



Bipole III- Manitoba Hydro

MOOSE



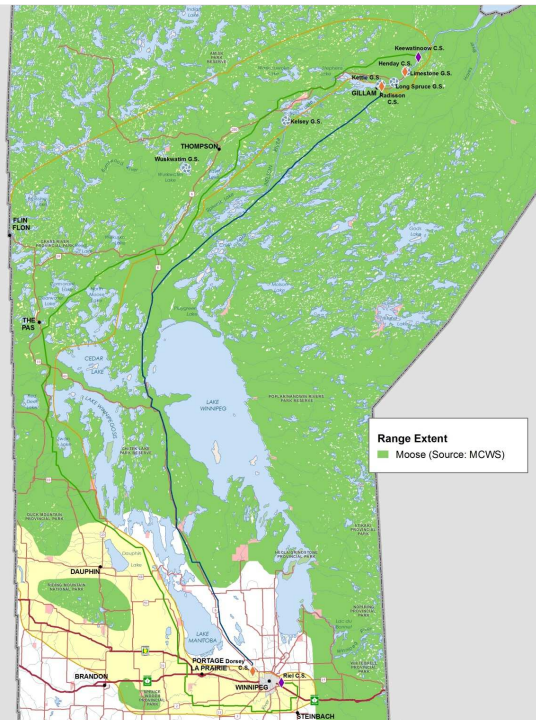
Outline

- Moose as a VEC
- Life history of moose
- Overview of moose management
- Alternate route evaluation
- Evaluation of the FPR
- Conclusions

Moose as a VEC

- Moose are important for rights-based and recreational hunting
- Important to First Nations and Metis for personal and community sustenance and cultural enhancement
- Important ecological role
 - Moose habitat reflects habitat needs for 80% of boreal forest wildlife

- Moose range in Manitoba



Moose

- Variety of habitat requirements over their home range (10-40 km² +)
 - Winter and summer cover
 - Winter and summer food (aquatics)
 - Reproductive
 - Important sites (mineral licks)



Moose

- Winter and summer cover
 - Dense coniferous and deciduous forest providing protection from elements and predators for escape
 - Late winter cover important
 - Lowlands/wetlands important during summer
- Winter and summer food (aquatics)
- Reproductive
- Important sites (mineral licks)

Moose

- Winter and summer cover
- Winter and summer food (aquatics)
 - Young deciduous and mixed forest providing high quality and abundant browse – aspen, willow, hazel, dogwood, maple etc.
 - Aquatic feeding areas important for lactation, antler growth, building reserves for winter, cooling and relief from insects
- Reproductive
- Important sites (mineral licks)

Moose

- Winter and summer cover
- Winter and summer food (aquatics)
- Reproductive
 - Dense habitat with escape routes, islands and peninsulas important, bogs, wetlands
- Important sites (mineral licks)

Moose

- Winter and summer cover
- Winter and summer food (aquatics)
- Reproductive
- Important sites (mineral licks)
 - Where found, used extensively to supplement mineral needs of moose and other ungulates

Factors affecting moose populations

- Habitat
- Hunting
- Predation
- Weather
- Disease and parasites

Factors affecting moose populations

- Habitat
 - Interspersion of food and cover (proximity)
 - Quality and abundance of browse
 - Prefer disturbed habitats, respond to new growth from fires and forest harvest and renewal
 - Response from forest fire can last 20 + years then habitat degrades
 - Mature mixed forests (white spruce/aspen) with riparian areas offer long lived high quality year round habitat (shrub associations)
- Hunting
- Predation
- Weather
- Disease and parasites

Factors affecting moose populations

- Habitat
- Hunting
 - Moose population response to harvest (hunting) can be positive and negative
 - Bull only, calf/bull
 - Any moose
 - Licensed hunters – historical regulation
 - Rights Based – unregulated - closures
 - Access density across moose range linked to decline
- Predation
- Weather
- Disease and parasites

Factors affecting moose populations

- Habitat
- Hunting
- Predation
 - Predation can affect adult and calf survival
 - In combination with high hunting pressure can further impact populations
 - Habitat fragmentation can increase predation (access, size of patches, distance to cover)
 - Unknown to extent predation affecting populations in Manitoba
 - Predation by wolves and bears (calves) can also result in low calf recruitment
- Weather
- Disease and parasites

Factors affecting moose populations

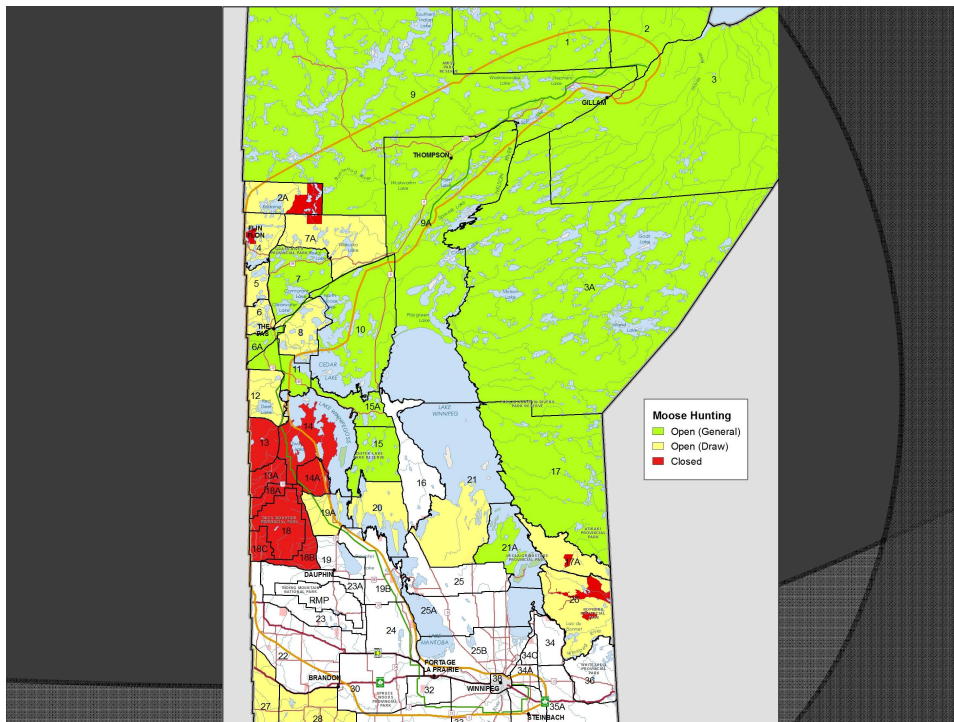
- Habitat
- Hunting
- Predation
- Weather
 - Snow accumulations can alter habitat availability and vulnerability to predators
- Disease and parasites

Factors affecting moose populations

- Habitat
- Hunting
- Predation
- Weather
- Disease and parasites
 - MCWS has not had reports of brainworm or CWD in western Mb.
 - Giant liver fluke
 - Winter ticks

MCWS Moose Management

- Manitoba Conservation (MCWS) is the responsible authority on moose management and hunting
 - Manitoba allocation policy,
 - Conservation
 - Rights based hunting
 - Residents
 - Non residents - outfitters
 - Forest management guidelines used to increase benefit.

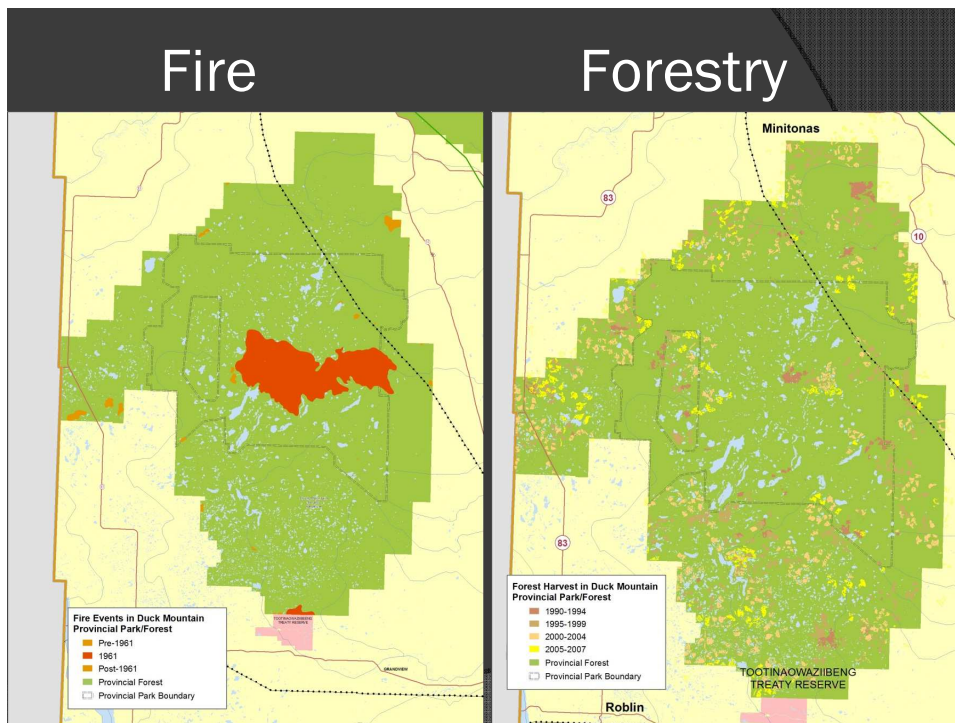


MCWS Moose Management

- Conduct moose surveys periodically
- Consultation with Rights-Based Communities on moose hunting closures
 - GHAs 13, 13A, 14, 14A, 18, 18A, 18B and 18C have been temporarily closed to rights-based-hunting
- Enforcement
 - Addition of two new natural resource officers
 - Increased signage indicating hunting closures
- Wolf Management
 - Extended seasons province wide
 - Increased bag limits in some GHAs
 - Trapper incentives
 - Conducting wolf surveys

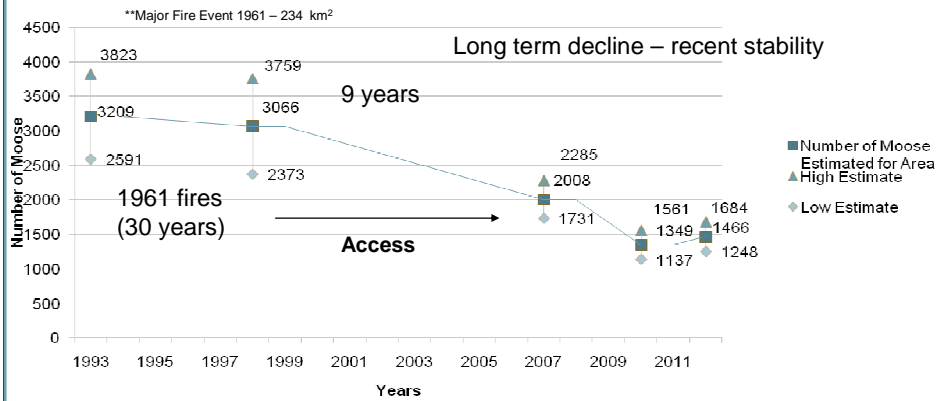
MCWS Moose Management

- Access Control
 - Restricting access and closing roads,
- Established various advisory committees
 - Developing long term moose recovery strategies with rights based hunters and Stakeholders.



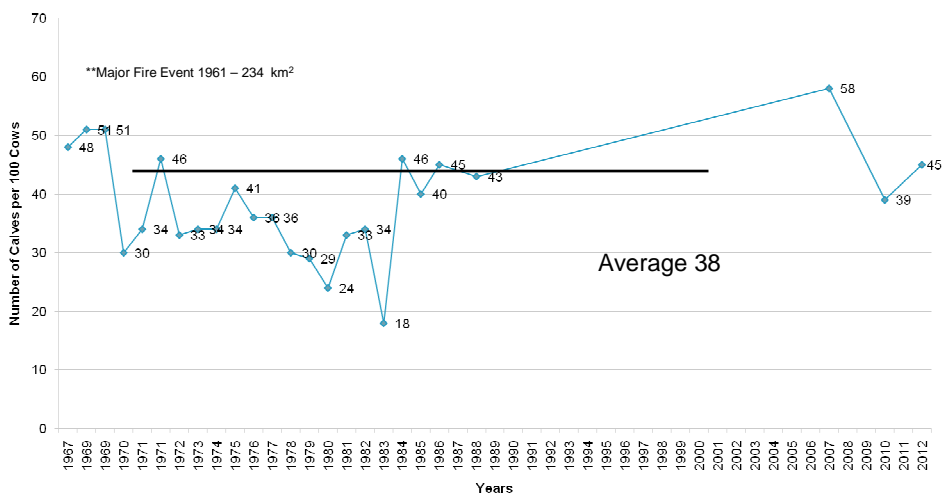
Historical Data: Duck Mountains Provincial Park

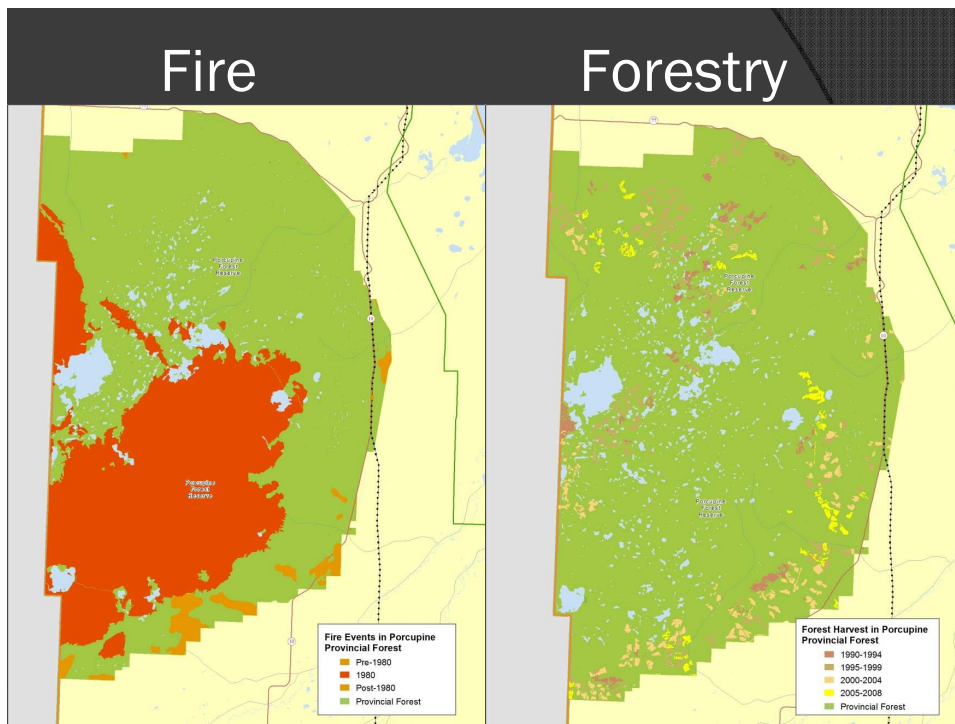
Historical Moose Population Estimates for Duck Mountain Provincial Park



Historical Data: Duck Mountains Provincial Park

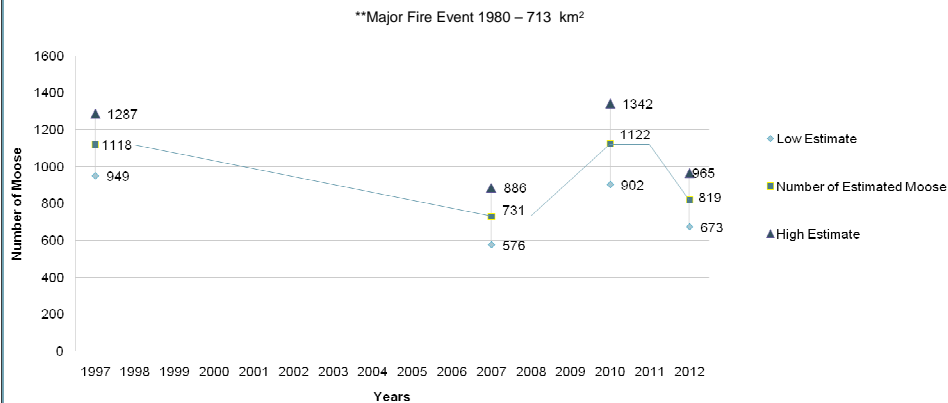
Historical Calves per 100 cows in Duck Mountains Provincial Park





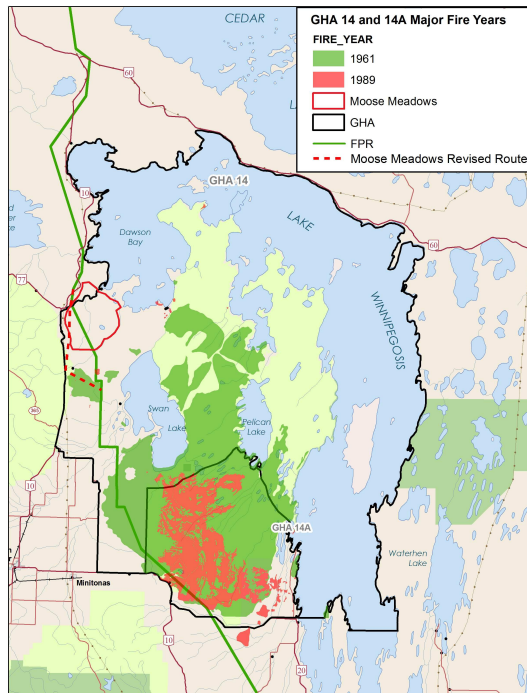
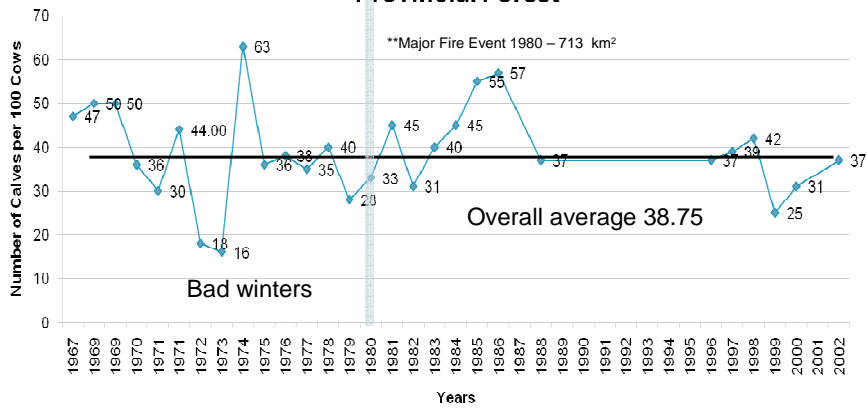
Historical Data: Porcupine Mountains Provincial Forest

Historical Moose population estimates for Porcupine Mountains Provincial Forest



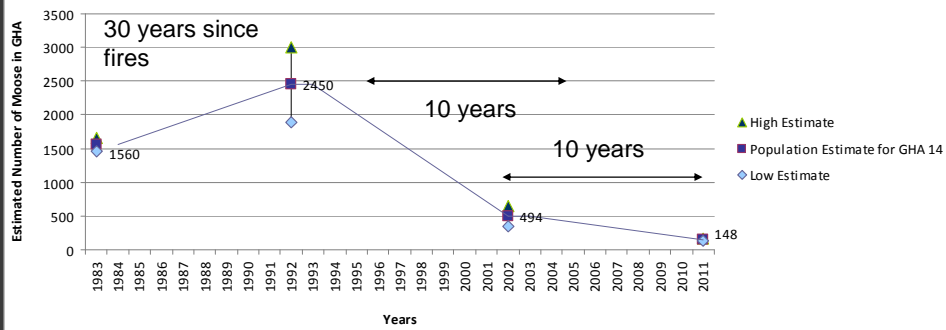
Historical Data: Porcupine Mountains Provincial Forest

Historical Calves per 100 cows in Porcupine Mountains Provincial Forest



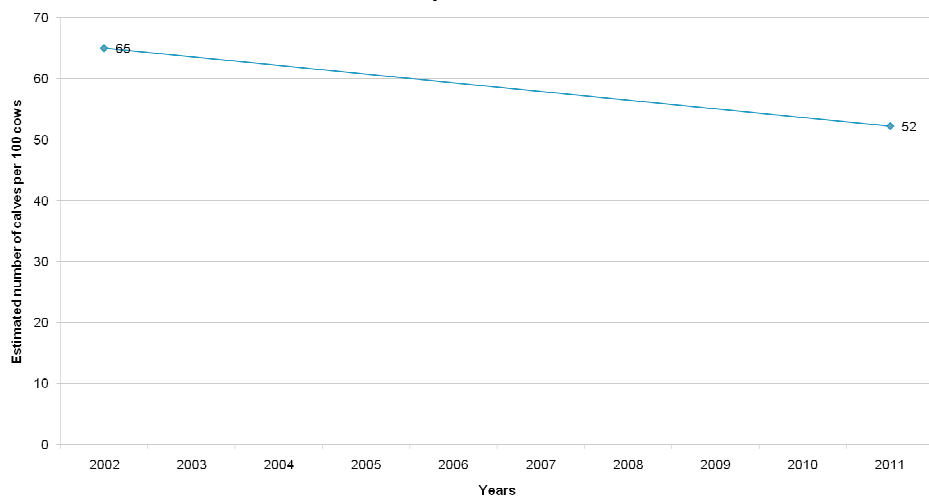
Historical Data: GHA 14

Historical moose population estimates for GHA 14

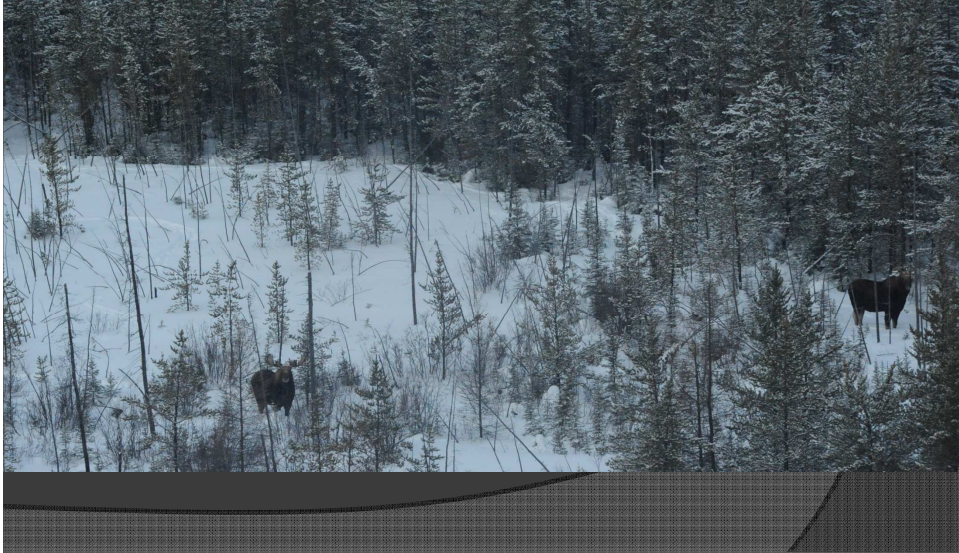


Historical Data: GHA 14

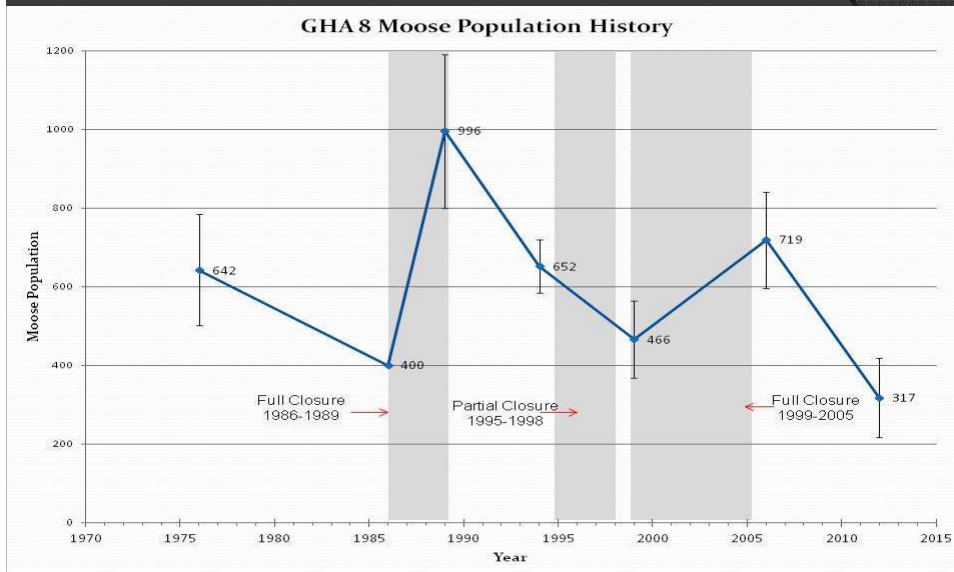
Historical calves per 100 cows in GHA 14



Moose response to Management

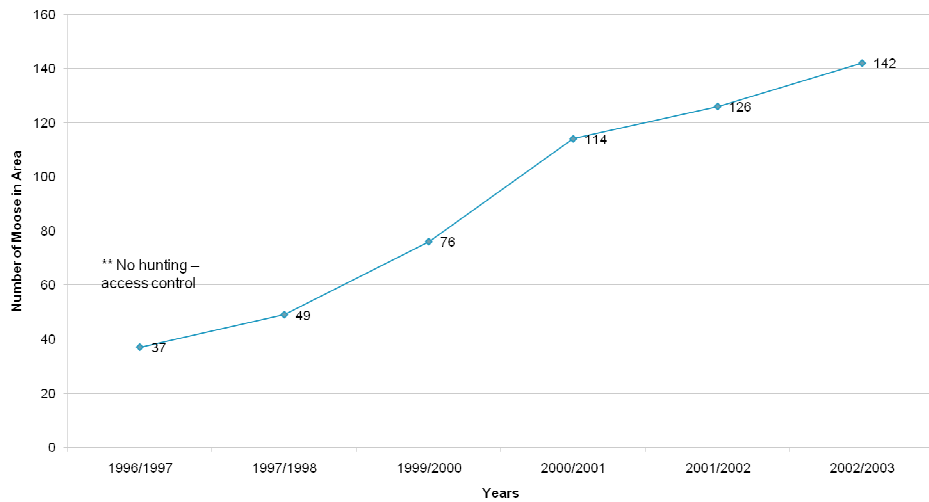


Voluntary Closures GHA 8 The Pas

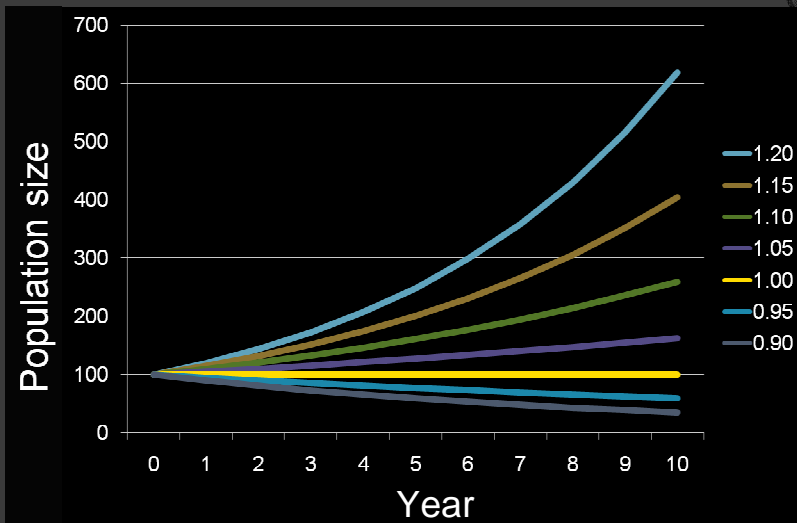


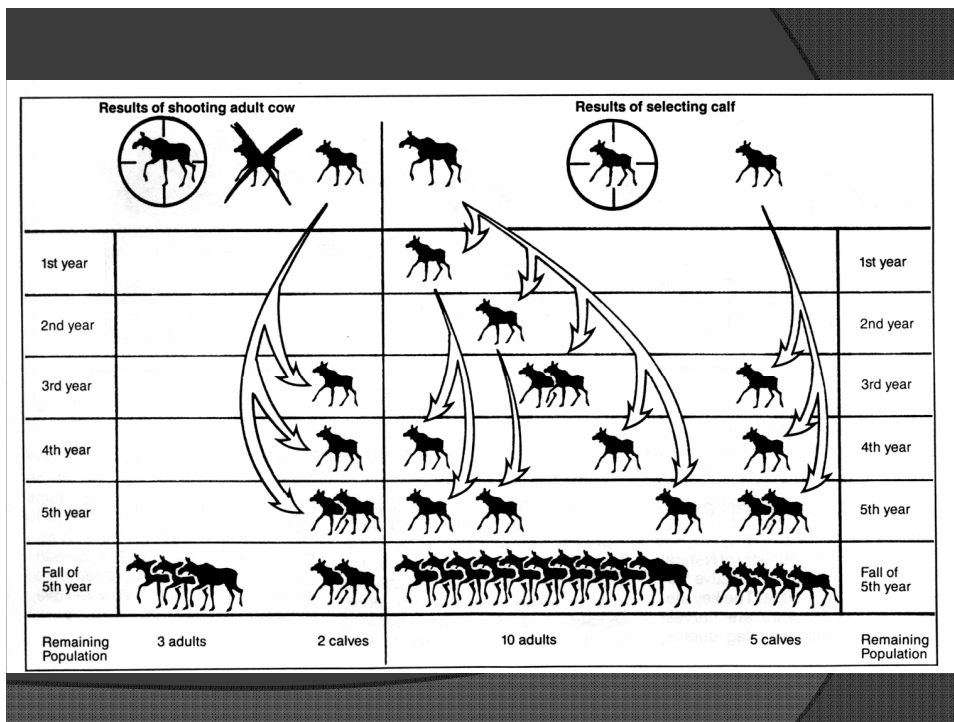
Hunting and Access Closures Happy Lake – Eastern Manitoba

Historical Moose Population Estimate for Happy Lake



Potential population growth at various rates





Summary

- Moose have large home ranges compared to area impacted by BP/III ROW
- Many components to moose habitat
- Moose responded to disturbance

Summary

- 5 year increase in Duck Mountain moose population – Decline from 20 year high
- Slight decrease Porcupine moose population – slightly lower than 20 year high
- Cow calf ratios are within historic averages
 - Suggests females in good condition
 - Adequate number of bulls
 - Demonstrates potential for quick population response if hunting closures are successful

Summary Continued

- GHA 14 – 14-A - 20 year declining trend
- Recent MCWS identification of critical nature of concerns for this area.
- Re-routing has occurred in this area (to be discussed in the following sections)

Bipole III – Potential Effects Used in the Evaluation of Alternative Routes

- Habitat Loss
 - Sensory disturbance/fragmentation
- Hunting - Access overharvest
- Predation
- Increase in Parasites and disease

Evaluation of Alternative Routes

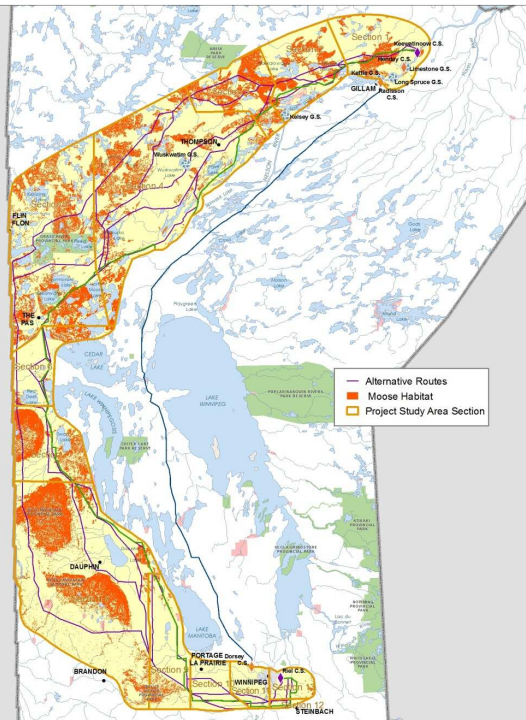
- Field data
- Desktop studies
 - Literature
 - Government information
 - Habitat modeling
- Aerial Surveys

Evaluation of Alternate Routes

- Habitat Loss
- Habitat Modeling
 - High quality winter habitat availability within ecodistricts to determine if habitat was constraining or limiting.
 - Winter most critical (access and hunting concerns)
 - Modelled habitat, in 3 mile Local Study Area, assisted in determining potential environmental effects and focus mitigation efforts

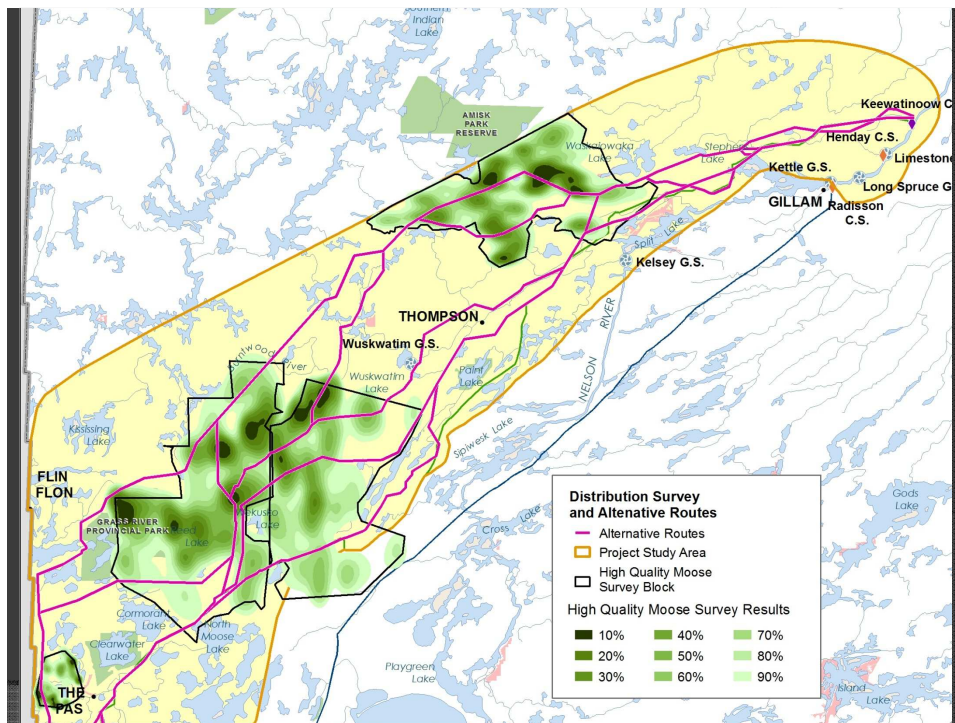
Evaluation of Alternate Routes

- Modeling High Quality Habitat



Evaluation of Alternate Routes

- Aerial Surveys – To identify routes and segments of concern.
- Northern Project Study Area High Quality Moose Habitat and Winter Aerial Survey Areas:
- South of Red Deer Lake, known information regarding the importance of the Duck Mountains, Porcupine Hills and GHA 14.
 - Intensive surveys for boreal woodland caribou conducted in 2010 and 2011 in GHA 14 (few moose observed).



Evaluation of Alternate Routes

- Routing Considerations
 - Minimize effects through avoidance
 - Parallel existing features where possible
 - Avoid core/ high quality habitat areas
 - Avoid known wintering areas

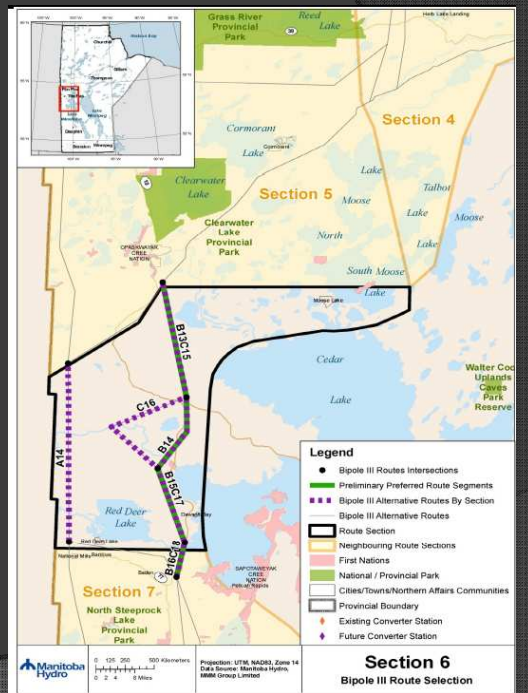


Assessment of Alternate Routes

- Ranking of the different sections
 - Route Selection Matrix (RMS) assessed the 13 sections using 27 factors and gave a rank of High, Medium or Low (in some cases, Very High also applied)
 - Moose incorporated into overall Mammal ranking

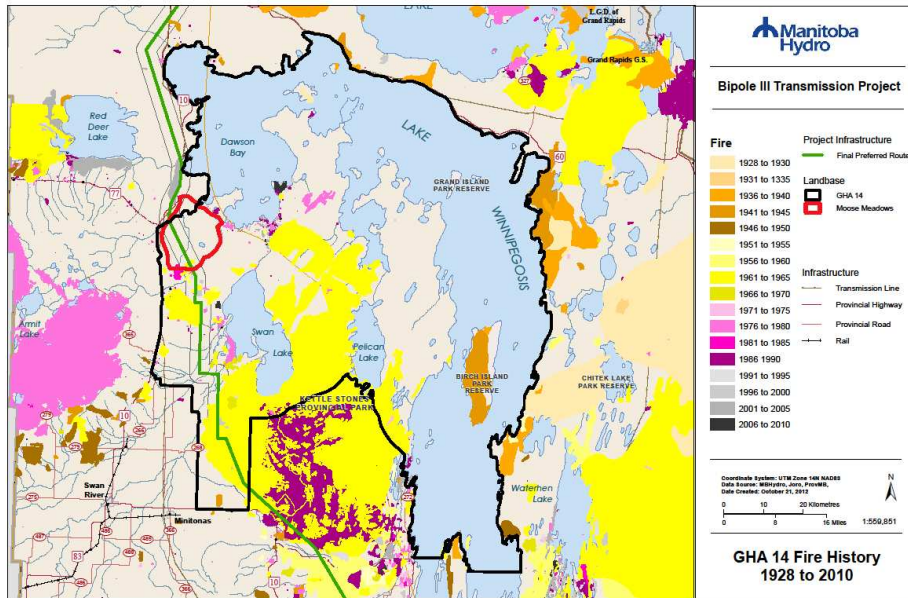
- E.g.) Overall Section 6 was ranked medium for 5/6 segments within the mammals component

| SECTION | SEGMENT | Vegetation | Forestry | Birds | Mammals |
|---------|---------|------------|----------|-------|---------|
| 6 | A14 | M | L | L | M |
| 6 | B14 | M | L | L | M |
| 6 | B13C15 | M | L | L | M |
| 6 | B15C17 | M | M | L | M |
| 6 | B16C18 | M | M | L | L |
| 6 | C16 | M | M | L | M |

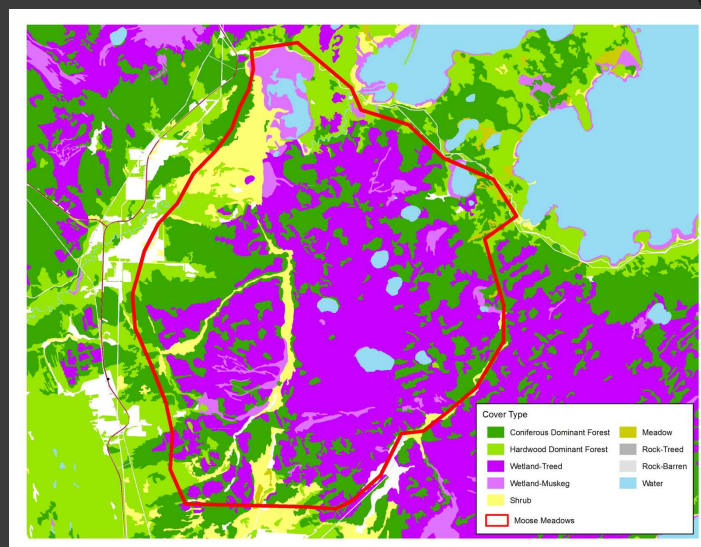


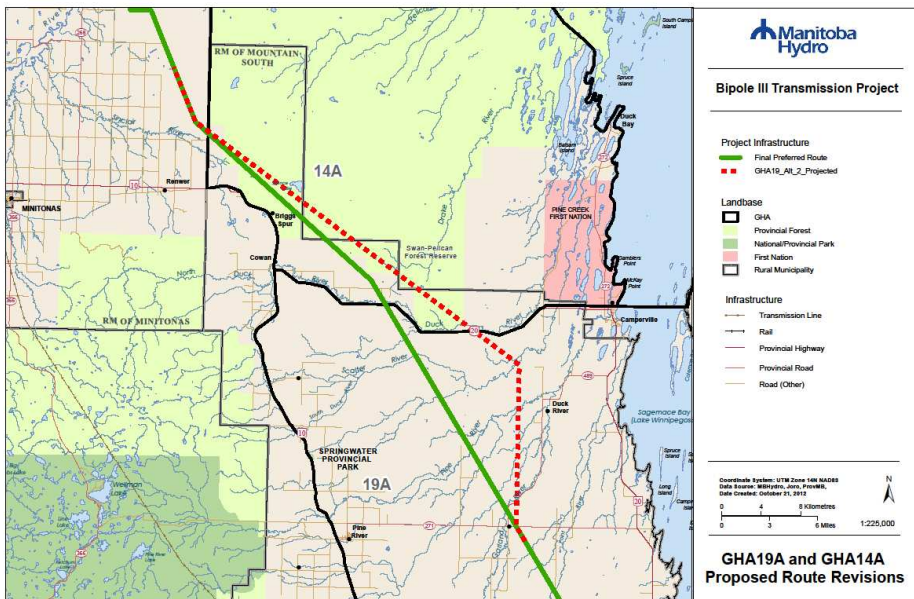
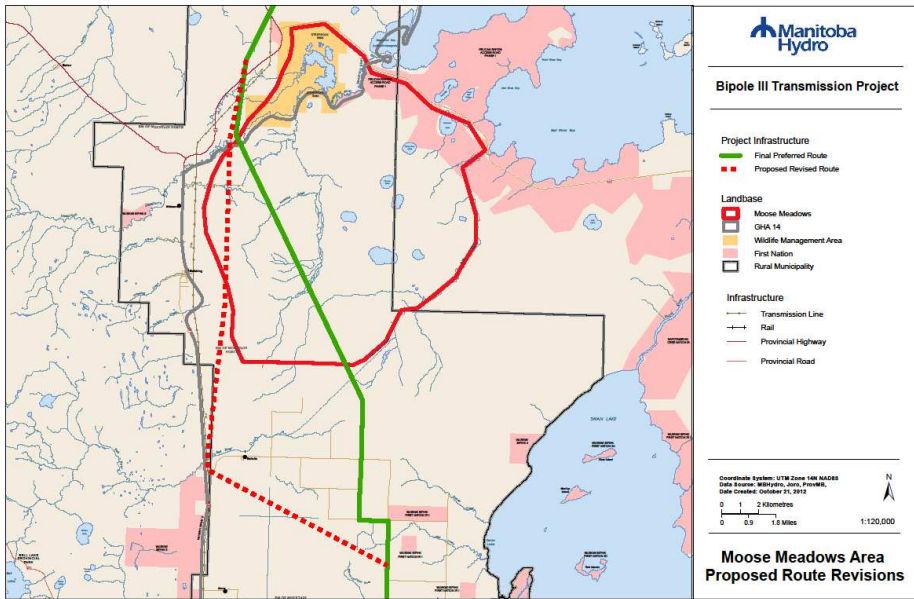
Evaluation of the FPR

- Amount of habitat alteration small in comparison to availability
- Moose Model
 - The Study Area contains 1,099km² of high quality moose habitat
 - Only 22km² (<2%) would be affected
- Moose Meadows (GHA 14/Section 7)
 - This route avoids high moose populations in the Porcupine Provincial Forest
 - As of August 31, 2012, changes to the FPR have been suggested by EAB for sections in GHA 14A and 19A.
 - New routes developed in cooperation with MCWS in these areas



Moose Meadows





Evaluation of the FPR

- Routing provided overall mitigation through avoidance (The Pas, Snow Lake, Limestone Lake)
- Parallels existing linear features
- Minimized amount of un-fragmented habitat

Evaluation of the FPR

- Habitat Loss
 - Based on the total life requirement area for moose, the FPR represents a small amount of potentially affected habitat
 - Habitat is not lost but altered and kept at an early stage of development. Will be converted from “cover” to “food”
 - Protection of riparian areas will not result in any alteration to these habitats
 - PSA 1,099 km² high quality habitat – FPR only 2% of this

Evaluation of the FPR

- Sensory Disturbance
 - During construction (winter) moose may be displaced temporarily
 - Higher energy costs to moose as a result of displacement (minor)
 - Displaced into poorer habitats (not expected) as habitat not limiting

Evaluation of the FPR

- Increased harvest of moose outside of closed areas due to hunting closures
 - Red-Deer Lake to The Pas FPR parallels existing access
 - Parallels Wuskwatim transmission Line – Rail Line
 - Increased pressure on moose in adjacent areas due to hunting closures will have little effect as areas are currently accessible

Evaluation of the FPR

- Effects of increased predation as a result of linear development
 - Limited evidence in literature of increased predator effects as a result of transmission line ROW:
 - Wolf use of linear corridors
 - Evidence from wolf collaring (preference for young forest and water (frozen lakes and rivers))

Evaluation of the FPR

- Parasites and disease
 - WT deer abundant south of Red Deer Lake
 - Habitat limiting for deer north of Red Deer Lake
 - FPR follows existing disturbance corridors
 - No reports from MCWS of Brainworm in moose or elk in western Manitoba

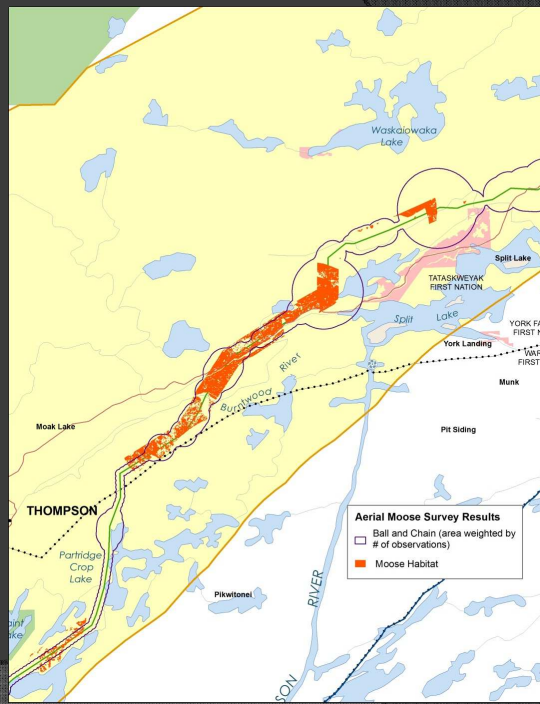
Incorporation of ATK

- Much overlap of traditional areas, broad delineations of moose use areas
- Information supports parameters for modeling
- Importance of moose evident throughout project area
- North populations are healthy
- Western populations of concern

Mitigation

- The majority of negative effects on moose habitat and populations in the Project Study Area was mitigated during the planning and routing process;
- Access management
- Avoid critical calving/parturition periods;
- Riparian management;
- Establish buffers around mineral licks; and
- Natural regeneration providing forage in ROW.

- Environmental Protection Planning
 - Example of relative moose density and high quality habitat along FPR to focus riparian management other potential prescriptions

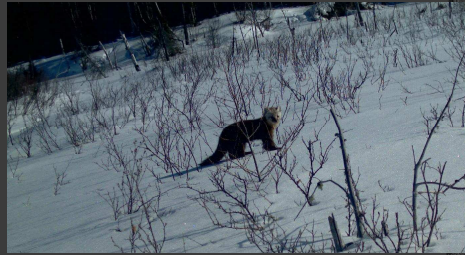


Cumulative Effects

- Recognition of other projects, now and into the future
 - Forestry, mining, hydro transmission and generation, roads
- Additional habitat alteration and minor loss.
- Access and hunting closures
- Requires monitoring

Effects of route changes on other species

- Revised routes in Wabowden, GHA 14 and 19 assessed
- Conclusions of EIS have not changed



Conclusions

- Moose habitat requirements are diverse (winter, summer, calving, aquatics, mineral licks)
- Large home ranges compared to FPR
- Young forest
- Disturbed and fragmented areas preferred



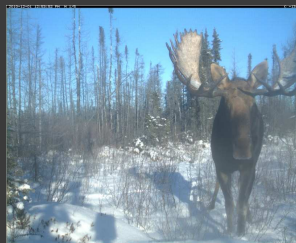
Conclusions

- The area of the ROW is a small part of the annual life cycle requirement
- Moose will forage near and on ROW's
- Summer use less concern
- FPR avoided known important wintering areas
- New info from MCWS being used in re-routing (Moose Meadows)



Conclusions

- Effects from increased hunting not expected due to FPR paralleling existing linear development where access already exists



Conclusions

- Predicted residual effects are based on results of studies, proposed mitigation, monitoring and adaptive management.
- Residual effects considered not significant.



Questions