

Natural. Valued. Protected.



Moose Harvest Management Guidelines

*Ontario Ministry of Natural Resources
June 2009*

*Cette publication hautement spécialisée **Moose Harvest Management Guidelines** n'est disponible qu'en anglais en vertu du Règlement 411/97 qui en exempte l'application de la Loi sur les services en français.
Pour obtenir de l'aide en français, veuillez communiquer avec
Linda Maguire au ministère des Richesses naturelles au
linda.maguire@ontario.ca.*

TABLE OF CONTENTS

1.0 INTRODUCTION	1
2.0 PAST MOOSE HARVEST MANAGEMENT SYSTEMS.....	2
3.0 MOOSE HARVEST MANAGEMENT PRINCIPLES	3
4.0 MOOSE HARVEST MANAGEMENT	4
4.1 Planning the Moose Harvest	4
4.2 Managing the Moose Harvest Using Harvest Management Strategies.....	5
4.2.1 Using Moose Harvest Management Strategies	5
4.2.2 Types of Moose Harvest Management Strategies.....	6
A. Selective Harvest Systems.....	8
B. Seasons	10
C. Area Management.....	12
D. Gear - Firearms	14
E. Hunter Management - Party Hunting and Validation Tags	15
4.2.3 Other Moose Harvest Management Strategies.....	16
4.3 Assessing Moose Harvest Management	16
5.0 REFERENCES	18
APPENDIX A: Other Moose Harvest Management Strategies.....	19

1.0 INTRODUCTION

Context

Ontario is fortunate to be home to an abundance of forests and wetlands that provide valuable moose habitat that sustains a healthy moose population. As a result, moose hunting is a very popular recreational activity pursued by many Ontario residents and non-resident hunters from Canada and the United States. The popularity of moose hunting in Ontario requires an intensive management approach to ensure a sustainable moose population. Moose population assessment and harvest management are critically important in maintaining healthy moose populations and their related benefits.

Moose management and resultant harvest opportunities are guided by the broad approach to cervid management outlined in Ontario's *Cervid Ecological Framework* and *Moose Management Policy*.

Scope

Moose harvest management in these guidelines refers to the management of moose harvest. Allocation of the harvest amongst various users is not considered herein.

Purpose

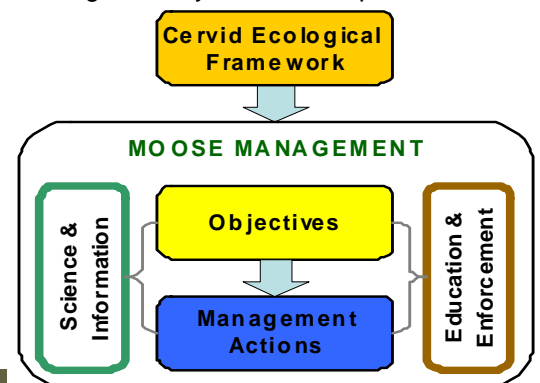
These harvest management guidelines are intended to overview the range of management actions, or harvest management tools that can be employed to help meet ecologically-based moose population goals and objectives at a variety of management scales including broad Cervid Ecological Zones, sub-Zones and Wildlife Management Units (WMUs). Specific moose population objectives are periodically developed using Ontario's *Moose Population Objectives Setting Guidelines*.

Adaptive Moose Management Approach

Moose management in Ontario reflects an adaptive management approach. Harvest management strategies that are used contribute to an adaptive approach as outlined below:

1. Objectives - Population objectives are set to achieve ecological sustainability and provide for optimal benefits associated with moose and moose-related activities.
2. Management Actions - Management strategies are implemented to achieve these objectives. There is a need to consider land use and resource management practices in managing moose as well as a need to integrate moose harvest and habitat management strategies to ensure a cohesive and effective management regime for moose.
3. Science and Information - The moose population, annual harvest and trends in moose habitat availability are monitored and assessed to determine if the objectives and associated benefits are achieved.

Science and Information may indicate that the harvest management strategy employed or other management actions should be changed. It may also indicate that the objectives should be re-examined. The adaptive management cycle is then repeated.



2.0 PAST MOOSE HARVEST MANAGEMENT SYSTEMS

1970s - Ontario had a very open harvest system for moose during this period. All hunters were eligible to take a moose of any sex or age anywhere in the Province where there was a season. Harvest was controlled primarily by season length on large management zones, varying from 6 days in the south to 3 months in parts of the northwest. Party hunting was permitted. In addition to regular gun seasons, a small number of bow and/or muzzle-loader seasons were implemented. This approach resulted in very high harvests of moose. During this period moose numbers declined throughout much of the province. Allowable harvests were not calculated during this period. Harvest assessment consisted of broad provincial-level surveys which provided an estimate at the management zone level.

Late 1970s – Early 1980s - A number of changes in harvest management were made in response to the general moose population decline. WMU boundaries were established in 1975 across Ontario. Controlled hunts with a limited number of any-moose tags were implemented in several WMUs. Seasons were also delayed and shortened. A primary change was the requirement that hunters hunt in groups of 2 or 3 for a portion of the season. Despite these changes, moose populations did not increase substantially.

1980-2000s - A review of the moose program in the early 1980s resulted in significant changes to moose harvest management and the introduction of the selective harvest system. With the advent of the selective harvest system came harvest planning and the calculation of allowable harvests and tag quotas (residents and tourist industry). Harvest assessment was also initiated on a WMU-level. A limited number of bull tags and cow tags were issued for each WMU with an open season. These tags were distributed by random draw (e.g. lottery). All hunters were allowed to take a calf in any of these WMUs. The rationale was to protect cows as the main breeding component of the herd and retain enough bulls for breeding. Calves were left open to allow all hunters to hunt, and because it was thought that their harvest would remain low and would mostly be compensatory with other forms of mortality. Because of the direct control on a large part of the harvest, other aspects of the harvest system were relaxed. Seasons were lengthened again, the season start date was moved earlier, and an annual season was implemented in the south (replacing a system of alternate year hunts). Earlier bow seasons were implemented in most of the northwest and northeast. Party hunting was liberalized in 1988 and redefined in 2004.

2000s to Present - A harvest management strategy to control moose calf harvest was implemented for the first time in 2004. In addition, adult moose harvest (e.g. cows, bulls) was limited (by reducing tags) to further protect the breeding population and accelerate recovery. Applying these harvest management strategies has resulted in moose population increases.

Lessons Learned

Collectively these changes, in particular the selective harvest system, have resulted in an increase in the moose population from approximately 80,000 in 1983 to about 109,000 in 2007. This has been accompanied by a concurrent increase in hunter numbers over time. However, where moose populations are in decline or well below the population objective, new approaches may be needed to address harvest management.

Adult Harvest Management - Limiting the harvest of bulls and cows to a calculated allowable level for each WMU has increased the moose population in many WMUs across the Province. It is clear that the open any-moose system, previously in place, did not help sustain healthy moose populations. In most WMUs there was too much hunting pressure for uncontrolled harvest to be sustained.

Calf Harvest Management - Limiting the harvest of calves to a calculated level has helped increase and restore the population in the WMUs where it has been applied. Decreases in total % harvest were also implemented in these units over the same period. This approach of controlled calf harvest produces more adult moose hunting opportunities in the long term, but it results in a reduction of overall hunting opportunities. Owing to the large number of moose hunters, unmanaged calf harvest can contribute to low recruitment of adult moose in some WMUs causing difficulty in reaching population objectives, and resulting in lower adult harvests. The calf harvest is a large and increasing part of the total harvest in some WMUs. In these areas, adult harvest is being reduced to keep total harvest within the allowable level. This can create concern amongst hunters who generally prefer to hunt adults.

Season Length - Short seasons in southern Ontario likely help to limit harvest levels. These short seasons limit hunting opportunities. Previous approaches indicate that shortening seasons to 2 weeks alone does not reduce the harvest enough for populations to recover as few hunters hunt more than 2 weeks.

Hunters per Moose - Requiring hunters to hunt in groups of 2 or 3 and place 2 seals on a moose did not help sustain healthy moose populations as moose harvests continued to be high causing population declines across large parts of the province. More liberal party hunting regulations associated with the selective harvest system tend to increase harvest. Hunters can hunt in large groups and can continue to hunt even after they have harvested an animal. Generally hunters like this aspect of the open and flexible system.

3.0 MOOSE HARVEST MANAGEMENT PRINCIPLES

The following general principles guide moose harvest management in Ontario. These are reflected in current policy as outlined in Ontario's *Moose Management Policy* and build on lessons learned from previous approaches used in Ontario:

- 1. Adaptive** - Applying an adaptive management approach, whereby management actions are guided by newly obtained science and management information, will help ensure that harvest management strategies are continuously evaluated and refined.
- 2. Ecological** - Recognizing that harvest management approaches must consider the broader ecosystem, and help maintain natural ecosystem processes and functions that in turn help support a productive and healthy moose population.
- 3. Strategic Management Scales** – Achieve moose management goals and population objectives by using the *Cervid Ecological Framework* (and associated zones) to guide decision making at the sub-zone and WMU levels.
- 4. Standardize and Simplify** - Using, wherever feasible, standard and simple harvest management strategies within Cervid Ecological Zones or sub-zones.
- 5. Socio-economic** -

- *Participation* - Enabling as much participation as possible in moose-related activities in Ontario. Wherever possible, enabling all resident moose hunters to participate in a hunt for a moose of some type annually.
- *Flexibility* - Providing flexibility by enabling hunters to hunt moose alone or in a group.

6. Transparency - Consulting and communicating clearly on the development and implementation of harvest management strategies and results.

4.0 MOOSE HARVEST MANAGEMENT

Moose harvest management in Ontario is an iterative three-step process:

- 4.1 Planning the Moose Harvest (e.g. allowable level of harvest)
- 4.2 Managing the harvest using harvest management strategies
- 4.3 Assessing the effectiveness of harvest strategies in achieving allowable harvest

These steps are covered in the following sections.

4.1 Planning the Moose Harvest

Purpose

This step in moose harvest management is the calculation of the allowable harvest. The allowable harvest should attain the moose population objective in the desired period. The number of validation tags available is then calculated. These determinations are made through a moose harvest management planning process as described below.

Moose Harvest Management Planning

Moose harvest management plans are developed at the WMU level, and are guided at the broader landscape level by objectives set out in the *Cervid Ecological Framework* by ecological zone. The planning process addresses the following elements:

- **Format:** The Ontario Moose Harvest Planning System software program (Moosharv) captures the elements used in planning the allowable licenced moose harvest and tag quotas by WMU.
- **Area:** While plans are prepared for each WMU with a moose hunting season, they will be aggregated by Cervid Ecological Zone for evaluation and reporting purposes.
- **Timing:** Plans are prepared in late winter. This takes advantage of the most recent aerial survey and harvest information, and allows changes to be made to the current year's planned harvest. Tag quotas for the tourist industry are generally determined one year in advance.
- **Frequency:** Plans are prepared when significant new information is available and are reviewed annually. Significant new information may include a new aerial survey or a significant change/ trend in tag filling rates. The main planning interval is generally 3 to 5 years. Keeping the harvest approach steady for a few years allows the actual harvest to be better used as a trend. It also avoids unnecessary reactions to minor fluctuations in harvests that may be more related to sample variation than to actual population status.
- **Calculating the Allowable Harvest:** A reliable way of determining the harvest level for licenced harvests is to analyze the trend data for populations and licenced harvests.

Some of the factors to take into account in determining the licenced harvest rate are productivity, net recruitment and other sources of significant mortalities. Expected recruitment from calves to adults in the population and trend data over time can assist in determining the allowable harvest. Net recruitment can be estimated using % calves and # calves per 100 cows from mid-winter moose aerial inventory surveys, and in conjunction with calf harvest estimates, can also be used to estimate pre-hunt recruitment potential. Dividing the allowable harvest into bull, cow, and calf components will vary depending on the harvest strategy in use.

- **Estimating Tag Fill Rates:** Generally, tag fill rates should be projected where 3-5 year trends are evident, but otherwise should be averaged.
- **Other Methods for Managing the Harvest:** The % harvest employed in harvest planning will also depend on other harvest management strategies used.
- **Planning Principles:** When a change in moose population level is desired (to meet population objectives at the CEZ or WMU levels), early action should be considered. This gives the best chance of reaching the population objective in the desired timeframe. More moderate or delayed approaches may increase the risk of not achieving the population objective and associated benefits in a timely fashion.
- **Decision Support - Modelling:** Use the modelling component of the moose harvest planning software to predict the effects of the calculated allowable harvest and tags. If results do not reflect desired outcome, re-examine model inputs or model calibration.
- **Decision Support - Historical Harvests:** Past harvests and associated population responses provide an indication of whether the proposed harvest strategy will accomplish the desired objectives. Consider harvest strategies and levels which led to increases or declines in the past and examine if conditions have changed (e.g. increasing deer populations, climate/habitat changes, challenges in recruitment).

Coordination and Public Availability

- **Coordination:** Regional Wildlife Biologists coordinate the planning process across Cervid Ecological Zones (CEZs).
- **Public Availability:** Moose harvest plans are available to the public on request. They may be summarized by Cervid Ecological Zone or in WMU-specific moose population reports and made available on MNR's website.

Moose harvest plans are discussed with provincial committees. Local districts are also encouraged to discuss moose harvest plans at local committees.

4.2 Managing the Moose Harvest Using Harvest Management Strategies

To assist in achieving moose population objectives and to help achieve allowable harvest levels, harvest management strategies are employed. This section describes how harvest management strategies can be used, and the range of potential harvest management strategies available for use in Ontario. It must be stressed that the use of harvest management strategies must consider the moose harvest management principles to ensure effective, ecologically-based practices that contribute to moose sustainability over the broader landscape. Changes to the harvest strategies will require coordination across CEZs or subzones and public consultation in order to ensure effectiveness.

4.2.1 Using Moose Harvest Management Strategies

Harvest management strategies are set to achieve moose population objectives (ecological sustainability and socio-economic considerations – see Ontario's *Moose Management Policy* and *Moose Population Objectives Setting Guidelines*).

- **Area of Application** - In general, harvest management strategies will be applied consistently within Cervid Ecological Zone/sub-zone. Situations in adjacent Zones should also be considered. The rationale is to reasonably standardize the regulations, ensuring the system is relatively easy to understand and implement.
- **Time Frame** - Harvest management strategies will be reviewed periodically. This may occur when the progress towards population objectives is evaluated, when the overall moose program is reviewed, or in response to other new information. Ideally harvest management strategies will remain relatively stable while still allowing flexibility. If a different harvest management strategy is required, there is a need for co-ordination and consultation. Timely and responsive decision-making is an important consideration in ensuring healthy moose populations.
- **Methods** - Harvest management strategies need to be effective, acceptable and easily administered. Potential harvest management strategies that best meet these criteria are described in Section 4.2.2. Consideration should be given to modifying an existing harvest management strategy before moving to a new strategy.
- **Coordination** - Use a coordinated, ecological approach to develop a consistent method across WMUs with similar issues. Regional Wildlife Biologists will arrange coordinated approaches within each Cervid Ecological Zone.
- **Consultation** - Consultation is needed for any significant changes to the harvest management system. Depending on the magnitude or type of change, a posting on the Environmental Registry may be considered or required (e.g. policy or regulation proposal).

4.2.2 Types of Moose Harvest Management Strategies

Moose harvest management strategies need to work well for the moose population, for the public, and be easily administered. Public comments received through the 2008 Ontario Moose Program Review were considered in the development of harvest management strategies. The following principles apply:

Effective - Strategies need to have a specific and significant intended effect on the moose harvest and should work toward achieving moose population objectives. The need for this principle is supported by past experiences in Ontario, experiences in other jurisdictions, science-based information, and verified by results of modelling exercises.

Acceptable - There needs to be public/community support for the harvest strategy. The level of support may be gauged by previous use and public consultation. The intent is to provide optimal sustainable hunting opportunities, high hunt quality, and flexibility for hunters.

Feasible - Strategies should be relatively simple and affordable to implement and enforce.

A large number of harvest management strategies were considered for potential use in Ontario. These included: strategies already in use; new strategies suggested; and strategies used in other jurisdictions. The following strategies best meet the above criteria either by themselves or when used together, and may be considered for use in Ontario.

The harvest management strategies for Ontario fall into the following general categories:

- A. Selective Harvest System: type of moose hunted
- B. Seasons: timing of moose hunting

- C. Area Management: geography over which moose can be hunted
 D. Gear: use of firearms
 E. Hunter Management: party hunting.

Moose Harvest Management Strategies - Summary	
Category and Strategy	Conditions for Consideration
A. Selective Harvest Systems	
bull and cow harvest limited, calves unlimited (existing Provincial system)	Strategy has been successful across most WMUs
bull, cow, and calf harvest limited (eastern Ontario system)	Option for calf harvest reduction <u>where</u> no other feasible methods are available and/or option is preferred by stakeholders to address excessive calf harvest in return for increased adult tags (AVTs)
B. Seasons	
8+ week gun season	provides large amount of hunting opportunities (currently used in northwest)
4-8 week gun season	For consideration where supply of tags reasonably meets demand (currently used in northeast)
2-4 week gun season	May increase tag quotas slightly by potentially decreasing tag filling rates in WMUs with longer current seasons
6 day gun season	Areas with high hunting pressure (currently used in south)
split gun season (2 separate seasons with a portion of tags each)	Where shorter seasons are expected to cause crowding issues.
delayed gun and bow seasons (Slight shifting of up to 6 days)	May decrease tag fill rates as seasons occur further from rut
short calf gun season (e.g. 12 day, 6 day, 3 day, end at deer season start)	Option for calf harvest reduction.
C. Area Management	
Cervid Ecological Zones (CEZs)	<i>Cervid Ecological Framework</i> (and associated CEZs) provides overarching strategic guidance for population management and objectives at the sub-zone and WMU levels
Wildlife Management Units (existing Provincial system)	Current system – used to meet objectives within CEZ
Local area hunting closures and restrictions	Option for protecting vulnerable moose populations for consideration only in exceptional circumstances with additional land use considerations and consultation requirements.
D. Gear - Firearms	
bow - separate moose allocations/ tag quotas	May be used to divert pressure from gun season
bow - new early seasons	May be used to diversify opportunities and divert pressure from gun season.
Guns - tag allocations in most WMUs	current system, preferred firearm type
E. Hunter Management - Party Hunting & Validation Tags	
- hunt alone or in any size party - parties not fixed in composition	present system, allows greatest flexibility for hunters
- may hunt adults alone or in party, if tag for WMU	

- may hunt calves alone or in party in most WMUs	
- hunter may harvest any moose for which party possess validation tag	
- hunter may continue hunt after shooting or sealing as long as within a party with remaining unfilled valid tags	
- party members must be within 5 km of tag holder in same WMU	
- must notify other members immediately of harvest	

A. Selective Harvest Systems

I) Controlled Harvest of Bulls and Cows – Uncontrolled Harvest of Calves

Description - This selective harvest system has been the primary method of moose harvest management in Ontario since 1983. A limited number of bull validation tags and cow validation tags are issued for the allowable harvest of adults in each WMU. Calf harvest is unlimited and comes off the top of the total allowable harvest (except in 5 WMUs at present - see Controlled Harvest of Bulls, Cows, and Calves). All hunters in the Province may harvest a calf in WMUs with this system.

Biological Rationale – The selective harvest system is designed to limit the moose harvest to the allowable level. It also allows the management of the age and sex structure of the population to optimize productivity. Generally, cows receive the most protection as the main reproductive component of the herd. Bull harvest is also controlled to maintain an appropriate bull to cow ratio for breeding. The remaining hunting pressure is diverted to calves. Heavy harvesting of calves reduces the allowable harvest of adult moose, and can reduce the recruitment of adults to the population.

Socio-Economic Rationale - The current system allows a very high level of hunter participation. All hunters can hunt a calf in most parts of Ontario that have moose hunting seasons. Many hunters prefer to hunt adult moose, and it can be difficult to get an adult tag in WMUs with high hunting pressure.

Results - The original selective harvest system has successfully sustained healthy moose populations. The moose population in Ontario has increased from about 80,000 at the start of the selective harvest system in the early 1980s to about 109,000 in 2007. Moose hunter numbers and hunting technology also increased over that same time period. Where there is excessive pressure on calves there is the need to consider the effect on recruitment to ensure sustainable moose populations

Criteria for Use -

- **General** - The controlled harvest of bulls and cows will continue to be the main tool for moose harvest management in Ontario. Exceptions may be where calf harvest is too high and negatively affecting the recruitment of adult moose in the population. In these circumstances, the system of controlled harvest of bulls, cows, and calves, outlined in A II, may be employed.

Conditions -

- **Allowable Harvest** - A reliable way of determining the harvest level for licensed harvests is to analyze the trend data for populations and licensed harvests. Some of the factors to take into account when determining the licensed harvest rate are productivity, net recruitment, other sources of significant mortalities, immigration/emigration and population objective. Expected recruitment from calves to adults in the population and trend data can assist in determining the planned harvest. Net recruitment can be estimated using % calves and # calves per 100 cows from mid-winter moose aerial inventory surveys. In this harvest system, where calf

harvest is uncontrolled the planned calf harvest will generally be based on representative average calf harvests from previous years or projections of calf harvest.

- Sex Ratio - Generally a ratio of 40 bulls to 60 cows should be maintained to ensure reproduction, a higher ratio of bulls may be needed in dispersed populations.
- Calf Component – As calf populations vary between WMUs, long-term recruitment data relative to population trends are a good measure to estimate calf productivity in a specific WMU. If trend data demonstrates a serious concern for calf recruitment then consideration may be given to employing an alternate harvest management system (e.g. calf harvest control).
- Tag Numbers - Use representative averages or projections of tag filling rates to achieve moose population objectives (whether the objective is to increase, maintain or decrease the moose population).

II) Controlled Harvest of Bulls, Cows, and Calves

Description - Consistent with the selective harvest system, the control of calf harvest was implemented in several WMUs in eastern Ontario. The harvests of bulls, cows, and calves are each controlled by a limited number of validation tags. Hunters not receiving a tag can party hunt, or hunt for a calf in WMUs where the calf harvest is not controlled. This system can be considered for use in WMUs where the objective is to increase the moose population.

Biological Rationale - Shares the same rationale for controlling bull and cow harvest under the selective harvest system. The addition of calf harvest control aids in increased calf recruitment and population restoration/growth.

Socio-Economic Rationale - This system limits hunter participation in WMUs where it is applied. It may also divert hunting pressure to other WMUs. Limiting calf harvests generally allows for an increase in adult moose hunting opportunities in the long term. The tourist industry seldom harvests calves; however any management strategy that reduces adult harvest must consider the effects on the industry.

Results - This system has helped improve the moose populations and adult tag numbers where it has been implemented. Due to the effects of limited hunting opportunities, this system is not preferred by many hunters, and may reduce hunting related economic activity. Hunters may not want or be able to leave their traditional hunting area or, should they hunt elsewhere, may contribute to crowding in other WMUs.

Criteria for Use -

- General - This is an option for use where the moose population objective is not being achieved or adult moose harvests are declining because of low calf numbers or high calf harvests. Hunters have expressed a preference for other methods to reduce calf harvest and this system should be considered only when there is no other effective alternative. The use of this harvest management strategy should be reviewed periodically to ensure its continued use is necessary to help achieve harvest and population objectives.
- Considerations -
 - Area of Application - a Cervid Ecological Zone/sub-zone where,
 - Calf Numbers - low, generally < 15% of mid-winter population (30 calves/100 cows), or
 - Adult Tags - very few, generally > 20 applicants per tag, or
 - Calf Harvest - generally high, > 40% of available recruitment, or > 40% of harvest

Conditions -

- Allowable Harvest - A reliable way of determining the harvest level for licensed harvests is to analyze the trend data for populations and licensed harvests. Some of the factors to take into account in determining the licensed harvest rate are productivity, net recruitment, other sources of significant mortalities, immigration/emigration and population objective.. Expected

recruitment from calves to adults in the population and trend data over time can assist in determining the planned harvest. Net recruitment can be estimated using % calves and # calves per 100 cows from mid-winter moose aerial inventory surveys, and in conjunction with calf harvest estimates, can also be used to estimate pre-hunt recruitment potential. Calf harvest should be set to maintain desired recruitment of adults.

- Sex Ratio - Generally a ratio of 40 bulls to 60 cows should be maintained to ensure reproduction, a higher ratio of bulls may be needed in dispersed populations.
- Calf Component - Where trend data demonstrates a serious concern for calf recruitment.
- Tag Numbers - Use representative averages or projections of tag filling rates to achieve moose population objectives.

B. Seasons

This section presents a list of possible tools for consideration where a change in moose season length is being explored. Analysis and consultation would be required to determine the tool that would best allow moose managers to attain the moose population objective. If a shortening of moose seasons is deemed appropriate, it may be applied to either or both resident and non-resident seasons depending on circumstances.

Current Season Length

Description - Moose season lengths are quite variable across Ontario. A long moose season currently exists in the northwest region (e.g. 3 week bow, > 10 week gun). The northeast region moose season is of moderate length (e.g. 3 week bow, 5-6 week gun); while the south uses a short moose season (e.g. some 6 day bow seasons, 6 day gun)

Biological Rationale - The length of the moose hunting seasons in Ontario generally vary according to hunting pressure. Most hunters hunt for one or two weeks, and the longer seasons in the northwest and northeast produce a variable impact on moose harvest depending on hunter density/abundance. The 6 day season in the south generally limits the time available to hunt and therefore the harvest.

Socio-Economic Rationale - Harvest control offered by the selective harvest system allowed a liberalization of seasons in 1983 to allow more opportunities to hunt. Before the selective harvest system, seasons were generally shorter, as short as 2 weeks in the northeast and only every other year in the south. Tourist industry business practices are adapted to the current season length.

Results - The season regime in the northwest is reasonably compatible with the adult moose harvest and the number of adult tags available. The long season can contribute to relatively high calf harvests, high tag fill rates and lower number of adult validation tags available in many WMUs. Even with the short season in the south, harvest of both adults and calves are high and tag numbers are relatively low. The present system may lead to crowded hunting conditions - particularly in the short seasons in the south and in heavy pressure areas in the northeast.

Criteria for Use -

- General - The existing season regime should be retained in areas where the availability of adult moose tags is relatively high, or the existing season is already very short.

Shorter Adult Season

Description - A shorter moose gun season (e.g. 3 weeks) could be applied to Cervid Ecological Zones or sub-zones with currently longer seasons where an increase in moose population is required in order to meet overall moose population objectives, or where tag numbers are low.

Biological Rationale - On average, a 3 week gun season may help control tag filling rates and could reduce the moose harvest by about 10% (based on past harvest).

Socio-Economic Rationale - The reduced harvest which may be achieved by shortening a season could potentially allow approximately 10% more adult tags to be issued. Hunters, particularly in the northeast have generally indicated that 3 weeks provides an adequate amount of hunting opportunities. As non-residents generally prefer to harvest adults, the implications for the tourist industry should be considered.

Evaluation - The effect of a 3 week season on harvest and tag numbers can be projected from past harvests (shifting of pressure from the last part of the season to the first part was also considered). According to input from the 2008 Moose Program Review, hunters in the northwest generally preferred a longer season, while hunters from the northeast preferred a shorter season (e.g. 3 weeks). Shorter seasons were not favoured in the south.

Criteria for Use -

- **General** - Cervid Ecological Zones or sub-zones (with consideration given to inclusion of adjacent WMUs) where adult tags are relatively scarce and hunters favour a shorter season.
- **Considerations** -
 - Area of Application - Cervid Ecological Zone/sub-zone where,
 - Adult Tags - relatively low, generally > 10 applicants per tag.

Split Season

Description - This method manages hunters in high hunting pressure areas in the effort to produce a positive result in the moose population and/or hunt quality. A split season could take the form of two gun seasons of 2 to 3 weeks with a portion of tags in each or two gun seasons of 6 days with a portion of tags in each (e.g. in Southern Ontario).

Biological Rationale - Using split seasons may reduce overall moose harvest by providing more places where hunters are absent and to which moose can escape.

Socio-Economic Rationale - Splitting the hunting pressure between seasons can reduce crowding; thereby potentially increase the quality of the hunt. Implications for the tourist industry should be considered.

Evaluation - This harvest management strategy has merit for potentially reducing the overall harvest while improving the quality of the hunting experience (reduced crowding) and increasing the availability of adult validation tags. Since the present licence and tag system is not equipped to implement this management strategy, further consideration of administrative requirements should be reviewed before proposing this strategy. The implications for the enforcement program must also be considered.

Criteria for Use -

- **General** - Consider where hunter crowding and/or harvest control is a concern
- **Considerations** -
 - Area of Application - A Cervid Ecological Zone/sub-zone, where,
 - Hunting Pressure - relatively high (> 200 days per 100km²), or calf harvest unacceptably high, and/or there are relatively more than 12 hunter applicants per tag available (based on guaranteed group size)
 - Note: requires specifying for which season each calf tag is valid.

Later Season Start

Description – Delaying the start of the moose hunting season slightly (by up to 6 days) is another potential means of reducing tag filling rates. An example would be to delay the start of the

season 4 days from the current season start date. This would not generally have to involve any change to the end date of the moose hunting season.

Biological Rationale - Moving the seasons slightly later will move the hunt further from the rut. This may reduce harvest rates slightly, however, it is expected that the effect will not be large.

Socio-Economic Rationale - Starting the season later may help position it in cooler weather. The effect on the tourist industry should be considered.

Evaluation - The start date of the gun season sometimes coincides with high rut activity in the north. In recent years, the weather in the first week of the hunt is often warm. The proposed change is a cautious attempt to address these issues. Moving the gun season out of the first week in October in the northeast and northwest was generally favoured in public comments received through the 2008 Moose Review.

Criteria for Use -

- *General* - Could be applied to Cervid Ecological Zones/sub-zones where moose are a main focus of management and/or areas where there is an identified need to reduce tag filling rates.

Shorter Calf Season

Description – A shorter calf season may increase the number of calves available for recruitment in some WMUs and in turn provide more adults for population growth or harvest. Shorter calf seasons might include: a 6 or 12 day season starting in the second week of the gun hunt, a 6 day season starting in the second week of the gun hunt, a 3 day calf hunt, or closing the calf hunt at the beginning of the deer gun hunting season.

Biological Rationale - In the northeast or the northwest, a 6 day calf season that corresponds to the southern region gun season could potentially reduce the calf harvest by up to 50%. A 3 day season in the south may reduce the calf harvest by less than 50%. This could improve adult recruitment in populations with low calf numbers or high calf harvests. Consideration should be given to having shorter seasons in the north corresponding to the southern gun hunt.

Socio-Economic Rationale - Most of the calf harvest prevented by shortening the season could potentially be harvested as adults in the future. This would allow more adult tags to be issued. The shorter season for calves would still allow all hunters the opportunity to hunt alone and harvest a moose. Placing the calf season in the second week of the hunt should reduce crowding in the first week. This harvest strategy is not expected to impact the tourist industry.

Evaluation - The potential effects of the shorter season on harvest and tag numbers can be projected from past harvests (shifting of pressure from the last part of the season to the first part was also considered). This harvest strategy was favoured over controlling calves via tags by hunters in the 2008 Moose Program Review.

Criteria for Use -

- *General* - The short calf season is an option for use where calf numbers are low or calf harvest is high and contributing to low adult harvest and low tag numbers.
- *Considerations* -
 - Area of Application - A Cervid Ecological Zone/sub-zone where,
 - Calf Numbers - Low, generally < 15% of mid-winter population, or
 - Calf Harvest - generally high, > 40% of available recruitment, or > 40% of harvest, or
 - Adult Tags - Relatively low, generally > 10 applicants per tag

C. Area Management

Ontario's *Cervid Ecological Framework* (and associated zones) establishes broad moose management objectives and provides guidance for specific local management decisions. Harvest management strategies should consider the context of all WMUs within a given Cervid Ecological Zone.

Wildlife Management Units

Description - For the purpose of regulated hunting, Ontario is divided into Wildlife Management Units. Moose are hunted in 67 WMUs, ranging in size from ~1000 km² to 40,000 km².

Biological Rationale - WMUs generally correspond to ecological areas using recognized ground features to distinguish boundaries. Moose population and harvest data are collected by WMU.

Socio-Economic Rationale - WMUs generally have distinct natural or man-made boundaries, which can be easily recognized for hunting purposes or data collection. Managing moose harvest by WMUs serves to distribute hunting pressure at a manageable scale, and to improve the quality of the hunt.

Evaluation - WMU-specific moose harvest management has generally worked well in Ontario. Within some WMUs there may be broad areas with large differences in moose productivity or hunting pressure. Moose population objectives and harvest management strategies should consider such variations.

Criteria for Use -

- *General* - Existing WMUs coordinated by Cervid Ecological Zone/sub-zone
- *Considerations* -
Differing moose densities within and among WMUs present management challenges but represent both a natural component of a functioning ecosystem, and/or reflect past and present management practices.

Local Area Hunting Closures and Restrictions

Description - In exceptional circumstances there may be a need for closures to moose hunting in small areas – from less than 10 km² to several hundred km². Other activities and access are generally permitted. An alternative to complete closure may be the restriction of moose hunting in small areas to firearm types (e.g. bow equipment only). Any restrictions or closures may be considered as part of other land use or resource management planning processes and can be carried out under Section 10(2) of the *Fish and Wildlife Conservation Act, 1997* as per the associated policy WilPp.6.2.8 titled “Temporary closure of Crown land to hunting”.

Biological Rationale - Moose may benefit from protection in small areas. Moose can be very vulnerable to harvesting in large cutover areas, where cover for moose is greatly reduced and access for hunters is generally increased. Hunting closures can help protect moose in these areas until their vulnerability is reduced. Protecting these local moose can also help maintain the overall population.

Socio-Economic Rationale - Local hunting closures allow vulnerable areas to continue to produce moose for harvest outside the area and/or for future harvest. Many hunters may also consider it as a stewardship issue to protect moose when they are extremely vulnerable, and prevent the extirpation of moose in local areas.

Evaluation - Research in Ontario has demonstrated that moose can be vulnerable to over-harvesting in large cutover areas (Rempel et al. 1997). However, this technique has not been commonly employed and is only used where significant action is required to sustain healthy moose populations. This harvest management technique has enforcement implications due to the additional attention that these areas would require. Use of this technique received some support in public input to the 2008 Moose Program Review.

Criteria for Use -

- General - Option for significantly vulnerable areas where moose are likely to be over-harvested.
- Considerations -
 - Area of Application - Significantly vulnerable areas, as follows:
 - Cutover Areas - Large forest harvest areas where lateral cover for moose has been greatly reduced and access for hunters has been greatly increased – may require closure for up to 10 years for cover to regenerate.
 - Moose Concentration Areas - High density moose areas that would be very susceptible to harvesting and population decline from the moose population objective.
 - Size - Closure area should affect, or eventually affect, the ranges of at least a medium number of moose (generally about 20 or more).

D. Gear - Firearms**Gun Hunting**

Description - The existing gun hunting system in Ontario, including muzzle-loaders. All but two of the 67 WMUs with a moose hunt have a gun hunt, and two WMUs have a bow/muzzleloader specific season.

Rationale - Restrictions on gun hunting is not generally considered to be a preferred strategy for controlling harvest. Gun hunting is the most popular hunting firearm and it is desirable to provide for these opportunities wherever appropriate.

Criteria for Use - General - Continue with the present system of enabling gun hunting in most Cervid Ecological Zones.

Bow Hunting - Early Bow Hunting

Description – Most WMUs in the northwest and northeast regions currently have long early bow seasons (e.g. 3 weeks) with separate tag allocations. Those WMUs that have an early bow season in the southern region presently only have short early bow hunt (e.g. 6 days), many of which also have a separate tag allocation. Bow hunting for moose is allowed in all 67 WMUs.

Biological Rationale - Bows are generally less effective firearms and can be employed as a method to reduce tag filling rate. Bows are used as a main harvest management strategy in only a few WMUs. In other WMUs, diverting part of the hunting pressure to bow has a small effect on harvest control. Bow harvest success rates for bulls are generally less than for guns, and relatively few cows and calves are taken. Thus, this strategy has the potential to contribute to protecting herd productivity.

Socio-Economic Rationale - Allowing moose to be hunted with a variety of firearms provides a diversity of hunting opportunities. Because bows are generally less efficient, more adult tags could potentially be provided for a bow hunt than a gun hunt. Bow seasons are also positioned in the rut, which is very popular for hunters who like to call moose. The implications for the tourist industry should be considered.

Evaluation - Ontario provides a wide range of opportunities to hunt moose with different firearms. The high quality opportunities provided by bow hunting has the potential for expansion. A separate allocation of adult tags for all WMUs with an early bow season might divert a number of hunters from gun hunting to bow hunting. Caution should be exercised as this may result in stakeholder/public concerns since guns remain the firearm of choice for the majority of hunters. Bow hunting could also be used to provide a small hunt in WMUs which could not support gun hunting.

Criteria for Use -

- General - Use wherever possible to diversify hunting opportunities (where consultation indicates support).
- Considerations -
 - Area of Application - Add early bow seasons (e.g. in southern Ontario) or to enable new hunting opportunities for moose in areas where the allowable harvest is low.
 - Separate Tag Quotas - Consideration be given to including separate tag quotas for all early bow seasons

E. Hunter Management - Party Hunting and Validation Tags

Description – Present party hunting and validation tag system in Ontario:

Party Size - All moose hunters with a valid license may hunt alone or in any size of group/party.

Party Makeup - Members of parties are not fixed. Hunters can hunt with one party of hunters one day and another party the next.

Hunting Adults - Hunters may only hunt an adult moose if they have a valid seal with the appropriate validation tag for a bull or a cow, or they are hunting in a party with a hunter who has a valid seal for the adult moose. Adult validation tags are only valid in the WMU for which they are issued. The group may only harvest as many animals as the type/sex that corresponds to the number of seals and validation tags possessed by its members

Hunting Calves - All moose hunters are eligible to harvest a calf in most WMUs. Calf licenses are valid for almost all WMUs with a moose season. However, there are several WMUs with a limited harvest of calf tags, or none at all. Hunters may only hunt a calf in these WMUs if they have a validation tag attached to their game seal that permits the hunting of calf moose in that unit or they are hunting in a party with a hunter who has a validated seal.

Harvesting Moose - Any hunter in a party may harvest moose for which any party member holds a valid tag. Hunters can continue to hunt in the party for other moose, even after they have used their seal or have harvested a moose provided there are still hunters in their group that possess unused seals.

Communication - All hunters in the party must hunt in the same WMU and be within 5 km of the hunter that holds the seal valid for the animal they are hunting for. Each member of the party must be able to reliably and immediately communicate with other members of the party. A hunter harvesting a moose must notify all other members of the party immediately. All members of the party must be actively participating in the hunt.

Rationale - The party hunting system limits the harvest of moose to the number of valid seals in the party.

Socio-Economic Rationale - The party hunting system is designed to enable as much hunter participation and flexibility as possible. Hunters can hunt alone or in any group size they choose. They can hunt almost any WMU where there is a moose season. They can hunt for whatever moose they or their party is eligible to take, and can continue to hunt after they have harvested a moose or used their seal.

Evaluation - The existing party hunting system is generally popular with hunters. However, its flexibility results in higher tag filling rates and therefore lower numbers of adult tags. The party hunting system would require substantial adjustment to reduce the moose harvest significantly. Some adjustments to the party hunting system were suggested in the public input to the 2008 Moose Review (See Appendix 1).

Criteria for Use

- General - The existing party hunting system will continue to be used because of the flexibility it provides to hunters. Any changes to the system will be based on public consultation.

4.2.3 Other Moose Harvest Management Strategies

A large number of other potential harvest management strategies were examined, but not recommended for use in Ontario at this time. In some cases, these strategies did not meet the principles associated with effectiveness and acceptability. In other cases, these potential strategies were similar enough to existing strategies to not warrant a change. These methods and a brief evaluation of each are presented in Appendix A.

4.3 Assessing Moose Harvest Management

Estimating the Harvest

Hunter Harvest Surveys - At present, hunter harvest surveys are the method for measuring the annual moose harvest. These generally provide a statistically valid estimate of the harvest and serve as a reliable index of trend. These surveys provide adequate information to manage moose sustainably. Hunters participating in these surveys build a strong sense of participation in the system and stewardship of the resource.

Accuracy and Precision - It is extremely important that harvest surveys be done annually according to set standards. This is essential for reliable comparisons within and among Cervid Ecological Zones, sub-zones and WMUs. Given concerns with calf populations in some areas, enhanced information (e.g. enhanced calf hunter surveys) may be needed in order to make responsive moose management decisions.

Timing and Frequency - Estimate and assess harvest after each hunt to detect changes promptly. If necessary, incorporate any changes into following year's Moose Harvest Plan.

Mandatory Reporting - Currently, the tourist industry and five WMUs in the province (48, 55A, 55B, 57, 65) require hunters to report their harvest. There is some interest in having all hunters report their harvest annually. Changes in reporting requirements may be considered in the future along with other changes to Ontario's fish and wildlife licensing system.

Reporting

The moose harvest estimates need to be calculated and reported consistently in order to make direct comparisons within and between Cervid Ecological Zones, sub-zones and WMUs. The following standard calculations will be employed:

Number of Moose Harvested - The main measurement for comparison through time within each WMU is the estimated number of bulls, cows, calves, and total moose harvested.

Moose Harvest Density - Moose harvest density is used to standardize comparisons within and between WMUs and Cervid Ecological Zones/sub-zones. Harvest densities for bulls, cows, calves, and total should be reported. The following landbases are used, and these correspond with the main density calculations for the moose population:

- Moose Range - Land and Water - This harvest density represents the total number of moose harvested over the total landscape area.
- Moose Range - Land Only - Same as above but with water removed. This calculation is sometimes used in areas with a large amount of water.

Other Statistics

Hunter effort and harvest per unit effort are useful measures of hunting quality. The following statistics can offer valuable information to help manage moose sustainably:

Effort - Hunter Numbers and Hunter Days - These are standard measurements of the amount of hunting in each WMU. Both are reported by bull, cow, calf, and total tags.

Pressure - Hunters and Hunter Days per 100 km² - These are standard measurements of the intensity of hunting or crowding, and are used in comparisons within or between WMUs and Cervid Ecological Zones/sub-zones. These are reported by bull, cow, calf, and total tags.

Harvest per Unit Effort - Hunter Success Rate (%) and Hunter Days per Moose Harvested - These are standard measures of hunting success or quality. They are also useful indices of population status and trends – if effort remains relatively constant. Hunter success rate (or tag filling rate) is also used in determining the number of tags issued to take the allowable harvest. These statistics are reported for bull, cow, calf, and total tags.

Number of Moose Observed – Number of live moose seen. This can be reported as number of moose seen per hunter day to control for variations in effort from year to year

Using Harvest Estimates

Because of the variability associated with harvest estimates it is necessary to be cautious with direct comparisons to the allowable harvest. Caution is particularly important when using harvest estimates to set the tag filling rate. The tag filling rate determines the number of tags allocated to achieve the planned harvest. Using an atypically low tag filling rate could result in an over-harvest. Conversely, over-estimating tag fill rates can result in the loss of harvest opportunities.

To minimize these problems an average tag filling rate should be used, unless recent tag fill rates are clearly trending up or down, in which case the tag fill rates should be projected. The average should be for the longest possible period that seems to represent recent conditions (e.g. 3 years). Extrapolating a declining tag filling rate is not generally recommended. Declining filling rates can indicate a declining population - management actions may vary depending on the population objectives for a given Cervid Ecological Zone/sub-zone and WMU.

5.0 REFERENCES

Rempel, R., P. Elkie, A. Rodgers, and M. Gluck. 1997. Timber-management and natural-disturbance effects on moose habitat: landscape evaluation. *Journal of Wildlife Management* 62(2): 517-524.

APPENDIX A: Other Moose Harvest Management Strategies –Raised During 2008 Moose Review

A variety of other strategies were raised and considered to enhance moose harvest management. These ideas came from other jurisdictions and from public input to the 2008 Moose Review. This Appendix summarizes these strategies, and comments on their potential applicability and effectiveness in Ontario. These options are not considered for implementation at this time but may warrant consideration in the future as Ontario's moose management program continues to evolve and respond to changing environments and societal needs.

1. Selective / Controlled Harvest Strategies

A variety of systems to control the number of moose harvested by age and sex were examined.

1.1 Any-Moose Harvest System

Description - Licences would be valid for any sex or age of moose. In areas with medium or high hunting pressure the total number of licences would need to be limited. This system was used in Ontario in the 1970s, however due to increasing hunting pressure it was abandoned in favour of a system that was better able to grow and maintain the sustainability of the moose herd.

Biological Considerations - This system tends to promote the harvest of adults over calves, which would be beneficial in areas where calf recruitment is a problem. However, it does not provide control of the sex or age distribution of the moose harvest or population, and as a result it is less suitable for optimizing productivity than the present Ontario system.

Socio-Economic Considerations - Some hunters prefer this system because it eliminates the need to identify the age and sex of the moose before harvest... The main drawback would be that tag filling rates would increase if any moose can be taken and there could be fewer tags issued. Perhaps more importantly, not everyone would be able to hunt because the total number of tags would be limited.

1.2 Controlled -Any Adult Moose

Description - The harvest of adults would be limited, but the harvest of calves is open. This is a variation on the previous system. It is also similar to our present system, but adult tags would be valid for either sex.

Biological Considerations - Does not provide control of the sex of the harvest or the population. This system is less suitable for optimizing productivity than the present Ontario system.

Socio-Economic Considerations - Some hunters would prefer this system because it eliminates the need to identify the age and sex of the moose before harvest. The main drawback would be that tag filling rates would increase, resulting in fewer tags being issued compared to the present system.

1.3 Antlered / Antlerless

Description - This is similar to Ontario's deer management system. Licences would be valid for antlered moose (bulls) or non-antlered moose (cows and calves). The number of antlerless tags would be limited, but the number of antlered tags could be limited or unlimited.

Biological Considerations - This system provides protection to cows and calves, which are the main reproductive component of the herd. Limiting the number of antlered tags would also protect bulls. Antlered tags would likely need to be limited in Ontario because hunting pressure in many WMUs could result in the over-harvesting of bulls. Theoretically this system provides less harvest than systems where calves are harvested separately.

Socio-Economic Considerations - This is a straightforward system that would control calf harvest. It also has the advantage of eliminating the mistake of harvesting a small cow instead of a calf. The main drawback to this system is that it prevents everyone from being able to hunt and does not meet the principles set out in policy. This approach is therefore not considered at this time.

1.4 Bulls-Only

Description - Harvest would be restricted to adult bulls only. In areas with medium or high hunting pressure the total number of licenses would need to be limited.

Biological Considerations - Protects cows and calves, who are the main reproductive components of the herd. However, it does not provide control of the sex ratio of the population, and is less suitable for optimizing productivity than the present Ontario system. In this system the potential exists for bulls to be over-harvested and cows under-harvested.

Socio-Economic Considerations - Some hunters prefer this system as it protects cows and calves. However, harvesting just one sex results in lower overall harvest and fewer tags. In addition, where bull tags are limited not all hunters would be able to hunt.

1.5 Antler Size Restrictions

Description - This is a variation on the bulls-only system which would allow only bulls with a certain antler type to be harvested, for example spike/forks, a specific width, or 3 brow tines, etc. Where these systems are in place, all hunters are allowed to harvest a bull of the specified type. A version of this system was consulted on in the 2008 Moose Program Review.

Biological Considerations - Protects the main reproductive components of the herd (cows and calves) as well as a portion of mature bulls. However, there is a risk that the bull component of the population could be over-harvested in WMUs with high or medium hunting pressure.

Socio-Economic Considerations - This system has the advantage of allowing all hunters to hunt an adult sized moose. The majority of hunters who commented on this system in the 2008 Moose Review were not in favour of it being considered in Ontario. The main reason stated by respondents was the perceived difficulty in identifying antler type. Hunters felt that the wrong moose would be harvested by mistake.

1.6 Combination Systems (Quebec's System)

Description - Quebec combines elements of a Bulls-Only System, an Any-Moose System and a land/area management regime dissimilar to Ontario's current model. In a large part of moose range, licenses are valid for a bull and calf in alternate years. In the intervening years, licenses are valid for a bull, cow, or calf. This system prohibits the harvesting of cows every other year. There are also other important harvest controls in their system, including: 3 or 4 hunters required to tag the moose, generally short seasons, and a large network of parks, game reserves, and controlled access areas where the moose harvest is limited.

Biological Considerations - Protects cows every other year. Because all licenses are valid for an adult, there is a tendency to harvest adults instead of calves. In Ontario, under current land/area management regimes, this type of uncontrolled hunting of adults would likely result in population declines in many WMUs with high hunting pressure. Given that a major change to Ontario's landbase availability and land management regime is unlikely in the very near future, and given that the sustainability of the moose herd is of paramount importance, implementing this type of moose management strategy is not recommended.

Socio-Economic Considerations - It has the advantage of allowing all hunters to hunt for an adult moose every year. However, if populations begin to decline, satisfaction with the quality of hunting would decline. During the 2008 moose review, hunters were generally not in favour of imposing land/area and access controls for hunting purposes or greatly shortening

hunting seasons and preferred a system that is open, equitable and accommodates all hunters to the greatest degree possible.

2. Seasons

A large number of season suggestions were put forward for consideration. They are condensed in the following categories:

2.1 Frequency of Seasons

Description -

- calf season every second or third year
- variations on the Quebec system - any-moose every other year with only bulls and calves in the alternate years; or bulls every year with antlerless every other year
- 3 year rotation through bulls only, cows only, and calves only
- within season rotation through bulls only, cows only, and calves only
- complete closure every 2 or 3 years,

Biological Considerations - The implied rationale for having less frequent seasons is that the harvest would not be limited by tags when the season is open. This may work for some sex and age classes in some WMUs, but there are a large number of WMUs where high hunting pressure would result in heavy over-harvesting in only one season. Rebuilding these populations may take several years. It is very difficult to assess population status and recruitment with pulse/periodic hunting pressure. Results of aerial surveys would be very variable depending on whether they were performed in the year prior to or following the hunt.

Socio-Economic Considerations - Season rotations would not eliminate the need for control of the adult harvest in many WMUs. Restricting open hunting for calves to every other year would also mean that a large number of hunters could not go moose hunting every year. This would have negative economic effects on businesses that depend on moose hunters. Closures of the entire season would greatly reduce hunting opportunities and economic benefits. The systems involving rotating through three types of seasons over three years or within a year may be very complex to implement and difficult to understand.

2.2 Length of Seasons

Description -

- lengthen seasons - 2 week season in north and 6 day season in south is too short
- shorten seasons - north - suggested anywhere from 9 day to present season less a week; season should not extend into snow was common
- season just right - many comments from the northwest indicated they liked the present season length including the snow hunt, some hunters also liked existing northeast season
- crowding - largest concern with shorter seasons was the perceived effect that hunters would be condensed into a shorter time period resulting in crowding
- short calf season - 1 week is too short, and unfair to hunters who can't go that week

Biological Considerations - Most hunters hunt for 1 or 2 weeks during the season, so seasons longer than 2 weeks have relatively small effects on controlling hunter harvest. This signals that the calf season needs to be short to be effective. Similarly, increasing the 6 day season in the south would increase harvest and may require a reduction in tags.

Socio-Economic Considerations - In general, hunters favour medium or long seasons that do not restrict their hunting opportunities. Another concern related to shorter seasons is potential conflicts associated with crowding. The implications for the tourist industry need to be considered.

2.3 Season Start Date

Description -

- Gun season - most comments favoured delaying the season by a week

- Bow season - 1 week delay also mentioned
- Calf season - some hunters suggested starting the calf season in the 3rd or 4th week of the gun hunt

Biological Considerations - A full week delay in the start of the hunt may reduce the harvest slightly more than the potential half-week delay detailed in the strategies. Depending on socio-economic concerns, the season could be moved a week later in the future. Delaying the calf season until the 3rd or 4th week of the gun hunt would lose the benefits of coinciding with the southern hunt.

Socio-Economic Considerations - Delaying the hunt by a week should improve the conditions for meat handling more than the proposed delay of just over half a week. This could be considered in the future if early season conditions continue to be generally warm. Delaying the calf hunt until the 3rd or 4th week of the gun hunt is likely seen as too late by most hunters.

2.4 Special Seasons

A separate season for northern hunters was suggested, as well as a 1 week earlier start for local hunters. These ideas were not considered at this time because of the large number of hunting groups that have mixed membership and views from across the Province.

3. Area Management / Access

A variety of suggestions were made related to the level at which moose should be managed. They fall into the following categories:

3.1 Wildlife Management Units – Boundaries/Size

Description -

- subdivide or change WMU boundaries where appropriate

Considerations - The configuration of WMUs in Ontario, used for the management of numerous wildlife species, reflects a variety of circumstances including ecological variability, geographic and identifiable features (eg. lakes, roads) and administrative boundaries (municipal, landownership) boundaries. Moose are managed so that they are sustainable across ecologically similar areas, regardless of WMU size or boundary. The CEZs provide overarching guidance and management direction that is implemented at the local scale. Moose are currently the most intensively managed species in Ontario

3.2 Wildlife Management Units – Calf Harvest

Description -

- limit calf tag validity to only one WMU

Biological Considerations - About 20% of calves harvested are from a WMU different than the one the hunter applied to for an adult tag. This varies by WMU, but is an important factor in less than half the WMUs with low calf populations. Requiring hunters to hunt in only one WMU would be unlikely to reduce the calf harvest by 20%. Hunters would spend their entire hunt in one WMU, being more likely to harvest a calf there and overall calf harvest would not likely be meaningfully reduced.

Socio-Economic Considerations - Many hunters enjoy the flexibility of being able to hunt in different WMUs over the season.

3.3 Parks and Game Preserves

Description -

- allow hunting of moose in Parks and Game Preserves
- create a network of small sanctuaries for moose throughout their range
- close corridors along roadways and surrounding wetlands to hunting

Considerations - There were several comments on this topic. Parks and Game Preserves provide useful baseline information on moose populations without the impacts of hunting.

The addition of new parks and or protected areas would need to be considered within the context on an overall land use planning exercise that is not part of a moose program review. The proposed harvest management strategies can be used to control the moose harvest and maintain strong populations without an additional network of small refuges.

4. Firearms

Most of the suggestions here related to seasons and tag allocations for firearms other than rifles, but there were also some suggestions for restrictions on firearms.

4.1 Seasons for Firearms

Description -

- shorter bow season (2 weeks)
- longer bow season (4 weeks)
- eliminate bow seasons
- add bow seasons (1 week in south)
- bow only hunts (no gun season)
- bow season after gun season
- add separate muzzle loader seasons

Considerations - Most of the moose harvest occurs during the gun hunt, so seasons for other firearms have a relatively low impact on the moose harvest. Although a few season changes were suggested, there was little dissatisfaction with the present system expressed by the public through the 2008 Moose Program Review.

4.2 Firearm Restrictions

Description -

- prohibit crossbows where harvest needs to be reduced
- limit number of shots in high powered rifles to 2

Considerations - Widespread banning of either crossbows or rifles or restricting their number would not be supported by most hunters at this time.

5. Vehicle Use

There were very few suggestions regarding vehicle use.

Vehicles and Firearms

Description -

- prohibit the carrying of firearms on ATVs
- further restrict the conditions for carrying firearms on all vehicles

Considerations - The use of ATVs, and conditions of their use, can be contentious among moose hunters. Consideration of changes can be considered in the future if conditions warrant.

General Vehicle Use

Description -

- restrict the use of ATVs (only for camp set up, game retrieval, etc., not hunting)
- restrict the timing of ATV use (after noon)
- prohibit the use of ATVs in some (or all) areas
- prohibit the use of snowmobiles

Considerations - The use of ATVs, and conditions of their use, can be contentious among moose hunters. Consideration of changes can be considered in the future if conditions warrant.

6. Party Hunting and Validation Tags

Party hunting overlaps the harvest management system and the tag distribution system, and many suggestions were presented for changing the present system.

Compulsory Party Hunting

- fixed party (for example 4+ hunters with one seal)
- variable party (for example, 4 seals per moose)

Description - This system forces the sharing of a moose. Hunters would have to hunt in a minimum party size, for example four hunters. This would limit a group of 4 hunters to only one moose.

Considerations - Eliminating the harvest of moose by individuals and small groups would make more tags available to larger groups and may satisfy more hunters. However, this harvest reduction would not be sufficient to remove the need for limitations on adult tags. The pressure in most WMUs would result in over-harvesting if one moose per four hunters was permitted. Also, this system would no longer allow single hunters, or groups of 2 or 3 to hunt, something that would be unpopular with many hunters. While Ontario's current moose tag draw system, does encourage people to hunt in groups to maximize access to tags, the current system does accommodate those who choose to hunt individually.

6.2 Reduce Multiple Harvesting by Parties

- Only one tag per group in the draw (bull, cow, or calf – not calf tags for group members)

Description - Hunters could apply in any size group in the draw, but the group would receive only one validation tag. Successful groups would get a bull tag or a cow tag, groups unsuccessful in the draw would receive one calf tag. Hunters could still apply alone in the draw for an adult tag and receive a calf tag if unsuccessful.

Considerations - There are no statistics on the number of parties that take multiple moose, but some estimate around 20%. These additional animals are often calves. However, limiting harvests to 1 moose per group in the draw will not likely result in a 20% decline in harvest. This is because hunting parties can be made up of more than one group of draw applicants.

6.3 Reduce Multiple Harvesting by Hunters

- fixed party, no hunting after seal used
- shooter must seal the moose, no party hunting after seal used

Description - This system restricts hunters who kill more than one moose in a year. With a fixed party license, only the hunters named on the licence could hunt for that moose, and when the moose is taken the hunt is over for all those listed.

Considerations - There are no statistics on how many hunters harvest more than one moose in a season. In some cases the multiple harvests by parties are made by the same hunter encountering a group of moose. The impact of multiple harvests by individual hunters would be partly addressed by changes to reduce multiple harvesting by parties (see 6.2). From the hunter perspective, many prefer the present approach that is more open, where parties can change and any member of the party can harvest any moose the party is eligible to take. Limiting hunters to a single harvest would require a more restrictive system of fixed parties.