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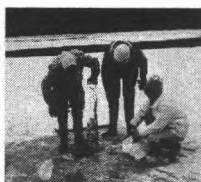
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# Northern River Basins Study



NORTHERN RIVER BASINS STUDY PROJECT REPORT NO. 125

## A COMPILATION OF ARCHIVED WRITINGS ABOUT ENVIRONMENTAL CHANGE IN THE PEACE, ATHABASCA AND SLAVE RIVER BASINS



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Prepared for the  
Northern River Basins Study  
under Project 5904-D1

by

Jean Crozier  
CIRC: Crozier Information Resources Consulting Ltd.

NORTHERN RIVER BASINS STUDY PROJECT REPORT NO. 125

**A COMPILATION OF  
ARCHIVED WRITINGS ABOUT  
ENVIRONMENTAL CHANGE  
IN THE PEACE, ATHABASCA AND  
SLAVE RIVER BASINS**

Published by the  
Northern River Basins Study  
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## **PREFACE:**

The Northern River Basins Study was initiated through the "Canada-Alberta-Northwest Territories Agreement Respecting the Peace-Athabasca-Slave River Basin Study, Phase II - Technical Studies" which was signed September 27, 1991. The purpose of the Study is to understand and characterize the cumulative effects of development on the water and aquatic environment of the Study Area by coordinating with existing programs and undertaking appropriate new technical studies.

This publication reports the method and findings of particular work conducted as part of the Northern River Basins Study. As such, the work was governed by a specific terms of reference and is expected to contribute information about the Study Area within the context of the overall study as described by the Study Final Report. This report has been reviewed by the Study Science Advisory Committee in regards to scientific content and has been approved by the Study Board of Directors for public release.

It is explicit in the objectives of the Study to report the results of technical work regularly to the public. This objective is served by distributing project reports to an extensive network of libraries, agencies, organizations and interested individuals and by granting universal permission to reproduce the material.



# A COMPILATION OF ARCHIVED WRITINGS ABOUT ENVIRONMENTAL CHANGE IN THE PEACE, ATHABASCA AND SLAVE RIVER BASINS

## STUDY PERSPECTIVE

The Traditional Knowledge Component developed a community based research project over a three year period; a structured survey process was used to acquire responses from second generation and older traditional users of the lands, water and wildlife. Historical research was included to provide a point of reference in assessing the significance of change and impact. This report presents in textual and electronic forms the results of a review of existing knowledge, as chronicled in diaries and notes of frontiersmen and early enterprisers. This work was an intricate and important aspect of the Traditional Knowledge Component Program for several reasons. The primary reason was to prepare a document and database for reference and clarification on the state of the environment prior to extensive development along the Peace, Athabasca and Slave river systems. This would augment information derived from the oral history transferred amongst successive generations by First Nations People.

Much of the data reviewed and synthesized for the database was accessible through the Provincial Archives and Government Libraries. The documents selected for review were identified using a criteria that included archival and ecological dimensions. The passages extracted and compiled into the database provided insight on the way people interacted and perceived the land and its resources in the past. The database contained 233 records with data mostly from the time period prior to 1940.

The results of this project formed the basis of an historical overview chapter to the Synthesis Report (No. 12), "A Report of Wisdom Synthesized from the Traditional Knowledge Component Studies". The electronic database and the report are only a small portion of the information contained in archived records. Its availability to all people who wish to use its contents is a milestone achievement at this time as it provides an opportunity for consumers, planners, and developers to revisit the past with relative ease. In doing so an evaluation on the impact of progress can be made at an individual level.

### ***Related Study Questions***

- 12) *What traditional knowledge exists to enhance the physical science studies in all area of enquiry?*





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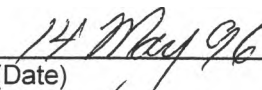
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Whereas the above publication is the result of a project conducted under the Northern River Basins Study and the terms of reference for that project are deemed to be fulfilled,

**IT IS THEREFORE REQUESTED BY THE STUDY OFFICE THAT;**

this publication be subjected to proper and responsible review and be considered for release to the public.

  
\_\_\_\_\_  
(Dr. Fred J. Wrona, Science Director)


  
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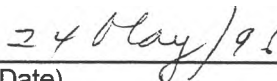
Whereas it is an explicit term of reference of the Science Advisory Committee "to review, for scientific content, material for publication by the Board",

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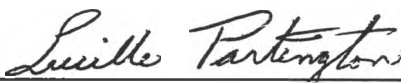
  
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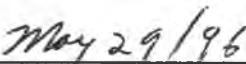
  
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Whereas the Study Board is satisfied that this publication has been reviewed for scientific content and for immediate health implications,

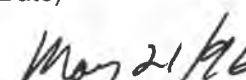
**IT IS HERE APPROVED BY THE BOARD OF DIRECTORS THAT;**

this publication be released to the public, and that this publication be designated for: [ ] STANDARD AVAILABILITY [ ] EXPANDED AVAILABILITY

  
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(Lucille Partington, Co-chair)

  
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(Date)

  
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(Robert McLeod, Co-chair)

  
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## REPORT SUMMARY

The Traditional Ecological Knowledge, Review of Existing Data Project (Northern River Basins Study Project 5904-D1:) was designed to obtain and record existing ecological knowledge as recorded in archival documents. The project's Terms of Reference are included in Appendix A.

The interdisciplinary nature of the project required close integration of the knowledge and experience of all team members; that knowledge base encompassed information management, librarianship, archives, wildlife biology, geography, and traditional understandings.

The consultant project team worked with the client Traditional Knowledge Component team, as well as the client Manager of Information and Data, to clearly define project activities, significant data sources, and subsequent data retrieval requirements.

The project team developed and implemented criteria for document selection; those criteria included both archival and ecological elements, and were designed to enable researchers to select and record the most relevant of available information.

The documents researched and recorded in this project included the journals of the fur traders (primarily from the Fort Chipewyan, Fort Dunvegan, and Fort Assiniboine posts), the Royal Northwest Mounted Police, settlers and travellers through the area. Archived government records were accessed, such as those of the Geological Survey of Canada, the Department of the Interior, the Department of Indian and Northern Affairs, and the Alberta Legislative Library. The Hudson Bay Archives were a source of exceptionally valuable information.

An electronic database was developed to ensure accurate and rapid retrieval of information. The electronic records were created using a standardized and internationally recognized format, using software that enables retrieval of each word in each field. The database consists of two hundred and thirty-three records, many of which are lengthy (four or five pages), and all of which include exceptional attention to detail. The records may be searched for specific ecological information ranging from river flooding to fish harvest, fur trade and weather records, geological and environmental descriptions, illness and death of both humans and animals.

This project and its resultant database provides a unique and valuable source of historical ecological information.

## ACKNOWLEDGEMENTS

CIRC: Crozier Information Resources Consulting Ltd. wishes to acknowledge the tremendous contribution and cooperation which was unstintingly given throughout the course of this project.

The personnel of the Northern River Basins Study were unfailingly helpful and considerate of the magnitude of the task at hand. Robert More, as Manager of Information and Data, consistently provided valuable assistance and advice. Ken Crutchfield, Associate Science Director, provided a good-humoured and objective perspective to the task at hand. The Traditional Knowledge Component Leader, Sonny Flett, provided guidance, advice, assistance, and support throughout the project. The Traditional Knowledge Project Manager, Lea Bill, was a tower of strength and knowledge to the project group; through her, each member gained insight and appreciation in the value and significance of traditional knowledge and the perspective of those who live with the land.

As the project progressed, numerous people provided expert knowledge and support. David Leonard, Provincial Archivist at the Provincial Archives of Alberta, provided initial guidance and support; he also contributed a significant period of time in guiding project staff through the idiosyncrasies of archival research. Judith Beattie, Keeper of the Hudson Bay Archives, was unfailingly cooperative and helpful in selecting the most valuable information from the vast quantity of source material, and in making interlibrary loan facilities available to project staff. Bryan Corbett, Archivist at the University of Alberta, provided advice and direction regarding the organization and content of archival collections and information sources, including both government and non-government collections. The staff of the National Archives of Canada, including specialists with specific collection responsibilities, often assisted beyond the call of duty in helping the project team obtain required materials.

Each of these people deserve sincere thanks for their efforts in assisting the project team identify and obtain the necessary documents, and to do so within the very limited time (three months) and financial resources available for completion of the project.

As Project Leader and president of the contracted company, I take full responsibility for having guided the project through its course, and for the final decisions made regarding materials selection and documentation. The Archival database is the primary deliverable of this project; it constitutes a significant step in the recognition and use of Traditional Knowledge for environmental review and long-term recognition purposes. As such, this project and its resultant database is a leader; any errors or omissions that become apparent in it will undoubtedly be similar to those which occur whenever a new path is chosen.

Every staff member at CIRC, particularly those who worked directly on the project, put not only professional expertise but heart and soul into the discovery and documentation that constituted their project work. Margaret Harris supervised and organized the electronic data, as well as completing research activities. Carolle Bourgon was responsible for researching, translating, and summarizing all French-language materials. Rita Murray researched the materials and prepared detailed summaries of archival knowledge. Gertrude Blair McLaren provided invaluable knowledge of, and insight to, the intricacies of archival research and materials availability. Betty Sparling provided constant support and administrative coordination. Carl Surrendi and Dennis Surrendi contributed their intimate knowledge of the environment and of the issues which the project activities addressed. Grant Pearsall and Carolyn Coburn of the I.D. Group Ltd. contributed their knowledge of geography and other relevant studies.

CIRC: Crozier Information Resources Consulting Ltd. is proud to have been chosen to complete this work, and to have created a database that may, in time, be considered a landmark undertaking.

Jean Crozier, Project Leader  
CIRC: Crozier Information Resources Consulting Ltd.  
4552 - 99 Street  
EDMONTON AB T6E 5H5

February 28, 1995

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This project (Project 5904-D1: Traditional Ecological Knowledge, Review of Existing Data and Information) was completed as an initial effort to review and record the environmental knowledge of the people as recorded in archival documents. The project was completed as a component of the **Traditional Knowledge Documentation Project (5902-C1)**, which is a community participation based project that is holistic in nature. The ecological project component was designed to obtain and record "the observations of individuals who by virtue of their closeness with nature have gained knowledge of natural processes and their connections between ecosystem components"<sup>1</sup>

The project had three primary objectives, as identified in the project Terms of Reference (which are included as Appendix A):

- to prepare a listing of Traditional Ecological Knowledge information resources with abstracts
- to abstract specific documented traditional ecological knowledge of a biophysical nature
- to record specific information that documents the influence of development on systems that were naturally regulated by nature.

The Terms of Reference were further detailed, and agreed upon as the project choices became apparent; those details were documented in a letter dated October 26, 1994 from Robert More (Manager, Information and Data) to the consultant. A copy of that letter is also included in Appendix A for clarification.

The Traditional Knowledge Documentation Project itself utilizes specific principles linked directly to traditional native practices and values, acknowledging the spiritual aspect of knowledge and experience. The Project acknowledges the validity in using various methods of obtaining information as well as the value of the information obtained. As is stated in the Status Report of January 1994<sup>2</sup>:

Traditional Knowledge offers the opportunity to gather local information that may be biologically significant but not statistically proven . . . It is the goal of this traditional knowledge pilot project to provide an historic and personal perspective from northern communities which will

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<sup>1</sup>Northern River Basins Study. "Terms of Reference, 5904-D1: Traditional Ecological Knowledge, Review of Existing Data and Information." Edmonton: 1995. p.1.

<sup>2</sup>Northern River Basins Study. Status Report. January 1994, p. 10.

complement conventional scientific research. This component's work will also assist in helping the Study establish historical trends and predict future patterns regarding the fish, wildlife and plant life of the northern river basins.

The sources of information for the Archival project were restricted exclusively to those contained in archival institutions. This decision was made and incorporated into the terms of the contract; in recognition of the limited time and financial resources available for completion of the project, no materials outside of these archival documents were included in the research. In fact, the resources accessed through specialist identification proved to contain a vast amount of information, many of which provided extremely detailed descriptions of specific areas,<sup>3, 4</sup>.

The technology available to us today enables the retrieval of selected information according to the needs of the user. The electronic database of archival information is the primary deliverable for this project, and was developed using INMAGIC<sup>R</sup> Plus<sup>TM</sup> software. In accordance with the project agreement, the Archives database was developed and deposited with the Northern River Basin Study. The database contains 233 entries, each of which contains archival information relevant to the ecology of the study area.

It appears to have been only recently recognized that traditional knowledge is a source of information relevant to current environmental conditions and historical ecological variations, and that these traditional knowledge frameworks can be used by western science as a source of learning.<sup>5</sup>

This project provides the Northern River Basins Study with a background of information recorded as European contact was initiated in the study area.

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<sup>3</sup>Item No. 160, William Ogilvie (surveyor) and Item No. 68, Peter Fidler (surveyor), Archives database prepared for the Northern River Basins Study by CIRC: Crozier Information Resources Consulting Ltd., Edmonton. December 1994.

<sup>4</sup>Items No. 107 - 110, Canada Department of the Interior Annual Reports, and Item No. 215, Katherine Hughes' report of her trip from Lesser Slave Lake to Peace River in 1909; included in the Archives database prepared for the Northern River Basins Study by CIRC: Crozier Information Resources Consulting Ltd., Edmonton. December 1994.

<sup>5</sup>Sadler, Barry and Peter Boothroyd, eds. Traditional Ecological Knowledge and Environmental Assessment. A Manuscript Report prepared for the Canadian Environmental Assessment Research Council. March 1993. p.1

## 2.0 STUDY AREA

The Northern River Basins Study (NRBS) is a joint undertaking of the governments of Canada and Alberta, with the Government of the Northwest Territories as a co-signator, and with the cooperation of the Governments of British Columbia and Saskatchewan. The study itself grew out of the need for additional baseline information regarding the Peace, Athabasca and Slave River basins<sup>6</sup>.

The recognition of need developed in response to the public concerns regarding development within the northern river basins. Local residents and other interested parties expressed their concern to governments, which in turn responded with the initiation of the Northern River Basins Study. A Study Board developed a vision statement and 16 Guiding Questions to "further assist in the development of the Study's scientific research program, and with the communication of project results".<sup>7</sup> The Vision Statement and 16 Guiding Questions are included as Appendix B.

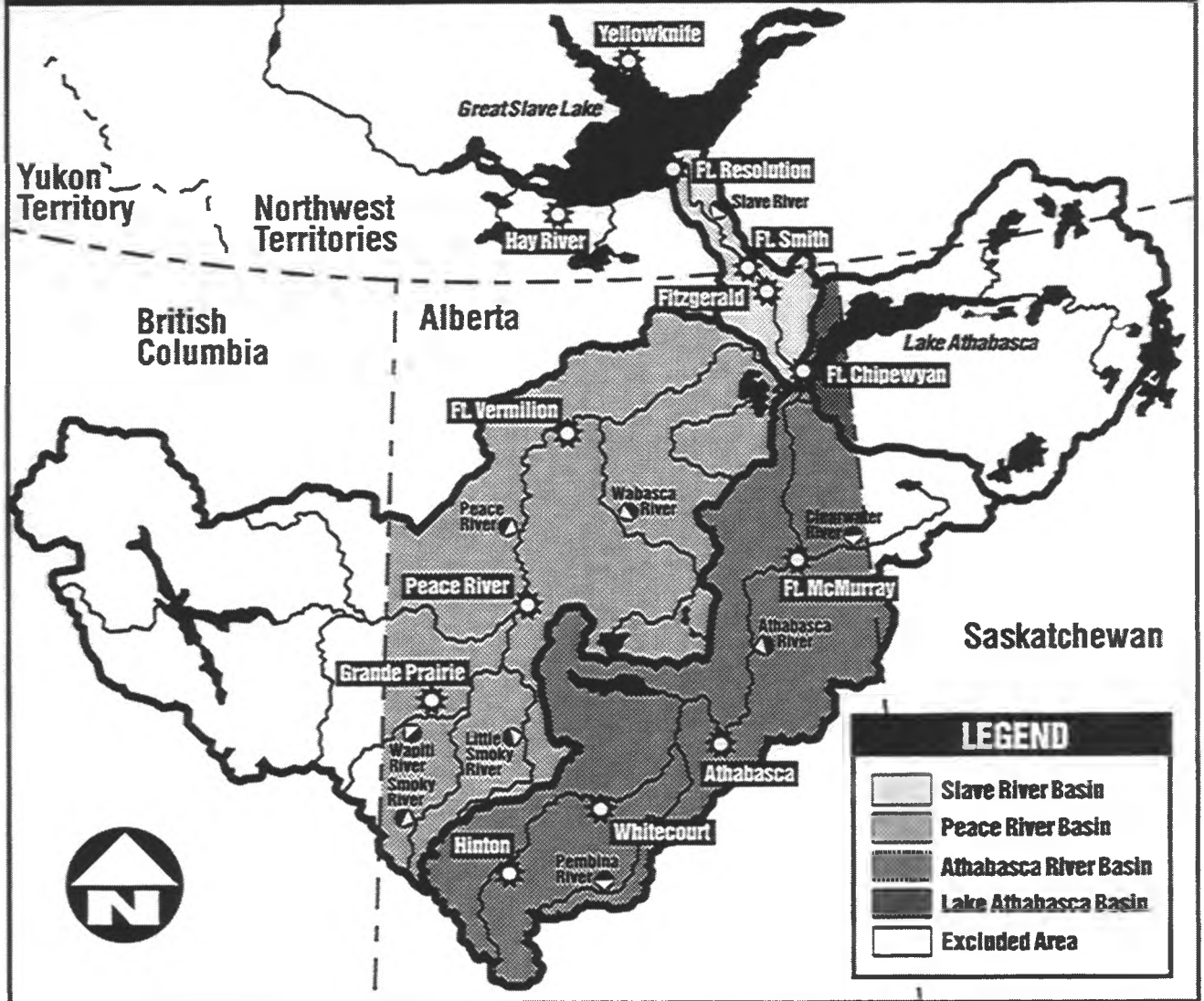
The following map was prepared by the Northern River Basins Study, and clearly portrays the extent of the study area.

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<sup>6</sup>Northern River Basins Study. Annual Report, 1992 - 93 Fiscal Year. Edmonton. March 31, 1993. p.3.

<sup>7</sup>Ibid, p.4

# Northern River Basins Study



### 3.0

## MATERIAL AND METHODS

The contractor perceived this project as one that required a multi-disciplinary approach, to accommodate the multiple facets of the ecology itself, to identify and access available archival records, and to ensure overall management of the information acquired. To meet this end, the contractor formed a project team consisting of information management specialists, librarians, library technicians, archivists, wildlife biologists, and geographers. The project leader's knowledge base encompasses the areas of information management and librarianship, history and geography, and an appreciation of traditional knowledge and its application. The project team worked closely with client personnel, including both Traditional Knowledge component representatives and the Manager of Information and Data.

### 3.1

## IN-HOUSE SEMINARS

In-house seminars were held to ensure that all project personnel were fully acquainted with the skills and expertise of their associate team members, and included the specific requirements and emphasis of the project. The overall and specific details of wildlife biology and ecology of the study area were presented in a seminar prepared and delivered by Dennis and Carl Surrendi, wildlife specialists. A seminar detailing the most effective techniques for archival research was presented by David Leonard, Provincial Archivist. The client project members from the Northern River Basins Study (NRBS) Traditional Knowledge Component were invited to attend these sessions; their presence added significant depth to the sessions.

A third in-house seminar was held and led by Lea Bill, Project Manager of the Traditional Knowledge Component of the NRBS. The seminar was designed to provide the team members with an opportunity to explore and discuss the meaning and interpretation of the term "Traditional Ecological Knowledge", its extent and nuances. The seminar included a strong spiritual component, reflective of the appreciation for the natural environment held by those who live on the land and the holistic perspective held by them.

These seminars also served as forums for clarification and appreciation of the criteria used in selecting source materials.

### 3.2

## INFORMATION SOURCES

The information sources were selected by the consultant project team, reviewed for accuracy and appropriateness with recognized archivists (D. Leonard, B. Corbett), then discussed with and approved by the client project leaders. It was determined that the most significant sources of archival material would include:

1. Provincial Archives of Alberta
2. University of Alberta
3. Hudson Bay Archives
4. National Archives of Canada

Contact was also made with additional potential sources of relevant material, including:

1. The Grey Nuns archives
2. The archives of the Alberta Association of Registered Nurses
3. Glenbow-Alberta Museum and Archives
4. Hay River Museum and Archives
5. Prince of Wales Northern Heritage Centre (Yellowknife)
6. City of Edmonton Archives
7. University of Toronto Archives

Personnel from each of these institutions were contacted, and the extent and value (to this project) of the materials housed in the institution were discussed. Identification of the facilities and collections anticipated to yield the highest volume and value of documents, within the time and resources available, was made. Each selection was discussed with the client project leaders; arrangements to access specific collections were made with full knowledge and approval of the client project team members.

Archival materials can be loaned only in microform format. Where only paper records of project-relevant documents existed, the materials were reviewed on site at the sponsoring institution. The consultant project team utilized the interarchival loan facilities of the archives to access information housed in non-Edmonton locations, wherever possible. For example, microfilmed materials were borrowed from the Hudson Bay Company Archives (HBCA) for review at the Provincial Archives of Alberta (PAA); this process eliminated the need to go to Winnipeg to review the HBC archival documents. Also available at the PAA were microfilmed records from the federal Department of Indian Affairs, as well as the annual reports prepared by the Department of the Interior. The availability of these records eliminated the need for extensive travel and accommodation in Ottawa, although it was necessary to spend some time there to access records such as those of the Royal Canadian Mounted Police; those records are housed only at the National Archives of Canada (NAC) in paper form, and are not available through other means.

### 3.3 RECORDS SELECTION AND REVIEW

Identification and selection of those materials most appropriate to the project objectives within the time and budget available proved to be a significantly difficult task.

A voluminous amount of documents with potential applicability to this project are being retained by Canadian archival institutions. For example, the National Archives of Canada holds records relating to the federal Department of Indian Affairs extending to 2,155 linear metres of paper, 257 microfilm reels, 898 microfiche sheets, and 46 data files. In addition to those records, other materials exist in a variety of locations and record groups; these record groupings reflect the arrangement and re-arrangement of federal and provincial departments.

The Hudson Bay Company Archives consist of the diaries and journals of the Company's traders, as well as records of the Company's administrative activities. Many of the records have been microfilmed and are available for use in other archival institutions on interlibrary loan, a service used extensively by the project team.

Criteria were developed by project team leaders to ensure that records most relevant to the project were accessed and reviewed. The criteria included:

1. Geographic area; as defined by the NRBS area
2. Date range; primarily prior to World War II
3. Extent of records; large collections reviewed selectively, small collections reviewed according to project value
4. Finding aids availability; finding aids prepared by the holding archives to serve as a guide to collection content
5. Ease of access; collection contents must be accessible, without restrictions
6. Range of information; narrowly or broadly defined subject matter

In addition to archival criteria, the consultant specialists developed ecological criteria which were used during the initial review for selection of archival materials. The following ecological criteria were included:

1. Wildlife / animals
2. Fish / fisheries
3. Forestry / plants / vegetation
4. Weather / climate
5. Land
6. Geology
7. Water / hydrology
8. Fire
9. Ecological health / fitness / balance
10. Human health / healing

The above criteria were used to assist in evaluating the relative significance (to the project

objectives) of the documents or record series when subjected to initial review by project team members.

The project team specialists reviewed selected finding aids at specific archival institutions, contacted relevant archivists, and made arrangements to use the archival facilities and materials prior to moving staff onto the selected site to begin actual document review.

The primary records or record series selected, in accordance with the above criteria, for use in this study included:

1. Hudson Bay Company journals and diaries
2. Department of the Interior surveys
3. Settlers' diaries and journals
4. Journals and diaries of the Oblate Fathers of Mary Immaculate
5. Records of the Anglican Church of Canada, Athabasca diocese
6. Geological Survey of Canada journals and notebooks
7. Northwest Mounted Police journals, diaries, and district reports
8. Department of Indian Affairs records
9. Alberta Legislature Library records (a specific collection which includes original journals from Ft. Chipewyan)
10. Private manuscripts, notebooks, and journals

In consultation with the client project leaders, the consultant team selected specific documents or record series. For example, the journals and diaries of the chief trader in specified posts (Fort Dunvegan, Fort Chipewyan, Fort Vermilion) were selected. Where those journals were extensive, selective decisions were made (in conjunction with the client project leaders) regarding specific years' documents to be reviewed. The project team chose to include, in the database, detailed extracts from the post journals at ten-year time intervals. To obtain the broadest and most extensive coverage possible within the project parameters, the ten-year intervals were staggered across the area; for example, the Ft. Chipewyan post records for the year in each decade ending in the number "2" were reviewed (such as 1892), the Ft. Dunvegan records for the year in each decade ending in "3". There were several instances where the journals for a specific year were not available; in that case, journals for the closest year were chosen for review.

The CIRC project team recorded the retrieved information directly onto the selected database management software (INMAGIC<sup>R</sup> Plus<sup>TM</sup>) using portable computers. This method ensured that all information, once entered, could easily be retrieved; duplication of effort or of document review was likewise prevented.

No interpretation of the data (such as causative factors in short- or long-term environmental change) was undertaken. The information is recorded in the database just as it was found in the



records (including variant spellings, the original authors' perspectives and opinions, and considerations or assumptions later interpreted differently by others).

Published documents, books, periodicals, "active" government records, photographs, oral histories, and related materials were specifically excluded from this study due to time and budget considerations. The two exceptions to this guideline are the two periodical articles included in the database because of their accessibility and their perceived value to the project, and the information excerpted from the Annual Reports of the Department of the Interior<sup>8</sup>

### 3.4 SOFTWARE

The software selected for use on this project is a program commonly used for database creation and information retrieval (INMAGIC<sup>R</sup> Plus<sup>TM</sup>). The database is available for viewing through an adjunct software (SearchMAGIC<sup>TM</sup>), which is the read-only version of the system. Delivery of the database together with one copy of the software was supplied in accordance with the terms of the contract.

The software used for this project was chosen because of its superior retrieval capacities (each word in each field is retrievable), as well as its flexibility and reporting capabilities. The software is commonly used in both the library and legal disciplines; there are over 15,000 installations of this software in North America.

The data structure was developed to meet the anticipated criteria for retrieval, as well as the descriptive standards developed by the Bureau of Canadian Archives<sup>9</sup>. Those standards identify the data fields defined under the Rules for Archival Description (RAD); these basic standards were enhanced with additional data fields (such as "area") to assist the user in retrieving desired records and information.

A copy of the data structure is included in Appendix C, as are examples of the records included in the database.

To ensure the addition of all appropriate information, and to simultaneously eliminate repetitive data, the consultants prepared electronic records using the following process and in accordance with RAD descriptive requirements:

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<sup>8</sup>Canada. Department. of the Interior. Annual Report. Ottawa. Various dates. Various pagination.

<sup>9</sup>Bureau of Canadian Archives. Planning Committee on Descriptive Standards. Rules for Archival Description. Ottawa. 1990. Various pagination.

1. An "umbrella" record was created for each record group, such as that of the records of the Oblate Fathers<sup>10</sup>. Those records include information relevant to the entire collection of information (called the "fonds" level description in archival terms), such as the history and scope of the collection. Record number 3 in the database describes the collection of the Oblates of Mary Immaculate, at the fond level.
2. Creation of individual records for specific items within each record group (such as the diary of Fr. Joseph-Vincent Letresse, record number 17<sup>11</sup>). These individual records are linked to the fonds level records by repetition of the "title" and the "accession number" fields.

Sample records showing this format are included in Appendix C.

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<sup>10</sup>Oblate Fathers of Mary Immaculate. Note that there are 12 records in the database, composed of summaries and excerpts from the diaries and journals of the men who came to the study area under the jurisdiction of their Order. These records are available in original paper format, at the Provincial Archives of Alberta.

<sup>11</sup>Letresse, Joseph-Vincent. "Mes souvenirs [My memories]". Oblates of Mary Immaculate Fonds. File No. 6890. Accession Number 71.220. Record ID: 17. Archives database prepared for the Northern River Basins Study by CIRC: Crozier Information Resources Consulting Ltd., Edmonton. December 1994.

The database produced from the archival research and documentation completed for this project provides a unique source of information regarding the historical ecology of the study area. The electronic records may easily be searched to determine detailed information, such as the number of moose shot in the vicinity of a specific fur trade post (such as Dunvegan) in a specific month and year<sup>12</sup>, or the incidence of disease or starvation in a particular locality at a specific time or date<sup>13</sup>, or the date(s) when river floods occurred in specific areas<sup>14</sup>. The software is capable of supporting user searches for specific information, including subject matter, location, year, creator of the records, holding archival institution, and archival accession number.

The database records were created by including, in the "Abstract" field, direct quotations or excerpts from the archival documentation made available to the researchers. The detail included in the electronic records, therefore, is dependent upon that which constituted the original archival record. The researchers have made no attempt to edit (that is, change content or spelling) of the archival records; this verbatim recording of information was completed in accordance with the discussions and agreement between the NRBS project team and that of the consultant team. The researchers do recognize that the recording of data in this way may leave the database open to the criticism of today from those people who, in retrospect, question the validity of the values and assessments of the traders. The project was designed to deliver a database of information not previously easily accessible to the end user; the possibility of recording potentially unverifiable data was recognized from the outset and may be addressed through future activities as included in Section 7: Recommendations.

The intent of the project, as indicated in the letter of October 26, 1994 to CIRC from R. More (included in Appendix A):

... compile a database that is a comprehensive, baseline "index" to the archival literature. All aspects of environmental observations will be given equal weight;

no particular aspect will be pursued at the expense of any other. Meanwhile, we acknowledge the inherent perspectives of the different archival sources and hope that a great variety in sources will lead to a balanced perspective considered over all.

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<sup>12</sup>Record numbers 114, 186, and 187. Archives database prepared for the Northern River Basins Study by CIRC: Crozier Information Resources Consulting Ltd., Edmonton. December 1994.

<sup>13</sup>Record numbers 26 to 28, 86, 88, 123, 206,208, 211, 216. Archives database prepared for Northern River Basins Study by CIRC: Crozier Information Resources Consulting Ltd., Edmonton. December 1994.

<sup>14</sup>Oblates of Mary Immaculate. Letter of Fr. Jean Seguin (at Fort Good Hope) to his family, dated June 1875, in which he describes the ice breakup of May 25, with water rise of up to ten feet in six hours; by the next morning, the river had receded fifteen feet. See record #12 in the database.

The database provides the required "index" to the archival literature selected by the project team, in agreement with the client project leaders.

Of the 233 records created within this database, the following record groups generated the largest number of individual records:

1. Hudson's Bay Company archives:	52 electronic records
2. Canada. Dept. of the Interior:	17 electronic records
3. Canada. Dept. of Indian Affairs:	16 electronic records
4. Oblates of Mary Immaculate:	12 electronic records
5. William Pearce records:	7 electronic records

The remaining 129 electronic records in the database consist of documentation extracted from a variety of sources, including those records included in a unique collection from the Alberta Legislature Library as well as records from individual geologists, settlers, and missionaries. A listing of these records is available by pressing <F3> at the "Title" field of the search screen.

The information in the database may be retrieved by the user, and interpreted in a number of different ways, as is required by the user. For example, since each word in each field is searchable (with the exception of "noise" words such as "a, an, and, the, le, la, les"), the user may conduct a search to retrieve records containing the term or terms required at to address a specific issue. For example, a search of the "Abstract" field for the word **moose** yields 67 records. If the words **moose** and **starvation** are combined (that is, combined with "and") the search results in retrieval of 17 records. The word **dogs** is found in 42 records, **dog\*** combined with **starvation** yields 11 records. **Flood\*** is included in 13 records, **flood\*** and **Slave** yields 11 records, **flood\*** and **river** also yields 11 records.

The records may be retrieved in an infinite variety of combinations; the user is urged to search for words in different fields (abstract, subject), and to use varying combinations of words (moose, dogs, starvation, indians, rivers, muskrats, grasses, salt, tar, bitumen).

The records vary considerably in length, according to the quality (assessed against the criteria established and outlined in Section 3.3). Some records are brief, particularly those that were reviewed but found to contain minimal information of use in meeting the project objective (such as record ID numbers 78, 87, and 192). Where this finding occurred, the abstracter included a relevant explanation in the "Notes" field.

Other records are exceptionally lengthy. For example, many of the records generated to excerpt information from the Hudson's Bay journals contain great detail, including such items as daily weather records, fur volumes traded, post visitors, number of fish caught, number of moose in the shed. Most of the 52 post records have resulted in electronic database records of twelve- or

thirteen-screen display lengths (a screen contains twenty-three lines of type; these records, therefore may be four or five printed pages in length). Dates are included in individual entries, to ensure that the reader may identify specific environmental occurrences or events with a specific date. Examples of the detail included in these post records such as the following example from record number 211, which is from the Fort Chipewyan Post Journal 1865 - 1867:

" . . . April 13: . . . a few Indians arriving with their furs. . . April 21: . . . first goose seen at the Fort . . . May 1: . . ice looking quite firm and sound; lots of snow still on the ground. . . May 18: . . . the little river breaking up. . . June 13: . . . very few fish - never over 30 a day -- 120 fish p day required for a full ration. . . July 29: . . . haymakers arrived. . . 1500 bundles stacked and about 3000 mowed . . . Sept. 2: . . . Indians dying of measles particularly the children . . . within the last fortnight we have heard of the deaths of 23 Indians -- including women and children. . . "

The records provided by the early surveyors (retrieved from the database by searching for all **Canada. Department of the Interior** entries in the "Title" field) are exceptionally detailed. They include meticulously documented accounts of environmental conditions at the time of original sighting by non-Aboriginal scientifically-trained persons. For example, record number 58 (Annual Report for the fiscal year ending 1913) indicates that:

" . . . good hay and water were found to be abundant . . . Along the Athabaska there is a strip of dry land, but beyond this rim a muskeg . . . extends westerly to the Pelican mountains . . . Young timber from 35 to 75 years old covers an area of 2,060 square miles or 2,219,520 acres".

Records of the Geological Survey of Canada are similarly detailed; those records may be retrieved by selecting **Canada. Geological Survey of Canada** at the "Title" field prompt. For example, record number 147, quoting from Geological Survey field notebook number 1171 dated 1881, describes Lake Athabasca:

" . . . This lake also has at one time ben very much larger than it is at present as the low hills of from 40 to 60 ft. in height are from one mile to two from the shore line, this space being filled with dark and very rich soil but only about a foot and a half or two feet above the water. . . "

The researchers also created database records for those items which initially met the criteria for review. Where the archival documents proved to have insufficient or non-specific information for inclusion in this project, an electronic record was created and notation made in the "NOTES" field that the document(s) could be reviewed in greater detail at a later time. For example, record #63, the diary of Hugh MacIntyre, was identified for in-depth review at a later stage.

The overall result of this project is the creation of the database of over two hundred records. Each record contains information that is fully useable and retrievable through the applications software. The information has not previously been assembled and collated into an electronic database. This database of traditional knowledge is unique.

This database of excerpted archival records has resulted in a fully retrievable data set of significant environmental details.

The archival documents used in creating these records are extensive, scattered, and are retrievable only through laborious and time-consuming manual searching. No other such electronic database of archival information housed in Canadian archival institutions, currently exists. Manual retrieval of, and access to, these records depends to a significant degree upon the skill and knowledge of the researcher.

The individual records in the database itself portray the perspective of the original writers of the material. For example, the database contains fifty-two records extracted from the Hudson's Bay Archives. Those records consist of extracts from the diaries or journals of the person in charge of individual posts. That person (the factor or chief of the post) was primarily concerned with the fur trading business, and secondarily on matters that impacted on the fur trade (such as provisioning of the posts). The major emphasis, therefore, of records found in those journals is on fur and food -- if something could be shot or trapped, it was likely referred to in the journals. To the post superintendents, those who provided fur and food (the aboriginal population) were to be treated in a manner that would encourage them to continue trading; the records are replete with references to Indians being fed or sheltered. It may be noted here that the Hudson's Bay Co. imposed record-keeping guidelines upon its employees, which explains the extent and detail of extant records. The Northwest Company, however, apparently did not do so; it is notable that few records exist for those posts which were operated by the Northwest Company prior to its merger with the Hudson's Bay Company in 1821.

The records generated by the early surveyors and geologists contain great detail. The records of the surveyors were published in the Annual Reports of the Department of the Interior. The notebooks of the geologists employed by the Geological Survey of Canada are housed in the National Archives of Canada; many of those notebooks include detailed sketches of the terrain, the geological dip and strike, and the land elevations. The notebook contents are excerpted in the database, with notations regarding the availability of sketches. These survey or geological survey records also portray the specific interests of those personnel; specifically, that of recording the details for which they were both trained and employed to do.

The records of the Royal Northwest Mounted Police also emphasized the primary interests and responsibilities of those men. The records portray any law-related activities, as well as patrol movements. Of particular interest to this study are the comments made by the police regarding the landscape, and the flooding and river freeze-up and thaw, such as are found in records number 134, 135, 137, and 138.

The settlers and farmers also had their own interests paramount during their recording of sights and perceptions. They were primarily interested in the land's ability to support agricultural activities, and their diaries reflected their impressions of the land when first seen, as well as the crop yields, forest or grass fires, rain- or snow-fall.

Also included in the database are excerpted archival records of individuals such as Katherine Hughes (records number 235, 215, 216, and 217), who made a tour alone of the Peace River and Athabasca districts by frontier stage, canoe, river-boats, and scows in 1909. Ms. Hughes's environmental descriptions are couched in linguistic descriptions quite different from those of the Royal Northwest Mounted Police, the geologists, or the surveyors; for example, record number 215 includes the following description of her journey from Lesser Slave Lake to Peace River:

" . . . into lovely woods - tall slim poplars like a forest of magnified celery - white trunks with plenty green tops. . . "

The same record includes one of the few references to medicinal plants, found in the researched archival documents:

" . . . young Harvey threw the weed we call "old man". . . it is also very good for stopping cuts. . . "

A notable and unfortunate (but unavoidable) lack in the review of records and preparation of the database is the knowledge base of the area's aboriginal inhabitants. All of the archival records available for this project were and are in written form; without a written language, the knowledge of the aboriginal peoples who lived on the land is by-passed in a project that is restricted (as was this one) to written archival records. It is anticipated that this significant lack will be addressed through the information gathered in the overall Traditional Knowledge project, and in particular through the oral documentation component of the project.

A further complication or consideration in this project was the manner or format of the records themselves. The records were prepared for specific reasons (to satisfy Hudson's Bay regulations, to provide governmental survey data, to report on policing activities); individual records therefore addressed specific issues. The diaries or journals of individual settlers or other individual persons were prepared according to the needs, whims, or abilities of the writer. The present-day researcher is forced to search through the irrelevant (to this project) detail to retrieve data that describe the environmental or ecological factors of interest to this study. The records were not prepared in a manner that provides the researcher with any standardization in data observed, collected, recorded and maintained.

The method of approach used by the research team is one that successfully provided guidelines in the selection and documentation of records relevant to the project's Terms of Reference. The large volume of available records relevant to the subject area and geographic region of the project is vast. Several record collections or series exist which are of potential value in this search for

knowledge, but were not accessed due to the constraints of time and financial resources. Included in those potential resources are the following records:

1. Canada. Department of Indian Affairs records
2. Canada. Department of Health and Welfare records
3. Canadian National Railways records
4. Canada. Water Resources Branch records
5. Canadian Parks Service records
6. Records of Tyrrell and others (University of Toronto)
7. Additional Hudson Bay Company records
8. Records housed in areas such as McLennan (additional Oblate records) and High Prairie (traditional knowledge oral histories)
9. Settler, trader, and exploration records retained in Calgary, Winnipeg, Ottawa, Toronto and possibly London

There are some significant gaps in the knowledge as found in the records and recorded in the database. These gaps may be significant in our overall understanding of the environment, and the subsequent activities that impact upon the environment.

The gaps in the current knowledge base which are most obvious to the research team include:

1. Pre-contact knowledge (that is, pre-European contact)
2. Impact of residential schools on the environment
3. Aboriginal knowledge, perspectives, and customs
4. Traditional healing practices
5. Health-related herbs, plants, natural substances
6. Non-game, non-furbearing animal information (that is, data regarding songbirds, small animals such as mice or voles)

Some of these gaps may be addressed by future work, and through coordination of effort with disciplinary specialists, as outlined in Section 7: Recommendations.

The fur trade is popularly and historically considered to have been the primary force in opening western Canada for later development. As such, fur trade activities have been examined and analyzed by historians from Zaslow<sup>15</sup>

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<sup>15</sup>Zaslow, Maurice. The Opening of the Canadian North. 1870 - 1914. Toronto: McClelland and Stewart. 1971. 339 p.



to Potyondi<sup>16</sup>. Due to the time and fiscal constraints of this project, however, none of these published works were included in the study. They therefore do not appear in the database. Neither did the project team review current government or agency reports, air photos, maps, or audio-visual materials. None of the available oral histories were included in the project activities. The study was restricted exclusively to the review of archival documents.

Neither was the study of sufficiently broad scope or fiscal support to enable research staff to analyze the collected data for environmental trends, statistical analysis of specific concerns (such as floods, animal population fluctuations, weather trends, human and animal health) or catastrophic occurrences. It is reasonable to believe that some of these concerns may have been reviewed, analyzed, and charted for trends and changes.

As the database currently stands, the data contained therein comprise a unique collection of information that is ready for use, interpretation, and correlation with scientific data.

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<sup>16</sup>Potyondi, Barry. "Wood Buffalo National Park: An Historical Overview and Source Study". Parks Canada Manuscript Report Number 345. [Ottawa?]. 255 pp.

The project requirement for delivery of a database that enables the user to search for, and retrieve, information in combinations that are generated at will and in accordance with the need of the moment, has been fulfilled. The database includes excerpts or summaries of records from those collections deemed most significant, when measured against the criteria developed for this purpose.

This database is, however, an initial correlation of data that will, in time and with additional resource commitment, provide users with ecologically- and historically-significant documentation.

RECOMMENDATIONS

To obtain a fully comprehensive foundation of knowledge, this study could be carried on for an extensive time period, with activities exclusively dealing with archival records. The study just completed is an essential beginning, and provides a solid foundation of knowledge. One of its primary values is that of indicating the type and extent of knowledge available, as well as the areas in which information is either unavailable or has not yet been discovered.

Those archival records deemed significant but which were not reviewed due to time and fiscal constraints, are recommended for future review. Included in this group are:

1. Canada. Department of Indian Affairs records
2. Canada. Department of Health and Welfare records
3. Canadian National Railways records
4. Canada. Water Resources Branch records
5. Canadian Parks Service records
6. Records of Tyrrell and others (University of Toronto)
7. Additional Hudson Bay Company records
8. Records housed in areas such as McLennan (additional Oblate records) and High Prairie (traditional knowledge oral histories)
9. Settler, trader, and exploration records retained in Calgary, Winnipeg, Ottawa, Toronto and possibly London
10. Alberta provincial government records
  - a. Premier's papers
  - b. Court records (relevant to forest fires)
  - c. Northern Alberta Railway records
  - d. Department of Transportation records
11. Non-governmental records
  - a. Settlers' diaries
  - b. Diaries of bush pilots, riverboat personnel
  - c. Karl Clark's papers
  - d. Grey Nuns' records (especially related to schools, health)

**IT IS RECOMMENDED THAT:**

**. . . records in the preceding list be reviewed for relevant information. The data obtained during this study is a small sampling of the data available. Environmental assessment and**

**evolution is a process that encompasses a myriad of factors; the records identified in the list above will provide a broader base of knowledge and understanding than is possible with those of the present database, even though it consists of a unique detail and data set.**

The consultant anticipates that specific, relevant archival records may have already been collated and interpreted. For example, the Hudson Bay Company journals include detailed climatological information.

**IT IS RECOMMENDED THAT:**

**. . . an agency such as Environment Canada may have collated those records and assembled them in a database for easy access and use; it is recommended that a search be made for correlative or interpretative records or publications be sought and included in this database.**

It is also suggested that other records relevant to the environment over a lengthy period of time may have been collected and collated. Records such as those of water levels (river and lake), ice jams, quantities of furs traded, possibly church records of births and deaths, school populations, health records, and fire effects may exist in collated form.

**IT IS RECOMMENDED THAT:**

**. . . Searching for and reviewing of this type of information, perhaps in thesis form, be undertaken.**

**IT IS RECOMMENDED THAT: . . . a review of "active" government reports would be valuable for the purposes of this study, and that those reports be reviewed, abstracted, and included in this database.**

Those reports are often found in government department libraries, although many of them were prepared and retained within the responsible branches and were not ever submitted to a central authority for retention. Such reports will be accessible primarily through personal contact. It is believed that they undoubtedly contain valuable information. This information could be incorporated into a database for ease of retrieval and for comparative study.

Oral transcriptions have been prepared both through the NRBS Traditional Knowledge component, and by several other agencies or organizations. Reviewing those histories (and

generating indices to the information) will substantially enhance the breadth and scope of the present knowledge base.

**IT IS RECOMMENDED THAT:**

**. . . the oral transcriptions being completed for this component be indexed and abstracted, and that those records be included in this database of historical ecological knowledge.**

In recent years, studies relevant to the geographical study area have been conducted for commercial publication either in book or article form. It is suggested that, rather than repeating research already completed, a comprehensive review and search for published literature be completed. Relevant literature may be reviewed and abstracted, and a database of that information created. Included in the review of published literature should be extensive reviews and consideration of the comprehensive bibliographies which have been published on related subject areas and which are relevant to this study.

**IT IS RECOMMENDED THAT:**

**. . . the published literature containing information relevant to, or descriptive of, the ecological study of the NRBS area be reviewed and abstracted, and that the resultant records be included in this ecological knowledge database.**

The final stage in this process is that of interpretation. Raw data is extremely interesting, but is of less value than is information that has been collected, collated, and interpreted in the context within which it was created. It is strongly suggested that the true benefit of this study will lie in the accurate and sensitive interpretation of the information and data collected throughout the project's activities.

**IT IS RECOMMENDED THAT:**

**. . . all the data obtained and included in this database be reviewed and interpreted to identify environmental or ecological change, evolution, or man-made induced change.**

Interpretation of the information contained in the database would address issues such as that of the frequent mentions made of starvation or privation due to a lack of game animals. A noted wildlife biologist and team member (D. Surrendi) indicated that such conditions are believed to have existed in localized areas. That is, stress put on game populations through hunting in local, specific areas may have resulted in reduction of the population within that locale and the resulting

privation of those who are dependent on game for food. At the same time, it is not uncommon for game to exist in numerically superior conditions within a short but inaccessible distance of those who need the game.

8. REFERENCES:

Bureau of Canadian Archives. Planning Committee on Descriptive Standards.  
Rules for Archival Description. Ottawa. 1990.

Potyondi, Barry. "Wood buffalo National Park: An Historical Overview and Source Study". Parks Canada Manuscript Report Number 345. [Ottawa?]. 255 p.

Sadler, Barry and Peter Boothroyd, eds. Traditional Ecological Knowledge and Environmental Assessment. A Manuscript Report prepared for the Canadian Environmental Assessment Research Council. March 1993.

Zaslow, Maurice. The Opening of the Canadian North. 1870-1914. Toronto: McClelland and Stewart. 1971. 339 p.





## **APPENDIX A: TERMS OF REFERENCE**



*Northern River Basins Study*

October 26, 1994

Ms. Jean E. Crozier, President  
CIRC: Crozier Information Resources Consulting Ltd.  
4552 99 Street  
EDMONTON AB T6E 5H5

Dear Ms. Crozier;

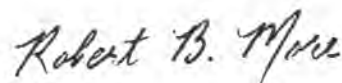
**Re: Project 5904-D1: Traditional Ecological Knowledge, Review of Existing Data and Information**

This letter is to document the conclusions that you, I and Sonny Flett made in our meeting on Tuesday, October 25, 1994:

1. Our primary goal is to compile a database that is a comprehensive, baseline "index" to the archival literature. All aspects of environmental observations will be given equal weight; no particular aspect will be pursued at the expense of any other. Meanwhile, we acknowledge the inherent perspectives of the different archival sources and hope that a great variety in sources will lead to a balanced perspective considered over all.
2. The objective of the effort therefore is to maximize the variety of sources, the volume of source literature, the geographic extent and the time span.
3. The result expected from the researchers for each source item entered into the database will be;
  - a. extracted text quotations to reveal the nature and detail for the writer. A practical guide to extracting text quotations for any one source item will be; 25 words or less, twice.
  - b. factual entries giving the geographic, temporal and ecological extent.
  - c. researcher commentary evaluating the features of the item that aid or inhibit the value-for-effort.

I trust these conclusions match your memory. Thank you for guiding Sonny and I in our consideration of the nature and extent of the archival literature available to us; it appears detailed, of consistent quality and voluminous. Sonny, Lea and myself are very pleased with the progress to date. Notwithstanding the conclusions above, we encourage your team to continue to exercise their own fine judgement in respect of the value of what they find and the amount of text extracted.

Yours sincerely,  
**NORTHERN RIVER BASINS STUDY**



Robert B. More, P.Eng.  
Manager, Information and Data

/rbm;7422-5904-D1

copies: Sonny Flett, Lea Bill, Erik Ellehoj, Tom Beckley  
Ken Crutchfield, Bill Gummer, Fred Wrona

# **NORTHERN RIVER BASINS STUDY**

## **APPENDIX A - TERMS OF REFERENCE**

### **5904-D1      Traditional Ecological Knowledge, Review of Existing Data and Information**

#### **I.      BACKGROUND & OBJECTIVES**

Traditional ecological knowledge is considered to be the observations of individuals who by virtue of their closeness with nature have gained knowledge of natural processes and their connections between ecosystem components. These individuals perceive trends and ongoing changes within the ecosystem, including ecosystem growth patterns, landscape changes, water fluctuations and cyclical patterns in wildlife and fish.

The **Traditional Knowledge Documentation Project** (5902-C1) is a community participation based project that is holistic in nature and utilizes specific guiding principles that are strongly linked to traditional native practices and values. This holistic approach not only acknowledges the spiritual aspect of knowledge and experience but also includes acknowledgement of the many different methods of attaining objectives and of completing work. This includes the utilization of conventional and traditional ways of retrieving information from the holders of this knowledge.

The knowledge of the people is the single most important aspect that allows this project to be in existence and the community ownership of this knowledge is an intrinsic aspect of the project as it acknowledges that traditional knowledge is a valued body of information to which the respect of copyright and intellectual property right apply. The Traditional Knowledge Documentation Project will enhance the biophysical science studies of the Northern River Basins Study.

The broad objectives of the Traditional Knowledge projects are;

1.      To document the Traditional Ecological Knowledge of the people who use the land in a traditional manner.
2.      To document the history of Traditional Ecological Knowledge as recalled by the traditional people within the study area.
3.      To demonstrate the value of Traditional Ecological Knowledge in scientific research.
4.      To demonstrate the value of Traditional Ecological Knowledge in predictions of future natural and industrial environmental changes.
5.      To achieve recognition as a valued and important component of the scientific research process.

6. To demonstrate the value of traditional methods of data collection as an empirical scientific process.

## **II. PURPOSE**

This project, **Traditional Ecological Knowledge, Review of Existing Data and Information** (Project 5904-D1), has specific objectives which include reviewing archival resources (government and corporate records, and published literature), compiling and transcribing pertinent Traditional Ecological Knowledge information into an electronic database and, interpretation of key findings as they relate to specified areas of interest.

The specific objectives of this project are:

1. To prepare and provide a listing of Traditional Ecological Knowledge information sources with abstracts.
2. To abstract specific documented information that substantiates traditional ecological knowledge in a biophysical sense.
3. With reference to Traditional Ecological Knowledge information sources, produce a report which references specific information on developments that influenced the availability and flow of water, structures which have impeded flow, changes in landscape, removal of trees, changes in land stewardship, regulation and management, natural resource management specifically as it pertains to air, water, land, wildlife and fish, and those systems that were naturally regulated by nature:
  - a. Land
  - b. Water
  - c. Fish and Wildlife
  - d. Plants
  - e. Utilization of these resources
  - f. Development
  - g. Specific chronological environmental information on structural systems within present legislation, policy, management and regulation pertaining to ecosystem management.
4. To provide a document that must be organized in a manner which will assist in data analysis and final report preparation.

## **III. REQUIREMENTS**

1. Prepare a "Method of Approach" document that includes:
  - a. Criteria to be used for evaluating information sources in respect of the potential to yield information useful on traditional ecological knowledge.
  - b. The form in which the information will be organized and presented.

- c. A work plan that provides the preliminary selection of sources from each of the following groups;
  - c.i first priority, archival resources;
    - government archival resources
    - documentation of newcomer's findings upon arrival
    - explorer journals and records
    - missionary's journals and records
    - fur trade journals and records
    - community archival resources
    - archival photographs documenting environmental and traditional ecological knowledge
    - aerial and satellite photographs documenting environmental changes
  - c.ii. second priority, government and corporate records;
    - environmental impact assessments
    - government employee field notebooks
    - riverboat/bush pilot observations
    - mapping history
    - government legislation, policies and regulation
    - health studies
  - c.iii. third priority, published literature;
    - outline and description or transcript of films documenting environmental changes and traditional environmental knowledge
    - historical literature
    - anthropological literature
    - publications authored by local and/or native individuals
    - oral history research and documentation
    - legends, stories and songs

2. Upon approval of the "Method of Approach" document undertake the necessary work to compile an archival database that includes:

- a. citations in appropriate bibliographic format of all documents located;
- b. annotations for all documents reviewed;
- c. abstracts pertinent to the project as described in section II. PURPOSE for all documents selected for detailed consideration;
- d. data about document location, standardized subject headings, document ranking and geographic locator.

Submit versions of the bibliographic database as particular portions of the data are added. With each version provide a brief written overview that includes;

- a. the facilities and resources consulted,
- b. the documents reviewed and abstracted,
- c. the ecological trends implicated by the abstracts.
- d. the facilities and documents targeted for the next version.
- e. any research issues that require resolution.

3. Upon approval of the "Method of Approach" document undertake the necessary work to prepare a "Project Report" that includes:
  - a. systematic information relevant to the traditional ecological knowledge documentation project as outlined in the objectives.
  - b. a summary of major noteworthy trends in environmental change revealed by the compilation of Traditional Ecological Knowledge information specifically as it relates to specific objective 3 in section II. PURPOSE.
  - c. a discussion of the efficacy of your method and the identification of problems arising in extracting and assessing records.
  - d. the identification of traditional knowledge sources specifically within the NRBS area.

#### IV. DELIVERABLES

1. All submittals will be provided to the Project Liaison Officer.
2. Five cerlox bound copies of a draft "Method of Approach" document are to be submitted by **September 22, 1994**.
3. Ten cerlox bound copies and two camera-ready copies of the final "Method of Approach" document are to be submitted by **September 30, 1994**.
4. The first version of the archival database, a read-only version of the database management software and an associated overview document is to be submitted on or before **October 17, 1994**.
5. The second version of the archival database and an associated overview document is to be submitted on or before **October 31, 1994**.
6. The third version of the archival database and an associated overview document is to be submitted on or before **November 15, 1994**.
7. The fourth version of the archival database and an associated overview document is to be submitted on or before **November 30, 1994**.
8. Ten cerlox bound copies of the draft "Project Report" documenting all findings and sources are to be submitted by **November 30, 1994**.
9. Three weeks after the receipt of review comments on the draft report, the Contractor is to provide the Project Liaison Officer with the final submission, comprising;
  - a. ten cerlox bound copies of the final "Project Report",
  - b. two unbound, camera ready copies of the final report,
  - c. an electronic copy of the final report on disk,

- d. one original set of 35 mm slides which highlight the significant findings, suitable for subsequent presentations, and
- e. four duplicate sets of the 35 mm slides.

## **V. REPORTING REQUIREMENTS**

1. The Contractor is to provide draft and final reports in the style and format outlined in the NRBS document, "A Guide for the Preparation of Reports" which will be supplied to the contractor by the NRBS.
2. The final report is to include the following: an acknowledgement section that indicates any local involvement in the project, Report Summary, Table of Contents, List of Tables, List of Figures and an Appendix with the Terms of Reference for this project.
3. Text for the report should be set up in the following format:
  - a. Times Roman 12 point (Pro) or Times New Roman (WPWIN60) font.
  - b. Margins are 1" at top and bottom, 7/8" on left and right.
  - c. Headings in the report body are labelled with hierarchical decimal Arabic numbers.
  - d. Text is presented with full justification; that is, the text aligns on both left and right margins.
  - e. Page numbers are Arabic numerals for the body of the report, centred at the bottom of each page and bold.
4. Other important considerations for the report are:
  - a. If photographs are to be included in the report text they should be high contrast black and white.
  - b. All tables and figures in the report should be clearly reproducible by a black and white photocopier.
  - c. Along with copies of the final report, the Contractor is to supply an electronic version of the report in Word Perfect 5.1 or Word Perfect for Windows Version 6.0 format.
  - d. Electronic copies of tables, figures and data appendices in the report are also to be submitted to the Project Liaison Officer along with the final report. These should be submitted in a spreadsheet (Quattro Pro preferred, but also Excel or Lotus) or database (dBase IV) format. Bibliographic databases are acceptable in Pro-Cite. Where appropriate, data in tables, figures and appendices should be geo-referenced.
5. All figures and maps are to be delivered in both hard copy (paper) and digital formats. Acceptable formats include: DXF, uncompressed E00, VEC/VEH, Atlas and ISIF. All digital maps must be properly geo-referenced.
6. The presentation package of 35 mm slides is to comprise one original and four duplicates.



## **VI. CONTRACT ADMINISTRATION**

The Component Leader for this project is:

Lloyd (Sonny) Flett, Component Leader  
Traditional Knowledge Component  
Northern River Basins Study  
690 Standard Life Centre  
10405 Jasper Avenue  
Edmonton, Alberta T5J 3N4  
Bus. Phone: (403) 427-7412  
Fax: (403) 422-3055

Questions of a technical nature are to be directed to:

Lea Bill, Project Manager  
Traditional Knowledge Component  
Northern River Basins Study  
690 Standard Life Centre  
10405 Jasper Avenue  
Edmonton, Alberta T5J 3N4  
Bus. Phone: (403) 427-1742  
Fax: (403) 422-3055

The Project Liaison Officer, for enquiries regarding contract administration, is:

Robert (Bob) B. More  
Manager, Information and Data  
Northern River Basins Study  
690, 10405 Jasper Avenue  
Edmonton, Alberta T5J 3N4  
Bus. Phone: (403) 427-1742  
Fax: (403) 422-3055



**APPENDIX B: VISION STATEMENT AND SIXTEEN GUIDING QUESTIONS**



# The Northern River Basins Study

The Northern River Basins Study is a four and one-half year study aimed at examining the relationship between development and the Peace, Athabasca and Slave river basins.

Over its lifespan, the Study will contract more than 100 research projects relating to water quality, fish and fish habitat, hydrology/hydraulics, and use of aquatic resources.

The information gathered by the Study will form a data base that will be used to assess the cumulative effects of development on the aquatic environment of the Peace, Athabasca and Slave rivers within Alberta and the Northwest Territories.

Funding for this study is shared equally by the governments of Canada and Alberta. The Government of the Northwest Territories is a signator to the agreement which governs the Study.

The Northern River Basins Study is now at the half-way point of its mandate. The Study Board is pleased with the progress of the Study and would like to provide an update on what the Study has accomplished so far, and what work is planned to the Study's completion in early 1996.

The Board wishes to thank the hundreds of people who have participated in the Study. Public input has enhanced the development of the Study's scientific work, and has helped set the groundwork for the Study Board's final recommendations. The Study Board believes that substantial progress has been made toward achieving the Study's goals as expressed in the Study's vision statement, and through answering the Board's essential 16 Guiding Questions.

## Vision Statement

*(Approved by the Study Board 1992)*

At the end of the study, in order to be deemed a success, given the available resources within the scope of the Agreement, and recognizing the diversity of stakeholder interests, the Northern River Basins Study will have:

- 1 promoted a shared, holistic understanding of a broad spectrum of baseline ecosystem conditions and processes in the basins;
- 2 presented recommendations for action on alleviating the cumulative effects of development in the basins;
- 3 prompted actions that are alleviating pollution problems; and
- 4 recommended mechanisms and on-going consultative management processes for ensuring long term protection and stewardship of the vitality and integrity of the three basin's ecosystems.



# The 16 Guiding Questions

*(Approved by the Study Board 1992)*

## 1-a

HOW has the aquatic ecosystem, including fish and/or other aquatic organisms, been affected by exposure to organochlorines or other compounds?

## 1-b

HOW can the ecosystem be protected from the effects of these compounds?

## 2

WHAT is the current state of water quality in the Peace, Athabasca and Slave river basins, including the Peace-Athabasca Delta?

## 3

WHO are the stakeholders and what are the consumptive and non-consumptive uses of the water resources in the river basins?

## 4-a

WHAT are the contents and nature of the contaminants entering the system and what is their distribution and toxicity in the aquatic ecosystem with particular reference to water, sediments and biota.

## 4-b

ARE toxins such as dioxins, furans, mercury, etc. increasing or decreasing and what is their rate of change?

## 5

ARE the substances added to the rivers by natural and man-made discharges likely to cause deterioration of the water quality?

## 6

WHAT is the distribution and movement of fish species in the watersheds of the Peace, Athabasca and Slave Rivers? Where and when are they most likely to be exposed to changes in water quality and where are their important habitats?



## 7

WHAT concentrations of dissolved oxygen are required seasonally to protect the various life stages of fish, and what factors control dissolved oxygen in the rivers?

## 8

RECOGNIZING that people drink water and eat fish from these river systems, what is the current concentration of contaminants in water and edible fish tissue and how are these levels changing through time and by location?

## 9

ARE fish tainted in these waters and if so, what is the source of the tainting compounds (i.e. compounds affecting how fish taste and smell to humans)?

## 10

HOW does and how could river flow regulation impact the aquatic ecosystem?

## 11

HAVE riparian vegetation, riparian wildlife and domestic livestock in the river basins been affected by exposure to organochlorines or other toxic compounds?

## 12

WHAT native traditional knowledge exists to enhance the physical science studies in all areas of enquiry?

## 13-a

WHAT predictive tools are required to determine the cumulative effects of man-made discharges on the water and aquatic environment?

## 13-b

WHAT are the cumulative effects of man-made discharges on the water and aquatic environment?

## 14

WHAT long term monitoring programs and predictive models are required to provide an ongoing assessment of the state of the aquatic ecosystems? These programs must ensure that all stakeholders have the opportunity for input.

## 15

HOW can the Study results be communicated most effectively?

## 16

WHAT form of interjurisdictional body can be established, ensuring stakeholder participation for the ongoing protection and use of the river basins?

# Define Data Structure

Name of structure: TEK

Description line (optional): Traditional ecological knowledge, NRBS project

Record ID field(s): ID

Order key field(s): NAME FILE\_NO REEL\_NO

Type	LABEL	NAME	INDEX	SORT	EMPHASIS	for each field
F/1	ID	*	T	9	1	
F/2	NAME	*	Y	9	1	
F/3	OCC	OCCUPATION	Y	9	1	
F/4	TI	TITLE	Y	9	1	
F/5	MD	MATERIAL	Y	9	1	
F/6	ED	EDATE	K	9	1	
F/7	LD	LDATE	K	9	1	
F/8	PD	PREDT	K	9	1	
F/9	EX	EXTENT	Y	9	1	
F/10	HI	HIST	K	9	1	
F/11	CU	CUHIST	Y	9	1	
F/12	SC	SCOPE	K	9	1	
F/13	ST	SCTI	Y	9	1	
F/14	SR	SOURCE	K	9	1	
F/15	ACQ	ACQU_DT	Y	9	1	
F/16	OR	ORIG	Y	9	1	
F/17	RE	RESTRIC	Y	9	1	
F/18	FA	FIND_AID	Y	9	1	
F/19	CT	CITATION	Y	9	1	
F/20	AM	ASSOC	K	9	1	
F/21	LO	LOCATION	Y	9	1	
F/22	AN	ACC_NO	Y	9	1	
F/23	BN	BOX_NO	Y	9	1	
F/24	FNO	FILE_NO	Y	9	1	
F/25	FNM	FILE_NME	Y	9	1	
F/26	RN	REEL_NO	Y	9	1	
F/27	RNM	REEL_NM	Y	9	1	
F/28	FI	FICHE_NO	Y	9	1	
F/29	FIN	FICHE_NME	Y	9	1	
F/30	AB	ABSTRACT	K	9	1	
F/31	AR	AREA	Y	9	1	
F/32	LT	LATITUDE	Y	9	1	
F/33	LN	LONGITUDE	Y	9	1	
F/34	NTS	*	Y	9	1	
F/35	DLS	SURVEY_NO	Y	9	1	
F/36	SUBJ	SUBJECT	Y	9	1	
F/37	NOTE	NOTES	K	9	1	
F/38	REF	REFERENCE	Y	9	1	
F/39	PR	PERSON	Y	9	1	
F/40	DT	DATE_ENT	Y	9	1	

Stop words: A AN AND BY FOR FROM IN OF ON THE TO WITH

Leading articles: THE A AN

ARCHIVAL LISTING

Record ID: 3

NAME: Oblates of Mary Immaculate.  
OCCUPATION: Missionnaires, Roman Catholic.  
TITLE: Oblates of Mary Immaculate Fonds  
DATES: 1842 TO 1984. [101 m.]  
HISTORY: The Congregation of the Oblates of Mary Immaculate was founded in Aix-en-Provence, France by Blessed Charles-Joseph-Eugene de Mazenod under the name Societe des Missionnaires de Provence on October 2, 1815. The Oblates of Mary Immaculate arrived in Canada in 1841. Earlier that year, Ignace Bourget visited Europe in order to secure more clergy to assist him in the Diocese of Montreal. Following the meeting in 1841 between Bishop Bourget and Bishop de Mazenod, a small group of Oblates left Marseilles for Montreal. In 1844 it was decided that a few Oblates should be sent to what is now Western Canada, in response to a request from Bishop Provencher, vicar Apostolic of the Hudson's Bay and James Bay. This area which had only four or five priests, covered an area which extended from the United States to the Arctic Ocean and from James Bay to the Pacific Ocean. Therefore in 1845, Pierre Aubert and Alexandre Tach reached Red River Colony. The Oblates continued westward into what is now the political provinces of Saskatchewan and Alberta, with missions being founded at Ile-la-Croix in 1846 and Fort Chipewyan in 1849.  
FINDING AIDS: A guide to the Archives of the Oblates of Mary Immaculate, Province of Alberta-Saskatchewan. Edmonton: Missionary Oblates. 1989.  
AREA: Alberta, Northern.

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ARCHIVES LISTING

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Record ID: 12

NAME: Oblates of Mary Immaculate  
TITLE: Oblates of Mary Immaculate Fonds  
FILE NO.: 6174  
FILE NAME: Beaudry, Patrice [Patrick]. Journal [Diary] 1923-1940  
ACCN. NO. 71.220 BOX NO. 143

\*\*\*\*\*

Record ID: 15

NAME: Oblates of Mary Immaculate  
TITLE: Oblates of Mary Immaculate Fonds  
FILE NO.: 880  
FILE NAME: Faraud, Henri. Biographie [Biography]. Dix-huit ans chez les  
sauvages par Fernand-Michel.

\*\*\*\*\*

Record ID: 16

NAME: Oblates of Mary Immaculate  
TITLE: Oblates of Mary Immaculate Fonds  
FILE NO.: 6761  
FILE NAME: Lecorre, Auguste. Un missionnaire aveugle. [A blind missionary]  
1930  
ACCN. NO. 71.220 BOX NO. 166

\*\*\*\*\*

Record ID: 17

NAME: Oblates of Mary Immaculate  
TITLE: Oblates of Mary Immaculate Fonds  
FILE NO.: 6890  
FILE NAME: Letresse, Joseph-Vincent. Mes souvenirs [My memories]  
ACCN. NO. 71.220 BOX NO. 171

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## APPENDIX C: DATA STRUCTURE AND SAMPLE RECORDS



## APPENDIX C: DATA STRUCTURE AND SAMPLE RECORDS

This Appendix includes;

- a. A listing of the TEK data structure defined to InMAGIC.
- b. An "Archival Listing" to show some of the content entered.
- c. An "Archives Listing" to show some of the archives storage referencing.
- d. A plastic sleeve containing 2 disks which contain the database of archived writings.

The two disks contain five files:

1. Disk 1 of 2; INSTALL.BAT, being 82 bytes in size.  
DISCLAIM.TXT, being 910 bytes in size.  
SPLICE.COM, being 1,300 bytes in size.  
ARCWRITG.E01, being 1,454,592 bytes in size.
2. Disk 2 of 2; ARCWRITG.E02, being 983,889 bytes in size.

To install the database on a microcomputer, using DOS:

1. copy the three files, INSTALL.BAT, DISCLAIM.TXT and SPLICE.COM to a directory on your hard drive (ARCWRITG is recommended).
2. from the directory type **splice d:**  
where d: = the drive reading the floppy disk 1 of 2 (usually a:).
3. When presented with the appropriate message on the screen, remove disk 1 of 2 and insert disk 2 of 2. The result will be file ARCWRITG.EXE (2,438,419 bytes) added to the directory.
4. Type **install**.

The result will be a 31 files in the directory requiring 4,488,021 bytes. The viewer provided with the database requires windows 3.1 to run; to implement the viewer icon into windows:

1. Activate windows, giving the Program Manager window.
2. Highlight the Applications group icon (single click).
3. Select File > New > Program Item > OK.
4. Enter the required information and click on OK;
  - a. Description = Folio Bound VIEWS
  - b. Command Line = bvviews.exe
  - c. Working Directory = c:arcwritg

A double-click on the Folio Bound VIEWS icon will produce the message, "STOP: This application uses CTL3DV2.DLL which has not been correctly installed." This message may be ignored; a single-click on "OK" will invoke the viewer.

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**The viewer provided to allow access to the database is a proprietary product of Folio Corporation called Folio Bound VIEWS; information about the capabilities and sale of this product and others can be obtained from**

**Folio Corporation: 5072 North 300 West, PROVO, Utah 84604**

**Phone: (801) 229-6700 Fax: (801) 229-6790**

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