RIC Report 002
Discussion Document

A REVIEW OF RANGE AND WILDLIFE HABITAT INVENTORY IN B.C.

FOR

WILDLIFE HABITAT AND RANGE INVENTORY TASK FORCE OF THE B.C. RESOURCES INVENTORY COMMITTEE

BY

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PREAMBLE

This report is submitted to the Resources Inventory Committee (RIC) by the Wildlife Habitat and Range Inventory Task Force.

The Resources Inventory Committee consists of representatives from various ministries and agencies of the Canadian and the British Columbia governments. First Nations peoples are represented in the Committee. RIC objectives are to develop a common set of standards and procedures for the provincial resources inventories, as recommended by the Forest Resources Commission in its report The Future of our Forests.

To achieve its objectives, the Resources Inventory Committee has set up several task forces, including the Wildlife Habitat and Range Inventory Task Force. The terms of reference for the Task Force are to review the current status of Range and Wildlife Biophysical Habitat Inventories in the province, to identify data requirements and to recommend strategies required for more accurate and cost-effective inventories. This is the full report of that work.

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INTRODUCTION

This report overviews the current status, issues, data requirements, needs and strategies for range and wildlife habitat inventories in the province.

The report is divided into 4 sections:

The first section describes the three focus tasks of current status of inventories, identification of data requirements and needs and inventory strategies with the approach taken to each.

The second section describes the history and current status of range and wildlife habitat inventories in the province. This is supported by reference map overlays to provide a geographical summary of inventory history and status with accompanying specific inventory reference descriptions.

The third section identifies data requirements and needs as determined during the task force workshop and through interviews with resource professionals. In addition, it includes estimated costs of carrying out inventories at different scales and for different purposes.

The fourth section summarizes proposed inventory strategies, including need for definition, use of existing inventory and inventory data storage and information systems, the necessity for two range inventory components, range of inventory needs, standards and procedures, biophysical and range ecosystem classification integration and overall inventory integration opportunity (partners in inventory approach).

1.0 THE TASKS AND APPROACH

1.1 CURRENT STATUS OF RANGE & WILDLIFE HABITAT INVENTORIES IN B.C.

TASK

To review and document the current status of the range and wildlife habitat inventories in B.C.

APPROACH

Map and document status through direct interview with headquarters and regional agency staff supplemented by telephone and fax contact with regional and district staff and consultants.

1.2 IDENTIFICATION OF DATA REQUIREMENTS AND NEEDS

TASK

To identify data requirements and needs for range and wildlife inventories.

APPROACH

A task force workshop combined technical presentations and issues discussion with a focus on data requirements and needs. This was supplemented with interviews utilizing a guideline questionnaire format.

1.3 INVENTORY STRATEGIES TASK

To recommend strategies for accurate, cost effective, integrated range and wildlife habitat inventories vital for effective resource management and land use planning.

APPROACH

Based on understanding of inventory history, current status, identified data requirements and needs strategy, recommendations were prepared for consideration.

2.0 CURRENT STATUS OF RANGE AND WILDLIFE HABITAT INVENTORIES IN B.C.

Over the years significant parts of the province have been covered by various kinds and scales of range and wildlife habitat inventory for a diverse range of purposes. The quality and utility of inventory, varies with purpose and scale of endeavour. All of the inventory is useful within the confines of the purpose and technology available at that time and the scale of inventory activity. Inventory use intensity is highly variable in general. It is a matter of differing opinion as to what inventory is vital - particularly with reference to scale.

**** Refer to accompanying inventory location maps and detailed inventory data forms for geographical area, extent and descriptions of existing inventory of different types and scales.**

Most of the information for our inventory summary mapping was obtained over a very short time period, from very busy, people with heavy workloads.

Although we feel this represents most historical inventory activities well, we cannot vouch for its absolute completeness.

2. 1 RANGE

Current legislation requires the MOF to maintain an inventory of the forage resource on Crown forest and range utilized by livestock and wildlife. Ever increasing demands are placed upon the Crown forest and rangeland base to provide for the needs of a wide range of users and potential users.

Looking back may help us look ahead with more knowledge, and it is important to understand range inventory within a historical context.

In the 1930's, broad range types (1:2,000,000 scale) were mapped (open range, timbered and alpine) within priority areas of the southern interior. From 1950-70, range inventory was carried out for range management purposes on a priority basis and included: range improvements and 12 range community types based on a letter map system of geographical identification.

During the 1970's the above range improvement oriented initiatives continued with regional variations and included the so called K project and Unit maps for which information was all subsequently rolled into the Unit map process. With the coming of the federal-provincial ARDA and ARDSA agreements in the late 1970's and the associated CRMP process, came the CRMP maps with updated improvements identification, which temporarily replaced the Unit maps.

Subsequently, as the CRMP maps became outdated with respect to use and cover, it was necessary to use the Unit maps, the CRMP maps and forest cover maps for range management purposes.

During the period between 1979-1982 efforts were made to introduce a standard range inventory procedure and an initiative was taken to implement an interior provincial inventory at the regional level. Problems with vegetation classification, procedures and agency responsibility

issues resulted in discontinuance of the program in 1982. Other more significant problems were those of funding and permanent staffing.

In 1983-84 fourteen general range types (GRT's) were generated using the first forest inventory information base and the Forest Inventory Planning File (FIP) for each range unit, as part of provincial resource analysis requirements. In addition, a Range Program Review resulted in changes in range inventory responsibility within the Ministry, a Range Inventory Discussion Paper addressed many of the issues and a range inventory methodology pilot project was initiated in the East Kootenay.

In 1985, digitizing of range unit boundaries and range improvements on GIS and IGDS commenced. The associated Range Improvement System (RIS) is a data base developed for the storage and retrieval of attributes associated with range improvements.

Following the termination of the inventory initiative of the early 1980's, range resource (forage) inventory was virtually discontinued except for the East Kootenay pilot project. Other inventory oriented projects which contribute to range resource knowledge include: Cariboo wetland forage production sampling, Chilcotin permanent sampling sites, Kamloops Region exclosures, rangeland reference sites on logged areas and field application of satellite imagery to map vegetation.

The intensity of use and indeed opinions on usefulness of range inventory information are highly variable amongst range management professionals and users. Identified users of range inventory information include: resource industries (ranchers, forest, tourism), resource and land use planners (both industry and government at all levels), resource managers (local, regional and provincial levels), and public interest groups (general public information and the public involvement in the various planning processes).

The following summarizes the current status of (1) range improvements (cultural) mapping and (2) range resource (forage inventory) obtained from various sources.

Cultural Inventory

Historically at scales of 1:15,000 to 1:50,000 this inventory identifies range improvements, administrative unit boundaries and facilities. In general, at best, this mapping which covers a significant part of the range resources of the province requires updating to be useful for resource management purposes.

The Range Improvement System (RIS) data base was developed in the 1980's for the storage and retrieval of attributes associated with range improvement projects. It has mixed support at present.

Forage Resource (Range Ecosystem) Inventory

In the 1930's, broad general range types were mapped at small scales (1:2,000,000) followed by various initiatives that focused on mapping at variable scales, general range types (GRT's) and plant communities. Initiatives to standardize efforts and initiate a productivity oriented inventory were not successful for a number of reasons.

In the early 1980's fourteen general range types (GRT's) were generated for all provincial range units using forest inventory type groups for the purposes of resource analysis required by legislation.

With the exception of the East Kootenay methodology pilot project little forage resource (range ecosystem) inventory, as such, has taken place since. Other initiatives have contributed to the understanding of the resource base. These include forage benchmark initiatives and range ecosystem interpretations, based on using existing forest inventory GIS and data systems such as the Forest Inventory Reporting System. Opinions differ, often sharply, on the usefulness of the products resulting from these initiatives.

2.2 WILDLIFE HABITAT

Current legislation (Wildlife Act) does not include provisions for wildlife habitat inventory, although the Forest Act does provide for this in areas under its jurisdiction. The Wildlife Management Discussion Paper of 1991 profiles the need for wildlife habitat inventory. Understanding of wildlife habitat requirements is of increasing concern to professional wildlife managers and the public.

Habitat classification and mapping within the Ministry of Environment, Lands and Parks is now focussed on the ecological (biophysical) approach. This multi-disciplinary approach to habitat classification and mapping had its start in the federal-provincial Canada Land Inventory program of the 1960's and 70's. CLI wildlife capability mapping (ungulates and waterfowl) covered approximately two-thirds of the province by 1979 when the program was concluded.

The CLI wildlife capability mapping was ecologically based, in that it drew on parameters from a number of disciplines, but field data was collected by wildlife biologists who often had limited experience in disciplines important to wildlife habitat evaluation.

A multi-disciplinary (biophysical) approach was adopted for habitat mapping following two pilot projects; the Creston Wildlife Pilot project in 1973, and the Springbrook-Biophysical Pilot project in 1975. Early biophysical projects were conducted with independent field teams in the separate disciplines and products were oriented to multiple users.

Terrain, soils vegetation and wildlife units were set up as an arm of the ELUC Secretariat under the Resource Analysis Unit (later the Resource Analysis Branch). In 1979 the Inventory Section of the Fish and Wildlife Branch was transferred to the Resource Analysis Branch and amalgamated with the Fish and Wildlife inventory units there.

In 1984 a multi-disciplinary group, the Habitat Inventory Section, containing elements from the various units was set up to focus on wildlife habitat. Nationally, loose coordination between provincial and federal interests in ecological land classification in Canada, is done through the Canada Committee on Ecological Land Classification. Methodologies for data collection were standardized by the Ministries of Forests and Environment in 1981 with the publication "Describing Ecosystems in the Field". This standardization was continued in 1985 when the Ministry of Environment adopted the Ministry of Forests Vegetation zonation system (biogeoclimatic zones and subzones).

To describe and map habitat requires understanding of biophysical characteristics from a range of disciplines including: surficial geology, soils, climatology, plant ecology and wildlife biology. Thus, it is necessary to have specialized teams to carry out biophysically based habitat inventory. Several themes are evolving as standard products of biophysical inventory. These include a habitat map which combines terrain, soil and vegetation information as well as depicting existing productivity of the land (suitability) and potential production (capability).

Several publications have resulted from this approach including: Describing Ecosystems in the Field; Forage Capability Classification for B.C.;. Wildlife Capability Classification for B.C. and Data Entry procedures for Ecosystem Description Forms: Wildlife.

Habitat mapping projects have been conducted at several scales to serve different purposes.

Species specific or combined species habitat characteristics, resource capability and suitability can be interpreted from the biophysical information base at various scales as demand dictates.

Ecologically based (biophysical) mapping is completed or underway at scales of 1:50,000-1:250,000 for approximately one quarter of the province. This mapping is interpreted and results in habitat, capability and suitability maps for wildlife.

Attempts have been made to simplify habitat mapping through the use of available detailed forest cover inventory. Some areas have been digitized and coloured maps can be generated for habitat characteristics interpretation through automated mapping systems. Unfortunately forest cover alone often does not give a good indication of wildlife habitat characteristics.

The Wildlife Branch is making ecological habitat classification and mapping, central to the management of wildlife species and their habitat.

The following table summarizes scales of endeavor, type of map and some of the current uses of the inventory.

Table 1 WILDLIFE HABITAT MAPPING SUMMARY (from Pendergast 1992)

SCALE	TYPE OF MAP	SOME USES
1:5,000 1:20,000	Habitat Unit Classification Capability & Suitability	- operational planning - Habitat enhancement - Habitat protection - Coordinated resource planning
1:50,000 Biophysical	Habitat Unit Classification and capabilitynd and suitability ratings areas for ungulates	- Subregional plans - Habitat protection - Selecting enhancement - Coordinated resource plans - Census stratification
1:250,000 Biophysical	Habitat Units and capability and suitability ratings	- Broad Scale planning - Census stratification

1:500,000 Biophysical	(Biogeoclimatic units) General capability	- Regional Planning (general) - Census estimates
1:2,000,000	Ecoregions	- Provincial Resource Planning, Strategic Planning

Users of wildlife habitat (biophysical) inventory include: a diverse range of resource industries, government agency land use planners and resource managers and public interest groups. The intensity of use of this inventory appears to be increasing as more areas of the province are completed.

The following summarizes status of wildlife habitat (biophysical) inventory in the province (for detail see Inventory Summary Map and detailed description forms).

1:2,000,000 Ecoregion & 1:500,000 Ecoregion/Subzone Mapping

- Completed for the entire province

1:250,000 Wildlife Habitat (Biophysical) – Preliminary

- Preliminary biophysical mapping based on existing information such as biogeoclimatic zones, ecoregions, topography, soils, forest cover and landsat. This type of mapping began in 1990-91 to be used for TSA planning and is adequate only for interim use while field data supported mapping is underway.
- Mapping covers large portions of south/central B.C. areas along the southeast border with Alberta and a portion surrounding Williston Lake.

1:250,000 Wildlife Habitat (Biophysical) – Field Verified

- Biophysical mapping based on fieldwork, and has higher degrees of accuracy than the preliminary 1:250,000.
- Mapping is based on analysis of existing information and surficial geology soils, vegetation and wildlife information collected in the field by multidisciplinary teams.

1:50,000 Wildlife Habitat (Biophysical)

- Mapping is based on analysis of existing information and surficial geology, soils, vegetation and wildlife information collected in the field by multidisciplinary teams. Portions of the province have been mapped using this scale and method.

1:50,000 Wildlife Capability

- Mapping which reflects wildlife capability characteristics, in general; primarily has a habitat mapping basis, although some are based on soils and vegetation zonation mapping.

1:5,000 to 1:50,000 Wildlife Habitat-Special Studies

- Vary widely in scale, and data collection as well as product. The definition of this "Habitat Mapping" has been wide to include all sorts of habitat-type mapping from vegetation maps to avalanche paths to strictly habitat mapping with wildlife capability, and suitability interpretations. This includes a series of 14, 1:5,000 estuary maps. Most of these studies were carried out to help resolve specific conflicts and land use planning issues.

3.0 IDENTIFICATION OF DATA REQUIREMENTS AND NEEDS

The following data requirements and identified needs for both Range and Wildlife Habitat Inventory are derived from a number of sources including: task force workshop presentations and deliberations, consultation and interviews with those carrying out inventories and resource managers, published technical materials (see references) and some inventory user contact.

The following table summarizes data requirements and needs as determined at the task force workshop.

TABLE 2 EXAMPLE SUMMARY REQUIREMENTS AND NEEDS (FROM TASK FORCE WORK SHOP)

WILDLIFE HABITAT	RANGE
1:2,000,000 Provincial Planning Overview, Biogeoclimatic zone mapping, ecoregion mapping. **Data Requirement** Biogeoclimatic zones, ecoregions.	**1:2,000,000** Range resource strategic planning, range resource planning, range boundaries, livestock stocking rate, weed areas, range resource values. **Data Requirement** —
1:500,000 (Provincial Scale) General regional planning, population estimates (apply to all scales except 1:5,000), regional admin. Management, integrated management planning, international planning, biogeoclimatic subzone mapping. **Data Requirements** Biogeoclimatic subzone, ecoregions.	**1:500,000 (Provincial Scale)** Range units, bio control releases, infested and infestable areas, range resource values. **Data Requirements** —
1:250,000 (Regional Scale) Broad scale planning & TSA planning, GIS prototype project, Provincial Standard (TRIM), integrated management planning issues, regional administration management.	**1:250,000 (Regional Scale)** Range resource planning, resource emphasis development, administrative management overview, TSA planning, biogeoclimatic subzone mapping for site identification & interpretation, range and nonrange areas, range

Data Requirements Subzone variants, ecosection restructured 1:250,000 mapping, equivalent of baseline thematic mapping (interpretation of satellite imagery), broad habitat classes, suitability and capability mapping.	resource values, presence/and absence mapping **Data Requirement** Same as 1:500,000, net authorized AUM's.

1:100,000 Similar to 1:50,000. **Data Requirement** Similar to 1:50,000.	**1:100,000** Similar to 1:50,000. **Data Requirement** Similar to 1:50,000.
1:50,000 Subregional plans, regional planning, habitat protection and management, selecting enhancement areas, coordinated resource plans, local resource management plans, census stratification, mapping sensitive & critical areas that map out at 1:50,000, rare and sensitive species and ecosystems (elements). **Data Requirement** Ecoregions, biogeoclimatic subzone variants-habitat classes, soils, terrain, wildlife field data capability, suitability, potential for enhancement, equivalent of baseline thematic mapping (interpretation of satellite imagery).	**1:50,000** Weed spray sites, LRUP, CRMP (subunit planning) license and permit planning, utilization zones, range sites, bio release sites. **Data Requirement** Weed spray record, range plant communities, wetlands.

1:20,000 Same points as 1:5,000, sensitive and critical habitats that map out at 1:20,000 scale, framework for more detail survey (TRIM standards). **Data Requirement** Bathymitry, water chemistry, better info on non-forested areas on forest cover maps, repeat of 1:50,000 data requirements, land status, TRIM mapping, aquatic weed distribution, more ecological based forest types. Ecoregions, biogeoclimatic subzone variants-habitat classes, soils, terrain, wildlife field data capability, suitability, potential for enhancement.	**1:20,000** Utilization zones, admin. Boundaries, weed spray areas, improvements, community pastures, grazing lease tenure management, general range types (LRUP, CRMP), vegetation sample locations, vegetation mapping to differentiate veg. Types, sensitive areas, bio-control release sites. **Data Requirement** Better typing of forest types, especially Crown closure, better mapping of non-forest areas on forest cover range plant communities.
1:5,000 Operational planning, habitat enhancement, protection for rare and endangered species, property acquisition, small sensitive and critical habitat ie: shorezone, wetland. **Data Requirement** Tidal patterns for estuary/shorezone, more detailed forest information (cruise data etc.), site level habitat information, detailed data for terrain, soils, vegetation, wildlife.	**1:5,000** Lease management, maps and plans (Generally at 1:20,000) intensive range improvements (not commonly done). **Data Requirement** —

3. 1 RANGE

It is apparent from this review that two different focal points exist with respect to range inventory; both of which are vital to effective land management and represent basic requirements to satisfy the Ministry of Forests mandate under the Forest Act. They are:

- a cultural (improvements) inventory; and
- a forage resource (range ecosystem) inventory

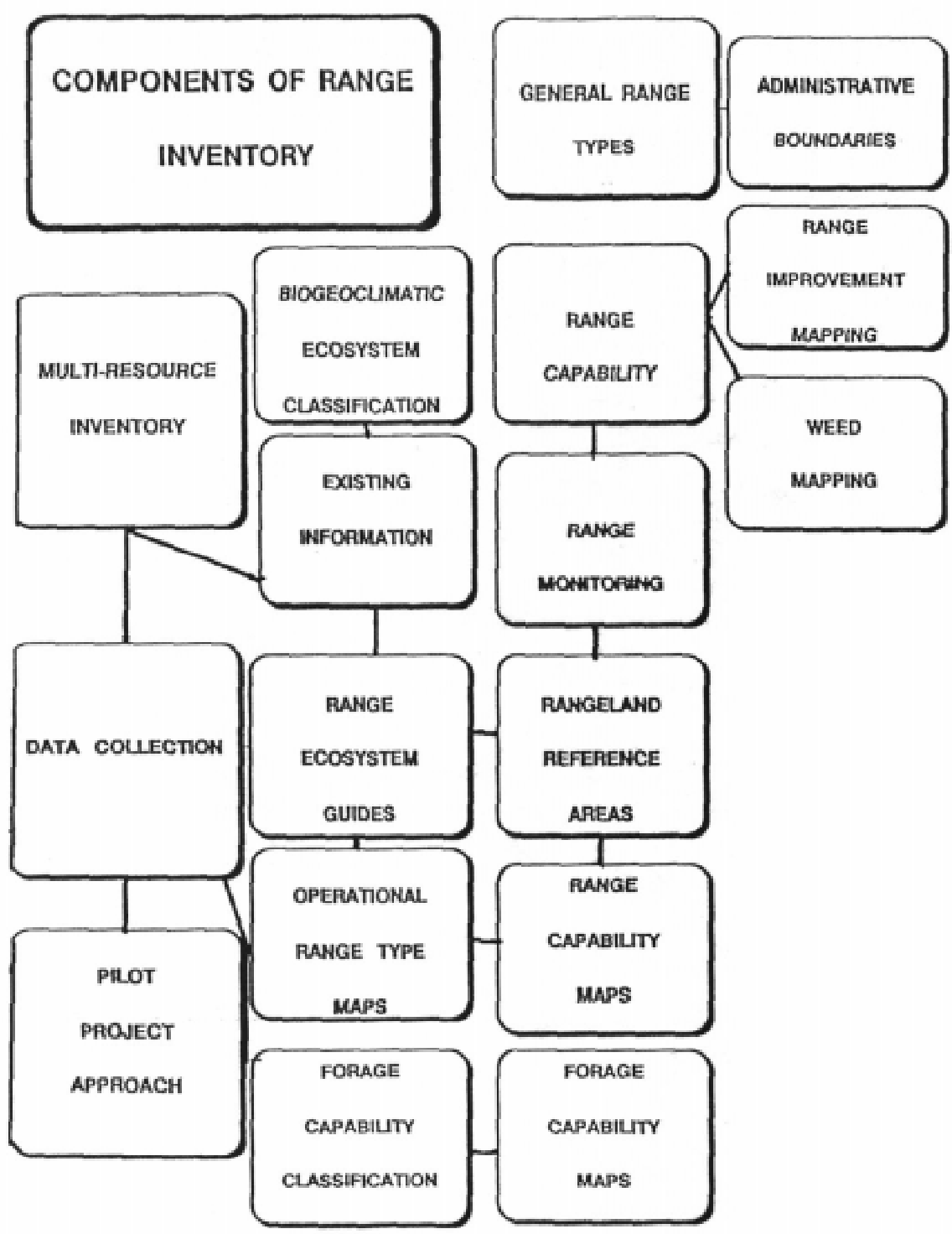
The interpretation of what "range" is, impacts on data requirements. The interpretation of range as forage for domestic livestock vs. the wider interpretation implied in legislation, of forage for domestic livestock and wildlife affects the data requirements.

Figure 1 "Components of Range Inventory" provides a proposed comprehensive framework for an integrated approach to range inventory and places in an overall context, data requirements needs and potential needs.

There are strong differences of opinion amongst range management professionals and inventory users regarding the kinds of range inventory and data required for various levels of resource management and planning. One area of clear consensus is the need for weed mapping, that is mapping of occurrence infestation leading edges for provincial and local containment strategic planning.

Core data requirements for cultural inventory include: legal base, access, administrative boundaries (range unit etc.), water developments, fencing location and other infrastructure facilities. Provision for regular updating is required.

Figure 1



From Erickson 1992

Focus data requirements for forage resource (range ecosystem) inventory include vegetation (biogeoclimatic oriented), location of permanent transects, exclosures and bench marks. There are differing opinions on direct need for forage productivity interpretation and associated vegetation community groupings and other biophysical inventory such as surficial geology, soils, climate etc.

The need has been established for a Range Manual (currently being prepared) including a chapter on range inventory.

With respect to needs, in general, it is apparent that requirements for different purposes are quite diverse, however they include:

- ± 1:100,00, 1:250,000 to 1:2,000,000 (roll up) of range ecosystem values (High, Moderate and Low values) for provincial and regional resource planning, land use strategy, resource emphasis development and resource management area planning.
- ± 1:20,000-1:50,000 priority focus on cultural inventory and range ecosystem inventory in priority areas (primarily oriented to land use conflict resolution). Questionable need for productivity information.

The following is a summary of experiences in other jurisdictions (U.S., Alberta and Saskatchewan).

In the U.S., the Bureau of Land Management developed and implemented a detailed range inventory methodology, which was subsequently not used by field staff (it is reported that costs were a major factor). Since then a generalized field guide approach has been developed. The USFS approach is reported to vary with Region - from utilization check approach to an ecological approach and combinations of both.

Alberta has a generalized form of range assessment oriented to range site, range condition and stocking rate referenced to a handbook. AFS has established exclosures on rangeland reference areas, that are currently being classified into ecoregions and community types. Alberta Lands have undertaken a program focused on benchmark sites, which are then classified into community types. Both programs include long term forage productivity data collection through annual clipping.

Saskatchewan is currently reviewing its approach to range inventory and is considering an approach similar to Alberta. To date they use a modified land capability for agriculture system.

These experiences are useful and help to show that caution must be used in direct application to B.C. range inventory needs.

Estimated costs of range inventory are as follows:

Cost/Map Sheet			
	Forage (Range Ecosystem) Inventory	**Cultural (Improvement) Inventory**	**Weed Inventory**
± 1:250,000	$ –	$ –	$ –
± 1:50,000	$ –	$ –	$ –
± 1:30,000	$ –	$ –	$ 5,400.
± 1: 20, 000	$ 10,000	$ 4,000	$ –
(Cranbrook Project)			

3.2 WILDLIFE HABITAT

There is general agreement on the high value of biophysical habitat inventory for effective input to land use planning and resource management. This is particularly so with small scale biophysical mapping, but applies to larger scale priority area mapping as well, in areas of high land use conflict or high wildlife and biodiversity values.

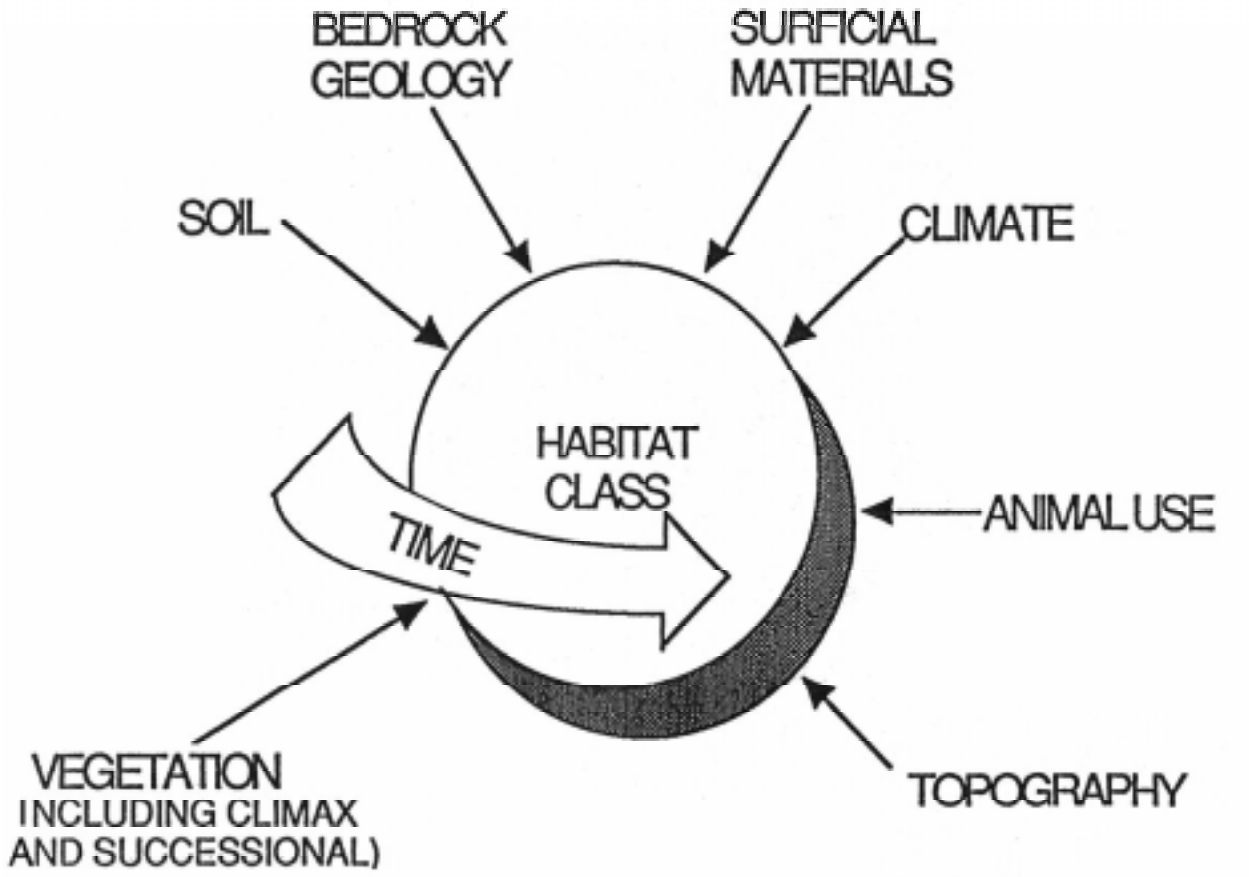
Core data requirements for biophysical wildlife habitat inventory, as outlined in Figure 2, provide the basic ecological framework for multi-species habitat inventory. This includes inventory information on bedrock geology, surficial geology, soils, vegetation (climax and successional), climate and wildlife ecology.

Needs are focused on completing small scale coverage of biophysical habitat mapping (1:250,000) and meeting demand for larger scale mapping (1:50,000 and larger) for priority areas.

Figure 3 outlines the approach to multi-disciplinary biophysical habitat inventory.

Table 3 outlines Biophysical Habitat Inventory completed, and per map sheet cost for completion at various scales of inventory intensity.

Figure 2



PARAMETERS THAT ARE USED TO DEFINE HABITAT CLASSES

From Lea, March 1992

Figure 3 Biophysical Habitat Mapping Flow Chart (multi-disciplinary team approach)(After Fenger 1985)

Each step leads to the next, quality and reliability hinge on how well the preceding tasks were carried out.

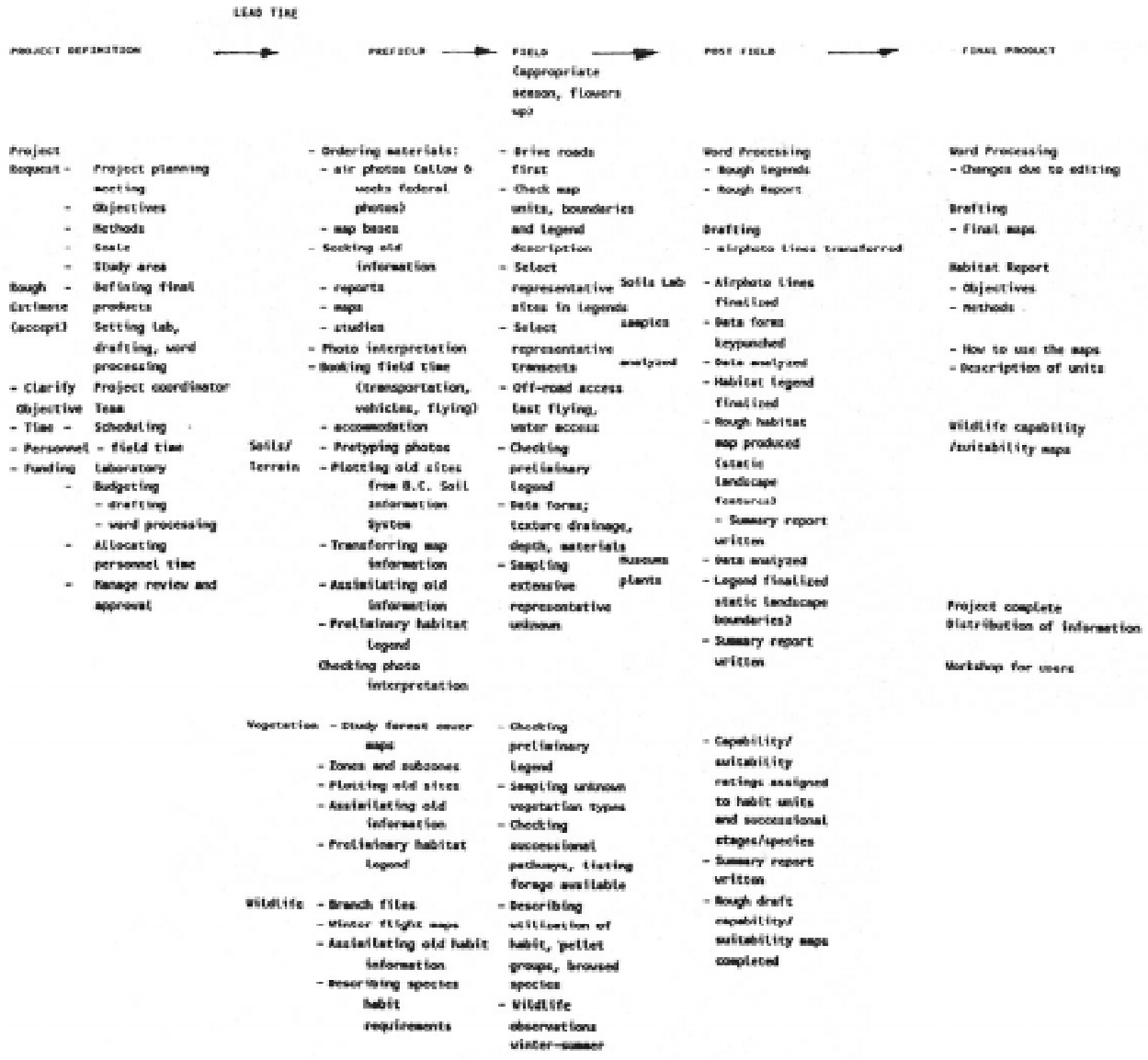


Table 3 Biophysical (Habitat) Inventory Completed, Estimate of Area Need and Cost

	Area Completed	Estimate of Area Needed	Cost Million $	*Cost per map sht. Thousand $
1:2,000,000 Ecoregions	entire Province	completed	–	–
1:500,000 Ecoregions/ subzones	entire Province	completed	–	–
1:250,000 Preliminary Biophysical (Done with existing data)	8 map sheets 13% of Province	14 map sheets 22% of Province	0.4	15
1:250,000 Biophysical	10 map sheets 16% of Province	32 map sheets 50% of Province	4.8	100-150
1:50,000 Biophysical	130 map sheets 12% of Province	230 map sheets 21% of Province	8.6	25-50
		Province		
1:5,000-1:20,000 (operational)	20 map sheets <1% of Province	140 map sheets 2% of Province	5.3	25-50
* Cost varies with ease of access and size of project area (unit costs are less in large project areas)				

Experience elsewhere (U.S. and Canada) suggests the biophysical (habitat) inventory is a rational one; although expensive at large scales. The opportunity to integrate with the national ecological land classification system also provides an option for improving habitat inventory. In addition, the biophysical inventory can be interpreted for other purposes and uses associated with land use planning and resource management.

4.0 INVENTORY STRATEGIES

The following strategies and recommendations focus on the two basic questions posed by the Resource Inventory Committee to all Task Forces, that is:

1) What information is vital for effective land management, at what levels of detail and for what purposes?

2) How can this information most efficiently be acquired in a manner that minimizes duplication, promotes cooperative data collection, and encourages broad application and long term relevance?

In addition and related to the above, as per Task Force terms of reference, we recommend strategies required for more accurate and cost effective integrated Range Ecosystem and Wildlife Biophysical Habitat Inventories. Obviously the range cultural inventory component is of interest to livestock range interests only.

It is key that, for both range and wildlife habitat, the inventories be "user" driven and that inventory approach, level of management and inventory products be monitored by the user communities and adjustments made to meet the changing demands for cost effective integrated practical inventory information.

4. 1 RANGE

4.11 What is Range?

A decision is necessary as to whether range is all inclusive, as implied in the legislation "producing forage for livestock and wildlife" or the narrower interpretation of forage for domestic livestock only. This is interpreted differently in different regions. This effects the provincial approach to range inventory specifically, and the opportunity for integration with other inventory initiatives.

We recommend the broader interpretation "forage for livestock and wildlife" and subsequent inventory strategies are made based on this interpretation

4.12 Use of Existing Inventory and Inventory Information Systems

FIR is user friendly for range inventory purposes, but for operational management some enhancements should be made for interpreting range ecosystems, forage production capacity and range condition. Every effort should be made to improve the usability of this system for range resource planning and management at appropriate levels of detail.

The Range Improvement System (RIS) data base, which was developed for storage and retrieval of attributes associated with range improvement projects, has had mixed support, due to lag time for request which reduces the systems utility.

Every opportunity should be taken to integrate. It is suggested that, for example, it may be possible to incorporate RIS information into the Forest Tenure Administration System (FTAS) and improve inventory product delivery. This is but one example of efficiencies that might be effected through re-examination by data system professionals.

Don't lose site of older hard copy inventory - general applicability may still hold. Take advantage of existing information wherever possible rather than gathering new information.

4.13 Necessity of Two Range Inventory Components

We are persuaded that for resource management and land use planning purposes, consideration must be given to both the range cultural (improvements) inventory and the forage resource (range ecosystem) inventory. Emphasis on an individual component or a combination of the inventory will depend on scale and purpose.

4.14 Improved Ecological Basis for GRT'S

Through use of biophysical inventory, or some other means, attempts should be made to place GRT's on a firmer ecological base.

4.15 Field Guide/Range Manual Approach

The operational ecosystem field guide and range manual approach, including inventory sections, should be encouraged. This is a most important contributor to the use and understanding of inventory.

4.16 Array of Needs

It is suggested that a range inventory must accommodate the array of needs, from provincial small scale for range (forage) value (High, Moderate and Low) to provision for site specific field guide information on plant associations or communities. One specific need which warrants priority attention is weed mapping, from the small scale provincial strategic perspective, as well as, site specific location and "leading edge" of infestation mapping.

4.17 Range Productivity

There is considerable ambivalence about the importance of range productivity inventory. With reported high seasonal variation and low predictability and interpretation, it is questionable as to whether costs of range productivity determination and mapping, excepting in broad groupings (small scale), can be justified.

4.18 Standards and Procedures

It is imperative that provincially correlated range inventory standards and procedures be implemented to effect consistency in approaches and product delivery, yet provide regional flexibility.

4.19 Range Ecosystem Classification

Complete the East Kootenay pilot project to further test classification system options and mapping methodology.

4.2 WILDLIFE HABITAT (BIOPHYSICAL) INVENTORY

4.21 Demand for Inventory (Larger Scale and Greater Area Coverage)

The demand for Biophysical (Habitat) Inventory at various scales is accelerating. Demand is associated with regional wildlife program initiatives, as well as other resource management and land use planning tasks. Linkages with other inventory programs utilizing or providing biophysical information will be critical to meeting this demand in a timely fashion (eg: Timber Inventory).

4.22 Standards and Procedures

There is some user interpretation difficulty due to lack of inventory standards and procedures. To ensure compatibility of products correlation, mapping standards and procedures utilizing the "Draft Biophysical Habitat Mapping Methodology" as a base to start from is required.

4.23 Map Production, Geographic Information System and Data Systems

Current limited access to the above necessities are being partly met through a current issue paper. However, cooperative arrangements with other agencies should also be pursued (eg: Crown Lands and ministry of Forests), for an effective inventory program Mapping standards should be carefully correlated through Crown Lands for all agencies.

4.24 Access to Biophysical Inventory Information

Consideration should be given to a geo-referenced cataloguing system, identifying all sources of biophysical information, to take advantage of existing inventory. This may well lead to shorter time frames for habitat capability and suitability interpretation.

4.25 Special Areas Search (1:250,000 Scale)

In terms of identifying critical special habitats from a provincial and regional perspective, it is imperative that completion of the 1:250,000 biophysical habitat mapping be finished as rapidly as possible, to set an informed framework. This is particularly true in the northern half of the province.

4.26 Large Scale Habitat Inventory Priorities (<1:20,000 Scale)

Our interviews suggest that a method for determining large scale habitat inventory priorities should be refined.

4.3 INVENTORY INTEGRATION OPPORTUNITY

Inventory costs of the future will demand every integrative step possible be taken. There is most significant sympathy for integration and coordinating inventory regionally. Options for integration are significant and have already been initiated with, for example, the Procedures for Environmental Monitoring in Range and Wildlife Habitat Management. A focal point for developing range/wildlife habitat inventory integration mechanisms is the common interest in ecosystem classification.

The joint use of biogeoclimatic, biophysical and ecological classifications as bases for ecosystem classification should be the first step in effecting integration.

Continuing organized dialogue between practising inventory professionals in both agencies, with support from executives of both agencies and RIC will be critical if practical cost effective inventory integration is to take place in the future. Inter-agency secondment to link perspectives and approaches should be initiated at the first opportunity.

4.31 Inventory Data Storage and Retrieval System

A common data storage and retrieval system for biophysical habitat and range ecosystem component of range inventory and research data should be shared between these two agencies and perhaps others, such as the biogeoclimatic classification group in the Forest Service.

4.32 Biogeoclimatic Ecosystem Classification and Ecoregions (Biophysical) Approach (Partners in Inventory)

The linkages are practical in our opinion, beneficial and complimentary to both approaches. Both systems can be used to best advantage for specific tasks, yet shared use of classification and inventory information resulting is a must. Methods of direct linkage and shared use must be pursued by professionals involved in inventory and classification. Perhaps prototypes at various scales would test compatibility and provide an integration opportunity field reality check. We need examples of what can be done on an integrated comprehensive approach.

*NOTE: With respect to both 4.31 and 4.32 consideration should be given to a multi-agency protocol agreement.

4.33 Shared Use of Biophysical Inventory

Where biophysical inventory information is now available or where future inventory is planned, opportunity to share inventory initiatives and use should be encouraged. For consistency, the more resource agencies using the same ecologically based inventory information the easier integrated planning and resource management will be.

4.33 Integration with Large Scale PHSP Mapping Initiatives

This detailed land resource information should be shared with other resource agencies, perhaps through GIS systems.

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