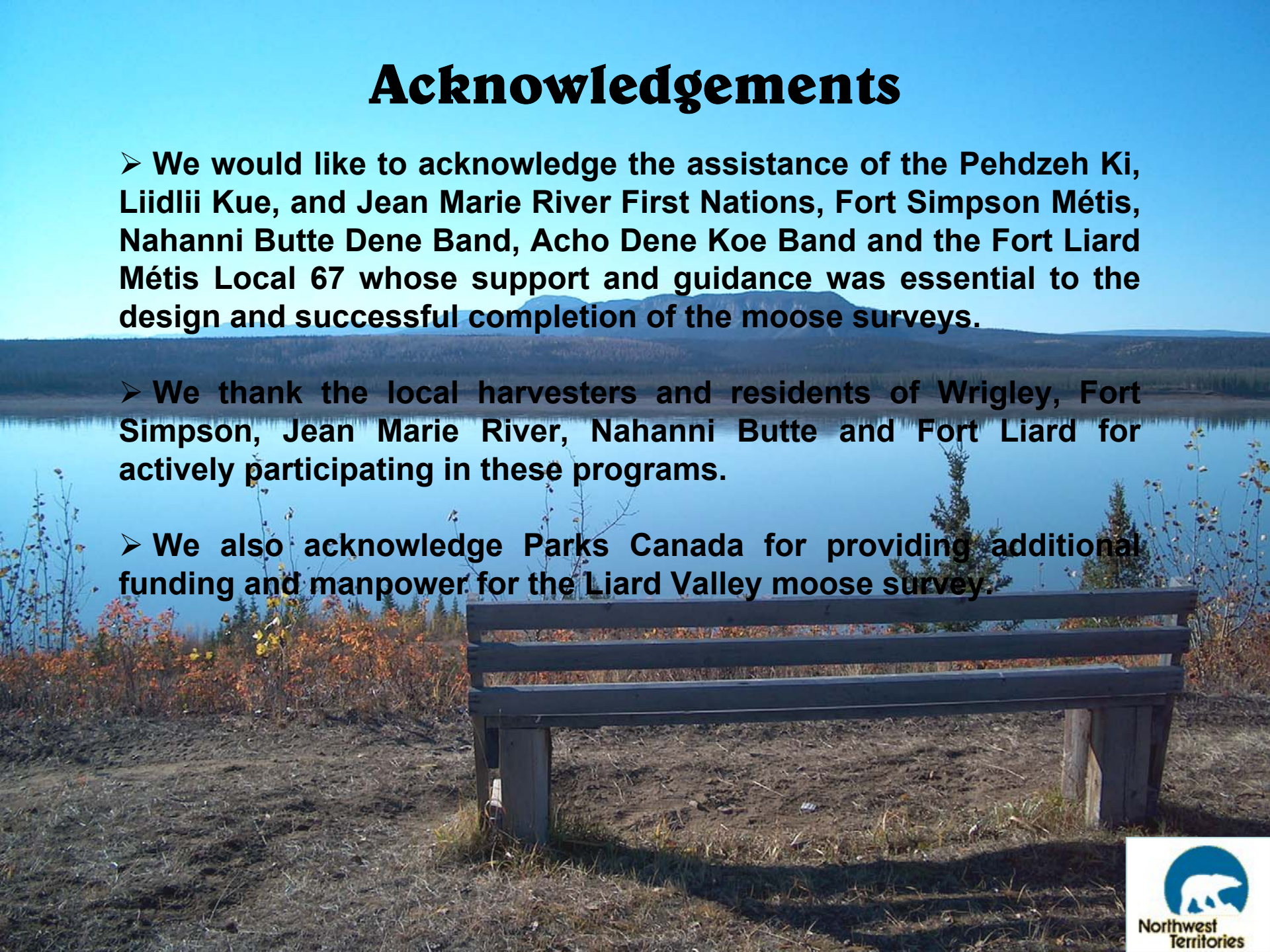
Required Biological Samples

Acknowledgements

- We would like to acknowledge the assistance of the Pehdzeh Ki, Liidlii Kue, and Jean Marie River First Nations, Fort Simpson Métis, Nahanni Butte Dene Band, Acho Dene Koe Band and the Fort Liard Métis Local 67 whose support and guidance was essential to the design and successful completion of the moose surveys.

- We thank the local harvesters and residents of Wrigley, Fort Simpson, Jean Marie River, Nahanni Butte and Fort Liard for actively participating in these programs.

- We also acknowledge Parks Canada for providing additional funding and manpower for the Liard Valley moose survey.



Northwest Territories