



**THIRD ANNUAL MEETING
OF THE
PROVINCIAL CANADA LAND
INVENTORY CO-ORDINATORS**

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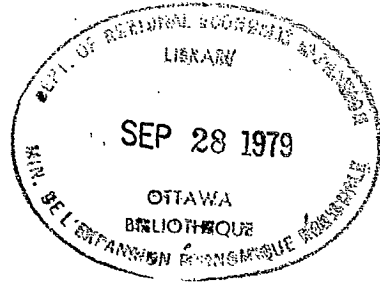


DEPARTMENT
OF REGIONAL
ECONOMIC
EXPANSION

MINISTÈRE DE
L'EXPANSION
ÉCONOMIQUE
RÉGIONALE

Third annual meeting of the Provincial Canada
Land Inventory Co-ordinators
TABLE OF CONTENTS

	<u>Page</u>
<u>PART I</u> <u>OPENING REMARKS</u>	
Hon. J. Ross Barrie	1
M.J. Fitzgerald	1
R.J. McCormack	1
<u>PART II</u> <u>REPORTS AND DISCUSSION</u>	
Provincial Co-ordinators	2
Geo-Information System	10
Cartography	13
Relationship of Canada Land Inventory	16
Other Discussion Items	17
<u>PART III</u> <u>LAND USE PLANNING</u>	
The British Columbia Land Capability Analysis System	18
Identification and Analysis of Land Development Potential	29
Panel Discussion	34
<u>PART IV</u> <u>BANQUET SPEECH</u>	
Planning Strategy in Manitoba	37
<u>APPENDIX</u>	



PART I

OPENING REMARKS

THE HONOURABLE J. ROSS BARRIE,
MINISTER, DEPARTMENT OF NATURAL RESOURCES
PROVINCE OF SASKATCHEWAN

The Honourable J. Ross Barrie welcomed delegates on behalf of the province. Noting the increasing pressures on land resources and the evidence of misdirected land use, Mr. Barrie felt that it was very important to give serious consideration to the use of our land resources. Mr. Barrie mentioned Saskatchewan's consideration of a proposal for a pilot land use plan to coincide with the proposed Special Area in northwest Saskatchewan.

MR. M.J. FITZGERALD,
WESTERN REGIONAL DIRECTOR,
DEPARTMENT OF REGIONAL ECONOMIC EXPANSION

Mr. M.J. Fitzgerald brought greetings on behalf of the Honourable Jean Marchand. Referring to the special areas where development work was commencing, Mr. Fitzgerald felt that the value of the Canada Land Inventory was now readily apparent. He noted the growing foreign interest in the Canada Land Inventory and the extent to which the Inventory has been internationalized.

MR. R.J. McCORMACK,
CHIEF OF THE CANADA LAND INVENTORY

The Chairman, Mr. R.J. McCormack, outlined the program for the meeting. He remarked on the value of holding these annual meetings in the provinces to encourage communication and to acquaint a larger number of people with the Inventory program.

Noting the time allotted for the description of the British Columbia Land Capability Analysis System, Mr. McCormack expressed the feeling that it is better to hear one program described in depth than three or four superficially. At subsequent meetings there would be an opportunity to hear of projects in other provinces.

The Chairman referred to the increasing interest in the Canada Land Inventory from a number of other countries and other federal and provincial government departments and agencies. Interest is such that it will be impossible to deal with these requests on an individual basis. Group meetings at the provincial, federal or international level were proposed.

PART II

REPORTS AND DISCUSSION

PROVINCIAL CO-ORDINATORS

NEWFOUNDLAND

Mr. J.J. Lowe reported Canada Land Inventory progress for the forestry, ungulates, and recreation sectors. Forestry fieldwork is expected to be completed for Newfoundland by the summer of 1970, mapping by March, 1971. Labrador forestry is expected to be completed in 1974. Recreation mapping at 1:50,000 scale will be completed this fiscal year and at 1:250,000 during next winter. No final maps will be produced for Labrador during 1970-71; the year will be spent in reconnaissance and production of draft maps for field checking in 1971. The ungulate sector uses the forest capability maps for site information and consequently map production for the sectors is synchronized. The Island will be completed in 1970-71 and reconnaissance work will begin in Labrador.

The biophysical survey will commence next summer in Labrador under the leadership of the Canadian Forestry Service with participation from the three inventory sectors. Mr. Lowe noted the extension of the Canada Land Inventory area to include Labrador through a cost-sharing agreement administered by the Canadian Forestry Service and co-ordinated by the Canada Land Inventory. Mr. Lowe also noted increasing interest in capability maps from resource planners and managers in his province.

PRINCE EDWARD ISLAND

Dr. J. Lovering reported that with the completion of the Canada Land Inventory for Prince Edward Island, a preliminary macro plan with an integrated capability map was being completed. This macro plan will serve as a basis for land-use planning at the micro and meso levels. These plans will be used in conjunction with the land development corporation's efforts in farm consolidation and removal of low capability agricultural lands into other uses.

NOVA SCOTIA

The Nova Scotia report was presented by Mr. John Hilchey. All mapsheets for the agriculture sector have been completed and published. No forestry maps have been published, but mapping is scheduled to be completed in Spring, 1971. Nine counties have been completed, three are being checked, four are in preparation. Three counties remain to be surveyed. Mapping for ungulates has been completed and narratives are being written. This will be finished by March, 1970. Mapping for the recreation sector is complete. No maps have been published and the Director of Provincial Parks, Mr. E. Atkins, feels that these should not be released to the public before an acquisition program for recreational sites is underway.

NEW BRUNSWICK

Mr. Harold Hoyt presented the progress report for New Brunswick. All fieldwork and maps have been completed for the recreation sector. Forestry fieldwork has been finished and maps are expected to be completed by the end of this year. A small amount of fieldwork is outstanding for the wildlife sector, but most maps have been submitted. Agriculture fieldwork is finished excepting an area where additional work has been requested in connection with the establishment of a new national park. Narratives are outstanding in all sectors, particularly wildlife. Both English and French narratives for agriculture are being submitted.

Mr. Robert Watson gave a brief report on the New Brunswick land-use plan, which began in late 1969 with the purpose of producing a macro plan for the province. Delineating and mapping of priority resource areas based on Canada Land Inventory data is scheduled for completion next month. In association with the federal Department of Energy, Mines and Resources, an economic atlas was started. Information from this atlas will aid in analysis of Canada Land Inventory data. Results from the overall project are expected in the fall.

QUEBEC

The Canada Land Inventory report for Quebec was presented by Mr. Marcel Belzile. Fieldwork in the agriculture sector is complete and all mapping will be submitted by April, 1971. During the past year 163 forestry mapsheets were processed. The forestry sector will be completed in March 1972, the last sector to finish. Map production for wildlife is closely related to forestry. During the year 15 1:50,000 maps and three 1:250,000 maps were completed. Four 1:250,000 maps are scheduled in 1970-71. Fieldwork and mapping at 1:50,000 is complete for the recreation sector. Mapping at 1:250,000 will be finished in early 1971. It is hoped to renew the sport fish program for the province following discussion with federal officials. Fieldwork and cartography for the Outouais region land-use plan is nearing completion and a report is in preparation.

Mr. Belzile raised two questions, one concerning financial responsibility for information distribution, the other concerning problems associated with cadaster maps. Increasing requests from provincial departments and agencies for Canada Land Inventory data have raised the question of financial responsibility to meet these requirements.

ONTARIO

Mr. Emerson Ward reported for Ontario. Mr. Ward stated that the Canada Land Inventory had provided great impetus for a

program which the province had previously advocated. An Ontario Land Inventory has been established which goes into greater detail than the Canada Land Inventory; it will provide data for resource planning and management.

Fieldwork in the agriculture sector is complete and manuscripts will be finished this year. A small research program dealing with the economics of agricultural production will involve the use of capability data. This study will be completed by early 1971. Forestry fieldwork is complete. Mapping which is being done at 1:250,000 only will be completed in 1970. Recreation fieldwork is complete and all manuscripts will be submitted in early 1971. Excepting four mapsheets, wildlife fieldwork is complete. Final submission of manuscripts is scheduled for March, 1971.

Mr. Ward regretted the lack of success in obtaining an extension of Canada Land Inventory boundaries in Ontario. He felt there was definite need and demand for such data in the development of northern areas.

MANITOBA

Reporting for the Canada Land Inventory in Manitoba was Mr. Richard Goulden. During 1969-70, 28 capability maps were submitted from the province. Mr. Goulden listed several technical reports which had been published by the Inventory group. Percentage completion for inventory sectors is agriculture 75%, forestry 65%, recreation 80%, sport fish 75%, ungulates 65%, waterfowl 85%, present land use 70%. The waterfowl sector is expected to be the first to be completed in January, 1971. The entire inventory will be completed in March 1972.

Mr. Goulden mentioned the problems facing his group because of the lack of progress with the Geo-Information System. He asked what attempts the federal government was making to overcome operating problems of this system. Mr. Goulden also inquired about the status of the wildlife capability classification and the publication of it. Manitoba is anxious to secure the publication of this guideline.

Mr. Goulden announced that a proposal for a pilot land use planning project would be submitted to the Canada Land Inventory for approval within a few weeks. The Pas and region has been chosen for this project.

SASKATCHEWAN

Mr. Gary Michael presented the Canada Land Inventory report for Saskatchewan. In the agriculture sector during 1969 fieldwork was undertaken for three mapsheets. This sector, as do all other sectors, expects to reach completion by March, 1971. Forestry

fieldwork covered two mapsheets in 1969 while the recreation sector covered four mapsheets. Five ungulate mapsheets remain to be started. All fieldwork is completed for the waterfowl sector. The sport fish program was dropped with the withdrawal of federal support. A report is in preparation which may enable the continuation of the sport fish program if the provincial agency which previously conducted it renews its interest. Support was expressed for the bio-physical land classification and for an extension of the northern Canada Land Inventory boundary for agriculture capability. During 1970, fieldwork is being co-ordinated in the Meadow Lake area in anticipation of a possible pilot land-use planning project.

ALBERTA

Mr. S. Scott gave the Alberta presentation. The percentage completion by sector was reported as 70% for agriculture, 60% for forestry and ungulates, 75% for waterfowl, 55% for recreation, and 30% for sport fish. Despite this progress, Alberta lacks full sector coverage for any one area. Recreation is the only sector scheduled for completion in 1971. Waterfowl will be 95% complete, agriculture, forestry and ungulates 90% complete, and sport fish 65% complete at that time.

All large scale maps have been assembled into a library in the province and distribution has been arranged. Canada Land Inventory maps and data are being used for research purposes by 12 to 15 different agencies and for planning purposes by 35 to 40 agencies.

A proposal had been recently submitted for a pilot land use study in the foothills area. The province also attempted to undertake a pilot bio-physical project, but no approval has been given for it.

Mr. Scott registered disappointment with the present status of the Geo-Information System. He stressed the present need for retrieval services for capability information and area measurements, and a solution to the problem of collation of census data. Mr. Scott submitted a list of questions to the Chairman for possible consideration during the meeting. In closing Mr. Scott expressed regret that approval had not been received for extensions and supplementary funds for Alberta's program. He felt that such approvals were delayed because they went through the ministerial level. The Chairman stated that there was no established procedure requiring involvement by the Ministers and that, with the exception of the question of extensions, such matters could be handled by those responsible for the projects. However, he felt that it was to the province's advantage that such approvals go through the higher level.

BRITISH COLUMBIA

Mr. W.A. Benson reported for British Columbia. The waterfowl sector is complete; the recreation, ungulate and present land use sectors will be completed in the coming year. The agriculture sector is one-third complete and the forestry one-quarter complete. Mr. Benson anticipates the entire program to reach completion by 1980.

Mr. Benson expressed concern with the present status of Canada Land Inventory publications. He felt that there were far too many interim documents and in particular there was immediate need for the recreation and wildlife classification guidelines. As for those publications already printed, British Columbia had experienced great problems in securing copies. In the preparation of narratives, Mr. Benson felt that the federal co-ordinators should become more involved and that the requirement for conformity was impractical. British Columbia intends to go beyond the existing Inventory boundaries. The province hopes that, in particular, the Canadian Wildlife Service will take steps to aid in this extension as it is felt that this agency can provide valuable assistance in waterfowl mapping.

DISCUSSION OF PROVINCIAL REPORTS

The first item for discussion was the Queen's Printer. The Chairman noted that the problem of distinction between the federal and provincial Queen's Printer as noted by Mr. Benson had been resolved, but there was still a problem of distribution of maps through federal government bookshops. Mr. Roberts and Mr. Johnston were asked to work this out with the Queen's Printer.

Regarding the request from Nova Scotia to hold the release of recreation capability maps, the Chairman stated that he appreciated the need for lead time especially in this sector, but at the same time the Inventory had to account for a certain amount of production. It would be possible to hold the release of these maps for perhaps one year, but an indefinite holding period was impossible. Mr. Roberts indicated that his storage space was limited. Mr. Ward stated that Ontario favoured distribution as soon as possible and that this did not significantly interfere with acquisition of lands for public use. The Chairman noted that the only agreement to withhold maps is with British Columbia where sector maps are held until the capability analysis is completed.

The next discussion item dealt with the request from Quebec for financial aid in map distribution within the province. The Chairman referred to the existing policy whereby the Canada Land Inventory shared the cost in the preparation of the 1:50,000 and assumed the total responsibility for distribution of the 1:250,000; the federal government does not share costs in the provincial distribution of the 1:50,000 scale. It was suggested that if the Quebec C.L.I. group was finding this cost too great, a charge be levied against recipients. Mr. Lowe said that in Newfoundland maps were delivered to various departments and they were responsible for distribution. Mr. Benson recommended that slides be taken of the map in Ottawa prior to publication and that these be sent to the provinces where copies could be made. The Chairman agreed with the suggestion. He noted that the existing policy was a discretionary one and suggested that Mr. Belzile discuss it with him further.

Regarding the conduct of cadaster surveys, the Chairman said that with the exception of land use planning projects, the C.L.I. cannot undertake such costs. However, under ARDA, a program on a cost sharing basis was underway in the Maritime provinces. Mr. Belzile stated that it was not a question of undertaking the survey but of co-ordinating the cadaster survey to coincide with the scale of C.L.I. maps. The Chairman suggested that they could discuss this further with Mr. Roberts.

The Chairman acknowledged previous remarks regarding the delay in supplying new publications as well as reprints of existing publications. He did point out that both the recreation and wildlife guidelines were in the publication process. Mr. Coombs stated that the recreation guidelines were expected in March, and that, as was the case with wildlife, the requirement for simultaneous publication in English and in French was the chief factor in delay. Mr. Ritchie said that if there were no complications, the wildlife guidelines would be out by mid-March. In reply to Manitoba's query, no further changes will be made to the wildlife classification.

The present land use and sport fish classification guidelines will be appended to a revised version of the Objectives, Scope and Organization publication which is in process. Both Mr. Ward and Mr. Goulden wanted to know the reason for this. The Chairman stated the reason was for convenience but they could be printed separately. Mr. Goulden suggested that as every province did not have a sport fish program, its inclusion was perhaps misleading. Mr. Hilchey wondered at the possibility of including a non-detailed description of all classification systems in the appendix. The Chairman acknowledged this possibility and cited Quebec's publication as an example.

It was suggested that there was a danger in describing the present land use classifications in that a possible demand would be created for maps that were unattainable. The Chairman stated that he did not see any problem; very shortly the majority of maps will be available, at least in manuscript form, and that sport fish maps could be secured from the federal C.L.I. and present land use from the provinces.

Mr. Benson reaffirmed his long standing request for publications and suggested that 10 or 15,000 rather than 5,000 copies should be printed. The Chairman suggested all publication requests should be submitted through the Operations Co-ordinator, Scott Johnston.

It was decided that the question of extension of the C.L.I. boundary would be discussed by the Chairman and provincial co-ordinators Thursday evening.

Mr. Benson elaborated on his earlier request that federal co-ordinators take a more active role in the writing of narratives. He noted certain inconsistencies in instructions coming from Ottawa. Mr. Benson felt that while some useful changes were being made by editors, the main area of contention was changes in style. These narratives have been examined closely before submission to Ottawa and these stylistic changes are annoying. There do not appear to be any problems with the agriculture sector descriptions, but the editors are not as well informed about the use of common or local names for other sectors. As the maps will be used primarily in the province where local names are understood, it is more important to use them rather than

national names. Mr. Benson suggested that comments be returned to the author on a separate piece of paper, rather than being marked on the original copy.

Dr. Duffy supported Mr. Benson's statement that the great problem was with stylistic changes which were not of great value. He stated that co-ordinators have an opportunity to read narratives before they go to the editor but personally he does not feel he has sufficient time to act as a middleman between the province and the editor. Dr. Duffy suggested that the problem was perhaps too rigid an application of our request for standardization of certain information.

The Chairman stated that standardization as such was not necessary, and that flexibility was desirable in the writing of narratives. What is necessary, however, is agreement in certain basic descriptive data. Using Prince Edward Island narratives as examples, he pointed out discrepancies in total land area, average rainfall and other factors. These discrepancies were unacceptable.

Mr. Roberts was asked to discuss the problem of over-editing with Mr. Woods. The Chairman promised that the federal co-ordinators would examine narratives after editing to determine any problems and if necessary, some other editing arrangement would be made. Mr. Benson suggested that possibly the Canadian Forestry Service, Canadian Wildlife Service and National Parks could assume this role.

GEOGRAPHIC INFORMATION SYSTEM

Mr. John Foster, Director of Information Systems for the Department of Regional Economic Expansion, discussed the current status of the Geographic Information System and plans for the coming year. An organizational framework now exists within which the design and operation of resource information can be managed. Such a framework was previously lacking. The former personnel organization consisted of consultants under short term contract, a term contract for systems engineering services and four junior programmers. There was no permanent public servant responsible for the technical management or control of the activities in this area. At present there is a permanent staff of nine in addition to a closely supervised contract for systems engineering services. The existing establishment calls for a staff of 28 with 12 support staff. Four recent graduates will join the division in May, but the filling of additional positions depends on recruiting.

The past six months have been spent getting the Branch organized and negotiating a contract for computer services. Previously it had cost up to \$400 for every mapsheet entering the system. Under a new contract with Systems Dimensions Ltd., it is expected that this cost will be reduced to \$200 per sheet.

Acceptance testing, to determine the weaknesses and strengths of the system, has been underway. They are experiencing a failure rate of 16 percent. No indication is given for the map rejection and this percentage must be reduced. Providing that there is no significant failure rate, that the manpower is available, and that the source maps are free from error, Mr. Foster expects to process 1500 sheets during the year.

The 1500 mapsheets were selected on a regional basis, 400 for the west, 300 for the central region and 400 for the east. This leaves a flexibility of 200 to 400 which will be processed later if the funds and personnel are available. The regional basis was chosen rather than provincial coverage as this would not give each province sufficient number. If selection had been based on the number of maps submitted, too much weight would be given the East.

Areas to be examined within the regions have been chosen according to the availability of coverage, the relevance to other programs such as FRED and Special Areas, and the representativeness of the maps to test the system. In testing, agriculture and present land use maps receive first priority, forestry and recreation second priority, followed by wildlife.

DISCUSSION

In reply to Mr. Scott's earlier question whether area calculations would be possible and when would the provinces have access to the system, Mr. Foster replied that area calculations would be possible. Summary tables indicating the area of each unit and descriptive data cells would be given to the province, but he could not say exactly when this would be. The relating of socio-economic census data to resource data was posing difficulties. Such data is difficult to obtain from the Bureau of Statistics and it is further complicated by the changing census units. Mr. Foster will not have sufficient resources to deal with the 1961 and 1966 census and will therefore wait until late 1971 and 1972 when he will be able to use the 1971 census.

Mr. Goulden asked what steps were being taken to provide capability analysis. Mr. Foster explained that this was part of the package that had been turned over from International Business Machines and was now in the process of acceptance testing. This would be completed later this year and when it is available, the provinces would receive it. Thus far, 300 sheets from Prince Edward Island, Quebec and Ontario have been processed, producing a failure rate of 16 percent. This is a serious problem that must be overcome.

Mr. Benson asked whether Mr. Foster felt he was capable of undertaking capability analysis and whether he felt the provinces' needs would be met. Mr. Foster replied that in some cases the type of analysis desired by the province could be done, but in other cases it could not. It would be reasonable to expect that the provinces would have individual requirements, and accordingly it would be their responsibility to establish programs to meet these needs. Data analysis support cannot be supplied through the Geo-Information System, but hopefully technical advice and support can be provided.

Mr. Benson also wanted to know if there was anything that British Columbia could do to build their own computer program and if Mr. Foster could aid them. Mr. Foster will eventually send the reduction system and the technical manpower to assist the province in the initial set-up of the program. However, at the moment the reduction system has not been fully tested, nor is there manpower available. Mr. Benson expressed concern that there was nothing that Ottawa could do immediately; he has a computer man on staff, but is about to lose him if no work is available. It was suggested that this man be sent to Ottawa to introduce him to the system.

Mr. Ward wanted to know how long it would take to input all maps into the system. Mr. Foster stated that if there were no complications, map input would require little time but because of existing problems, the process is lengthy and thus we are talking in terms of years.

Mr. Lowe understood that all maps were not being input at the 1:50,000 scale and wanted to know what effect this had. Mr. Foster replied that there were some other scales being included and that it appeared that this would not be a problem.

Mr. Goulden wanted to know what the acceptable failure rate would be. Realistically, it will be 3% and negotiations are underway with IBM to achieve this. This failure rate has nothing to do with the map inputs; it is a failure of the system itself. It is mostly a problem with the program, rather than the hardware, although it is often difficult to tell.

Mr. Belzile asked if it would be necessary to go through Ottawa to input maps in addition to those already designated. Mr. Foster said it would be necessary to use the federal scanner, but if this was not satisfactory the province could purchase the program and the scanner from IBM.

Mr. McKay inquired about the availability of alternatives to the Geo-Information System and the willingness of Ottawa to explore these methods. Mr. Foster felt that they should be looking at other systems, but they were handicapped by a lack of manpower. However, he was unaware of any other system for digitizing information which will enable the analysis we require. Mr. Goulden mentioned an Alberta company which provides manual digitizing at reasonable rates. Mr. Foster said such means are acceptable for simple maps, but are very difficult for more complex maps such as present land use. Mr. Goulden stated that they had submitted their most complex present land use map and it had been accepted.

In summary, the Chairman felt that it is a matter of several years before the total Inventory receives computer coverage. He reminded the provinces that the only federal commitment is to supply the data tapes along with the programs for input and retrieval. In addition, Mr. Foster will give technical assistance in setting up the system. The Chairman warned the provinces that they should not depend on the federal government as a resource service centre, but they should begin to make their own plans to undertake programs to use and to handle this data. He pointed out that a considerable amount of lead time and preparation was necessary before the provinces would be in a position to accept this system.

Mr. McCormack felt that it was not a problem of the federal government producing the information, because it is possible, but more a problem of when it will be in a position to do so. The provinces are thus presented with three possibilities: to do the work by hand; to look at possible alternatives; to accept the fact that the system will be operational and prepare to receive it. The Chairman felt that we are at the third point and action should be taken accordingly.

CARTOGRAPHY

Mr. J.G. Roberts, Cartography Chief, reported map progress by sector for the 1:250,000 published series for the fiscal year 1969-70 as follows:

	<u>1969</u>	<u>Total to Date</u>	
<u>Agriculture</u>			
received	25	116	
published	10	60	
at press	3		
in progress	53		
percent of total sheets received			58%
 <u>Forestry</u>			
received	26	36	
published	4	5	
at press	1		
in progress	30		
percent of total sheets received			17%
 <u>Recreation</u>			
received	35	75	
published	4	5	
at press	8		
in progress	62		
percent of total sheets received			38%
 <u>Wildlife-Waterfowl</u>			
received	18	121	
published	20	20	
at press	11		
in progress	90		
percent of total sheets received			61%
 <u>Wildlife-Ungulates</u>			
received	41	77	
published	5	5	
at press	4		
in progress	68		
percent of total sheets received			39%

	<u>1969</u>	<u>Total to Date</u>
<u>Land Capability Analysis</u>		
published	1	
in progress	1	
<u>Special Projects</u>		
published	11	
in progress	2	
<u>Grand Totals</u>		
received	145	425
published	43	96
at press and expected by March 31	27	
in progress	304	

Mr. Roberts stated that his objective of 100 maps for distribution during the year was not met because of a series of production problems. These problems included symbolization changes for agriculture maps, submission of new manuscripts superceding those already prepared, tardiness in returning edited maps, extensive field changes at the editing stage requiring complete resymbolization, delay in outfitting the photo mechanical plant, government austerity which froze four working positions, and most importantly, translation difficulties. Mr. Roberts noted that of those maps in progress, a considerable amount of work had been done, constituting 30 to 40 complete maps.

During the year 3,147 maps were received for computer input. This brought the total to 8,572 for which cartography was complete on 6,387. Encoding and digitizing had been completed for 5,991 sheets and 481 had been scanned. In addition, 4,379 autositives and 5,754 ozalid prints were supplied.

Mr. Roberts indicated that a map distribution system had been established and co-ordinators would be asked to up-date provincial distribution lists. He also stated that if the provinces were doing translations, it was necessary for editorial purposes to indicate in which language the original narrative was written. The original text preferably should be edited before translation.

DISCUSSION

The Chairman expressed concern that Cartography was receiving more maps than it was producing. He noted that in the past year Cartography had been allotted more funds than it could use, and consequently it was not a problem of finances. Mr. Roberts felt that production figures could be somewhat misleading. He pointed out that considerable work had been done on some maps which have not yet been published. The major problem, translation, appeared under control. Mr. Roberts stated that the addition of 8 or 10 draftsmen would not appreciably increase production. He explained a backlog of at least 100 maps was needed to keep his present staff busy.

Mr. Ward commented that it looked like a 10-year program for Cartography and it might become worse. He asked if there were unnecessary steps in the present handling of maps and descriptive narratives. Mr. Roberts did not feel that the production schedule would be as long as Mr. Ward foresaw, nor would it become worse. He could not see any change in the handling system which could speed production.

Mr. Jenms asked if any consideration had been given to the possibility of having cartography done by the provinces or by private firms. Mr. Roberts stated that previous experience indicated these possibilities unsatisfactory. Such arrangements required much direct supervision and problems were introduced in transporting materials.

In concluding the discussion, the Chairman suggested that a careful examination of map production be made during the coming year. Mr. McCormack felt that all problems did not rest with Ottawa and that co-operation was needed from those submitting maps. The provinces, in some instances, were overly tardy in returning manuscripts. Also, changes to maps already submitted should be avoided.

RELATIONSHIP OF CANADA LAND INVENTORY

Regarding the federal-provincial aspect of the Inventory, the Chairman indicated that he proposes to present a progress report to the Canadian Council of Resource Ministers. The council was one of the initial backers of the Inventory and several of its committees, specifically the Forestry Committee, have requested a report. In making this report reference will be made to the provincial appraisals that have been submitted.

A number of countries, Finland, Norway, England, Scotland and the United States, have requested permission to send groups to Canada to become acquainted with the Inventory. Unfortunately, sufficient manpower and time do not exist to deal adequately with these requests on an individual basis. Consequently a recommendation has been made to the Canadian International Development Agency that they convene an international symposium to enable one large scale presentation of the Inventory. CIDA's concern, however, is with underdeveloped countries and the decision about participating countries rests with them.

In making this proposal, it is recommended that foreign representatives meet in Ottawa for an initial briefing and then visit one province to observe the field program in operation. There would be no cost imposed upon the province, but a certain amount of time would be involved.

Both Mr. Ward and Mr. Goulden indicated that their province welcomed the opportunity to greet international delegates interested in the Inventory. Mr. Belzile was responsive to meeting with delegates from French-speaking nations.

The federal co-ordinators will be giving a presentation of the Inventory to CIDA officials to provide a basis for a decision on our proposal. A similar presentation has been proposed for officers from various other federal agencies to promote a better understanding of the Inventory.

The general information brochure which was previously requested is in preparation and will be available at the end of April. This brochure describes the operation of the Inventory and is intended for distribution to the general public. It is anticipated that such a publication will promote better public understanding of the Inventory.

OTHER DISCUSSION ITEMS

Mr. Ward raised the question of what was to happen after the Inventory. He asked whether the federal government was interested in pursuing more intensive studies and supporting the collection of data for resource management purposes.

Mr. McCormack noted the federal agreement to sponsor one pilot land-use planning project in each province. However, there was no commitment to proceed beyond this, nor to become involved in the resource management field.

Mr. Goulden expressed the belief that the federal government would welcome the opportunity to participate in another program such as the Canada Land Inventory either by extension or intensification of the existing program.

The Chairman stated that he was not attempting to discourage this type of thinking. He was merely stating present government policy, which indicated a shifting away from involvement in such programs. There is nothing to prevent the provinces from making such recommendations. Mr. McCormack proposed an informal meeting of the federal and provincial co-ordinators by the end of June to consider such matters.

A suggestion was made from the floor that water be included within the Inventory terms of reference.

The Chairman acknowledged that the inclusion of water was an oversight, but this factor was not being completely ignored. The capability classification for sport fish is examining limitation factors such as water depth, oxygen, and temperature.

In fact, the degree of concern for the water factor in this classification is so great as to make the title sport fish somewhat of a misnomer. Assuming the successful passing of the Canada Water Act, the mandate for water studies rests with the Department of Energy, Mines and Resources. Consequently, such questions should be addressed to that department.

PART III

LAND USE PLANNING

THE BRITISH COLUMBIA LAND
CAPABILITY ANALYSIS SYSTEM *

I INTRODUCTION

The technique whereby several disciplines effectively integrate their activities in map form is discussed in this paper. This technique is believed to be practical and to allow a better analysis than could result from a planning team that may not contain enough professional disciplines and may be unaware of the implications and limitations of the data. It is recognized, however, that what has proven to be a satisfactory approach in one province may not be acceptable elsewhere.

Capability analyses are undertaken in British Columbia at the request of the ARDA Ministerial Committee. The Land Capability Analysis Committee is composed of 24 persons plus a number of invited observers; the working core is provided by the Canada Land Inventory project leaders.

II PRIOR CONSIDERATIONS

There are two important implications in showing a single typical use: the analysis is restricted to physical capability only and all conflicts must be resolved in committee. Only prime use areas are mapped, but compatible uses may be mentioned in the map narrative.

The analysis deliberately precludes economic and social inputs because it is considered dangerous to introduce an incomplete input. Once a socio-economic input is used, all factors and policies that relate to regional development should be analyzed and social values placed on capability ratings. Rather than attempt this the capability analysis is restricted to the five capability sectors.

The primary assumption in the analysis is that all classes are equal unless proven otherwise. Although there are arguments against this simplistic approach, it is difficult to reconcile them with our current level of knowledge. In addition, although the seven class capability range is condensed into four groups, the class rating is reverted to when conflicts arise.

* Abstract of presentation by D. Benn, W.A. Benson, C. Black, D. Blower, G. Howell Jones, J. Marshall, G. Runka, E. Taylor.

There are certain other assumptions that are made before undertaking the analysis. Good management to current standards is assumed for all sectors, with the individual sectors setting their own management guidelines, subject to inter-sector review. Most sectors, particularly agriculture, assume a minimum unit size that is compatible with proper management of their land. At the same time the relative location of the individual units is considered: "small" units adjacent to larger blocks are retained while "small" isolated units that cannot be properly managed are eliminated. The highest rating is used. This means that in agriculture the irrigated rating is used where it is better than the dry farm rating. The first class in a complex is considered to be representative of that unit. It is only in conflict situations that reference is made to the total complex. As the data are grouped and simplified, it is assumed that where the user requires specific data he will refer to the individual 1:50,000 manuscripts. No consideration is given to other renewable resource users, such as fish, upland game birds, and big game other than ungulates.

Land Capability Analyses cannot substitute for on-site and regional planning which would consider site and land use factors, managerial skills, financial inputs and supply and demand patterns. Planners or land managers must refer to individual sector maps, select appropriate interdisciplinary committees or advice, and make full use of other relevant data. Since the Canada Land Inventory data represented in the overlay analysis is only one aspect of the planning process, further studies are needed to indicate the best use of land in the region. The Land Capability Analysis map merely shows the best physical capability for each land unit.

Climate

Climate per se is not evaluated as a separate entity in the intersectorial exercise. The individual and combined climatic parameters are assessed as they influence the physical potential of the individual sectors at the beginning of the field inventory. As such, climate plays a subordinate role in the inventory until the planning and management stage, at which time it can again be utilized.

The basic climate for agriculture is predicted on the use of frost-free period, growing degree accumulations, moisture availability, and moisture deficits both seasonal and periodic. These parameters are combined in a climate capability for agriculture map. The forestry sector is not as certain of the exact role of climate in determining forest physical capability, but the extreme winter temperatures, snow depth and total annual precipitation are useful parameters. In general, more moisture - more wood is a fair maxim. Water temperature is important to the waterfowl biologist. Sunshine and cloud amounts, and frequency, wind and rain are an important determinant of recreation capability even though

its integration is somewhat subjective. Winter snow depth and distribution, cold winter temperatures and summer droughtiness are significant in determining physical capability for ungulate wildlife. The agriculture sector is alone in presenting a climate capability classification which can be mapped. The use of climate data by other sectors is still parameter by parameter, although parallel schemes for these other sectors are needed.

Agriculture

In determining soil capability for agriculture, the physical capabilities and the basic considerations of soils, climate and good management as indicated in the national capability classification are the only considerations. Four groupings for Land Capability for Agriculture have been established - Prime Capability (Classes 1-3), Moderate Capability (Class 4), Limited Capability (Class 5), and Native Range (Class 5 and 6 Agriculture - Ungulate 3).

Irrigated and non-irrigated capability ratings are applied where irrigation is the accepted practice and irrigated ratings are used for purposes of the analysis. The dual rating system was adopted to facilitate a more practical classification in the southern interior where climatic droughtiness and low soil moisture holding capacities are counteracted by irrigation as a matter of general practice.

The size of the agricultural unit is considered indirectly in that no small isolated blocks are left. This has some implications beyond the capability analysis in that high social service costs could be involved in these isolated pockets.

Compatibility between agriculture and other sectors is not particularly good when considering agriculture classes 1 to 5, as it is difficult to have complementary uses in cultivated areas. This means, when allocated to agriculture, prime and moderate capability lands are basically single use areas. Where there are equivalent ratings for agriculture and forestry, the area is allocated to agriculture unless it occurs in isolated units.

Waterfowl is most often complementary but conflicts with agriculture can be expected in some high capability agricultural areas where drainage of potholes and meadows destroys prime waterfowl habitat.

Recreation conflicts are site specific, most often occurring on fans and shorelands. Agriculture is complementary where the management of agriculture lands can provide a pleasing pastoral setting.

Forestry

Considerations vary with the region but in general most extensive recreation and ungulate uses are compatible with forestry

as long as they are given management consideration. Depending on the type of management, forestry is most often compatible with other uses. High Yield (1 to 3), Moderate Yield (4), and Limited Yield together cover major acreages in most Land Capability Analysis Areas. Recreation adjacent to lakes and rivers, as well as along stream corridors is kept as narrow as possible because these are the highest capability forestry sites. Good total land management is assumed for this sector, but this is not necessarily compatible with good timber production management.

Recreation

The basis for defining the limits of each recreation class is the number of users per unit area, per unit time. The major difficulty with this criteria is that data as to what the actual numbers are for each class is lacking. Only in the instance of a few of the features such as bathing beach and skiing is there criteria available to aid in defining class limits for individual features.

Quite different features are rated with one set of defined capability classes. Thus extensive features such as canoeing, hunting, game observation, angling are compared with bathing beaches. As a result, the better angling areas are rated relatively low (Class 4) while a "second" class beach with moderate limitations is rated Class 2.

In carrying out the overlay exercise, problems occur at the Class 4 and 5 levels. Class 4 units along streams invariably compete with Class 3 or better forestry. Keep in mind that a Class 4 rating on streams or rivers for camping, canoeing, angling, usually represents about the best rating for these features.

To help resolve this problem from the recreation sector's point of view, a major assumption has been that features are often as important as capability class in determining if a unit should be retained on the Land Capability Analysis Map. Each feature has a different significance in this regard. Historic sites, thermal springs, waterfalls, campsites and rock formations might be considered to have high significance while cottaging, boating, pastoral setting and man-made features are considered to have low significance. The significance of features changes from one region to another.

Using the "significance of features" as an approach at the intersector level, small site-specific units of recreation may supercede other sectors of a higher class. Consideration of the features is particularly important in facilitating a "trade-off" between sectors when there is a class-to-class conflict for a large extent of land. The key to the success of this approach is in having the actual field personnel involved in creating the final Land Capability Analysis Map.

Perhaps the most important conflict that recreation has as a user of land is with itself. The capability rating system may recognize this and allow higher classification for extensive activities; in effect, they have higher relative capability if they tend to disturb the land less, because use for recreation will be longer lasting.

Ungulates and recreation are generally compatible but intensive management for game may require habitat control that is, temporarily at least, deleterious to esthetics. Recreation use of game habitat may destroy the habitat for game or interfere with animal access to and from the habitat. Hunting does restrict the use of the same area for other recreation activities. Conflict between wetlands and recreation occurs at the intensive level; motor boats disrupt waterfowl nesting. Waterfowl habitat may accommodate occasional viewing, canoeing and photography at the extensive level; this, however, requires management input such as supervision or construction of access, or blinds. It is important to recognize that hunting is not the only justification for wildlife. Fur bearers, birds other than waterfowl and carnivores all hold interest to the recreationist.

Major apparent conflicts between agriculture and recreation are often a result of inadequate map scale and will be overcome as more detailed mapping progresses. Agriculture often enhances esthetics for recreation and complements extensive recreation pursuits such as riding and hiking. The major conflict of agriculture with recreation is in the access to features. A combination of uses could prove to be an added source of income of the farming unit, resolving the conflict.

Now that British Columbia is on a sustained yield basis, only temporary conflicts should occur between recreation and forestry. The conflict between recreation and harvesting is not the most important conflict between recreation and other uses of the land. This assumes that cutting will not deteriorate special, usually site specific features, and may actually enhance recreation values in certain situations. The major conflict of recreation and forestry in practice involves the secondary activities associated with commercial forestry, such as road location, culverts, and mill sites.

Ungulates

The ungulate inventory in British Columbia is less intensive than most other sectors. The main reason for the difference in intensity is the fact that the resource is hard to study and lacks a backlog of inventory-type data from which a land capability inventory can be developed in detail. Not only are distribution and abundance figures over most of the province very sketchy, but also, many of the basic habitat requirements of the animals themselves are unknown.

With ungulates, soil, climate, and topography work indirectly by determining the vegetation; climate and topography also act directly on the ungulates. Because of this, the ungulate sector cannot put as much emphasis on soils as do the forestry and agriculture sectors. For these reasons the approach of the ungulate sector has been less intensive and more empirical than other sectors.

In the intersector analysis, the ungulate sector is faced with comparing its relatively broad map units with the smaller and more well defined units of other sectors. Another major problem is the fact that the economic value of a given class of land for ungulates is not known. Because of this, it is impossible to objectively compare classes between sectors and decide what is the best use of each parcel of land. It is for this reason that the intersector analysis has been termed a land capability analysis rather than a land use plan.

Despite these limitations, almost all the prime capability lands have been assigned to each sector in Analysis areas completed to date. For ungulates this has involved mainly Class 1 and 2 lands, for other sectors Class 1, 2, and 3 lands. This indicates that the ungulate classes have been rated approximately one class lower in the overlay analysis.

The main conflict involving ungulates has been with agriculture, although, because of the restricted amount of good agricultural land in British Columbia, the conflict has not been widespread. Intensive agriculture is basically incompatible with wild ungulate production, although some compatibility exists between whitetail deer and certain types of farming. Agricultural grazing is generally compatible with summer wild ungulate production, but incompatible with winter ungulate production. This is true because the intensity of use by ungulates on critical wintering areas is such that competition by domestic livestock is severe. Because of the compatibility between wild and domestic ungulates on non-wintering ranges, integrated use areas, called Native Range, have been shown on some of the overlay analysis maps.

Forestry and ungulate production are generally quite compatible as the better class ungulate lands are usually too dry or too wet for intensive forestry. Much of the Class 3 and lower wildlife lands have gone to forestry, however, with wildlife discussed in the map report as being an important secondary user on these lands. This is a satisfactory arrangement, as on these classes of ungulate land, good forest management practices are generally beneficial to ungulates, and the land base remains in public hands.

Little or no conflicts have occurred between ungulates and either recreation or waterfowl in the study areas analyzed to date. Intensive recreational activities, however, could conflict if they

overlap winter ranges, migration routes or mineral lick areas. The compatibility of use between ungulates and extensive recreation activities on alpine areas in the higher mountains has been recognized in the Capability Analysis areas by the inclusion of a highland category. This highland type has been designated as an integrated wildlife and recreation use area, as no other sectors have high capabilities within this zone.

Wetlands

Land capability considerations made by the wetlands sector are limited only to capability for waterfowl production, migration and wintering use.

Due to an irregular and mountainous terrain, most of British Columbia is topographically unsuitable as high quality waterfowl habitat. Wetlands vary from large, permanent, deep lakes in valley bottoms to extensive, flat muskegs. Between these extremes, however, there are situations favoured by waterfowl which vary in quality and density and which are so distributed as to require consideration on an individual wetland basis. In other areas such as the grasslands and parklands of the Interior plateaux, wetlands may often be assessed as large units or landforms.

Because most wetlands in this province have been treated on an individual basis, the conflict between waterfowl and other users has so far been very small. In the present capability studies, water and the land supporting water bodies have offered greater potential for waterfowl use than they have for most other land-users.

In the intersector relationship of land capability analysis there is no conflict of interests between wetlands and ungulate uses. Since wetlands in timbered areas are typically of low quality for waterfowl production or migrational use, there is little competition for lands between the wetlands and forestry sectors. Similarly, the site-specific nature of recreational use of water and the difference in time and type of use generally reduces conflict between the recreation and wetland sectors to a very low level.

Of all land users, agriculture is the one which affects the wetlands interest most. This influence can be either adverse or beneficial and is intensified by the fact that the limited arable lands of this province are often highly rated by both sectors. However, when considered in the context of the Land Capability Analysis, the importance given to water and wet areas by the wetlands sector is generally greater than that for land. Thus, conflicts between this group and others in establishing multi-use priorities are minimal.

III EVALUATION AND TECHNIQUES

To illustrate the adjustments that have been made to accommodate local needs, the four developmental stages in the land capability analysis will be summarized.

Stage 1

In May 1967 a small working committee which had been set up previously for technical co-ordination, was asked to show proof of performance for two years' Inventory work. The area chosen was the Prince George Special Sales Area. In order to ensure that the work was done quickly, with as little interference as possible with the current field programme, each sector was given a 1:50,000 autopositive of the area and asked to plot their own high capability areas. Agriculture and waterfowl chose to show Classes 1-4 as their high capability while the other sectors showed Classes 1-3. There were a number of problems: (a) quite a bit of the area was not yet mapped, (b) this unmapped area varied from sector to sector, and (c) the degree of generalization varied between sectors.

The map produced had what is now recognized as an agricultural bias, in that the few assumptions that were made were pro-agriculture. Conflicts were resolved mainly in agriculture's favour as it "generally yields a higher return than the same class in any other sector". At the same time, problem and low capability areas were assigned to the convenient title of "multiple uses".

Stage 2

The Deputy Ministers Committee's response on viewing the Prince George map was to ask for it in greater detail. A new and more sophisticated analysis to evaluate the development potential of the Prince George area was started. The initial overlays were to provide a direct comparison between physical capability and present use, highlighting such things as (a) farmland available for improvement, (b) areas suitable for mechanical reforestation. The initial overlays were then to be superimposed on others to highlight the area of unrealized potential. The initial overlay work was undertaken by a class of 40 geography students at the University of Victoria. The resulting maps and acreage tabulations were disappointingly poor and represented 40 different measurement standards. Supported by an unenthusiastic response from the Deputy Minister to the presentation of some of the better maps, the work was abandoned.

Stage 3

In February 1968 the Intersector Committee was reconvened to undertake a simple analysis of "single typical use" or prime use. This finally resulted in the published Land Capability Analysis for the Prince George Special Sales Area. Table I shows somewhat of a bias

towards agriculture and to a lesser extent, towards forestry. There were three groups for agriculture, two for forestry and one each for recreation, ungulates and waterfowl. In addition the resolution of some conflicts were influenced by present land use.

TABLE I
DATA GROUPING (PRINCE GEORGE SPECIAL SALES AREA)

	Agriculture	Forestry	Recreation	Ungulates	Waterfowl
Prime Group	1-3	1-3	1-3	1-3	1-3
Moderate Group	4	4	-	-	-
Limited Group	5	-	-	-	-
Low Potential	6&7	5-7	4-7	4-7	4-7

Stage 4

When work commenced on the East Kootenay area, a real attempt was made to correct the apparent deficiencies of the Prince George area. The analysis was extended to include the moderate groups for ungulates and waterfowl, the moderate and limited groups for recreation, and the limited group for forestry. Two new categories of "Native Range" and "Highland" were introduced, permitting the elimination of the low potential category. Also, conflicts were resolved without recourse to present land use.

TABLE II
DATA GROUPING (EAST KOOTENAY)

	Agriculture	Forestry	Recreation	Ungulates	Waterfowl
Prime Group	1-3	1-3	1-3	1W & 2W	1-3 & 3M
Moderate Group	4	4	4	3 & 3W	4
Limited Group	5	5	5	-	-
Low Group*	6&7	6&7	6&7	4-7	5-7
Special Categories:					
Native Range	5&6	5&6	6&7	3&4	6&6
Highland	6&6	6&7	5&6	3-6	5-7

*not shown

The East Kootenay Analysis has set the pattern for the present Bulkley Analysis and for future work. The legend should remain fairly constant, although the interpretation of which classes belong in each group may change from region to region. The further development of the overlay analysis was facilitated by a change in technique from manual overlay, with an occasional assist from an epidiascope, to the use of coloured overlays in an overhead projector.

The preparation of materials involves seven steps. Sector capability maps at 1:50,000 are photographically reduced to a common scale of 1:126,720. These are joined together into two-mile map sheets and ozalid prints are produced. A planimetric base map of the area is printed on clear film at the same scale. This base is normally a photographic enlargement of the 1:250,000 publication base. The second step requires colouring the 1:126,000 prints for each sector according to a colour scheme devised for the analysis. Only those classes to be considered in the exercise need be coloured for each sector. From these coloured sector prints, the required information is placed on clear acetate overlays that cover the area under consideration. With the fourth step, the drafted overlays and planimetric base are photographically reduced to a scale of approximately 1:1,000,000 suitable for projection on an overhead projector. Next, clear contact positives are made from the reduced sector negatives. Once these are obtained the lines delineating moderate and low class areas are opaqued on the negative. This leaves only prime areas. Clear contact positives are then made from these. In step six transparent colour overlays are produced at the same scale using GAF projecto-viewfoil film. This is an ozalid process. Two copies are made of each sector for both sets of overlays. The colour transparencies are then fastened so that they may be overlaid in any combination when mounted on the projector.

The overlay process involves four steps. A white paper base (approximately 6' X 6') is mounted on the wall. Using white paper as a projection screen, one of the overlays is projected and co-ordinate reference points are marked on the paper screen. The prime capability group of transparencies are then projected, and using the analysis colour system, the areas of single no conflict capabilities are coloured.

In step three all conflicts that occur within primary areas are resolved. The overlay of all groups is projected and the same procedure as in steps two and three is repeated.

In preparing a preliminary map the five sector overlays at 1:126,720 are overlaid and a single matte autopositive is made. This shows all sector boundaries that are considered in producing the capability analysis. From here it is relatively simple to colour the autopositive according to the boundaries established on the preliminary map obtained in the above four steps. All questionable areas are noted and are presented at a subsequent intersector meeting where corrections and any alterations are made.

IV SUMMARY

The Land Capability Analysis is basically a physical evaluation of a number of land capabilities. It shows, from the ecological standpoint, the highest and best prime use of the land, but not the only uses. Each land area shown has secondary and even tertiary uses which should be considered, and which probably will be required for optimum use.

To date the land capability analysis has served a variety of uses. It has been used to delineate the administrative boundaries of government land agencies and to determine policy for agriculture, forestry and recreation. The analysis has also resulted in a Cabinet and Deputy Ministers Committee on Land Use in British Columbia. In the future planning and development of the province's land resources, the land capability analysis system will make a significant contribution.

IDENTIFICATION AND ANALYSIS OF LAND DEVELOPMENT POTENTIAL *

INTRODUCTION

The Province of Ontario has embarked upon an ambitious program for regional development. This program has three major objectives: the encouragement of each region to achieve its socio-economic potential, the encouragement of careful use of the natural environment, and the improvement of the efficiency and effectiveness of provincial services.

Land use planning plays a major role in the regional development program. A generalized land use plan will be prepared for the province pertaining to the period between 1969 and 1971 and showing anticipated land use in 1976 and 1981. Using Canada Land Inventory information as resource data, an assessment will be made of the biological and physical environment for economic activity, especially primary industries.

The following description of the approach of the Regional Development Branch in the regional development program pertains to the Midwestern Economic Region, but with minor adjustments could be applicable to the entire province.

SIEVE MAPPING TECHNIQUE

Two techniques are being employed to analyze and synthesize land use and land capability information on a regional basis. One method represents the traditional qualitative sieve mapping procedure. The second method involves the use of a computer grid system to quantify and analyze land development potentials and to integrate socio-economic factors.

The map components and development factors are the same for both techniques. Four major map components are used: existing land use, land capability, land physically unsuitable for urban development and socio-economic factors.

The existing land use map component comprises three development factors: woodlands over 100 acres, large institutional holdings, and public lands and urban built-up areas.

* Abstract of paper presented by James W. Blair of the Regional Development Branch, Ontario Department of Treasury and Economics. Copies of the detailed presentation are available from the Canada Land Inventory, Ottawa.

Five development factors are included in the land capability map component: two groupings of lands for outdoor recreation, two categories of areas with high capability for agriculture, and areas of high capability for wildlife production.

The next map component, land physically unsuitable for urban development, is composed of the following development factors: excessive slope, land liable to flooding, poorly drained or marsh areas, water bodies, organic soils and aquifer or aquifer recharge areas.

The sieve mapping process produces a composite map indicating: zones of high resource potential, zones of multiple or competing resource potential, zones of potential conflict between urban and resource use, areas most suitable for urban development and existing environmental and/or physical hazards. This is the type of information required for first level or concept plans.

In an attempt to pinpoint and evaluate possible conflict between urban and resource uses, the area within a three-mile zone of the built-up limits of each urban centre in the Midwestern Economic Region was examined using the sieve mapping process at a scale of 1:50,000. An evaluation and rating was made for each of the selected urban centres as to the extent that development factors conflicted with urban growth or acted as a constraint on development. This evaluation can be matched with the proposed future land requirement of the centre to determine the magnitude of the conflict. The detailed overlay map can also be used to indicate the desirable pattern of future development for each centre.

As the number of development factors increase, it becomes excessively difficult to read the sieve-type of map. With more than three development factors overlaid it is difficult to read the significance of each distribution vis-a-vis the other. It is impractical to read gradations of suitability for different land uses very precisely, let alone quantify the values discerned.

The legibility problems have been overcome to some extent by using completely transparent coloured material for each development factor. In addition, a technique has been developed whereby the overlays showing existing woodlands, urban land use, public land and institutional holdings, agricultural capability and recreation capability are combined to form a base. Other development factors are then added to this base.

The sieve mapping method has a very low capacity to reveal or analyze the locational attributes of each particular parcel of land; this method cannot effectively integrate important socio-economic factors into the total analysis.

It was partially a result of working with the above mapping limitations that a decision was made to analyze resource data using a computer grid system.

COMPUTER GRID SYSTEM OF RESOURCE ANALYSIS

The basic spatial unit for data collection and analysis is the four square kilometer unit based on the Universal Transverse Mercator grid system. The four square kilometer grid size was chosen on the basis that it satisfied both the scale of data use and the need to keep data collection and analysis costs within practical limits.

The computer program used in this project was developed by the Regional Development Branch. It is similar to the SYMAP type mapping system and the "Grid" program developed at the Graduate School of Design, Harvard University. It represents a highly efficient means of graphic display of large quantities of information collected on the basis of a rectangular co-ordinate grid.

The program requires two sets of data input. First, the data values associated with the spatial grid; for example, the amount of Class 1 agricultural land within each grid square. Secondly, a series of instructions about the particular procedures and forms that are to be used for analysis and display.

The computerization of resource data involves the following steps: (a) Mapping of development factors at the scale of 1:50,000. (b) Outlining of four square kilometer grid cells on the above maps. (c) Manually calculating and recording the number of acres occupied by each development factor within each grid cell. (d) Calculating and mapping the percent of each development factor within each grid square.

A grid map (Land Development Potential Map) is produced indicating the relative developability of each grid square in the form of a grey scale between black and white. Single factor maps or maps showing any combination of factors are produced as required.

Two additional steps in this method of evaluating and integrating resource and development factors which improve significantly the value of the output are: the allocation of different degrees of importance to the development factors and the integration of socio-economic factors.

The allocation of different degrees of importance to the development factors involves the construction of a key table of weights. Given that no objective system of deriving these values is available and the difficult task of objectively devising one, it is obvious that any weighting scheme adopted must be extremely arbitrary. It must be closely geared to the use to which the output will be put and the goals and objectives within each region.

If the development factors are to be viewed in terms of constraints on urban development, then it is perhaps logical to break the weighting scheme into two categories: development factors which can be considered as absolute constraints on urban development, or as environmental hazards and development factors which can be considered as programming constraints.

There are two possible methods of integrating socio-economic factors with the physical development factors. One method is to prepare transparent overlays for socio-economic factors and overlay them on the computer grid map. A second method is to have the socio-economic factors as a separate part of the computer grid system. That is for each socio-economic factor an objective score is determined for each grid cell. These are aggregated and added to the physical development factor scores.

As a broad analysis of potential land use, the computerized map showing land development potentials has an important role to play in the regional development plan-making process. However, one must emphasize that it is a planning tool and, therefore, its relatively low position in the planning process must be maintained. In summary, the Land Development Potential Map represents a potential decision surface for regional analysis.

USE IN REGIONAL PLANS

One important use of the output from the sieve mapping and computer grid system technique is to point out resource growth zones in addition and complementary to urban growth areas. These would be areas in which public investment and programs could be concentrated. An attempt would be made through the designation of resource growth zones to provide the framework for rural land use policies, to concentrate on and maximize the productive capacity of rural resource based industries, and to solve regional problems.

Predominant resource use would be designated in areas where there is no or little overlap between land potentials. For instance, an area of high recreation capability and low capability for other resource uses suggests a high suitability for recreation facility development in that area. Public and private recreation investment could then be geared to these areas.

Multiple and competing resource use areas would also be designated. A good example is the Fonthill Kame area in the Niagara Peninsula where there is a pronounced conflict between mineral production, fruit growing and passive recreation. The position of the Regional Development Branch would probably be to outline the zones of multiple and competing resources potential, and to indicate that a more comprehensive planning approach to them is imperative before government policy can be established in these areas.

Zones of conflict between urban and resource use would also be shown. This could be achieved by overlaying zones of prime urban development on the map showing land development potential. More detailed land use planning would be recommended in these zones of conflict. In addition, zones of existing inherent environmental and/or physical hazards can be indicated. These areas can be designated for future open space use.

Output from the resource analysis procedures as presented in this paper assist in both the creation and implementation of the policy guidelines.

In summary, land use and capability mapping as described above, makes up but one of the tools, albeit an important tool, to be used in the development of Ontario's regional plans.

PANEL DISCUSSION

Topic: Does land-use planning tell us how to make the best use of our resources? If not, what is required?

Panelists: Marcel Belzile, Canada Land Inventory Co-ordinator, Quebec.
Richard Goulden, Canada Land Inventory Co-ordinator, Manitoba.
Gordon Staines, Supervisor of Lands, Western Region, Canadian Wildlife Service.
Henry Thiessen, Chairman, Conservation and Utilization Branch, Alberta Department of Agriculture.

Moderator: James Maxwell, Canada Land Inventory Land-Use Planning Co-ordinator

In his opening remarks Mr. Maxwell stated the objectives of the panel: to review what land-use planning is about, especially as it relates to the Canada Land Inventory, and to promote discussion on the Ontario and British Columbia presentations. The moderator reviewed the concepts behind resources, highest and best use, and land-use planning. Common to all is the concept of dynamism. Mr. Maxwell continued by outlining the steps involved in the land-use planning process: the identification of problems and objectives, the assembly of information and data concerning the physical, social, economic and institutional characteristics of the area and finally the implementation of the plan. Mr. Maxwell pointed out that the critical factor is the process used to formulate the plan rather than the plan itself. It is his belief that we have not yet achieved a successful integration of the various information systems to produce a total plan.

Mr. Maxwell mentioned the need for local participation in the formulation and implementation of plans. He stressed the need for a framework through which all departments and agencies concerned with land use could work.

Commenting on the planning process, Mr. Belzile felt there is too much reliance placed on the physical inputs in a plan to the detriment of social and economic aspects. Integration is most necessary. Quebec has followed the same process as British Columbia, but he wondered if there were other ways to plan. The Quebec situation shows several other departments with the power to plan land use; a co-ordination power is needed to bring these together.

Mr. Goulden stated his disbelief at such a thing as a land-use plan. He stated that it would be possible to give guidelines to suggest kinds of activity, but it would be arrogant to suggest that we could make a plan to show the best use of resources. The stimulus and incentive for

land-use planning, according to Mr. Goulden, must come from the national level. He was concerned that the Department of Regional Economic Expansion was more interested in economic incentives without really going through the rigorous process of planning for land-use.

Mr. Thiessen stated that he did not feel land-use planning tells us how to make the best use of resources. He also stated that planning must be a total approach; the planner must share this process with all disciplines. The planner must develop the plan along with those who will be affected by it. At the same time the politician as well as the administrator should be involved in the planning process.

Mr. Staines stated that the Canadian Wildlife Service was looking at the prairies and identifying areas of land-use conflict, primarily between wildlife and agriculture. This is a form of land-use planning using planning concepts for a specified program.

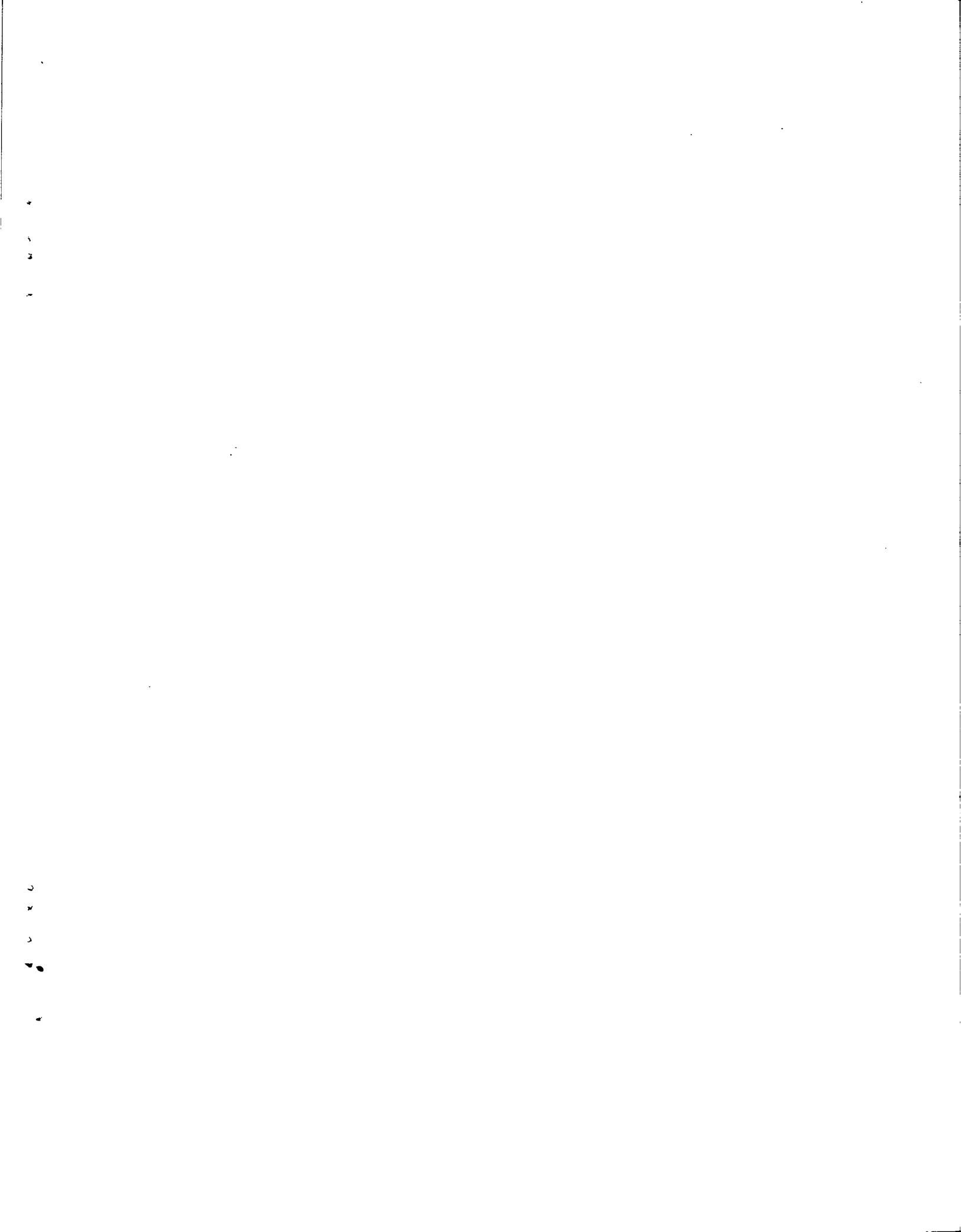
The problem of defining best use was raised. It was agreed that this was a difficult thing to determine. Because of this, Mr. Goulden suggested that we should concentrate on making as few irrevocable changes as possible. Dr. Solman felt that nothing was irrevocable but it was more a question of economics.

Mr. Maxwell discussed two previous factors which he felt were important: involvement and integration. While there was general agreement as to the need for involvement by the public in the planning process, one must consider the kinds of involvement that are desirable and the problems that it brings. He cited a New Brunswick example where the local people had been brought into the planning process. These people differed very basically in their approach, and it became a problem of reconciling their views with those of the federal and provincial planners.

Turning to the question of integration of socio-economic and physical data, Mr. Maxwell agreed that it was a complex process. However, he felt that only when the social and economic factors were included in the planning process, could a land-use plan be considered a good plan. It was thus a problem of devising a framework to achieve this integration.

Mr. Ward challenged Dr. Richard's statement that physical planning is not planning. He felt that a plan for management purposes could be established without involving social or human aspects.

Mr. Maxwell stated that engineers and planners in the past proceeded with the assumption that a physical or management plan could be implemented without consideration of the social or human inputs. They were unaware of the external effects that this plan might have. As we have become aware of these externalities, we have turned to comprehensive planning and the multiple discipline approach.



PART IV

BANQUET SPEECH

PLANNING STRATEGY IN MANITOBA

BANQUET SPEECH, E.A. POYSER*

The word "planning" in one way and another has become fashionable in society. In fact there are those who would make it a compulsory set of steps that must be followed before man's environment is changed by any major physical development. Planning has had its inning in Manitoba as a dirty word, as a fashionable word, and as a compulsory word. At the present time, I am of the opinion it is a fashionable word with overtones of a need for it to become a compulsory set of steps in areas where major environmental change is anticipated. The areas of Southern Indian Lake and The Pas, where rapid expansion and environmental change are taking place, provide a setting for which a controlled set of planning systems is required.

In the area of economic and resource development, a much broader and enlightened approach is being taken by government and political officials. I note an interest and an attempt to define and support a limited number of growth centres. Tax concessions by municipalities to induce industrial location may be prohibited in the interest of limiting ad hoc industrial development. I note also a major effort by government itself to tailor all programs operational in the province to meet specific objectives rather than continue them for historic tradition. A central economic planning unit and planning strength in line departments are considered necessary to facilitate the use of public funds to achieve objectives of public policy. The principle of program planning and budgeting and plan evaluation are becoming recognized as essential tools in the planning process. Public participation and involvement, citizens' councils and advisory committees are also seen as necessary events in this process. The people and their elected officials, in short, want to evaluate and redefine the purpose and objectives of government programs.

In Manitoba we have reached the stage where the necessary programs and tools and the requisite environment exist to undertake and encourage meaningful planning. However, it was not always so. Personally, I can speak about the ten-year period between 1960-70. For discussion purposes, I would divide this time into two periods, 1960 to 1965 and 1965 to 1970.

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During the 1960 to 1965 period, planning was largely a departmental responsibility and therefore unco-ordinated. Early ARDA arrangements provided some attempts to integrate data for "problem" areas of the province, but such attempts did not substantially change the state of planning. The style of planning was best described as "indicative planning". In effect this was best illustrated by the COMEF report which undertook a broad overview of human and natural resources and projected objectives that the Manitoba economy might reach by 1975. Government agencies and business were expected to react and adjust to these stated objectives. Considerable adjustment was made by a few agencies but only marginal adjustments were made by most. The COMEF report was a start at broad planning, but it failed because it did not provide the ways and means to reach its stated objectives. The point to note is that it is incumbent upon people who state objectives to fashion programs and to allocate budgets to meet those objectives.

One significant development in the 1960-65 period was the production through the ARDA program of a plan for the Inter-lake region, which integrated its objective setting with programs and finances to make it work. This effort was spearheaded by a central political understanding of the process both federally and provincially. I speak here of the leadership of Mr. Sauvé and Mr. Roblin. Without their strong leadership it would not have been possible to achieve the degree of integrated program planning in that region of Manitoba.

In the 1965 to 1970 period a greater effort was made to co-ordinate departmental and agency activities. The focus turned inwards to implement program and financial planning. As those in other federal and provincial governments who have gone through this know, this process can be distressing to the traditional bureaucratic approach. I must say that in my opinion, to date, it has erred on the control side rather than stressed the integration of programs to achieve objectives.

During this period the FRED plan was made operational for the Interlake region. There were many heartaches in it, but by and large the people in the region who are the leaders comment on its value; the central management, planning and cabinet systems see it as an advantage, as programs are compared to objectives held regionally, provincially, and federally. In Manitoba it has been a very positive initiative to overall provincial faith in a planned program budget approach.

During this period regional development systems based on municipal support have been formed representing seven areas in Manitoba outside of metro Winnipeg. Each area has one or more discernable trade centres which dominate the region involved. At the moment these organizations are promotional in character regarding

development of their region. They have had varying degrees of success in examining and agreeing upon where growth in the region might take place. I mention these as they are an evolutionary socio-political-economic means of achieving subregional identities, which can harmonize with the present aspirations of the Department of Regional Economic Expansion with respect to specially designated areas.

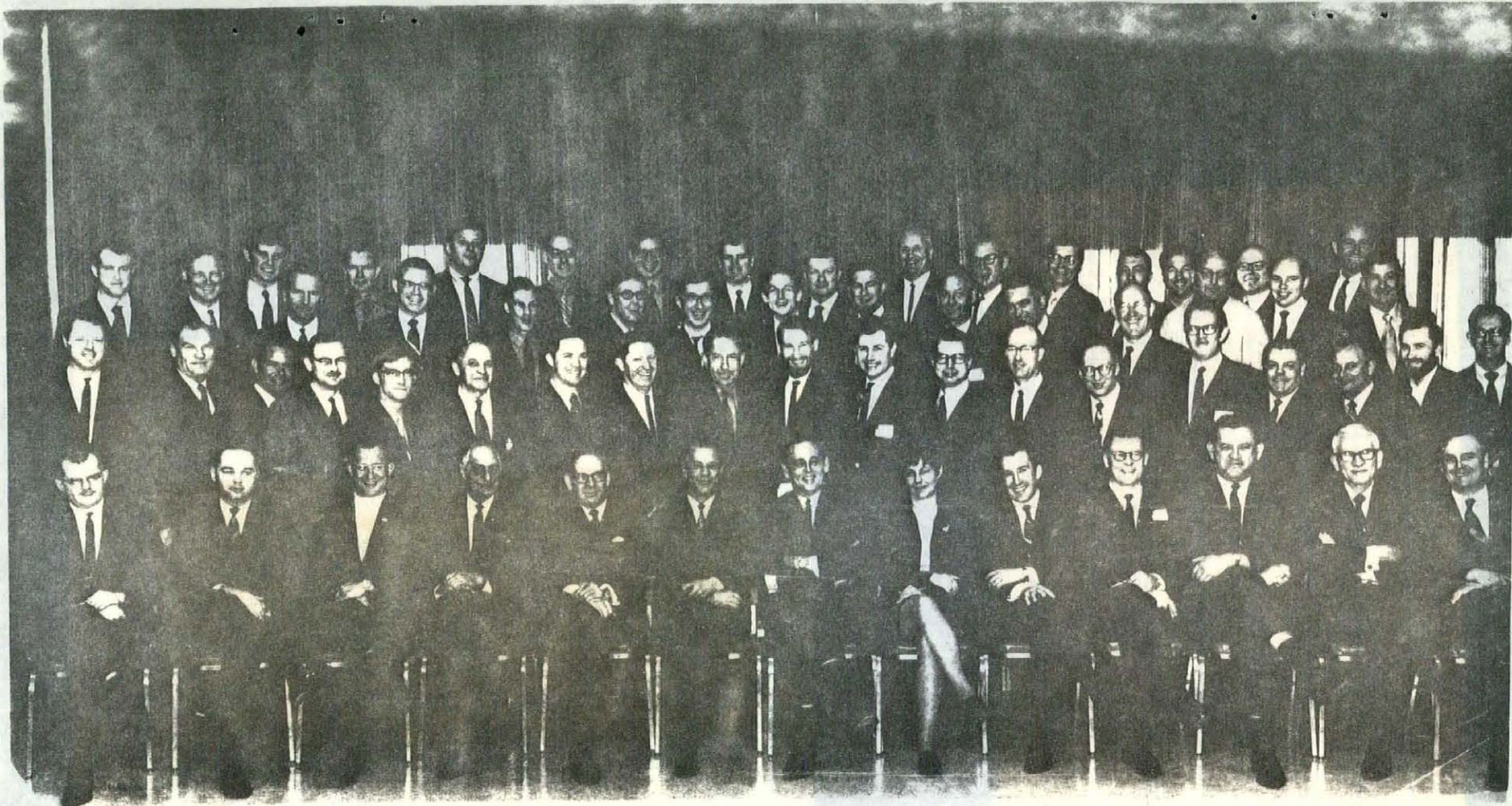
Planning for land use must encompass the social, political, economic as well as the environmental aspects. Planning today is being undertaken by a number of groups which presents a challenge of co-ordination. In Manitoba this role of co-ordination is being fulfilled by the Planning and Priorities Committee.

But communication as well as co-ordination is essential in the planning process. Those involved with the Canada Land Inventory possess valuable technical knowledge, but I cannot help but feel that there is a great gap in the communication of that knowledge. It is essential that there be a basis for the politician, the public servant, and the private citizen to communicate. I would suggest that Manitoba's success thus far has in a large measure, been attributable to good communication internally and externally.

What does the future hold for Manitoba respecting planning? At present, planning personnel are working out a hierarchy of centers and the role of these centers in employment, regional trade, social and cultural amenities, and so on. There is a feeling that Winnipeg is big enough and that complementary regional centers should be supported. There is recognition, however, that controlled development is essential to limit increasing infrastructure costs. One can imagine the role that might be played in encouraging the quality environment for people living in these regional centers. Questions such as what should PFRA and ARDA priorities be, where should housing be encouraged, and what will be manpower requirements, are now very much in front of the politician and bureaucracy. To integrate program plans relative to these questions, there appears to be a major desire by government officials to strengthen central capacities for economic analysis and planning co-ordination. An integrated central-line planning effort is being anticipated. Systems which integrate analysis, effort and interactions of all activities, both public and private in given regions, are seen as essential to plan evaluation. A Land Planning Commission is being considered for The Pas to bring under control and give direction to the development taking place in that center and the effect of that change on the surrounding region.

Whether planning strategy for Manitoba is sufficiently well founded and equipped to contend with present and future planning requirements within the province remains to be seen. There has been a series of approaches to planning under test. A growing group of people both public and private see the need for better integration of public and private policy. The next five-year period is likely to produce a more pervasive planning strategy in the province.

APPENDIX



First Row, Left to Right: 1. J. Lovering 2. L. Bradley 3. M. Belzile 4. H. Hoyt
5. J. Hilchey 6. R.J. McCormack 7. A. Benson 8. A. Beaulieu 9. R. Goulden 10. J. Lowe
11. G.G. Rathwell 12. E. Ward 13. S. Scott

Second Row, Left to Right: 1. P.J. Duffy 2. W. Sly 3. Wilf Jenns 4. S.C. Zoltai
5. G. Michael 6. A. Kabzems 7. J. Maxwell 8. G. Runka 9. V. Solman 10. C. Hutton
11. I. Jackson 12. H. Thiessen 13. C. Jenkins 14. D. Hitchman 15. B. Watson 16. K. McComb
17. V. Mann 18. T. Rock 19. Jim Blair

Third Row, Left to Right: 1. Scott Johnston, 2. A. Barr 3. J. Ellis 4. R.S. Watson
5. E. Taylor 6. R. Murray 7. G. Howell-Jones 8. D. Benn 9. H. Gavin 10. J. Shalkwyk
11. G. Staines 12. L. Barber 13. C. Matthews 14. Jack Prosser 15. J.G. Roberts

Fourth Row, Left to Right: 1. C. Black 2. Allan Blyth 3. J. Senyk 4. D. Bernier 5. H. Rostad
6. D. Blower 7. D. Marshal 8. K. Nelson 9. D. Coombs 10. A.E. Borys 11. H. Goulden
12. M. McKay 13. R.D. Thomasson 14. J. Foster

