Consideration for Moose Management in Ontario

Northern Ontario First Nations Environmental Conference

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Purpose

- Factors Affecting Moose Populations – Overview
- A look at Carrying Capacity and Habitat
- Effects of Climate Change
- Parasites and Diseases
- Predation
- Harvest
- Setting Population Objectives

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Overview of Factors Affecting Moose Populations

Climate

Hunting

Predators

Competitors

Parasites, Disease

Biological Characteristics

Accidents

Habitat

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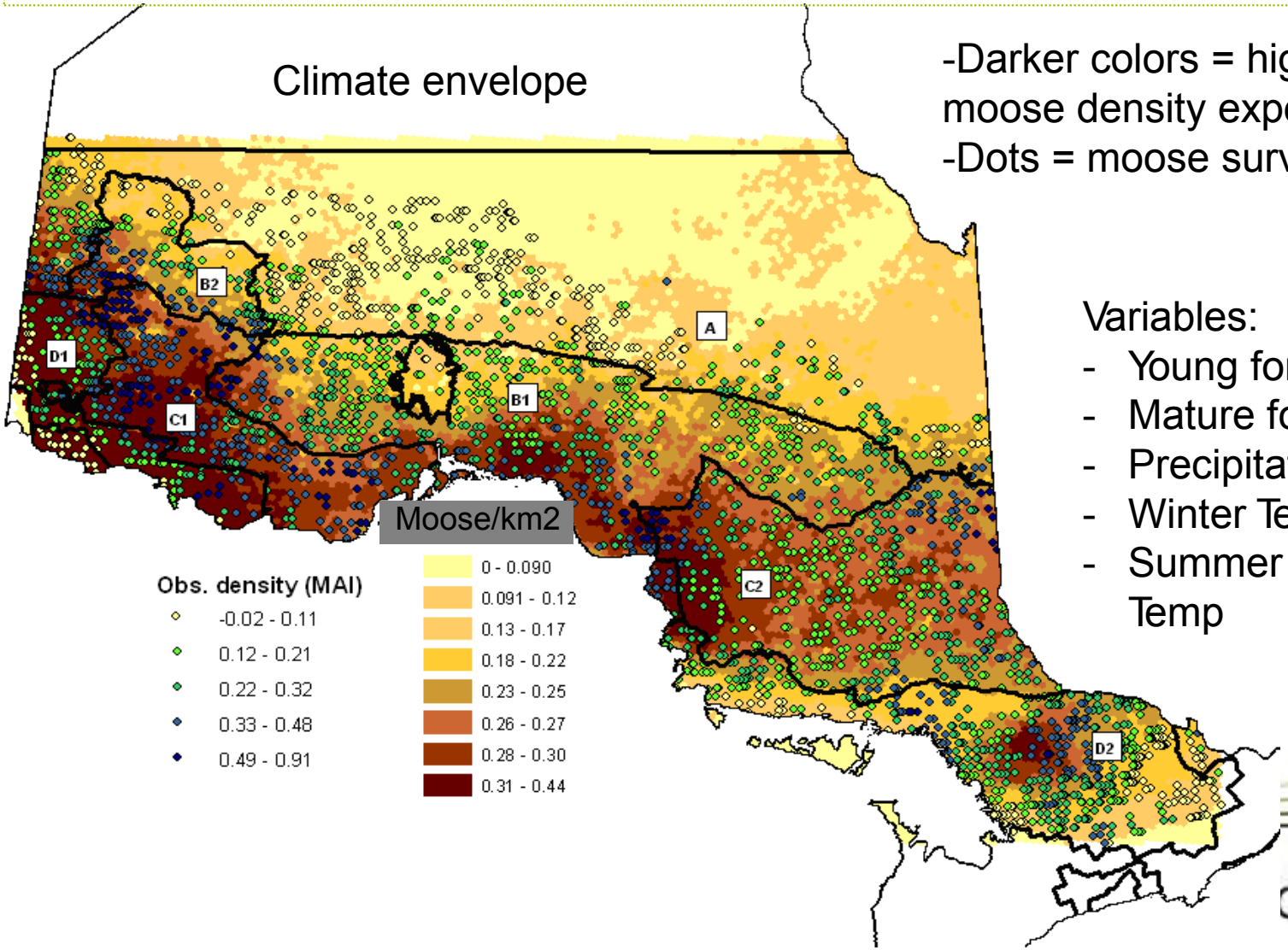
Model of Environmental Carrying Capacity



-Darker colors = higher moose density expected
-Dots = moose survey plots

Variables:
- Young forest
- Mature forest
- Precipitation
- Winter Temp
- Summer Temp

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Forestry and Moose Habitat Management

- Crown land licensed for forestry (Area of the Undertaking) and moose range almost completely overlap (except for far north, extreme south)

- Moose habitat management ≈ forest management

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Climate Change

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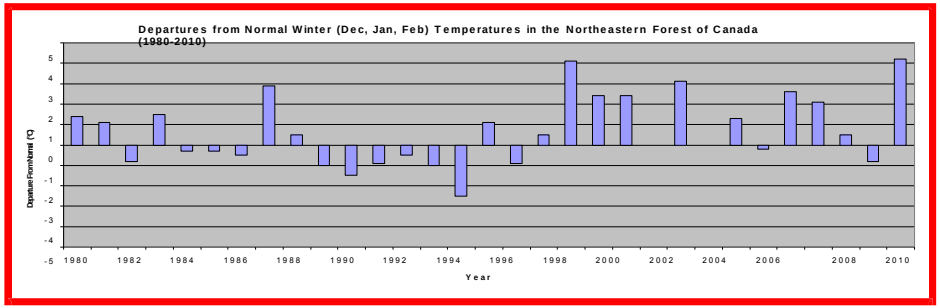
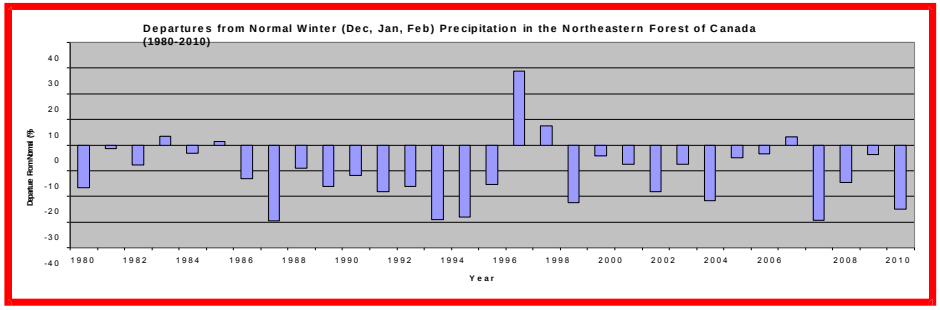
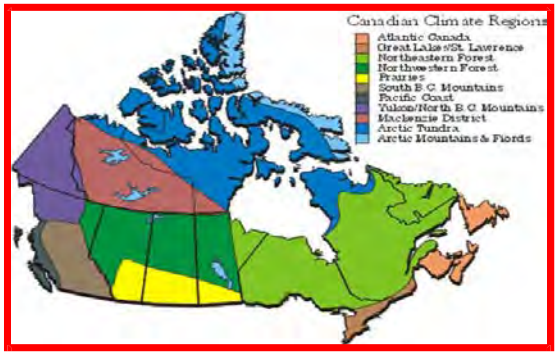
Climate Change Effects on Moose

In the Boreal Forest of Northeastern Canada since 1997 there have been:

- at least 10 winters with warmer than normal temperatures
- at least 12 winters with less than normal precipitation







Source: Environment Canada Climate Trends and Variations Bulletin – http://www.ec.gc.ca/adsc-cmda/default.asp?lang=En&n=4A21B114-1

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Climate Change – Potential Effects on Moose

- Extended periods of high temperatures and heat stress may reduce feeding, leading to:
  - insufficient fat reserves for winter
  - insufficient quality or quantity of milk for calves – implications for body size and fat reserves for winter

- Warmer and more variable early fall temperatures leading to asynchrony of bulls and cows during the rut, leading to:
  - lower calf production
  - increased risk of overharvest if rut and hunt aren't properly timed

- Increased occurrence of extreme weather such as freezing rain leading to increased risk of hypothermia

- Warmer temperatures, particularly in fall & later winter, could result in increased infestation by winter ticks

Photo: M. Lankester

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Parasites, Disease

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Parasites, Disease

Brain worm (meningeal worm) – *Parelaphostrongylus tenuis*

- Moose are dead-end hosts in which worms rarely mature to produce larvae, and therefore don't pass the parasite on to other moose

Liver fluke – *Fascioloides magna*

- Abundance in moose related to deer densities

Winter tick – *Dermacentor albipictus*

- Moose are the primary host and ticks are common to all moose populations except in the far north of Canada, Alaska and Newfoundland

Other commonly observed parasites/diseases in Ontario moose

- Skin tumours/warts (fibromas)
- Hydatid cysts
- "Moose measles"

Predation

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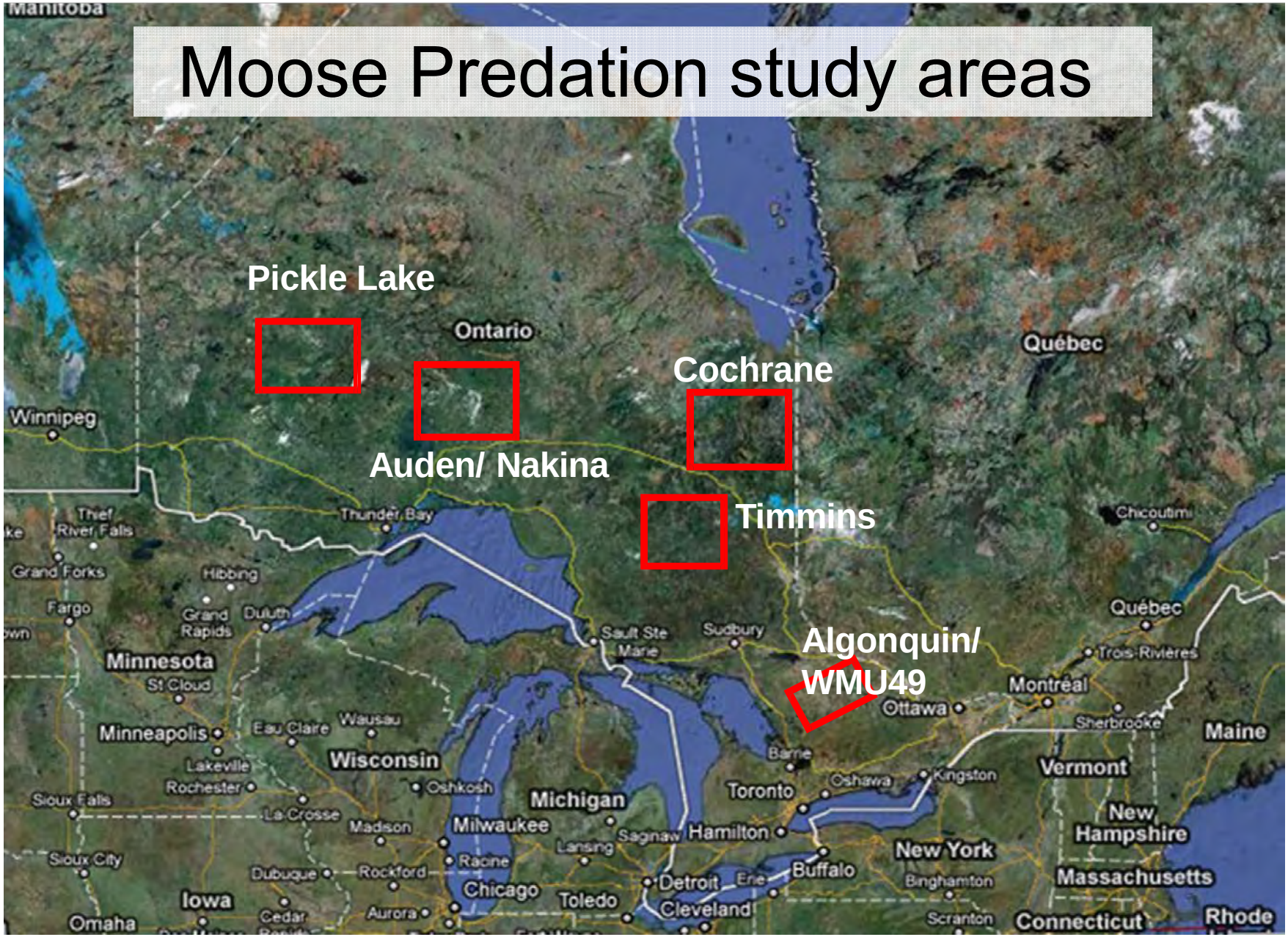
Moose Predation study areas
Pickle Lake
Ontario
Cochrane
Québec
Winnipeg
Auden/ Nakina
Timmins
Thunder Bay
Chicoutimi
Thief River Falls
Grand Forks
Hibbing
Fargo
Grand Rapids
Duluth
Québec
Sault Ste Marie
Sudbury
Algonquin/ WMU49
Minnesota
Trois-Rivières
St Cloud
Montréal
Ottawa
Sherbrooke
Maine
Minneapolis
Eau Claire
Wausau
Wisconsin
Barrie
Vermont
Lakeville
Oshawa
Kingston
Rochester
Oshkosh
Toronto
Michigan
Sioux Falls
La Crosse
Madison
Milwaukee
Sagnaw
Hamilton
New Hampshire
Lansing
New York
Sioux City
Racine
Dubuque
Rockford
Detroit
Erie
Buffalo
Binghamton
Massachusetts
Chicago
Toledo
Cleveland
Iowa
Aurora
Scranton
Connecticut
Rhode
Omaha
Cedar

Wolf use of Moose during spring in the Nakina area (northwest Ontario)

Moose was the most common prey item among 108 wolf scats collected near Nakina in northwest Ontario during May-June 2012 & 2013

Food item	% scats containing food item	% total scat volume composed of each item	% Biomass of consumed
Moose	49.5	42.4	76.8
Beaver	38.6	34.4	12.5
Caribou	8.9	8.1	7.3
Snowshoe Hare	9.9	6.2	1.7
other	7.9	5.3	1.8

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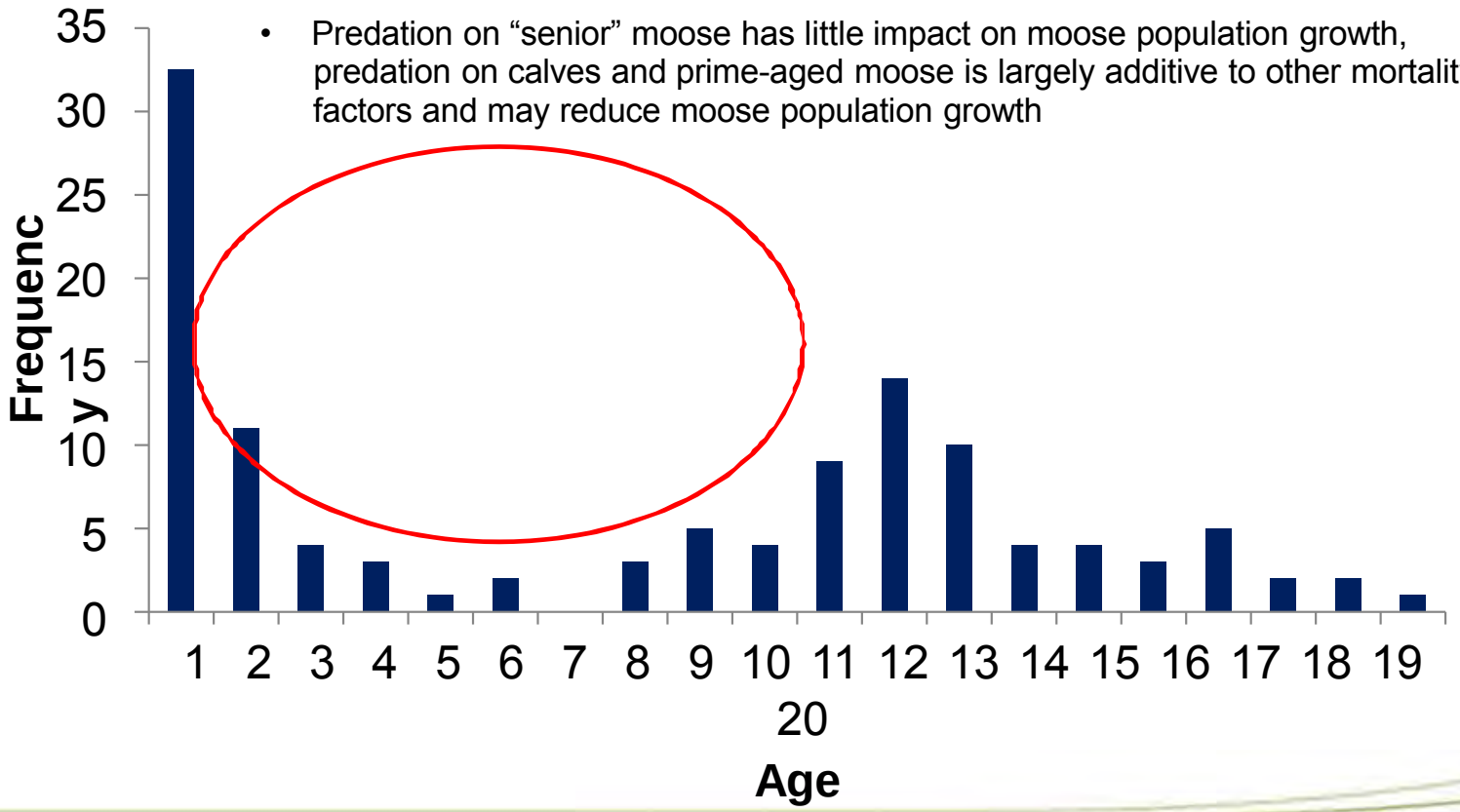
Wolf Predation – Age of Moose Taken

- Wolves generally take mostly calves, yearlings and “senior” moose
- Predation on “senior” moose has little impact on moose population growth, predation on calves and prime-aged moose is largely additive to other mortality factors and may reduce moose population growth



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Bear Predation on Moose in Spring: Northern Ontario

- We also collected 432 bear scats in the Nakina area of northwest Ontario in early June 2012 and another 231 scats in late May to early June 2013
- Most scats contained primarily vegetation
- Only 3-4% of scats contained any discernable moose remains

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Harvest

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Moose hunting (regulated)– then and now

	Early 1980's	Present
MOOSE	80,000	97,500 (115,000 peak)
HUNTERS	100,000	107,000
SEASONS	Short season (2-4 weeks)	Long seasons (2-3 months)
ROAD ACCESS	Less access in many WMUs	Increased road access
ATVS	Limited use (Argos, Honda Big Red)	Very common use (4-wheelers)
WIRELESS COMMUICATION	Limited use	Very common use (2-way radios, cell phones)
PARTY HUNTING	No party hunting (no party harvest)	Party hunting
SUCCESS RATE	20-30% gun, 5-10% bow	40-50% gun, 20-30% bow
CALF HARVEST	Very limited – few hunters targeting calves	Substantial in many WMUs – many hunting parties targeting calves
TAGS	At least 47,000 adult validation tags (1984)	13,126 adult validation tags (2014)

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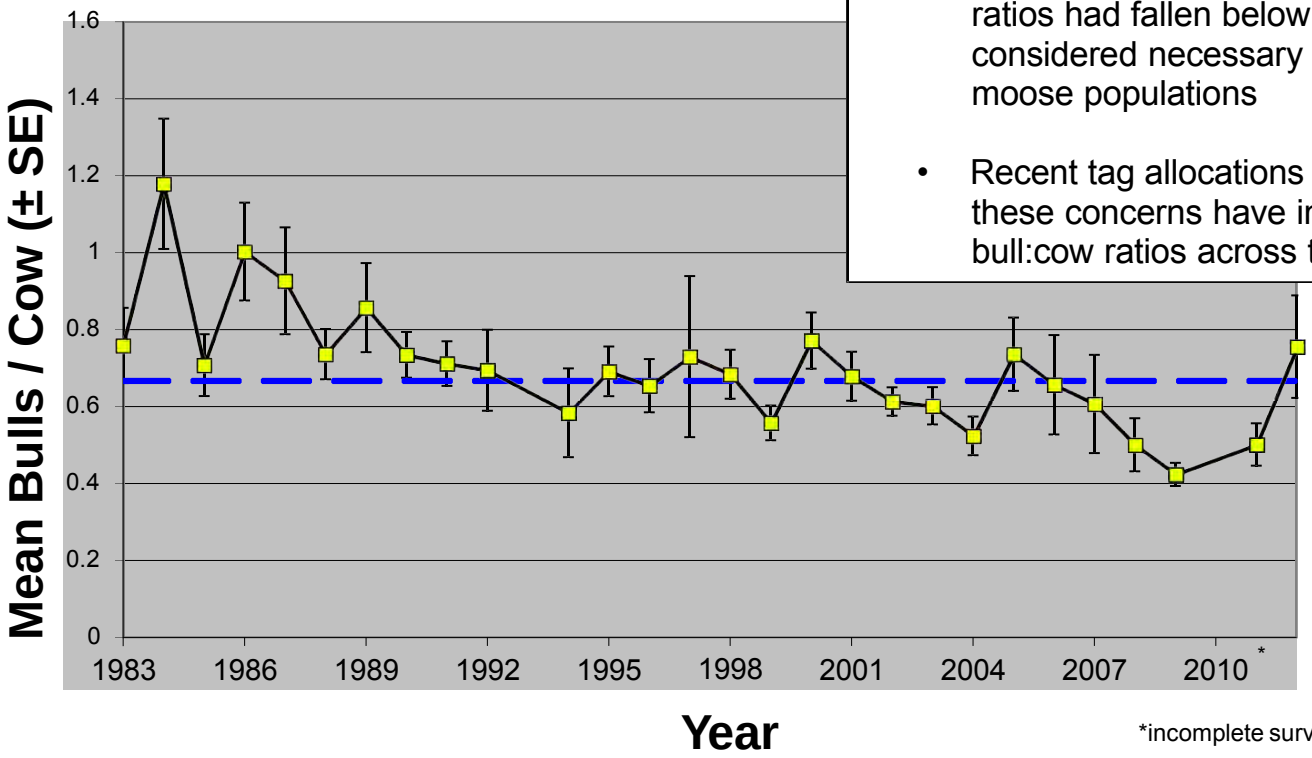
Mean Bulls/Cow in NW Ontario WMUs 1983-2012



- In northwest Ontario WMUs bull:cow ratios had fallen below levels considered necessary to maintain moose populations
- Recent tag allocations to address these concerns have improved bull:cow ratios across the region

*incomplete survey

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Moose Population Objectives

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Setting Population Objectives

Ecological Population Range

A. Habitat Suitability - *Upper Population Potential*

- delineation of areas into main, other and non-moose range (computer modelling, local knowledge).

B. Other Cervid Factors - *Refined Upper Population Potential*

- consideration for multiple cervid species that exist on the same landscape (using guidance from CEF, species specific policies).

C. Moose Ecosystem Interactions - *Upper and Lower Ecological Limits*

- upper limits related to: predator systems, habitat impact, disease and parasites
- lower limits related to: predators, habitat function, productivity/survival

Setting Population Objectives

Socio-Economic Population Range

A. Interests in Moose
   - e.g., Recreational, cultural and spiritual, food, socio-economic

B. Activities
   - e.g., hunting and harvest, viewing and other inherent (spiritual/cultural) benefits, associated economic benefits generated

C. Area Accessibility
   - consideration given to large remote areas, different user groups, where moose related activities area practices, location of the moose population

Thank You!

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