MOOSE AND FOREST MANAGEMENT IN NEW BRUNSWICK

Jeffrey R. Patch, Gary C. Moore and W. Robert Watt

Forest Management

Forest management involves planning interventions in a biological system with the objective of deriving benefits or products from that system. The biological system is the total forest (10^5 or 10^6 ha) while interventions are carried out at the scale of component stands (10^1 or 10^2 ha) in the forest. The benefits or products gained may be wood fibre, wildlife or recreational opportunities.

Forest management for timber is not harvesting of a stand, it is not planting, it is not protection. It is not any stand level activity performed in isolation or done without specific design in light of forest level performance. Although the above activities have been called forest management, they are really just tactics and, without design, have represented mere tinkering in the woods.

Similarly, forest management for moose is not just protecting moose wintering and calving areas or designing specialized cuts. Forest habitat management is the scheduling of harvesting, silviculture and protection activities in time and space so that desired stand types and development stages are available at desired times and locations throughout the forest being managed. As with forest management for timber, anything else is just tinkering.

Wood Supply Analysis and Forest Management

Forecasts of potential wood shortages have prompted the N.B. government to take action to achieve greater control and predictive capabilities with respect to scheduling forest harvesting and silvicultural activities. A Forest Development Survey (FDS) is being conducted wherein forest stands are classified according to tree species composition, development stage, canopy closure and other attributes. A computerized Geographic Information System (GIS) has been purchased to link stand attributes to geographic locations. Wood Supply Analysis (WSA) procedures have been developed to predict long-term forest level consequences of forest management strategies on wood supply. These WSA procedures utilize FDS information and GIS analytic capabilities to forecast spatial and temporal availability of forest stand types and development stages under alternative forest management strategies.

Habitat Supply Analysis and Forest Management

The development of habitat management planning has been slower. Integration of wildlife habitat objectives into forest management planning has been constrained by the expression of habitat goals in qualitative and hence unimplementable formats.

In order to remedy these shortcomings the Department of Forests, Mines and Energy initiated a 2-year project with funding from Wildlife Habitat Canada to develop quantitative forest habitat-wildlife population relationships. The relationships will form the basis for quantitative definition of habitat objectives (in terms of forest structure) and development of habitat supply analysis (HSA) procedures. HSA procedures will be used to evaluate alternate forest management strategies with regard to spatial and temporal availability of habitat defined in terms of forest stand types and development stages. Goals and strategies expressed in terms of quantified forest structure are implementable and measurable, and therefore consistent with the needs of an adaptive resource management process.

Moose and Forest Management

The Department of Forests, Mines and Energy has defined objectives for sustainable harvests of game species, including moose. The habitat management question for moose becomes "how do we use descriptive (attribute) and spatial (geographic) forest resource information to quantify habitat required to support a moose population which allows us to attain harvest objectives?"

Alternatives for ungulate habitat models include empirical models based on census data and energetics models ranging from cover/forage ratios to energy supply and expenditure curves associated with different stand types. Regardless of the approach it is recognized that factors other than habitat act to regulate populations. For this reason, quantification of required habitat could be disastrous if based solely, for example, on moose censuses or energetics relationships.

Let's hypothesize that in winter moose utilize mixed-wood stands with an intolerant hardwood (birch/aspen) component in 50-plus-year old development stages. What proportion of the total forest should have those characteristics? What spatial distribution is important? For example, is it desirable to have 5% of the forest in that habitat type for every 1000 ha total area; or perhaps for every 10 000 ha? Similarly, what proportion of the forest should be in 15 to 30 year old development stages? Usable information must be in quantitative terms and must be relatable to population numbers that can be supported. It will then be possible to design a long-term forest management strategy that creates and/or maintains desired forest structure characteristics.

In reviewing moose literature, or that for any forest species, several problems become apparent. Definitions of required habitat at the forest structure scale are not presented. Suggestions are made regarding cut block size and/or modifications, but these represent habitat management at a small scale and with a static view. Predictably, the terminology used is inconsistent and is often not easily relatable to New Brunswick forest stand descriptions. Lastly, and highly disturbing, is the apparent disparity regarding identification and relative importance of factors operating to regulate moose numbers.

Despite uncertainties and complexities we are not willing to throw in the towel. To do so is resignation that habitat management for moose is not possible. We must develop models or hypotheses based on the best scientific information available and apply them in directing forest management decisions. Evaluation and refinement will occur on a continual basis through monitoring and research.

Acknowledgements: Credit for the ideas presented in this workshop belongs largely to Dr. Gordon Baskerville, Dean of Forestry, University of New Brunswick. Funds for development of habitat supply forecasting techniques have been provided by Wildlife Habitat Canada.