HECLA ISLAND - MANITOBA'S ANSWER TO ISLE ROYALE

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Abstract: Hecla Island, encompassing about 171 km$^2$, is the largest island in Lake Winnipeg, located approximately 125 km north of Winnipeg, Manitoba. Timber extraction in the late 1940's and early 1950's resulted in a large white-tailed deer (Odocoileus virginianus) population and a small number of moose (Alces alces). Since that time deer have almost disappeared, while the moose herd has increased substantially. In 1969, the island was turned into a provincial park and a causeway completed to it in 1971. Between 1969 and 1971 most of the inhabitants were moved off. Prior to this time, there was an unofficial harvest of moose by locals and the suspicion exists that this harvest kept the moose herd in check. Since 1972-73, there has been a 73.9 percent increase in the moose herd. Overbrowsing has reached a critical stage resulting in a small die-off of primarily moose calves in the mild winter of 1975-76 and a reduced calf crop in 1976. In January 1977 examination of browse plots indicated that utilization had already reached 90-100 percent with the 1st reported mortality occurring in February. Wolves inhabit Hecla as well as the other islands in this archipelago, and move back and forth between islands and the mainland during the winter months. The location of wolves at breakup dictates on which island they spend the summer. Close scrutinizing of Hecla for the past 5 years indicates that predation by wolves on the moose herd is minimal.

Hecla Island, the largest island in Lake Winnipeg, is situated approximately 125 km north of Winnipeg. It encompasses 161 km$^2$ (62 mi$^2$), measuring about 6.4 km (4 mi) wide by 25.8 km (16 mi) long. The soil is infertile with copious amounts of rocky glacial till broken in places by blocks of limestone jutting to the surface. Until 1971 access was restricted to small boats, a ferry, and aircraft. However, in 1971 a causeway was completed so now a paved highway runs from Winnipeg to the southwest shores of Hecla Island. A gravel road, presently in the process of being upgraded, traverses the island from the causeway to the north end.

Historically, the island was settled by Icelandic people who engaged in commercial fishing, timber harvest and, to a lesser extent, farming.
Forestry operations were carried on extensively until the mid 1950's when they were terminated. In 1969 Hecla Island, along with other associated islands, was set aside as a provincial park so now this archipelago is referred to as Hecla Island Provincial Park. With the advent of the park, an exodus of people occurred. Today only 6 families are full-time residents. A limited amount of agricultural activity is still carried on. Commercial fishing is an important source of income for islanders and those living on the mainland adjacent to Hecla.

Hecla Island is far different from Isle Royale in that construction of a golf course, picnic and camping grounds, 14-family vacation homes, hotel, tennis courts, outdoor amphitheatre, assorted nature trails, and a new access road across the marsh on the southwest side of the island, all done by the Park's Branch, has seriously detracted from the pristine nature of the island - a situation which has not been allowed to occur on Isle Royale.

**VEGETATION**

Forest types include dense stands of mature aspen (*Populus* sp.), green ash (*Fraxinus pennsylvanica*), spruce (*Picea* sp.), balsam (*Abies* sp.), jackpine (*Pinus banksiana*), and tamarack (*Larix laricina*) intermingled with vagrant stands of white birch (*Betula papyrifera*). Other tree species include assorted varieties of willow (*Salix* sp.), red osier dogwood (*Cornus stolonifera*), mountain maple (*Acer spicatum*), hazel (*Corylus* sp.), alder (*Alnus* sp.), pincherry (*Prunus pennsylvanica*), saskatoon (*Amelanchier alnigolda*), and mountain ash (*Sorbus americana*). Many species of shrubs, plants, and grasses can be found throughout the island.

The west side of the island is bordered by a marsh ecosystem stretching about 3/4 the length of the island. A few long leads containing excellent browsing areas extend inland from the marsh area. Old hay fields still exist but they are gradually being taken over by assorted tree species.

Moose have inhabited the island since pristine times with white-tailed deer being a relatively new addition to the ecosystem, 1st appearing in 1920. An old-timer advised the writer that he shot 2 deer in 1920 and was
perplexed as to what he had shot. Both ungulate species responded positively to timber extraction although it is impossible to estimate populations prior to 1970. When questioned about numbers, the old-timers invariably report that there were "lots of jumpers" (deer) and many moose. Winter weather has periodically had an adverse effect on population numbers with the most notable die-off occurring in the mid 1930's. Since 1971 the most notable die-off of moose and deer occurred during the severe winter of 1973-74. In 1974-75 the moose population was reduced by 10.5 percent.

Trend surveys from 1965-71 indicated that the moose herd was increasing and total counts from 1972-77 indicated that the herd had increased by 73.9 percent (Table 1). Herd composition from 1971-77 is given in Table 1 and the ratios of bulls/100 cows, calves/100 cows, and calves/100 adults are given in Table 2. The present estimate of herd size is 214 moose.

Cessation of timber harvest in the mid 1950's has resulted in maturation of the habitat. This, along with a few severe winters since 1970, has resulted in a deer population today of no more than 20-25 animals.

TIMBER WOLF

Timber wolves (Canis lupus) were first seen on the island in the mid 1920's following the appearance of white-tailed deer. Since then the population has fluctuated and today there are no packs resident solely on the island.

Wolves move back and forth between islands and the mainland during the ice period. This has probably been the situation since they appeared in the 1920's. The location of wolves during the ice-free months is dependent on their location at breakup. Since the 1972-73 winter, no evidence of predation by wolves on the Hecla moose population has been documented.

Harvest of wolves is the major reason for their failure to build up into sizable packs and maintain their integrity as seen east of Lake Winnipeg where packs of as many as 20 animals are known to exist. Wolves on and in the vicinity of Hecla Island feed extensively during the winter months on...
Table 1. Hecla Island moose herd statistics.

<table>
<thead>
<tr>
<th>Year</th>
<th>Bulls (%)</th>
<th>Cows (%)</th>
<th>Calves (%)</th>
<th>Estimated population</th>
<th>Percent change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1971-72</td>
<td>37.9</td>
<td>62.1</td>
<td>23.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1972-73</td>
<td>54.7</td>
<td>54.3</td>
<td>21.6</td>
<td>123</td>
<td>+23.6</td>
</tr>
<tr>
<td>1973-74</td>
<td>-</td>
<td>-</td>
<td>21.2</td>
<td>152</td>
<td>-10.5</td>
</tr>
<tr>
<td>1974-75</td>
<td>-</td>
<td>-</td>
<td>17.3</td>
<td>136</td>
<td>+38.3</td>
</tr>
<tr>
<td>1975-76</td>
<td>51.3</td>
<td>68.7</td>
<td>27.6</td>
<td>186</td>
<td>+214</td>
</tr>
<tr>
<td>1976-77</td>
<td>38.6</td>
<td>61.4</td>
<td>20.0</td>
<td>216</td>
<td>+15.1</td>
</tr>
</tbody>
</table>

Table 2. Hecla Island moose herd statistics.

<table>
<thead>
<tr>
<th>Year</th>
<th>Bulls/100 cows</th>
<th>Calves/100 cows</th>
<th>Calves/100 adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>1971-72</td>
<td>61.1</td>
<td>50.0</td>
<td>31.0</td>
</tr>
<tr>
<td>1972-73</td>
<td>120.5</td>
<td>61.5</td>
<td>27.6</td>
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<td>1973-74</td>
<td>-</td>
<td>-</td>
<td>26.9</td>
</tr>
<tr>
<td>1974-75</td>
<td>-</td>
<td>-</td>
<td>20.8</td>
</tr>
<tr>
<td>1975-76</td>
<td>105.2</td>
<td>79.3</td>
<td>29.8</td>
</tr>
<tr>
<td>1976-77</td>
<td>62.7</td>
<td>40.0</td>
<td>24.5</td>
</tr>
</tbody>
</table>
rough fish left by commercial fishermen around net holes. They are frequently caught on the open ice by fishermen and trappers, and as pelt prices are relatively high they are harvested by these individuals.

BEAVER

There are a few beaver colonies on the island which are serving to some extent as habitat manipulators. Aspen trees cut down by beaver are being extensively pruned by moose.

PROBLEM

The primary problem with Hecla Island is a lack of suitable habitat for the ever-increasing moose herd (i.e. the herd has exceeded the carrying capacity of the island). There are presently 9.1 moose/km$^2$ (3.5/mi$^2$) of island or 15.8/km$^2$ (6.1/mi$^2$) of moose habitat. The cessation of logging in the 1950's and fire suppression have resulted in habitat maturation which has reached the critical stage today. Weatherill (Manitoba Dept. Mines, Res. Environ. Manage. 7pp. 1970) recommended a habitat manipulation program and designated areas on which to carry it out. This recommendation was never acted on by the Park's Branch primarily because of their natural system concept. However, the writer did clear-cut 0.8-2.0-ha (2-5-acre) plots which have regenerated to black poplar ($P$. _balsamifera_), trembling aspen ($P$. _ tremuloides_), mountain maple, and red osier dogwood. These areas have been browsed extensively by moose for the past 2 years.

Red osier dogwood is the preferred browse species and according to old-timers this has always been the situation. Other species used in varying amounts are birch, trembling aspen, balsam poplar, several species of willow, pincherry, hazel, saskatoon, balsam, and mountain maple.

Browse surveys done in 1976 indicated that on 1 plot, 45 percent of the aspen, 67 percent of the balsam poplar, and 84 percent of the red osier dogwood were browsed. Red osier was the only species to show evidence of dead stems due to overbrowsing with 17 percent of the stems and 52 percent of the twigs dead. On the 2nd plot, 40 percent of the trembling aspen, 69 percent of the red osier, and 29 percent of the willow were browsed. Twenty-
three percent of the red osier twigs was dead due to overbrowsing. An examination of these plots in January 1977 indicated that utilization was close to 100 percent on red osier dogwood. It is assumed that more extensive browse surveys planned for 1977 will indicate that utilization on all browse species is much greater than we found on the 2 plots in 1976.

A perusal of habitat in February and March of 1977 indicated that utilization of red osier is almost 100 percent over the entire island with heavy use of hazel, balsam poplar, mountain maple, pincherry, willow, trembling aspen, Saskatoon, and balsam fir being severely utilized. There is also evidence that black spruce (P. mariana) is being utilized to a limited extent. Mountain maple and balsam are not preferred browse species for moose in Manitoba, and use of these species is evidence of a lack of suitable quantities of preferred species.

**DISCUSSION**

The winter of 1973-74 was considered severe with snow accumulations exceeding 75 cm. An area on the mainland northwest of Hecla had a large concentration of moose (about 0.4/km$^2$ or 0.8/km$^2$ of moose habitat) with severe overbrowsing evident. That winter about 70 percent of this herd was lost. The present Hecla situation is analogous to the aforementioned but more severe. There was a limited die-off of moose on Hecla in the 1973-74 winter with dead animals being observed. The reduction in the population the following year was 10.5 percent. However, the herd compensated for this loss during the 1975-76 winter by showing a 38.3 percent increase.

One of the interesting ratios to look at is the bull/100 cow ratio since 1971-72, keeping in mind that there has never been a hunting season on the island. In that year, there were 61.1 bulls/100 cows, while the following year (1972-73) there were 120.5 bulls/100 cows (1971-72 winter was considered to be severe). The explanation for this may be that a die-off of cows occurred during the 1971-72 winter or more likely that those flying the survey that year assumed that all antlerless animals were cows. This ratio gradually decreased to 105.2 in 1975-76, then dropped sharply to 62.7
in the 1976-77 winter. It would appear that over the last few years there has been a selection against bulls, the reasons for which are open to speculation.

The percentage of calves in the population has fluctuated since 1971-72 with the lowest (17.2) following the severe winter of 1973-74, and the highest (27.6) following the mild winter of 1974-75. The winter of 1975-76 was very mild causing expectations for a bumper calf crop in the wintering population of 1976-77, but this was not to be. That winter (1975-76) a dead calf was found with a percent fat content in the femur of .03, an obvious case of malnutrition. This may have been an indicator of condition of females in the spring of 1976 resulting in still-born calves or weakened calves that succumbed shortly after parturition. In spite of this, it is noteworthy that 1 cow was in suitable condition to produce triplets and raise them to at least 9 months of age. Another dead calf was found in early February 1977 with a percent femur fat content of .32. A reduced calf crop again in 1977 is anticipated. Flights over the island in the late winter of 1976-77 turned up some animals which appeared to be in a weakened condition.

Hedging on red osier dogwood has only become evident in the last 4-5 years which is an indicator of the time interval over which the moose population has expanded. Removal of islanders to the mainland has taken away the only significant mortality factor except for the severe winters this herd has experienced.

Management plans for the island must include removal of moose concomitant with a habitat manipulation program. It has been recommended that the hydro line be managed for suitable moose habitat and not sprayed to retard growth of vegetation. In terms of habitat manipulation, we are recommending to the Park's Branch that 2-ha (5-acre)plots to be cleared out as well as selective cutting of spruce, balsam, and trembling aspen on the upland sites.

It is imperative to ensure the continued well-being of the island's moose habitat and thus the moose herd that animals be removed prior to the
winter of 1977-78. Removal can be accomplished in a number of ways, including hunting season, Indian harvest, selective culling by government personnel, or drugging and removing to another location. It is the opinion of the writer that the most logical method is allocation of hunting licenses via a draw to Manitobans. To ensure that overutilization of browse doesn't occur in the fall of 1977, this removal should be held as early in the fall as possible.

An alternative to the above is to leave the situation as it is. The results of this will be:

1. A continuation of habitat destruction reducing the ability of the island to support a viable moose herd. The implications of this to the Park's Branch nonconsumptive-use policy of the resource is obvious.
2. Mortality of animals due to malnutrition, the severity of which is directly related to winter conditions. A winter similar in severity to that of 1973-74 will result in loss of 150 animals. As responsible wildlifers, we are endeavoring to assure that this doesn't happen. It is counterproductive to set the stage for winter losses on one hand while restricting hunter use of the resource on the other.

The anticipated fall population for 1977 is 235 moose, and in the opinion of the writer about 135 moose must be removed. With habitat manipulation, the island will support at least 0.8 moose/km². Sufficient numbers of moose must be removed to allow browse regeneration. The population should be maintained at 80-100 animals for 2-3 years.

There should be no question as to the fact that the island is overpopulated, but rather we have attempted to make the process of removal the main issue which in the eyes of the public can be an end in itself. We are suggesting a controlled rifle season in early October 1977 with the possibility of a primitive-weapons season preceding this. Park's personnel must recognize that a limited removal program may be inevitable every 2-3 years if natural mortality does not keep the herd within the capacity of the island to support it. At these times, a primitive-weapons season alone
may be sufficient to meet that end.

Hopefully, the Manitoba Department of Tourism will recognize that Hecla Island is far from a natural system and that consumptive use of the moose resource on Hecla is legitimate. It is also a means to ensure the continued integrity of the moose herd and nonconsumptive use of that resource.