

Appendix H

Moose (*Alces alces*)

Introduction

The importance of moose to our area is underlined by the fact that a moose was recently chosen for the Superior National Forest centennial logo. Tourists visit the area year round to try and catch a glimpse or possibly a picture of our largest member of the deer family. Moose hunting on the forest is an important tradition for many people and a recreational pursuit for others.

Moose populations have been declining in northern Minnesota in recent years. Aerial surveys to monitor moose in 2007 indicated a 23% decrease in the moose population in one year (Lenarz 2007). Population estimates in 2008 were higher but the long-term trend still suggests a declining population (Lenarz 2008). Explanations for this decline include disease, parasites, higher deer densities, a warming climate or a combination of these factors (Axelson 2008).

Indicators

Quantitative indicators and other relevant scientific information were used to analyze effects of the alternatives on moose. The analysis focused on the predominant risk factors pertinent to the species. Indicators were selected based on consideration of 1) species' environmental requirements (habitat quantity, quality, and spatial pattern), life history, and distributional range and 2) potential impacts of management activities. The habitat indicators used for moose that were the same indicators used for the Forest Plan (Forest Plan FEIS, section 3.3.4.2.b):

Forage habitat: upland forest less than 10 years old

Upland conifer cover: upland conifer cover greater than 9 years old

Recent research indicates the importance of conifer stands in providing thermal cover for moose (Leptich 2007, Dussault et al. 2004). In Maine, female moose showed a preference for lowland conifer forest (Leptich 2007). Therefore, the acreage and distribution of lowlands in the Clara Project Area are discussed as well.

Analysis Parameters

A time frame of six years (2008-2014) was used to consider future effects for moose. This is a reasonably foreseeable future timeframe because it includes all known future projects and provides a reasonably reliable estimate of when the majority of activities (including secondary activities such as reforestation) should be completed. The year 2014 marks the first decade of the Forest Plan and is used as our benchmark to measure cumulative changes to management indicator habitats.

Affected Environment

Very few (less than 1%) of the forested uplands in the Clara Project Area are currently less than 10 years old and measured as foraging habitat for moose (Table H-1). Despite this, moose sign and evidence of browsing have been seen throughout the project area. Twenty-seven percent of the uplands are older conifer stands which are expected to provide winter and summer thermal cover for moose. Thermal cover is well-distributed throughout the project area. The area around Mistletoe Lake, Holly Lake and Mistletoe Creek is believed to have higher moose densities relative to the rest of the project area (DNR meeting notes, Jan. 29, 2008, project record,).

Table H-1: Upland habitat indicators for Moose within the Clara Project Area

Indicators	Existing Condition - 2008		Alternative 1 – No Action 2014		Alternative 2 2014		Alternative 3 2014	
	Acres	%	Acres	%	Acres	%	Acres	%
1. Acres and percent of young upland forest <10 years old	128	0.5	12	0	2895	11.4	1702	6.7
2. Acres and percent of upland conifer (spruce and pine) > 9 years old on all uplands	6,885	27	11,328	45	9,708	38	9,864	39

Data source: Existing condition for vegetation indicators are based on 2008 CDS data, and all alternatives are based on projected CDS data in the year 2014. Other Footnotes: Percentages are based on the percent of total upland forest on federal lands in the project area (25,300 acres) for the Mesic Birch-Aspen-Spruce-Fir Landscape Ecosystem.

Table H-2. Lowland habitat indicators for Moose within the Clara Project Area

Management Indicator Habitat	Existing Condition 2008		Alternative 1 2014		Alternative 2 2014		Alternative 3 2014		Forest Plan Objectives Decade 1
	Acres	%	Acres	%	Acres	%	Acres	%	
MIH 9: Lowland Black Spruce-Tamarack Forest									
Young	23	0.6	12	0.3	12	0.3	12	0.3	+
Pole	797	20.0	675	17.0	675	17.0	675	17.0	n/a
Mature	2,499	62.8	2573	64.7	2573	64.7	2573	64.7	-
Old/Old Growth and Multi-Aged	661	16.6	719	18	719	18.1	719	18	+
Totals:	3,978	100.0	3,978	100	3,978	100	3,978	100	

Percents represent % of total lowlands for MIH 9 (Existing Condition) on NFS lands.

Environmental Effects

There would be more foraging habitat created with Alternative 2 (11 percent) than with Alternative 3 (7%) as a result of more timber harvesting (Table H-1). Alternative 3 would create less disturbance by proposing mechanical fuel reduction in some of the stands that are proposed for harvesting in Alternative 2. Although not measured with these indicators, mechanical fuel reduction would still stimulate the growth of young trees and other browse species. Alternative 1 proposes no management activities so would do less than the other alternatives to create forage for moose. Timber harvesting as well as natural disturbance events on all lands will continue to create foraging habitat across the landscape (Appendix I).

Thermal cover should be available to moose under all of the alternatives. Conifer forest makes up 38-45% of the uplands in the project area (Table H-1). There are no management activities proposed in lowland conifer stands so this habitat does not change by alternative (Table H-2). Riparian habitats, wetlands and lakes are protected using Operational Standards and Guidelines (Appendix E). Across the landscape, thermal cover is expected to increase over the next decade (Appendix I).

The Clara interdisciplinary team considered the habitat needs of moose when developing the project alternatives. Specifically, we looked at the spatial arrangement of foraging habitat and thermal cover. A decision was made to not harvest some stands in order to provide more thermal cover (Compartment/stand: 66-40, 66-45, 67-02 and 67-06). In other stands, timber harvest was proposed but would leave a mature conifer component specifically for moose (all managed stands in compartments 67, 66-45, 66-46 and 66-48).

A comment received during public scoping expressed concern for a lack of foraging habitat in the roadless area. Both action alternatives propose treatments that would stimulate browse in the roadless area. New forage is expected following timber harvesting, underburning and mechanical fuel reduction in Alternative 2 and following underburning and mechanical fuel reduction in Alternative 3. No new foraging habitat would be created as a result of management actions under Alternative 1. The wildlife analysis for the Forest Plan considered large unmanaged areas, such as the Boundary Waters Canoe Area Wilderness, and determined that game populations would continue to be viable across the forest (FP p. 3.3.4-28). Natural disturbance events and timber harvesting will continue to create foraging habitat across the landscape. For these reasons, moose habitat needs are expected to be met under any of the Clara Project alternatives.