ANNUAL PROGRESS AND STATUS REPORT

WILDLIFE SECTOR, CANADA LAND INVENTORY, ARDA

WESTERN REGION

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TABLE OF CONTENTS:

Introduction:

The following discussions will deal with all three sections of the wildlife sector presently engaged in the inventory, that is waterfowl, sport fisheries and ungulates.

Since the inventory was first staffed and initiated, it has been continually evolving in scope, methodology and priorities. The original wildlife inventory was to consist of a white tail deer capability classification and a waterfowl classification both to be shown on one set of maps. At present, a separate classification is being carried out for waterfowl and the "whitetail deer" classification has been expanded to include all indigenous ungulate species. Both waterfowl and ungulate classifications will be published on separate maps.

In addition, funds for a Sport Fisheries capability inventory have been made available, a classification framework devised, and work started to implement the program in two provinces. This is a marked contrast from the whitetail-waterfowl-basis of classification first conceived for the w ldlife section. In fact, the wildlife sector has received a great deal of attention in the Canada Land Inventory program. Personnel engaged in the wildlife sector have responded by producing maps at a rate that has made this sector one of the most productive in the Canada Land Inventory (CLI). This is particularly true of the wildlife sector in Western Canada.

This past year has been characterized by a rapidly changing status of provincial inventory in the west. Staff turnovers in Alberta and Saskatchewan have raised serious problems for ungulate programs in these

provinces. Appendix A is a list of present staff engaged in the inventory in Western Canada.

In general, the Canada Land Inventory in Western Canada has made outstanding progress in this past year. Contributing to better communication both inter and intra provincially has been the appointment of inventory co-ordinators in Saskatchewan, Alberta, and Manitoba. The importance of vigorous co-ordination at the provincial level is evidenced by the progress and leadership in the utilization of inventory results by British Columbia where an inventory co-ordinator has been active for several years.

Recent Developments:

Two significant developments within the past year have been the extension of inventory boundaries in Alberta and British Columbia, and the extension of the inventory time period from March 31, 1970 to March 31st, 1971.

The total area to be mapped in Western Canada now consists of approximately 660,000 square miles which represents 114 1: 250,000 scale map sheets (or portions thereof) for publication and public distribution by each sector. (See map #1) Although there has been a significant increase in area to be covered in Alberta and B. C., the Waterfowl programs are still scheduled for their original completion dates. The time extension recently announced, however, will be a boon to the ungulate inventory in Alberta and Saskatchewan and to the Sports Fisheries inventory which is presently in the formative stages in B. C., Alberta and Saskatchewan.

Other developments include the transfer of the position of the regional wildlife co-ordinator to the ARDA regional office in Winnipeg.

The appointment of inventory co-ordinators within the provincial ARDA directorates in Saskatchewan and Alberta this past year has resulted in renewed interest and co-operation among Federal and Provincial personnel in various sectors in these provinces.

The establishment of a map and data repository in British Columbia has instigated a similar project in Alberta. A renewed provincial interest in the inventory and utilization of results lends optimism to the idea of integrated land use planning and resource programs at provincial levels encompassing areas not formally designated as Rural Development areas.

There is evidence that land use adjustment and soil and water conservation programs are required throughout the settled portions of the various provinces. The efficacy of ARDA depends on developments concurrent in all areas of the province, and not restricted to discrete rural areas. In fact, there is evidence that areas in need of ARDA resource adjustments are not necessarily well defined units, but occur as pockets throughout the agriculture and fringe areas of Canada.

Wildlife and Rural Development Programs:

The advent of a comprehensive rural development plan under the fund for Rural Economic Development (FRED) in the inter-lake region of Manitoba has abruptly brought into focus the necessity for increased co-ordination to include wildlife developments with other resource development programs. The Edson Rural Development area in Alberta is

yet largely in the planning stage of a comprehensive development plan. There has been activity on the part of a local committee, a provincial biologist and the regional wildlife co-ordinator to initiate proposals and plans for development of the wildlife resource in this area. A report prepared by the Regional Wildlife Co-ordinator is attached (Appendix B) as an example of the type of measures deemed necessary for a wildlife involvement in the rural development program. Unfortunately, very little progress on the report recommendations was made following its' preparation. The reasons for this are largely unknown, but provincial initiative and interest at senior levels was lacking, and Federal ARDA officials did not engage in extensive discussion of the matter. One unfortunate aspect of this matter is the frustration of efforts by the local (Edson) wildlife and recreation committee to support such a program. It is apparent, however, that the inclusion of wildlife developments and alternative uses of marginal farmland for wildlife production should be made under certain circumstances, and wildlife considered on an equal footing with other resources. The prime requisite for viable programs of this nature are vigorous initiative on the part of provincial wildlife agencies working through the Wildlife Co-ordinator and the provincial ARDA directorate. Lacking initiative at senior levels in the provincial framework negates the functioning of Federal personnel charged with the advisory and planning role for such developments.

In addition, close liaison and communication with the regional ARDA administration is a necessity. It is acknowledged that extensive communication was not maintained by the regional wildlife co-ordinator

while he was stationed in Edmonton and the regional ARDA office was in Regina and Winnipeg respectively.

Further ARDA and FRED developments which are proposed for B. C. and extensive areas of northern Alberta and Saskatchewan will require a great deal of time and planning on the part of the regional wildlife co-ordinator and provincial authorities if wildlife developments are to be part of these programs. If several rural development programs covering large areas are initiated and approved, it would necessitate a full time job for at least one man at the Federal level to adequately carry out the necessary planning and liaison to achieve the above mentioned goals. I can foresee the need for full time wildlife representatives concerned solely with development in each province if ARDA programs now being considered are effected and if provincial activities in the field of rural development are increased.

Regional Progress to Date:

Although preparation of map sheets at a 1: 50,000 scale for computer input is being carried out by the waterfowl and ungulate groups, progress is most meaningfully measured by 1: 250,000 map sheets which will be published. A total of 114 1: 250,000 sheets within the inventory area represents the initial preparation of approximately 3500 1: 50,000 half sheets by each group.

Table 1 illustrates regional progress for ungulates and waterfowl and their combined progress to depict sector progress as a whole.

Table # 1 Regional Mapping Progress

	Total 1: 250,000 Sheets	Total Completed To Date	% Inventory Completion
Waterfowl	114	57.5	50%
Ungulates	114	34.5	30%
Combined Ungulates & Waterfowl	228	93.0	40%

Table 2 shows a breakdown by province for each group. A slight variation in total ungulate maps in Saskatchewan a Manitoba is due to the fact that mapping boundaries for ungulates is based on provincial boundaries rather than map sheets.

Table 2 Wildlife Sector Progress by Province

		Total 1: 250,000 Sheets	Total Completed To Date	% Inventory Completion
Waterfowl	B.C.	41	26.5	65%
	Alta.	32	15	47%
	Sask.	24	9	38%
	Man.	17	7	41%
Ungulates	B.C.	41	18	44%
	Alta.	32	10.5	33%
	Sask.	24.5	3	13%
	Man.	16.5	3	18%

In preparation of the above tables and the appended maps an assumption was made that maps presently in preparation and due for completion on March 31st are considered completed. Of significance in the above tables is the relationship between total maps completed and percentage of inventory

completion. Note, for example, the relatively uniform percentages for waterfowl progress in the three prairie provinces when a variation of almost 50% in actual numbers of maps within the inventory exists. This serves to reiterate the degree of variability in detail and source data for mapping which can occur from province to province and is a direct function of the job to be done in the time available.

The appended maps portray the location and extent of progress for each group (Maps 2 and 3) and future program scheduling to the completion of the inventory (Maps 4 and 5).

Despite the extension of the inventory time period to 1971, a target date of March 31st, 1970 is being maintained for the waterfowl inventory and the B. C. Ungulate inventory. Due to disrupted programs and staffing problems specific scheduling for ungulate programs in Alberta and Saskatchewan (Map #5) to 1971 is not presently possible.

Waterfowl Inventory Progress:

As will be noted in table 1, 50% of the inventory has been completed to date. The mapping for waterfowl is progressing satisfactorily and systematically in all provinces. The inventory has benefited markedly from the continued participation of original staff.

Earlier problems of interpretation, setting of class units and parameters, and land versus water classes have been resolved. Matching of classification boundaries at provincial borders has been carried out to some extent (mainly Alberta and B.C.). Additional time matching map sheets will have to be spent by biologists in adjoining provinces in future.

Data collection additional to the inventory requirements has been

systematized primarily through the use of a card filing system and transcriptions of aerial survey tapes. A systematized methodology has been evolved to suit conditions prevailing within each province (this includes amount of area to be mapped as well as variations in terrain). Details of data collection and storage will be provided in a later section of this report.

Ungulate Inventory Progress:

Table 2 provides essential data on ungulate inventory progress. The progress of British Columbia has been outstanding to date. An experienced research crew under Mr. D. Blower, project leader, has made excellent progress. No major problems in scheduling or completion by the indicated target date are anticipated.

It should be noted that adjustments in scheduling du to a changing ARDA boundary were required following the establishment of the present boundary which is a sizable expansion of the original boundary shown in Map #1.

Maps have been produced on schedule in Alberta to date. However, the recent resignation of the project leader and transfer of a project biologist has curtailed most inventory activities at the pres nt time. A technician is presently engaged in draughting results on maps and producing completed 1: 250,000 sheets from existing 1: 50,000 base maps.

The Chief Biologist of Alberta is aware of the necessity of staffing the project quickly if adequate progress is to be made and if the schedule is to be adhered to. The province is presently looking for a qualified candidate to take over the project.

In my discussions with the chief biologist it has become clear that when a project leader is found, methodology and results of the program to date need to be reviewed. Many of the northern map sheets submitted recently have been based primarily on extrapolations of data collected for similar soils and land forms elsewhere. While this procedure is not bad in itself, it appears that undue emphasis has been placed on minor differences in soils with the result that capability units for some of these sheets are extremely small and numerous. It has been questioned whether discernable differences in capability significant to ungulates does, in fact, occur in these areas. I personally favor a review of the Alberta program initiated by the provincial wildlife branch as soon as possible. The acceptance and future usefulness of the program depends on their confidence in the results, and cognizance of the limitations of the inventory.

The foregoing problems are due in large part to the lack of a written record of events leading to the present inventory and the departure of those involved in its formative stages. The recent appointment of a new wildlife administration lacking the background of meetings and conferences leading to the inventory program has compounded this problem.

It will be necessary for the regional wildlife co-ordinator to take a very active role in orienting the new project leader when he is appointed as well as encouraging a rapid, and satisfactory solution to existing problems of priorities and methodologies.

The Saskatchewan ungulate inventory has produced one 1: 250,000 map sheet to date and two others are nearing completion. Serious problems similar to those found in Alberta face the program. In addition to the later entrance of Saskatchewan to the inventory, a rapid turnover of staff engaged

in the program has led to serious problems in maintaining continuity. The need for training and orientation of new staff has retarded the actual production of maps. Perhaps more serious is the lack of background of new personnel, which may result in inconsistent interpretations of field data and classification criteria. The recent resignation of the project leader from the provincial branch has left the program dependent on one inexperienced biologist and supporting staff.

Although maps may be produced under these circumstances, they cannot approach the quality of maps produced by a seasoned and experienced team. The nature of the Saskatchewan inventory in the past leads me to believe that a disjointed program will continue until the status of program is defined by the provincial wildlife administration and steps are taken to establish it on a more formal basis than at present. With the recent appointment of a new wildlife Director for the province, changes in emphasis or priorities may be forthcoming.

My general assessment is similar to that of the Alberta situation, that is, if the program is to be viable it must provide meaningful and useful information to the provincial Wildlife Branch.

The special arrangement of the CLI inventory unit in Manitoba has facilitated the rapid development of the ungulate program and has developed a spirit of purpose and co-operation among the various inventory sections. All sectors are housed in the same quarters which includes the inventory administrative staff headed by the provincial co-ordinator, Mr. M. MacKay. Much of the inventory work is being executed on a contractual basis. A well defined written agreement between the inventory group and the Wildlife

Branch spells out provincial requirements clearly. To date this system has worked very well and to the mutual satisfaction of all concerned.

Despite the fact that Manitoba entered the inventory at a late date, the ungulate group are well organized and have had a full survey crew in the field during the summer of 1967. The first two maps are due to be completed by March 31st and are presently on schedule. A third sheet (62-I) originally scheduled for completion March 31st has been delayed to September.

I have had an opportunity to view map sheets at a 1: 50,000 scale produced by the Manitoba group and these appear to be of high quality.

In summary, the progress of the ungulate inventory in Western Canada has been variable. Those provinces which were late in becoming involved in the program or have had staffing problems will benefit greatly from the extension of the inventory period to March 1971 if action to revitalize their programs is taken soon.

Sport Fisheries Inventory

The need for a sport fisheries capability inventory was recognized following the establishment of the other wildlife programs. This was due primarily to the need for information of this nature for the water-oriented outdoor recreation inventory. In addition, sport fishing in itself can be a major attraction of significant economic value in rural areas.

In 1965, limited funds ($236,000 for Western Canada) were made available for a sport fisheries inventory. A classification framework was developed by Dr. V. E. F. Solman of the Canadian Wildlife Service and subsequently modified by provincial fisheries biologists prior to its adoption

as a national framework.

Recent modifications have been proposed by Mr. T. Northcote of B.C. which result in a more meaningful rating of lakes in Alberta and B.C. These proposed modifications have been favorably received by Alberta personnel.

Although administration of the sport fisheries inventory is carried out by the recreation sector of the CLI, the wildlife co-ordinators are responsible for technical advice and co-ordination at provincial levels.

Manitoba is the only western province presently operational in the sport fisheries inventory. A team consisting of two permanent technicians plus two summer students is headed by Dr. Alex Fedoruk, project leader. As mentioned previously, the Manitoba inventory group have a unique and special relationship with each other. As a result, and due to the fact that inventory funds have not been earmarked in Manitoba, but are allotted as a lump sum, the sport fisheries inventory is not limited to its original allotment of $39,000. In fact, a very detailed and comprehensive program of inventory evaluation and classification of lakes within the ARDA boundary is being carried out. A great deal of limnological data is being obtained in addition to inventory requirements. These date include information on lake depth and morphometry, total dissolved solids, total dissolved oxygen, spot sampling for species distribution of fishes, and collection of plankton. This reflects the value placed on this information by the province. Although separate maps will not be published for the sport fisheries sector, the information will be utilized in several ways, particularly in the recreation inventory water ratings.

The other Western provinces have had great difficulty in getting their programs underway. Alberta has recently advertised a position for

the sport fisheries inventory and are anxious to get the program underway. Presently an analysis of lake and stream data in their files is being carried out by a technician on their staff. To date no candidate has been hired to devote full time to the inventory and the program remains fragmentary. It is anticipated, however, that preliminary analysis of existing data will be completed this winter and that a field season will be carried out during the summer of 1968.

If the presently advertised position is not filled, it is my understanding that contractual arrangements will be considered to carry out the program.

B.C. has been actively attempting to recruit a biologist to take charge of their inventory for some time. The Fish and Game branch is eager to carry out the inventory but have been unable to find a suitable candidate for the position. As a result the B.C. Wildlife and Recreation Inventory sub-committee were asked to consider letting the job out on a contractual basis. This has been done, and a private consulting firm has been awarded the contract. Work should get underway immediately.

Both B.C. and Alberta would like to carry out a comprehensive fisheries inventory similar to Manitoba, but are unable to do so because of limited funds. As a result, their programs must rely heavily on the collation and extrapolation of existing data with a minimum of field checking.

In summary, the sport fisheries inventory in Western Canada (with the exception of Manitoba) is still in the formative stages. A great deal of co-ordination will be required to bring this program to the level of the ungulate and waterfowl inventories. However, with the extension of the CLI completion date, sufficient time remains to carry out the program.

I cannot be optimistic that Saskatchewan will get a program underway.

They have been una le to obtain staff due to a poor salary structure and have indicated an unwillingness to have the work done by contract. During my two meetings with the Chief Fisheries biologist this past year there was no indication of progress or an early solution to the problem.

During my discussions with provincial fisheries administrators, on several occassions mention was made that insufficient funds were available to carry out a comprehensive inventory. I also feel that in many respects, funds are inadequate to carry out the type of survey desired. I would favor a thorough review of the sport fisheries program in the near future to determine specific financial needs with provincial personnel and to seek ways to strengthen these programs with additional funds.

Inventory Data Banks:

It has been recognized that although capability maps will be published at a 1: 250,000 scale, (1 inch = 4 miles) these maps are of a generalized nature primarily for administrative planning and public information. More detailed information exists on 1: 50,000 scale maps. In addition, a great deal of source data leading to these maps has been compiled by various agencies. The following discussion outlines the types and format of data available, and storage and handling of maps (particularly within the Canadian Wildlife Service).

1. ARDA Geo-information System

Data from all 1: 50,000 maps for all ARDA sectors is put on computer tape of the ARDA geo-information system at Ottawa. This input data consists of capability boundary and clas ification data as found on 1: 50,000 map sheets. Analyses of Wildlife and input information from other inventory sectors and combinations of these can be carried out. There is evidence,

however, that demands for computer time will limit the availability originally anticipated for the operation.

2. Provincial Computers:

In view of the volume of data and anticipated uses of inventory data for land use planning provincially, two provinces are setting up computer programs for their own use. Manitoba has already acquired a computer for this purpose and B.C. has firm plans to do so in the near future.

3. Provincial Map Repositories:

British Columbia has taken the lead in the establishment of a provincial map repository or library for the storage of maps at 1: 50,000 scales as well as other data and reports arising from the inventory. The impetus for a central repository was a result of the need for security of original manuscripts and to provide availability of data in a central location.

In addition it is anticipated that more use will be made of information that can be interpreted by someone familiar with the aims and results of the inventory. At present, the Alberta ARDA administration is in the process of establishing a map repository in Edmonton. It is anticipated that Manitoba will develop some storage system to complement their computer setup.

4. Western Region Waterfowl Map Repository: Canadian Wildlife Service

During the past year central map storage facilities were organized to house all completed waterfowl inventory maps for the Western region of the C.W.S. The purpose was to maintain security of original manuscript maps, to compile a central and comprehensive reference collection, and to enable central processing of requests for specified map sheets. In addition the use of

ARDA maps by the Canadian Wildlife Service lands section will be facilitated by this system.

The operation of the system (which is housed in the regional library and maintained by the librarian) is as follows: Manuscript 1: 50,000 maps are sent in as completed blocks (32-1: 50,000 to a 1: 250,000 block) by the field biologist. These are maps on a plastic base material which can produce ozalid prints. The plastic material is called "mylar" and map sheets are referred to as "mylar sepias". Various names given plastic base materials refer primarily to their weight and thickness.

A cheaper form of "paper" sepia which is also reproducible, is available. However, it's use for a permanent collection is not desirable as it is very susceptible to mutilation in handling and in the reproducing process.

Following receipt of the maps from the field they are filed in a special cabinet in the library. Requests for copies must be approved by the regional wildlife co-ordinator, and for outside agencies by the national wildlife co-ordinator. Within the Wildlife Service the Lands supervisor has free access to maps. When copies are required the maps are removed and ozalid prints are run off. The originals are promptly returned to the regional library.

This system is a very efficient method of storage and distribution of maps as only one copy on hand is required, and multiple copies can be produced while maintaining the originals.

There is no regional repository for ungulate maps as these are the property of the provinces responsible. Centralization of maps will occur in those provinces where provincial repositories have been established. In addition, map files are being maintained by ARDA biologists within each

province.

Data acquired by C.W.S. ARDA Biologists

Field data collected by the waterfowl sector is variable depending on the region and requirements of the individual biologist. However, standardization has been effected by the use of data cards which contain information on individual wetlands as well as surrounding areas. These data are obtained both by air and ground checks, and because of the nature of the ARDA inventory tend to be of the reconnaisance type. Some detailed water analyses are being carried out in B.C. and Manitoba where water conductivity readings are taken. This specific conductivity information can be interpreted as total dissolved solids in parts per million. In some cases specific ions are identified. Although minor variations occur (mainly in format) the data cards adopted generally contain the following information: exact marsh location, size, pothole type, approximate maximum depth, adjacent topography, dominant submergent and emergent vegetation, surrounding soil types and texture, emergent vegetation interspersion, importance to waterfowl (nesting, staging etc.) local information, and capability rating with subclass limitations listed.

In B.C., conductivity and pH readings are taken on all wetlands checked (which includes a large number accessible only by air). In Manitoba, two types of analyses are carried out - a general card for all wetlands checked and a more detailed card which is prepared for a few high quality wetlands on each major landform. Water analyses in Manitoba include a breakdown of total alkalinity, a determination of the sulphate ion concentration and pH.

Data such as the above are being systematically tabulated and provide a fund of wetland information on specific wetlands and areas in addition to capability map ratings.

In addition to biological information, an extensive air photo library is being accumulated in each provinces. These are available to other biologists at any time and will be useful for other purposes than the present survey.

The above sources of data taken singly may not be significant. However, the sum total of a systematic and comprehensive compilation of wetlands will be of great value when completed. The usefulness has already been apparent in many instances. Of interest has been the cataloguing of high quality wetlands outside of the "prairie pothole area" which has been the focus of so much activity and research on waterfowl. When all data from the present survey have been tabulated some vital analyses can be made of habitat quality and potential in our largely unknown northern areas which may loom greater in importance for waterfowl production in future.

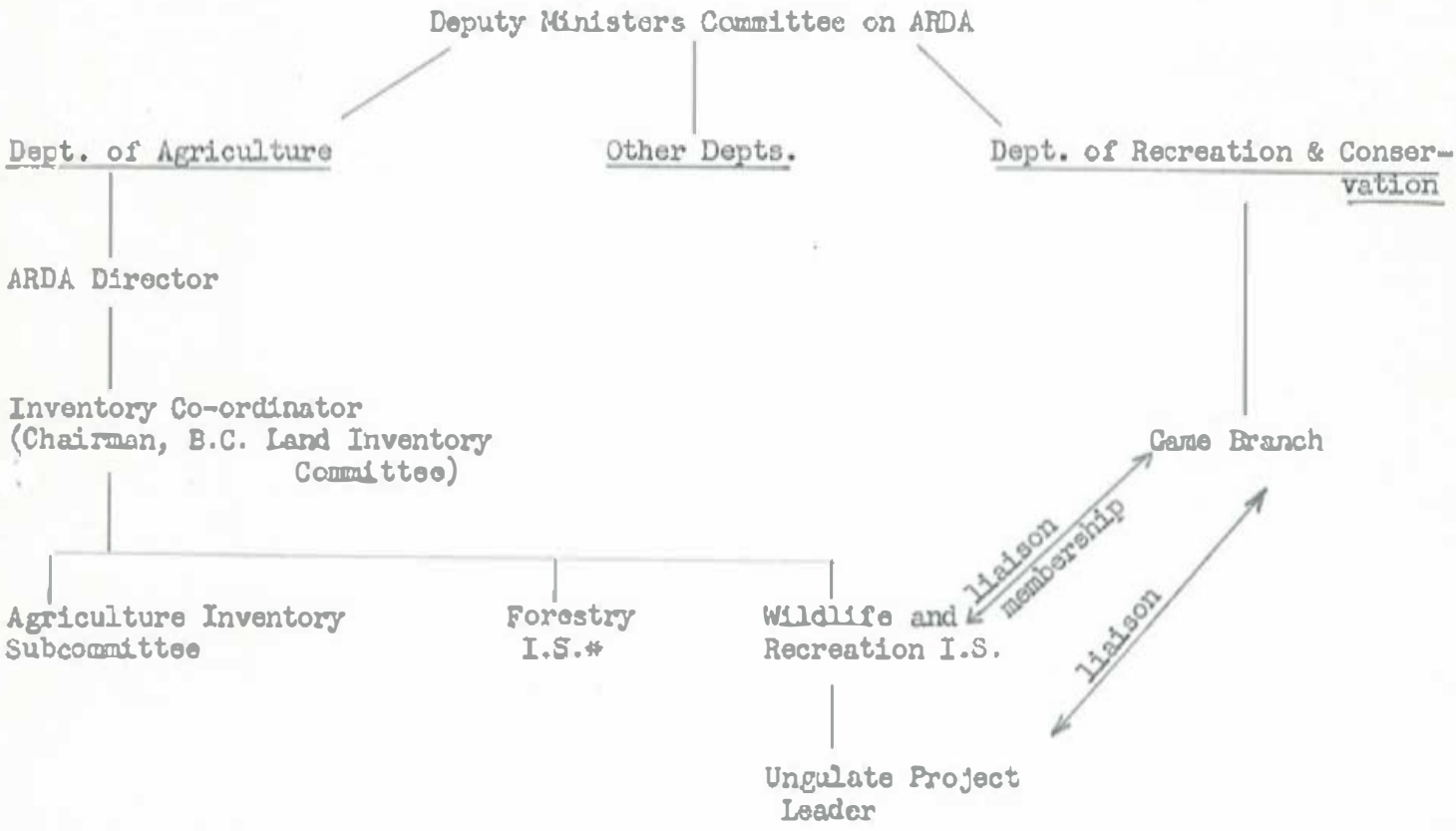
Regional Administrative Structures

General varying administrative frameworks exist within provincial ARDA administrations. The following descriptions briefly outline the relationships of wildlife inventory personnel to these agencies as well as provincial wildlife agencies.

1.) British Columbia: Administrative planning and financial control is exercised by the B.C. Wildlife and Recreation subcommittee on ARDA. This committee has membership from the B.C. Fish and Game branch, Parks Branch, Universities and the Canadian Wildlife Service and is chaired by Dr. P. J. Bandy of the Fish and Game branch. It reports to the B.C. Land Inventory

Committee which is chaired by the inventory co-ordinator for B.C. and consists of all B.C. inventory personnel plus members from agencies involved in the program.

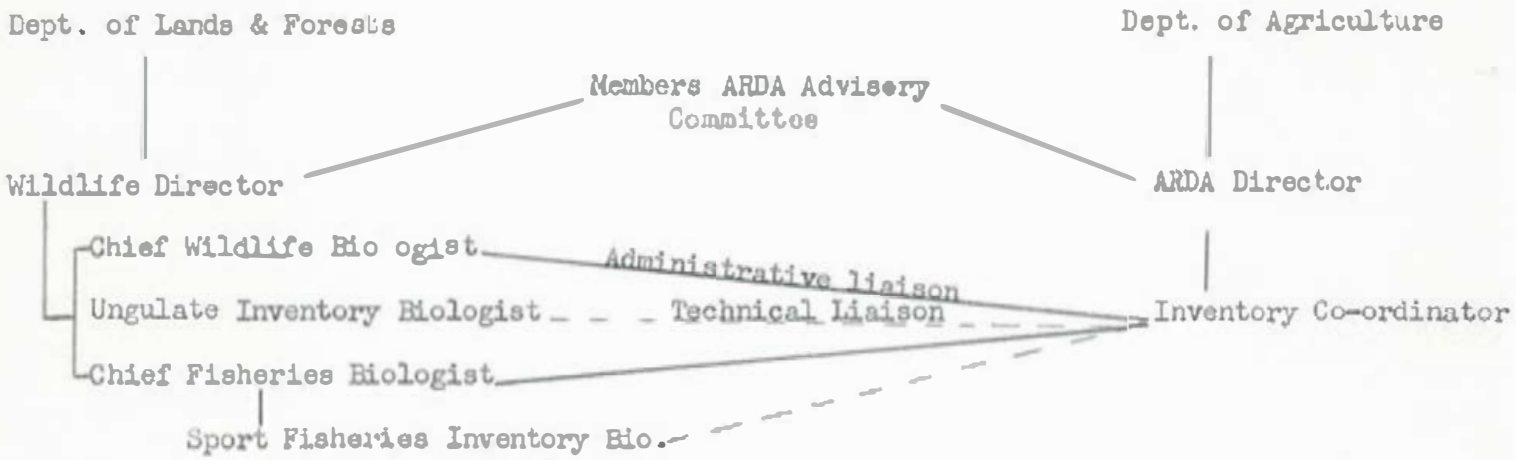
The ungulate inventory group is housed within Department of Agriculture (ARDA) offices and receives their administrative support services.



*Inventory Subcommittee

2.) Alberta: The ungulate and sport fisheries programs and personnel are contained within the Fish and Wildlife Division and supervision is exercised through their regular administrative channels. Budgeting and financial support for the program results from the Chief Biologist working through the provincial inventory co-ordinator (Dept. of Agriculture).

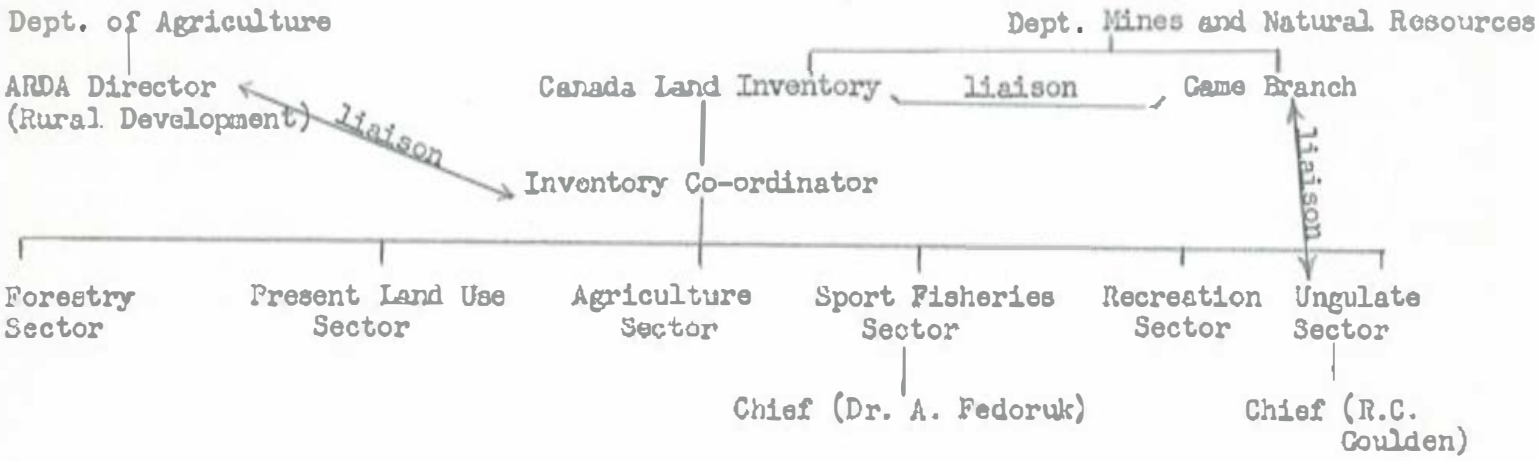
At senior levels, the Director of Wildlife is a member along with other branch Directors of an ARDA advisory Committee which reviews all ARDA proposals, budgets and programs and makes recommendations to the Deputy Minister responsible for ARDA. This committee is chaired by the ARDA Director.



3.) Saskatchewan: The ungulate inventory group is contained within the provincial wildlife branch and supervision is exercised by the Chief Wildlife Biologist. To date, liaison with the ARDA administration has been mainly at the level of the assistant Director of Wildlife and the provincial ARDA Director (more recent y the newly appointed Inventory Co-ordinator). This liaison has been primarily involved with financial matters rather than program development or planning.

4.) Manitoba: The CIJ administrative structure in Manitoba is in my opinion the best in Canada to serve the needs of the present inventory as well as

for planning leading to implementation of results in future. While the rural development administration falls within the Department of Agriculture, all CLI sectors exist as a separate group within the Department of Mines and Natural Resources. This multi-disciplined group of ARDA personnel are housed in the same quarters complete with administrative services and personnel. Weekly meetings chaired by the inventory co-ordinator are a regular feature. Budgeting and planning functions are carried out by this administration. The involvement of the provincial Wildlife Branch is only to review results of the ungulate program prior to their submission to Ottawa for publication. A written agreement between the Director of Wildlife and the inventory co-ordinator ensures a clear understanding of provincial wildlife requirements and the responsibilities of the inventory group methodologies etc. Although this administrative setup is not the only way to achieve liaison and communication necessary to the inventory, it is very effective and could well serve as a model for other provinces to consider.



At present, the regional wildlife co-ordinator functions as the ARDA supervisor within the regional framework of the Canadian Wildlife Service. He also acts as a functional supervisor and technical advisor to provincial ungulate and sport fisheries personnel. The foregoing descriptions clarify the variability of administrations dealt with by the regional co-ordinator and serve to explain why in some cased close liaison exists between the co-ordinator and provincial Chief biologists while in others most communication is carried out directly with the inventory co-ordinator. In some cases, most dealings are directly with the staff performing inventory work.

As a further observation on provincial administrative structures I would like to point out that program developments and planning have been most successfully carried out where there is a close connection between the wildlife inventory group and provincial ARDA administrations (such as in B.C. and Manitoba). This association plus frequent contact with other inventory sectors have encouraged a common objective and facilitated both short term and long term planning. It is my opinion that integration of wildlife considerations with other resource developments during land use planning will depend on increasing ties of this nature within provincial governments. The Canada Land Inventory has provided one vehicle for achieving a multi-discipline approach in the allocation of land resources. This has been of particular significance to wildlife agencies which in many cases and on many occasions received very little consideration in the past.

Conclusion:

This past year has been very stimulating and interesting from a personal point of view. As noted in the report, progress in the various wildlife groups

is variable. I am particularly gratified with the progress and accomplishments of the C.W.S. waterfowl inventory group.

Staff turnover is a chronic problem facing provincial ungulate programs. However, results have been most encouraging where programs are underway. The response of provincial wildlife administrators to the inventory has been enthusiastic where maps have been produced by the inventory group. Tangible evidence of accomplishment seems to rekindle interest and recognition of the potential value of the inventory.

Much pioneering work and liaison lies ahead in order to establish a viable sport fisheries inventory program in all provinces. Once again staffing has been a serious impediment to getting these programs underway.

The forthcoming transfer of the position of Regional Wildlife Co-ordinator to Winnipeg will raise some problems regarding the supervisory role presently carried out for ARDA waterf wl inventory biologists. I am particularly concerned that the neceseary relationship of the co-ordinator within the regional framework of the C.W.S. will suffer in the areas of long range planning, as advisor to the regional superintendent and to prepare for the integration and future activities of the present inventory group with the Wildlife Service following the Canada Land Inventory.

There are several possible solutions to the above problem, but each possibility requires further discussion and analysis of wildlife service policy and objectives regarding the future of the inventory group.

Since it's inception, the Wildlife sector of the CLI has shown a degree of initiative and accomplishment which has been exceptional. I view the future with optimism and the conviction that this program will benefit wildlife as

much by establishing its importance in the total resource picture in Canada as for the maps and fund of information it produces.

APPENDIX A

Wildlife Sector
Canada Land Inventory Technical Staff: Western Canada

Waterfowl

British Columbia:	E. W. Taylor	Biologist
	J. F. Carriero	Technical Officer
Alberta:	H. R. Weaver	Biologist
	C. D. Schick	Technical Officer
	F. H. Walther	Technical Officer
Saskatchewan:	R. E. G. Murray	Biologist
	C. Matthews	Technical Officer
Manitoba:	G. D. Adams	Biologist
	R. C. Hutchison	Technical Officer

Ungulates:

British Columbia:	D. Blower	Project Leader
	B. Mide	Biologist
	A. Luckhurst	Biologist
	W. Tremblay	Technician
Alberta:	Wm. Hall	Biologist*
	S. Clements	Technician
Saskatchewan:	T. Rock	Project Leader
	K. Schoelhaase	Technician
	E. Bear	Technician
Manitoba:	R. C. Goulden	Project Leader
	H. Goulden	Biologist
	Two Summer Assistants	

Sport Fisheries

Manitoba:	Dr. A. Fedoruk	Project Leader
	Two Permanent Technicians	
	Two Summer Assistants	

*Part-time

APPENDIX B

June, 1967

FOR DISCUSSION

WILDLIFE AND RURAL DEVELOPMENT

CENSUS DIVISION 14

INTRODUCTION:

Census Division 14 contains a wide variety of wildlife species. Big game species include sheep, goat, deer, moose, elk and bear. Game birds consist of several species of grouse and waterfowl. In addition, the area contains numerous lakes and streams which support sought after game fishes.

The value of the wildlife resource to the area has been discussed by Stelfox[1]. I do not intend to analyze in detail economic aspects of wildlife in this report, but to explore some of those areas where development will have both direct and indirect benefits to the local economy.

Although wildlife utilization by hunting and fishing provides a definable source of income to the area, non-consumptive wildlife benefits which are closely associated with recreation and tourism contribute to an undetermined degree. Development of the wildlife resource should encompass both aspects of consumptive and non-consumptive utilization in order to contribute maximum benefits to the area and fully exploit recreation potentials.

POTENTIAL FOR DEVELOPMENT:

In order to accomplish those objectives of an integrated resource development plan for CD14, wildlife development proposals must consider the amount and feasibility of management inputs required in relationship to the benefits to be accrued. As mentioned, CD14 contains a great variety of wildlife species.

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[1] The Wildlife Resource in CD14 by J.G. Stelfox, October 6, 1965. Mimeo.

However, not all species are amenable to management, nor do all species require intensive management programs. Therefore, the species which should and can be managed may be narrowed considerably. These are: white-tailed deer, ruffed grouse, waterfowl (ducks and geese), and the fur-bearing muskrat. Sport fisheries, which is closely associated with outdoor recreation is also an important area where habitat manipulation can result in increased utilization and benefits. Several big game species found in the area are highly important for hunting recreation. These are the moose, elk, and big-horn sheep. However, these species do not lend themselves to intensive management practices, and, with the exception of maintaining critical wintering areas, in the case of sheep and elk, large scale management inputs are not presently feasible. The following section discusses those types of development that would be feasible and justifiable within the framework of the present rural development comprehensive plan.

TYPES OF DEVELOPMENT AND MANAGEMENT FOR WILDLIFE C.D. 14:

1. Lakes:

Lakes with a capability for producing sport fish occur throughout the C.D. 14 area. Rehabilitation of lakes will provide a direct recreational benefit to the area. The term "rehabilitation" includes such management practices as the removal, by poisoning, of undesirable fish now present, and the introduction and stocking of sport fishes - primarily of the trout family. The recreation benefits to be derived from a well developed sport fishery have been well documented throughout North America.

As it is impossible to divorce sport fishing from other areas of water oriented recreation, it would be desirable to establish camping, picnicking and other facilities for recreational use at lakes managed for sport fishing. In this way the potential for both wildlife and outdoor recreation would be realized. Direct economic benefits to be derived from the manage-

ment input required would have to be analyzed in detail in order to obtain data on cost versus benefits. However, many examples of such benefits may be referred to, both in Canada and the United States.

2. Waterfowl Development.

The intensive management of waterfowl is best carried out on large water areas. In C.D. 14, Chip Lake which at present has a low productivity for fish due to shallow water depth, offers the greatest potential for development as a goose and duck production area. However, the lake is presently too deep (mean depth 10') for optimum waterfowl habitat.

The types of management required in order to make Chip Lake an optimum production area for waterfowl include the following: The reduction of water depth to approximately four to five feet; the construction of artificial islands to supplement those exposed by the draw down, and water level control for manipulation of water levels at various times of the year.

As a result, waterfowl populations presently breeding on the lake would be increased considerably. The major requirement is to provide shallow water depth and increased vegetative edge and nesting habitat throughout the 20,000 acre lake. At present, goose production on the lake is negligible. However, with habitat manipulation and the initiation of a breeding colony, a large goose population could be built up on the lake over the poriod of a few years. St. Mary's reservoir in Southern Alberta with its large goose population is an example of the success of re-establiehing Goose flocks to their former breeding range.

Many data exist which document the importance of goose hunting to the economy of local areas. Two examples are the Hanna and Kindersley areas in Alberta and Saskatchewan respectively, which attract hunters from all over western North America. Undoubtedly with the establishment of a goose population on Chip Lake some of the hunter activity which emanates from Edmonton to the southeastern areas of the province could be funnelled into C.D. 14.

If development on Chip Lake for waterfowl were carried out, the influence on muskrat populations would be considerable. At present, muskrats utilize only the more shallow areas around the edge of the lake. Desirable muskrat habitat is also desirable waterfowl habitat. The potential exists on Chip Lake for establishing a major trapping area that would serve a number of local residents. This aspect of the Chip Lake development will be discussed further under income oriented wildlife potential.

3. Marginal Land Developments.

As part of the ARDA program of land use adjustment and alternative land use development, thousands of acres of marginal agricultural land will be available for alternative uses. In most cases, these areas are highly amenable to habitat manipulation for the aforementioned Whitetailed deer and Ruffed grouse. Intensive management programs can be initiated on marginal lands both by ARDA and the Provincial Wildlife Division if tenure for this purpose is secure. Therefore, it is proposed to develop a comprehensive plan to designate those marginal lands available for alternate uses as wildlife management areas, and to initiate programs for the necessary habitat manipulations required to increase wildlife populations. Development would probably take the form of selective clearing, seeding of food and cover crops as well as maintaining habitat at desirable successional stages.

In designating wildlife management areas, wildlife production should

constitute the primary land use. However, other uses such as grazing, if regulated, are not incompatible with wildlife production. Other activities to ensure maximum utilization of these lands should be explored. Those include the possibilities for year round use in other forms of recreation not directly associated with hunting (Bird watching, nature photography etc.).

INCOME ORIENTED WILDLIFE DEVELOPMENTS:

The value of the wildlife resource in C.D. 14 has both direct and indirect income benefits. Indirect income is derived primarily through hunter use activity and tourism, while direct income at the present time consists primarily of trapping and providing guiding and other services to outside hunters.

Increased direct income benefits are possible in association with wildlife developments in C.D. 14. Participation in actual management procedures such as habitat manipulation and restoration, would form the basis for involving local labor in project work. This local participation may take the form of the seeding and planting of lure crops for waterfowl, selectively clearing marginal agricultural land to produce optimum deer and grouse habitat, and the seeding of desirable food and cover crops for deer and grouse. Any fencing, or maintenance activities required for wildlife management areas could also be carried out by local labor. In most instances, contracts for this work could be let to farmers who have the necessary machinery, and are located in the area of the development.

The possibility also exists for private individuals to increase wildlife potential on their lands for the express purpose of selling services and the privilege to hunt and fish on private lands to the general public. There are precedents for this type of activity in rural areas in the United States where a portion of farm income is derived from leasing or the sale of hunting and fishing privileges. Such operations could be carried out in conjunction with the normal culture of the land for agricultural crops.

This point is mentioned as a possible future income potential and should be explored further.

As mentioned, direct income presently is derived primarily from the sale of services and from trapping. At this point, I would like to outline some of the potential trapping benefits to be derived from the Chip Lake development proposal.

During the 1962-63 trapping season a total of 18,203 muskrats were trapped in C.D. 14. The value of the pelts totaled $27,520. With the intensive management of Chip Lake for waterfowl production a corresponding increase in muskrat populations would take place. Water level manipulation to maintain the lake at approximately a four foot depth would provide optimum habitat for muskrats as well as waterfowl. At the present time, the muskrat population of Chip Lake is small and restricted to narrow fringes of suitable habitat. However optimum habitats are capable of supporting fall populations of twenty muskrat per acre. Chip Lake contains approximately 20,000 acres. With management input an increase of muskrat populations to even an average of <u>five</u> per acre would result in a fall population of 100,000 for the lake with a harvestable surplus of approximately 60,000, three times the number harvested in all of <u>C.D. 14</u> in 1962-63.

The value of the fur resource will vary, but it could be considered to be in the order of $90,000. This would provide an additional source of income of $1,500. annually for 60 local residents if populations increased to expected levels. Significantly, trapping activity would take place during the winter when agricultural activity is at a minimum.

I recognize that the above data are based on several assumptions which must be considered in more detail, and based on more specific information.

However, the direct income benefits to be derived locally from this resouce are considerable and could conceivably be three or four times the amount indicated. Specific development proposals must await a more detailed consideration of Chip Lake from a biological and engineering viewpoint.

WILDLIFE AND OUTDOOR RECREATION:

A close relationship exists between wildlife and several forms of outdoor recreation. Although direct forms of recreational wildlife utilization include hunting, fishing, and nature study, ancilliary activities are hiking, camping, boating etc. Therefore, wildlife development and utilization cannot be divorced from the need for corresponding and complementary recreational developments.

Specifically, in C.D. 14, programs to improve sport fisheries require a close consideration of providing facilities to accommodate those engaged in fishing as well as those participating in other water oriented recreation such as swimming, boating, picnicking, and water skiing. In some cases, a recreational area will provide primarily wildlife attractions. However, even in those instances, public use will require facilities.

In planning comprehensive wildlife and recreation programs for C.D. 14 close consideration should be given to providing maximum utilization for varied recreation.

For example, lakes which are suitable for rehabilitation and sustaining a sport fishery generally have additional attractions of scenery, clear water for swimming and water skiing and forested uplands for picnicking and camping. These additional recreational potentials should be exploited where they occur in association with sport fishing in order to derive maximum benefits for expenditures in sport fisheries and outdoor recreation programs.

Although it may be agreed that recreational facilities will be utilized whether or not sport fishing is an attraction, there is documented evidence

which indicates a direct relationship between popularity of an area for recreation and the presence of wildlife in various forms. Even in those cases where users are not fishermen this relationship holds true.

The above discussion is presented in order to emphasize the need for a close liaison in planning between wildlife and recreation agencies and personnel, particularly at the provincial levels, and to point out that wildlife developments have strong implications for various outdoor recreation activities.

ADMINISTRATIVE REQUIREMENTS AND PROGRAM DEVELOPMENT:

The following is a proposed, tentative shcedule for a wildlife and rural development program in C.D. 14. As there is no precedent for such a program, ample discussion is expected regarding the proposals made in this report.

Administration.

Funds to carry out any wildlife programs will be derived from Federal ARDA and the province on a 50:50 cost sharing basis. However, the administration and execution of the program including personnel, should be carried out by the Fish and Wildlife Division of the Department of Lands and Forests. The Wildlife Co-ordinator and Regional Wildlife Co-ordinator ARDA should act in an advisory capacity to Federal and Provincial agencies, as well as initiating proposals valid within the ARDA framework. They will maintain a close association with the program, but will not be directly involved in the program administration.

Personnel involved in carrying out the program should be provincial employees. At first it may be necessary to fill personnel requirements on a contract basis. Personnel should work in the C.D. 14 area in close association with both regional wildlife biologists as well as the regional resources

co-ordinator and various local ARDA committees. He will report to the Chief Biologist of the province. Reports of progress etc. should be obtained by the Regional Wildlife Co-ordinator through the Chief Biologist of the Wildlife Division.

Program development:

At the presenttime, several proposals for lake rehabilitation and a study of Chip Lake development potential have been made. These were made as a result of the involvement and participation of Mr. Gordon Haugen, Regional Fisheries Biologist for Edson. Mr. Haugen worked in close association with the Regional Resources Co-ordinator and local ARDA Committees and is responsible for initiating a wildlife and recreation program to date.

In my capacity as Regional Wildlife Co-ordinator, I have been closely involved with Mr. Haugen, attended meetings of the local Wildlife and Recreation Committee, Mr. Belyea, the Regional Resources Co-ordinator, and consulted with the Chief Biologist and Director of Wildlife for Alberta.

As a result of the several meetings discussions and consideration of the program in C.D. 14, it is apparent that a full time Wildlife Development Biologist be hired to work in Edson as soon as possible either on contract or preferably as a provincial employee. His responsibility would be solely to carry out the investigations suggested, to obtain detailed information for specific proposals, and to initiate proposals where warranted.

Initiation of work projects and utilization of local labour and extension activities should be carried out in conjunction with the Regional ARDA office. However, many aspects of this relationship need to be defined. The following is the proposed phasing of a wildlife rural development program in C.D. 14.

Phase I - 1967-68.

1. Appointment of a full time wildlife development biologist to work in the area, based at Edson.

2. Completion of Land Capability inventories for ungulates and waterfowl. Start of Sport Fisheries inventory.

3. Delineation of marginal lands available for alternate (wildlife) use.

4. Initiation of Lake - rehabilitation projects.

5. Biological and engineering survey of Chip Lake.

Phase II - 1969-70.

1. Completion of Sport Fisheries inventory.

2. Collation of capability survey data with lands available for alternate use to establish priorities..

3. Preparation of specific wildlife development proposals, detailed plans and cost estimates.

4. Co-ordination of wildlife proposals with proposed recreation priorities (based on recreation survey of area).

5. Preparation of a master plan and program for wildlife and recreation in C.D. 14.

6. Initiation of Chip Lake Management scheme. (if feasible)

7. Continuation of Lake rehabilitation.

Phase III - 1971-75.

1. Completion of lake rehabilitation and Chip Lake management programs.

2. Action programs for wildlife management on marginal lands. Establishment of Wildlife Management areas.

3. Continued assessment of valid management proposals.

4. Investgation of Income-oriented wildlife development possibilities particularly in association with present farming practices.

5. Extension of wildlife work to explain programs and to provide information on private development potentials oriented toward a cash crop.

6. Assistance to interested residents in obtaining necessary knowledge required for part time trapping and guiding activities.

As noted in the above, immediate action on lake rehabilitation has been suggested on the basis of the proposals of the Edson ARDA recreation and wildlife committee. For those lakes specified, adequate access and biological information exists to implement this program.

However, other programs must await the accumulation and analysis of sufficient detailed data. This would be the job of the development biologist. In the initial planning phases one biologist would be sufficient. However, with the implemenation of programs additional personnel would likely be required. At this stage, it is not possible to forecast what those requirements may be.

If wildlife programs are to be successful in the context of rural development in C.D. 14 and elsewhere I feel that approaches should adhere to the following points:

1. Biologists should be concerned solely with rural development programs and should work at the local level and with local committees.
2. Programs must relate in large part to people on a local basis and if possible should provide an alternative source of income. That is, the wildlife resource should become an economic benefit rather than disbenefit.
3. An extension role to explain, teach and involve local residents in wildlife programs is essential to the long term success of both wildlife and rural development programs.
4. Active participation of local labor in construction, habitat manipulation and other activities associated with developments for wildlife. This is one method of providing a direct economic return to local farmers while establishing a program which will result in indirect future benefits to the community at large.

5. The above should not preclude developments which may be justifiable on a biological basis alone with no immediate local benefits. Such projects may be significant in the provincial or national context. Not all programs can be related directly to the local economy and this should not be the basis of excluding biologically valid proposals.

6. Programs should be administered within the Provincial Wildlife Branch but personnel active in programs should work within the regional ARDA framework and closely with the Regional Resources Co-ordinator, preferably under the same roof.

7. Action programs require staff and considerable attention. If programs are approved, commensurate staffing of professional and technical personnel is required to ensure their success. It is however, difficult to say who should provide staff and to what extent at this time.

8. Wildlife programe must, where possible, relate to and complement outdoor recreation activities and vice versa. If full potentials in either field are to be realized they must be carried out in conjunction where possible.

It is my conviction that there is a valid and useful place for wildlife programs in a rural development context. This paper is written to initiate discussion and lay the necessary groundwork to achieve a role for wildlife in a comprehensive rural development plan for C.D. 14 and future rural development areas. It is meant to be a starting point.

The prospects provided for people-oriented wildlife developments under ARDA are numerous and exciting. Their implementation and success will depend on the initiative taken by Federal and Provincial wildlife agencies in recognizing the possibilities and acting upon them.

R.D. Jakimchuk,
Regional Wildlife Co-ordinator,
Canada Land Inventory.

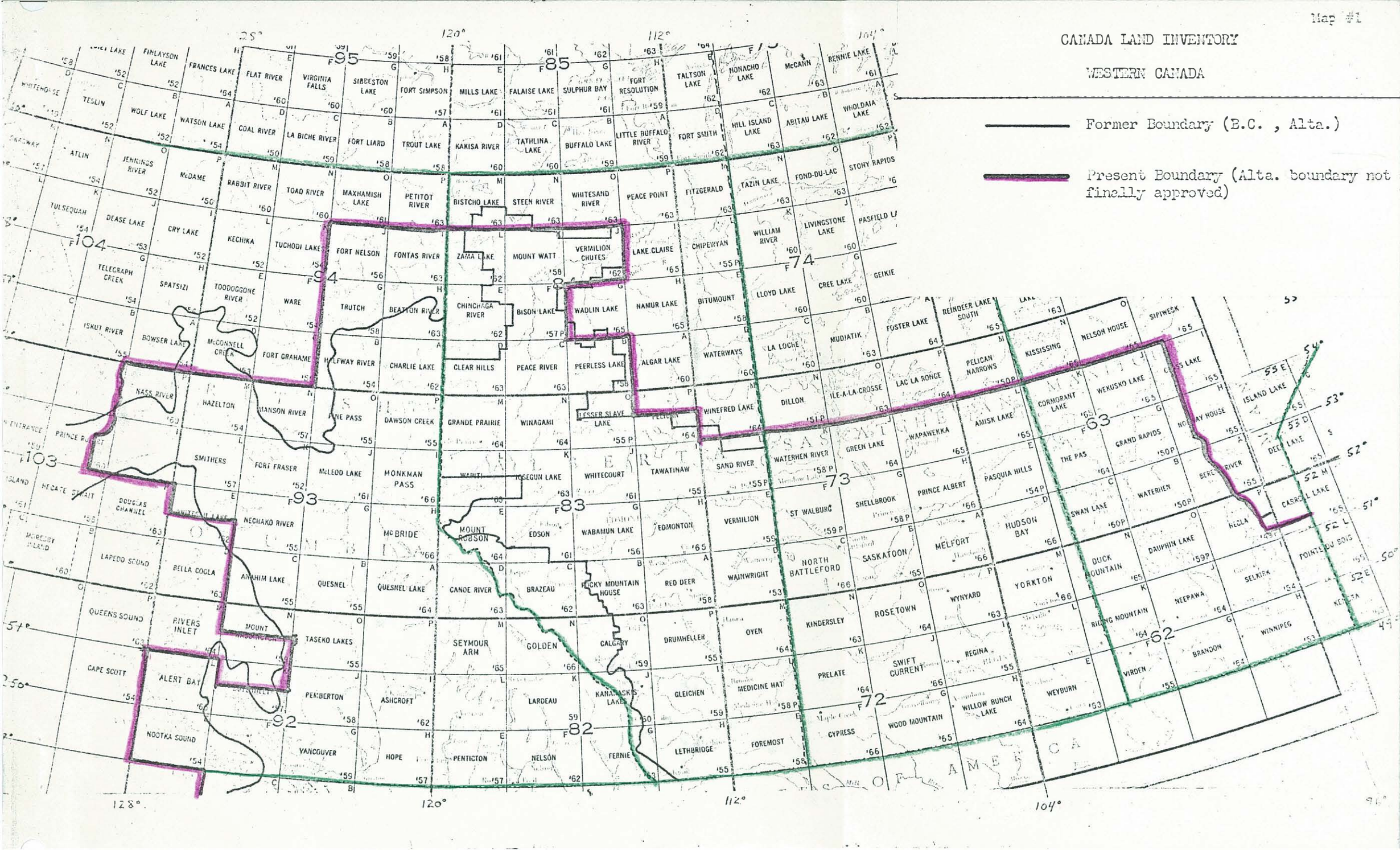
APPENDIX C

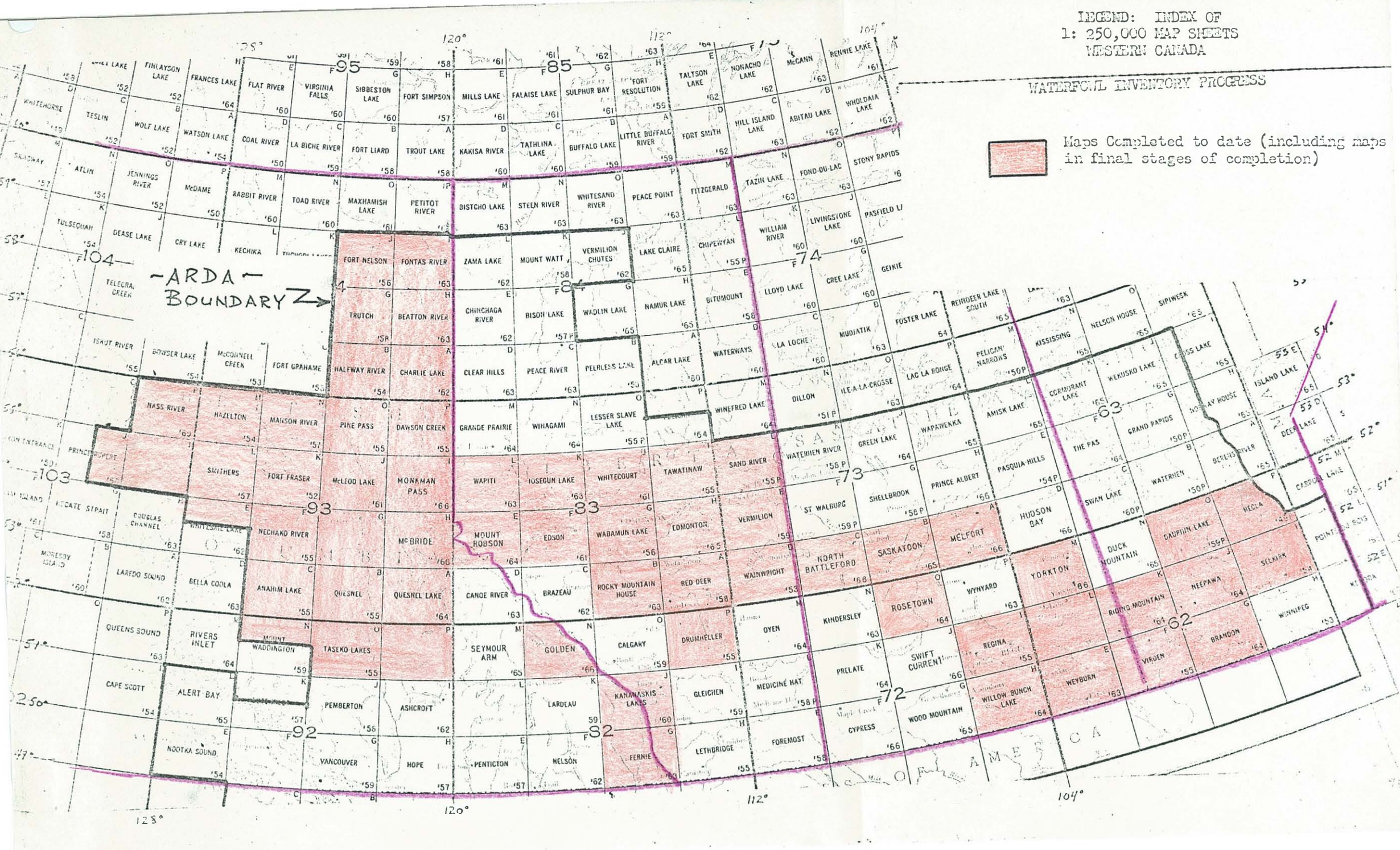
CANADA LAND INVENTORY

WESTERN CANADA

Former Boundary (B.C. , Alta.)

Present Boundary (Alta. boundary not finally approved)

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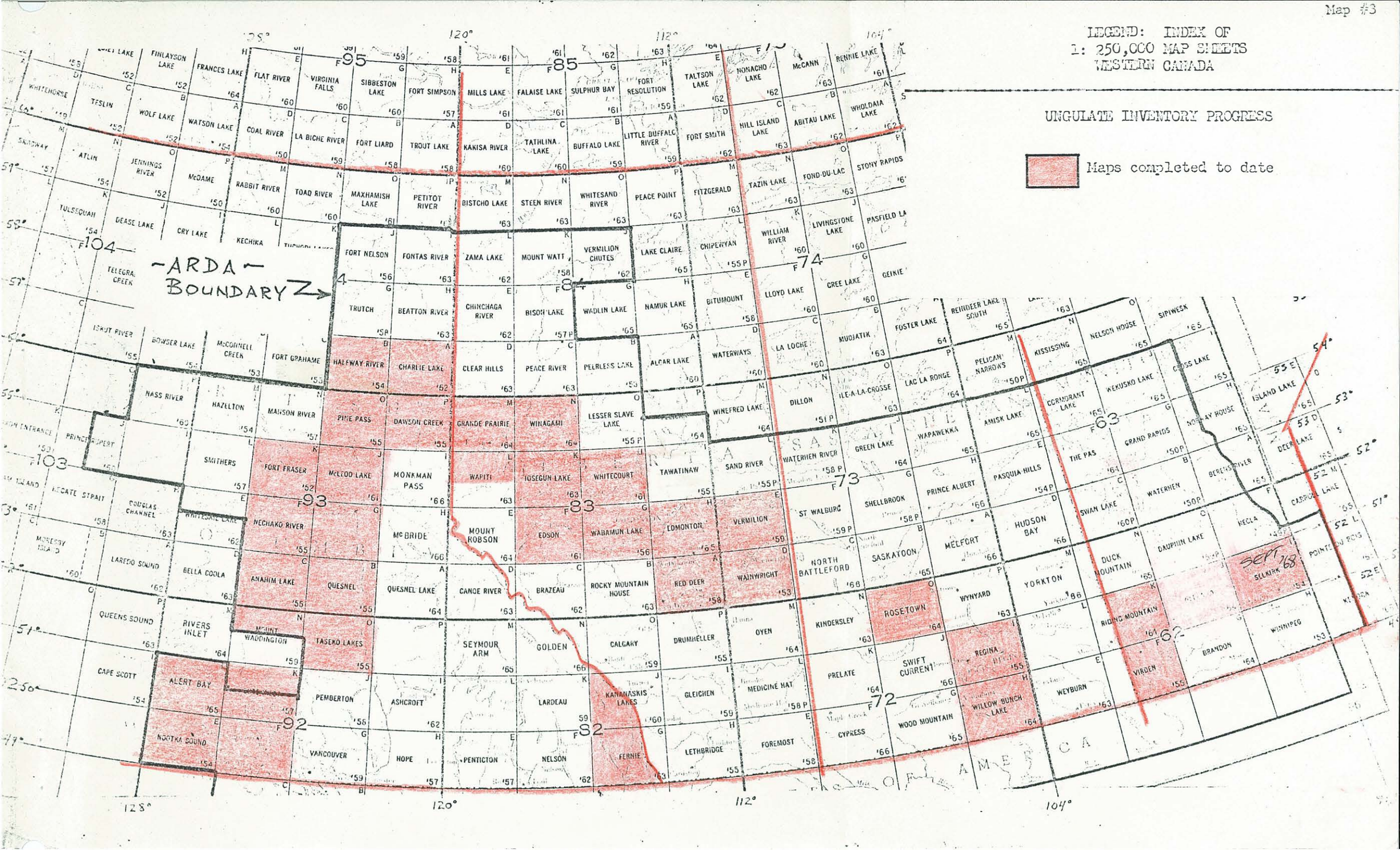
WESTERN CANADA
WATERFOWL INVENTORY PROGRESS
Maps Completed to date (including maps in final stages of completion)
ARDA BOUNDARY
95
85
74
104
84
63
103
93
83
73
62
92
82
72
120°
112°
104°
128°

LEGEND: INDEX OF
1: 250,000 MAP SHEETS
WESTERN CANADA

UNGULATE INVENTORY PROGRESS

Maps completed to date



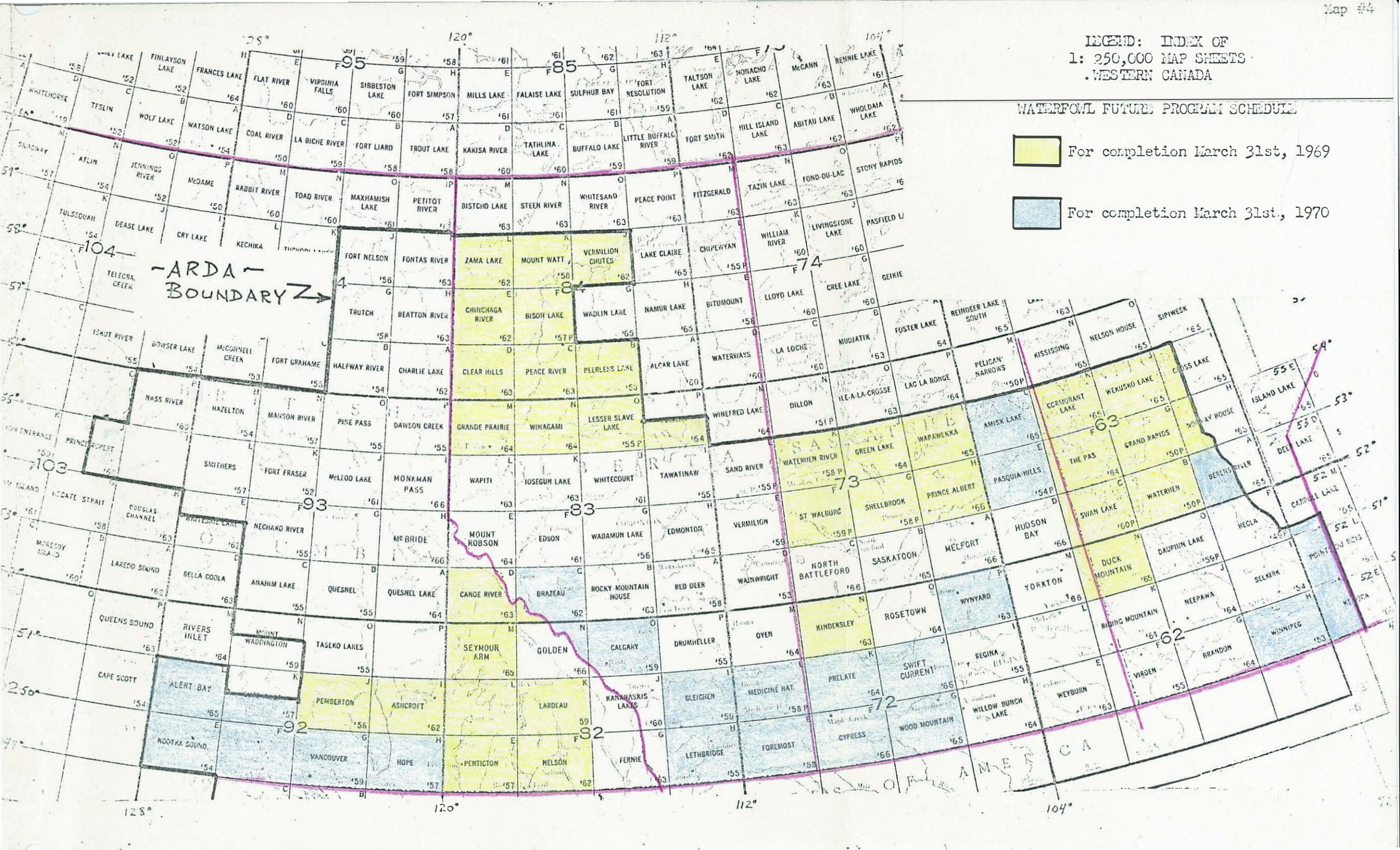
LEGEND: INDEX OF
1: 250,000 MAP SHEETS
.WESTERN CANADA

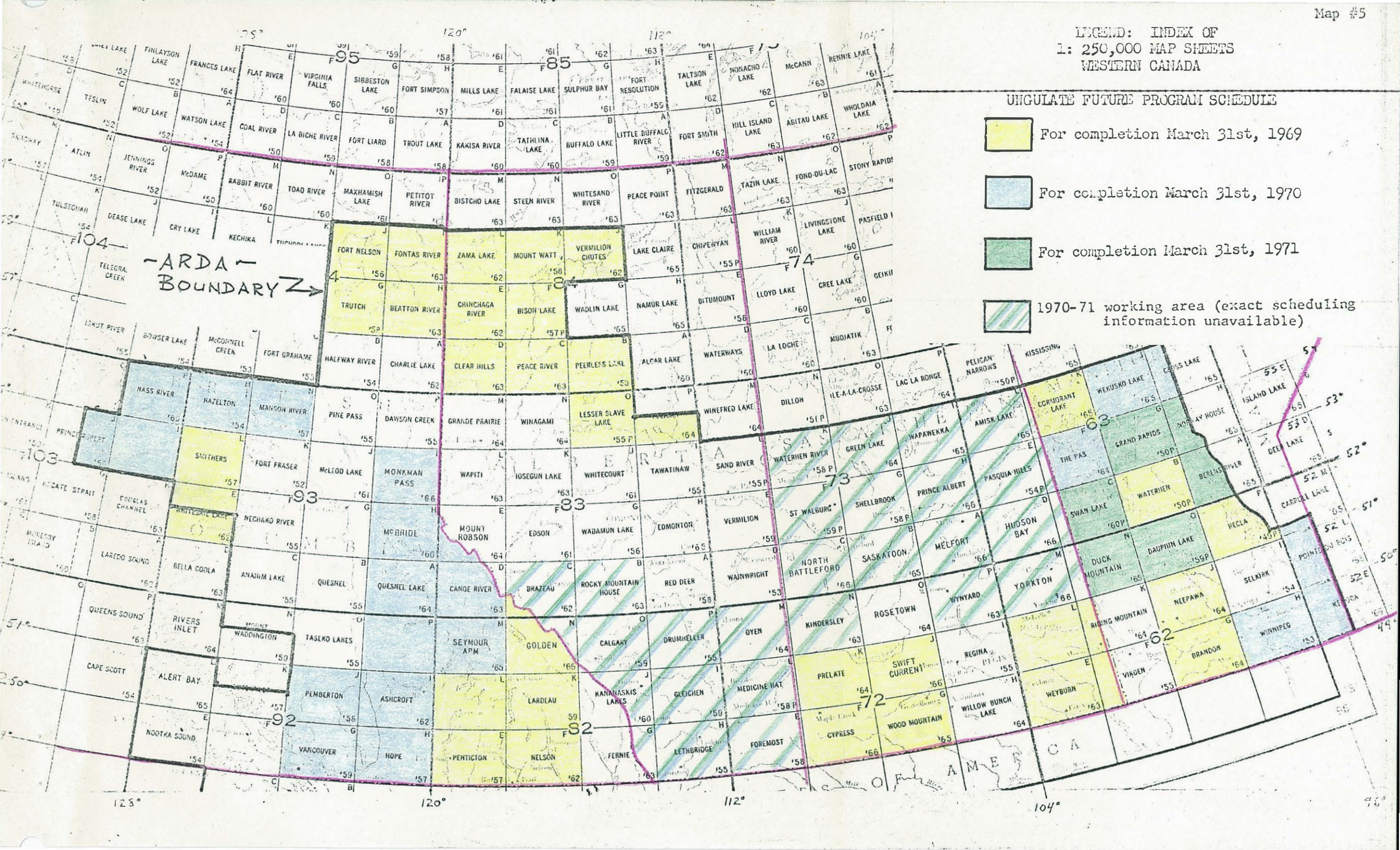
WATERFOWL FUTURE PROGRAM SCHEDULE

For completion March 31st, 1969

For completion March 31st., 1970

-ARDA-
BOUNDARY

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UNGULATE FUTURE PROGRAM SCHEDULE
For completion March 31st, 1969
For completion March 31st, 1970
For completion March 31st, 1971
1970-71 working area (exact scheduling information unavailable)
-ARDA-
BOUNDARY
95
85
104
74
94
84
103
93
83
73
63
92
82
72
62
FORT NELSON
FONTAS RIVER
ZAMA LAKE
MOUNT WATT
VERMILION CHUTES
TRUTCH
BEATTON RIVER
CHINCHAGA RIVER
BISON LAKE
WADLIN LAKE
HALFWAY RIVER
CHARLIE LAKE
CLEAR HILLS
PEACE RIVER
PEERLESS LAKE
SMITHERS
HAZELTON
MANSON RIVER
PINE PASS
DAWSON CREEK
GRANDE PRAIRIE
WINAGAMI
LESSER SLAVE LAKE
FORT FRASER
McLEOD LAKE
MONKMAN PASS
WAPITI
IOSEGUN LAKE
WHITECOURT
NECHAKO RIVER
McBRIDE
MOUNT ROBSON
EDSON
WABAMUN LAKE
EDMONTON
QUESNEL
QUESNEL LAKE
CANOE RIVER
BRAZEAU
ROCKY MOUNTAIN HOUSE
RED DEER
TASEKO LAKES
SEYMOUR ARM
GOLDEN
CALGARY
DRUMHELLER
PEMBERTON
ASHCROFT
LARDEAU
KANANASKIS LAKES
GLEICHEN
VANCOUVER
HOPE
PENTICTON
NELSON
FERNIE
LETHBRIDGE
MEDICINE HAT
FOREMOST
PRELATE
SWIFT CURRENT
REGINA
CYPRESS
WOOD MOUNTAIN
WILLOW BUNCH LAKE
WEYBURN
VIRDEN
BRANDON
WINNIPEG
SELKIRK
NEEPAWA
RIDING MOUNTAIN
DUCK MOUNTAIN
DAUPHIN LAKE
SWAN LAKE
WATERHEN
GRAND RAPIDS
THE PAS
CORMORANT LAKE
WEKUSKO LAKE
ISLAND LAKE
DEER LAKE
CARROLL LAKE
HECLA
POINTE DU BOIS
BERENS RIVER
NORWAY HOUSE
CROSS LAKE
KISSISING
PELICAN NARROWS
LAC LA RONGE
ILE-A-LA-CROSSE
DILLON
WINEFRED LAKE
LA LOCHE
MUDJATIK
ALCAR LAKE
WATERWAYS
LAKE CLAIRE
CHIPEWYAN
NAMUR LAKE
BITUMOUNT
WILLIAM RIVER
LLOYD LAKE
CREE LAKE
LIVINGSTONE LAKE
TAZIN LAKE
FOND-DU-LAC
PEACE POINT
FITZGERALD
BUFFALO LAKE
LITTLE BUFFALO RIVER
FORT SMITH
HILL ISLAND LAKE
ABITAU LAKE
WHOLDAIA LAKE
TATHLINA LAKE
KAKISA RIVER
TROUT LAKE
FORT LIARD
MILLS LAKE
FALAISE LAKE
SULPHUR BAY
FORT RESOLUTION
TALTSON LAKE
NONACHO LAKE
McCANN
RENNIE LAKE
SIBBESTON LAKE
FORT SIMPSON
VIRGINIA FALLS
FLAT RIVER
FRANCES LAKE
FINLAYSON LAKE
WATSON LAKE
COAL RIVER
LA BICHE RIVER
RABBIT RIVER
TOAD RIVER
MAXHAMISH LAKE
PETITOT RIVER
BISTCHO LAKE
STEEN RIVER
WHITESAND RIVER
WOLF LAKE
TESLIN
WHITEHORSE
JENNINGS RIVER
McDAME
ATLIN
TULSEQUAH
GEASE LAKE
CRY LAKE
KECHIKA
TELEGRAPH CREEK
ISKUT RIVER
BOWSER LAKE
McCONNELL CREEK
FORT GRAHAME
NASS RIVER
PRINCE RUPERT
DIXON ENTRANCE
HECATE STRAIT
DOUGLAS CHANNEL
MORESBY ISLAND
LAREDO SOUND
BELLA COOLA
ANAHIM LAKE
QUEENS SOUND
RIVERS INLET
CAPE SCOTT
ALERT BAY
NOOTKA SOUND
WHITESAIL LAKE
MOUNT WADDINGTON
SAND RIVER
WAINWRIGHT
VERMILION
WATERHEN RIVER
GREEN LAKE
WAPAWEKKA
AMISK LAKE
PASQUIA HILLS
PRINCE ALBERT
SHELLBROOK
ST WALBURG
NORTH BATTLEFORD
SASKATOON
MELFORT
HUDSON BAY
YORKTON
WYNYARD
KINDERSLEY
ROSETOWN
OYEN
ALBERTA
SASKATCHEWAN
MANITOBA
GULF OF AMERICA
128°
120°
112°
104°
53°
52°
51°
50°
49°