

FUR AND FIR: CONFLICT RESOLUTION ON VANCOUVER ISLAND

MARVIN ENG
B.C. MINISTRY OF ENVIRONMENT
WILDLIFE BRANCH
780 BLANSHARD STREET
VICTORIA, B.C.
V8V 1X5

ROBIN HOFFOS
B.C. MINISTRY OF FORESTS
RESEARCH BRANCH
31 BASTION SQUARE
VICTORIA, B.C.
V8W 3E7

ABSTRACT

Conflict exists between forest and wildlife managers regarding the fate of old-growth timber set aside as winter habitat for ungulates on the south coast of British Columbia. We describe the basic research and the resulting management tools resulting from a cooperative research program, between the B.C. Ministries of Environment and Forests, that addressed this conflict.

INTRODUCTION

Habitat management is commonly used to achieve wildlife population objectives. However, wildlife managers often lack direct control over habitat manipulations that indirectly result from forestry. Foresters have control but are often unaware of the effects of forestry on wildlife habitat. The resulting lack of integrated planning frequently leads to conflict. The Integrated-Wildlife Intensive Forestry Research (IWIFR) program was undertaken by the British Columbia government from 1981 to 1991 to aid in the resolution of one such conflict.

The goal of the IWIFR program was to reduce conflict over old growth stands that are deferred from harvesting as winter range for black-tailed deer (*Odocoileus hemionus columbianus*) and Roosevelt Elk (*Cervus elaphus roosevelti*). IWIFR was intended to determine the importance of the deferred stands to the long term viability of ungulate populations and to investigate the potential for integrated management of timber and ungulates in intensively managed, second growth forests.

The conflict is linked to the cyclic nature of winter severity on Vancouver Island and the south coast of

British Columbia. Severe winters, with heavy snowfalls and persistent deep snowpacks, re-occur approximately every 15 to 20 years. One such very severe winter, that occurred during 1968/69, caused substantial mortality among black-tailed deer and Roosevelt Elk. Wildlife managers believed that much of the mortality was the result of the removal of stands that had provided severe winter range for these ungulates. As a result, during the 1970's, wildlife managers called for the deferral from harvesting of many south facing, mid elevation old growth patches and low elevation, valley bottom old growth patches that they believed represent severe winter habitat for black-tailed deer and Roosevelt elk, respectively. These deferred stands are extremely valuable for timber because of their high timber volume, and because access roads necessary for harvesting are often in place.

The issue has significant social and economic implications. There are currently over 50,000 ha of old-growth timber temporarily deferred from harvest with an estimated value of more than 50 million dollars (Ministry of Environment and Ministry of Forests 1983). Black-tailed deer and Roosevelt elk are the principal big game species on the south coast of British Columbia, receiving in excess of 150 000 hunter days per year with an estimated annual value of more than 5 million dollars (Reid 1985a, b). In addition, there is substantial public pressure to incorporate a range of non-timber values in forestry plans.

The old growth winter ranges have only been "deferred" from harvesting until such time as it has been determined whether or not black-tailed deer and Roosevelt elk can survive a severe winter in managed second growth.

THE RESEARCH

In an attempt to obtain the information and management tools required to resolve the conflict the Integrated Wildlife-Intensive Forestry Research Program (IWIFR) was begun in 1981. IWIFR was a cooperative program. The Ministry of Forests and Ministry of Environment shared responsibilities and funding with additional support from several member companies of the Council of Forest Industries (COFI), the University of B.C., the B.C. Science Council, Wildlife Habitat Canada and the Habitat Conservation Fund.

The research was done in two phases over a span of ten years, beginning in 1981. Phase I was devoted to basic ecological investigations of deer and elk habitat needs, relationships among habitat features and the effects of forest management on habitat requisites. Phase II focussed on testing Phase I hypotheses, developing management tools and communicating

results.

The ten years of IWIFR research has resulted in over 40 B.C. government publications (Published as Ministry of Environment, Wildlife Branch, Wildlife Bulletins and Ministry of Forests, Research Branch, IWIFR Series) and numerous scientific journal articles. Examples of the projects that span the range research conducted fall into 3 categories:

- 1) Verification of Existing Beliefs: Several studies were conducted, particularly early in the research program, with the primary goal of determining whether or not existing beliefs about ungulate habitat were valid. For example, snow interception studies were conducted to document the beliefs about the influence of tree canopy closure on snow interception (McNay *et al.* 1988).
- 2) Natural History Studies: Natural history studies were principally deer and elk habitat use studies. Other work was also conducted to describe ungulate food habits and population parameters (e.g. Brunt *et al.* 1989).
- 3) Experimental Research: Several projects were initiated to test specific hypotheses and to answer specific questions. For example, the Winter Range Creation project (Nyberg *et al.* 1986) was initiated to determine whether or not deferred old growth winter ranges could be replaced by suitably managed second growth stands. This question resulted in the development of a specific silvicultural prescription, designed to replicate the attributes of old growth winter ranges in second growth stands. The prescription was applied to five areas across Vancouver Island and one area on the mainland south coast. The results of this project will be monitored to determine the effectiveness of the prescription.

THE RESOLUTION

The results of the IWIFR research were used to develop two major management tools designed to assist in the integrated management of timber and wildlife resources. These tools, discussed below, included a planning handbook and a computer based habitat assessment and planning (HAP) tool.

THE HANDBOOK

One of the major products developed from the IWIFR research is the handbook, "Deer and Elk Habitats in Coastal Forests of Southern British Columbia" (Nyberg and Janz, 1990). Numerous authors

contributed to the handbook and guidance was provided by steering and technical committees comprised of representatives from government, universities, industry and the public.

The handbook is a reference document providing pertinent background ecology and applied information on habitat manipulation in a planning context. It is intended to educate and provide a tool for problem solving and communications. The handbook has been distributed to a range of professionals and technicians involved in the preparation and review of forest management plans.

Although the handbook is large, consisting of 6 chapters and 5 appendices totalling 310 pages, it is constructed to facilitate easy use. The habitat management chapter has a modular format, permitting selective use, and the planning chapter includes a step by step planning checklist for quick consultation. The handbook was published in both perfect bound and 3 ring bound versions; the latter allowing for removal of specific pages as required for field use or photocopying.

To facilitate use and understanding of the handbook, 7 workshops were held at seven locations on Vancouver Island and the lower mainland of British Columbia. The workshops were attended by 152 individuals involved in forest management and planning from both government and industry.

Initial response to the handbook and training has been positive. The real determination of handbook success will be its use in affecting changes in forest management. The handbook has not been available for sufficient time yet to determine whether that is occurring. A survey of individuals who attended training sessions will be done in late 1991 to assess use and usefulness of the handbook and training.

THE HABITAT ASSESSMENT AND PLANNING TOOL

The HAP tool is a series of micro-computer based models that allows forestry and wildlife managers to incorporate the spatial and temporal aspects of wildlife habitat into operational forestry plans. The HAP tool helps managers to assess the suitability of habitat for individual wildlife species and the impacts of proposed forestry plans on that habitat; identify the risk of uncertain management actions; and document the rationale used to make decisions.

Several important guiding principles were involved in the development of the HAP tool. The HAP tool has been designed as a mechanism that provides

information to managers which they can use to make decisions. That is, it is a decision aid not a decision making system. In developing the HAP tool we have used the simplest possible models that provided useful and realistic results. An expert specifies the minimum parameter set required to achieve the desired model output and then estimates the parameter values. Using the simplest possible models makes development and validation of the models easier and it allows managers to understand, and therefore believe in, the system (Bunnell 1989).

The core concept of the HAP tool has long been understood and accepted: "game abundance should increase in situations where various types of food and cover come together" (Leopold 1933). Previous methods to include "habitat interspersion" in habitat models, using "interspersion indices" (e.g. Hienen and Cross 1983), were not adequate because it is the specific spatial arrangement of stands that is important rather than some generalized measure of interspersion. Adequate representation of spatial interspersion is possible only by processing habitat data while retaining its spatial integrity. This requires computerized map analysis (GIS).

The HAP tool consists of 3 component parts:

1. The regional priorities model is based on an expert system decision hierarchy designed to rank watersheds, within a region, in terms of their need for habitat management relative to the species of concern.
2. The watershed assessment model is GIS based and uses expert derived rules. It allows the assessment of habitat suitability and habitat requirements within watershed-sized areas.
3. The management options model determines the most cost effective methods of producing the habitat requirements identified by the watershed assessment model.

Each model has linked inputs and outputs that operate in an integrated and iterative fashion. The regional priorities model is used to obtain a ranking of planning units (watersheds) in terms of the need for habitat management. The watershed assessment model provides an evaluation of the proposed forestry scenarios and assists with the specification of habitat management requirements. The management options model is used to determine the most appropriate management actions for achieving the habitat requirements.

The watershed assessment model forms the core of the HAP tool. Watershed assessment is a stepwise and

potentially iterative process. First, a current habitat suitability is assessed. Forest harvesting scenarios are then overlaid on the existing conditions and changes in vegetation through time are determined. The projected habitat suitability under each scenario is compared with agency objectives. Input to the model includes large scale GIS data and proposed forestry plans. Model outputs are of 4 types:

1. Data Inadequacy: an identification of stands in the watershed where the available data are not sufficient to allow a reliable assessment of the present or future habitat conditions.
2. Sensitive Stands: identification of stands in the watershed where large changes in habitat suitability may result.
3. Future Forecasts: maps and tabular reports of the changes in habitat suitability through time.
4. Documentation: records of the results of the watershed assessment to aid in future evaluation of decisions.

HAP develop efforts to date have concentrated on habitat suitability models for black-tailed deer (Eng et al. 1991) and Roosevelt elk (Brunt 1991). Both models have been subjected to ongoing verification and validation during their development. Validation of the Roosevelt elk model is presented in Brunt (1991). A comprehensive paper on the validation of the black-tailed deer model is in preparation. An operational trial of the HAP tool for black-tailed deer in the Nimpkish River valley on northern Vancouver Island is currently in progress.

The HAP tool offers significant advantages over traditional methods of habitat planning (analog maps) because habitat interspersion can be modelled. Iterative assessments, comparing different scenarios, can be accomplished with minimal effort. However, there are several difficulties with the application of the HAP tool. Although some of these are technical in nature, the most important difficulties relate to corporate and institutional attitudes. First, effective use of the technology requires that wildlife managers explicitly state their habitat objectives and develop methods of comparing those objectives to the objectives of other resource sectors. Secondly, management at all levels of industry and government must be willing to accept the cost and short term reduction in staff productivity that will be associated with the implementation of the technology.

THE CONCLUSIONS

Based on experiences from the IWIFR program, some broad conclusions can be made in regard to

research directed at resolving resource management conflicts. As Carl Walters (1986) points out, "...management is done by people as well as for people." Implementation of research results by managers therefore depends not only on the validity of those results but also their acceptability. The cooperative structure of IWIFR ensured that managers and others had some sense of ownership of research results which in turn appears to have contributed to their acceptance.

In dealing with conflict resolution there is often a tendency to seek technical solutions to non-technical problems. Issues often reflect social, political and economic factors and these can change quickly. Research spawned from issues therefore runs the risk of being irrelevant to the original issue by the time results are available. Since the inception of IWIFR, public concern over biodiversity has superseded the interest of the hunting public for large game animal populations. Therefore, it is important to ensure that research is directed appropriately, sufficient time is available for achievement of results and where possible, tools are developed that are sufficiently flexible to permit broad application.

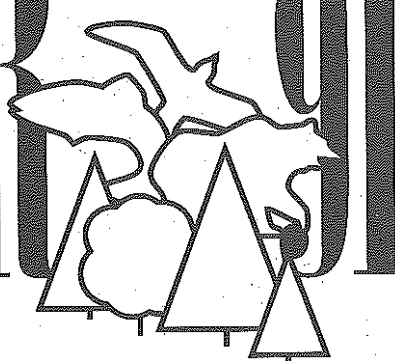
In many cases, research on complex ecological systems may be more appropriately framed in an adaptive management context. "Learning by doing" (Walters 1986) may provide better insight about large systems over a range of possible states than study of component parts and consequent extrapolation to the whole. Adaptive management encourages one to "embrace uncertainty" rather than ignore it (Walters 1986) and enhances communication and ownership by bringing the realms of research and management closer together.

REFERENCES

1. BUNNELL, F.L. 1989. Alchemy and uncertainty: What are good models? Gen. Tech. Rep. PNW-GTR-232 Portland OR: USDA, Forest Service, Pacific Northwest Research Station. 27 pp.
2. BRUNT, K.R. 1991. Testing models of the suitability of roosevelt elk (Cervus elaphus roosevelti) seasonal ranges. M.Sc. Thesis, Dept. Biology, Univ. of Victoria, Victoria, B.C.
3. BRUNT, K.R., D.Q. BECKER, and J.A. YOUNDS. 1989. Vancouver Island Roosevelt elk/intensive forestry interactions. Phase 1 (1981-1986) job completion report. Research, B.C. Ministries of Environment and Forests. IWIFR-33. Victoria, B.C.
4. ENG, M., S. MCNAY, D. JANZ, L. KREMSATER, I. MACDOUGALL and R. PAGE. 1991. Assessing and planning the spatial and temporal features of black-tailed deer habitat. Presented at Habitat Futures 1989 workshop, Oct. 16-20, 1989, Pack Experimental Forest, Eatonville, WA. in press.
5. HIENEN, J. and G.H. CROSS. 1983. An approach to measuring interspersion, juxtaposition and spatial diversity from cover type maps. Wildl. Soc. Bull. 11: 232-237.
6. LEOPOLD, A. 1933. Game management. Charles Schribner's Sons N.Y., N.Y. 481 pp.
7. MCNAY, R.S., L.D. PETERSON and J.B. NYBERG. 1988. The influence of forest stand characteristics on snow interception on the coastal forest of B.C. Can. J. Res. 18:566-573.
8. MINISTRY OF ENVIRONMENT and MINISTRY OF FORESTS. 1983. Reservation of old-growth timber for the protection of wildlife habitat on northern Vancouver Island. B.C. Min. of Forests, Information Ser. Br., Victoria, B.C.
9. NYBERG, J.B., F.L. BUNNELL, D.W. JANZ and R.M. ELLIS. 1986. Managing young forests as black-tailed winter ranges. B.C. Min. For., Victoria, B.C. Land Mngage. Rep. 37.
10. NYBERG, J.B. and D.W. JANZ. 1990. Deer and elk habitats in coastal forests of southern British Columbia. B.C. Ministry of Forests Special Report Series 5, Victoria, B.C.
11. REID, R. 1985a. The value and characteristics of resident hunting. B.C. Min. Environ., Wildl. Branch. Victoria, B.C.
12. REID, R. 1985a. The value and characteristics of non-resident hunting. B.C. Min. Environ., Wildl. Branch. Victoria, B.C.
13. WALTERS, C. 1986. Adaptive management of renewable resources. Macmillian Publishing Company, N.Y., N.Y. 374 pp.

PROCEEDINGS

WILDFOR 91



**WILDLIFE & FORESTRY:
TOWARDS A WORKING PARTNERSHIP**

JASPER, ALBERTA, OCTOBER 7-10, 1991

A FORUM ORGANIZED JOINTLY BY:



**THE CANADIAN SOCIETY OF ENVIRONMENTAL BIOLOGISTS
LA SOCIÉTÉ CANADIENNE DES BIOLOGISTES DE L'ENVIRONNEMENT**



**CANADIAN PULP AND PAPER ASSOCIATION
L'ASSOCIATION CANADIENNE DES PÂTES ET PAPIERS**