INTEGRATING FORESTRY AND WILDLIFE MANAGEMENT THROUGH FOREST MANAGEMENT PLANNING IN BRITISH COLUMBIA

by

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ABSTRACT

Since the restructuring and enactment of forestry legislation in 1979, the B.C. Ministry of Forests has placed increased emphasis on Forest Management Planning as a strategic level of planning to achieve its broadly stated goal of Integrated Resource Management (IRM). This has taken place as a result of the recognition by resource managers that the broad implications of the more localized, tactical planning are not well understood and that planning for the various forest resources needs to be done on a more comprehensive, proactive basis. The thesis examines the two fields, IRM and strategic planning, and attempts to determine how they can be linked to enable effective planning for forestry and wildlife resource management.

Criteria identified as being essential for effective IRM are outlined, then applied to processes for forestry and wildlife integration through a case study approach. Three management units - two government managed Timber Supply Areas and one corporate managed Tree Farm License - within the Nelson Forest Region are examined.

The Ministry of Forests has made and continues to make significant advances in facilitating integrated forestry and wildlife management through Forest Management Planning. Yet some serious weaknesses of the process hinder the delivery of integration at the field level. Foremost is the lack of an overall integration mechanism across disciplinary lines and within the existing planning hierarchy of the Ministry of Forests. The lack of Regional plans having broadly

based IRM units, in addition to the lack of clearly defined policies and explicit philosophy of land use, has meant that the integration of forestry and wildlife at the Forest Management Planning level is being undertaken without the needed context. Another critical weakness is the lack of clearly defined, quantitative objectives at the Forest Management Planning level to provide guidance to resource management design. This factor, coupled with the lack of formal monitoring, has meant that the Ministry's potential for adaptive management with regard to cause and effect relationships is seriously compromised.

The groundwork for effective IRM planning has been laid however. Prominent among the gains made as a result is an increased level of communication between the Ministry of Forests and Ministry of Environment on issues that transcend the sectoral boundaries.

Overall the integration of forestry and wildlife management through Forest Management Planning is in a state of transition but with the existence of some significant deficiencies, the potential for effective IRM planning has not yet been met.

Several recommendations to remedy existing deficiencies are offered. Most essential is the need to improve direction through clearly defined policies and objectives and to translate these into regional plans that enable the evaluation of multiple alternatives at the Forest Management Planning level. The inter-relatedness and importance of all criteria for effective IRM planning underscores the need to address all facets of the process concurrently and continuously.

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I. INTEGRATED FOREST RESOURCE MANAGEMENT IN B.C.

In British Columbia, integrated resource management (IRM) and planning programs have evolved through a complex interaction of government agencies with changing needs and priorities for resource use. IRM has taken on different forms through change in political philosophy and through interpretation by implementing agencies and officials. Thus the use of natural resources in B.C. has been tempered by a collectivity of government agencies, each having its own legislative mandates, philosophies and administrative styles. These factors have combined to give British Columbia its own distinct approach to integrated resource management and planning.

IRM, as a strategy to attend to resource issues, has taken on different interpretations, but can be described as:

> A decision-making process whereby all resources are identified, assessed and compared before land use or resource management decisions are made. The decisions themselves may be multiple or single use within a given area... The application of integrated resource management results in a regional mosaic of land uses and resource priorities which (should) reflect the optimal allocation and scheduling of resource uses. (B.C. Ministry of Forests and Lands, 1988).

Considerations of resource integration have been advanced through the growing awareness that the environment is comprised of interdependent ecosystem components which form a complex web. It is not possible to implement a strategy of single use without having an effect on other resources or use of the same resource for different purposes (Tysdal, 1973). Thus IRM involves a coordination and balancing of natural resource uses through a multi-tiered planning framework and requires the consideration of numerous legitimate

interests.

In British Columbia, planning for the integration of forestry and wildlife resources has received attention particularly because the province has a greater expanse of productive timber land and a greater diversity of wildlife species than any other province or territory in Canada, coupled with the fact that most of the province's wildlife species are forest dwelling and depend to some extent on forest cover (Forestry Wildlife Group, 1987). Hence, planning for integrated forestry-wildlife uses often elicits emotionally charged controversies over land use decisions and practices which complicate efforts to resolve conflicts. In B.C., joint planning committees, improved methods of information sharing, development of protocol agreements, and other mechanisms have all been used to improve cooperation and communication between forestry and wildlife agencies through Forest Management Planning.

A. PURPOSE AND APPROACH

This thesis examines one level of forest resource planning in B.C. - Forest Management Planning - in the context of IRM, and poses the research question "Is the integration of forestry and wildlife resource management in B.C. being successfully carried out through Forest Management Planning?" A subsidiary question is "What are the appropriate decisions to be made at this level of planning?" The purpose of this study therefore is to evaluate the effectiveness of strategic integrated forestry-wildlife resource planning in B.C. and highlight the major strengths, weaknesses and innovations of the process. Effectiveness can be defined as the degree to which a program meets the purpose(s) for which it was

established (Weiss, 1972). Wildlife is interpreted in this thesis to mean both fisheries and wildlife resources.

The thesis consists of six chapters. In Chapter 1 both integrated resource management and strategic planning are reviewed, beginning with a brief discussion of the concepts and circumstances that gave rise to integrated resource management in North America. The evolution of IRM in B.C. is also described, including the different political philosophies involved, and what the current approaches are in striving towards IRM.

Chapter 2 provides a discussion of the framework for IRM through Forest Management Planning. Institutional arrangements, through which IRM is implemented, are reviewed specifically in the context of forestry and wildlife planning in B.C. These arrangements include government organizations, legislation and Timber Supply Area or Tree Farm License planning processes. The basic strengths and weaknesses of each are identified.

In Chapter 3 the proposed evaluation criteria for effective IRM within a framework of Forest Management Planning are discussed. The focus of the chapter is on the eight evaluation criteria selected by the author and a commentary on their importance to effective IRM planning.

Chapter 4 puts forth the results of several interviews conducted in case study areas within the Nelson Forest Region and compares these with results of interviews carried out in Victoria. Results of the interviews are combined with

insights gained from other documentation. These results are presented according to the criteria identified in Chapter 3 and form the main source of information for this study.

In Chapter 5 the interview results are evaluated according to the eight criteria, within a comparative framework. The major findings of the study are presented, setting the stage for the final chapter.

Chapter 6 discusses the conclusions drawn from the study and presents some recommendations for improving IRM and Forest Management Planning in B.C. The chapter also provides recommendations for future study.

In pursuing these ends, the thesis examines two fields of planning - integrated resource management and strategic planning - and attempts to determine how the two can be linked to enable effective planning for integrated forestry and wildlife resource management. The emphasis is on the practical application of planning rather than on the theoretical basis, although it is recognized that the evaluation criteria inherently draw on theoretical research.

At the formative stage of the study, the focus was on Forest Management Planning for Timber Supply Areas (TSAs). However, a subsequent policy announcement by the Minister of Forests indicated a potentially major shift from Crown managed TSAs to corporate managed Tree Farm Licenses (TFLs). This thesis then, emphasizes Crown initiated planning but recognizes the increasingly important role that TFL planning may play in the management of the Province's

natural resources. Since the intent of government is to ensure that TFL planning closely parallels TSA planning, the recommendations arising from this study will, for the most part, apply to both government and corporate processes.

The research employs a case study approach whereby the planning processes as applied to two TSAs and one TFL are reviewed, then evaluated against the eight criteria for measuring program effectiveness. In consultation with government officials in Victoria, the Nelson Forest Region of B.C. was selected because this region has critical, overlapping resource values for both wildlife and forestry and is at an advanced stage in the strategic integrated resource planning process.

Several sources of information, mainly in the form of library material, other published and unpublished documents, and interviews were used in the thesis research. While the literature provided the necessary background material, the emphasis was placed on interviews to provide the information required for the evaluation of planning processes.

Information gathering consisted of two phases. In the first phase, library material and documents from the B.C. government and other jurisdictions (mainly Alberta and the U.S.) were examined for information pertaining to IRM, strategic planning and the evaluation criteria. These were further studied to derive indices for estimating the planning process effectiveness as the basis for interview questions. In the second phase, fifteen interviews were conducted, nine of which took place in the Nelson Forest Region (Regional and District planning levels) and six of which took place in Victoria (Headquarters level).

B. BACKGROUND TO INTEGRATED RESOURCE MANAGEMENT

Integrated Resource Management has developed differently in various jurisdictions across North America, providing each political unit with a distinct form of management. The following pages describe the development of IRM concepts in North America and, more specifically, how it emerged in B.C. Policies for and current approaches to IRM in B.C. are also presented.

1. Historical Development of IRM Concepts in North America

Integrated resource management has evolved over the last several decades through the concept of "multiple use". This latter concept arose in the United States in the early twentieth century and gained impetus in the 1940s when resource managers recognized the need for cooperation and coordination in national land use planning. However, confusion and difference of opinion as to what multiple use meant served to hinder the application of its principles (Smith, 1970; Tysdal, 1973). The precise meaning of multiple use was not established either by consensus among natural resource experts or by legislative decree (Hall, 1963). It was eventually clarified through the passing of the U.S. Multiple Use - Sustained Yield Act of 1960 which defined multiple use as:

> the management of forest and related areas in a manner that will conserve the basic land resource itself while at the same time produce high level sustained yields of water, recreation, wildlife and forage harmoniously blended for the use and benefit of the greatest number of people (Multiple Use - Sustained Yield Act, 1960 as cited by Starr, 1961).

Multiple use therefore attempted to provide an increased yield of products and

services from a chosen area while also maintaining or enhancing resource productivity.

Over the decades preceding the 1960s, it had become apparent that the limitations of the natural resource base were being felt primarily as a result of continued social consumption of resources. High expectations for the abundance of natural resources have thus resulted in scarcity, substantiating the need for the optimized use of resources. It was this need that led to a change in management philosophy, in essence from an uncoordinated single use strategy to the strategy of IRM.

The concept of multiple use expanded in the late 1960s and early 1970s to include the integrated management of resources. This evolution indicated a change in management philosophy from uncoordinated single use management to an interdisciplinary, more sophisticated management strategy. Integrated resource management also became a more ecologically based concept in that it considered interrelationships of resource uses with each other and within a total system (Tysdal, 1973). Despite its importance, acceptance of IRM has been slow in coming due to the lack of adequate definition of the terms of multiple use which led to the philosophy of IRM (Smith, 1970) and due to the related lack of explicit distinctions between methods and practice that created confusion among professional foresters and the general public (Tysdal, 1973).

It is important to note that, unlike the United States, Canada has not legislated multiple use and integrated resource management as a requirement. Instead the

procedures for integrated resource planning and management are left to the discretion of senior level resource managers. In British Columbia, IRM is governed by the Ministry of Forests Act and other policies† and procedures which state that the uses of all forest resources will be planned in a careful and deliberate manner so that maximum social and economic benefits are attained (Bullen, 1987a).

The development of integrated resource management in Canada was different than that in the United States for a number of reasons. Prominent among these is the fact that 90% of the forest land in Canada is Crown owned, making the question of social versus economic values a very important consideration. Also, constitutional arrangements in Canada gave the provinces jurisdiction over forest lands and other natural resources so that each province and each natural resource agency within the provinces developed policies and procedures in varying ways. Finally, the integration of forestry and wildlife resources - a form of IRM - has been slow to evolve in Canada due to:

1. the perceived abundance of timber and wildlife which had reduced the level of concern for scarcity;

2. the lack of understanding of complex interactions between timber and wildlife resources;

3. the lack of communication between forestry and wildlife professionals as well as the lack of examples providing demonstrated results of successful integrated resource management (Innes, 1985); and

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†The Ministry of Forests has recently developed policies that provide a working definition of Integrated Resource Management and Integrated Resource Planning. At the time of this writing, these are in draft form.

4. the dominant importance of timber in the economy of B.C., a factor that has in the past suppressed concern for wildlife.

But the processes of IRM are improving as agencies develop mechanisms to further the concept of partnership in resource planning.

Despite these differences, the need for integration was felt in both Canada and the U.S. and resulted in a series of conferences and written statements on the subject. In 1970 the Subcommittee on Multiple Use of Canada's Department of Regional and Economic Expansion wrote a report entitled "Towards Integrated Resource Management" in preparation for a national meeting on forest lands. In that report members of the subcommittee endorsed the need for higher levels of coordination between agencies and suggested that land use teams of single disciplines should evolve into integrated management teams (Subcommittee on Multiple Use, 1970). The following year, the Canadian Institute of Forestry (1971) adopted a forest policy statement which stated

> Generally, effective resource management requires the harvesting of crops such as timber and game to maintain a productive system and a stable environment. The deliberate and careful planning of the various resources to interfere with each other as little as possible and to complement each other as much as possible, with due regard for their order of importance in the public interest in each management unit will achieve the optimum social and economic benefit to the people of Canada.

This statement was essentially adopted by the B.C. Ministry of Forests in their "Statement of Integrated Resource Management" of 1983.

To summarize, approaches to resource management supported in North America have evolved from single use, to multiple use and finally to IRM. Confusion has

often arisen over the use of these terms, in particular between single use and multiple use and between multiple use and IRM. For example, a corporate forester may view wilderness preservation as single use that excludes any form of development while a wilderness advocate may view preservation as multiple use that allows for such benefits as recreation, aesthetics, watershed protection and the retention of fish and wildlife habitat. In the view of the Chief Forester of B.C. (Cuthbert, 1988a), single use is directed towards the utilization of only one resource in a given area, with other potential resources excluded or not actively managed. Multiple use is a form of management whereby two or more resources in a particular area are concurrently utilized such that none of the components impose a detrimental effect on one another.

Integrated resource management is more of a philosophy than a form of management. It is the result of a sometimes complex interdisciplinary process in which all resource values are considered along with the social, economic and environmental needs in a given area. Resources are managed according to a desired emphasis over space and time and therefore IRM can lead to a pattern of single, multiple or sequential uses within an area (Cuthbert, 1988a). It is often the interdisciplinary approach to IRM that is emphasized, with each resource sector having specific management goals and requirements that most often involve some compromise in the integration process. In this interactive process, minimum standards or thresholds are set, based on public demand or biological requirements, and a "decision space" is delineated (Mealey and Horn, 1981). Within this decision space, certain goals may be emphasized in the articulation of management alternatives, but the provision of resource outputs

requires that all resources being considered are adequately represented in the process (Mealey and Horn, 1981).

2. The Evolution of IRM Policy in B.C.

Integrated resource management emerged in B.C. in such a manner that its precise origin is indeterminite. While the government had looked towards the United States for several years to see how multiple use concepts were developing, it was not until the late 1960's and early 1970's that the concepts of multiple use and integrated resource management commanded close attention in B.C. (Tysdal, 1973). IRM policy finally became part of the political agenda through a change in government in the 1970's and thus has existed for little over a decade in British Columbia. Three phases which characterize the evolution of IRM policy can be recognized.

- Phase 1 (Pre 1972) The Growing Awareness of Environmental Concerns
- Phase 2 (1972-1975) Emergence of IRM as a Policy Goal
- Phase 3 (1975-1985) Implementation of IRM From the Perspective of a Different Political Philosophy

a. Phase 1: The Growing Awareness of Environmental Concerns

Amidst the trends that led to policies of IRM in B.C., there were a number of occurrences that, in combination with each other, had a profound effect on the resource base. Increasing population was one factor which, along with the increased utilization of resources, contributed significantly to the problem of

resource depletion. Also, changing social lifestyles including increased affluence and leisure time led to increasing demands for more carefully derived resource decisions.

Government organization evolved slowly in response to these changes. Prior to the 1970's government was organized such that each resource sector was the responsiblity of a specific branch of a single agency. There remained relatively sharp isolation between government agencies. While this approach enabled specialists to focus upon well defined problems with a clearly defined clientele, it failed to adequately deal with pressing issues associated with resource scarcity and interaction (Heayn, 1977). Because management issues were viewed in terms of the discipline and clientele, social interests and issues as well as interests outside the pervue of the agency were often overlooked.

The 1960's was an era characterized by conflict between industrial or commercial users and public users. This decade of ecological enlightenment was manifested in the form of the environmental movement and resulted in the proclamation of a variety of environmental protection legislation including the Pollution Control Act of 1967 and the Environment and Land Use Act of 1971.

Conflicts were also occuring between government agencies, most notably in areas where there was departmental overlap in jurisdiction and where narrowly focussed, opportunistic styles of decision-making were encountered. As early as the 1950's conflict between forestry and fisheries agencies gave rise to a system of referrals to provide an early opportunity for review of timber harvesting

applications. Although IRM did not become a formalized process during this period, provincial and federal fisheries agencies had a marked influence in the evolution of mechanisms for IRM planning (Dorcey, 1986).

In response to conflicts arising from forestry and wildlife management activities, the Forest Service and wildlife staff entered into discussions over how logging operations might be adjusted to meet the needs of the wildlife resource, for example designing the configuration of cutblocks to provide adequate wildlife habitat (C. Young, 1977). These discussions were the beginning of a push to implement ecologically sound logging and eventually led to the development of the Coast Logging Guidelines in 1972. Also resulting from the conflicts was the establishment in 1969 of an unofficial cabinet committee, the Land Use Commmittee (LUC), to provide a forum for conflict resolution and to attempt to mitigate interagency disputes (Tysdal, 1973). This committee consisted of the Ministers of Agriculture; Lands, Forests and Water Resources; Mines and Petroleum Resources; and Municipal Affairs.

The initial years of the LUC were ones of innovation in policy and program development. For example the folio system, which consisted of a series of maps, each delineating interests of the various resources, was put into practice. The highlighting of areas of conflict through the folio system was one mechanism supported by the LUC that facilitated the resolution of several conflicts.

As a result of the LUC's success, the Cabinet Committee was formally established under the Environment and Land Use Act of 1971 and was renamed

the Environment and Land Use Committee (ELUC). The Act gave the ELUC general authority on resource problems and provided the establishment of an Environment and Land Use Technical Committee (ELUTC) consisting of the Deputy Ministers of the member ministries (ELUTC, 1978). This Act became the single most important piece of resource legislation in B.C., superceding all other Acts related to specific resource issues (Addison, 1984). Its significance also lay in the fact that it became the pinnacle of IRM policy under the Social Credit party.

b. *Phase 2 (1972-1975) The Emergence of IRM as a Policy Goal*

The New Democratic Party took office in 1972. This policy-oriented Government, unlike the Social Credit Party that preceded it, became a strong supporter of Integrated Resource Management. The Minister of Lands, Forests and Water Resources was himself a proponent of the development of policies that provided the mechanism for the equitable allocation of resources. Of significance to the evolution of IRM was the fact that the Minister was in a position of power, having control over three major resource departments. This situation became the focus for considerable controversy.

One of the first initiatives towards a more refined approach to integrated resource management was the development of the Coast Forest Guidelines. In 1972, the Chief Forester of the Ministry of Forests stated in a letter addressed to all coastal forest companies,

    if the forest industry wishes to continue its success as the prime user

of British Columbia forests, it must accept the need for maintaining
an environment satisfactory and suitable to the needs of all British
Columbians (W. Young as cited by C. Young, 1977).

The letter, which outlined twelve ways in which logging operations should be

modified to accommodate the needs of other resource uses, brought into use the

Coast Logging Guidelines which were general applications to be further refined as

time progressed.† Introduction of the guidelines brought into sharp focus the

demands of other forest users and served to dramatically alter the philosophy

and practice of forestry in B.C. (C. Young, 1977). Although designed with

fisheries resources in mind, they served as a catalyst around which various

resource agencies discussed such issues as the appropriate cutblock size to protect

critical wildlife habitat.

The concept of IRM was a matter of concern for the ELUC due in part to its

mandate which included the authorization to "make recommendations to the

Cabinet on any matter relating to the environment and the development and use

of land and other natural resources." To further its capabilities in studying "any

matter pertaining to the environment or land use", the ELUC established a

permanent support staff, the ELUC Secretariat, in 1973 (ELUC Secretariat,

1978). In situations where the bilateral or multilateral arrangements to

decision-making were not succeeding, the ELUC Secretariat assisted by conducting

interdepartmental reviews and providing recomendations to ELUC. The Resource

Planning Unit of the Secetariat was instrumental during 1974 in planning for

the regional resource management administrative framework which was to be part

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†The Coastal Forest/Fisheries Guidelines have been finalized in 1988 and are
currently in use by the forest industry.

of an ongoing program to decentralize the integrated resource management process.

While many studies were coordinated by the ELUC Secretariat, other integrated resource studies were conducted by the Ministry of Forests or by independent consultants. The focus was on localized issues at the watershed level. One planning initiative was that undertaken for the Tsitika Watershed on Vancouver Island. Development proposals for this watershed evolved into a complex resource issue and resulted in the formation of an interdisciplinary planning committee. The completion of the integrated resource management plan marked the first time that the Allowable Annual Cut for a Timber Supply Area had been reduced to meet the concerns of wildlife habitat protection and demonstrated the need for linking tactical planning with the broader strategic planning (Bunnell, pers comm, 1988).

IRM during this period was thus undergoing a process of experimentation with several mechanisms. Interagency committees were struck to conduct analysis on specific issues; the Coast Logging Guidelines were developed and were being further refined; a program of Environmental Protection Areas† for delineation on maps was established; and Regional Resource Management Committees (RRMCs) were instituted.

The RRMCs were a focal point for the institutional changes that took place in

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†Environmental Protection Areas, areas regarded as being sensitive to the impacts of timber harvesting, were identified and mapped onto forest cover maps by staff of the Ministry of Environment. These designations later became known as Environmentally Sensitive Areas (ESAs).

the NDP era. Through these Committees, comprised of senior management level regional staff of the various resource agencies, the formalization and diffusion of IRM was established. The Committees were set in place to serve as the regional vehicle for ELUC's conflict resolution objective, and the intent was that the RRMCs would be given the responsibility for preparing IRM plans for various sub-regions (Integrated Management Units) within their jurisdiction (Heayn, 1977).

c. Phase 3: Implementation of IRM

With the 1975 election, the Social Credit Government was reinstated, leaving a partially developed policy in place. How the policy was to be implemented by the newly elected Government remained a question not only because of the different philosophy of the new Government but also due to the fact that during the 1972-1975 period no clear direction had been provided. IRM was not enshrined in written legislation, nor was it implemented on a consistent basis throughout the Province.

The new Social Credit Government, in adopting the concept of IRM, undertook some significant institutional changes to mold resource policy according to its own interpretation of the concept and reduce some of the controversies associated with the existing institutional arrangements. One of the first changes it made was to divide the Department of Lands, Forests and Water Resources into two separate ministries: the Ministry of Forests and the Ministry of Environment. The second change was to place the ELUC Secretariat within the Ministry of Environment. The role of the Secretariat was downplayed as the ELUTC (the Technical

Committee of Deputy Ministers) was reactivated into dealing with resource policy matters. In 1979 the Secretariat was disbanded due perhaps to bureaucratic resentment to the priveledged position that it held (O'Riordan, pers comm, 1988).

In 1979, following a government policy review of the recommendations provided by the Pearse Royal Commission on Forest Policy (1976), the government enacted the Ministry of Forests Act (R.S.B.C. Chap. 272, 1978) and the Forest Act (R.S.B.C. Chap. 140, 1978). The commitment to integrated resource management is found in the former Act which, in Section 4(c), states that under the direction of the Minister, the Ministry is

> to plan the use of the forest and range resources of the Crown so that the production of timber and forage, the harvesting of timber, the grazing of livestock and the realization of fisheries, wildlife, water, and outdoor recreation and other natural resource values are coordinated and integrated, in consultation with other ministries and agencies of the Crown and with the private sector.

Reference to the private sector was also taken to mean public interests.

Thus the Ministry of Forests was charged with the responsibility for developing and implementing policies of integrated resource management in concert with other agencies. It became apparent that the government's approach was not to create a large umbrella organization but rather to engage in coordinated efforts through line agencies. The Ministry of Forests, through its legislative mandate, was given a leadership role in providing direction to integrated resource management.

In the 1980's further changes were instituted as significant forces in the

evolution of integrated resource management policy. Prominent among these was the dismantling of the the Regional Resource Management Committees. With this action, the leadership role of the Ministry of Forests became more pronounced; however a vacuum was created at the regional level with respect to coordination of resource management programs and IRM.

Of great significance to IRM was the the creation of the Integrated Resources Branch in the Ministry of Forests in 1986. The lack of an integrated approach had been noted by two government reviews as being a serious deficiency.† The intent of the Integrated Resource Management program is to combine the management of all non-timber resources with a planning function so that activities for timber, range, recreation, wildlife, fisheries, and water would be integrated (MoFL, 1987).

In summary the evolution of IRM in B.C. has involved experimentation with various mechanisms and agency programs. For example the MoF has, through its Public Involvement Program, experimented with various forms of public involvement - from direct participation at the planning table to consultation and review (Nixon, 1989).‡ Through several adjustments in the decision-making and planning processes, the B.C. Government has tailored IRM to serve its purposes and circumstances.

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† These were the MoF's Ministry Mission Review (1986) and the Resource Management Review (1987).
‡The role of the public in IRM remains to be a significant issue in B.C.

C. RATIONALE FOR IRM PLANNING

The opening pages of the thesis described the social forces that made integration especially relevant in today's management philosophy. Continued consumption led to increasing resource scarcity and subsequently to concerns about maintaining a healthy environment. Concepts such as "conservation" and "sustained yield" evolved and became entrenched in the field of resource management. Yet the side effects of resource development were given little attention, with the result that non-timber resources such as fish and wildlife incurred losses through forest harvesting in some areas. Organization within resource management agencies was compartmentalized to the extent that it inhibited the solving of inter-disciplinary problems, as these agencies pursued single, narrowly focussed-objectives.

Related to this institutional compartmentalization is the specialization in the fields of knowledge which tends to run counter to the integration of diverse components of natural resource management. Clawson (1986) suggests that the move towards integration has been and continues to be constrained by adherence to specialized methodologies. The forces that push professionals to fields of specialization are the proliferation of knowledge and the impossible task for one to grasp all this knowledge. People generally feel comfortable by limiting their range of interests, familiarizing themselves with significant literature on the chosen field and attempting to make a contribution to existing knowledge. But the drawback is that "one may be uninformed about developments in some other field which may render much of one's results redundant, obsolete or unimportant" (Clawson, 1986).

The antithesis of specialization is integration whereby the professional or, more likely, a planning team takes on a broader problem such as land use and studies or at least considers its physical, biological, social, economic and political aspects. Integration involves the application of a diverse body of knowledge - a breadth which does not enable even the most talented team to comprehend all the factors involved or to understand the linkages between variables. But the integrative approach is applicable to real life situations and therein lies its strength (Clawson, 1986). Because natural resources are linked by a complex web of ecological relationships, institutions must use integrative approaches to take into account at least the broader relationships of the whole.

Although there are benefits associated with specialization,

> someone, somewhere, in our society must look at natural resources as a whole, must balance up the use of one kind of resource against the use of others, and must synthesize the partial truths of various specialists into a larger, broader, more inclusive truth. If one looks to the improvement of human welfare, now and in the future, one must consider all the possible avenues to that improvement. This almost certainly includes physical, biological, and social factors, together with political considerations and analyses and the interactions of many concerned groups within the larger body politic. Obviously, integration is complex and difficult, and high precision fine-tuning may be unattainable. But...it is also necessary, indeeed indispensable. The big question is how, not whether (Clawson, 1986).

Today it has become more widely accepted that resources need to be managed through coordinated and integrated initiatives (Lang, 1986). The rationale for integrated resource management has its basis in both process oriented and product oriented factors.

1. Process Oriented Rationale for IRM

Cooperation and coordination of legitimate interests associated with different resource sectors arises through planning and management; it encourages cooperative problem solving. People working together contribute diverse knowledge, experience and analytical capabilities. With a truly integrated process that incorporates multiagency interests in a shared planning environment and allows participation by the relevant publics, it becomes easier for a wide range of interests to have a bearing on plan direction.

Planners attempt to recognize and overcome problems such as intensive use of a resource that results in pressures on the land. IRM enables the planner to take a more proactive stance, thereby providing opportunities to anticipate problems and circumvent them.

Integrated resource management fosters cooperation as a mechanism for conflict resolution. As Radford (1980) states, "the existence of conflict promotes cooperation by giving rise to the need for it." With IRM, representatives of different disciplines come to view management problems from the perspective of other disciplines; thus it encourages increased understanding (Lang, 1986). Because common and shared goals are pursued, participants are motivated to contribute. Finally, an integrated approach to planning assists institutions by encouraging the efficient allocation of planning resources and the standardization of methodologies. The plan itself provides guidance for managers in their day to day activities and indicates to resource developers what is expected from them in managing publicly

owned resources.

2. Product Oriented Rationale for IRM

Integrated resource management is necessary for deriving maximum benefits from scarce resources; a coordinated arrangement for resource uses will result in greater net benefits to society than if each is planned for independently (Fox, 1984). An integrated approach seeks an acceptable balance between development and the protection and maintenance of environmental values.

A key product of the IRM process is an IRM plan which, if properly developed, enunciates clear goals to help decision-makers determine trade-offs and enable monitoring of the plan; provides clear direction to ensure that the public and resource managers understand IRM intent; and, provides a planning map that visually portrays how the mosaic of resources will be managed and accommodated. Through an adaptive approach, integrated resource plans provide flexibility so that options remain available in the face of changing perceptions and socio-economic conditions.

In summary, integrated resource management is fundamental to good planning and is in fact inseparable from it because all elements considered in the planning process are interdependent. The planning process itself must be integrated to foster cooperation and to enable rigorous evaluation of the disparate variables involved.

D. FORESTRY/WILDLIFE INTERACTIONS

This section summarizes some of the interactions that take place between forestry and wildlife resources, thus providing a background on how IRM ultimately affects "the product" - animals and trees. A discussion of these tangible entities should not be completely separated from the planning process however, because many of the changes that take place to wildlife habitat through forest management practices are not effectively understood or administered (Forestry Wildlife Group, 1987).

Timber management exerts an enormous influence on the welfare of the wildlife resource because it is the foresters that manage or give control to the character of the forest cover (Forestry Wildlife Group, 1987). "In one decision, a forester can destroy or create more wildlife habitat than most wildlife biologists can do in a lifetime" (W. Young, 1984). Thus there is a need for wildlife staff and foresters to work in harmony with each other, with the wildlife biologist providing guidance to foresters so that forest management activities can be made to complement wildlife management efforts. This need for coordination has long been recognized as a fundamental component of such concepts as "sustainability" and "conservation". As early as 1873, U.S. President Theodore Roosevelt, whose conservation philosophy altered government policy towards natural resources, recognized the need for melding forest and wildlife resources when he stated that "the preservation of forests and game go hand in hand. He who works for either works for both" (cited by Gilbert and Dodds, 1987).

Forest management can affect wildlife habitat and wildlife in three general ways:

1. Increased access provided by logging roads may lead to increased wildlife mortality through legal and illegal hunting.

2. Logging may result in the permanent or temporary change to critical habitat types.

3. Logging and subsequent silvicultural activities have the potential to change wildlife habitat diversity, thus changing the capability of a given area to support wildlife that rely on forest diversity (Hamilton, 1988; Bunnell and Eastman, 1976).

Many wildlife species depend on old growth forests during winter for forage, thermoregulation, and for reduced snow depth to enable movement. Old growth forests are relatively stable, with frequent but low magnitude disturbances that maintain an uneven aged stand structure. Timber harvesting converts old growth forests to managed forests that are characterized by infrequent but high magnitude disturbance events affecting entire stands of trees.

The shift in overstory structure and dynamics has major implications for the composition and biomass of understory vegetative species. Clearcuts provide some productive habitats and forage such as grasses, forbs and shrubs, especially in coastal areas of B.C. where winters tend to be mild and snow accumulations are unusual (Harestad, 1982). But as the canopy of young, even-aged stands closes (age 25-35 years), understory vascular plants are virtually eliminated because they cannot tolerate the competition.

The changes in forest structure, dynamics and competition also have important implications for wildlife habitat quality, although the effects of converting old growth forests to second growth forests are not completely understood. Where timber harvesting decreases habitat diversity, wildlife species diversity also tends to decline.

E. CURRENT APPROACHES TO IRM IN B.C.

Integrated resource management is a primary goal of the Ministry of Forests (MoF) which is explicitly enshrined in the Ministry of Forests Act (1978). The lack of detail as to how integration is to take place within a cooperative framework has been the cause of some debate. The Resource Planning Manual of the B.C. MoF (1984d) recognizes the variable application of planning procedures, noting that because planning is in a sense problem solving, planning approaches must be adapted to particular circumstances. A systematic approach to planning has, however, been identified by the Ministry to enable planners to carry out their actions in an orderly fashion. The seven steps included in the framework are:

1.   Preliminary Organization

2.   Information Assembly

3.   Analysis

4.   Evaluation of Options

5.   Selection of an Option

6.   Implementation

7.   Monitoring

The participation of other resource agencies is brought into the MoF planning framework as required. Development proposals for timber, range and recreation are referred to these agencies for comment prior to approval. The levels of interagency participation are dictated by the nature of the issues which can be viewed as being either routine or non-routine. Routine issues are those involving little complexity and therefore can be dealt with expeditiously by the agencies involved while non-routine issues are characterized as complex and therefore requiring considerable negotiation between agencies.

In seeking an optimum blend of resources, resource agencies articulate their objectives knowing that timber harvesting has retained a dominant position in nearly all management situations. The B.C. government stresses timber production as the primary output of forest lands when considering tradeoffs among competing uses, while other uses are restricted so as to minimize any impacts on timber productivity. Timber harvesting not only provides economic benefits of vital importance to the Province but also determines the capacity of the forest land to support other uses. For example, forestry practices have a high potential to dramatically restructure vegetative cover over a wide area, thus affecting wildlife habitat. The success of resource integration therefore hinges on how well various natural resource agencies can adapt to the policies put forth by the Ministry of Forests (Apsey, 1978) and how closely communication takes place between professionals at all levels of planning.

In addition to the dominant position of timber harvesting, the MoF takes the lead role in facilitating interagency coordination and is responsible for deciding if,

when and how the impacts of forest management on resources other than timber are to be ameliorated (MoF, 1984). The stigma of lead agency has, in some cases, created negative views among other resource agencies over the legitimacy of the planning process (Bryant, 1984).

F. STRATEGIC PLANNING AS THE KEY LEVEL FOR IRM IN B.C.

In the literature dealing with hiearchical planning, there is a three level typology of management: strategic, tactical and operational.

Strategic planning is a form of planning whereby an agency utilizes a sequence of mutually reinforcing actions in pursuit of an interrelated set of well defined objectives (Crowe, 1983; Lang, 1986). This form of planning involves the formulation of goals, objectives, and strategies which are centred on program lines rather than on the organizational lines of the agency. The emphasis is on goal setting. The strategic plan itself provides a mechanism for structured decision-making and for maintaining operations in a continuous fashion through progress evaluation. It is a sophisticated form of planning whereby agencies are forced into taking a comprehensive view of their actions, evaluating both past and future activities (Crowe, 1983). Tactical planning emphasizes procedures with a view to achieving well defined ends. Operational planning is concerned with ensuring that programs and procedures are conducted both efficiently and effectively (Lang, 1986). It converts the agency's program objectives into projects through implementation at the field level. In theory, these levels of planning fit into an overall dynamic, integrated management system that involves continuous

evaluation of program objectives and monitoring of progress.

Some authors combine tactical and operational planning into a single category of tactical planning. For simplicity's sake, this thesis will use this categorization and discuss the attributes which differentiate strategic planning from the lower level tactical planning. Firstly, strategy deals with the longest relevant time horizon of concern to the agency (Irland, 1985). For society as a whole, decisions are based on one or two centuries in terms of projected timber supply. Long term objectives are established for the organization in its attempt to define the problems, arrive at the preferred strategy and monitor performance. Secondly, strategic plans are prepared for relatively large land units; that is planning is non-spatial in context, with strata-based classes within land units. This means that there is a high organization of data which is non-site-specific. Finally resource managers utilize average costs per strata when weighing general costs versus benefits of land use allocation decisions (Sessions, 1988). Managers are forced into using average costs because of the broad level of planning involved.

In contrast to this characterization of strategic planning, tactical plans are short range plans having spatial identification that explicitly enables linkage with the various resources being managed. Costs and benefits may be derived because of the localized nature of planning that allows identification of the resources (Sessions, 1988).

Government agencies have increasingly adopted strategic planning in their repertoire of management processes because this form of planning can help them

in dealing with the many significant changes that have taken place in recent years (Bryson and Einswieller, 1987). These changes have forced government organizations to think strategically about what the role of government should be, what actions ought to be undertaken and how limited resources should be allocated: strategic planning can help planners and decision-makers determine their overall future direction. Strategic planning in the public sector is therefore "a disciplined effort to produce fundamental decisions shaping the nature and direction of governmental activities within constitutional bounds" (Olsen and Eadie, 1982 as cited by Bryson and Einswieller, 1987).

It is the dynamics of the planning environment that give rise to the special characteristics of strategic planning within public agencies. Unlike corporate strategic planning in which strategies are formulated in response to market conditions, public sector strategic planning involves the formulation of strategies in response to complex interactions between plans, the actions of decision-makers and forces in the government's external environment. With regard to external factors, for example, resource managers have been required to give more careful consideration to multiple stakeholders with varied and changing interests who may be affected by the organization's strategies (Mason and Mitroff, 1981). The strategic emphasis, therefore, shifts from a relatively simple market dependence to the more complex and inter-related set of political, soio-economic and legal considerations (Nutt and Backoff, 1987).

The above attributes of strategic planning give rise to yet another important characteristic - the highly uncertain planning and decision-making environment

(Irland, 1985; Marshall,1987). Resource planners face uncertainty when there are many critical variables that affect a plan and when the potential outcome of a plan based on more than one alternative is not known. These uncertainties can be related to the models used in planning or to such variables as the changing nature of the problem, political constraints and policy specifications (Marshall, 1987).

Strategic planning has received endorsement by resource agencies for a number of reasons. Primary among these is the fact that this form of planning offers a more holistic approach to land use than the more localized plans. Strategic planning enables the planner,

> to appreciate the particular environmental pressures in a given region, and to appraise the consequences of a particular development in terms of a broader context (Selman, 1976).

In the absence of a strategic plan, planners may fail to recognize what the implications of localized actions are in terms of the cumulative impacts.

Strategic planning enables agencies to have a more comprehensive vision than that brought about through conventional long-range or comprehensive planning. In fact comprehensive planning is not really 'comprehensive' at all but is tied to programs having functional plans that

> often are not integrated with one another and typically ignore what government ought to be doing as contrasted with what it already does (Bryson and Einswieller, 1987).

Other reasons for the increased emphasis on strategic planning include the contention that it is more analytically rigorous and broadens the participatory

basis in planning, although as Kaufman and Jacobs (1987) have found, there is some divergence of opinion on these contentions.

While strategic planning offers several advantages, some weaknesses with this form of planning have meant that it may not be received with enthusiasm by practitioners. Various authors (e.g. Dick, 1981; Kaufman and Jacobs, 1987) point out that it can be a very costly, time consuming undertaking and that it is difficult to maintain the interest level of decision-makers who have a short term agenda. Some serious weaknesses also appear to exist in the goal setting and implementation within government agencies. While planners or managers within a corporation can assume a profit goal, the goals of government agencies are often ambiguous and implicit, making it difficult to evaluate or modify current practices (Nutt and Backoff, 1987). In strategic planning, goals are variable and sometimes are not shared by or even understood by policy-makers or the general public (Irland, 1985). Moreover, there exists a problem of "implementing priority actions in the decentralized, pluralistic decision-making system of the public sector" (Kaufman and Jacobs, 1987). Weak linkages have tended to exist between the broad strategic policy-making and planning levels and the more site specific, implementation oriented levels.

The remainder of this thesis examines strategic planning of B.C.'s forest lands which is directed by Forest Management Planning for Tree Farm Licenses (TFLs) and Timber Supply Areas (TSAs). The importance of this planning level has been made explicit by the Ministry of Forests which, in a discussion paper on its planning framework, stated that Forest Management Planning provides a link

between the broad policies on a provincial and regional level and the more area specific development levels (MoF, 1983; MoF, 1988b). In so doing it channels development on a controlled basis. Thus through the process of Forest Management Planning, headquarters policies and regional priorities are translated into broad resource targets where resource use requirements of the various agencies are addressed. Provincial forest management policies which guide these plans are in large measure geared towards the availability of timber supplies over the long term (Percy, 1986). These policies influence the allowable annual harvest levels and therefore the extent to which the current stock of timber resources will be depleted and the habitat for wildlife manipulated. The Ministry of Forests takes the role of lead agency ' and, through inter-agency liaison, identifies a range of strategies relative to the various resource values.

1. Eras in Strategic Planning

The history of Forest Management Planning in B.C. can be designated into three eras: the unregulated era, the yield control era, and the timber supply management era (Percy, 1986). These are briefly outlined as follows:

a. The Unregulated Era

During the period from the colonial times to 1945, the government's major role consisted of allocating timber rights to forest companies for the purpose of harvesting timber. There was little regulation of the timing and levels of harvest; these were determined largely by market forces. Policies centred on promoting economic growth.

b. The Yield Control Era

Prior to 1945, the unbalanced pattern of timber harvesting had led to apprehension over the long term supply of raw wood material and the negative impacts on community stability. Thus in the yield control era which extended from 1945 to 1978, the B.C. Government took a much more active role in regulating timber supplies. Based on the recommendations of the Sloan Commission of Inquiry (1945) the government brought the province's forest resource under sustained yield management units. Forest Management Licenses, subsequently renamed Tree Farm Licenses (TFLs), were introduced

> to promote the orderly development and careful management of Crown
> and private land holdings, and to encourage industrial development and
> community stability by providing long-term supplies of timber for
> existing or proposed utilization plants (Pearse, 1976).

While the licensees were to manage these forest lands under sustained yield policies, the B.C. Forest Service would be responsible for approving strategic plans (called TFL Management and Working Plans) and enforcing the necessary provisions. The second type of management unit, Public Sustained Yield Units (PSYUs), were Crown forest lands managed by the Forest Service to meet the needs of smaller and unintegrated enterprises or to provide timber where area-based licenses were inappropriate.† These units eventually came to be known as Timber Supply Areas.

The TFLs granted in this era carried with them either a single, perpetual term or 21-year renewable terms. This tenure then, enabled large forestry enterprises

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†In the interior of B.C, fire and pest managment concerns, in particular, make area-based tenures less efficient to the MoF and less tenable to licensees due to the risks involved.

to attain an assured wood supply required to promote investment in processing plants.

Forest management had, for the most part, reached a high standard in TFLs because of the proprietary interest that licensees developed within a defined geographical area and the several incentives provided through the licensing system. But there were several weaknesses associated with both types of management units which, as noted by Pearse (1976), became the source of considerable public debate. Firstly, there were dramatic increases in the allowable annual harvest levels in PSYUs and even more so in some TFLs, attributable to increased recovery of wood through close utilization practices. The discretion provided to government in setting harvest rates based on poor data was a serious deficiency but this problem was exacerbated by a virtual absense of planning in management units (PSYUs and TFLs). A submission by the B.C. Forest Service to the Pearse Commission acknowledged the deficiency in developing long term plans. As stated in the submission,

> Although a general understanding exists of what data (are) required and a major effort is being made to coordinate the gathering of resource data and define the nature of options open to management unit plans are not being adequately formulated for either Public Sustained Yield Units or Tree Farm Licenses at the present time. This disturbing situation exists primarily because of the lack of planning staff in resource departments, undefined or poorly defined resource management objectives, lack of data and the absence of a uniform resource management planning system (B.C. Forest Service, as cited by Pearse, 1976).

c. The Current Era

The current era of timber supply management commenced in the late 1970s with the enactment of the Ministry of Forests Act and the Forest Act. The former act, with its emphasis on resource management in the broader context, was passed in 1978 to "affirm the provincial interest in all resources" (Apsey, 1978). Periodic reviews through the Ten Year Forest and Range Resource Analysis and the Five Year Forest and Range Resource Program are required under the Act. Thus the Act entrenched the Ministry's intent to undertake a more holistic management approach by giving greater recognition to strategic supply and demand analysis. It became apparent that resource allocation and IRM were to be fundamental concepts of program development.

The TSA planning process began in earnest during the early 1980s as part of the Ministry's policy to manage the province's forests under the concept of sustained yield and link this policy with that of IRM such that TSAs would be viewed as resource management units. However the focus during the initial years remained on the determination of Allowable Annual Cuts (AACs) facilitated by technical analyses for deriving various timber management scenarios and an assessment of each for long term timber supplies. There was little flexibility in adjusting the AAC to accommodate the need for critical wildlife habitat, with the result that lines of communication between wildlife and forestry staff were strained.

The mid 1980s to the present have been years characterized by the MoF's strengthened philosophy on IRM and its link to strategic planning. Unlike the

previous years, the Ministry has indicated its willingness to accommodate other resource values even if it means the downward revision of the AAC.

G. THE LINK BETWEEN STRATEGIC PLANNING AND IRM

The MoF's planning framework (Figure 1) has been established to facilitate both hierarchical and lateral (inter-agency) IRM planning. This framework enables decisions to flow in a two way fashion between levels in the hierarchy; policy decisions and direction come down from the top while information flows upwards. Lateral planning occurs when the resolution of problems transcends sectoral boundaries of the agencies involved.

Integrated resource management takes place within Forest Management Planning through multidisciplinary planning processes. The preparation of TSA Resource Management Plans and TFL Management and Working Plan is carried out at approximately the same level of detail as the Subregional Strategic Plans of the Ministry of Environment. Within this framework, each resource agency has the opportunity to state its own management objective for the TSA or TFL. Multidisciplinary planning processes facilitate the identification of objectives, and the subsequent design and description of management options provides for integrated use of resources. The evaluation of these options is carried out in terms of the direction provided to the timber, range and recreation programs of the Ministry of Forests. The general public also has the opportunity to influence the contents of new or revised TSA Resource Management Plans or TFL Management and Working Plans through the Ministry's Public Involvement

Provincial Policies

Within the context of government priorities, provincial policies give overall direction to the Ministry of Forests. The ministry's Executive formulates ministry policy and sets forest and range resource use goals.

Regional Priorities

Within the context of provincial policies, Regional priorities coordinate ministry activities with those of other ministries and set tentative production targets for timber, range and recreation for the TSAs and TFLs within Regions.

Forest Management Planning

Within the context of Regional priorities, forest management planning lays out broad, long-range management strategies for timber, range and recreation for each TSA and TFL. Program options are examined and, for timber, AACs are set and 20-year supply areas are identified.

Local Resource Use Planning

Within the context of management strategies for a TSA or TFL, local resource use planning establishes integrated resource management guidelines for areas where resource use development is proposed. Local planning can range from extensive appraisal to intensive study and is carried out to enable development planning to proceed.

Resource Development Planning

Within the context of area-specific management guidelines, resource development planning details the logistics for development. Methods, schedules and responsibilities for accessing, harvesting, renewing and protecting the resource are specified to enable site-specific operations to proceed.
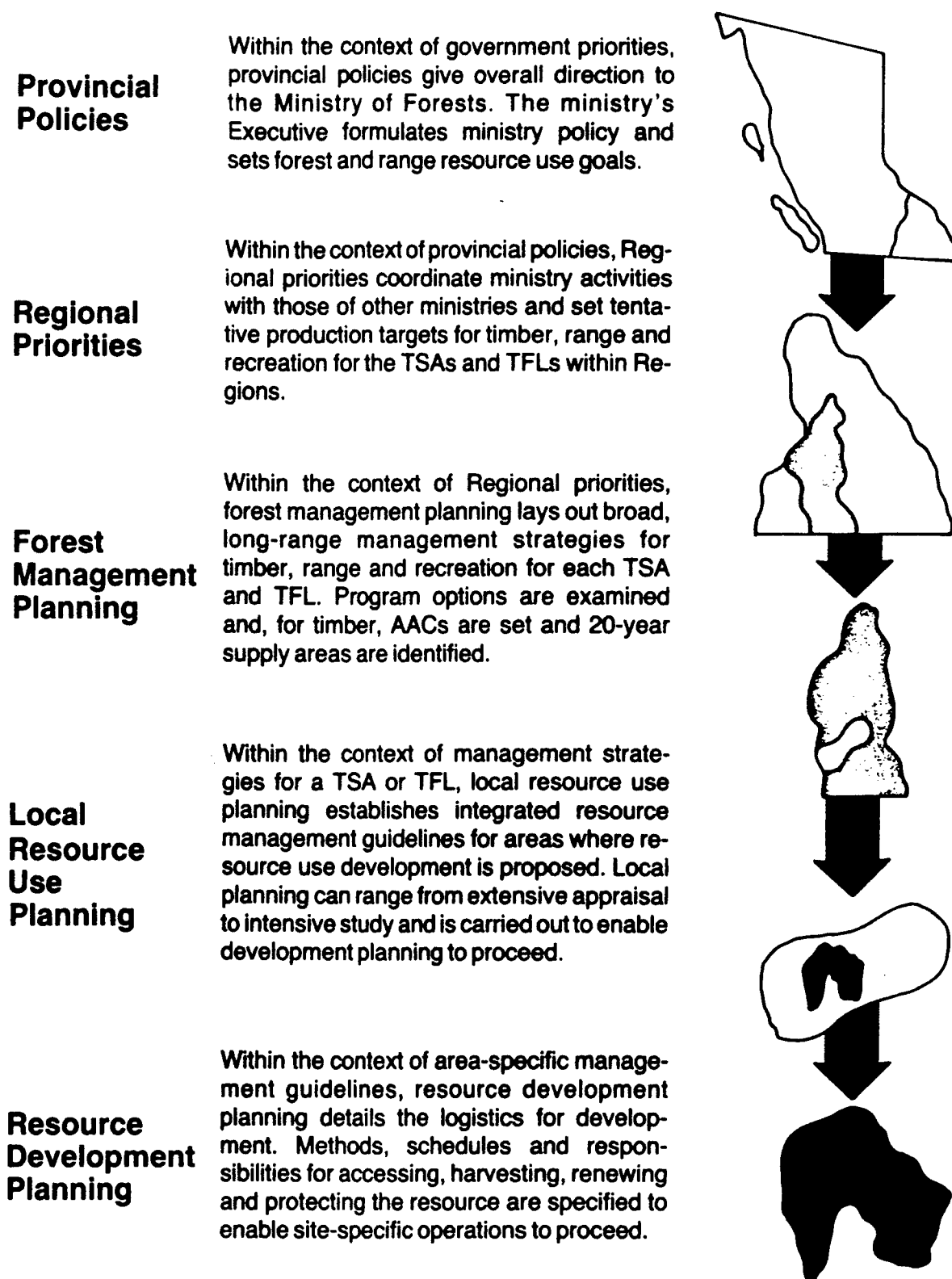
Figure 1.   The Ministry of Forests Planning Framework
             (Source: MoF 1984d)

Program. Thus the intent is, through multilateral communication and negotiation, to prepare a plan that achieves an optimal balance betwen resource allocation and resource production levels among the various user groups (MoF, 1984a).

Although strategic planning through TSAs and TFLs provides the opportunity for coordinated management objectives of various resource agencies, this level of planning is relatively new to resource agencies; therefore planning processes are continuously being refined to better address interagency concerns through IRM. In addition, there exists an inconsistent application of planning processes between the different Forest Regions of the Province. Each Region has its own style, in part developed to suit the unique needs of that region, when it comes to developing processes and procedures for strategic planning, resulting in variable degrees of planning program effectiveness.

II. INSTITUTIONAL ARRANGEMENTS FOR INTEGRATED RESOURCE MANAGEMENT

The institutional arrangements for developing, administering and implementing policies for resource and land use in B.C. have changed markedly over the last several decades. This evolution has taken place as agencies have confronted increasingly complex resource issues brought about, in part, by changes in the external environment. It was only in the 1970s that the provincial government attended to primary resource problems through IRM approaches by facilitating higher levels of coordination and inter-agency communication. The Government has chosen to improve coordination of planning mechanisms in the institutional framework through joint planning by line agencies of natural resource sectors rather than through the creation of a large umbrella resource department such as the Alberta Department of Energy and Natural Resources. This chapter discusses institutional arrangements for IRM in B.C. and focusses on what forms government organizations take and the planning mechanisms they have put in place to achieve IRM goals.

A. ORGANIZATIONS, POLICIES AND PROCESSES

With the recent institutional changes discussed in the opening chapter, there are four ministries charged with the responsibilities for developing and implementing policies and programs for the integration of natural resources in British Columbia: the Ministry of Forests, the Ministry of Environment, the Ministry of Crown Lands and the Ministry of Energy, Mines and Petroleum Resources. Other ministries are consulted or become active participants when the impacts of

resource development require their input. Furthermore, resource issues of a contentious nature may be propelled into the political arena where the Environment and Land Use Committee and other cabinet committees may adjudicate the process.

Numerous forums for resource planning and management have arisen at various planning levels in British Columbia. This thesis focuses on institutional arrangements that are predominant in promoting integrated resource management at the Forest Management level of planning in the context of forestry and wildlife resources.

1. Environment and Land Use Committee

The ultimate forum for conflict resolution on environmental matters and the highest level of resource program coordination in B.C. is the Environment and Land Use Committee (ELUC) of Cabinet. This committee, which is comprised of members of the executive council having portfolios related to environmental policy and decision-making, is empowered under the Environment and Land Use Act (R.S.B.C., Chap.10, 1979) to ensure the consideration of the environment in land use. ELUC serves as the vehicle for ensuring the coordination of decision-making in policies and issues of environmental matters which surpass the interests of a single department (ELUC Secretariat, 1978). The responsibility to ensure a proper balancing of land use with environmental protection therefore translates into tradeoffs affecting user groups and economics.

In the institutional hierarchy, the Environment and Land Use Technical Committee (ELUTC) is the bureaucracy directly accountable to ELUC. This is the highest level within the civil service for conflict resolution; otherwise issues are resolved politically by ELUC. The Deputy Ministers in the portfolios parallelling those of ELUC serve as technical policy advisors to the member Ministers of that Committee and evaluate resource use alternatives generated by the line agencies. With regard to resource integration policy, the demands placed on the ELUTC are considerable, for it must ensure that all land and resource use programs of the provincial government and local governments are coordinated so that socio-economic and environmental objectives are achieved, provide sound advice to ELUC and act on the directives of that Committee, and give direction to interagency task groups (MoF, 1984a).

2. Ministry of Forests

The Ministry of Forests is structured administratively into three levels - headquarters, regions and districts. Each level is responsible for carrying out administrative functions relating to three program areas of the Ministry: timber, range and recreation. At the headquarters level, the government establishes policy direction and funds programs. The Ministry consults with other ministries to determine their program objectives and how these interact with Ministry of Forests programs (MoF, 1983).

The Regions' functions include the interpretation of provincial policies in a regional context and the establishment of regional guidelines and priorities to

meet the set program goals (MoF, 1983). They then monitor and evaluate performance in the various Districts. One of the Regions' primary functions is to ensure the consistent and effective administration of policies and plans originating from headquarters. A TSA Planning Coordinator and a Planning Officer are responsible for coordinating and monitoring TSA planning functions, although this role is presently being decentralized to the districts. It is uncertain what the future role of regional planners will be once this decentralization has taken place.

Districts are subdivisions of regions and consist of an organizational structure designed to implement programs and policies in accordance with regional guidelines and district procedures (MoF, 1984a). Staff at the district level are responsible for approving and administering forest industry development plans and providing liaison with other ministries to ensure that natural resources are properly integrated into timber harvesting plans. The Resource Officer, Planning and the Resource Officer, Timber are, under the supervision of an Operations Manager, responsible for planning TSAs as well as reviewing and giving direction to TFL Management and Working Plans which are both ultimately approved by the Chief Forester of the MoF. The detailed tactical integrated resource plans (Local Resource Use Plans and operational plans) are linked to these broader strategic plans.

Of major significance is the recent creation of the Integrated Resources Branch at the headquarters level. Three main components constitute the Integrated Resources Branch: the Resource Planning Section, the Range Section and the Recreation Section. Also included on staff is the Provincial Public Involvement

Coordinator.

The Integrated Resource Management Program "protects, conserves and develops the Crown's non-timber forest resources and integrates activities for these resources with the activities for timber production" (Bullen, 1987b). The Resource Planning Section's purposes are:

1.   to provide the direction for the development of integrated plans of action for Ministry managers;

2.   to develop mechanisms that help ministry staff address the concerns of resource users and client groups, and;

3.   to prepare procedures that optimize the use of provincial forest lands through

    a.   minimizing resource conflicts

    b.   providing a spectrum of benefits from wilderness preservation through to industrial development, and

    c.   maintaining environmental quality (Bullen, 1987b).

Thus the IRB strives to provide provincial guidelines and standards for effective IRM of forest lands and facilitates liaison with other agencies, industry and the public.

The Timber Harvesting Branch is responsible for developing policies to ensure effective management of the Province's TFL system and other forms of tenure found within TSAs. Part of this function entails the review of TFL Management and Working Plans prepared by licensees. The Branch also holds the responsibility for coordinating the government review of TFL applications.

The Inventory Branch is responsible for maintaining and coodinating an updated inventory program for the Province's forest land base. Within the Branch, the Forest Resource Analysis Section plays an important role in conducting the timber supply analysis of TSAs. The future supply of timber over the short term (twenty years) and long term (two hundred years) is projected through the application of forest planning models which incorporate specific information and management assumptions. Staff within the section are also responsible for determining and documenting the timber supply impacts of TFL applications as well as reviewing the various documents associated with TSA and TFL planning.

There are three major acts under the jurisdiction of the Ministry of Forests which deal with forest and range planning and management. These are the Ministry of Forests Act (R.S.B.C., Chap. 272, 1978), the Forest Act (R.S.B.C., Chap. 140, 1978) and the Range Act (R.S.B.C., Chap. 355, 1978). The Ministry's mandate for resource integration is spelled out in Section 4(c) of the Ministry of Forests Act as stated on page 18.

An important aspect of the Ministry of Forests Act is the requirement for the periodic submissions of analyses and reports to the Legislature. Linked to the requirement for integration of Section 4(c) is Section 7 which requires the submission of a resource analysis to the Lieutenant Governor-in-Council once every ten years. This is to include a summary of developments and questions of public policy that are to "significantly influence or affect the use, ownership, licensing and management of the forest and range resources."

The Act also requires the annual submission of a Five-year Forest and Range Resource Program discussing the alternatives that can be taken by the forestry sector to attain desired objectives regarding increased productivity of forest land. These sections of the Act are important for strategic planning and for ensuring accountability of managers for actions taken; no other ministry is held accountable to the extent that the Ministry of Forests is by the Ministry of Forests Act (Toovey, 1987).

The Forest Act is a comprehensive piece of legislation setting out the conditions for forest management. The Act provides the Ministry of Forests with complete responsibility for management of forest and range resources within Provincial Forests. Provincial Forests are Crown lands that

> provide the greatest contribution to the social and economic welfare of the province if the land is maintained for integrated management of renewable natural resources (MoF, 1979).

The Forest Act states that a Provincial Forest shall be managed and used only for

1.   timber production, utilization and related purposes;

2.   forage production and grazing by livestock and wildlife;

3.   forest and wilderness oriented recreation; and

4.   water, fisheries, and wildlife purposes;

5.   preservation of wilderness;

6.   energy, mineral and petroleum development; and

7.   other purposes compatible with the above or permitted by regulations.

Another important section of the Act in the context of strategic planning is Section 7 in which an Allowable Annual Cut is determined by the Chief Forester. The Chief Forester must consider the rate of timber production that can be sustained on a given area taking into account, among other factors, "constraints on the amount of timber produced from the area that can reasonably be expected by the use of the area for purposes other than timber production." An additional consideration is "the economic and social objectives of the Crown...for the general region and for the Province." It is important to note that these considerations lead to a determination for a rate of harvest rather than a calculation of sustained yield (Toovey, 1987).

Section 28 sets out the general terms and conditions of Tree Farm Licenses. One of the requirements is that the holder of a TFL must submit for the approval of the Chief Forester a Five-Year Management and Working Plan prepared by a Registered Professional Forester. The plan must document the measures taken to protect forest resources including wildlife in the TFL area.

Finally, Sections 53 to 56 specify the purposes and policy for the deletion of areas and reduction of allowable annual cuts (AACs) for Tree Farm Licenses and other forms of tenure. This may be in response to wildlife management requirements.

3. Ministry of Environment

The Ministry of Environment is structured administratively with a headquarters located in Victoria and six regional offices located throughout the province. The responsibility for program direction and policy making lies with headquarters while the various regions are responsible for implementing these programs and policies. Two Branches are influential in shaping coordinated efforts for integrated forestry-wildlife planning. The Wildlife Branch conducts wildlife habitat and wildlife capability mapping. The Branch is also involved in setting provincial policies and procedures in producing wildlife plans at the provincial and regional (strategic) level, in coordinating wildlife and habitat research, and in consulting with other government agencies. The Planning and Assessment Branch coordinates the production of various regional strategic plans (Harcombe, 1984).

The Ministry of Environment is responsible for administering the provisions of two Acts having implications for wildlife management. Through its administration of the Wildlife Act (S.B.C., Chap. 57, 1982) the Ministry is given the mandate to manage and protect wildlife populations and their habitat. Wildlife is defined as "raptors, threatened species, endangered species, game and other species of wildlife prescribed as wildlife" and may include fish. Wildlife habitat means "the air, soil, water, food and cover components of the environment on which wildlife depend directly or indirectly to carry out their life processes."

Under the Wildlife Act, the Ministry is provided with the opportunity to develop integrated resource use plans involving wildlife. The Minister, with the consent of

Cabinet, may designate Crown land as Wildlife Management Areas and under Sections 4 and 5 of the Act, may further designate such areas as Critical Wildlife Areas for the protection of threatened or endangered species, or as Wildlife Sanctuaries. The designation of Wildlife Management Areas requires resource management plans and agreement by the affected resource agencies (Harcombe, 1984) since they may be situated within Provincial Forests.

The other statute affecting the management of wildlife is the Environment Management Act (S.B.C., Chap.14, 1981) which empowers the Minister of Environment to participate in matters relating to the management, protection and enhancement of the environment including preparation of environmental management plans.

4. Interministerial Committees

In addition to ELUC and the two line agencies described in the preceding pages, there are several informal and formal interministerial committees, comprised of representatives from various resource agencies, which provide a forum for coordinating specific agency policies and programs in an attempt to achieve IRM. The committees operate at various levels of planning, each performing a specific function relating to policy development, program development, project approval and implementation. In terms of Forest Management Planning, a joint Forests/Environment Planning Coordinating Commitee and working committee has been formed at the headquarters level. The Coordinating Committee is responsible for program and policy development for TSAs. At the senior TSA level

(headquarters), resource mangement goals and priorities for each resource sector are being articulated, while at the local level (regions and districts) these goals and priorities are to be implemented. The working committee is also an interministry team which has the primary function of assisting the Coordinating Committee and ensuring that action points arising from meetings are implemented.

Within the various forest districts of the province are TSA Steering Committees which have been established to act as an advisory type of committee to the Forest Service in dealing with a wide range of topics. These committees, comprised almost exclusively of Ministry of Forests staff and company foresters, are very important, in the context of TSA planning, for analyzing specific issues and providing technical advice to Ministry planners who, in turn, are responsible for coordinating the planning process for TSAs. Representation by the MoE has now occurred on several TSA Steering Committees.

5. Strengths & Weaknesses of Institutional Arrangements

Institutional arrangements in B.C. have evolved and are continuing to evolve to meet the changing socio-economic needs of British Columbians and adjust to other circumstances that surround management of natural resources. The discussion that follows† highlights some of the documented strengths and weaknesses of the above institutions in the context of integrated forestry and wildlife planning.

†This discussion is intended to provide information on institutional arrangement rather than on the evaluation of the planning process, the central component of this thesis. Criteria for evaluation are not applied to these institutional arrangements.

A primary consideration in attempts to achieve integrated management objectives is an appropriate organization within the civil service. As mentioned in the first chapter, the B.C. Government has adopted an organizational approach whereby resource integration is achieved through negotiation between line agencies rather than within a single ministry. Discussions have taken place at the senior civil service level in regard to the integration of forestry and wildlife agencies within a single ministry but the latest reorganization has, for the time being, slowed any initiatives toward this. There are advantages and disadvantages to this type of adminstrative organization. On the positive side, the levels of communication between foresters and wildlife biologists would be greatly enhanced, with the result that fewer issues would require resolution at the political level. A negative consequence however, would be the possibility that some issues best resolved by Cabinet decision would not be elevated to the political level. A further problem associated with a single forestry and wildlife ministry, where neutrality in planning and decision-making is required, is that forest managers will face difficulty in convincing the public that forestry interests will not automatically take precedence over wildlife interests (Fox, 1984).

As part of institutional arrangements, an appropriate legislative framework is the cornerstone upon which integration can be made to work. Legislation in B.C. has, over the last decade, resulted in some major advances towards improved management of public resources. Of significance to integrated use of natural resources is the Ministry of Forests Act which gives explicit recognition for the need to plan for the use of forestry and wildlife resources through methods of cooperation and coordination. The major weakness is the lack of definition as to

what the words "integration" and "coordination" are and how integration is to be achieved in a cooperative framework. The lack of clear definition of basic concepts in existing legislation and program goals leads to ambiguity in interpretation and poor understanding of intent (Harcombe, 1984).

The Wildlife Act (1982) has been strengthened to better protect and manage wildlife within the framework of overall resource development for the Province. For example through a change in definitions, "wildlife" has been broadened to cover non-game animals, and "wildlife habitat" has been given a broader and more specific definition for the terms of the Act (Section 1). New initiatives include Section 3 which allows for the "acquisition, administration and improvement of land for habitat management purposes, and for entering into agreements with other agencies and individuals to achieve this". Also the Act is consistent in its approach with the established processes of the Environment Mangement Act (1981) for the overall management of the Province's environment.

A weakness of both the Wildlife Act and the Environment Management Act is the lack of direction with regard to cooperative resource planning and management. Neither act specifies a directive for integration of wildlife resource planning with the planning of other resource ministries (Sturmanis, 1986). However the need to undertake inter-agency cooperation is expressed in the "Proposed Wildlife Management Plan for British Columbia" (MoE, 1979), a document that enunciates several key policy statements on wildlife management.

B. FOREST MANAGEMENT PLANNING

Closely associated with institutions, and in a sense indistinguishable from them, is the planning and decision-making process. It is through studies of process that the political influences surrounding policy issues; the norms, assumptions and values found in government ideology; and the opportunities and constraints imposed by institutions, lead to a better understanding of organizations (Simeon, 1979).

Governments face a difficult task in unifying diverse perspectives, values and objectives into an integrated form where cooperation and common understanding are integral components of integrated planning. When organizations attempt to ameliorate resource problems including shifts in power among the interests involved, they look to planning as a means of reducing the many uncertainties that arise and their associated costs. But as Lang (1986) appropriately states,

> this presents both an opportunity and a dilemma since the uncertainty that generated the need for more planning also makes planning evermore difficult.

Not only is planning a difficult, time consuming undertaking, but the time required to realize the full benefits accrued to the process may take several years and the process may not receive full support from senior administrators (Dick, 1981). Despite these obstacles, organizations are giving increased emphasis to planning in order to provide a foundation for organizing and controlling activities. For these organizations planning provides "a system for decision-making and evaluation within a framework of quantifed objectives" (Crowe, 1983).

Planning is part of a management system that, if properly conducted, integrates the activities of an organization including the development of agency goals, program objectives, strategies for implementation, and mechanisms for evaluation and monitoring. It is a dynamic, integrated system that can be conceptualized through four questions that relate to a particular phase of an agency's planning system (Crowe, 1983). These questions are:

1.   Where are we? This question centres on the inventories and leads to a determination of what the desired program outputs are.

2.   Where do we want to be? The agency formulates goals, objectives and strategies and combines these in the development of strategic plans.

3.   How will we get there? Because an agency cannot attain all program objectives simultaneously, priorities are established. These are directed towards operational planning which translates program objectives into projects.

4.   Did we make it? The agency uses monitoring to obtain feedback from plan implementation. Evaluation measures provide the basis for "fine-tuning" the system.

An institutionalized planning process that effectively addresses these questions is likely to provide a proactive rather than reactive approach to dealing with issues, reduce the degree of uncertainty and complexity that surround issues, and address public demands for demonstrated agency accomplishments.

Forest Management Planning is an important level of planning for two types of management units - TSAs and TFLs - that lays out broad, long range management strategies for timber, range and recreation within the context of

Regional priorities. It is used to address the question posed above "Where do we want to be?" Program options are examined and for timber, AACs are established and twenty year supply areas for the forest industry are identified. Management planning is strategic in that it links the broad, largely non-quantitative provincial and regional policies and programs to the more detailed operational plans.

The planning processes for each type of unit are different because they serve different objectives and are designed to reflect tenure arrangements that are conveyed to the holders of various licenses. Moreover, planning processes will necessarily differ across the province due to geographic variation.

This section of the thesis examines the two broadly based management units in British Columbia - units that have been the vehicle through which government implements forest policy.

1. TSAs and TSA Planning

A Timber Supply Area is a geographic land unit that represents a logical area for the analysis of the supply and demand for the timber resource. TSA boundaries were originally defined on the basis of locations of manufacturing centres and transportation routes and on the available timber supply but for ease of administration are now more closely aligned with forest district boundaries. There are now 35 TSAs in the province. All forms of tenure, with the exception of TFLs, are scattered throughout Timber Supply Areas and form a mosaic of

timber tenures. The distribution of these tenures and the amount of timber available to different sectors of the industry is based on an apportionment plan prepared by the government. Thus TSAs are volume-based, a feature that provides the government with flexibility in making adjustments to existing licence areas and in opening up additional areas for new licences.

TSA plans are the basis for establishing the AAC and for managing timber, range and recreation resources on provincial forest land, taking into account other resources such as fish and wildlife. They are comprehensive documents that establish for each TSA:

1.   TSA objectives for timber, range, and recreation expressed whenever possible as quantitative, long-term supply forecasts;

2.   management strategies for timber, range and recreation; used in the preparation of District annual Five Year Proposals and the coordination of Local Resource Use Plans and Development Plans;

3.   resource use assumptions underlying stated TSA objectives; documented on planning maps; and

4.   licensee supply ("chart") areas for timber harvesting over the next 20 years (MoF, 1984d).

The TSA planning process has continued to evolve since the Forest Act in 1979. A "first round" of TSA planning commenced in 1981 and lasted until 1985, with the major emphasis directed towards the attainment of timber management objectives, particularly the determination of AACs. Forest planners faced difficulties in adjusting to the newly developed policies and procedures with the

result that only 10 plans were completed for the 33 TSAs that existed at the time.

TSA planning is now going through the "second round" during which TSA Resource Management Plans are to be completed for all TSAs in the province. The TSA planning process during this round is concerned with giving much greater emphasis to integrating non-timber resources with the timber resource.

The specific goals for TSA planning are:

1. To determine the land base available for timber harvesting;

2. To regulate the rate of timber harvest in conjunction with other uses and the regional woodflow picture;

3. To ensure efficient and orderly timber harvesting, and;

4. To establish priorities and directions for Local Resource Use Planning.

Thus TSA planning is intended, in part, to identify how other agency objectives and mandates influence the manner in which the Forest Service carries out its responsibilities. All TSA Resource Management Plans are to be coordinated with the strategic plans of other resource agencies, for example the sub-regional wildlife plans of the Ministry of Environment. The interactions between timber and wildlife resources are assessed in terms of how habitat needs and other "constraints" may "net down" or constrain the available timber supply while the impacts of timber harvesting and subsequent silvicultural treatments are evaluated in terms of how they may affect wildlife habitat requirements. It has often been emphasized by the Ministry of Forests that TSA planning should give the Ministry a certain leverage to make decisions regarding an Allowable Annual Cut

(AAC) within an IRM environment. Thus the relationship between timber supply and non timber resources such as wildlife is an important consideration.

An AAC is approved by the Chief Forester for each TSA for a five year period and is based on:

1.   analysis documents

2.   the Regional Manager's recommendations

3.   judgement

4.   Section 7 of the Forest Act

5.   the Ministry's present level of funding

Especially relevant to the wildlife resource is Section 7.1(d) of the Forest Act which states that the Chief Forester must consider "the constraints on the amount of timber produced from the area that can reasonably be expected by the use of the area for purposes other than timber production." His discretionary power, coupled with the fact that a number of considerations form the basis for AAC determination, demonstrates the opportunity for flexibility in TSA planning and management. However, in reality, there exists considerable pressure from timber interests to maintain or increase the AAC.

The TSA planning procedures are set out in Chapter 3 of the Resource Planning Manual (MoF, 1984d).† The procedures in the manual are somewhat complex for persons not well acquainted with the TSA planning process or forest management in general and their complete description and evaluation are beyond the scope of this thesis. Instead a general overview of the process, following the systematic

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†Prior to 1984, TSA planning guidelines were outlined in a memorandum addressed to all Regional Managers (May 28, 1982).

approach outlined on page 26, is provided. The planning steps are indicated in Figure 2.
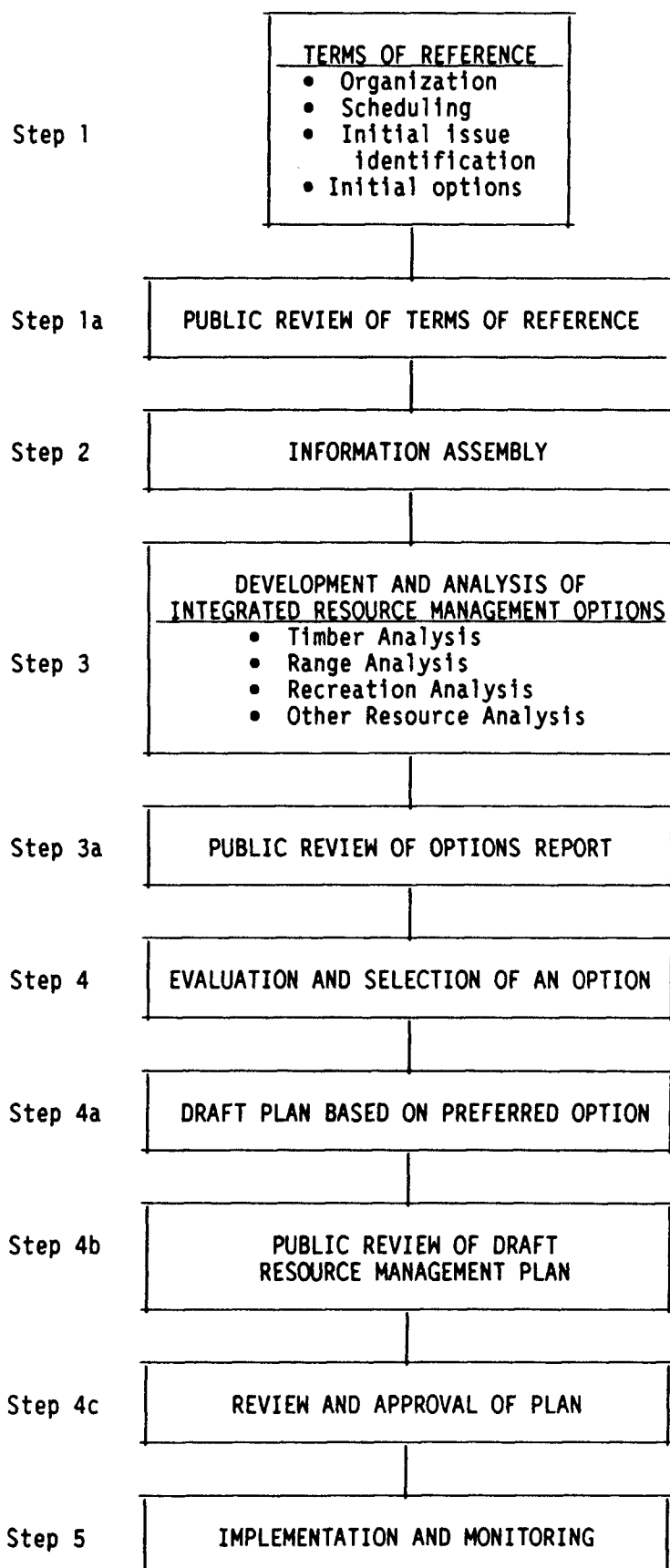
The description that follows is based on the Resource Planning Manual but it should be noted that at the time of this writing, the manual is undergoing revision so that the resource requirements of other agencies can be better incorporated into the planning process.

In the setting of Terms of Reference (Preliminary Organization), issues are identified by Ministry staff in consultation with the public and other agencies. These issues have a major bearing in determining what options need to be considered and how planning activities will further proceed. Some of the main issues currently being addressed at the TSA level, in the context of forestry and wildlife planning include:

1. size and shape of cut block openings, the number of harvesting passes and the time interval ("green-up") between harvesting passes;

2. composition of forest vegetation over time. Since most wildlife habitat needs are on the extreme ends of forest succession (early seral† stages or late climax stages), the requirements for both old growth or mature timber, and early seral communities for forage over time are critical; and

3. the allocation of the range resource between wildlife and cattle.

The final TSA Resource Management Plan must document how these issues will be addressed in the 20 year horizon. Issues are synthesized into alternative courses of action so that options represent practical management alternatives

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†A sere is a stage in the development of a vegetative community over time (plant succession).

Figure 2. **TSA PLANNING PROCESS**

Step 1

TERMS OF REFERENCE
- Organization
- Scheduling
- Initial issue
  identification
- Initial options

Step 1a

PUBLIC REVIEW OF TERMS OF REFERENCE

Step 2

INFORMATION ASSEMBLY

Step 3

DEVELOPMENT AND ANALYSIS OF
INTEGRATED RESOURCE MANAGEMENT OPTIONS
- Timber Analysis
- Range Analysis
- Recreation Analysis
- Other Resource Analysis

Step 3a

PUBLIC REVIEW OF OPTIONS REPORT

Step 4

EVALUATION AND SELECTION OF AN OPTION

Step 4a

DRAFT PLAN BASED ON PREFERRED OPTION

Step 4b

PUBLIC REVIEW OF DRAFT
RESOURCE MANAGEMENT PLAN

Step 4c

REVIEW AND APPROVAL OF PLAN

Step 5

IMPLEMENTATION AND MONITORING

(Source: MoF, 1988a)

designed in an integrated use context and achievable within budget limitations. Following this, selection of procedures for carrying out subsequent activities is identified. These sub-steps are finally documented in a Statement of Issues, Scenarios and Procedures and approved by the Regional Forests Manager to signify acceptance with the direction given to TSA Resource Management Plan development.

The Terms of Reference give direction to the second step, Information Assembly, in which forestry data is updated, reworked and synthesized for use in the planning process. A number of information reports are generated, based on the best available information that conforms to MoF policy.

Analysis of Options in step 3 entails the assessment of a number of proposed options through timber supply modelling. Forest planning models are centred on providing sustainable levels and schedules of timber harvest for the integrated resource use options previously documented in the Statement of Issues, Scenarios and Procedures. Analyses for non-timber are also undertaken to establish alternative supply targets for the respective resource values. The impacts of the integrated use options on these values are assessed and documented in the various analysis reports.

The fourth step is the Evaluation and Selection of an Option which consists of discussion, consultation and comparative evaluation of the various analysis reports. The TSA Options Report, which describes a range of feasible options, is evaluated by MoF staff, other agencies, the public and industry prior to the

Chief Forester's determination of an AAC and decision regarding apportionment. The Selection of an Option is a consultative process whereby a review between the Chief Forester, the MoF Executive and staff (but not MoE) who took part in the development and analysis of options, leads to a determination of an AAC. The AAC is determined by the Chief Forester for a five year period and represents a strategic 20 year perspective in addition to a long term (200 year) timber supply objective. The preliminary AAC and other decisions are documented in a Draft TSA Resource Management Plan which is reviewed by the public and agency staff prior to final approval.

The final step is the Implementation and Monitoring of the Plan. Implementation of the TSA Resource Management Plan is the responsibility of District staff who use the plan to establish forest management program proposals for the Ministry's Five Year Program. In theory the TSA Resource Management Plan serves to give direction by providing an AAC specification and serving as a norm in the less specific operational decision-making.

Monitoring involves all levels of staff. District staff assess resource assumptions used in previous options to determine their validity; Regional staff audit District implementation; and Headquarters staff audit Regional activities in addition to undertaking research and development in planning methodology. The level of monitoring that takes place varies according to programs within the MoF.

The procedures summarized above have been subject to interpretation by various Regional and District staff; thus the planning process has had different forms of

application that are dependant upon personal perspectives and the circumstances surrounding management activities.

2. TFLs and TFL Planning

Tree Farm Licenses are relatively long term tenure agreements between the Provincial government and major forest products firms, providing responsibilities for forest management within a specified area. This arrangement is designed to fulfill two major objectives. The first is to place most of the planning and management responsibility on the license holder who is to grow successive crops of timber in perpetuity while considering non-timber values. The second is to provide a secure supply of timber for established licensees and thereby attract investments in the forest industry (MoF, 1984c). These objectives therefore have long term implications for the management of Crown lands and for the stability of communities in surrounding areas.

Unlike TSAs, Tree Farm Licenses are area-based tenures that grant rights to the licensee to manage forest resources according to a Management and Working Plan prepared by the licensee and approved periodically by the Chief Forester of the MoF. Each license has a term of twenty five years with the opportunity for replacement once every ten years. This enables the terms and conditions to be included in the license document to be changed by government if deemed necessary.

Management planning for TFLs is undertaken through a three-tiered planning

process. At the upper level, five year Management and Working Plans are prepared which set the approved AAC for each license area, and outline broad objectives for timber harvesting, forest protection and integrated resource management. The plan is a comprehensive document that contains an inventory and analysis of resource values, the proposed annual harvest levels, and the proposed strategies to manage and protect the various resources. In essence this document is the foundation of the TFL (Kennedy, 1986). The second level, represented by five year development plans, provides specific information regarding harvesting and forestry projects (e.g. bridge construction) in the license area in the ensuing five year period. These development plans are updated annually to account for changes in information. The third level of forest management planning (which also applies in TSAs) is the preparation of preharvest prescriptions and cutting permits that are approved by the MoF. These documents provide specific timber and topographic information from proposed harvesting areas and are the vehicle providing authority to the licensee to harvest timber in designated areas according to specific requirements.

The planning process for TFLs through Forest Management Planning is similar in many respects to that for TSAs in that participants follow the same steps to ensure careful preparation and evaluation of options for the Chief Forester's decision. Thus the planning process is similar to that indicated in Figure 2 except that the public is involved during the Preliminary Organization (equivalent to Terms of Reference) and Review of the Draft Management and Working plan as compared with three steps in the TSA Planning procss. Also, the onus is on the license holder to initiate and carry out the majority of planning activities in

the preparation of the Management and Working Plan and in so doing, he must consult with the Forest Service, other agencies, and the public. The planning process for TFLs involves fewer participants than for TSAs, with Ministry staff having largely a coordination, review and approval function.

Like TSA options, the options for TFL management must reflect the Ministry's Five Year Forest and Range Resource Analysis, operate within the levels of funding identified by the Five Year Program and incorporate resource use priorities established by the Regions. Even though TFL planning is initiated according to corporate needs and undertaken by a Registered Professional Forester employed by the company, the process must be carried out in accordance with Ministry of Forests policy.

Preliminary Organization involves an identification of the timber, range and recreation issues and the tentative management objectives. The licensee is responsible for obtaining public input as part of the identification of issues and for establishing public involvement procedures. Moreover the TFL holder is responsible for choosing the timber supply analysis procedures in consultation with the Inventory Branch of the MoF. These procedures include the kind and format of data to be used, the procedures for synthesizing and aggregating the data and the planning models to be used (Robb, 1985).

Of primary importance is the Evaluation and Selection of an Option whereby integrated resource use options are evaluated by the licensee and a preferred option is selected for further consideration. Based on the preceding data, results

and decisions, the licensee prepares a Draft TFL Management and Working Plan that summarizes the decisions, proposals and recommendations. This document is reviewed by staff of the MoF and other agencies to determine how the licensee's preferred management strategy affects their objectives. Public review also takes place during which the licensee's proposals are evaluated. Following a 30 day period for receipt of written comments, the Chief Forester reviews all feedback provided by the various agencies and the public in addition to the recommendations given by Headquarters, Regional and District staff. Further consultation takes place between the Chief Forester, the Executive and Forest Service staff who participated in the development and review of the Management and Working Plan.

The Chief Forester exercises a good deal of discretion in the approval of the plan, based on funding levels and long term objectives. He retains the authority for specifying in the approval letter any obligations that the licensee must adhere to for the term of the plan. These reflect periodic changes encountered in forest management.

Forest Management planning through the three-tiered process as outlined above may gain increasing importance over coming years. This is due in part to a 1987 policy announcement by the Minister of Forest and Lands. The Minister announced that, in return for increased requirements on the part of forest companies for assuming greater management responsibility and increased processing of wood products, "security will be available to the industry by increasing the number of Tree Farm Licences from the current level of 29% to

a maximum of 67% of the provincial allowable annual cut."† Individual applications for tenure are to be judged in terms of company performance and the public interest.

It is important to note that the transfer of management responsibilities to the forest industry carries with it the requirement for producing integrated forest management plans and for actively seeking the input of government agencies, other organized interests and the general public in the development of these plans. As noted by the Chief Forester,

> Industry developed Management and Working Plans and Five Year Development Plans will be integrated resource plans. Management and Working Plans will be expected to mirror TSA Resource Management Plans in their comprehensiveness with respect to other uses... If these plans do not adequately address other values and uses, or if adequate consultation has not taken place, these plans will not be approved (Cuthbert, 1988b).

Also significant to the increased management responsibilities by forest companies is the concept of partnership agreements (otherwise known as "Letters of Understanding")‡ between the licensees and the B.C. government. The goals of the agreement are to reduce the involvement of the MoF in field-level forest planning and to increase the licensee's accountability to the public for forest management. A reduction in the size of the MoF has further encouraged this agreement. The licensee must apply to the MoF to enter into this agreement and

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†At the time of this writing a series of hearings have been held to allow the opportunity for public input. The policy is subject to change based on the input received.

‡This partnership concept was previously known as the Subsidiary Agreement. There are currently 2 Subsidiary Agreements and 6 Letters of Understanding in place. Eight Letters of Understanding are pending at the time of this writing. This agreement may be extended to include volume-based tenures.

the application will only be accepted if the licensee has a proven record of performance in forestry, range and recreation management activities. Although no mention is made of management for resources other than timber, each TFL has at least one Registered Professional Forester (RPF) who, as mentioned above, is responsible for undertaking forest management planning. The assumption is that the RPF is qualified to make the best decisions for the tenure regarding the management of both timber and non timber resources.

The partnership agreement involves an auditing procedure whereby management at the field level is periodically reviewed.† Moreover the licensee is expected to hold regular public meetings at which time the licensee's annual report is made available to interested parties.

3. Strengths and Weaknesses of Forest Management Planning

The following subsection discusses some of the general documented strengths and weaknesses of Forest Management Plannning in an integrated forestry/wildlife context. The research results of this thesis, which are evaluated against eight criteria (Chapter 3), will discuss these more fully and will validate or invalidate some of the findings in the literature.

A basic strength of the TSA Planning process is the ability for the identification and resolution of problems at a stage where planning flexibility exists. Incorporation of wildlife habitat requirements into plans as a result of TSA issue

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†Auditing is similar to monitoring but involves less contact with the licensees and is more formal in its approach.

identification can result in less interagency conflict at the more localized planning and review stages (Price, 1987).

In the past, a lack of inventory data on wildlife had resulted in plans of a somewhat rudimentary nature. However with recent improvements to the data base, the Wildlife Branch has undertaken extensive planning to exert an influence in the strategic planning process of the MoF. The products of the initiative include:

1. A Provincial Wildlife Strategy which emphasizes policy and strategic issues,

2. Provincial Species Statements which are comprehensive, technical documents detailing important aspects of wildlife species and providing prescriptions to manage the species and its habitat.

3. Regional Wildlife Plans which identify regional issues for wildlife species and wildlife habitat, provide a supply/demand analysis and contain an integrated list of species and habitat priorities.

These products have clarified the basis for recommendations provided by wildlife staff and will undoubtedly raise the level of credibility, making wildlife biologists and habitat staff more effective negotiators in integrated resource management (Prouse, 1987).

A weakness in the planning process is the fact that the Ministry of Environment has no legislative control over the land base; thus wildlife and their habitat are managed primarily through policy, inter-ministry liaison, discussion and persuasion (Harcombe, 1984). This process is characterized by advocacy planning in which

each interest group strives to the best of its ability to achieve its own goals, with the result that tradeoffs are made. This concilliatory approach inevitably results in strained relationships between participants and a situation that does not favor interests whose objectives are difficult to define. As noted by Thomas (cited by Robb, 1987)

> the best defined and driving mechanism for the overall process is timber harvesting followed by stand regeneration. Wildlife targets are much more difficult to define and quantify and as a result, objectives for wildlife have usually been thought of as constraints.

A fundamental weakness is the lack of provincial or regional guidelines for integrated resource management. "No overall land use policy for the province has yet been articulated, nor is there a clearly defined and explicit philosophy of land use" (Strang, n.d.). As a result, many resource use issues "are propelled into the political arena by an excessive level of uncertainty that affects all participants, be they wilderness advocates, fishery and wildlife managers, foresters or others" (Association of B.C. Professional Foresters, 1987). Related to this is the lack of clearly defined concepts in legislation and program goals (Harcombe, 1984).

Another weakness pointed out by Harcombe (1984) is the fact that the planning process for wildlife has tended to focus on featured species management, with little effort directed to managing for species diversity or richness. Moreover wildlife plan objectives have been articulated in terms of population parameters rather than areas of quality habitat required. While wildlife habitat needs have been qualitatively defined, forestry related objectives such as the AACs have been

quantitatively defined through Forest Management Planning. Thus there exists a basic difficulty in incorporating wildlife needs into timber supply analyses.

The MoF's Timber Supply Analysis System has enabled planning staff to derive management options and identify the consequences of each for future timber supplies. Through these mechanisms and in the context of the Ministry of Forests Act (Section 4c), the intent is to manage the resource base for all resources in order that socio-economic values are fully realized. But as Percy (1986) states,

> despite the increasing sophistication of the Forest Service in terms of projecting future timber supplies and evaluating the consequences for various timber management policies, the criteria by which the forest resource base is managed are largely ...physical criteria.

Other authors (e.g. Irland, 1985) similarly state that strategic forest planning has been excessively technically oriented and that managers have been unsuccessful in identifying issues in such a manner as to obtain public support.

Since the early 1980's there has been a growing support for an overall land use strategy to guide forest managment. This has been supported by the Wilderness Advisory Committee (1986), the Association of B.C. Professional Foresters (1987), the forest industry and a number of environmental and outdoor recreation groups. The common bond in this desire for a comprehensive land use strategy is to obtain a more mutual vision of the future with respect to the "working forest" to sustain commercial forest harvesting, the environmental and recreational land base and other resource needs. In order to achieve a common future, all resource sectors will have to enter into negotiations in a spirit of give and take.

The very fact that this growing call for a land use strategy has developed, particularly by organizations like the forest industry which are intimately involved in MoF strategic planning for IRM, underlines a major weakness in current approaches.

Another weakness that exists in the process is the fact that the analysis system of the MoF, which is designed to generate sustained yield timber harvesting projections through the use of forest planning models, has been unable to capture IRM issues. As noted by Williams et al (1988), "The timber supply model currently in use can constrain the rate at which individual analysis units are harvested. It does not adequately model the harvesting patterns and constraints that arise from integrated resource management." Because the analysis system cannot model the constraints through an area-specific harvest schedule, the IRM issues such as retention of wildlife habitat are roughly approximated by proportionally reducing the net land base for the purpose of projecting the long term timber supply.

These then are the more commonly cited strengths and weaknesses of Forest Management Planning. Planners of both the MoF and MoE are striving to improve upon the weaknesses that currently exist but at the same time recognize that some are most difficult to rectify because they are the product of complex institutional arrangements and the relative priority and importance given to planning.

III. CRITERIA FOR EVALUATING IRM

This chapter puts forth and discusses criteria for evaluating the effectiveness of integrated forestry/wildlife planning through Forest Management Planning.

Evaluation of program effectiveness requires clear and specific criteria for success (Weiss, 1972). Several normative criteria for assessing the effectiveness of Forest Management Planning in the context of IRM were derived through an examination of the literature on integrated resource management, institutions and planning processes. Eight criteria have been selected based on documentation in books, journals, and conference proceedings and in consultation with government officials. The evaluation criteria are:

1.   clear, quantitative objectives

2.   a hierarchical planning framework

3.   shared (interagency), cooperative planning

4.   meaningful participation by the relevant publics

5.   flexibility in plans and planning processes

6.   an adequate data base

7.   commitment to planning

8.   a monitoring program

Below, each criterion for effective planning is presented and its rationale is provided in a brief commentary.

> **Criterion 1** Written objectives established for the resource agency which are clear, quantified and consistent with provincial forest and environmental policy.

Commentary An objective is a "statement of intention that has been identified, analyzed and expressed with sufficient specificity to indicate how it can be accomplished within the time and resources available to the agency" (Branch, 1983). This definition suggests that explicit objectives are purposive; for this reason they are to be found in all plans and programs having implementation as an intent (Branch, 1983). Thus objectives are highly significant, particularly because they provide direction for intended program accomplishment.

Explicit, quantitatively defined objectives enable the various agencies involved to recognize the needs of each. Thus the provision of such objectives lays the groundwork for resource tradeoffs, ultimately exerting influence over the manner in which the planning process is administered and the resources integrated in the field.

This criterion is closely linked with flexibility because when resources or other elements in the planning environment change, objectives must be revised accordingly. It is also associated with monitoring since changing realities reflected in feedback mechanisms interact with objectives as "dependent variables" in the analytical loop.

Criterion 2 Planning undertaken within a comprehensive framework of hierarchical levels, from the enunciation of provincial policy by government to plan implementation vis-a-vis operational planning.

Commentary Resource planning should be undertaken within a comprehensive framework because such a framework is needed to facilitate the development of

plans at levels of detail and emphasis appropriate for particular circumstances such as public demand and complexity of information. The problem of defining the "appropriate level of emphasis and detail" is an important one, for it is often difficult for planners to "scope" the planning process appropriately (Petch, 1985).

Effective planning involves progressive refinement of management decisions through a hierarchical framework of levels. This is noted by Pearse (1976) who stated that "planning at one level of detail can be undertaken only in the context of plans and objectives for a broader area."

In British Columbia, strategic plans at the Forest Management level refine the broad goals and objectives as stated in overall policies. These plans in turn must provide guidance for planners undertaking tactical plans: a requirement highlighted by the Ministry of Forests (1985) in an evaluation of the TSA planning program. As the evaluation stated, "TSA Plans must reflect government priorities and give direction to lower level Local Plans and Resource Development Plans."

Criterion 3 Incorporation of multi-agency interests in a shared planning environment, with each participant having a stake in the outcome viewed as an equal partner.

Commentary The criterion of joint planning or shared decision-making seems to capture the essense of integrated resources management since it is reflected in many of the terms associated with the concept such as interdisciplinary, interactive and resource optimization. The dominant concept of joint planning is "consensus decision-making": an attempt to reach a general accord in effecting a

purpose rather than reaching unanimity (Petch, 1985).

A key reason for accommodating several interests in a planning endeavor is the innovation which entails seeking solutions leading to better decisions and reduced costs (Innes, 1984). Integrated resource management, while regarded by managers as being a superior approach to planning, involves negative phenomena such as complexity, uncertainty, value-conflict, and instability. Joint planning through an "equal partnership" approach has a greater potential than conventional planning in reducing the undesired effects of these phenomena. Any agency planning programs that confines its analyses or forecasting to a single discipline will be unable to capture the full breadth of most situations requiring high level decisions, and will likely produce biased, narrow results (Ascher and Overholt, 1983).

Criterion 4 Meaningful participation by the relevant publics in a formalized process.

Commentary The definition of democracy, "government by the people" implies participation by the individuals who will be affected by decisions. Public involvement offers many advantages which ultimately result in more acceptable forms of planning for resource use. These benefits accrue to both the public and the government. As stated by a former Deputy Minister of Forests, "Citizens of the Province need to know what the implications are of choosing among various resource options and we as forest managers need to know what an informed public wants in order to present technical options that are workable" (Apsey, 1980). Public involvement, with its sharing of information, assists planners in the

development of options and decision-makers in making choices. It is an important mechanism in IRM for mitigating resource conflicts and determining appropriate resource tradeoffs, in turn resulting in greater acceptance by the public of land use proposals.

Accountability of decision-makers is another important aspect of public involvement. Integrating the relevant publics into the planning process enhances the accountability of decision-makers and the legitimacy of decision-making procedures.

Criterion 5 Plans and planning processes should be flexible to accommodate changing needs, circumstances and information.

Commentary Flexibility should be built into IRM plans to accommodate changing circumstances and the introduction of better information (Petch, 1985). Plans and planning processes that retain flexibility will continue to serve as aids in decision-making. Planning thus becomes a recursive, often repetitive process of decision-making, characterized as having a dynamic "looping" of planning steps.

Amendments to plans should not be undertaken so frequently and be of such great extent that the management direction becomes totally obsolete; otherwise the plan will be of little value. On the other hand, amendments should not be made so infrequently that the stated direction within plans is dealing with outdated issues. Flexibility must also apply to planning processes but again, proven structures should not be totally abandoned if it means that there is no mechanism for dealing with future problems (Petch, 1985).

The move towards greater flexibility in the planning process should also involve a consideration of how existing institutional and professional frameworks impede such a progression (Armson, 1984).

> **Criterion 6** An adequate data base which provides relevant physical and measureable data on the natural systems of a given area. Data should be integrated such that they enable ease of comparison between the resource values involved. Moreover, at the management unit level the data base should enable recognition of broad land-use interactions and highlight known areas of conflict.

Commentary Resource management decisions should be based on the best available factual information. "The more complete the information, the better the management" (Munro, 1987). This means that an integrated resource information base should be developed by, and accessible to, the relevant resource agencies (Livingstone n.d.). A carefully designed resource information base will provide the input needed to help meet agency goals, objectives, issues and problems. It follows therefore that coordinated data systems should be designed in such a manner that issues and data needs can be addressed and that resource inventories can be conducted in logical and critical areas. Because resources are interrelated, the data base should reflect this interrelationship. Only by doing so can there be ease of comparison of the resource values being considered. The failure to integrate resource information not only hampers the implementation of IRM programs, but also gives the public an impression of a disorganized, ineffective, and uncoordinated resource effort (Glascock, 1978).

> **Criterion 7** Commitment in terms of adequate levels of funding which is required to carry out strategic planning and in terms of official adoption and implementation of plans and policies.

These provide an indication of attitude toward planning processes and the resultant product.

Commentary If lack of commitment to policy is an impediment for management at a political level, there will be little chance of plan success at the operational level where implementation takes place (Innes, 1984). Commitment to planning, as reflected in budget levels, is very much a reflection of attitudes. Salwasser (1984) states that "attitude is more important than laws, procedures or technology in resource coordination... The bottom line is that people have to want to manage forests for wildlife and timber in the first place." The philosopher Goethe stated that

> Until one is committed, there is hesitancy, the chance to draw back, always ineffectiveness concerning all acts of initiative (and creation). There is one elementary truth, the ignorance of which kills countless ideas and splendid plans: that the moment one definitely commits oneself, then providence moves too.

Commitment is difficult to guage but can be ascertained indirectly by surrogate measures such as budgetary levels as well as plan implementation. Funding must be made available at sufficient levels to enable planning to be carried out and for plans and policies to be implemented. As noted by Innes (1984) "policies without funding are like cars without wheels - they may appear attractive but they don't go anywhere."

The importance of plan implementation cannot be overstated. Without the will to implement the plan and enforce its requirements in a sensible manner, planning becomes nothing more than a meaningless gesture.

Criterion 8 **A mechanism for monitoring the plan implementation to determine the extent to which agency objectives have been achieved and to enable the agency to evaluate the effects of alternative actions.**

Commentary Monitoring is an important feedback mechanism for answering the agency's question "Did we meet our objectives?" In fact the establishment of objectives becomes meaningful only when there is a mechanism for evaluating the degree to which they have been attained. "A part of integrated resource management must be the process of establishing a reference point, defining the results achieved, and modifying procedures in the light of experience" (Innes, 1984).

A planning program without monitoring will be doomed to failure because "managers will soon come to regard objectives as just an exercise in writing and the system will quickly be viewed as something that took a lot of time and effort with no results" (Crowe, 1983). The failure to evaluate program achievements through concrete, explicitly defined evaluation measures has resulted in many planning documents "collecting dust", a phenomenon often noted in the literature dealing with planning implementation and evaluation. Monitoring enables the agency to not only determine progress towards stated objectives, but also to identify and address problem areas and to ascertain whether or not the objectives are realistic (Crowe, 1983).

IV. STUDY RESULTS

This chapter discusses the results obtained from the interviews that took place in the case study areas (Nelson Forest Region) and in government headquarters (Victoria). It also introduces the study area and the interview approach.

The results provided in this chapter and the evaluation of these results provided in Chapter 5 emphasize the process aspects of IRM rather than the outcome aspects. The documentation in the following two chapters is intended to be a qualitative analysis more than a quantitative analysis. It was felt that the results obtained from this process and policy oriented study would be difficult to capture numerically. Also, the study used a relatively small sample size consisting of experts, requiring that there be a tradeoff between meaning and numerical precision.

Preceding the discussion of results is a brief description of the specific case study areas within the Nelson Forest Region (Figure 3). The management units selected are the Golden TSA, Cranbrook TSA and Crestbrook Forest Industries TFL#14. Nine professionals involved in Forest Management Planning in the Nelson Region and affiliated with either the MoF, MoE, or the forest industry, were interviewed. In addition, six professionals at the Headquarters level (Victoria) were interviewed to provide a provincial perspective on IRM at the Forest Management level. A list of the people interviewed and their affiliation is provided in Appendix 1.

approximate scale : 1 : 2,000,000

BRITISH
COLUMBIA

NELSON
FOREST
REGION

Kinbasket
Lake

GOLDEN T.S.A.

ALBERTA

Columbia R.

GOLDEN

T.F.L.
14

REVELSTOKE

Upper
Arrow
Lake

INVERMERE

CANAL FLATS

Slocan
Lake

KASLO

Lower
Arrow
Lake

KIMBERLEY

NELSON

CRANBROOK

FERNIE

CASTLEGAR
SALMO
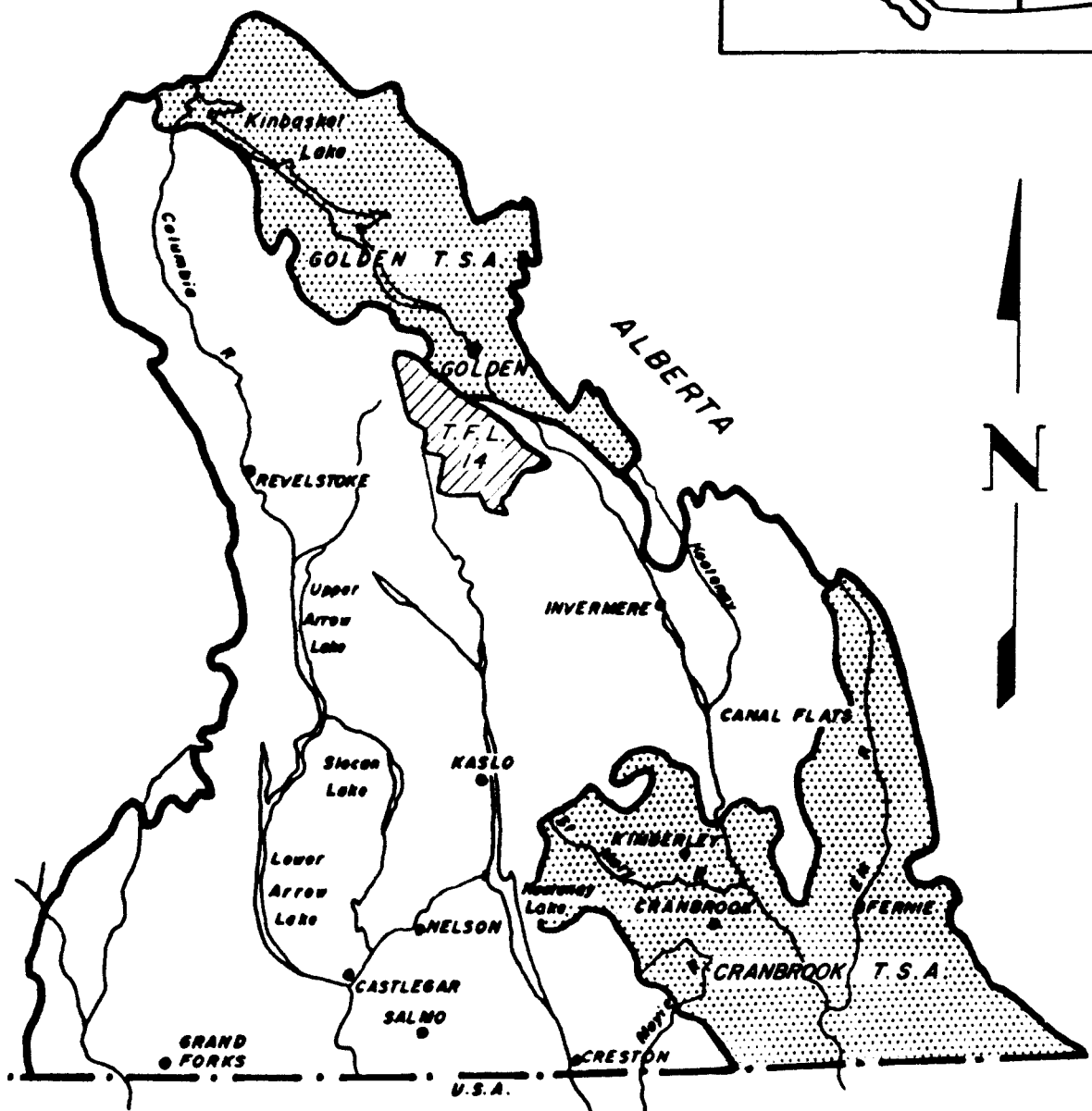
CRANBROOK T.S.A.

GRAND
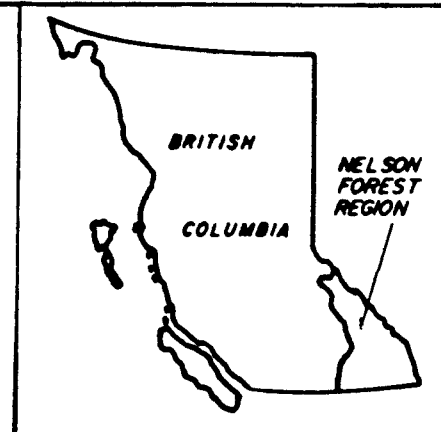FORKS

CRESTON

U.S.A.

N

FIGURE 3

A. STUDY AREAS

As stated in the opening chapter, the study areas within the Nelson Forest Region were selected on the basis of their important, overlapping wildlife and forestry resource values and because the strategic integrated resource planning process is at an advanced stage. TSAs have been emphasized in the study because this form of management unit comprises all but approximately six million hectares of provincial forest land in B.C.

1. Golden TSA

The Golden Timber Supply Area is the most northerly TSA in the Nelson Forest Region (Figure 3) and encompasses approximately 899,000 ha of land of which approximately one third is currently classified as productive Crown forest land. The TSA boundaries coincide with those of the Golden Forest District and have been established to take into account the existing transportation infrastructure and the location of manufacturing facilities. The steep topography and difficult access have combined to constrain forestry development in many parts of the TSA. The TSA provides important habitat for such wildlife species as deer, elk, black and grizzly bear, caribou, sheep and goats.

a. Forestry/Wildlife Issues

Forest Service and Wildlife staff recognize several issues relating to forest management activities and their impacts on wildlife. The major strategic issues

are as follows:

1. old growth forests - While wildlife experts call for the retention of old growth forests to provide for the maintenance of habitat diversity, forestry staff state the need for converting these stands to managed forests, thereby increasing the annual volume increment.

2. riparian zones - These zones, which are associated with surface water, are very productive areas that form well defined wildlife habitat types within the drier surrounding area. They are highly sensitive to habitat manipulation and as such may take several years beyond initial harvesting to recover.

3. cover requirements - If second pass harvesting follows initial harvesting too soon, shelter requirements for wildlife will not be met and the cover-to-forage ratios will be distorted, resulting in a reduced carrying capacity of the land. Timber harvesting can be especially detrimental if carried out on winter ranges.

2. Cranbrook TSA

The Cranbrook TSA is situated in the extreme southeast corner of B.C. and covers a total area of 1,412,700 hectares. Of this total, 386,162 hectares is classified as the net forest land base. The TSA supports high values of timber, range and wildlife resources including critical winter range for ungulates such as deer, elk and sheep. Populations of grizzly bear are scattered throughout the TSA. The Rocky Mountain Trench area within the Cranbrook TSA† contains such

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†The Rocky Mountain Trench also occurrs in other TSAs within the Nelson

high wildlife habitat capability, that the Canada Land Inventory developed a special classification for this area.

a. Forestry/Wildlife Issues

There is a need to distribute timber harvesting to ensure an adequate diversity of wildlife habitat in both space and time. Also, the large number of roads that are used for ongoing forest management and recreation has a potential impact on wildlife habitat utilization. Therefore road access must be carefully managed to minimize pressure on certain wildlife species.

A significant area of range land used by both wildlife and livestock exists in the area. Continuous update of Coordinated Resource Management Plans † within the scope of the TSA Resource Management Plan is required to attain a harmonious blend of timber, range, wildlife and recreation resources within the TSA.

3. Crestbrook Forest Industries TFL #14

Tree Farm License #14, situated within the Invermere TSA,‡ totals 139,500 ha, of which 46,000 ha is productive forest land. A diversity of land forms and forest types produces a wide range of resource uses. Timber and wildlife management are highly important within this TFL. Six ungulate species inhabit

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†(cont'd) Forest Region and in other Forest Regions of B.C.'s interior but is particularly valuable for wildlife in the Cranbrook TSA.
†CRMPs are a form of Local Resource Use Plans (i.e. tactical plans) that have been developed for overlapping forest and range areas of B.C.'s interior.
‡Although it is situated within the boundaries of the TSA, it is not managed as part of the TSA.

the area. In addition, most of the carnivore species indigenous to western Canada, are found within the TFL.

a. Forestry/Wildlife Issues

The licensee has not identified in the TFL Management and Working Plan any issues that occur as a result of timber harvesting and its impact on wildlife. Sumanik (1984) has stated in the company's IRM document that forest harvesting will alter wildlife habitat, inducing either a positive or negative impact on wildlife "depending on the habitat requirements of each species".

B. THE INTERVIEWS

Several sources of information were used in this study; however an emphasis was placed on interviews to provide the information required for the evaluation of planning effectiveness. Prior to the interviews, a list of potential respondents was prepared, based on their involvement in TSA/TFL planning. Many of these experts were listed in workshop proceedings, government documents, and other sources and additional interviewees were added at the suggestion of various government officials (see Appendix 1 for a listing). An attempt was made to select an appropriate balance of persons between the MoE and the MoF. The interview questions were then mailed to all respondents prior to the interview stage.

Each interviewee was asked a series of questions - some open ended and some

specific - relating to the criteria. These questions varied, however, according to the nature of the work the interviewee was involved with. The questions were worded to both avoid ambiguity and to elicit a response that was most pertinent for each criterion (see Appendix 2). Each respondent was assured of confidentiality in the responses in order to promote openess and prevent fear of reprisal. Most respondents, however, had no concerns about being quoted: all were open and forthright in expressing their views on IRM and Forest Management Planning processes.

C. STUDY RESULTS ACCORDING TO CRITERIA

The results are presented below, according to each criterion with an emphasis on the strengths and weaknesses of the planning process. Case study responses are combined with headquarters responses but in order to facilitate a comparative evaluation on some important findings, a distinction has been made between the two levels.

1. Clear, Quantified Objectives

All respondents were asked what their agency's objectives were and whether these objectives provided guidance to resource planners in Forest Management Planning. MoF respondents indicated that the primary objective of the MoF in the context of IRM is to maintain a given level of timber production while accounting for or managing for other resource values. This falls in line with Section 4(c) of the Ministry of Forests Act.

It was felt that this objective alone did not provide guidance to resource planners in Forest Management Planning except in a very broad sense. The objective however, is being refined at the TSA level such that individual resources are being assigned objectives in the TSA Resource Management Plan. The Cranbrook TSA is one of the few TSAs that has developed production targets for various resources such as recreation, range and wildlife.

Respondents acknowledged that objectives for resources other than those under the jurisdiction of the MoF are not interpreted for TSA Resource Management Plans; in essence they are broadly stated so that they provide little meaning in terms of the strategies to be used to achieve unspecified targets. Respondents acknowledged that non-timber resources are often treated as constraints. Moreover, the objectives of the MoF are largely unwritten and undocumented.

Several respondents noted that the MoF is placed in a difficult position when stating objectives because, on the one hand, it is to ensure a vigorous, competitive industry, and, on the other hand, it is to plan the use of the forest and range resources in an integrated manner through cooperation and consultation. This duality of objectives has created a number of problems in the planning process; in particular it has given the MoF the appearance of a non-neutral body.

Wildlife representatives stated that the objective of the MoE is, in general terms, to maintain the diversity of wildlife species and habitats. While it is recognized by the MoE that this objective is general for the province, the Ministry attempts

to promote integration by acting under Section 4(c) of the Ministry of Forests Act by refining objectives through forestry plans. They also stated that this broad objective does provide direction to resource planners when combined with Regional Wildlife Plans which specify how the wildlife management objectives of the MoE are to be attained.† Quantification of wildlife populations and the strategies used to maintain them was felt to be adequate; however, quantification of habitat management requirements was felt to be lacking. Irreplaceable habitats such as wetlands and old growth forests are currently an issue in Forest Management Planning but decisions have not tended to focus on what the requirements are to maintain diversity in wildlife species, where these specialized habitats should be distributed and for what reasons. Another MoE respondent pointed out that there is no policy that states that the MoE will co-ordinate its activities and objectives with other agencies and practice integration.

Respondents were asked what the relative importance of TSA Planning was in attaining their agency's objectives, as compared with other levels of planning. Most respondents (6/9) in the Nelson Forest Region stressed that Forest Management Planning is critical for attaining their agency's objectives. One respondent stated that plans are driven by timber supply considerations and

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†The MoE's ability to formulate objectives varies considerably from region to region and from resource to resource. For example, a greater understanding of featured species has led to more clearly defined objectives than for non-game species. The direction given to the preparation of guidelines for wildlife protection such as the optimal distribution of remnant forests or size of clear cuts, is therefore largely a function of the species information or geography. For a wide range of non game species the best that can be done to maintain approximately present numbers is to maintain a forest mosaic that includes habitat currently being used. The intent is to provide the MoF with qualitative information which will then be incorporated into a Geographic Information System (GIS) to determine the effects on the AAC.

currently do not meet the needs of other resources. Wildlife representatives expressed a concern that although TSA Planning has become a high priority within both ministries, it is a time consuming process; other projects within the MoE are being set aside in order that TSA Planning can be carried out. Another respondent expressed uncertainty as to whether TSA Planning was effective for achieving lower level planning objectives and suggested that most gains would be made with effort equally divided between TSA Planning and field level management.

All respondents (6/6) at the headquarters level stated that despite some weakneses, Forest Management Planning is essential for attaining their agency's objectives† and is also important for identifying issues. The resolution of issues such as the amount of habitat that must remain intact, the rate of harvest, the number of harvesting passes, the size of cuts, and the guidelines that impact on how this is to be carried out must be strategically addressed through TSA planning. Once these issues are resolved at the TSA level, an opportunity exists at the lower planning levels to develop more detailed guidelines.

Headquarters respondents, like their regional counterparts, felt that although the objectives of the MoF, as enshrined in the Ministry of Forests Act, provide general direction at the provincial level, direction has been somewhat lacking at the TSA Planning level. Despite the increased importance of IRM, objectives for achieving IRM within the context of a given harvest level were stated to be vague. Wildlife objectives were felt be to be insufficiently incorporated into Forest

†Two respondents answered in the context of their previous employment with government.

Management Plans.

2. Hierarchical Planning Framework

Since the early 1980s, the MoF has placed an increased emphasis on Forest Management Planning to provide the context for the more localized plans, thereby reducing uncertainties and helping to scope development. Some criticism remains however, over the lack of direction given to Forest Management Planning through broader policy planning.

Interviewees were asked if Forest Management Plans presently provided direction for lower levels of planning and management. Some respondents noted that historically there was little direction provided except in situations where forestry operations were compatible with wildlife needs; where incompatibilities arose, timber harvesting tended to take precedence. There is now an increased commitment to providing a context for Local Resource Use Plans and as a result lower level plans are increasingly reflective of what is stated in TSA/TFL Plans. In the Golden TSA, respondents stated that TSA Resource Management Plans provide the guidance needed to carry out lower level planning and that they are satisfied with this guidance. A great deal of time was spent on issue identification and in delineating riparian zones and ungulate winter ranges. These efforts have increased the likelihood that the AAC will be indicative of these issues and reflected in Five Year Development plans. Regional wildlife staff were confident that the issues relating to fish and wildlife were being linked to operational planning through the incorporation of these issues into the cut

determination.

Another respondent in the Golden TSA acknowledged that TSA Resource Management Plans provide direction but the degree to which the plan is used by forestry staff is sometimes questionable. This person felt that it is of greater importance that lower level plans give direction to and be reflected in the TSA Resource Management Plan; hence "bottom-up" planning has to filter issues and information to the higher level which in turn feeds information and decisions back down to the lower level. A failure to do this in the past resulted in a lack of recognition on the part of foresters in the TSA, of the value of riparian zones for fish and wildlife resources and ultimately led to difficulties in resolving issues in these zones.

One respondent stated that TSA Resource Management Plans failed to provide the needed direction because they lacked specificity and did not pay sufficient attention to priorization. It was his feeling that statements have tended to be broadly worded and consist of unmeasureables, with the emphasis being on timber values.

Crestbrook Forest Industry maintains that the Management and Working Plan for TFL 14 provides good direction for all staff; and is, in essence, the driving force of Five-Year Development Plans and the vehicle for recognizing the needs of other resources.† One respondent noted that through careful planning, the

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†Under its Subsidiary Agreement with the MoF, the company is charged with the responsibility for considering all resources and is audited for performance on this basis.

company has been able to live with the plan over a long term - a situation that does not occur with all licensees.

Respondents at the headquarters level indicated that direction is currently being provided through the TSA Planning process but there is room for improvement, particularly through the clarification of IRM strategies. Issue identification was repeatedly cited as a positive function of TSA Resource Management Planing in providing direction whereby planners could assess all issues in the management unit and rank them in terms of ease of resolution and importance. TSA/TFL planning also provides the opportunity for resource staff to identify data gaps, research requirements and inventory needs.

Interviewees noted that there were a number of deficiencies at the higher levels of planning where Provincial and Regional goals and objectives are to provide direction to Forest Management Planning. A common thread was the lack of a strategy for designating areas with differing resource use priorities and the lack of refined objectives at the provincial level. For example there is presently no provincial document that acknowledges the higher value of wildlife in certain areas of the province. Respondents in the Golden TSA cited the need for improved direction from Headquarters in terms of providing a statement as to what the purpose of TSA Planning is and for specifying provincially endorsed wildlife population goals or targets.

There is currently a move towards decentralizing the TSA Planning function from the MoF Regions to the Districts. This means that District planners will have

the responsibility for undertaking functions related to both strategic and tactical planning. When asked what effect they felt this would have on the implementation of TSA Resource Management Plans, all respondents held favorable views, stating that the effective delivery, the quality of the product, and the actual implementation of the plan were positive benefits. Because District, MoE and industry staff have a better understanding of District level issues, they will be able to work in greater harmony knowing that they are dealing directly with people on "the front line" where IRM occurs. Decentralization would ensure better linkages between Forest Management Plans and operational plans because staff would have a vested interest in producing a document that meets their requirements and in seeing it implemented. Some negative effects, of a short term nature, were identified as being the transition of the planning function from a Regional TSA Planner whose sole job is TSA Planning, to a District Planner whose responsibilities span several functions and who will likely require training in TSA Planning. Another negative effect was determined to be the possible misinterpretation or lack of clear understanding of the direction being taken as one moves down the planning hierarchy.

3. Shared, Cooperative Planning

In order to provide insights on how interagency planning had evolved, interviewees were asked what recent initiatives had been recently undertaken to further joint planning efforts between forestry and wildlife staff. In the Nelson Forest Region various mechanisms had been put into place to improve interdisciplinary planning. The Regional Manager of the MoF and the Regional

Director of the MoE have signed a joint Protocol Agreement, designed to clarify Ministry roles and develop a partnership in Forest Management Planning. All TSA Planning meetings will now be referred to MoE staff thereby providing a greater oppportunity for their participation.

MoE respondents were particularly positive about recent initiatives that had taken place, noting that during the first round of TSA Planning, ministry staff were not involved in either the issue identification or the analysis stages; they are now involved in both. For example in the Golden TSA the regional wildlife habitat specialist had little involvement in the first round of TSA planning and was not an active participant on the TSA Steering Committee.† But by indicating to the Steering Committee the legislative mandate that the ministry had for managing other resources, this person became a participant in Steering Committee meetings and helped to clarify some important forestry and wildlife issues that had previously gone unnoticed.

A Forest Service representative acknowledged that the participation of the MoE on the Steering Committee has the potential of providing some immediate benefits. "Scenarios for the TSA Resource Management Plan will actually reflect what goes on in the field, with the ultimate benefit being less conflict at the operational level." With wildlife participation on the TSA Steering Committee, there has also been more serious discussion about improving the assumptions that are used in planning models. Although wildlife staff are not formally represented on the Steering Committees for many TSAs, their participation has already been

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†TSA Steering Committees typically consist of the main forest licensees in the TSA and appropriate MoF Regional and District staff.

identified by both ministries and at both levels as a positive means of bridge building.

Throughout the Region, various committee structures have been struck or expanded upon to include wildlife representatives. In the Kootenay Lake TSA for example, a TSA Analysis Wildlife Working Group, consisting of MoF and MoE staff, has been formed as part of the TSA analysis procedures.

A tangible development that has recently fostered cooperative joint planning between Crestbrook Forest Industries and various agencies is the signing of a Subsidiary Agreement.† In September, 1986, the company and the MoF signed the first formal Agreement to be executed in British Columbia.

> The agreement facilitates integrated resource management practices on Tree Farm License No. 14 lands and clearly sets out the resonsibility and accountability of each party involved in the management of the TFL resources (CFI, 1988).

Under the Subsidiary Agreement, the licensee is responsible for resolving problems with other agencies before a draft Management and Working plan is referred to the MoF. Thus a proactive approach has evolved whereby operational considerations are worked out beforehand. According to the company representatives interviewed, the low turnover of planning staff and the fact that the company is "front-and-centre" in discussing issues with wildlife staff are factors that have enabled the development of this trust in performance.

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†The MoE, however, remains very concerned about the effectiveness and efficiency of the Subsidiary Agreements, now termed "Letters of Understanding", which extends more operational responsibilities to forest licensees, including direct referral of harvesting and other intended activities to other agencies such as the MoE.

At the Provincial level, one group that arose in 1986 was the Planning Phases Committee which was established to study how timber planning should take place at the operational (tactical) level while avoiding duplication of effort and to determine how the silviculture Pre-Harvest Prescription should fit into the overall planning framework. The MoE has been involved in this work which is still ongoing.

Another group that was formed a year later was the TSA Planning Coordinating Committee comprised of MoE and MoF representatives at the Headquartes level. The main thrust of the committee is to determine what needs to be done by the respective ministries and accommodate these needs through the TSA Resource Management Plan.

One respondent noted quite correctly that recently implemented mechanisms may not be as important as what they are made out to be. According to this individual, cooperation is predicated on the personal traits of the individuals involved; "People who want to get along can work with just about any planning system. If they have a mind-set or pre-set bias, it doesn't matter how good the planning process is."

Notwithstanding this last statement, all respondents were asked what improvements they felt should be made to policies or processes to further joint planning initiatives. The majority of responses pertained to improvements in planning processes and organizations.

The most important need was to improve the understanding of participants to the planning process, the link that attaches operational planning to strategic planning and the benefits to the various participants. Moreover there is a need to ensure that the planning levels of various ministries coincide in order to enable the identification of the linkages, veto powers and authorities between ministry planning levels.

Despite the need for improvements to policies and processes, many gains in joint planning have been made over the last five to six years. Respondents were confident that time would lead to further progress in this field.

The third question on this criterion required the interviewees to state their level of satisfaction with TSA/TFL planning in terms of dealing with forestry and wildlife interactions. In providing their answers, some respondents referred to the working relationships with their counterparts in other ministries or forest companies while others referred to the approaches used and the final product resulting from strategic planning processes.†

In the Nelson Forest Region, most respondents (6/9) stated that they were satisfied with shared, cooperative planning at the Forest Management level but only two of these indicated that they were very satisfied. The remaining three were not satisfied. Of the satisfied respondents, two qualified their answers by stating that the satisfaction they obtained varied between Districts. The

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†All interviewees in the Nelson Region responded while two thirds of the interviewees at the Headquarters level responded because some felt that they were not close enough to the issues to accurately answer.

receptiveness of individuals in recognizing the need for wildlife and forestry integration, the personal traits of individuals and the levels of education were three of the variables cited as making a difference. Another two stated that although they were satisfied, further decision-making at the MoF Executive level would determine whether the TSA planning process is worth the time and effort put into it.†

Respondents in the Golden TSA were satisfied with the working relationships that had been developed over the years but the Wildlife representative noted that a high staff turnover rate in the MoF hindered the continuity of joint planning endeavors. One respondent at the Regional level referred to the increased levels of communication that had taken place between participants as compared to the first round of TSA Planning.

One dissatisfied respondent based his answer both on the individuals involved in TSA Planning and on the unwritten policies of the MoF. This person expressed the concern that the TSA Planning process is driven strictly by timber and AAC considerations and that analyses dealing with other resource values become an adjunct to rather than a part of the plan. In his opinion, a satisfactory mechanism to incorporate other values into the AAC determination is lacking. The respondent provided the comment that the framework for TFL Management and Working Plan preparation was even more problematic because although it was efficient in terms of providing an AAC, it failed to deal adequately with

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†At the time of this writing, no decision had been rendered on any TSA Resource Management Plans in the Nelson Forest Region. Hence this question was regarded by some to be somewhat premature to fully comment on.

other resource values.

When asked how satisfied they were with current shared, cooperative approaches to Forest Management Planning in terms of dealing with forestry and wildlife interactions, 2/4 headquarters respondents stated that they were satisfied, while 2/4 were dissatisfied.

One area of dissatisfaction lay with the MoE which expressed concern that the Chief Forester makes a decision in a brief period of time based on consultation with his staff, a decision that may have been completely counter to what wildlife staff had been arguing arduously for with Regional forestry staff.

Criticisms indicated that TSA Resource Management Plans have tended to pay little attention to wildlife other than through motherhood statements. This has conveyed the perception that foresters lack concern for resources other than timber. A weakness though is that wildlife staff have failed to provide clear objectives.

One respondent stated that in this province players feel no responsibility for others' problems and that an excess of gamesmanship occurs, much to the detriment of IRM. "Rather than encouraging win/lose postures that currently characterize much of the interaction that takes place in B.C., principled negotiation should be used that obliges the individual to own the problem."

One respondent expressed dissatisfation with current appoaches to joint planning,

stating that there remains a great deal of potential to develop, but at the same time he indicated satisfaction with recent progress that has been made and the fact that the MoF was doing its job to the best of its capability, resulting in increased attention to non-timber resources. It was his perception that policies and procedures were effectively communicated to planners.

4. Meaningful Public Participation

Interviewees were asked how the publics having a stake in Forest Management Plans were brought into the process, if at all, and which of these publics have tended to participate effectively. They were then asked to offer suggestions as to why participation was either effective or ineffective.†

The respondents began by noting that the "publics" in the Nelson Forest Region which include guide outfitters, rod and gun clubs, trappers and naturalists, are very active but more so in some Districts than others, depending on the nature of the issues. Some respondents felt that wildlife groups have not had significant involvement in the process because the MoE adequately represents their interests; that is there is no perceived need to bring them in as a separate entity.

Wildlife groups in the Cranbrook and Golden TSAs have tended to be more active than other areas of the Region due to the higher wildlife values found in

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†Respondents at the headquaters level were knowledgeable about public involvement in general; but some respondents did not feel qualified to answer the extent to which the MoF takes into account public views.

these two units.† Recognizing these values, wildlife interests have sought to remain informed on wildlife and forestry issues. Staff of both ministries in the two TSAs have generally been responsive to these requests by providing forums for discussion such as information meetings, open houses, or direct contact with key public interest groups where identified.

The one interest having a stake in all TSA Resource Management Plans is, of course, the timber licensee who, having contractual arrangements with the MoF, has a much stronger vested interest in the outcome of the planning process. Some respondents noted that the public involvement process is presently characterized by an imbalance because it gives favor to the timber licensees by enabling their participation throughout whereas public participants or other licensed users (e.g. trappers, guide outfitters) are involved only periodically.

Despite the fact that public input is sought through various mechanisms, effective participation by various interests has been constrained by the sheer magnitude of Forest Management Planning. According to one interviewee, public involvement in the Golden TSA has disintegrated over the years because public interests who initially attended meetings on a regular basis became overwhelmed with the amount and depth of infomation required for TSA Planning to the point where their attendance dropped off sharply. The approach now used in this TSA is to encourage involvement only insofar as the plan affects the public's "sphere of

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†The Columbia River Valley wetlands for example, provide habitat for waterfowl and large mammals of such abundance and diversity that the area has met the criteria for international importance developed at the International Conference on the Conservation of Wetlands and Waterfowl, in 1971 (Pedology Consultants et al, 1983).

influence"; that is people do not necessarily want to be involved in issues that do not have a direct bearing on their interests.

Staff of both ministries in the Golden and Cranbrook TSAs made reference to the disparity between corporate forestry interests and wildlife interests in terms of participant effectiveness. In their view, timber licencees participated effectively because they had a better understanding of the process, were more knowledgeable on forestry matters and had a much stronger vested interest in planning than the public had. Headquarters respondents noted that other groups often have marginal involvement because of their possible failure to be cognizant of the stakes they have in TSA Planning. Also, even if citizens understand the implications of forestry operations, they may fail to understand many of the technical terms associated with forest management and TSA/TFL Planning.

Crestbrook Forest Industries (CFI) Woodlands Division has gone to great lengths to involve the public in its planning process although staff have stated that input is limited to comments on the draft TFL Management and Working Plan; there is little involvement in plan preparation. In addition to periodic meetings for public review of the Draft plan, annual meetings are held by the company as part of the auditing process required by the Subsidiary Agreement. CFI has maintained an "open door " policy to enable the public to voice any concerns it may have regarding the management of resources on TFL #14, a policy which has led to a better public understanding of forestry operations.

The licensee has expressed concern about the poor turnouts experienced at annual

meetings and has attributed this to public apathy. The licensee, at a later time, indicated that TFL #14 was a non-contentious area. However MoF respondents noted that in some strategic planning units, the public failed to become involved because they were satisfied with the status quo. As one headquarters respondent put it, "If people do not take advantage of the opportunity for public involvement, it points out that they aren't always fully prepared to exercise their rights." In cases where non-participation occurs, the Forest Service is given an implied mandate to carry on with the status quo in the management of the forest resource. Therefore, the extent to which public involvement takes place depends largely on whether timber harvesting is compatible or incompatible with the affected resources.

All respondents were asked what effect public review and input has on the development of TSA and TFL plans and the recommendations provided in those plans. Respondents noted that the public has tended to be more involved in giving direction to plans at the operational level such as Coordinated Access Management Plans and Five-Year Development Plans. However it was noted this would ultimately affect the development of management strategies at the TSA level including the priorization for resource development. One respondent noted that in the Golden TSA wildlife interests have been very beneficial in identifying critical wildlife areas that the MoE was not aware of, with the result that information was subsequently built into the data base.

Respondents indicated that the effect which the public has depends largely on the extent to which interests have been involved in planning and at what points in

the process. If these interests have been asked to respond to a prepared plan without having prior input, they will likely be confrontative. Respondents at the headquarters level similarly stated that public review and input during the TFL Management and Working Plan process tends to be "after the fact" and that the public does not have a lot of ground for input at the latter stages. Positive effects were indicated to occur where integration of the public into the process took place at an early stage.

In the view of one government representative, public involvement has has had little effect because draft plans are released for public review under the assumption that these plans are already "reasonable" and when the occasional comment is received it is usually brushed off or ignored. It was also pointed out that when the planning framework has a status quo orientation, public involvement will obviously not be effective in resolving strategic issues at the TSA/TFL level.

Another person similarly held the view that public involvement has little effect on the development of TSA and TFL plans. He felt that from the standpoint of the MoF and the forest industry, public involvement should address questions of "who, what and where". Professionals feel that questions of "how and why" are their sole preserve and are not in the public domain.

Respondents at the headquarters level stated that the effect which public review and input has on the development of TSA and TFL plans varies from region to region and is dependent upon the stage during which input is solicited. It was

also noted that the length of meetings, amount of information and the technical jargon that is exchanged between participants often causes people to become disillusioned with the process with the result that interest tends to drop off markedly over time.

A MoF respondent viewed the effects of involvement as dependent upon the amount of "homework" that the MoF had done at the outset of the process. As he stated,

> If we (the MoF) have done our job at the early stages of issue identification, then public review should have virtually no impact because if we are truly in touch with the resources and the people of the area, we should have addressed the concerns even before going to the public.

This respondent also felt that participation by citizens did not result in significant changes to draft plans due to public acceptance of the status quo in addition to the lack of public understanding of the process and the technical aspects of the plans.

The last question that dealt with public involvement centred on the present role of the public in plan monitoring. It was acknowledged by the respondents that monitoring was essential and that the public should have an important role to play in this function, but there remained questions as to how the public could be incorporated into the process. Because of the complexity of the Plan and the planning process, the public would face a difficulty in determining whether or not the plan was breached. For this reason, respondents felt that monitoring by the public will continue to take place at the local level.

5. Flexibility

The "Planning Framework" of the Resource Planning Manual (MoF, 1984d) discusses the recursive nature of planning; that is the need for periodic adjustments to plans to ensure that new information is incorporated as it becomes available. For TSA Planning, the recognized time frame for revision of plans is once every five years; however even when plans are in place, analysis is ongoing in the attempt to resolve issues identified in the plan.

All interviewees were asked how often TSA/TFL Plans were revised and if the revisions were of a major or minor nature. Respondents expressed concern over the amount of time that it took to re-analyze and prepare plans. Staff found that because TSA Planning was a learning experience, analysis had taken longer than hoped, to the point where it would be done approximately once every eight years. This time frame was deemed unacceptable by some respondents since the plan would eventually be dealing with outdated or invalid issues; instead it was felt that the plan should reflect new issues that arise and should tie in with industry Five Year Development Plans.

In the Cranbrook TSA, a similar inability to meet the five year target for revision had been experienced. Planning staff noted that the process for analysis was cumbersome, requiring specialized expertise and computer equipment that were not readily available. Yet it was felt that as time progressed, plans could be revised once every five to seven years.

Headquarters respondents expressed concern that the process is taking too long due, in part, to resource people becoming mired in too much detail. People have often failed to limit themselves, indicating that they have not been provided with an adequate definition of scope.

While study area respondents recognized a five to eight year time frame, headquarters respondents recognized a variable time frame for plan revision. One respondent felt that in Districts where changes were constantly taking place, TSA Resource Management Plans should be updated on an annual basis rather than a 5-10 year basis when the plan will bear no resemblance to the original plan following re-analysis.

Another respondent felt that the concept of setting a time frame that is to be applied in a blanket fashion across the province is unrealistic. Rather each TSA should have an established 'management period' that would be dependent upon how contentious the issues are and how much certainty exists.† As appropriately stated by this person, "No agency should be wasting valuable resources on revising a plan that still provides guidance and therefore does not have to be rewritten."

Resource people throughout the Region felt that revisions had the potential to be of a major nature depending on the option that was chosen in the final plan.

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†For example in TSAs experiencing a slow rate of change or having the required information and a lack of contentious issues, 10-15 years may elapse before the plan needs to be revised. Also minor adjustments can be made at the operational level but when the sum of these minor adjustments becomes numerous, the plan must be revised.

Respondents felt that the driving force for changes to plans was felt to be changing circumstances that had a marked effect on the timber resource. Often the revisions were set in motion by ministry directive or by major resource conflicts. One MoE respondent stated that major revisions would normally not be made on the basis of wildlife needs.

Plan update for TFL Management and Working Plans is required by the Forest Act to take place once every five years, a time horizon similar to that of TSA Resource Management Plans.† According to one respondent, the five year time frame is most always met because of the incentive that licensees have in setting their management targets within an area based tenure over which they have a strong proprietary interest. TFL planning and analysis is, in essence, more ouput oriented.‡

Interviewees noted that revisions to TSA Resource Management Plans have tended to be driven by timber related issues whereas they should be driven by other IRM issues. The view was expressed that in situations where timber is implicated to have a negative effect on wildlife, revisions should take place to rethink the original decision.

In the view of one respondent, flexibility currently diminishes the value of the

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†Strategic TFL plans are also revised once every five years but the Chief Forester has the legal power to request the licensee to submit a new M&WP within the five year period if significant changes take place. Such factors as fire or reinventories that prove the AAC no longer reliable or indicated changes in management direction can prompt requests for revision prior to the end of the term.
‡As of this writing, the sixth Management and Working Plan for TFL 14 has just been completed.

planning process because it is used to rationalize significant deviations from agreed upon plans. This has often happened with outbreaks of mountain pine beetle which prompt the need for accelerated salvage logging. To the detriment of the MoE staff who put a great deal of effort into the planning process, everything "goes out the window", often without much notification given to these people. Although several options may be generated in the planning process, there is currently no contingency option to fall back on.

Despite the need for flexibility in planning, planners often face numerous constraints that may impede timely revision. When asked what some of the constraints on flexibility were, respondents centred their answers on the data base and analysis. One respondent stated

> There are real constraints in terms of the models we use and sometimes the mere fact that we use a model is a constraint in terms of what the model is, what it is sensitive to and what it is capable of handling. Also if one is going to get locked into a certain level of public involvement, flexibility may be compromised because it takes time to involve the people.

A respondent who centred his answer on the policy aspects of the process pointed out that the polarization and mistrust that results from political lobbying of special interest groups (licensees, public groups) has proven to be an impediment to flexibility.

A respondent in the Golden TSA stated that time schedules for analysis are a constraint. Input from the Fish and Wildlife Branch was received too late during this initial analysis because of various commitments in combination with lack of manpower.

The interviews carried out at the headquarters level indicated that agencies have come to face significant financial and manpower constraints which ultimately hinder the ability to participate fully in all facets of planning including plan revision. As one respondent stated,

> I have a suspicion that if we (the MoE) get this round of TSA Planning done, we may not have the resources to revise some of these plans again for another 10 years. That is why I think this round of planning is highly important.

Constraints in TFL planning are imposed by the objectives of the corporation which have a major influence on how a particular area is developed, how much reforestation takes place within a given period of time and what the standard of log utilization is. Companies must also consider such constraints as union and community stability problems.

A third question asked of respondents was whether there were some issues over which their agency could be more flexible than others. Forestry representatives stated that planning was more flexible over issues that had no impact on the AAC or that involved no significant costs to the licensee. Wildlife representatives stated that flexibility was something that they attempted to maintain; however recommendations provided by the Fish and Wildlife Branch are based on the life requirements of wildlife species and on how flexible the species under consideration is. If the species is adaptable to different habitat conditions imposed through forest management practices, the recommendations provided by wildlife staff are also flexible.

Difficulties in the planning process were being encountered when management requirements resulted in a potential impact on the AAC. Political pressure from the forest industry to keep reductions to the AAC as small as possible often results in wildlife needs being compromised, if not eliminated altogether. As stated by one respondent,

> The strong message that the MoE is getting, is that the industry will resist any deletions to the forest land base or anything that will result in an AAC reduction. With timber harvesting deferrals, one is talking about ungulate winter range. But in order for the spotted owl, for example, to remain in B.C. we must have deletions. (author's emphasis).

6. Adequate Data Base

Respondents felt that the existence of an adequate data base was a key criterion, as reflected in the degree to which it appeared in answers related to other criteria. Respondents were asked how sophisticated they felt the data base was, how the data bases for forestry and wildlife allowed for ease of comparison, and what the critical gaps in knowledge were between the two resources in conducting analysis as part of plan preparation.

Respondents noted that continual progress was being made in obtaining a sophisticated data base for strategic planning. As an example in the Nelson Forest Region, the wildlife habitat base has been refined from the broad scale Canada Land Inventory to a more detailed mapping of habitat capability based on seasonal types. Also great strides had been made by the MoE in its program of biophysical mapping. Other areas of improvement include the increased

accessibility, the level of detail, the geographic reference and the application of the data to resources other than timber. As a result of recent and ongoing forest reinventories, a new data base is coming into effect. Wildlife representatives were confident that the data base would be further improved through use of computers but at the same time expressed the concern that models for simulating the effects of habitat manipulation on wildlife, especially non-game species would not be available for a considerable period of time.

Timber information is still the key data; however other information pertaining to such resources as non-game wildlife species is gaining increasing prominence. The most useful information was cited as being planning cells† but it was also recognized that Resource Emphasis Areas,‡ once established, would become highly valuable in the planning process.

Three respondents pointed to the disparity in levels of information that had been derived by the MoE and MoF. Also the MoF has developed a reasonably accurate inventory, given the vastness of the resource, but a forage inventory for livestock and wildlife is lacking. In the Cranbrook TSA where extensive range areas exist, a lack of forage inventory made it next to impossible to set targets for the range resource.

One respondent felt that the data base for Forest Management Planning and

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†Planning cells are homogeneous planning units usually defined on the basis of topography, access and other similar characteristics that can be assigned site-specific management prescriptions.
‡REAs are geographic units that give broad management direction to the use potentials of areas and provide a framework for more site specific resource use decisions. They are comprised of a number of planning cells.

lower levels of planning was relatively rudimentary and that considerable refinement was needed for effective planning. Identified weaknesses were: the lack of sampling to refine growth and yield curves as part of the forest inventory data base,† and the aggregation of forest type groups which compromised the level of data resolution.

One headquarters respondent who held a similar view, provided a formula to back up his contention that the data base is relatively unsophisticated. The formula is:

NV = IP - C where

1. NV is the net value of the information,

2. IP is the value of improved performance, and

3. C is the cost of obtaining the information.

The key words are "improved performance" which, according to this individual, has not been adequately addressed in B.C. The posture taken by government appears to be "How do we maintain the status quo?" rather than "How do we go about doing those things that will enable us to do a better job?" The provincial government currently does not have clear standards for assessing performance which would form the basis for determining information requirements.

The sophistication of resource information in B.C. varies from region to region and from resource to resource. For example, in some areas of the province and for some resources the MoE is able to provide measureable estimates of how

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†New yield curves that have come into effect have revealed a significant difference in the forest land base since 1979-1981 when the last yield analysis was carried out.

much of a given resource is needed in order to meet stated objectives, determine what the impacts of forest management will be on that resource and how forestry practices can be modified in order to meet MoE objectives. For other resources in other areas the lack of information seriously constrains the ability to come to terms with strategic analysis.

At the other end of the spectrum, one respondent stated that the information base for the wildlife resource in the context of strategic planning is excellent and need not depend on regional disparities. There exist biophysical maps, wildlife capability maps, landsat imagery and other forms of strategic information. This individual felt that people involved in strategic planning should take a step back from their current approach of using detailed information and attempt to think in terms of generalities. Moreover strategic planning should be done with the best information that is currently on hand, with the plan periodically updated as information becomes available.

The fact that some data are marginally relevant to the management issues being addressed was also raised during the interviews. Resource managers have failed to think functionally about the various resources with the result that data collection has been neither effective nor efficient.

The requirements for information gathering and analysis on the part of TFL licensees has become increasingly stringent over recent years. Under amendments to the Forest Act during 1987, license holders are now responsible for identifying and addressing IRM issues within their management unit. Crestbrook Forest

Industries has recently completed an inventory that was above MoF standards. Working with MoE staff, CFI developed an extensive inventory of wildlife species and management units by biogeoclimatic zone in addition to identifying the timber harvesting-wildlife habitat relationships in each zone. These were documented in the report "Integrated Resource Management on Tree Farm Licence #14" (Sumanik, 1984).

A highly important question for determining the effectiveness of Forest Management Planning is the degree to which the data bases for forestry and wildlife allow for ease of comparison and/or interaction in planning for those resources. In the Nelson Forest Region, there was virtual unanimity among respondents in stating that the data bases for forestry and wildlife are divergent in many respects, a fact that greatly hinders the planning process. On the other hand most respondents (4/6) at the headquarters level stated that some facets of the information base enabled relatively good comparison that allowed development of realistic options; but three of these people were critical of aspects of data.

One respondent in the study area noted that there is a real discrepancy in map scales and boundaries between the MoF and MoE. The different management units and inventory bases proved to be a difficulty in the planning process for the Golden TSA. Whereas the biophysical mapping for wildlife is based on a scale of 1:50,000 and 1:250,000, forestry data is based on a scale of 1:20,000. Because wildlife populations were located in different management units, several units within the TSA had to be dissected. Moreover information such as riparian habitat types which are not identified on forest cover maps had to be identified

and delineated then transposed onto forest cover maps for interpolation of the area and volume of timber affected. Only then could various scenarios be developed.

Other respondents felt that the divergence of the data bases stems from the lack of ecologically based inventory within the MoF. Forest cover maps provide no indication of the capability of the land to support resources other than the standing crop of trees. The MoE's ungulate capability maps on the other hand provide information on soil, slope, aspect and other ecological components. However another respondent indicated that the MoE emphasized its information system rather than its mapping system and as a result had not translated provincial fish and wildlife goals into a graphic format. Thus it was felt by this person that compatibility between data bases was less of a problem than availability.

A resource person at the District level stated that the Geographic Information Systems between the two ministries have been developed in virtual isolation from each other and as a result, "an incredible amount of money has been lost". This person agreed that ecologically based planning units would go a long way to reconciling some of the current incompatibilities between data bases.

Along with comparability, the manner in which information is used may hinder analysis. For example wildlife staff in some areas of B.C. attempt to derive area-specific data at a scale of 1:20,000 instead of aggregating the required information to the broader scale used by the MoF. On the other hand, one

respondent indicated that the 1:500,000 scale often used by the MoE in strategic planning is too broad.

The inability to incorporate wildlife and other resource information into the TSA analysis was another identified weakness. Wildlife information is area-specific, having fixed requirements, whereas timber harvesting projections are based on strata based units that change over time according to predetermined parameters. As one respondent stated, the area specific requirements "fall through the cracks" during the analysis.

Most respondents (7/9) in the study area felt that there were critical gaps relating to forestry-wildlife interactions but some were confident that ongoing research would adequately narrow the gaps. For example, although there is sufficient information on featured (game) species and their interaction with forestry, there remains a gap in terms of understanding of the interaction between non-game species and their habitat.

Another respondent felt that models simulating the interaction between habitat manipulation and wildlife populations, specific to each biogeoclimatic zone, were lacking. Currently there is a lack of information as to how alternative harvesting methods such as selective logging affects wildlife populations such that assumptions have to be made.

The representatives of Crestbrook Forest Industries felt that a critical gap was the deficiency in the Forest Service and TFL licensee data base in recognizing

wildlife values. According to one representative, these agencies need wildlife capability maps and riparian habitat maps in order to undertake effective planning. Without having the information identified on maps, there is a greater likelihood that field level staff will not be cognizant of the values in certain areas of the management unit.

Headquarters respondents took a broader view, generally stating that few if any gaps hampered the Forest Management Planning process. One felt that only general information is required for planning and in this context, is sufficient. The TSA Resource Management Plan would provide a focus for data gathering (inventory), just as it provides direction for research. Another person felt that information gaps exist but in terms of their application to strategic planning, they are not critical. The reasoning is that managers have not been prudent in setting resource management strategies. In the face of uncertainties, managers have not set resource harvest levels that are intuitively conservative, but rather have "gone out on a limb" by being liberal. In this regard, information has not been a constraint.

Other respondents indicated that the habitat requirements for ungulates, such as winter range, and how this interfaced with forestry, presently constitutes a critical gap. One person stated that timber management currently focussed on how adjustments could be made to accommodate wildlife resources. According to this person,

> Forest managers need to obtain equivalent information from wildlife staff as to how active wildlife habitat management can take place as opposed to passive management that relies on what we do through

timber management to achieve wildlife goals.

It was also noted that more detailed information on fish and wildlife resources is required in order that a higher degree of resolution would be provided that enabled comparison with forestry information.

7. Commitment to Planning

While levels of commitment are difficult to determine objectively, they can be measured through considerations such as the provision of resources and plan implementation. With regards to the former, all respondents were asked if their agency's budget was considered sufficient to meet its stated objectives for integrated resource management or if lack of funding has been a constraint.

Most of the government resource staff interviewed (6/7 in the study area and 4/4 in headquarters) indicated that budget levels were not sufficient to carry out integrated resource planning in addition to their other functions although some of these same people acknowledged that the budget was perhaps sufficient if it was allocated just for TSA Planning. Wildlife staff especially appeared to be working under highly constrained conditions. As noted by one wildlife habitat specialist

> We haven't had a budget increase since 1974. At this point in time we have less staff and the government is planning to reduce that even further. Much of the work is being contracted out to short term consultants. We could possibly meet our resource planning needs with the existing budget but we would certainly not be doing anything else. Because of our involvement in TSA Planning, we've had to give up other areas.

Other wildlife staff provided similar responses, noting that they were addressing

TSA Planning at the expense of other activities because of the perceived benefits of strategic planning. The agency does not differentiate between planning levels in the budget allocation process and hence additional manpower or funding for TSA Planning will not be forthcoming even though TSA Planning is an extra "brick on their wagonload." From the perspective of MoE staff, the lack of ministry personnel to shoulder the responsibility for long-term stewardship is a serious problem, one that is resulting in increasingly reactive and ad hoc planning rather than proactive planning that is characteristic of IRM.

Forestry staff too, have experienced recent cutbacks with respect to planning such that according to one respondent, the budget has been a severe constraint on what can be carried out through IRM. With regard to the Cranbrook TSA for example, manpower and budgets have been limiting factors; it has not been possible for forestry staff in the District to upgrade the data base or to conduct effective public liaison in anticipating problems and determining what the needs of the constituency are. It was felt that the inventories of all forestry program areas; timber, range and recreation in addition to inventories for wildlife had to be improved in the one TSA. In contrast, a MoF respondent in another District felt that the budget for his agency was sufficient for staff to carry out IRM planning. He felt that the key to operating within a limited budget is to implement IRM through harvest planning which reflects the analysis undertaken for TSA Planning.

One respondent acknowledged that the budget for conducting strategic planning is insufficient; however because of its importance, this should not be used as an

excuse for failing to plan. Although there exists a serious budget problem with wildlife agencies, there is still an obligation for remaining staff to do a good job. This same statement also applies to licensees; that is there remains an obligation on the part of TFL licensees to show a commitment to wildlife management regardless of funding. Some companies however, have stated that they would put much more effort and commitment into planning for wildlife if they were given greater control of the resource.

The second question asked of the interviewees was whether plans were implemented as agreed upon, and if changes were made, were all agencies made aware of the changes at the time they were proposed.† One respondent stated that TSA Resource Management Plans are probably "implemented" as agreed upon because they are vague; that is there are not many task-specific items that one can attach to the plan against which to measure implementation. Plans provide a strategic direction for timber in terms of an AAC and provide an indication of the general constraints but plan implementation is difficult to determine. If the TSA Resource Management Plan is truly a strategic document, implementation may be measured by the tasks performed in combination with the priorities set out in the strategic document. If the tasks were done consistently with the Plan, then the TSA plan can be considered to be followed, but if the tasks deviate from the priorities, the TSA Resource Management Plan is not followed.

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†A problem with the wording of this question was encountered because as one respondent correctly pointed out, strategic plans are not really implemented per se but rather are followed. Implementation is more oriented to project planning than strategic planning.

Respondents noted that it was usually the strategies associated with the timber resource that were implemented because of the measureability of this resource. Reasons for failure of resource staff to follow the plan were cited and included the lack of funding, political imperatives or directives and the unexpected contingencies that require adjustments.

When asked whether or not agencies were made aware of proposed changes, one MoF respondent indicated that agencies are made aware of proposed changes through the public involvement program while another indicated that all agencies are only sometimes made aware, due to the vague nature of the plan which provides the MoF with a great deal of leeway in interpretation of the significance of such changes. In the Cranbrook TSA, agencies are made aware of changes at the more detailed planning levels through "round table" discussions with the MoF.

A source of frustration among planners is not so much the changes themselves but the lack of communication between agencies prior to an altered strategic direction. When changes occur, such as a result of bark beetle infestations, operational realities deviate from the plan. Assumptions of a major nature resulting in changes to the AAC, do not always get referred from the TSA Steering Commitees to staff of the MoE.

The final question pertaining to this criterion was whether IRM would receive greater or lesser emphasis under the proposed arrangements for increased TFLs. This is a question of conjecture but is relevant to the study because it is

intended to provide an indication of the effectiveness of strategic TSA Planning as a baseline. As expected, a variety of answers were provided by individuals.

The most common response was that there would be less emphasis given to IRM because of the licensees' main interest in timber management. Respondents expressed concern that companies would generally not put a great deal of effort into managing for wildlife resources unless they could derive some economic benefits from doing so. Those values that are not part of the transfer of rights, such as wildlife resources, will likely become devalued and "if they are not compatible with logging, their demise is inevitable."

Two respondents felt that IRM would be improved under a TFL arrangement because the area based tenure provides an incentive to the licensee to articulate resource management objectives for a full range of resources. Moreover the TFL licensee is held accountable to agencies and the public for what the company has prepared in the Management and Working plan.

8. Monitoring

All respondents were asked if their agency conducted a monitoring program to ensure that the recommendations in the process were being carried out and to determine whether stated objectives were being attained. Respondents were emphatic about the importance of monitoring as part of the planning process but all government respondents pointed out a distinct lack of formal mechanisms through which this function is carried out.

Wildlife staff were especially critical of their own efforts to monitor, noting that their agency was more associated with the development aspects of planning that placed staff in a reactive mode. One respondent felt that the lack of monitoring was perhaps the biggest downfall of the Wildlife program. As he noted,

> We're making recommendations every day and we're not going back to review to see how they were implemented or how they worked. It's a tremendous weakness; one that will come back to haunt us.

This failure to monitor though, has to be tempered by the fact that staff cannot keep up with existing workloads and it is for this reason that reliance is sometimes placed on the MoF to act as "the eyes and ears" of the MoE.

Forestry staff too acknowledged that monitoring at the TSA Planning level and other levels was weak. Measurement usually comes in the form of subsequent TSA analysis when evaluation of the AAC levels takes place to determine if there should be an increase or decrease in harvest levels.

In the Golden TSA, monitoring is carried out via the Five-Year Development Plan where it becomes possible to see the planning direction that is outlined and the rationale used. Forestry staff attempt to meet with the various user groups to provide them with an awareness of the direction being taken and the planning implications. The public, in turn, gives feedback to forestry staff in order that adjustments can be made.

In the Cranbrook TSA, there is no monitoring mechanism to determine whether intended direction in the plan is being carried out but feedback is provided at

the local level through public input. Based on public reaction, major adjustments are taken into account and built into the next analysis.

Monitoring of Crestbrook Forest Industries' operations within the TFL is periodically undertaken by the MoF to determine if stated objectives in the M&WP have been adhered to. All relevent documents are reviewed, followed by field inspections and discussions with company staff. Representatives of the company noted that no internal mechanism was in place to measure performance against the documented objectives in the Management and Working Plan. However staff occasionally travelled to different areas to determine if the company's management philosophy had been met.

Forestry respondents mentioned that a chapter on monitoring is soon to be prepared by the MoF and that some clearly defined guidelines are intended in three to five years. Some Regions such as the Vancouver Forest Region have an annual reporting program on a TSA by TSA basis but other than this, there is no ongoing monitoring to provide the needed link between implementation and replanning. For example close monitoring of inventory information and company operations is not being effected to determine the percentage of accessible timber that is actually being harvested on an annual basis within a given drainage. Also, the monitoring undertaken by the MoE tends to be fragmented and in many cases it is carried out for ends that may not be consistent with the objectives of the TSA Resource Management Plan. Monitoring within the context of the plan was stated to be ineffective.

V. EVALUATION OF RESEARCH RESULTS

In this chapter, the results obtained from both the Regional and Headquarters interviews are evaluated. The various points of view between Headquarters and Region are compared and combined with sources of literature on the evaluation criteria. As pointed out in the previous chapter, the evaluation of the interview results is intended to be a qualitative analysis more than a quantitative analysis. Conclusions are embodied in the text to link with the results of Chapter 4 and to enable interpretation in the context in which they were reached. The evaluation that follows is categorized according to criteria.

A. CLEAR, QUANTIFIED OBJECTIVES

This thesis has stated the need for each agency to articulate clearly defined, quantified objectives in order to provide guidance towards intended program accomplishments through subsequent planning steps. These objectives must be appropriate for a given planning horizon; in the case of Forest Management Planning, this translates to a short term of 20 years and a long term of 200 years.

TSA and TFL planning follow generalized processes, requiring that objectives must constantly be refined for area-specific application. Once objectives have been refined to a level of detail appropriate for each management unit, various resource management prescriptions can be generated. Respondents affirmed that the objectives of the MoF and MoE were couched in very broad terms either in

legislation or in mission statements referred to by the respondents as "motherhood statements". Moreover, in both TSA Resource Management Plans and TFL Management and Working Plans, objectives for integrating forestry and wildlife resources are broadly stated without quantitative expression such that they provide little guidance to planners vis-a-vis plan implementation. An audit of forest management in Ontario by Baskerville (1986) arrived at the conclusion that objectives were phrased as statements of principle that conveyed "absolutely nothing of substance" and that failed to provide a cause and effect connection between actions and desired results. Similarly in B.C. plans fail to put forth explicit response measures; it is therefore not possible for resource managers to adequately evaluate progress and determine when objectives have been attained.

The MoF, in a recent Draft Policy Statement (MoF, 1988b), has recognized the need for clear objectives that have been "defined and harmonized" through consultation. This is at least a first step in enunciating clear, quantified objectives that enable measurement of management progress.

The research results indicate that the specificity of targets set by the MoF and the MoE differs between the two agencies. Forest Management Planning has tended to place a disproportionate emphasis on timber supply considerations, and has often failed to meet the needs of wildlife interests. Production goals for timber on forest lands have been set as AACs derived through resource analysis. Although production goals for some wildlife populations in the MoE's strategic units have been articulated, the lack of guidelines stating desired habitat requirements have put wildlife managers at a decided disadvantage against

forestry interests. Moreover, while advances have been made in the valuation of the wildlife resource, emphasis has been given to the timber resource in decision making because its production goals are more readily definable in classical economic terms. Finally, objectives for wildlife have been difficult to define and harvesting impacts difficult to determine because wildlife is more difficult to inventory, is subject to greater fluctuation and is less well understood scientifically than forest vegetation (Tefler and Dauphine, 1981).

Staff of the MoF have stated that a scarcity of information on the impacts of forestry on wildlife species and their habitat hampers the setting of clear objectives. Also, the need for wildlife species diversity has been cited by the MoE as being a primary objective of that agency, yet there remains a research gap as to what the capability is of forest land to support the diversity, density and distribution of wildlife. However this gap is currently being addressed. At the time of this writing, goals and objectives for each species and their habitat needs are being prepared by the MoE and are nearing completion. The MoF will then be advised as to what type of habitat is required to meet the MoE goals and objectives.

As stated by Dinkel and Erickson (1978), generalized program objectives at the strategic level may be translated into very different objectives by field level staff. This may lead to conflicting internalized objectives within programs. Thus it is important that objectives provide the needed direction to staff in carrying out local level planning. Based on the interview results, the ability of the two agencies to articulate objectives and follow these on a TSA by TSA basis varies

widely throughout the province depending on the nature of the resources, the availability of information on these resources and the willingness of field staff to implement activities within an interagency planning environment, taking into account objectives of each agency.

Objectives may be conflicting not only within an agency program but also may be at odds between programs. This is no more apparent than with the MoF which has dual objectives of ensuring a vigorous and competitive forest industry and on the other hand, ensuring the integration of resources in a coordinated manner through cooperation and consultation. As reiterated by one respondent who spoke of this issue at a recent meeting, "(the MoF) is in a conflict of interest role if it tries to resolve a land use issue with the MoE when it is an advocate of timber, range and recreation resources (MoF/MoE, 1987).

A majority of respondents indicated that Forest Management Planning is of paramount importance for considering both resource supply and demand and in meeting their agency's objectives. Regional and District staff in the Nelson Forest Region recognized the importance of Forest Management Planning but some were less convinced than headquarters staff about its importance in achieving stated objectives, noting that it was a time consuming task that compromised their ability to carry out other duties.

A review of documented sources on the objectives of TSA and TFL plans has confirmed that insufficient effort has often gone into the identification and documentation of IRM issues and objectives in the preliminary stages of Forest

Management Planning. Some of the Statements of Management Objectives, Options and Procedures for TFLs for example are highly generalized documents that fail to identify and quantify issues. The Statement for Crestbrook Forest Industries' TFL 14 did acknowledge the need to manage for other resources but its objectives were couched in general terms. In one case, the Statement for a particular TFL was submitted in a form that was nearly identical to another TFL held by the same company, even though the issues were in fact different. The Statement of Issues, Options and Procedures for the Cranbrook TSA (1984b) made no reference to wildlife or habitat needs of the MoE other than a sweeping statement regarding the possible alienation of the forest land base. Documents, including TSA plans, referred to other resource concerns ˙as "constraints" rather than valid requirements to be optimized and fully incorporated into the planning process. In essence then, non-timber resources have tended to be considered by planners as an adjunct to timber management objectives rather than as part of a combined objective function.

> Constraints enter the determination as peripheral bounds, that is they are not maximized, minimized, nor optimized, they are merely set in the sense that the solution (for timber management) stays within the bounds set by them (Baskerville, 1986).

The weakness in identifying and quantifying non-timber resource values and translating these into objectives is being improved upon by two recent initiatives. Firstly, as previously noted, the Provincial Species Statements, Regional wildlife plans and other levels of MoE plans which contain much needed information on wildlife habitat requirements, provide the basis for refined objectives that give improved direction to resource planners. Secondly, the Resource Emphasis Area designations (discussed more fully under the next criterion) at both the Regional

and Forest Management Planning levels should assist ministry staff in refining its objectives for area specific application.

B. HIERARCHICAL PLANNING FRAMEWORK

At the outset of this study, it was pointed out that the MoF and the MoE each have a hierarchical planning framework that theoretically addresses the issues of sustained yield production through different geographic levels. The major question that was asked in order to evaluate this criterion was whether or not Forest Management Plans currently provided the necessary direction to planners in IRM. This study has revealed some basic strengths and weaknesses of the currrent planning framework of the MoF. Firstly, planners at all levels recognize the importance of Forest Management Planning in enabling the identification of issues which in turn are incorporated into analyses and linked to operational plans. Through this level of planning, areas requiring Local Resource Use Plans such as high value watershed areas, have been jointly priorized by the MoF and MoE; in essense Forest Management Plans provide a context for LRUPs.

The respondents recognized that in order for planning to be effective, planning decisions must flow through a linked hierarchy in a dynamic, two-way fashion. As stated by the MoF in a recent draft policy statement (1988c)

> Planning involves progressively refining decisions from general to specific levels. Refinements also occur as a result of feedback from specific levels to the more general.

As a result of this linkage, Forest Management Planning has facilitated land use allocation through the use of such tools as planning cells and through the

derivation and application of guidelines. It has provided direction for further information needs and research requirements on a TSA by TSA basis.

An evaluation of the linkages between levels of planning has revealed a fundamental weakness. There is a missing link between the Provincial policy level and Forest Management Planning; that is Regional planning exists in name only whereas it should constitute a significant level that specifies regional resource priorities. This is verified by Pearse (1976) who states

> The government must recognize that effective resource planning and development are predicated on the design of coherent regional plans and the lack of them, therefore, demands attention.

This lack means that forest management decisions are made independently of policy design at the provincial level. Provincial policies themselves have failed to provide the necessary guidance to resource planners. A serious government inertia exists at the senior policy decision-making level (Sturmanis, 1986) which has hampered attempts to articulate clearly defined land use policies and prepare plans that are consistent with such policy.

In essence, Forest Management Planning is done in a vacuum. The problem is exacerbated by the previously discussed vague statements of objectives in Forest Management Plans. Unless there exists a complete and consistent framework of linked planning levels, each having clear objectives, decisions made at the higher levels may not represent what is logistically feasible at the more site specific level, i.e. in the forest. Conversely decisions made at the operational level may not be reflective of what is socially desireable.

TSA/TFL plans themselves need to provide direction through "top down" planning in which planners focus on a strategic twenty year perspective but also need to realistically reflect issues and information that are incorporated into the data base and ultimately into Forest Management Plans through "bottom up" planning. Identified issues within a given management unit are assessed through management scenarios which are modelled over the short, mid and long term. The implications of these scenarios are assessed and a planning direction is selected with a specific AAC. The strategic plan should then be prepared in such a manner so as to link the top (AAC) with the bottom up planning which resulted as a consequence of the land base issues.

Some planners expressed the view that Forest Management Plans provided sufficient direction but others stated that the often generalized statements contained within TSA/TFL plans rendered intended actions incomprehensible or vague. TSA Resource Management Plans have tended to pay insufficient attention to priorization and have lacked specification as to wildlife populations and habitat that will be affected by alternative forest management regimes.

In order for Forest Management Plans to give direction to and be reflective of development plans, long term timber supply projections need to be reconciled with short-term allocation decisions. The quality of the integration process is therefore largely dependent upon the accuracy of forecasts and how long term forecasts are assessed in terms of the effects of short term management policies (Hermansen 1989). Forest Management Planning in B.C. has been weak in this regard; short and long term analyses have not been linked (Williams et al,

1988) to ensure the sustainability of resources emanating from short-term decisions.

The Forest Resource Analysis Section (MoF, Inventory Branch) has recently proposed an analysis framework for IRM that is intended to address the reconciliation of long term and short term forecasts and the need to consider the spacial relationships between resources. The area-based approach, as opposed to the current strata based approach to resource analysis, permits strategic plans to be linked with operational plans (Dellert, 1989).

As part of the reconcilliation process, the short term analysis will consist of an area-based harvest schedule that is applied for the first twenty years of the two hundred year planning horizon. The long term (200 years) analysis will remain strata-based but will have an area-based resolution over the short term (20 years). The spacial definition that an area-based analysis system allows will help to ensure that short term harvests will not adversely affect long term timber supplies and that the AAC is operationally feasible (Dellert, 1989). Reconcilliation will therefore require an iterative refinement of land management scenarios that are ultimately derived through inter-agency communication.

TSA plans will more effectively articulate the needed resource management direction once Resource Emphasis Areas are established. REAs have been identified in this study as being essential for effective IRM planning. This concept which arose through the Land Use Strategy (Association of B.C. Professional Foresters, 1987) is based on the establishment of broad social, economic and

environmental objectives at the Provincial and Regional level. REAs† developed at the Forest Management Planning level are to be "areas of similar features, resource potentials, management requirements and operational constraints" (MoF, 1988a). But its success hinges on meaningful public input in identifying where and how resource development and management should take place (Zak, 1988). It will also require "cooperation of all government agencies having an interest in Crown land" (Zak, 1988) in ensuring that the REAs meet the needs of the respective ministries while at the same time remain consistent between the different planning levels.

The Forest Management Planning process is a highly valuable mechanism for identifying data gaps, research requirements and inventory needs. Some respondents indicated that these needs tend to arise as a natural course of action through the analysis process especially in TSAs facing shortages or deficits in the timber supply harvest forecasts or where there are high resource values that come into conflict. Priorization and follow-up of these needs prior to the determination of an AAC will provide a more realistic strategic direction than if they arise at a later time. An important point that arose in this study concerned the requirement for priorization and follow-up of these needs prior to the determination of an AAC. Unfortunately however, not enough attention is currently being paid to including these needs explicitly within plans.

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†The MoF has also termed these as Integrated Resource Management Units.

C. SHARED, COOPERATIVE PLANNING

Central to the effective management of natural resources is the sharing and coordination of values and inputs in a joint planning environment. Furthermore communication between all participants must be consistent and continuous if it is to lead to equitable decisions.

The most significant development in the Forest Management Planning process in B.C. in recent years has been the recognition by the MoF that the MoE is now a partner in TSA planning and has the opportunity to become a full participant in the process. In this context the MoF and the MoE have signed a "Protocol Agreement, Timber Supply Area Planning Process" (May 29, 1987) which recognizes this partnership and sets out the responsibilities of the MoE. Counteracting this positive move however, is the lack of regional habitat staff within the MoE to fully participate in the TSA planning process, the key words being "fully participate". Staff within the MoE have been very careful about committing themselves because by participating in the TSA planning process, they would have to drop other projects such as those relating to operational planning and mining development. While the respondents recognize the importance of TSA planning they also recognize that their full participation may not always be possible.

A fundamental weakness of Forest Management Planning is the weak inter-agency representation needed to formulate resource use options used as a basis for informed decision-making. Despite the fact that wildlife staff have

gained status as full participants in the TSA Planning process, the structure of planning mechanisms retains an overwhelming timber emphasis. The Steering Committee structure, which is comprised almost soley of MoF and industry representatives, has been established to provide technical advice to TSA Planners; yet there is no similar mechanism for non-timber interests. Cooperative planning in the Golden TSA was determined to be progressive in this regard; District MoF staff have recently extended an invitation to Parks Canada, the Trappers' Association and Ministry of Environment to participate on the TSA Steering Committee. But in general, the team planning approach at the strategic level, whereby agency and public representatives are provided with the opportunity to fully participate in the design of options, has not been embraced in B.C. As a result, the innovation that is channelled towards management design is somewhat narrow. Steering Committees in their present form ought to comprise but one component of a broader inter-agency framework that truly represents the array of values obtained from the forest land base.

Since conflicting objectives of competing resource users requires tradeoffs, a fair and equitable system dictates that participants are able to negotiate from positions of relative equality and that the process is coordinated by a neutral party (Pearse, 1987). The Forest Management Planning process in B.C. is weak on both counts. Firstly there exists a major imbalance between wildlife interests which have little in the way of financial and manpower resources at their disposal and timber interests which are provided with larger budgets and a greater number of professional staff. This means that wildlife staff are often hard pressed to attend meetings, fully analyze data and undertaking other

activities that are required in a joint planning environment.

Secondly, Forest Service personnel hold perceptions and values that are strongly influenced by their educational background. Having been given lead agency status, they are in a strong position to influence decisions that accords with these perceptions and values. In essence staff of the MoE are recognized in the Protocol Agreement as being "full participants" but are not equal participants as outlined in the criterion (Chapter 4).

The only form of planning in B.C. that can be considered joint planning in the truest sense, takes place through the Coordinated Resource Management Planning † process in which all participants hold an equal position and which is coordinated by a neutral person. The concept of a strategic approach similar to that of CRMPs was addressed by some respondents. Two options to consider therefore, would be:

1.   TSA Planning remains a Forest Service tool, and

2.   the planning process is neutral, involving all agencies.

With an interagency approach similar to the second, the resulting document would be a strategic MoF/MoE plan that would set the tone for other resource uses.

The major advantage of the CRMP approach is that the Wildlife Branch would not have to do its own planning independently of the MoF and would devote more time and energy to planning than if it were to be a single agency's

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†CRMPs are a form of Local Resource Use Plans (i.e. tactical plans) that have been developed for overlapping forest and range areas of B.C.'s interior.

process. It would also give all participants the feeling of equality and that their input is valid. The negative aspect of this approach would be the lack of power on the part of the Forest Service in administering timber as the dominant resource in B.C. The approach would require joint decisions by both ministries and all agencies would be able to affect the AAC.

Past planning between foresters and wildlife biologists has been characterized by a communication gap most notably at the field level where a lack of funding and manpower has forced wildlife and forestry staff to spend less time on the ground than is needed. But the gap in communication is closing due, in part, to joint research efforts and an improved information base which has vastly enhanced the understanding of the resources administered by the respective disciplines.

In the study area, joint planning was perceived to be improving between agencies largely attributable to improved communication, a factor acknowledged by Demarchi (1984) who states that

> Direct communication and an appreciation of each other's resource
> mandates are essential to achieving forestry and wildlife management
> and in this regard I think we are making excellent progress in
> southeastern British Columbia.

Still the lack of willingness on the part of both interests to view problems in a wide perspective remains an impediment to an effective negotiation process. As one respondent stated,

> Problems need to be viewed in their broader context, they can never
> be solved with a narrow focus on the problems themselves. Unless
> issues are mutually exclusive, there is usually a broader array of

options available than what appears to be the case at the outset of the process.

In order to improve cooperative planning therefore, people need to dispel their narrow perceptions in the search for a solution.

Inevitably conflicts between the mandates of forester and wildlife biologists will continue to occur especially where high resource values overlap or where the two resources are over-committed on the same land base. Even in cases where these problems do not occur "the hard economic imperatives of timber and wood fibre production usually take precedence over the more subtle, less well defined values of wildlife" (Demarchi, 1984) thereby creating friction between the two interests. Through the Protocol Agreement, the MoF and MoE have arrived at a process for conflict resolution. Where resource conflicts between the two agencies cannot be resolved at the District or Regional level, they will be referred to the Assistant Deputy Ministers of the two ministries. If the conflict cannot be resolved at this level, it will be referred to the Deputy Ministers. This is an efficient and effective mechanism for conflict resolution; as it stands, the vast majority of conflicts will likely be resolved at the regional and district levels while a small percentage will be referred to the Deputy Ministers for resolution (O'Riordan, pers. comm., 1988).

In the Golden TSA, participants in the planning process were initially not well educated on each other's resource requirements, but mutual education has manifested itself through the desire to jointly plan for IRM. One of the strong points of the joint planning efforts in this TSA is the willingness of planners

and other specialists to share information.

Joint planning in the Cranbrook TSA has also improved but in a different manner. Much of the success has been attributable to Coordinated Resource Management Planning which has been applied on a more localized scale to the most important and intensively used lands. There remains a reluctance on the part of the forest industry to fully participate in joint planning endeavors at the strategic level.

MoF staff have been frustrated in the past by the sporadic participation by wildlife staff of the MoE, although at the same time they recognize that the MoE has played and continues to play an important role in identifying issues. Thus one government representative stated "We are willing to incorporate other agencies on the planning team but, before doing so, there must be a commitment from them to participate through the whole planning process." This statement is meant to reduce the possibility of conflict by ensuring that decisions made throughout the process are in line with the requirements of the MoE but at the same time runs counter to the previous statement that habitat staff will not always be able to fully participate. Thus a dilemma is posed.

The interviews with Crestbrook Forest Industries' representatives and the documented material provided by these people demonstrate that the company is a model for industry efforts in joint planning. CFI has participated in several research projects on how forestry activities affect such wildlife species as grizzly bear, caribou and Rocky Mountain Elk. According to Sumanik (1984)

> This joint involvement in research and management has fostered a mutual understanding of resource problems and an approach to either solving or avoiding them altogether. CFI has developed specific policies which deal with other user groups sharing a common land base.

The efforts undertaken by CFI are underscored by the fact that they were also given favorable comment by MoE respondents.

A key policy direction taken by the MoF that has exceedingly important implications for the effectiveness of IRM generally and joint planning specifically is the transfer of volume based tenures within TSAs to area based TFLs and the increased responsibility placed upon licensees in managing these tenures. With the forest industry assuming more responsibility for forest management and the MoF assuming more of an auditing and monitoring function, the need for clearly stated IRM objectives and strategies in forest management plans has become essential.† It also highlights the need for closer communication between the MOF and other ministries as to the direction that industry is taking in the various management units.

D. MEANINGFUL PUBLIC PARTICIPATION

Opportunities for public involvement in B.C. have been in existence for a number of decades through briefs submitted to royal commissions on forestry, discussion papers on major policies, review of management unit plans, and other mechanisms. But it has only been in the last decade that the MoF has taken

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†This will be facilitated by recently enacted legislation which requires licensees to include in the planning process, inventories of all non-timber resources where available.

significant steps to incorporate public input into planning through a formalized process, largely in response to the perceived need to undertake more proactive, co-ordinated planning.

In 1981 the Ministry hired its first Provincial Public Involvement Coordinator who was responsible for setting in place the Public Involvement Program. The program was formalized through the preparation of a Policy on Public Involvement which was adopted in 1983 following input from various agencies and the public. The policy recognized the importance of public involvement at the various levels of planning including Forest Management Planning. For example under the policy, each TFL licensee is required to provide for public review of his draft Management and Working Plan, and although the mechanisms used to solicit public input are left to the licensee's discretion, he must ensure compliance with the Policy and Procedures. The licensee is required to provide proper notification, seek public response within a 30 day time frame, respond to those concerns, and refer copies of the exchanges to the Regional Manager.

There is a wide range of public interests that have a stake in the Forest Management Planning process including guide outfitters, trappers, recreationists and the forest industry. In fact it could be argued that all British Columbians have a stake in the outcome of strategic planning. As the case study revealed, citizens may not avail themselves of the opportunity to become involved in TSA or TFL Planning to learn about forest management issues or provide input into them. Publics tend to become more involved at the local level where tangible impacts are more readily perceived; but this type of involvement is unfortunately

more reactive in nature.

In most management units of the Nelson Forest Region, public involvement has taken place over a long period of time and remains well entrenched. Groups and individuals have remained very active and have taken the time to become well informed of the issues, dispelling the notion that all publics lack an understanding of forestry issues. As one respondent stated, "if you give the public good information, they can be trusted to come up with good decisions." Another stated that people who hold an interest in wildlife or fisheries management virtually become biologists. However forest industry representatives have a definite advantage over all other publics in Forest Management Planning by virtue of the knowledge they have on the technical aspects of forestry, the fact that they have contractual arrangements with the MoF and their comprehensive involvement throughout the planning process.

There are three major factors which have hampered the effectiveness of public involvement in Forest Management Planning. Firstly public input has often not been solicited during the Preliminary Organization and Terms of Reference stage of the planning process when the Statement of Issues, Scenarios and Procedures is being developed. While this step is critical for giving direction to subsequent planning, planners have often bypassed consultative mechanisms in favor of internal communication. Insufficient emphasis has been given to the determination of social issues and their documentation in the Statement of Issues, Scenarios and Procedures although this weakness has been addressed in the recent draft chapter of the Resource Planning Manual (MoF, 1988a). The same weakness

applies to the Statement of Management Objectives, Options and Procedures prepared by TFL licensees. Early involvement of citizens would serve to not only increase the correctness of assumptions built into plans thereby ensuring that planners are truly in touch with the resource, but also would reduce public reprisal at the more advanced planning stages when concepts may be contrary to public needs.

The second factor that has hampered public involvement is the vast knowledge that is required to adequately comprehend both plans and the planning process used to derive them; or, conversely, the inability of planners to communicate simply and clearly to the public on fundamental issues that affect them. This was strongly evidenced in the case of the Golden TSA where public interests' enthusiasm in the TSA planning process diminished as the depth of knowledge and length of time required for full participation became apparent. The TSA and TFL planning documents are available for public review in their draft form but tend to be either quite broad or technical in their content, their primary target being the forest industry and the Ministry of Forests. No summary reports on TSA or TFL plans are prepared for the benefit of the public.

The third factor limiting the effectiveness of public involvement in forest resource decision-making is non-participation by citizens, although as previously mentioned, many groups in the Region remain active. Some respondents attributed this to public apathy. Non-participation has been studied by Sewell and Coppock (1977) who note that people are more apt to respond to actual or proposed changes in their immediate environment. At the broader planning levels such as Forest

Management Planning, people find it difficult to relate to strategic issues nor do they understand the plan itself and therefore they often do not avail themselves of the opportunity to become involved. But the level of citizen participation cannot be soley attributed to comprehension of issues; other factors to consider include perceived probability of succeeding in an attempt to influence decisions, differences in access to resources and differences in alternative opportunities for using resources to achieve other goals. Respondents also suggested that these wildlife groups may have full confidence in the manner with which the process was being carried out and satisfaction with the status quo management.

One important consideration in the realm of public involvement is the provision of an adequate framework for participation to effectively occur. Some respondents in the case study area noted that the overall framework for public involvement at the Forest Management level of planning is presently inadequate and that although there is public concern over broader plans, people do not know how to participate. Two indications of this inadequacy became apparent during the study: a) there is presently a lack of graphical representation (i.e. maps and charts) to enable public comprehension of the available information and management alternatives, and; b) the public has not been made aware of the available processes and information, nor what the relevance of the various documents is.

Some respondents in the Nelson Forest Region perceived a somewhat limited role for the public in Forest Management Planning. For example forestry and wildlife staff in the Golden Forest District acknowledged that members of the public do not necessarily wish to become involved in all stages of the process and that the

public need not be involved beyond their own "sphere of influence". Wildlife biologists at the Regional level did not place a strong emphasis on the public involvement process stating that their agency adequately represented the public interests for wildlife in their transactions with the MoF representatives. In essence therefore, they have have taken an advocacy role for wildlife, a role that may not be appropriate given the fact that public wildlife interests are not a clearly defined clientele holding static values.

E. FLEXIBILITY

Forest Management Planning does not end with the Chief Forester's approval of plans. It is an ongoing cycle in which plans are revised to account for changing information, priorities and circumstances.

This study has revealed that, despite the recognized time frame of five years for TSA plan revision, MoF planners encountered tremendous difficulties in preparing and re-analyzing plans, difficulties that resulted in an initial 8 to 10 year time frame. Some of the factors that planners encounter which may lead to deviations from the intended time frame are public involvement, the issues that circumvent the planning process and the learning process that planners must go through in gaining knowledge on the nuances of planning and analysis. Many of the respondents expressed confidence that the time frame between plans would be reduced to five to seven years. This is due, in part, to the fact that once the data for specific issues are quantified, this information will be available for future analysis. Time constraints will therefore be less onerous.

Unlike TSA Resource Management Plans, TFL Management and Working Plans have most always been prepared and revised within a five year time frame. There are two basic reasons for this situation. Firstly the Forest Act (Section 28) requires the submission of a TFL Management and Working Plan every five years whereas there is no such requirement for TSA Resource Management Plans. The second reason is that the TFL licensee, being the only operator within a well defined area, is in a better position to prepare a plan that requires less in the way of revisions for shifting operations and deletions of operating areas. The profit motive provides a strong incentive within the corporation to maintain bureaucratic efficiency by clearly identifying needed operations at an early stage of the planning process. There is less inclination to change harvesting areas, for example.

At present, changes to TSA and TFL plans are driven largely by timber supply considerations; respondents could not point to any instances in which plans or the AAC had been revised on the basis of wildlife needs. Thus plans are much more flexible over issues that have little or no impact on the AAC. This form of constraint runs counter to the needs of wildlife staff who stated that they attempted to develop means of maintaining flexibility; but for certain species in some management units, deletions from the existing land base are required. This may translate into a reduction of the AAC.

A major problem with the process of change is that revisions are approved in isolation of the program requirements of other agencies. The lack of prior communication has the potential to negate years of effort by MoE staff and

instill a feeling of animosity between participants. For example, MoF changes to forestry operations resulting from a major fire in a TSA may be more damaging to wildlife habitat than the fire itself without MoE input. There is a need therefore to develop an agreed upon way of conducting interagency liaison in the course of dealing with change.

The degree and frequency of plan revision is closely linked with the identification of issues in the early stages of the planning process. If planners have paid careful attention to issue identification and the setting of priorities, the need for revision would not be as pressing as it might otherwise be; flexibility is, in essence, built into the plan.

A comparison between the two forms of management units reveals that TFLs offer less flexibility for IRM than TSAs. Legislation requires that where the Minister deletes Crown land from a TFL for the purposes of a) rights-of-way or b) any other purpose except timber production, and the deletion leads to a reduction of greater than 5% during a deletion period (25 years), compensation is payable to the licensee for the amount over 5% for the balance of the deletion period (Forest Act, 1978). Hence if changing needs and circumstances dictate a deletion to the land base for wildlife purposes for example, compensation in the form of cash or alternate timber would be required, an avenue not looked upon favorably by government. It is this lack of flexibility that has sparked public opposition to the proposed government policy of converting volume-based tenures within TSAs to area-based TFLs.

F. ADEQUATE DATA BASE

Effective forest resource management in B.C. is predicated on an adequate data base that is pertinent to the issues central to each management unit. The data base for Forest Management Planning in B.C. has vastly improved (MoF/MoE, 1987) over the last decade with ongoing research such as the Integrated Wildlife-Intensive Forestry Research program (IWIFR),† sophistication in modeling and the use of satelite imagery. However it appears that several problems are encountered that render strategic planning less effective than it might otherwise be. Firstly, data may not necessarily serve the analysis of identified issues. The finding of this study, that issues have often been identified hastily and with little research or communication between foresters and wildlife biologists, indicates that the basic resource information that is gathered may not adequately address some of the more acute timber and wildlife issues.

Secondly, inventories of forestry and wildlife resources have tended to be conducted singularly by each of the respective disciplines. With a lack of knowledge regarding some of the resources' functional attributes, no clear direction is provided for future research and data collection.

Thirdly, the geographic information systems of the two ministries have been

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†The IWIFR program, supported by the MoF and MoE, consists of two phases. During Phase 1 (1980-1986), research data on the impacts of forestry on habitats for deer and elk were accumulated. Phase 2 (1987-1991) will combine ongoing research with a program of information transfer to the field level. While the program commenced (and is continuing to take place) on B.C.'s south coast, it has shifted to the interior of the province where studies on forestry-caribou interactions are being undertaken.

developed divergently; as a result the data base does not sufficiently enable comparison or interaction between the two resources. The lack of systematic coordination of data bases on a common system has also resulted in a tremendous cost to government. This weakness is recognized by government and there is in fact a strong desire among departments to share and transfer data with one another. But at the same time there is a hesitancy about developing a monolithic data base as well as a concern about treading on other department mandates. It should be noted that a provincial standard,† which will eliminate duplication of effort and greatly enhance comparability, is currently being developed by the Surveys and Mapping Branch of the Ministry of Crown Lands in such a way as to avoid the above concerns.

There is also a weakness of information linkages between data systems within the MoF. As stated by Pelchat (1985)

> Individual systems in many cases have been developed to meet individual objectives and have not considered potential users of the data by other systems. A Ministry-wide commitment to coordination of systems and the data produced by those systems is required to alleviate future data non-compatibility.

Fourthly, planners have retained the practice of attempting to derive highly detailed information at the local level and applying this to the strategic level. This study has revealed that professionals at the District level and in some cases the Regional level fail to think in terms of generalities, especially wildlife staff who are constantly transferring wildlife information on forest cover maps at a scale of 1:20,000. The process of detailed mapping appeared to work well in

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†There is currently a committee to oversee standards in the data base. This committee includes representatives of the MoF and MoE.

the case of the Golden TSA because of its relatively small size but could not be expected to work in other large TSAs in the Province. While this detailed approach may be necessary in some instances, staff have not been as selective in their approach to information gathering as they ought to be. In contrast, staff at the headquarters level have tended to take a more holistic view of the resource base, recognizing that strategic planning must incorporate generalized information only.

A significant weakness regarding the data base is that in the past, resource data have not been geo-referenced or integrated between agencies such that the systematic analysis of all resources that flow from a specified geographic area could not be undertaken. The currently used strata-based approach to analysis, which consists of aggregating similar forest cover types, has meant that other resource values that require a high level of geographic fidelity, "fall through the cracks" in the analysis. The strata based approach has also failed to adequately permit the linking of strategic plans with development plans.

While the data base has not sufficiently addressed area specific resource requirements such as wildlife habitat, it is continuing to evolve with these needs in mind. For example a Forest Inventory Planning file has been developed by the Inventory Branch which enables a series of resource attributes to be transposed through digitized overlays. Also, the analysis framework for IRM, recently presented by the Forest Resource Analysis Section (Inventory Branch), relies on geo-referenced data to more accurately model site specific resource interactions and to reconcile short term versus long term harvest projections.

Using Geographic Information Systems, the framework will better enable analysis of the spacial relationships between resources of the forest land base. An integrative system that incorporates data from a spectrum of resource agencies and applies modeled management regimes to geo-based data will ultimately reduce some of the interagency conflicts that currently exist.

Some participants in the study stated that some information for strategic planning is quite rudimentary and that there exists several critical data gaps in the joint management of forestry and wildlife resources. For example data with respect to wildlife habitat is not well developed and as a result resource managers have encountered difficulties in translating wildlife populations to habitat objectives. However it is very difficult, if not impossible, to obtain accurate, strategic information that stands up over time. As noted by Salwasser (1984),

> Regardless of the elegance of inventories and planning models, our predictions of the results of planned treatments will always be less accurate than desired. In many cases they may be way off.

Moreover, because there is a distinct lack of monitoring (Section H) at the strategic level, it is difficult to determine the degree to which information is sophisticated.

In answer to the question as to whether there are critical data gaps in Forest Management Planning, headquarters respondents again differed in their perceptions from regional and district respondents. Headquarters staff have indicated that in the context of present management levels at the strategic level, data gaps are not restrictive to the process. Regional and District staff on the other hand have taken a different perspective, indicating that there are significant critical data

gaps on the interaction of forestry and wildlife resources that does affect the planning process.

While information pertaining to integration at the local level has experienced some shortfalls, there appears to be sufficient data, on a province-wide basis, with which to conduct strategic planning. Acknowledging that there are gaps, strategic planning can be used to identify where critical data gaps lie just as it can be used to guide where resource inventories need to be updated. Alternately, changes in information and technology that affect planning at the local levels of planning will eventually filter up to the strategic level of planning. With an appropriate hierarchical linkage and the necessary flexibility, plans can be altered to take these changes into account.

This thesis has emphasized the data base that pertains to 'natural systems' as outlined in the commentary in Chapter 3. However, some respondents made reference to the 'socio-economic systems' which are also of vital importance in an IRM context. Thus there is a need to link environmental with economic considerations, as has been evidenced through such initiatives as the establishment of a provincial task force on environment and economy.

The research has determined that Forest Management Planning has largely been concerned with the physical data required for forestry management as opposed to socio-economic data that is required for informed decision-making on the relative merits of various land management alternatives. This situation persists even

though accepted methods for evaluating costs versus benefits are in place.† The finding that strategic planning for IRM has retained a strongly technical orientation without the required level of socio-economic evaluation is supported by a number of authors (e.g. Dorcey, 1987; Irland, 1985). Respondents indicated that the MoF would likely attend to this shortcoming once clear objectives have been enunciated and other pressing needs with regard to improved planning direction have been attended to.

G. COMMITMENT TO PLANNING

Commitment in this thesis is evaluated in terms of both political commitment as reflected in budgetary allocation and bureaucratic commitment as indicated by plan implementation. Both are of vital importance for the mutual attainment of forestry and wildlife objectives.

While politicians have approved some positive policy endeavors and have espoused the need for long term resource planning in B.C., political commitment to IRM is generally not strong. This is reflected to a large degree in annual budgets allotted to the wildlife management program of the MoE and the integrated resource management program of the MoF. Recent annual reports confirm statements made by the respondents that expenditures for wildlife programs have decreased relative to revenues obtained from the wildlife resource.

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†Guidelines for Benefit/Cost Analysis in B.C. were developed in the 1970's by the ELUC Secretariat.

In the study area, effective strategic planning is highly constrained by a lack of budgetary allocations; wildlife staff cannot even meet the demands for day-to-day operational management. Each person employed by the Fish and Wildlife programs is generally responsible for planning for the wildlife resource in two forest Districts, some of which have very high wildlife values. All respondents stated that present levels of funding were insufficient, given existing workloads. However, one factor that has the potential of lessening the impact of budgetary constraints is the existence of a $350 million Forest Resource Development Agreement (FRDA) program† which if strategically planned for with wildlife in mind, could provide benefits far in excess of the approximately $1 million Habitat Conservation Fund allocated for wildlife enhancement projects.

Problems in gaining political support for wildlife resource protection is characteristic of other jurisdictions as well. In Alberta, where IRM has gained recognition for its advanced planning process, the provincial expenditure on fish and wildlife is only one thirteenth the value of the net economic benefit of the resource (Neave and Goulden, 1983). Despite the sophisticated IRM framework and the best efforts of resource planners, "elected and senior appointed officials in Alberta have demonstrated a low regard for public land and wildlife resources" (Horejsi, 1985). Similarly in Manitoba the provincial Wildlife Branch's budget represents less than 2 percent of the value of wildlife to the provincial economy (Neave and Goulden, 1983). Thus the lack of funding appears to be a problem in many, if not all, jurisdictions across Canada which has a system of

†FRDA is a joint federal and provincial agreement which is centred on the need to enhance the productivity of the forest land base through sivicultural endeavors. With the initial term (1985-1990) due to expire, both governments are discussing the possibility of a second five year term.

separating revenue and expenditures. The inability to apply revenue from lands designated for wildlife back to the resource has "reduced the opportunity and motivation for multiple use of these lands and, therefore, dedication of further wildlife areas" (Neave and Goulden, 1983).

The political level in B.C., recognizing the fact that ad hoc approaches to resource planning were resulting in exceedingly complex issues, promised a greater commitment to IRM. This commitment resulted in the creation of the Integrated Resources Branch of the MoF which was given a mandate to "establish policies and procedures for achieving a balanced use of Crown forest and rangelands and to optimize the total benefits accruing to the people of B.C." (Bullen, 1987b). However this positive move has been offset by the decrease in the number of staff responsible for Forest Management Planning.

A strong commitment to IRM has been stated in various government memoranda, speeches and the MoF's revised chapter on TSA planning which states that "the Forest Service is committed to the principle of integrated resource management." The former Director of the IRB made specific reference to the commitment required for the integration of wildlife and forestry management when he stated in a memorandum addressed to all levels of government in the MoF, "there is a significant wildlife interest to be incorporated...making this a key topic within the overall theme of integrated resource management" (Bullen, 1987b).

In addition to the establishment of the Integrated Resources Branch, the opening up of District resource planning positions over the last four years has paved the

way for increased implementation of IRM at the local level. But this study has revealed that plans may not be implemented as prepared because of lack of funding and political imperatives or directives. Often the intended direction of TSA plans is altered due to unexpected contingencies such as bark beetle infestation in the interior of B.C.† While this is accepted as reality, the lack of full commitment to IRM by the Forest Service becomes manifest when there is no or little attempt to bring the problem to the attention of wildlife staff who have spent a great deal of time assisting in plan preparation only to find out that the plan is no longer valid.

An additional problem identified is the need to have the Chief Forester briefed by senior MoE staff (in addition to his own staff) prior to making key Forest Management Planning decisions. Otherwise pertinent information that has been previously discussed between wildlife and forestry staff could be "lost" during the briefing stage that precedes the Chief Forester's determination of an AAC.

The degree to which MoF planners at the District level are committed to IRM varies across the province. According to MoE staff interviewed, forestry staff in some Districts are not receptive to planning for the needs of wildlife while in other Districts forestry staff are very much receptive and are committed to the process. It has not been possible for the MoE to evaluate the overall MoF commitment to IRM in the context of the TSA planning process because no TSA

†Bark beetle infestation, requiring accelerated salvage logging to decrease the spread or to salvage beetle-killed trees while they are still useable, is common in the Nelson Forest Region.

Resource Management Plans have been given final approval;† the Golden TSA and Cranbrook TSA Plans currently in place are interim plans only. Based on the willingness of planners in the study area to accomodate wildlife interests in the TSA planning process, the involvement of planners on various interagency committees and the effort put into devising initiatives to facilitate the process, there is a strong commitment on the part of resource planners in the Cranbrook and Golden TSAs to make IRM within the TSA planning framework succeed.

It is difficult to evaluate commitment of foresters to IRM in terms of plan implementation because the generalized statements that are characteristic of most plans provide a great deal of latitude for foresters when interpreting the intended direction of the TSA Resource Management Plan. Plans that were reviewed merely gave "recognition" or "consideration" to wildlife values rather than implementable strategies that were targeted towards clear objectives. Because of the enormity and complexity of Forest Management Planning, it may not be possible to implement plans as stated; but specific statements on what was implemented should be documented in order that the cause and effect relationships of the planning strategies can be examined.

The degree to which TFL licensees are committed to IRM in the context of Forest Management Planning also varies across the province; even within the study area there were variations. MoE staff expressed dismay over the fact that in the Nelson Forest Region, licensees had applied for cutting permits in areas

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†Final approval by the Chief Forester would not necessarily reflect on MoF planners in the Nelson Forest Region.

that had previously been identified as critical caribou habitat. Crestbrook Forest Industries on the other hand, has demonstrated a strong commitment to IRM, a factor which led to the signing of the first Subsidiary Agreement in B.C. This form of agreement is supposed to require the demonstration of a high level of management performance on the part of licensees. In the report "Integrated Resource Management on Tree Farm Licence #14" the company states "Crestbrook is firmly committed to effective integrated resource planning designed to protect the productivity of the forest land base while maintaining or enhancing other forest land values such as wildlife, recreation, grazing and water."

Commitment on the part of licensees has become of utmost importance with the impending transition of management responsibilities from the MoF to the forest industry. Through the Letters of Understanding (which replaces the Subsidiary Agreements) jointly signed by the MoF and the industry, the MoF will ensure

1. that clear direction is given to the forest industry regarding new responsibilities,
2. that the industry is required to produce integrated forest management plans,
3. that industry plans fit within the existing hierarchy established by the Ministry, and
4. that the elements are put in place which ensure that planning and operations are documented and audited, and that the objectives laid out in plans are indeed being delivered on the ground (Cuthbert, 1988a).

There exists a significant concern among respondents that TFL licensees will not live up to their obligations in managing all forest resources prudently. The concern is compounded by the possibility that the shift of management responsibility from the Forest Service to the licensee will result in a doubling of

the workload of the MoE staff† in ensuring protection of the wildlife resource.

This study has revealed that the traditional focus of foresters on timber-related objectives, while gradually giving way to a more balanced perspective and fuller appreciation of other resource concerns, still prevails among many foresters. The emphasis given to timber over other resources may not necessarily be detrimental but a more independent perspective is required if the process is to remain credible. This is acknowledged by Pearse (1987) who states

> Many foresters are not neutral in (resource use) conflicts but are party to them...Unless (foresters) develop a more empirical approach to assess the feasibility patterns of development, decisions about what forests will be managed for will continue to be made on the basis of relative power and prejudices of conflicting interests and more often by expedience.

H. MONITORING

The capacity to measure the status of changes to variables of the forest resources, plans and processes in the context of predetermined management objectives is a fundamental requirement of planning. Yet the research has shown that monitoring as part of the Forest Management Planning process in B.C., notably regarding IRM, has tended to be very weak.

The MoF does undertake some monitoring in two general ways: it monitors a) Forest Management Plans, and b) the inventory. Decisions made for Local

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†MoE staff have expressed the concern that if an impasse is reached when discussing IRM issues with TFL licensees, they will then have to rework the problem with the MoF.

Resource Use Plans are compared to resource use assumptions in the TSA Resource Management Plan. Also Regional Planning staff ensure that District management priorities are implemented according to the intent as stated in the TSA Plan. Finally the inventory base is updated to account for changes due to fire, pests, logging and silvicultural activities and built into subsequent TSA analyses and plans.

In order to properly assess something, one must develop a "yardstick" such as a policy against which performance is measured (Holling, 1984). The MoF carries out performance evaluation but emphasis is given to timber harvesting activities in the context of the Ministry's cut control policy. A cut control policy pursuant to Section 55 of the Forest Act is in place which requires that the actual harvest conducted by each TFL license is measured against the AAC established for that tenure. Under the provisions of this policy, the licensee is obligated to harvest no more or no less than 50% of the AAC during any one year. In addition the harvest must be within 10% of the cumulative AAC by the end of each five year cut control period.

There is very little monitoring carried out at the Forest Management Planning level in B.C. even though the mechanisms to monitor do exist. Because management objectives for IRM are not stated in measureable manner in Forest Management Plans, the actual 'implementation' is not testable. The generalized nature of stated objectives ensures that a desired outcome is always 'attained'.

Staff in the Golden TSA have acquired a good understanding of the process

required for effective monitoring and have developed a framework that outlines the feedback mechanism enabling staff to determine whether or not stated objectives have been achieved. Work has been continuing in further quantifying objectives as an necessary component of the monitoring function.

The responses indicated that monitoring for IRM falls far short of what it should be; that is to enable comparison between projected and actual performance so that feedback for the assessment of dynamic performance can be provided. As Baskerville (1984) states

> learning can only proceed by the identification of error. If error is allowed to slip by for lack of measurement or if there is no rigorous comparison of forecast to actual performance, then there is very little learning.

The reasons for the lack of monitoring at the strategic level are not well understood by the author. This highlights the need for further study. But possible reasons may include the shortage of staff as was apparent in this study, the lack of common measures against which to assess performance, the resistance to addressing error because of the explicit negative feedback that it may elicit and the fact that planners, by nature, tend to place more emphasis on the "front end" of the planning cycle where progress is more easily identifiable.

VI. CONCLUSIONS AND RECOMMENDATIONS

This chapter briefly summarizes the current state of Forest Management Planning in B.C. and provides conclusions in response to the question "Is the integration of forestry and wildlife resource management in B.C. being successfully carried out through Forest Management Planning?" Specific recommendations that may lead to improvements in current approaches to this strategic level of planning are offered.

Overall, this thesis finds that Forest Management Planning has advanced significantly since the first round commenced in 1980 but still faces a number of shortcomings on each of the criteria examined. This finding is also reflected in a summary of the recent Future Forest Conference (ESSA, 1988) which states that "Although there is a form of strategic land-use planning in B.C. ... it is not functioning effectively or adequately." The absence of an overall mechanism to enable integration through a well defined planning hierarchy and across disciplinary lines remains an impediment to successful Forest Management Planning and as a result "the reality of IRM falls short of what can be achieved" (Shebbeare, 1989). As has been pointed out previously, despite the best efforts of MoF and MoE planners, the weaknesses are often difficult to rectify because they are the product of political philosophy and complex institutional arrangements.

This thesis has identified both strengths and weaknesses of Forest Management Planning for IRM at the forestry-wildlife interface. The major strengths of the

planning process according to the criteria used in this study are as follows:

1. Clarity and quantification of objectives in strategic plans is continuing to improve with a much improved information base. For example the development of Provincial Species Statements and Regional Wildlife Plans has enhanced the opportunity of the MoE and MoF to provide more clearly defined objectives in TSA Plans.

2. The hierarchical planning framework of the MoF has, at the Forest Management level, facilitated issue identification and provided a context for Local Resource Use Planning and Development Planning while at the same time assisting planning and decision making at higher levels. It provides the opportunity for resource staff to identify data gaps, research requirements and inventory needs.

3. MoE involvement as a full participant on TSA Steering Committees has improved the level of trust and understanding between the MoE and MoF and has increased the accuracy of assumptions and identification of issues that are incorporated into analyses. In addition, the various committee structures that have been put into place have helped to coordinate interagency planning efforts.

4. The public has been given the opportunity to review and provide input into Forest Management Plans: an opportunity that exists for all management units regardless of the nature of the issues. The forums of discussion allow for consultation with key public interest groups and the general public at various stages of the planning process.

5. Flexibility exists in Forest Management Plans; plans are periodically revised on the basis of changing information and circumstances surrounding resource

management issues.

6. The data base for Forest Management Planning currently enables planners to determine broad interrelationships between potential resource uses as well as capability of land to support these various resource uses. A major effort is being put into continually refining information to provide greater resolution.

7. There is indirect evidence of an overall increase in commitment to IRM. Active involvement of planners on various committees established to improve the integration of forestry and wildlife management as well as motivation to "get the job done" under constrained conditions are indicators of this increased commitment.

In this study, the major weaknesses of the planning process according to each criterion were found to be as follows:

1. Objectives as currently stated in TSA and TFL plans are broadly construed such that they provide little guidance for planning in terms of how non-timber resources are to be integrated with forestry. The lack of quantitative rigour, combined with the lack of monitoring, has meant that it is not possible for resource managers to effectively guage achievements in IRM.

2. Because of the lack of provincial policies governing land use and lack of Regional plans, decisions made at the Forest Management Planning level are often made in a vacuum. Moreover at the Forest Management level, the failure of resource staff to priorize issues in terms of their importance and ease of resolution has left planners without guidance as to how and when

these issues should be addressed.

3. There is often a lack of communication at critical points in the planning process which has led to a great deal of uncertainty in the process. Substantive changes have been made to plans in isolation of MoE staff.

4. The timing of public involvement has often not been given careful consideration by resource management staff. Emphasis has tended to be placed on incorporating public review and input at the later stages of plan preparation rather than during the early stages of planning when issue identification is critical. Also, the problem that the public does not know how to participate at strategic levels of planning is compounded by the lack of summarized plans and graphical representation for ease of understanding.

5. TSA Planning is taking an inordinate amount of time and as a result, newly revised plans may be dealing with outdated issues. Moreover the MoE is not routinely notified when revisions are made which may have a major impact on the wildlife resource.

6. Planning is hindered by the divergence of data bases between the MoF and MoE as well as the failure of models currently used for TSA analysis to adequately capture area-specific wildlife habitat information. Furthermore the focus for information gathering has tended to be on the technical and biological aspects, with only limited information on broad socio-economic aspects.

7. Budgetary allocations to wildlife and forestry planning staff indicate that there is a lack of political commitment to IRM. As a result of underfunding and understaffing, staff at the Headquarters, Regional and District levels cannot devote adequate time and energy to Forest

Management Planning.

8.   There is a distinct lack of formal monitoring of TSA Resource Management Plans. The failure to monitor, combined with the fact that objectives have been broadly articulated, means that it has not been possible for planners to determine the extent to which objectives have been met; nor has the planning process been a learning experience for the agencies involved.

The evaluation of the strengths and weaknesses of Forest Management Planning for IRM has proven to be a difficult task considering that TSAs and TFLs differ in the complexity of issues and the planning approaches used to address those issues. Yet some of the identified strengths and weaknesses of the process became more apparent than others.

Although the team planning approach to IRM through Forest Management Planning has not yet evolved in B.C., the progress made in shared, cooperative planning appears to be the major strength of the process. Within the study area, increased communication on the part of professionals has led to greater understanding of each agency's requirements. In general, the MoF is seeking to fulfill its legislated mandate for cooperation and consultation and many gains have recently been made through the signing of protocol agreements, joint research efforts, establishment and expansion of inter-agency committees and other initiatives. These improvements to joint planning efforts have taken place despite the lack of a clearly defined land use policy at the senior government level.

In terms of overall strengths of the planning process, the research has

determined that the groundwork for effective IRM planning has been laid and that the MoF has made and continues to make significant headway in attending to the weaknesses previously discussed. The recently conceptualized Analysis Framework for Integrated Resource Management is but one example that deserves mention.

The primary weaknesses of the planning process appear to lay in the flow of decision-making within the hierarchical planning framework and in the setting of objectives. Foremost, as indicated in the opening paragraphs of this chapter, is the lack of an overall mechanismwithin the existing planning hierarchy to give direction to and coordinate IRM. Because there are no Regional plans having broadly based IRM units and no clearly defined policies and explicit philosophy of land use, Forest Management decisions continue to be made without a much needed context. Associated with this, the committee structure that has been adopted to resolve issues that transcend sectoral boundaries has not been organized in such a manner as to facilitate the effective flow of information and decision-making in complex IRM situations, i.e. when hierarchical and lateral (interagency) structures merge. It is recognized however,that recently established committees at the headquarters have begun to improve upon this.

Secondly, the ambiguous nature of stated objectives at the Forest Management Planning level has proven to be a serious obstacle in providing guidance to resource management design and has made it impossible for resource managers to know when these objectives have been attained. A failure to provide clear, quantified objectives will continue to hinder the evaluation of options.

While the strengths in the planning process are cause for optimism, the major weaknesses have proven to be an impediment to effective IRM planning. The process is still in a young, transitory and exploratory stage where there remains much potential to develop. In essence, therefore, the integration of forestry and wildlife resource management is not yet being carried out through Forest Management Planning in B.C. as effectively as it could.

The focus on the discussion and evaluation of the effectiveness of Forest Management Planning for IRM has been on the planning process but some respondents also made reference to organizational structure as a facilitator or impediment to such a framework. In particular there are positive and negative aspects of having one ministry, such as the Alberta Department of Forests, Lands and Wildlife, for conducting integrated resource planning for all resources. The main advantage of having an "integrated" organization is that it would minimize sectoral advocacy which tends to lead to conflict. Institutional organization that follows sectoral boundaries can lead to effective IRM; however the legislative backing to ensure that the holistic approach to IRM planning is effected needs to be strengthened.

This study has also revealed that in addition to the planning process, the effectiveness of forestry and wildlife integration is largely contingent upon the personal traits of staff involved. The willingness of staff to cultivate a truly professional relationship where trust, mutual respect and a desire to jointly accomplish the tasks set out before them predominate, is an attribute that has enormous implications for both the process and the product of IRM.

The effectiveness of forestry and wildlife integration can also be evaluated in terms of the "on the ground" results of plan implementation. This more localized evaluation would necessarily involve the application of ecosystem response indicators such as those developed by Thomas (1982) and Holling (1984).

These organizational, personality and ecological considerations as outlined in preceding paragraphs could also be applied as criteria in the evaluation of the effectiveness of IRM; however, this study has focussed on normative criteria pertaining to the planning process. Future research on the evaluation of IRM could be undertaken in these subject areas.

In retrospect, the eight criteria developed for this study through literature research and communication with government officials were appropriate for application against the Forest Management Planning process. The results of the study supported the theory discussed in the literature. In particular the findings pertaining to the hierarchical planning framework lend credence to the literature on strategic planning which states that agencies face difficulties in translating policies and objectives at the broad strategic levels into implementable strategies at the more decentralized, lower levels of the hierarchy.

The MoF has made considerable progress in addressing some of the deficiencies of the integrated resource planning framework. Here, remedial measures are suggested in further adding to or supplementing the gains made, recognizing that some will be more easily addressed than others. It is recommended:

1.   that the MoF develop clearly specified policies and measureable objectives

for strategic IRM planning through a participatory framework that includes other agencies and the public;

2. that the linkage between policy and land-use planning be strengthened through the development and implementation of the Resource Emphasis Area program and that this be done through a consultative framework that allows meaningful public input;

3. that the linkage between strategic and tactical planning be strengthened through the reconciliation of short-term decision-making and long-term resource projection as well as through clearly defined and documented (in plans) strategies for IRM;

4. that the MoF apply a more proactive approach by involving the public at the initial stages of the Forest Management Planning process in addition to other stages and that the public should be ensured of an understanding of the strategic planning process;

5. that the current committee structure be expanded upon to include a broader array of interests and that participants be encouraged to identify realistic IRM options;

6. that greater commitment be made by MoF staff to completing plans within a timeframe that enables current, rather than outdated issues to be addressed;

7. that increased emphasis be placed on obtaining information that is directed towards and facilitates socio-economic evaluation;

8. that a protocol be developed between the MoF and MoE which establishes the procedures for interagency notification when changes to existing plans are proposed;

9. that a greater commitment of funding and manpower resources be appropriated to the MoF (Integrated Resources Branch) and MoE in such a manner as to facilitate planning for forestry and wildlife integration; and

10. that rigorous monitoring of Forest Management Planning with follow-up monitoring of the Plan be instituted. This must be based on clearly established and agreed upon guidelines undertaken in the context of stated objectives.

The most pressing need is to improve direction through clearly defined policies and objectives and to translate these into regional plans that enable the rational evaluation of multiple alternatives at the Forest Management Planning level.

The inter-relatedness between many of the criteria became apparent during the study. Moreover the research demonstrated that all criteria examined are important for effective IRM planning at the strategic level such that the failure to adequately address a single criterion may very well prove to be a limiting factor for the overall success of the process. The inter-connectedness and importance of the criteria therefore suggest that a holistic approach should be used when remedial measures to be taken are assessed.

Forest Management Planning is a dynamic process that also requires continuous assessment. Over time, the definition of societal goals and public interests change as does the nature of the forest land base. A responsiveness in the planning process that is consistent with this ever changing situation can go a long way towards improving the integrated management of B.C.'s natural resources.

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APPENDIX 1

<u>Persons Interviewed</u>

Crover, J., Ministry of Forests, Integrated Resources Branch, Victoria, B.C., July 20, 1988.

Davis, R., Ministry of Forests, Kootenay Lake Forest District, Nelson, B.C., June 6, 1988.

Darychuck, G., Ministry of Forests, Nelson Forest Region, Nelson B.C., June 6, 1988.

Dick, J., Ministry of Environment, Planning and Assessment Branch, Victoria, B.C., August 2, 1988.

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Rounsville, D., Woodlands Div., Crestbrook Forest Industries Ltd., Parson, B.C., June, 8, 1988.

Soobotin, A., Ministry of Environment, Fish and Wildlife Branch, Nelson, B.C., June 6, 1988.

Travers, R., Ministry of Environment, Recreational Fisheries Branch, Victoria, B.C., July 5, 1988.

Vold, T., Ministry of Forests, Integrated Resources Branch, Victoria, B.C., June 30, 1988.

Volkers, T., Ministry of Forests, Cranbrook Forest District, Cranbrook, B.C., June 7, 1988.

APPENDIX 2

Interview Questions

I am currently undertaking research towards my Master's thesis which is entitled "PLANNING FOR THE INTEGRATION OF FORESTRY AND WILDLIFE RESOURCES AT THE MANAGEMENT UNIT LEVEL IN BRITISH COLUMBIA". The questions that I am putting to you will enable me to evaluate the effectiveness of TSA and TFL planning in B.C.- the main focus of my research. These questions will cover several criteria that I have determined as being important for measuring the effectiveness of integrated resource planning and management.

Objectives

1. Do the agency objectives provide useful guidance (direction) for you in your work?

2. Do you feel that it is important that objectives have a quantified expression? If so is this the nature of the objectives that you work with?

3. In what docmentation are these objectives expressed?

Joint Planning

1. What impact do you feel organizational structure has on joint planning efforts; for example, the single departmental structure of Alberta as compared to the multiple departmental structure of British Columbia?

2. What are some of the institutional arrangements that your agency has that influence how joint planning will take place?

3. What initiatives have been undertaken to facilitate the working relationship

between Forestry/Wildlife agencies and the forest industry?

4. What arrangements exist between agencies to promote neutrality in planning? Are joint committee/planning team meetings chaired by a neutral person? a rotating chairmanship between Forests/Environment?

5. What is the usual frequency of communications with forestry/wildlife staff to discuss or investigate in the field, issues pertaining to TFL/TSA planning? (given the complexity of issues in your Region/District).

Public Involvement

1. At what stage in the planning process is public input solicited?

2. How frequently are public representatives contacted on an informal basis to inform them of TSA/TFL plans, recommendations and decisions?

3. What mechanisms are used in your Region to enable public interests to provide input on plans?

4. What has been the usual level of response of the public to invitations to review plans? To what do you attribute this?

Commitment

1. Has funding from the upper echelons of government enabled the (agency) to meet its objectives with regards to integrated resource planning? Has lack of funding been a constraint?

2. Have resource planners been able to meet deadlines under normal working conditions? Do extenuating circumstances prevent planners from doing so?

3. Are plans implemented as agreed upon? If changes are to be made, are all agencies made aware of proposed changes; do mechanisms enable these

agencies to respond with sufficient lead time?

Comprehensive Framework

1. In your estimation what is the link between strategic TSA planning to operational planning? How should that link be made?

2. Do TSA/TFL plans presently provide the needed direction at lower levels of planning and management?

3. There is currently a move towards decentralizing the TSA planning function from the Forest Regions to the Districts. What effect do you feel this will have on the implementation of TSA plans? On the quality of information that goes into the planning process? On the commitments of time and money?

Data Base

1. Is information gathering and analysis structured such that agency program objectives and priorities are properly addressed?

2. Does the inventory process provide a basis for conflict resolution; that is does preplanning pinpoint specific information requirements?

3. Is the information organized such that it provides the best possible basis for identifying the range of choices and for making informed decisions as to what their consequences will be? does the information facilitate the derivation of options?

4. Are there gaps in knowledge and if so how critical are these?

5. How is wildlife habitat information (such as that documented in the MoE's subregional wildlife plans) incorporated into the forestry data base (modelling

techniques)?

6.   In your view how does the concept of forest zoning (such as the land use strategy) fit into TSA planning? Should this be a formal part of the process?

Flexibility

1.   How often are TSA/TFL plans in your Region revised? Are the revisions usually of a major or minor nature?

2.   What are some of the constraints governing the flexibility of planning at the TSA/TFL level?

3.   How does your agency deal with uncertainty when it comes to managing the resource in the face of changing technology, markets and social demands?

Monitoring

1.   Does your agency have a monitoring program to ensure that the recommendations in TSA/TFL planning are being carried out and are effective?

2.   Are there other ways that you obtain feedback to determine overall program effectiveness?