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Land Information Services Division

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**ALBERTA FORESTRY, LANDS & WILDLIFE
LAND INFORMATION SERVICES DIVISION
ANNUAL REPORT
1990-91**





LAND INFORMATION SERVICES DIVISION

ANNUAL REPORT 1990-91


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EXECUTIVE SUMMARY

Introduction

The Annual Report for 1990-91 of the Land Information Services Division of Alberta Forestry, Lands and Wildlife forms part of this report to the Canadian Council of Geomatics Annual Meeting, to be held in October 1991.

This executive summary notes the major points of interest for the council's members.

Initiatives

LRIS

The \$24.6 million funding for the Land Related Information Systems (LRIS) Project was released by Treasury on December 7, 1990 upon approval of the Parcel Mapping Agreement with three utility companies. In 1990-91, \$5.4-million was made available to the project. This will rise to \$6.4-million for each of the next three years. The funded project has two components: the Parcel Mapping Project and the LRIS Network development.

The agreement specified that the \$16 million to be spent on the Parcel Mapping Project must digitally compile all survey plans, currently registered at the Alberta Land Titles Offices by December 31, 1994. The parcel mapping is produced from the plans of survey filed with the Land Titles Office. This project

supplements the digital cadastral mapping started 10 years ago with those towns over 2 500 population. This latter project will also be complete by December 31, 1994.

The agreement specifies that the mapping must be kept up-to-date within 40 days until December 31, 1994 and within five days thereafter. If the mapping schedule falls behind, the utility companies can withdraw from the agreement with heavy financial penalties to the government. All production, quality control and maintenance is contracted to over 30 land survey firms.

The LRIS Gateway System will provide a remote access to the government's land-related databases and will open in early October 1991. At the end of 1992, a spatial database will be added initially using the cadastral mapping as a reference for land titles and Crown land leases and licenses.

A business unit will be created to aggressively market the LRIS Network's services. The business unit will be separated from the division in order to be more easily accepted by other departments, that is more neutral. The unit must cover its own operating expenses and fully recover the \$8.6 million cost of its technical development.

EXECUTIVE SUMMARY

The purpose of this report is to provide a summary of the findings of the study conducted by the Land Information Services Division of the Department of Energy, Mines and Technical Surveys. The study was completed in December 1981.

The study was conducted in order to determine the feasibility of establishing a land information system for the Province of Alberta. The study was conducted in order to determine the feasibility of establishing a land information system for the Province of Alberta. The study was conducted in order to determine the feasibility of establishing a land information system for the Province of Alberta.

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Introduction

The Annual Report for 1980-81 of the Land Information Services Division of the Department of Energy, Mines and Technical Surveys is the report to the Canadian Council of Economic Advisors. The report is to be published in October 1981.

The executive summary of the report is to be published in the report's summary.

Background

1980

The 1980 report provides for the Land Information Services (LIS) project. The project was initiated by the Department of Energy, Mines and Technical Surveys in December 1978. The project was initiated by the Department of Energy, Mines and Technical Surveys in December 1978. The project was initiated by the Department of Energy, Mines and Technical Surveys in December 1978.

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Alberta Vegetation Inventory

~~The first year of inventory activity has been completed.~~ In cooperation with the forest management agreement holders, a new specification for classification data has been developed. Initial steps have been taken to develop a database environment.

Global Positioning Technology

A three-year program has been started to put four or more Global Positioning System (GPS) control points into towns with a population of more than 400. The intention is to strengthen the control for the parcel mapping project in those towns not already part of the Municipal Integrated Surveying and Mapping program.

Financial Changes

The division's budget remains stable at \$22 million. This represents an effective cut of 5 percent because of inflation. The \$5.4 million increase for the LRIS project occurred in 1990-91. The \$1 million increase to \$6.4 million in 1991-92 for the LRIS budget was balanced by a general budget cut of \$1 million to the divisional budget. Thirteen positions were also abolished, of which 10 were encumbered.

A direct result of the requirement to abolish positions was the necessity to contract out all of the aerial photography contact printing and enlarging. Maps Alberta will now provide a cost-recovery service so the full cost of contracting out

is passed on to customers - both public and private sector.

Planning

The division has engaged an external facilitator for strategic planning and is dovetailing the process into the department's strategic planning project. The process has served as a consensus-building event and has confirmed mission, mandate, goals and objectives. Efficiency and effectiveness models are part of the objectives.

Portions of an Information Technology Strategic Plan were contracted to MacDonald Dettwiler.

Liaison

The division made a copy of its MASCOT geodetic data management system available to the British Columbia government for a nominal sum. The system utilizes GHOST and MANOR adjustment software.

Technology

The VAX-based Intergraph system, which supports the graphic needs of the Surveying and Mapping Branch, was upgraded to a new Intergraph UNIX-based system. Conversion of the software was successful in a production environment.

is passed on to customer - both public and private sector.

Planning

The division has engaged an external contractor for strategic planning and is finalising the process with the Government's strategic planning process. The process has served as a consensus-building event and has confirmed the division's strategic goals and objectives. It has also managed to get out of the division and effectively makes the part of the response.

Further to the Information Technology Strategy Plan was reviewed in March 2004.

Systems

The division made a copy of the MARSOT financial management system available to the British Columbia Government for a limited time. The system allows GHST and MARSOT adjustment software.

Technology

The VAX based legacy system which supports the graphic needs of the surveying and mapping branch was upgraded to a new language UNIX-based system. Conversion of the software was essential to a production environment.

Alberta Vegetation Inventory

The Alberta Vegetation Inventory (AVI) has been completed in cooperation with the forest management agencies. A new specification for data/collection data has been developed. Initial tests have been taken to develop a database in Microsoft Access.

Global Positioning Technology

A three-year program has been initiated to put into place Global Positioning System (GPS) control points and ground truth population of points from the field. The aim is to integrate the control for the ground surveying project in order to ensure that the data is accurate and reliable. The program includes surveying and mapping projects.

Financial Changes

The division's budget remains stable at \$22 million. This represents an effective cut of 2 percent over the previous year. The \$24 million increase in the 2004-05 project occurred in 1999-00. The 2004-05 increase to \$24 million in 1999-00. The 2004-05 budget was reduced by a general cut of 2 percent to the divisional budget. The 2004-05 budget was also reduced of which 10 percent was cancelled.

A direct result of the requirement to reduce government was the necessity to contract out all of the central processing unit (CPU) and other hardware. The contract for the CPU and other hardware will now provide a cost recovery service to the full cost of contracting out.

1.0 INTRODUCTION

The Land Information Services Division of Alberta Forestry, Lands and Wildlife provides land and resource information products and services to the department, other government departments and the public. The program includes the following:

- the administration of land survey legislation,
- survey control,
- mapping in support of provincial and municipal digital base mapping,
- resource information (data collection and analysis) services,

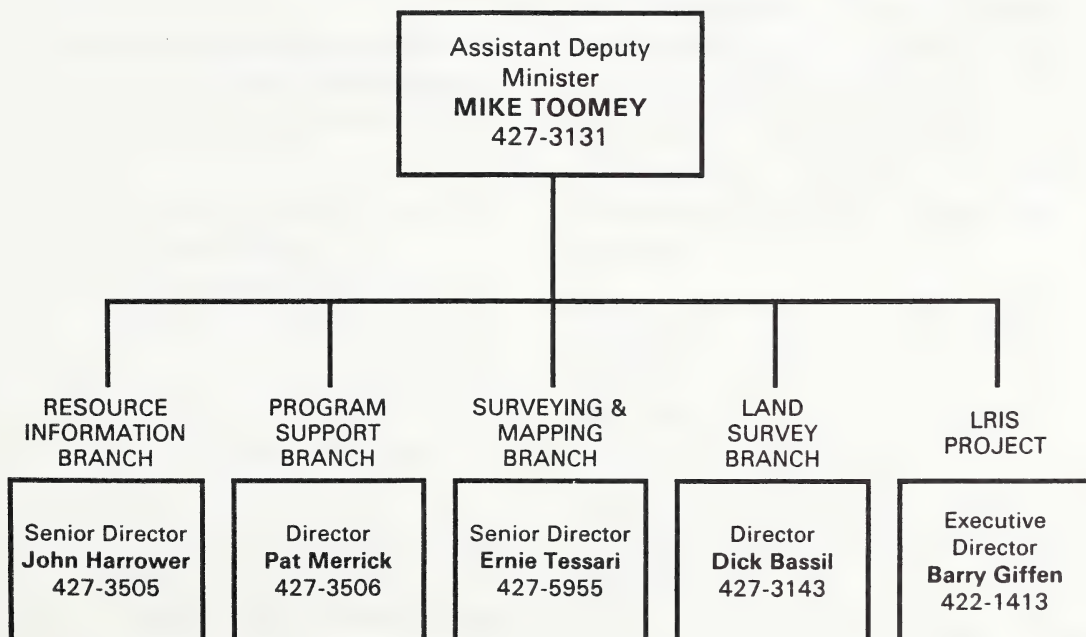
- distribution and sale of maps and land information products, and,
- coordination of the development of the provincial Land Related Information Systems.

The remainder of the annual report outlines details of program accomplishments.

The organization of branches is as follows:

Figure 1

LAND INFORMATION SERVICES DIVISION



2.0 GEOGRAPHICAL POSITIONING

2.1 Framework Survey Control

The basic survey control network for the province is provided by the Framework Survey Control Section. This network consists of survey control markers placed at a spacing of 10 km x 20 km over the province. The primary focus for this section in 1990-91 was survey control in selected small urban centres in support of the Parcel Mapping Project. This involved 84 towns and villages in central and southern Alberta.

Major Accomplishments:

1. In support of the Parcel Mapping Project, the section:

Placed monuments in 66 towns/villages

- 13 for conventional measuring
- 53 for Global Positioning System (GPS) centres

Levelling (2nd Order) conducted in

- 40 towns/villages
- 12 for conventional centres
- 28 for GPS centres

Cadastral ties were completed in 50 towns/villages

- 11 in conventional centres
- 21 in GPS centres
- 18 in traverse centres
- 13 centres were conventionally measured and positions of markers within 53 centres were

determined by GPS under contract to private survey firms.

2. Maintenance of the basic, non-urban survey control network was completed at 24 markers.

2.2 Alberta Township System Coordination

This program consists of integrating the Alberta Township System (ATS) with the Alberta Survey Control System (ASC) through field measurements and subsequently computing 800 000 coordinate pairs for governing monuments and key positions in the township system. As well, coordinates have been computed for the surveyed boundaries of national parks, Indian reserves, Metis settlements, other federal reserves and all settlement plans. Several attributes (i.e., width of road allowances were coded as being 66 ft. or 99 ft.) have also been compiled which complement the utility of the coordinate file. March 31, 1990 marked the completion of the first phase of this program which began eight years ago.

In 1990-91, ATS coordinates were revised in 78 townships to reconcile discrepancies found during the parcel mapping process in National Topographic Series (NTS) sheets 82H and 72E. Discrepancy checks were completed on 195 registered plans as part of the ongoing maintenance process in NTS sheets 82H and 83H.

The ATS coordinates were updated in the vicinity of 28 municipalities as new ASC/cadastral ties were received from the Survey Control Section. The Master Alberta Township System (MATS), Public Alberta Township System (PATS) and Municipal Integrated Survey and Mapping (MISAM) files were reconciled and the sixth edition of PATS was released.

Updated files are forwarded to Maps Alberta, for distribution, together with information on where the updates occur and instruction that Maps Alberta clients should be advised about the updates.

Elevations for section corners are now being derived from various sources. These sources include records from Geodetic Survey of Canada, Boundary Atlases, Bench Mark Diagrams, Alberta Survey Control Marker (ASCM) ID Cards, Alberta Transportation - Altitudes Publication No. 1 and 1:50 000 NTS maps. Approximately 25 000 corners now have elevations captured for them, although these have not been input into the MATS or PATS files to date.

2.3 Geodetic Computations

The Geodetic Computations Group executes mathematical adjustments and analysis to generate "published" survey control marker positions from field observations. This group also undertakes the management and distribution of this data to users.

Projects started.....	97
Projects completed	114
New survey control markers.....	1015
Old markers considered	3631
Revised survey control markers.....	2204

Urban projects undertaken include the towns of Gibbons, Beaumont, Grimshaw and Barrhead, as well as projects resulting from maintenance activities under the Rural and Municipal control programs. In addition, data processing for a Calgary annexation project was started. To manage the data associated with the processing and publication of the provincial survey control data, work continued on the Multipurpose Alberta Survey Control Operations and Task (MASCOT) system. This included completion of 360 service requests as well as refinement of system specifications for the readjustment task. In addition, tasks relating to the archiving of files and quality assurance of data were addressed.

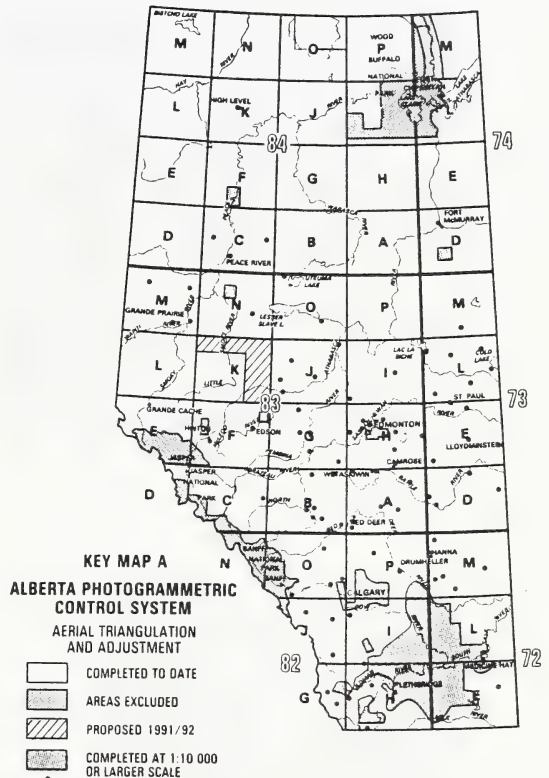
In preparation for the adoption of the new NAD83 horizontal datum and readjustment, the validation of existing observational data was completed. Blocking strategies for handling the data in the readjustment were confirmed with Geodetic Survey of Canada.

Other activities this past year included the following:

- implementation of GPS contractor validation procedures,
- completion of draft GPS data collection specifications,
- implementation of GPS data processing software and procedures,
- participation in NAD83 industry awareness initiatives,
- participation in a pilot program testing remote digital access to survey control data.

2.4 Photogrammetric Control

In 1990-91, 88 models were indexed bringing the total number of models indexed to 46 718. Control services were provided to users within government and private industry. Key Map A indicates areas covered.



3.0 PROVINCIAL BASE MAPPING

3.1 Medium/Small Scale

In 1990-91, the following was accomplished:

- The 16 digital files in the 1:20 000 city series were maintained as required.
- Ten digital files for towns were completed using specifications and procedures developed for the 1:20 000 city series. Subsequently, hard copy was completed for duplication and distribution by

Maps Alberta, for all city and town 1:20 000 maps.

- The 1:50 000 digital mapping project continued. **All 50 digital files in the 1:250 000 series were maintained as current.** Eight multicolored maps were produced. The 1:750 000, 1:1 000 000 and 1:2 000 000 positional and representational digital files were kept up-to-date and multicolor maps were produced from the digital data.
- Nineteen cartographic mapping projects were completed through the Revolving Fund.

- In total, 34 maps, 53 base maps, 674 bases, 1959 prints, 19 miscellaneous charts and graphs and 349 digital files were created, maintained or distributed.

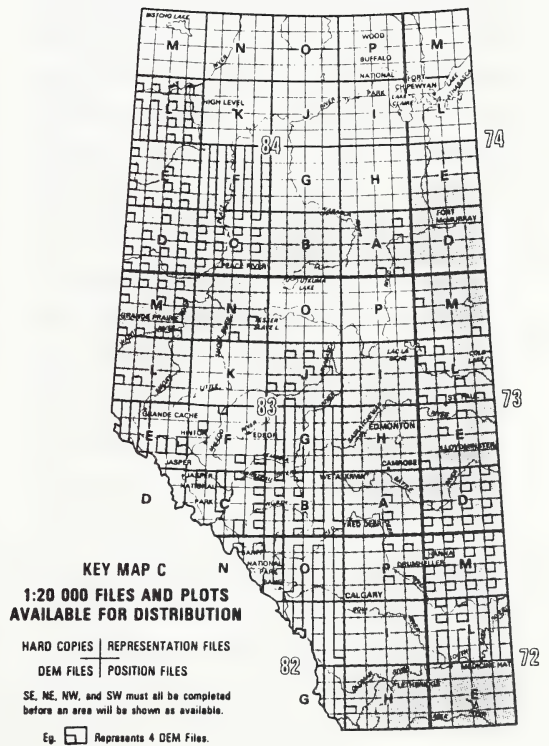
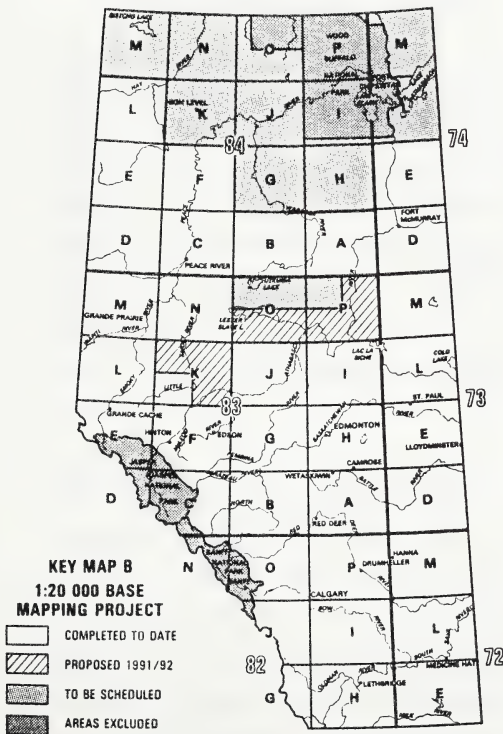
3.2 1:20 000 Scale

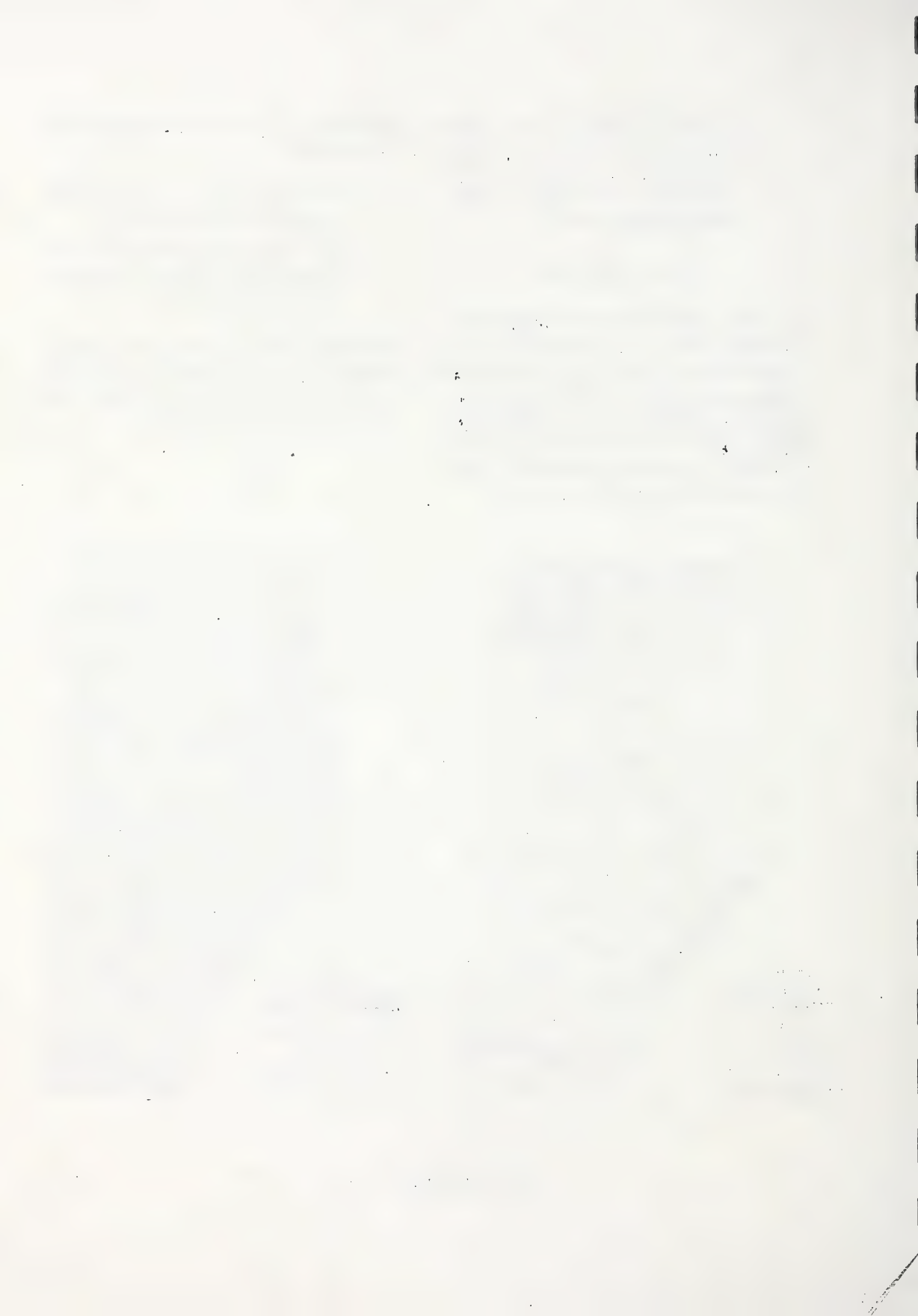
As part of the Provincial Digital Base Mapping Project, 245 digital files were contracted in 1990-91. As of March 31, 1991, up to 2080 files had been completed, covering 75 percent of the province. To complete the provincial coverage, excluding the national parks, there are 695 digital files remaining.

In addition, the following activities were accomplished:

- 1300 digital files were maintained for selected feature classes.
- 1447 diazo prints were distributed through Maps Alberta with digital sales totalling 1475 files.

Key Maps B and C indicate contracting completed to date, planned contracting for 1991-92 and the data available for distribution as of April 1, 1991.





3.3 Other Base Mapping

A study was completed involving collection, analysis and draft documentation of information on map users. The final report will be published by November 1, 1991.

In addition, 1:40 000 digital files and hard copy for the cities of Edmonton and Calgary were completed. The maps were lithographed and distributed through Maps Alberta.

4.0 MUNICIPAL INTEGRATED SURVEYING AND MAPPING

4.1 Municipal Survey Control

The Municipal Survey Control Section plans and coordinates the establishment and maintenance of high density survey control in and adjacent to major urban centres in the province. This provides the geographical positioning system or survey control component of the Municipal Integrated Surveying and Mapping (MISAM) program as administered under municipal/provincial cost-sharing agreements.

The towns of Barrhead, Grimshaw, Gibbons and Beaumont entered into the agreement under the MISAM program in 1990-91. Calgary also started an 800 m extension program around its existing MISAM boundary. A total of 296 Alberta Survey Control Markers (ASCM) were established in these areas. Service agreements with six land surveying consult-

ants, for a total of \$156 700, provided the reconnaissance, design, installation and measurement of survey control in these areas.

The section also approved the design and issued instructions for 45 ASC projects initiated by municipalities under the MISAM program. A total of 177 new ASCMs were established. Editing field returns of 11 ASC projects were completed.

In-house crews provided ASC measurements in seven municipalities to strengthen existing networks in preparation for NAD83. In support of the Parcel Mapping Project, the section also approved the design and issued instructions for placing and GPS-positioning of survey control markers in 40 project areas covering 52 smaller urban municipalities. Field returns were edited and passed to the Geodetic Computations Section for 22 of the project areas.

A total of 204 new ASCMs was established and 138 existing ASCMs were occupied to integrate the 40 project areas. Service agreements with three land surveying consultants totalling \$304 000 provided for the measurement by GPS of survey control in these areas. Furthermore, a shared cost project with Alberta Environment for \$8025 provided for the measurement by GPS of 14 new ASCMs in the town of Athabasca, bringing the total municipalities covered in this manner to 53.

In total, 691 new ASCMs were established and 1659 existing ASCMs were occupied to integrate new markers this year under a total of 102 ASC projects. Other activities included one week of Electronic Distance Measuring (EDM) instruction to University of Alberta Engineering students on the use of EDM systems and the installation of one additional GPS Basenet Pillar with Epoch 1 & 2 measurements performed by Geodetic Survey of Canada.

The MISAM Program is now under formal agreement with 72 municipalities in the province.

4.2 Municipal Mapping

Under the MISAM Program, the Cadastral Mapping Section is responsible for the development and maintenance of land survey coordinates and digital cadastral map bases at a scale of 1:1 000 for major urban centres in the province. From the 1:1 000 bases, 1:5 000 digital map bases are created and combined with contour (1 metre) and orthophoto components. The contour component is derived from a digital elevation model (DEM) obtained photogrammetrically for the area.

In 1990-91, coordinates and maps were created for 88 new 1:1 000 bases in Medicine Hat, 88 in Leduc, 80 in Lacombe and 85 in High River. Contracts for the generation of coordinates, linework and text were established for Lacombe, Leduc and High River and the text for Wetaskiwin. Photogrammetric

contracts for Lacombe, Hinton and High River were also established. Orthophoto/contour/cadastral mapping at a scale of 1:5 000 was completed for the remaining 12 bases in the county of Strathcona. Cadastral bases at 1:1 000 for Cardston and Peace River were converted into digital format. In addition to Edmonton and Calgary, coordinates and mapping in 31 other municipalities were maintained.

In total, coordinates for 370 new and 1645 revised 1:1 000 bases were generated. Maps for 556 new and 1390 revised 1:1 000 bases, 21 new and 147 revised 1:5 000 bases and 12 1:5 000 orthophoto/contour/cadastral bases were completed. In addition, 3256 digital files and 1203 hard copy bases were distributed to users. A detailed status of the MISAM Program appears as Table 1.

4.3 Liaison

The division made a copy of its MAS-COT geodetic data management system available to the British Columbia government for a nominal sum. The system utilizes GHOST and MANOR adjustment software.

4.4 Technology

The VAX-based Intergraph system, which supports the graphic needs of the Surveying and Mapping Branch, was upgraded to a new Intergraph UNIX-based system. Conversion of the software was successful in a production environment.

Table 1 **Municipal Integrated Surveying and Mapping (MISAM) Program**
1:1000 and 1:5000 Mapping Series

**DEM (Digital Elevation Model)*

MUNICIPALITY	MANUAL		DIGITAL		
	Cadastral	Contours	Cadastral	Contours	DEM*
Airdrie			•	•	
Barrhead			91-92	91-92	91-92
Beaumont			91-92	91-92	91-92
Black Diamond		•	•		
Bonnyville		•	•		
Bow Island			•	•	
Brooks		•	•		
Calgary			•		
Camrose			•	•	•
Canmore	•	•	91-92		
Cardston		•	•		
Carstairs		•	•		
Claresholm			•	•	
Coaldale	•	•	91-92		
Cochrane			•	•	
Cold Lake			•	•	
Crowsnest Pass			•	•	
Drayton Valley			•	•	
Drumheller / ID #17			•	•	•
Edmonton			•		
Edson			•	•	•
Fort MacLeod		•	•		
Fort McMurray		•	•		
Fort Saskatchewan		•	•		
Gibbons			91-92	91-92	91-92
Grand Centre			•	•	
Grande Cache	•	•			
Grande Prairie			•	•	
Grimshaw			91-92	91-92	91-92
Hanna		•	•		
High Level			•	•	•
High Prairie			•	•	•
High River			•	•	•
Hinton			•	•	
Innisfail		•	•		
Lac La Biche			•	•	
Lacombe			•	•	•
Leduc		•	•		
Lethbridge			•		
Lloydminster			•		
Magrath		•	•		
Medicine Hat			•	•	

Table 1 **Municipal Integrated Surveying and Mapping (MISAM) Program**
(cont.) **1:1000 and 1:5000 Mapping Series**

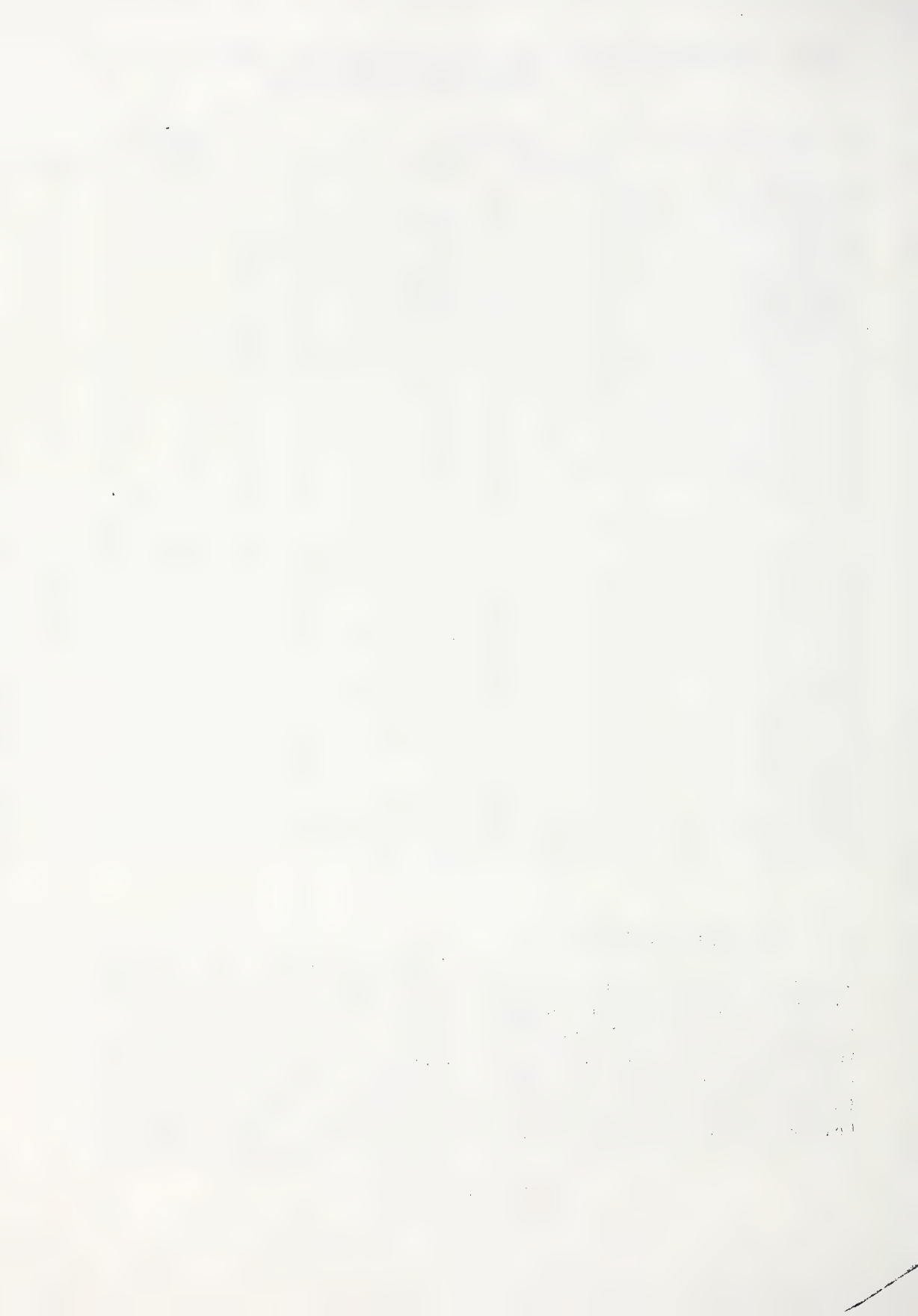
**DEM (Digital Elevation Model)*

MUNICIPALITY	MANUAL		DIGITAL		
	Cadastral	Contours	Cadastral	Contours	DEM*
Morinville			•	•	
Okotoks		•	•		
Olds		•	•		
Oyen			•	•	
Peace River		•	•		
Picture Butte		•	•		
Pincher Creek		•	•		
Ponoka		•	•		
Raymond			•	•	•
Red Deer		•	•		
Rocky Mountain House		•	•		
Slave Lake			•	•	•
Spruce Grove			•	•	
St. Albert			•	•	
St. Paul		•	•		
Stettler		•	•		
Stony Plain			91-92	91-92	91-92
Strathcona County			•	•	•
Strathmore			•	•	•
Swan Hills			•	•	•
Taber			•	•	•
Three Hills			•	•	•
Turner Valley		•	•		
Vegreville		•	•		
Vermilion		•	•		
Wainwright		•	•		
Westlock			•	•	•
Wetaskiwin			91-92		
Whitecourt	•	•			

5.0 PARCEL MAPPING

The Parcel Mapping Program is responsible for the compilation, in digital-graphic format, of registered plans of survey (except those cancelled or superseded) in each of the Alberta Land Titles Offices. Each of these plans of survey will be compiled using the Alberta Township

System as the underlying and controlling fabric. When complete, there will be approximately 7000-digital graphical files available for sale on a per township basis through Maps Alberta. A continuing maintenance program will ensure that all newly registered plans of survey are compiled. Funding was made available for this program during the fourth quarter of



the fiscal year. Production commenced by awarding contracts to 29 compilation contractors, two quality control contractors, two maintenance contractors and two printing contractors.

There were 193 townships comprising approximately 6500 registered plans contracted for compilation. Four of the townships have been approved for distribution. In addition, the preparation for compilation is ongoing in 228 townships comprising approximately 12 300 registered plans.

Ongoing maintenance of the 96 townships completed in 1988-89 included the addition of 200 registered plans to 63 townships. Maintenance procedures were also established.

During 1990-91, an agreement with a major utility company was made to complete parcel mapping within 211 predetermined interest areas. To date, 80 townships have been received and 60 townships have been approved for distribution.

Numerous enhancements to the Parcel Mapping Project have been implemented that facilitated the accelerated schedule imposed by the delay in funding. This included the second revision of the specifications document. Further during 1990-91, 162 manuscripts and 194 digital files were distributed to users.

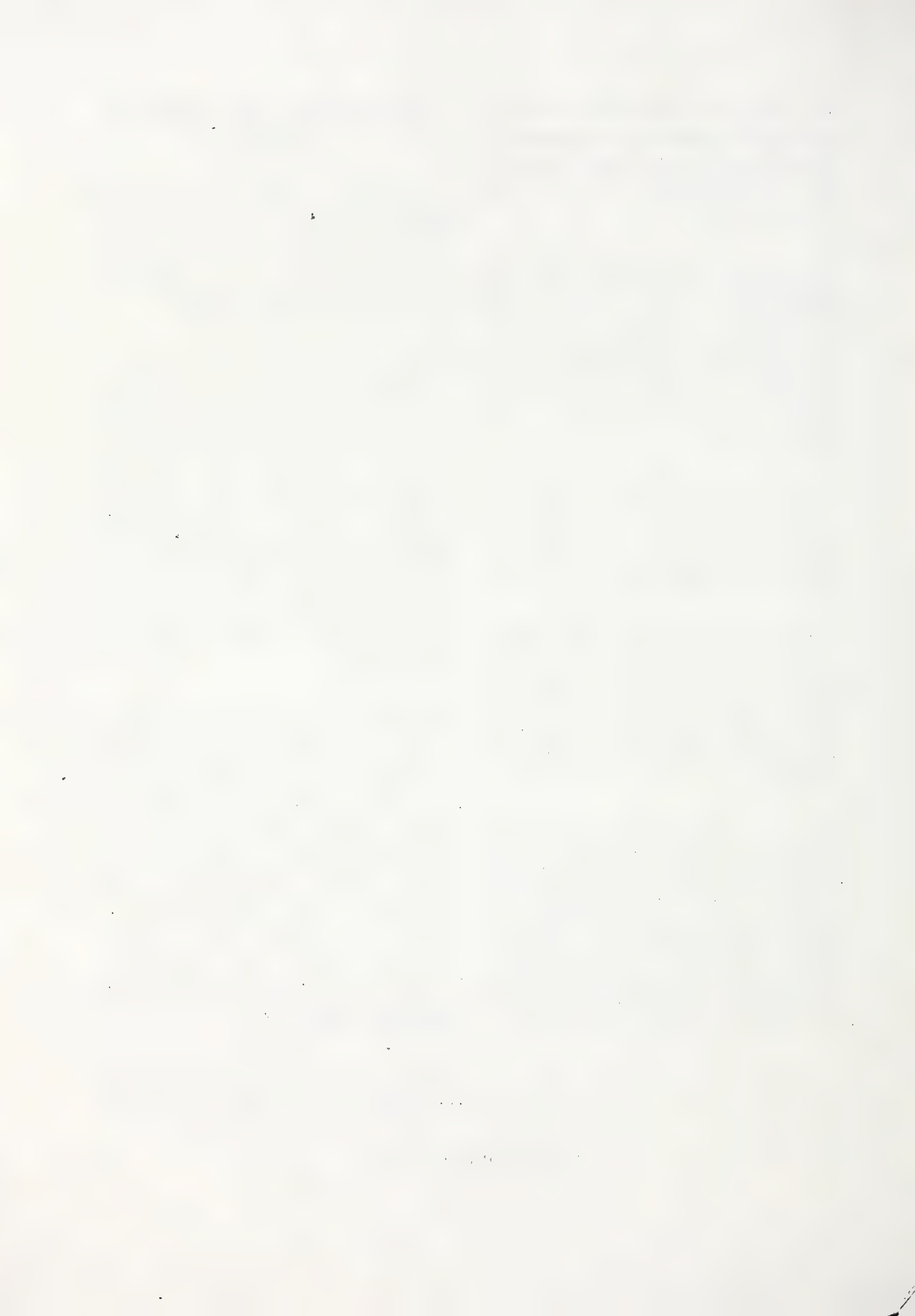
6.0 RESOURCE INFORMATION SERVICES

The mandate of ~~Resource Information Services Branch~~ is to provide natural resources information products and services in support of resource management programs undertaken by the department of Forestry, Lands and Wildlife.

A major accomplishment of the branch in 1990-91 was the work completed in assisting the department's Strategic Planning Team. Staff participated on the team and also facilitated a task force which dealt with the issue of the ~~sufficiency of natural resources information provided for resource planning~~. Interviews and questionnaires were conducted with department staff, results evaluated and a report presented to the departmental Executive Management Committee.

During 1990-91, a multi-year project referred to as the Alberta Vegetation Inventory (AVI) was completed, which involved the inventory and digital mapping of critical vegetation areas on the fringe of Alberta's forested lands. Since the data was produced in digital form and geographically referenced to the province's primary geopositioning network, the resulting automated analysis and mapping will be very cost-effective when used for ~~planning resource management activities~~.

The AVI was completed in cooperation with the Alberta forest industry, mapping companies and the Alberta Forest Ser-



vice as well as other departmental line divisions. Inventory and mapping specifications and processes developed for this project are considered to be on the leading edge of such activities in Canada.

Natural resource information products and services such as aerial photography, satellite imagery, thematic mapping, ecological studies, climate data, aggregate inventory and special graphics were provided to departmental clients on request.

6.1 Natural Resources Information Systems Development and Support

Activities were concentrated in three areas: Crown Land Activity Mapping, Vegetation Mapping and the Alberta Bird Atlas. A departmental task force, formed to address the need for mapping activities on Crown Land, produced a strategic plan for a Crown Land Activity Mapping System to provide low and high resolution mapping capabilities compatible in resolution to the LRIS Parcel Mapping Project.

A second task force was initiated to develop a Vegetation Information System to manage Alberta Vegetation Inventory data. The task force developed a project definition, began work on a proposal for solutions and defined the need for a low resolution inventory to provide complete coverage for the province. The section continued to develop Geographic Information System (GIS) applications for analysis of vegeta-

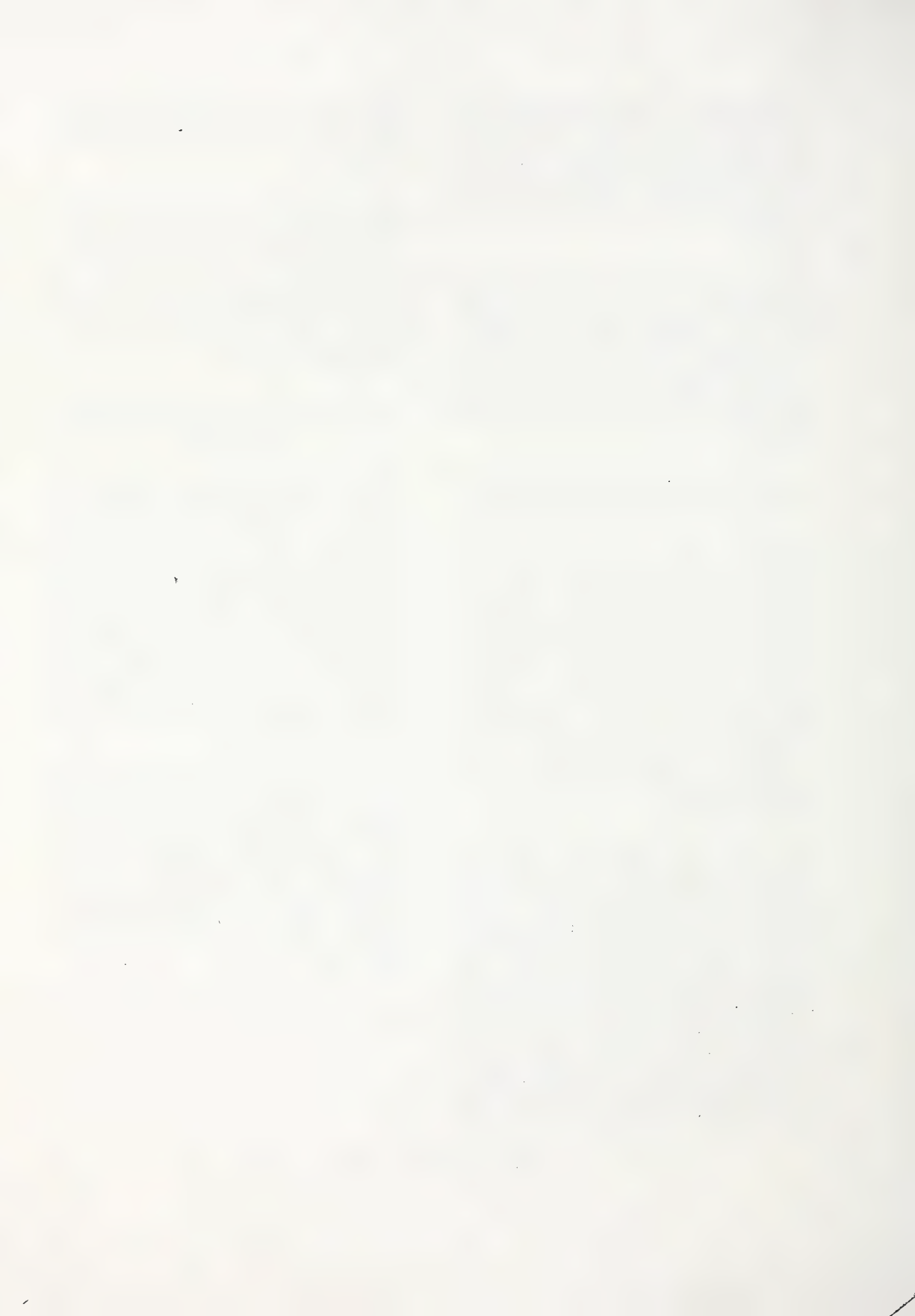
tion inventory, for subsequent incorporation into the Vegetation Information System.

Continued support was provided to the Fish and Wildlife Division in the development of the Alberta Bird Atlas System. A mapping subsystem was developed, tested and implemented with further enhancements made to the reporting subsystem.

6.2 Natural Resources Information Management

Activities involved improvement in the access to existing information, development and coordination of the branch work plan, and support for a conference along with consolidation of natural resources data for the Prairie Conservation Coordination Committee. Resources were devoted to the departments strategic planning activities with specific emphasis on support to the Resource Information Task Force.

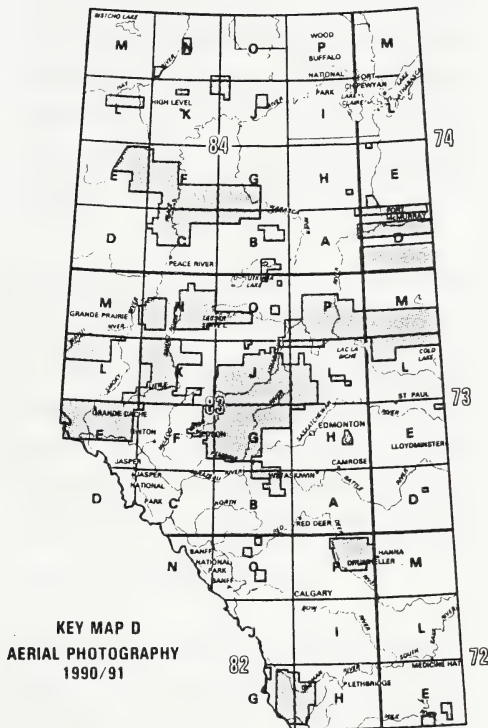
Numerous ad hoc requests for existing resource information were completed and over 300 natural resource reports were reprinted and distributed to various information users. Continued assistance was provided to the Land Related Information System Task Group on hydrography standards.



6.3 Imagery

6.3.1 Aerial Photography

In 1990-91, 188 individual areas were photographed covering over 88 000 km² (Key Map D). Over 31 000 line km of photographic coverage was flown during the year.



A high altitude, airborne imaging project was coordinated with the Alberta Forest Service and the Canadian Forest Service.

The airborne mission was flown by the United States National Aeronautics and Space Administration (NASA) using a special ultra-high altitude aircraft equipped with a variety of photographic and geopositioning instruments. Completion of the project resulted in the production of an additional 7 100 km of aerial photography and other related data.

Semi-controlled and uncontrolled photographic mosaics were completed for more than 35 areas covering 37 600 km². In addition, more than 190 000 contact prints, 8 600 enlargements and 1 500 diapositives were produced in support of departmental and public clients and distributed via Maps Alberta.

The branch organized a Global Positioning Workshop with representatives from each of the department's line divisions. Using GPS technology, which involved the use of satellite signals for fixing the geographic location of ground features, local field data was collected.

6.3.2 Remote Sensing

The Alberta Remote Sensing Centre continued to provide specialist services to the department and other Alberta clients. Five major projects in support of departmental clients were completed involving digital image processing demonstrations for forest and wildlife habitat classification, satellite image selection and acquisition for resource assessment and mapping, and consultative and technical information services.

Over 50 contemporary satellite images (film and digital) were acquired for project use and archival storage at the Centre.

6.4 Ecological and Biological Information

Climate inventory information was obtained from climate station networks installed and maintained by the branch to provide data to departmental clients. The Cadotte network, in northwestern Alberta, was dismantled as its five-year term expired. The Medicine Hat network continued to operate and two new stations were set up. Automated data loggers, installed at some stations, provided improved data quality and collection efficiency.

Detailed range vegetation inventories were completed for four projects involving departmental grazing allotments. New permanent sample plots were established in northern Alberta and comprehensive data were collected on existing plots, regeneration performance and stand dynamics plots in support of Alberta Forest Service research requirements throughout Alberta.

Ecological studies were conducted in support of the integrated resource planning program. Natural resources information was collected, collated and presented in graphics form for the Northeast Regional Plan.

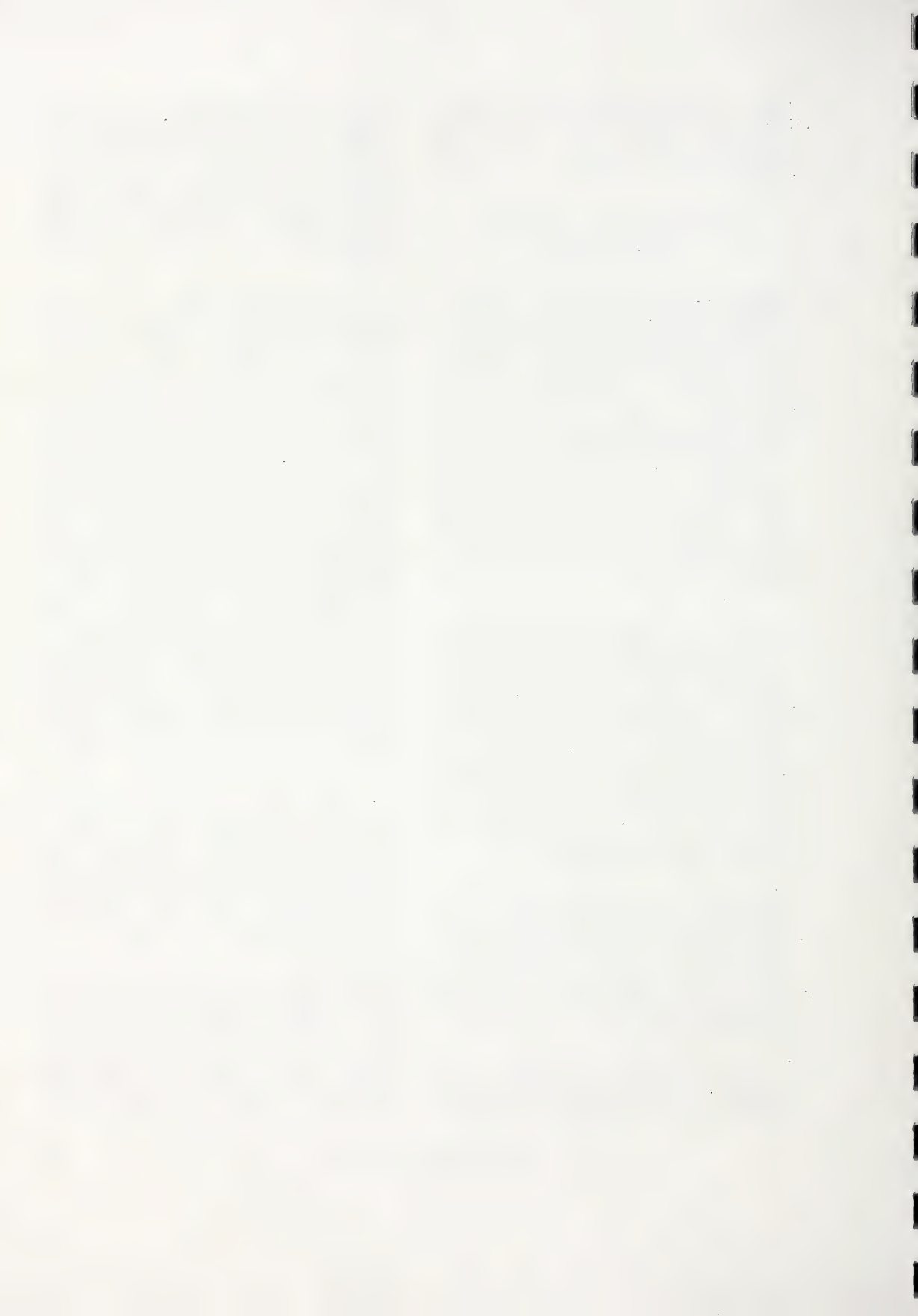
Lake Newell winter pronghorn habitat was delineated for the Eastern Irrigation

District to demonstrate the extent of habitat changes. Terrain and vegetation were inventoried for the Notikewin South Plan. Ongoing planning team support was also provided for the Berland, Bow Corridor and Crowsnest Corridor plans.

Ecological studies were completed for six Natural Areas: Fourth Creek, Ponton River, Canmore Flats, Mount Livingstone, Moose Mountain and Spruce Island Lake. Reconnaissance level information was compiled to describe the significant natural features of part of the eastern boreal forest region. Environmentally significant areas studies were completed for the Municipal Districts of Acadia, Starland and Kneehill and are in progress for the Municipal District of Cypress and the Counties of Mountain View, Newell and Forty Mile. Information is being compiled on remaining native habitats in the prairie and parkland ecoregions in support of the Prairie Conservation Action Plan.

An update to the Ecoregions of Alberta, published in 1981, was initiated. Ecoregions are being redefined and ecodistricts are being added to the system. A scientific report and a report for public distribution are planned.

Biophysical assessments were carried out to support local lake and river management planning. Areas completed this year were Musreau, Georges and Goldeye/Shunda lakes, the upper Red Deer River and the Ft. Smith-Ft.



Fitzgerald area. Biophysicals were also completed to assess the suitability of recreation lease applications for small areas near Lac la Nonne and the Cypress Hills. An ecological land classification is in progress to support recreation planning in the Willmore Wilderness Area.

6.5 Terrain and Aquatic Information

Inventory work was completed to collect landform and soil features information for a number of Crown rangeland dispositions. Field inventories were conducted and mapping completed for seven grazing dispositions under Public Lands Division jurisdiction and 14 dispositions managed by Alberta Forest Service. Approximately 50 townships were mapped at a reconnaissance level in the Hardisty-Wainwright area.

In support of departmental planning and land use management in the Athabasca area, a reconnaissance level aggregate inventory was completed to map information showing the location of potential sand and gravel resources .

Habitat studies were carried out for Little Fish Lake, Sylvan Lake and the Ministik Lake Bird Sanctuary. Support was also provided for interdepartmental aquatic habitat studies through contribution to the Instream Flow Needs and Farm Water Management projects for the Fish and Wildlife Division.

Refinements continue to be made to the method for rating erosion hazard potential. Mapping of hazard areas in the

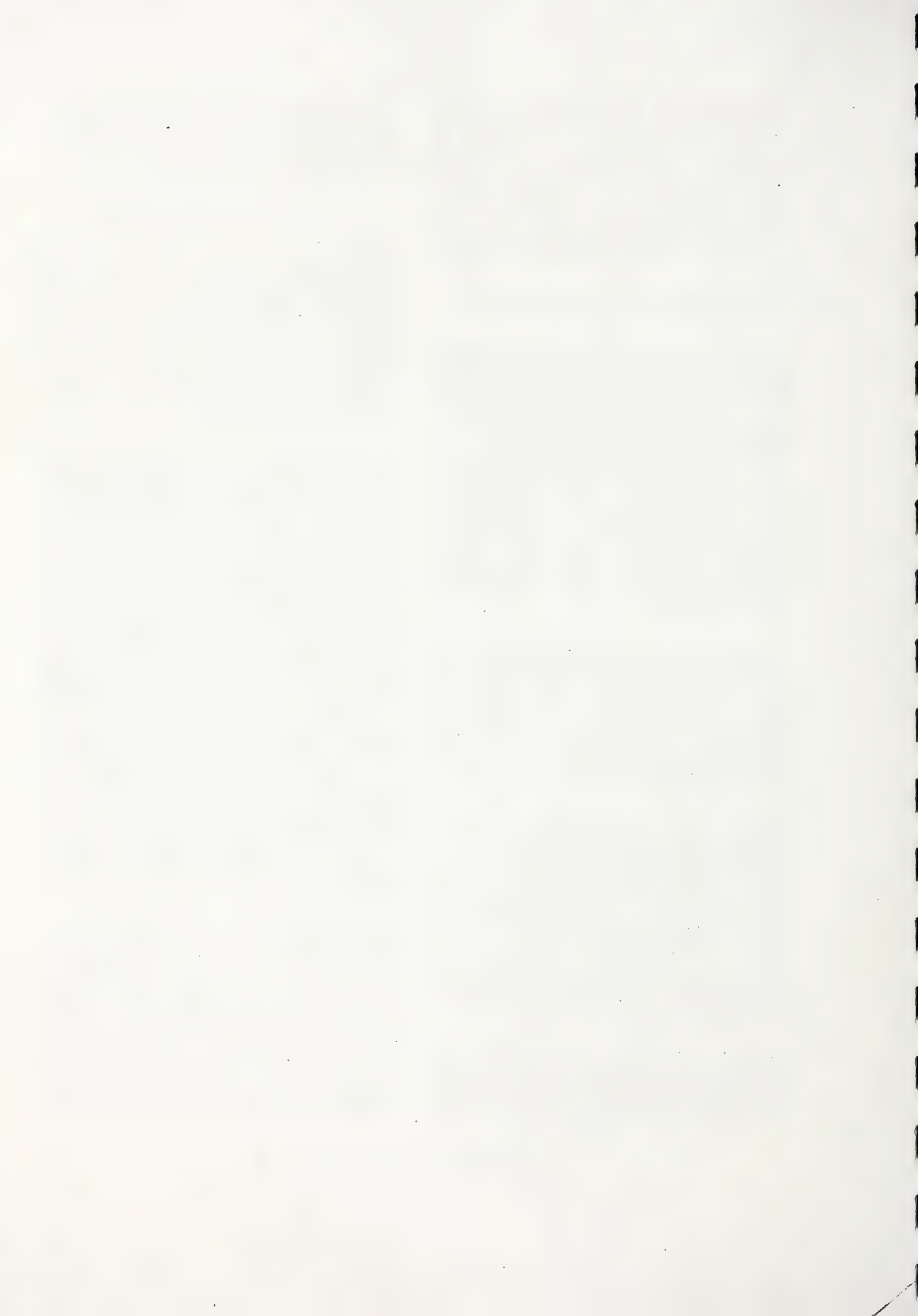
Rocky-Clearwater Forest neared completion and the rating process was initiated in the Clear Hills area.

6.6 Vegetation Information

Integrated vegetation information was provided in support of departmental resource management. The major project undertaken was the Alberta Vegetation Inventory which is based on cooperative involvement of both industry and government.

The branch provided consultative advice regarding inventory methodology and the use of geographic information systems technology. A cooperative project was undertaken with Weldwood of Canada Ltd. (Hinton Division) that illustrated the success of this association of government and industry. Other AVI activities included the completion of the mapping for 575 townships (see Key Map E on page 15); initiation of new inventory for 25 townships; preliminary planning of methods development work required for updating forest inventory; continuation of specifications development and development and presentation of an interpretation course for forest industry personnel.

Also undertaken in 1990, was the planning and implementation of a reconnaissance level vegetation classification project. This information is used for wildlife and habitat management plans particularly in areas where detailed vegetation data is not yet available. Satellite imagery was used to locate,



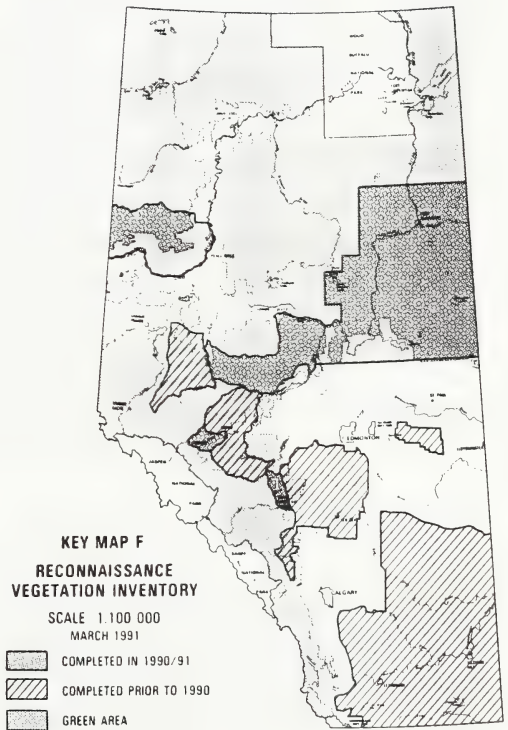
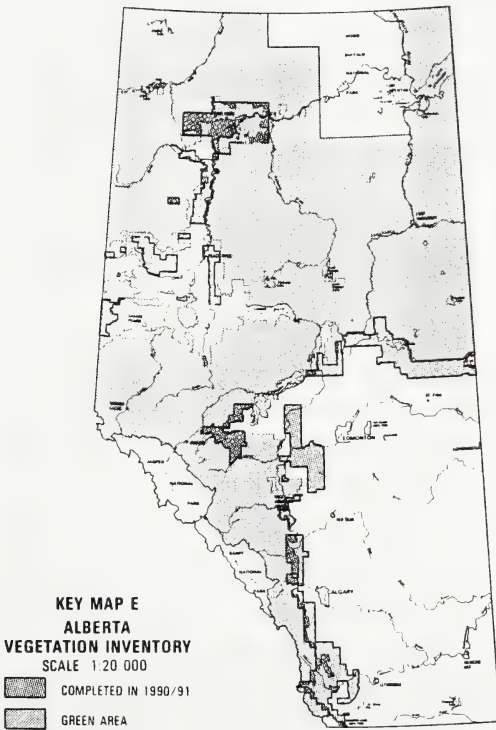
analyze and map vegetation in the North-east, Eastern Slopes and Peace River regions (see Key Map F). Computer assisted vegetation analysis and mapping processes were tested during this project.

6.7 General Mapping and Graphics

Thematic mapping and graphic services were provided in support of department resource management and development programs. The unit responded to approximately 500 requests for a wide variety of natural resources mapping ser-

VICES. A major accomplishment was the completion of the digital mapping of 591 townships of Alberta Vegetation Inventory in the forest fringe area. This included the establishment and data compilation of 3000 field plots required to support final timber volume analysis.

Research and development initiatives resulted in ongoing cost savings for the provision of color copies to support the Alberta Forest Service forest age classification projects.



A significant accomplishment in 1990 was the conversion of the department's 1:100 000 administrative map series to digital format. Future updates will use automated cartographic techniques at a fraction of the previous cost.

In addition, the following was accomplished: the development of specifications and methodology for production of 1:50 000 scale access and land use maps; compilation and interpretation support to the 1:20 000 Provincial Digital Mapping Program; map data audit for 375 contractor mapsheets and photogrammetric support to AFS in three-dimensional timber harvest modelling. Resources were also provided to mapping and graphic services in support of integrated resource management planning and various regional initiatives.

7.0 LAND RELATED INFORMATION SYSTEMS (LRIS) PROJECT

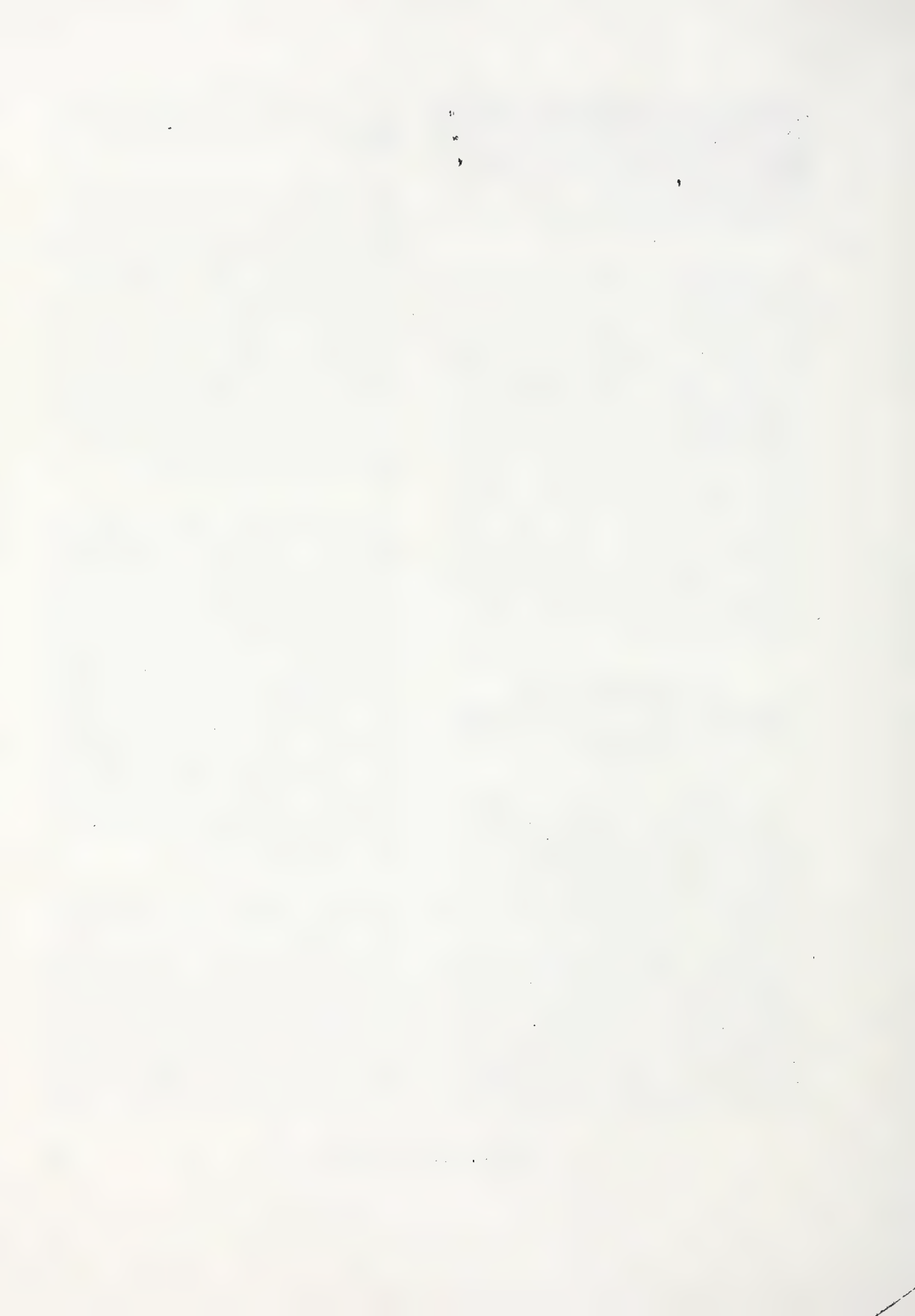
In the spring of 1990, the Legislature approved a four-year \$24.6 million funding commitment for the LRIS Network Project. This included \$8.6 million to develop the LRIS Network Project and \$16 million to undertake and complete the Parcel Mapping Project by 1994. These two projects will permit the LRIS Network to start up business in October 1991, initially delivering access to existing data and products in the Primary Systems; these are the two land registries (Alberta Land Titles Automation and

Land Status Automated System) and the geopositioning and mapping systems of LISD.

To complement technical development of the LRIS Network, a new administrative structure was created. This structure, the LRIS Project, was designed to coordinate and direct the technical and business aspects of project development. Under the leadership of the Executive Director, the LRIS Project consists of two branches, the LRIS Business Entity Development Branch and the LRIS Network Development Branch, as well as a core operations support group.

The LRIS Business Entity Development Branch is responsible for coordinating development of the entity that will manage the LRIS Network as a business. The LRIS Network Development Branch is responsible for the technical development of the LRIS Network, which includes development of the LRIS Gateway system (the computer system that will manage access to the LRIS Network) and the LRIS Spatial Database System (the restructured map information that will permit questions of "where" to be answered).

A number of studies and projects were undertaken during the year. The LRIS Network Development Branch coordinated the completion of the Proposals for Solution for the LRIS Network. Upon its completion, it was agreed that two systems, the Gateway and the Spatial Database, would be developed in parallel, but as separate projects. Work



proceeded on Gateway with a contract for the design of the system architecture and the Gateway construction being let in January 1991. The System Architecture phase was completed April 1, 1991. Work proceeded on the Request for Proposal for the development of the Spatial Database.

The LRIS Business Entity Development Branch has defined and proposed an entity, Land Information Alberta (LIA), to operate the LRIS Network as a business on a cost-recovery basis. A LIA Business Plan was developed to define the costs and projected revenues for the business. Both the LRIS Steering Committee and the Ministerial Advisory Committee have supported the LIA Business Plan. A marketing plan study was initiated to define the LRIS market and develop a strategy for entering the market. The plan is to be prepared by July 31, 1991 and once adopted will guide the LRIS Network business activities in its first year.

The LRIS Network Project was showcased at the international Urban and Regional Information Systems Association (URISA) conference in August. Attended by over 2600 people, URISA provided an opportunity for LRIS Network Project representatives to inform a very large and diverse audience about its work and progress.

Beyond the Primary Systems, Thematic Systems (or end-user's application systems such as lease inventory, highway inventory, wellsite information, or real

estate sales) are critical to LIA's success. A study was undertaken to determine the criteria for ranking Thematic Systems for their eventual integration into the LRIS Network.

An LRIS Network Project Communications Plan was developed to promote LRIS Network Project benefits, build and maintain support for the project and enhance its corporate image. From January to the end of March, the LRIS Project has made 12 presentations at various conferences and seminars throughout the province. Six issues of the LRIS Newsletter were produced, as readership increased to over 1700 and the monthly LRIS Bulletin continues to inform the over 110 committee participants involved in the LRIS Project development.

An Issue Tracking System was implemented to manage the variety of issues arising from the LRIS Project development. The system facilitates integrated solutions to multifaceted LRIS issues that arise from the client base.

Committee activities continued and evolved throughout the year.

The Ministerial Advisory Committee on LRIS (MAC) represents the municipal government and private sector, and to advise the Minister on development of the LRIS Project. The MAC Subcommittee on Municipal Systems identified and started to resolve issues regarding integration of municipal systems into the LRIS Network.

The MAC Subcommittee on the LRIS Industry Association was created to bring together private sector firms and individuals interested in LRIS, to create a core of personnel interested in pursuing an export market. The LRIS Steering Committee represents provincial government departments to the Minister. Through its various subcommittees, it continued to oversee and guide development of the LRIS Network.

For example, the LRIS Standards Management Committee reviewed and revised the data standards as drafted by the Data Standards Task Group (DSTG) and the EDP Standards Task Group (ESTG). The ESTG provided a draft set of EDP standards for the development of the LRIS Gateway. The draft Common Data Standards for the development of the LRIS Gateway have been compiled and reviewed. The LRIS Administration Management Committee provided administrative direction on intellectual property concerns and development of the LRIS Communications Plan.

The LRIS Network System Management Committee provided interdepartmental direction to the development team while the Thematic Systems Management Committee continued to add to its inventory of thematic systems and has undertaken a study to determine what data should be collected to rank thematic systems for integration into the LRIS Network.

8.0 DISTRIBUTION SERVICES

The distribution of divisional products and services is provided for by Maps Alberta. There are Maps Alberta offices in Edmonton and Calgary, with a dealer network of some 90 outlets providing access to LISD products and services in all major centres throughout Alberta.

8.1 LISD Revolving Fund Operations

The LISD Revolving Fund (RF) maintained a break-even operation, generating a slight surplus in the 1990-91 fiscal year. Annual sales were maintained despite the loss of two operating sections, which were returned to a government allocated budget basis. Annual sales reached \$1 966 111, up slightly from last year's level of \$1 955 228. Inventory levels were increased to anticipate major supplier cost increases from the Canada Map Office.

The Maps Alberta marketing plan was fully operational during this fiscal year. Further revisions were made by way of a Divisional Marketing Plan instituted as part of the LRIS Project. Specific product plans are being prepared for parcel mapping and 1:20 000 products, along with a review of the existing Maps Alberta marketing plan. A consulting firm has been retained to provide this input for the revolving fund.

8.2 Annual Sales Activity

Volumes of sales for the fiscal year 1990-91 were as follows:

Public	\$953 764 (48 percent of total sales)
Dealers	\$304 344 (16 percent of total sales)
FLW	\$208 809 (11 percent of total sales)
Other Gov't	\$499 194 (25 percent of total sales)
Total Sales	\$1 966 111

These sales are defined as 64 percent to the private (Public + Dealers) and 36 percent to government (FLW + Other Government) compared to 53 percent and 47 percent respectively, last year. The change in activity reflects the emphasis on increasing dealer sales and direct sales to the public.

8.3 Laser Copier Activity

With a strong demand for copy of materials in color and quick delivery of reprints of photographs, an upgraded color copier was leased. The new model will maintain and enhance service levels to Maps Alberta's clients. Annual activity of \$150 552 for the color laser dropped slightly (8 percent) from the previous year's level of \$162 691.

8.4 Point of Sale System

Maps Alberta has identified and issued purchase orders to acquire a point of sale

system to support its sales activities and those of the LRIS project. The system will be installed and operational in the 1991-92 fiscal year.

8.5 Remote Access Pilot

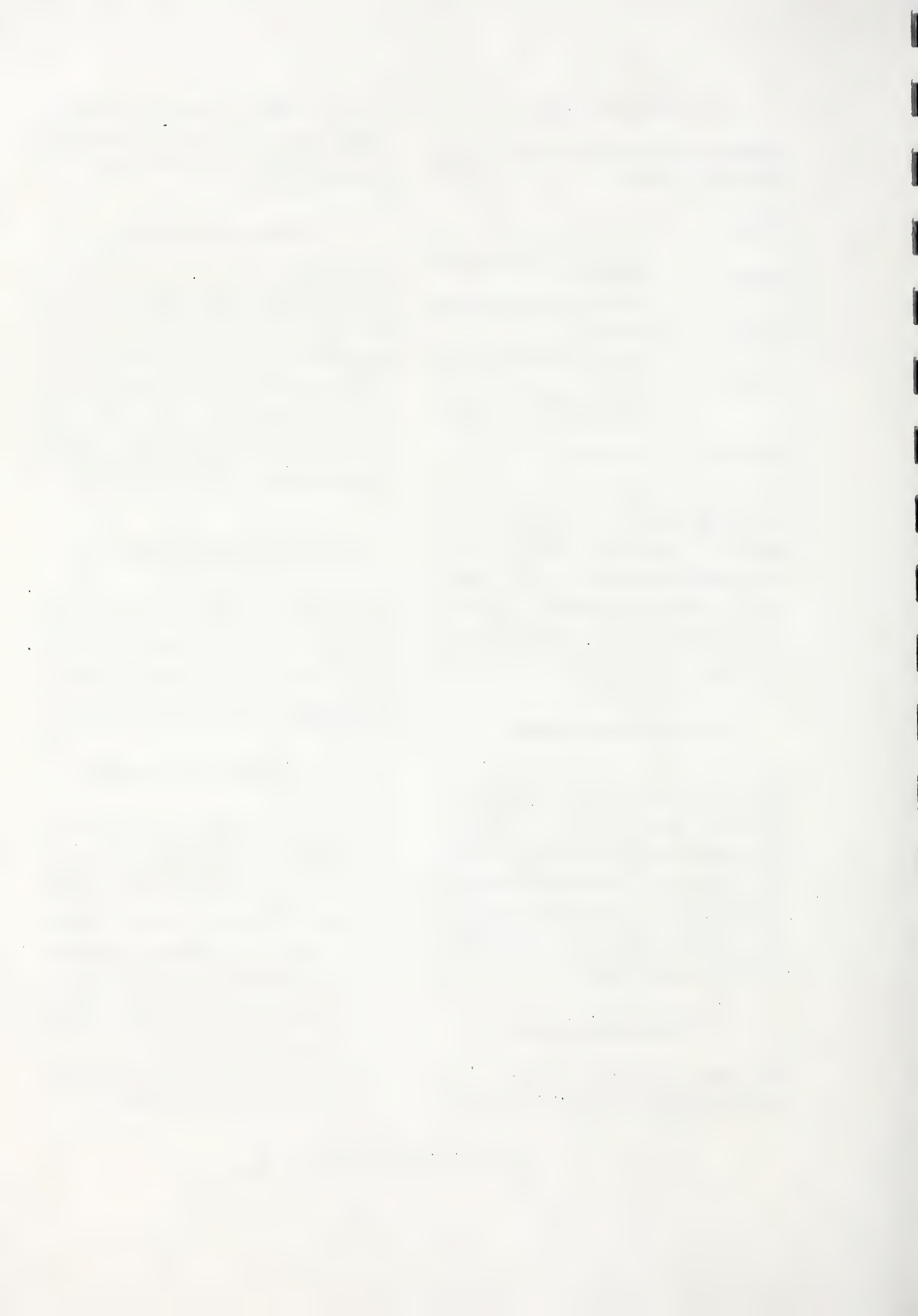
During the year this pilot, MASCOT Automated Distributed Data (MADD), was tested and implemented, with enhancements. The project identified and defined a number of key elements in distributing data to the surveying community via remote access. The lessons learned will be documented in a report to be delivered in the new fiscal year.

9.0 LAND SURVEY SYSTEM

The Land Survey System has a legislated mandate to maintain and preserve the boundaries that govern the extent of interest in land in the province of Alberta. This responsibility was carried out in 1990-91 through the following functions:

9.1 Legislation Administration

- The Examination and Training Amendment Regulation pursuant to the Land Surveyors Act became law August 23, 1990. This legislation will provide a more credible process for administering articles of training and provide a forum for discussion between the student and principal prior to and during the period of articles.
- A resurvey under Sec. 44 of the Surveys Act was confirmed.



- Implementation of Sec. 9 of the Surveys Act was initiated.
- Two provincial boundary issues were investigated for a potential boundary commission meeting.
- The proposed Surveying Professions Act has been referred to the Professions and Occupations Bureau for review and comment.

9.2 Monitor Standards

- There was an 18 percent increase of survey plans received for examination prior to registration in the Land Titles Office. In 1990-91, of the 557 plans received, 532 were examined.
- A random selection of 326 plans were given a visual check and 18 plans received a complete examination.
- Seven plans were referred by other agencies for examination.
- Quality of surveys were monitored by performing field checks on four surveys.
- Errors on 202 plans of survey were investigated and discussed with land surveyors.

9.3 Consulting

Service requests continued to increase as a result of the downsizing of the plan examination function. In 1990-91 investigation and decisions were provided for 82 inquiries.

9.4 Information Access

In 1990-91, 6550 survey plans were added to the Land Survey Document System (LSDS) and indexed. This is a 19 percent increase from the previous year. There is a growing interest in receiving this information in digital form.

Hard copy information on survey record, township plans, wellsite plans and field notes were distributed.

9.5 Coordination of Land Survey Activity

There were no requests from other agencies during the year to coordinate land survey activity .

3.3 International Access

In 1990-91, 45 surveys of business entities in the East-Surrey Economic Region (ESER) were conducted. This was a 10% increase from the previous year. There is a growing interest in providing the following information in digital form.

This information will be made available through the internet and other digital means. This will allow users to access information from anywhere in the world.

3.4 Construction of Land Survey

There was no revenue information regarding the year to date. This will be included in the survey activity.

A implementation of sec. 3 of the Survey Act was initiated. Two provincial boundary issues were investigated for a potential boundary commission meeting. The proposed Survey Act provisions and Operations Manual for review and comment.

3.5 Specialist Standards

There was an 18 percent increase of survey plans received for examination prior to registration in the Land Titles Office in 1990-91. 232 were received, 232 were examined.

A random selection of 250 plans were given a visual check and 12 plans received a complete examination.

A review plan was initiated by other agencies for examination.

A review strategy was developed for performing fieldwork on a large scale.

There are 201 plans of survey were investigated and returned with the survey.

3.6 Community

The following information is intended to be provided to the community of the region as a result of the completion of the ESER. Information provided in 1990-91 was provided to the community and decisions were provided for the community.

