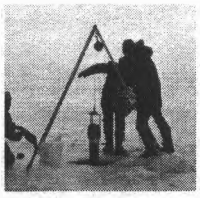
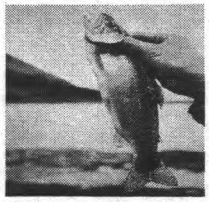
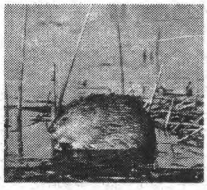
Canada Alberta Northwest Territories

Northern River Basins Study



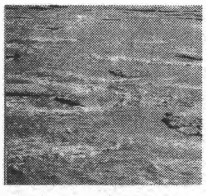


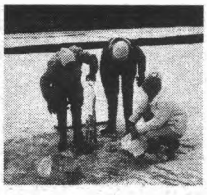





NORTHERN RIVER BASINS STUDY PROJECT REPORT NO. 70

WATER RESOURCES USE AND MANAGEMENT ISSUES FOR THE PEACE, ATHABASCA AND SLAVE RIVER BASINS: IMPLEMENTATION OF A HOUSEHOLD SURVEY, JANUARY TO APRIL, 1995






Prepared for the
Northern River Basins Study
under Project 4121-D3

by

Drobot Contracting Services Ltd.

and

Praxis, Inc.

NORTHERN RIVER BASINS STUDY PROJECT REPORT NO. 70

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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.

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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) — (Date) 10 Jan 96

Whereas it is an explicit term of reference of the Science Advisory Committee "to review, for scientific content, material for publication by the Board",
IT IS HERE ADVISED BY THE SCIENCE ADVISORY COMMITTEE THAT;
this publication has been reviewed for scientific content and that the scientific practices represented in the report are acceptable given the specific purposes of the project and subject to the field conditions encountered.
SUPPLEMENTAL COMMENTARY HAS BEEN ADDED TO THIS PUBLICATION: [ ] Yes [ ] No

(Dr. P. A. Larkin, Ph.D., Chair) — (Date) Jan 9/96

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**

(Lucille Partington, Co-chair) — (Date) Jan. 11/96

(Robert McLeod, Co-chair) — (Date) 11/01/96

WATER RESOURCES USE AND MANAGEMENT ISSUES FOR THE PEACE, ATHABASCA AND SLAVE RIVER BASINS: IMPLEMENTATION OF A HOUSEHOLD SURVEY, JANUARY TO APRIL, 1995

STUDY PERSPECTIVE

In order to assist the Board in discerning the attitudes and concerns of the basin residents on water management issues and possible recommendations, the Other River Uses component designed a five-step program to obtain the information. The steps included:

1. Identification of Stakeholders;
2. Development of an information gathering strategy;
3. Implementation of data gathering surveys;
4. Analysis of the survey results; and
5. Final synthesis report.

Related Study Questions

3. *Who are the stakeholders and what are the consumptive and non consumptive uses of the water resources in the river basins?*

This report deals with step three and describes the implementation of the household survey during January to March 1995 and presents the raw results (on diskette). The stakeholder survey, which was conducted simultaneously, is described in a companion report "Implementation of Surveys of Interest Groups, Industries and Municipal Governments, February to April, 1995" (NRBS Report Number 75). The approach and design of the surveys are discussed in "Design of Questionnaire and Survey Methods" (NRBS Report Number 58). This survey was necessary as no data bases existed that could fully describe the water management issues and concerns of the residents and how they made use of the aquatic resources present. A survey of users in the study area appeared to present the most cost-effective approach to obtain this information. The study area was divided into 12 regions based drainage basins and telephone prefixes. It was assumed that a person's location in the study area would affect their concerns and use of the aquatic ecosystem. A total of 2,621 households were contacted to obtain an initial sample size of 1,400 who were willing to participate in the survey. By mid April 714 completed surveys had been received. Several reasons were given for not completing the survey by respondents, the most common one being that they were no longer interested in the survey. The effect of non-responses on the accuracy of the survey results will be discussed in "Results of the Household and Stakeholders Surveys" (NRBS Report Number 69).

The results of the household and stakeholders surveys are analyzed in "Results of the Household and Stakeholders Surveys" (NRBS Report Number 69). The householder survey marked the first time that the residents of the study area have been surveyed to this extent. The resulting information will be useful not only for this study but for planning for many years in the future.

REPORT SUMMARY

The objective of Project 4121-D3 was to undertake a survey with a random sample of people residing in the northern river basins in order to collect information about these people, their use of the aquatic resources of the basin, and their attitudes and opinions about present and future water management in the basins. This survey was undertaken to help answer Study Board question #3: Who are the stakeholders and what are their consumptive and non-consumptive uses of the water resources in the river basins?

The household survey employed a sampling strategy and questionnaire that were developed as part of previous NRBS projects. The basic approach involved contacting a stratified, random sample of 1,200 households by telephone, soliciting their cooperation with the survey, mailing them the questionnaire, calling them to remind them to complete the survey and even conducting the survey over the telephone, if required. The study area was broken into 12 regions and initial intentions were to send questionnaires to at least 90 households in each region, and 180 in each of the two larger regions. As the project progressed, this number was increased to 100 for most regions and 200 in the larger regions. The questionnaire was pretested by 20 households before full implementation occurred.

A total of 2,621 households were screened in order to find 1,400 that were willing to complete the survey. This represents a participation rate of 53.4 percent. At the end of the study, 714 questionnaires had been completed, representing a 51 percent response rate. The most common reason for not completing the questionnaire was that the household was no longer interested in the survey. Survey results were then coded into two data bases: one for written comments and the other containing numeric and coded information. Analysis of this information is to occur as part of future NRBS projects.

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1.0 BACKGROUND

The Northern River Basins Study (NRBS) is a joint project between the governments of Canada, Alberta and the Northwest Territories that commenced in September of 1991. The purpose of the NRBS is "to characterize the cumulative effects of development on the water and aquatic environment of the Study areas by coordinating with existing programs and undertaking appropriate new technical studies". To undertake this study, a Study Board, Study Office and Science Advisory Committee were created. The study area includes the mainstems and main tributaries of the Peace, Athabasca and Slave rivers.

The Study Board developed a vision statement to provide overall guidance for the various technical activities being conducted in support of the study and also identified 16 questions that serve to focus study activities. One of these questions is:

#3. Who are the stakeholders and what are the consumptive and non-consumptive uses of the water resources in the river basins?

In order to answer this question, the Other Uses Component was established and a five step work program was developed. These steps included:

1. Identifying stakeholders;
2. Developing an information collection strategy (survey);
3. Implementation of the survey;
4. Analysis of survey results; and,
5. Preparation of a summary report.

The first two steps of this work program have been completed. Project 4101-B1 was undertaken in the fall of 1993 and produced a partial list of stakeholder groups (about 290) in the study area. This study also identified the general public as a stakeholder.

Strategies for collecting information from the general public were developed as part of Project 4121-D2. This project was completed in 1994 and recommended that a survey be undertaken with a stratified random sample of households in the study area. A survey was required because there are no existing data bases that describe how northern residents use the aquatic resources of the basin for such things as recreation, subsistence, transportation or other purposes or the cultural or lifestyle importance of northern rivers. The only way of obtaining this information is by directly questioning a sample of northern residents.

Project 4121-D2 proposed that about 1,200 interviews be conducted by telephone with a stratified random sample of households. Telephone surveys were recommended instead of mail-out surveys or face-to-face interviews for a number of reasons. Compared to mail-out surveys, telephone surveys produce much higher response rates so that there is less non-response bias. While face-to-face interviews can provide even better information than mail -surveys, they are very costly, especially given the number of completed responses necessary to provide a representative sample.

Table 1: DESCRIPTION OF STRATA USED FOR HOUSEHOLD SURVEY

Stratum	Description	Communities	Telephone Prefixes	Number of Telephones in 1994
1	Upper Athabasca River	Whitecourt, Jasper, Hinton, Brule, Jasper East	778, 852, 865, 866	7,782
2	Middle Athabasca River	Calling Lake, Grassland, Ft. Assiniboine, Blue Ridge, Athabasca, Flatbush, Wandering River, Smith	331, 584, 525, 648, 675, 681, 771, 829	5,342
3	Lower Athabasca River	Anzac, Fort McMurray, Fort McKay	334, 743, 790, 791, 828	10,369
4	Upper Peace River	Girouxville, Grimshaw, Berwyn, Silver Valley, Bonanza, Eaglesham, Hines Creek, Bear Canyon, Whitelaw, Brownvale, Worsley, Wanham, Rycroft, Fairview, Spirit River	323, 332, 338, 351, 353, 359, 494, 595, 596, 597, 685, 694, 765, 835, 864	7,019
5	Middle Peace River	Peace River, Manning, Dixonville, Keg River	624, 836, 971, 981	4,255
6	Lower Peace River	Fox Lake, Jean D'Or Prairie, High Level, Fort Vermilion, La Crete	659, 759, 926, 927, 928	2,717
7	Slave River and Delta	Fort Resolution, Fort Chipewyan, Fort Smith	394, 697, 872	1,017
8	Smoky/Wapiti Drainage	Nampa, McLennan, Beaverlodge, Hythe, Valleyview, Grande Prairie, Clairmont, Sexsmith, Fox Creek, Wembley, Woking, Grande Cache, Fahler, Donnelly, Debolt	322, 324, 354, 356, 524, 532, 538, 539, 567, 568, 622, 766, 774, 827, 837, 925, 957	22,111
9	Lesser Slave Drainage	Swan Hills, Faust, Driftpile, Canyon Creek, High Prairie, Grouard, Kinuso, Joussard, Slave Lake	333, 355, 369, 523, 751, 775, 776, 849	5,421
10	Pembina/Macleod Drainage	Wildwood, Clyde, Westlock, Marlboro, Drayton Valley, Barrhead, Cadomin, Peers, Edson, Evansburg, Sangudo, Mayerthorpe, Robb, Niton Junction, Lodgepole, Jarvie	325, 348, 349, 397, 542, 674, 692, 693, 723, 727, 785, 786, 794, 795, 894, 954	19,071
11	Wabasca Drainage	Little Buffalo Lake, Red Earth, Gift Lake, Peerless Lake, Wabasca, Chipewyan Lake	629, 649, 767, 869, 891, 899	642
12	La Biche/Other Drainage	Conklin, Lac La Biche, Boyle, Rochester, Plamondon	559, 623, 689, 698, 798	3,841
	TOTAL			89,587

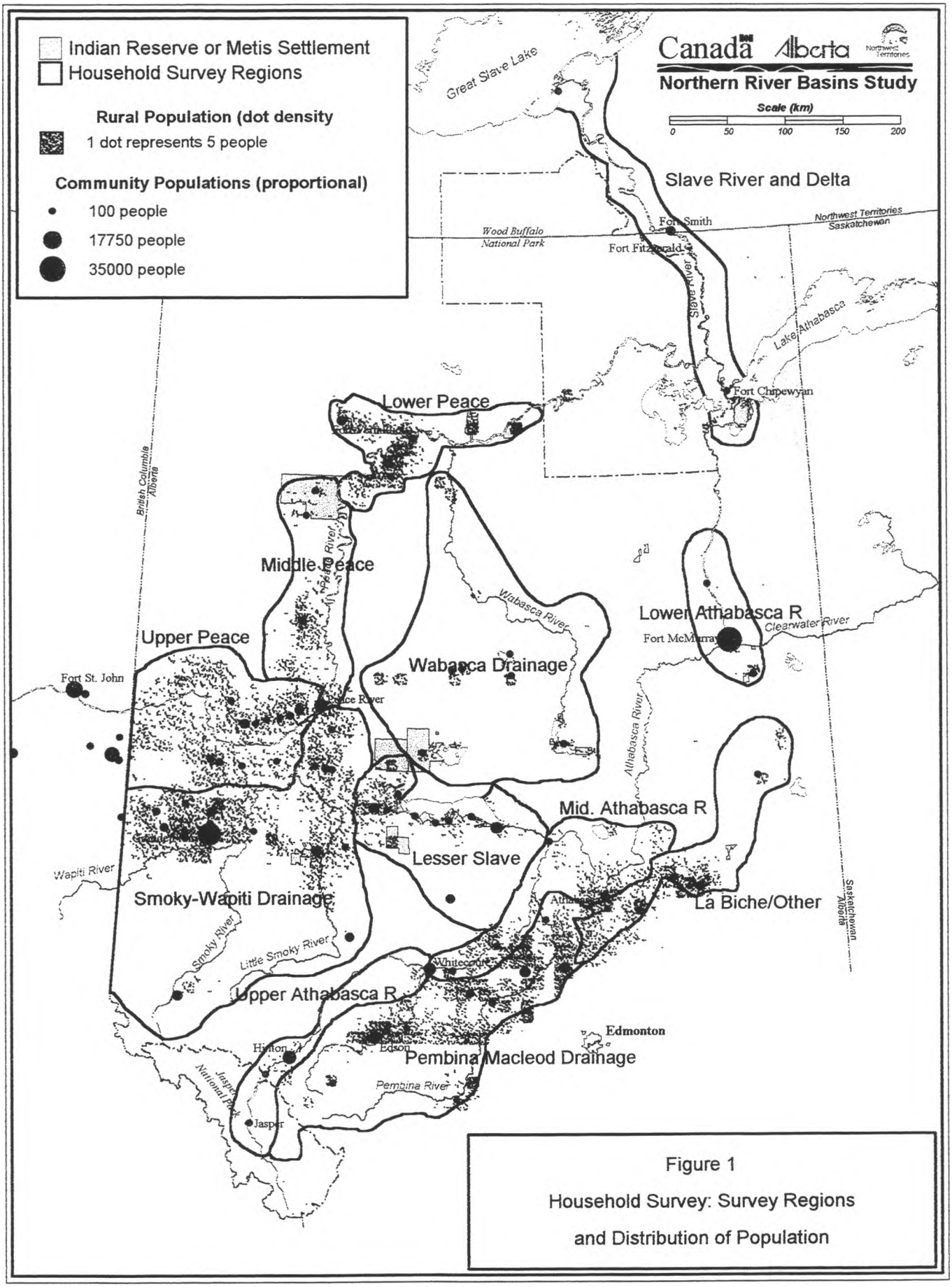

Figure 1

Household Survey: Survey Regions

and Distribution of Population

Another important advantage of telephone surveys is that telephone listings provide an easy way of describing a survey population and drawing samples of households. The only other comprehensive list from which to draw a sample are voters lists but these are difficult to obtain and are usually less current than telephone lists, which are updated quarterly.

As noted by Project 4121-D2, the only major drawback of using telephone surveys would be that a portion of northern residents (those without telephones) would be precluded from the survey. The extent of this omission was believed to be small, but could selectively omit some groups of people (for example, aboriginal people living in remote communities). Consequently it was suggested that the demographic characteristics of households included in the survey be compared to Census data for the region to determine the extent to which the sample results may have been biased by using the telephone.

A draft household questionnaire was developed as part of Project 4121-D2. This questionnaire was subsequently reviewed, modified and approved by the Study Board during the fall of 1994.

2.0 SAMPLE DESIGN AND SELECTION

Project 4121-D2 considered various methods for stratifying the basin population into a series of regions from which separate samples would be drawn. The recommended approach used strata that differentiated between people living along the river mainstems and people living along major tributaries. It also divided the major rivers into various reaches that are consistent with reach definitions being used in other NRBS studies. The strata were also defined in terms of telephone calling areas. This approach suggested a total of 12 strata be used for sampling, and each of these strata is defined in Table 1.

To ensure a balanced and representative assessment of households from each of the 12 regions, the recommended sampling strategy proposed that 90 households from each stratum be interviewed to ensure that results from even the smallest stratum will be statistically valid. Extra interviews (180 in total) were proposed for the two strata (regions 8 and 10) having the greatest number of households.

The random sample of telephone numbers used in the survey was provided by the Dominion Directory Company of Vancouver. This company maintains current lists (updated quarterly) of active telephone numbers for most of Canada and provided a random sample of residential telephone numbers for each of the regions shown in Table 1, based on the appropriate prefixes and the most recent set of telephone listings. They also provided the total number of active residential numbers for each region and this represents the survey population for each region.

For communities in the Northwest Territories, a different process was used. Telephone lists were not available on diskette, so a sample of residential telephone numbers was drawn at random from the most recent NorthwesTel telephone directory for Fort Smith and Fort Resolution. NorthwesTel did provide information on the total number of residential telephones in each community and this

was combined with the number of residential numbers in Fort Chipewyan to determine the total number of households in Region 7.

Based on the telephone information, about 89,587 households with telephones reside in the study area. According to the most recent Census information, there were 88,987 private households in the region in 1991. Given that there has been some population growth since 1991, almost all of the households in the region could have been included in a survey based on residential telephone listings. Although most households appear to have telephones, the demographic characteristics of survey households should be compared to Census data during the analysis of survey results to determine whether any particular groups were selectively missed by the telephone survey.

3.0 QUESTIONNAIRE DESIGN

The general design of the questionnaire was based on the survey instrument recommended by Project 4121-D2, and included changes and modifications based on comments made by the Study Board, the Study Office and representatives of the other component groups. The household questionnaire was initially designed to collect basic information on use of aquatic resources but, at the request of the Study Board, was expanded to solicit opinions on water management issues and concerns and to assess interest in establishing an inter-governmental and stakeholder committee responsible for water management in the basin. A copy of the final questionnaire is provided as Appendix B.

3.1 USUE OF AQUATIC RESOURCES

The first half of the questionnaire focuses on determining the ways and extent to which basin residents use the aquatic resources of the study area. Besides some general questions describing the demographic characteristics of their households, respondents were asked to identify and describe their source of domestic water. Respondents were also asked whether they were involved in agriculture, subsistence hunting, fishing or trapping, or recreation, and then asked a series of questions related to these activities. They were also asked to describe any changes in the water quantity, water quality, fish, wildlife or vegetation in the basin during the last 10 years.

The majority of the water use questions employed parametric (quantifiable) measurements of use. However, open-ended questions were used to solicit information on historic and future trends in water use and management.

3.2 WATER MANAGEMENT ISSUES AND CONCERNS

The questionnaire used various approaches to identify and characterize the water management issues and concerns of greatest concern to the general public. One series of questions asked respondents to describe in their own words the three factors that have had the greatest effect on water quality or quantity in the NRBS area over the last 20 years and to describe how they or members of their household have been affected and what actions should be taken to correct these problems. This relatively unstructured approach was adopted to ensure that respondents had considerable latitude in describing their concerns.

Table 2: SUMMARY OF THE FRACTIONAL FACTORIAL DESIGN USED TO RANK CURRENT THREATS TO WATER QUALITY/QUANTITY AND POTENTIAL MANAGEMENT ACTIONS

Threats/ Actions	Choice Set Number												Appearances
	1	2	3	4	5	6	7	8	9	10	11	12	
1			1			1	1	1		1		1	6
2	2			2				2	2	2		2	6
3		3			3		3		3	3		3	6
4	4		4				4		4	4	4		6
5			5		5			5	5		5	5	6
6				6		6	6		6		6	6	6
7		7	7	7						7	7	7	6
8	8	8					8	8			8	8	6
9				9	9		9	9		9	9		6
10	10				10	10				10	10	10	6
11		11				11		11	11	11	11		6
Issues per Set	4	4	4	4	4	4	6	6	6	8	8	8	
Questionnaire Version No.	4	3	1	2	4	2	3	1	3	4	1	2	

A second approach employed a very structured series of questions that asked respondents to identify from various lists, which of 11 possible threats to water quality or quantity in the basin were of most and least concern to them and to members of their household. A similar question asked respondents to identify the most and least effective management actions in dealing with these problems. The design of these questions employed a fractional factorial design which forces respondents to make choices but allows estimation of the extent to which some concerns are more important than others. The fractional factorial design, as shown in Table 2, required that respondents make choices from 12 different combinations of the 11 threats and management actions, and this was determined to be too onerous for respondents, given the range of other questions being asked. As a result, four different versions of the questionnaire were developed, each having three of 12 possible choice sets. The combinations for each of the four versions of the questionnaire are also shown in Table 2. These different versions were sent out in repeating sequence to households from each of the 12 regions to ensure that a random and representative sample of responses could be received.

A third question asked respondents to identify the key factors that should be used to measure the health of northern rivers. While an open-ended approach was used to allow respondents maximum freedom to identify these measure, a series of multiple choice questions related to the frequency of and responsibility for taking these measurements was provided to reduce the overall response burden.

The fourth approach simply provided space for respondents to identify the water management issues of greatest concern to them or their household and to list the most important recommendations that they would like the NRB Study Board to make. Space was also provided for any other comments that respondents wanted to make.

In summary, the questionnaire employed a variety of approaches to determine the issues and concerns of importance to the residents of the basins. This overall strategy was adopted so that values and attitudes could be assessed in terms of both parametric (quantifiable) and non-parametric measures and to minimize the extent to which the ensuing analysis would filter the actual information provided by respondents.

4.0 SURVEY IMPLEMENTATION

The recommended approach for conducting the survey involved initial contact by telephone to let households know about the survey and to solicit their cooperation. Respondents were to be given the choice of answering the survey questions at that time, or being sent a copy of the questionnaire by mail and then being called later. This approach was suggested because it would give respondents an opportunity to think about the questions before answering them and would

When the design of the questionnaire had been completed, it became evident that respondents would have a very difficult time trying to answer survey questions over the telephone without having a copy of the questionnaire in front of them. This was especially a concern for the questions developed using the fractional factorial design where respondents would be asked to pick single items from lengthy lists. Consequently, during implementation, potential respondents were not given the option

of having the survey conducted by telephone at that time and all interested households were mailed copies of the questionnaire before they were ever called back. Although a departure from the original design, this modified approach probably reduced potential response bias and also ensured that the survey was initially administered the same way to all respondents.

4.1 PRETEST

A pretest of the questionnaire was conducted during December, 1994 and early January, 1995. During the week of December 19-23, 1994, a random selection of potential respondents was drawn from the randomized telephone list. Regions 3 and 8 were targeted for the pretest. In total, 87 households were telephoned and 20 agreed to participate in the pretest. These people were informed of the study, its purposes, processes and the pretest. Respondents and the interviewers set up a date and approximate time to call back and review the questionnaire that would be delivered to them.

A questionnaire package, which included some background information on the NRBS, was then delivered to these households by courier. Respondents were asked to review the pretest questionnaire for coherence, ease of completion, questionnaire flow, information/content requested and question wording. The respondent attempted to complete the questionnaire on their own.

Telephone interviewers then called the respondent back as scheduled and discussed any problems or concerns people had with the questionnaire instrument and then conducted the survey over the telephone. The average length of these call was 43 minutes. Changes to the questionnaire were then made based on the pretest results

4.2 TELEPHONE SCREENING

After completion of a staff training session for telephone interviewers, full scale survey process commenced January 17,1995. Households were called in order from the telephone lists for each of the 12 regions. Each number was called once at different times on three different days before being passed over for another number.

Screening of the households to find 1,200 households to complete the survey took less time and budget than originally thought. As a result, it was decided to increase the over sample size by 200 in order to increase the number of completed responses and improve the statistical reliability of the results.

Overall, the telephone survey was considered to be highly successful. At the end of the survey, 2,621 households had been telephoned in order to find 1,400 households that would agree to participate in the survey. This represents a survey participation rate of 53.4 percent which means that, on average, telephone calls had to be made to 190 households in order to find 100 willing to participate in the survey. As shown in Table 3, the survey participation rate provide quite variable among the various regions. Below average participation rates occurred in the Slave River and Delta region (39 percent), the Wabasca drainage (44 percent) and in the Lower Athabasca region (46 percent). The highest participation rates were found in the Middle Peace region (61 percent), the lower Peace region (60 percent) and the Smoky Wapiti drainage (60 percent) calls.

Of the households contacted, 75 percent had not heard of the Northern River Basins Study. Reasons for not participating in the survey included lack of interest, insufficient time to complete it, the respondent's age, the respondent being new to the area and feeling unqualified to answer the survey, or that the respondent worked out of town. In some cases, the potential respondent hung up before the introduction to the survey could be completed. Based on the reasons given for not-participating, there would appear to be no strategic or systematic reasons for non-response. This conclusion will need to be reconsidered when survey results are compared to population characteristics as part of future analysis of the survey data.

4.3 MAILING OF QUESTIONNAIRES

Survey packages were then mailed to all households that had agreed to compete the survey. These packages contained the questionnaire, a covering letter, a postage-paid return envelope, and a recent copy of RiverViews, the NRBS newsletter, as background information. Participants were asked to complete the survey and them mail back.

4.4 TELEPHONE FOLLOW-UP

Telephone follow-ups began on February 15, 1995. Households that had not yet returned their surveys was called to determine whether they had received the survey package and to ask whether they had any questions about the survey. Approximately 1,843 follow-up calls were conducted. Duplicate surveys were sent to 47 households which had not yet received the package but were still interested in completing the survey.

Telephone contact with households in the NWT as part of Region 7 were delayed until the requisite licence was received. Calls to these households began on February 25, 1995. Households were contacted and screened as was done in the remainder of the area and survey packages were then mailed to interested households.

Response rates from the various regions were monitored throughout the survey. On March 22, 1995 it was realized that the response rates for regions 7, 9 and 11 were below 50 percent and a concerted push was made to bring up the number of completed responses in these regions. During a one-week period, 61 surveys from these regions were completed over the phone. Although this third set of telephone calls did make some respondents felt pressured to complete the survey, the overall response rate increased by nine percent and helped ensure a fairly balanced number of responses from all the various regions.

Table 3: SUMMARY OF SURVEY RESPONSE RATES

Survey Region	Telephone Contacts	Agreed to Survey	Survey Participation	Completed Questionnaires	Questionnaire Response Rate
Upper Athabasca River	168	100	59.5%	50	50%
Middle Athabasca River	169	100	59.2%	59	59%
Lower Athabasca River	217	100	46.1%	54	54%
Upper Peace River	186	100	53.8%	56	56%
Middle Peace River	163	100	61.3%	48	48%
Lower Peace River	165	100	60.6%	52	52%
Slave River and Delta	256	100	39.1%	51	51%
Smoky/Wapiti Drainage	332	200	60.2%	92	46%
Lesser Slave Drainage	199	100	50.3%	53	53%
Pembina/Macleod Drainage	364	200	54.9%	97	48.5%
Wabasca Drainage	227	100	44.1%	53	53%
La Biche/Other Drainage	175	100	57.1%	49	49%
TOTAL	2,621	1,400	53.4%	714	51.0%

5.0 SURVEY RESULTS

As of April 15, 714 questionnaires had been completed and returned. This represents an overall response rate to the survey of 51 percent. As in Table 3, response rates ranged from a low of 46 percent in the case of the Middle Peace River region to a high of 58 percent in the Middle Athabasca River region. The representativeness of the survey results will be determined in a future step in the overall project by comparing sample results to known characteristics of the overall survey population.

There were two major reasons for non-responses. In some cases, follow-up telephone calls determined that some respondents who had agreed to participate in the study later changed their minds and were declining to return the survey for a variety of reasons. About 81 households, or six percent of the survey, changed their minds about responding. The reasons for this change were reported as follows:

Not interested anymore	24%
Too busy to complete it	16%
Not interested in rivers	16%
Threw it out	12%
Too many questions	12%
Did not feel qualified	9.3%
Number no longer in service	5.3%
Didn't feel that it would help	2.7%
Too many personal questions	2.7%

The second explanation of non-response is that about 114 households (eight percent) told the telephone interviewers that they had sent the completed questionnaire back but these responses have never been received. The incidence of these types of non-response is shown below:

Survey Region	Change of Mind	Sent But Not Received
Upper Athabasca River	6	3
Middle Athabasca River	3	4
Lower Athabasca River	7	16
Upper Peace River	9	9
Middle Peace River	5	6
Lower Peace River	5	9
Slave River and Delta	11	28
Smoky/Wapiti Drainage	9	9
Lesser Slave Drainage		5
Pembina/Macleod Drainage	9	8
Wabasca Drainage	14	9
La Biche/Other Drainage	3	8
TOTAL	81	114

These two factors account for about one-quarter (28 percent) of the non-responses. Reasons for the other 72 percent on non-responses are unknown. Potential demographic factors that might explain the non-response should be assessed during future analyses of the survey data and comparison to census characteristics for the study area.

6.0 DATA ENTRY AND CODING

As specified in the terms of reference, information from completed surveys were entered into a single data base using SPSS/PC+ software. Numerical data were entered directly, but written responses were converted to numerical codes and then entered. On two occasions, listings of the survey data were generated, reviewed and edited to determine any errors or miscodes. These corrections were then made to ensure a clean copy of the final database. A complete copy of the codes used in the household survey is provided in Appendix C.

Questions 57 through 72, 77 and 79 were all open-ended questions that generated considerable written comments. For these questions, a verbatim transcript of all these comments was prepared in a separate data base which has every questionnaire as a separate file in and MSWORD format. In the future, these comments need to be reviewed and coded for entry into the final database for the project.

Copies of both data bases, on computer diskette as well as hard copies, were provided to the Northern River Basins Study at the completion of the project.

APPENDIX A

NORTHERN RIVER BASINS STUDY

TERMS OF REFERENCE FOR PROJECT 4121-D3:

IMPLEMENTATION OF HOUSEHOLD SURVEY

NORTHERN RIVER BASINS STUDY

DRAFT

SCHEDULE A - TERMS OF REFERENCE

Project 4121-D3: Implementation of Household Survey

I. BACKGROUND & OBJECTIVES

The Northern River Basins Study (NRBS) is a joint project between the governments of Canada, Alberta and the Northwest Territories that commenced in September of 1991. The purpose of the NRBS is "to characterize the cumulative effects of development on the water and aquatic environment of the Study areas by coordinating with existing programs and undertaking appropriate new technical studies". To undertake this study, a Study Board, Study Office and Science Advisory Committee were created. The study area includes the mainstems and main tributaries of the Peace, Athabasca and Slave rivers.

The Study Board developed a vision statement to provide overall guidance for the various technical activities being conducted in support of the study and also identified 16 questions that serve to focus study activities. One of these questions is:

#3. Who are the stakeholders and what are the consumptive and non-consumptive uses of the water resources in the river basins?

Eight component groups have since been established to address these 16 questions and the Other Uses Component is primarily responsible for developing and undertaking research and investigations related to the use of water resources. This group is working in close association with the Traditional Knowledge Component, which is responsible for collecting information on resource use and values of indigenous people and long-time residents.

In order to collect information about stakeholders and their uses of aquatic resources, the Other Uses Component is planning to undertake a survey of northern residents. The design of this study has been completed as part of Project 4121-D2, and a draft questionnaire has been developed, pretested with the Study Board (copy attached), and requires a some minor modifications before being ready for use. A consultant is now required to implement this survey which will use a combination of telephone calls and mail-outs to collect information from about 1200 households representing a stratified random sample of residents of the northern river basins.

The contract will proceed in two phases. The first phase will involve a pretest of the survey instrument and adjustments will be made in conjunction with the Component Leader. Phase II will involve the implementation of the survey for the Study area.

II. REQUIREMENTS

Phase I

1. The Contractor will meet with the Component Coordinator to review background information on the nature of the information required and the choice of survey approaches. The draft questionnaire will also be reviewed to identify any potential changes that would speed implementation or address potential problems, and a final version of the questionnaire will be developed. The proposed schedule for completing the surveys and the method for undertaking a pretest will also be reviewed.

2. The Contractor will undertake a small (20 households) pretest of the survey to identify any potential problems in the design of the questionnaire and to identify any procedures that improve the efficiency of conducting the survey or recording responses.

Phase II

3. The contractor will commence the survey by telephoning northern residents based on lists of randomly-chosen telephone numbers for each of the 12 strata included in the survey design. These lists will be provided by the NRBS. These 12 strata and the number of interviews to be completed for each stratum are as follows:

Stratum	Description	Telephone Prefixes	Number of Interviews to be Completed
1	Upper Athabasca River	778, 852, 865, 866	85
2	Middle Athabasca River	331, 548, 525, 648, 675, 681, 771, 829	85
3	Lower Athabasca River	334, 743, 790, 791, 828	85
4	Upper Peace River	323, 332, 338, 351, 353, 359, 494, 595, 596, 597, 685, 694, 765, 835, 864	85
5	Middle Peace River	624, 836, 971, 981	85
6	Lower Peace River	659, 759, 926, 927, 928	85
7	Slave River and Delta	394, 697, 872	85
8	Smoky/Wapiti Drainage	322, 324, 354, 356, 524, 532, 538, 539, 567, 568, 622, 766, 774, 827, 837, 925, 957	170
9	Lesser Slave Drainage	333, 355, 369, 523, 751, 775, 776, 849	85
10	Pembina/Macleod Drainage	325, 348, 349, 397, 542, 674, 692, 693, 723, 727, 785, 786, 794, 795, 894, 954	170
11	Wabasca Drainage	629, 649, 767, 869, 891, 899	85
12	La Biche/Other Drainage	559, 623, 689, 698, 798	85

4. The Contractor will attempt to contact each household on the list by calling a total of three times: on different day, of which must be a weekend/holiday, and at different times of the day. Households are to be telephoned in sequence to ensure a random sample, and initial efforts will focus on the first 85 households on the list. If there is no contact after three attempts, the Contractor will then strike that household from the list and replace it with number 86, 87, etc., until the required number of complete responses is achieved.

5. When a household is contacted, the Contractor will administer the screening component of the questionnaire, sufficient copies of which will be provided by the NRBS. Surveys are to be completed with an adult member of the household. The screening component identifies the way in which the remainder of the survey is to be done: over the telephone, by mail, or by mail with a telephone follow-up. If the respondent does not want to participate in the survey, the screening questions should still be completed as best possible so that they can be tested for non-response bias. Households that choose not to complete the reminder of the survey are not to be counted as part of the 85 complete surveys required for each strata.

6. The Contractor will implement the balance of the survey in accordance with the method preferred by each respondent:

   - over the telephone following completion of the screening questions;
   - by recording the name and address of the respondent and then submitting this list each day by FAX to Alberta Environmental Protection which will be responsible for sending a copy of the survey to the respondent by mail. Completed surveys will be returned to the Contractor by mail for data entry; or,
   - by recording the name and address of the respondent and then submitting this list each day by FAX to Alberta Environmental Protection which will send a copy of the survey to the respondent by mail. The Contractor will then call the respondent three weeks later to record the survey results over the telephone.

   The NRBS will provide the Contractor with a sufficient number of questionnaires to complete the survey. Alberta Environmental Protection will be responsible for mailing charges, including postage-paid return envelopes for questionnaires to be mailed back.

7. The Contractor will develop a data entry procedure for the survey and will build a verified data file consisting of all screening surveys plus all 1190 completed surveys. This data file must either be an SPSS\PC+ *.sys file or capable of easy translation into this format. All paper records of the survey and the data file are to be provided to the NRBS at the end of the study, along with a brief report that summarizes the participation and success rates for the survey plus any details that will assist in the interpreation of survey results.

This study must be completed by March 31, 1995 and will commence in mid December once the consultant has been selected. Preferably the pretest should be conducted prior to the Christmas holidays so that full-scale implementation can begin in January.

There will need to for one meeting with the Component Coordinator at the beginning of the project to review the details of the survey procedure. However, weekly telephone contact with the Component Coordinator will be required as the survey proceeds to describe progress to date and identify any problems.

III. REPORTING REQUIREMENTS

1) The Contractor is to provide draft and final reports in the style and format outlined in the NRBS Style Manual. A copy of the Style Manual entitled " A Guide for the Preparation of Reports" will be supplied to the contractor by the NRBS.

2) Ten copies of the Draft Reports along with an electronic disk copy are to be submitted to the Project Liaison Officer by January 31, 1995.

   Three weeks after the receipt of review comments on the draft report, the Contractor is to provide the Project Liaison Officer with two unbound, camera-ready copies and ten cerlox-bound copies of the final report along with an electronic version.

3) The final report is to include the following: an acknowledgment section that indicates any local involvement in the project, Project Summary, Table of Contents, List of Tables, List of Figures and an Appendix with the Terms of Reference for this Project.

   Text for the report should be set up in the following format:

   a) Times Roman 12 point (Pro) or New Times Roman (WPWIN60) font.
   b) Margins are 1" at top and bottom, 7/8" on left and right.
   c) Headings in the report body are labeled with hierarchical decimal Arabic numbers
   d) Text is presented with full justification; that is, aligns on both left and right margins.
   e) Page numbers are Arabic numbers for the body of the report, centred at the bottom of each page and bold.

   - If photographs are to be included in the report text they should be high contrast black and white.
   - All tables and figures in the report should be clearly reproducible by a black and white photocopier.
   - 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.
   - Electronic copies of tables, figures and data appendices in the report are also to be submitted to the Project Liaison Officer in a spreadsheet (Quattro Pro

preferred, but also Excel or Lotus) or database (dBase IV) format. Where appropriate, data in tables, figures and appendices should be geo-referenced.

IV. DELIVERABLES

1. All figures and maps are to be delivered in both hard copy (paper) and digital formats. Acceptable formats include: DXF, uncompressed Eoo, VEC/VEH, Atlas and ISIF. All digital maps must be properly geo-referenced.

2. All sampling locations presented in report and electronic format should be geo-referenced. This is to include decimal latitudes and longitudes (to six decimal places) and UTM coordinates. The first field for decimal latitudes/longitudes should be latitudes (10 spaces wide). The second field should be longitude (11 spaces wide).

3. Six to ten 35 mm slides that can be used at public meetings to summarize the project, methods and key findings.

V. CONTRACT ADMINISTRATION

The Project Liaison Officer (Component Coordinator) for this project is:

Jim Choles
Project Liaison Officer
Northern River Basins Study
690 Standard Life Centre
10405 Jasper Avenue Bus: (403) 427-1742
Edmonton, Alberta T5J 3N4 Fax: (403) 422-3055

Please contact the Component Coordinator on administrative matters.

This project has been proposed by the Other Uses Component of the NRBS.

The Other Uses Component Leader is:

Dr. Bruce MacLock/John Thompson
Alberta Environmental Protection
3rd Floor, 9820 - 106 Street
Edmonton, Alberta T5K 2J6
Bus. Phone (403) 427-0047 Fax: (403) 422-5136

Please contact the Component Leader on issues related to science.

APPENDIX B

NORTHERN RIVER BASINS STUDY

HOUSEHOLD QUESTIONNAIRE

Canada Alberta Northwest Territories

Northern River Basins Study
Household Questionnaire

Part I. Introduction

Your telephone number _____

Thank you for agreeing to answer this questionnaire. One of the objectives of the study is to find out how Northerners use and value the Peace, Athabasca and Slave Rivers. Your household was selected at random to help provide this information. We need your cooperation to answer a series of questions about how you and members of your household make use of the water resources of the region. We are collecting information from about 1,200 households. Individual responses will be kept confidential.

Part II. General Questions

1a. Where are you currently living? *(Circle one answer.)*

A. Town/city (specify) _____ *(Go to question 2.)*
B. Farm
C. Cottage/rural subdivision
D. Native reserve
E. Metis settlement
F. Other (specify) _____

1b. ***(if B to F selected)*** What is the name of the closest city, town, hamlet or village?

_____

2. How long have you been living in this location? *(Circle one answer.)*

A. Less than 1 year
B. Between 1 and 5 years
C. Between 5 and 10 years
D. Between 10 and 15 years
E. Between 15 and 20 years
F. More than 20 years

3. How long have you been living in the Peace, Slave or Athabasca River basins? *(Circle one answer.)*

A. Less than 1 year
B. Between 1 and 5 years
C. Between 5 and 10 years
D. Between 10 and 15 years
E. Between 15 and 20 years
F. More than 20 years

4. Which one of the following major rivers is nearest your current residence? *(Circle only one answer.)*

A. Athabasca River
B. McLeod River
C. Pembina River
D. Peace River
E. Wapiti River
F. Smoky River
G. Little Smoky River
H. Wabasca River
I. Slave River

5. About how far away is this river from your current residence?

_____ Kilometre **Or** _____ Miles

6. Do you identify yourself as? *(Circle one answer.)*

A. Aboriginal ——> Are you on a registered Tribal roll? Yes ____ No ____
B. Metis
C. Non-native

7. Which of the following categories best describes your household? *(Circle only one answer.)*

A. Single person
B. Couple with no children
C. Couple with children
D. Extended family
E. Single parent family
F. Two or more unrelated adults
G. Two or more related adults
H. Other *(describe below)*

_____

8. Including yourself, how many people are in your household? _____ people

9. Of these, how many are in the following age categories?

A. Under 5 years old _____
B. 5 to 9 years old _____
C. 10 to 14 years old _____
D. 15 to 19 years old _____
E. 20 to 34 years old _____
F. 35 to 44 years old _____
G. 45 to 54 years old _____
H. 55 to 64 years old _____
I. 65 years and older _____

10. How old are you? _____

11. Are you? _____ Male _____ Female

12. In which industries are you and members of your household currently employed? *(Circle all that apply.)*

A. Agriculture
B. Trapping/commercial fishing
C. Oil and gas
D. Forestry (logging)
E. Manufacturing (lumber, paper, etc.)
F. Construction
G. Transportation/communications/utilities
H. Retail or wholesale trade
I. Finance, insurance, other services
J. Government (health, education)
K. Unemployed
L. Other *(describe below)*

_____

Part III. General Use of Water Resources

The next part of this questionnaire asks some general questions about how you and members of your household use the water, fish, plants and wildlife in the river basin.

13. What is the source of your household's everyday drinking water? *(Circle one answer.)*

A. Municipal water plant ——> *(Go to question 15)*
B. Bottled water ——> *(Go to question 15)*
C. Well
D. Lake water Which lake? _____
E. River water Which river? _____
F. Dug out
G. Spring water
H. Other *(describe)* _____

14. Do you treat this water in any way before drinking it?

_____ Yes *(describe)* _____
_____ No

15. Are there any problems with the amount of water available from this source throughout the year?

_____ Yes *(describe)* _____
_____ No

16. Are there any problems with the quality of water available from this source throughout the year?

_____ Yes *(describe)* _____
_____ No

17. **Over the last 10 years,** have there been any noticeable changes in the quality or amount of water available from your usual water supply?

_____ Yes *(describe the changes you have noticed such as amount, smell, colour, taste, clarity)* _____
_____ No

18. Do you agree or disagree with each of the following statements?
(Check only one answer for each question.)

	Totally Agree	Agree	Disagree	Totally Disagree	Unsure
A. Water quality in the Peace, Athabasca and Slave Rivers is not really a major issue at the moment so new restrictions on industrial, agricultural or municipal water use are not required.					
B. Pollution of northern rivers is only a concern in a few locations and more enforcement of existing standards will solve these problems.					
C. Contamination of northern rivers is a major problem and some industries or municipalities should be forced to reduce effluent discharges, even if it means closing some operations.					
D. Existing water management regulations are interfering with economic development in the region and should be reduced or eliminated.					
E. New effluent discharges should not be allowed until a river basin plan has been completed.					

Part IV. Subsistence Use of Water Resources

19. Do you or any members of your household use any water resources for subsistence? By subsistence, we mean harvesting fish or wildlife only for your consumption or as a source of income.

_____ Yes
_____ No ——> *(Go to Yellow Section, Page 11, Question 39.)*

20. How often do you or members of your household participate in the following subsistence activities? *(Check appropriate answer for each activity.)*

	Daily	Weekly	Monthly	Yearly
Fishing				
Trapping				
Hunting				
Other *(specify below)*				

_____

Subsistence fishing

If you or members of your household do <u>not</u> participate in subsistence fishing, go to Question 27.

21a. List the three main species of fish and indicate how many pounds of these fish you and members of your household actually catch in an average year.

Name of species	Average annual catch *(specify pounds or kilograms)*
#1	
#2	
#3	

21b. Of these three species of fish, which would you prefer to catch. *(List in order of preference.)*

Preference	Name of species
#1	
#2	
#3	

22. In which three main bodies of water do you and members of your household usually fish and what proportion of your total catch comes from each? *(List in order of importance.)*

Importance	Name of water body	Percent (%) of annual catch
#1		
#2		
#3		

23. Do you or members of your household fish in the mainstems of the Athabasca, Peace or Slave Rivers or any of their major tributaries?

_____ Yes _____ No

If yes, please indicate the three most important sites along these rivers and indicate the proportion of total catch that comes from each location. *(To help describe the site, use the nearest major landmark that people would know.)*

Importance	Name or Description of Site	Percent (%) of annual catch
#1		
#2		
#3		

24. Over the past 10 years, have you or any members of your household noticed any changes in the number, quality or health of fish you have caught?

_____ Yes _____ No

If yes, describe the types of changes you have noticed.

Number: _____
Quality: _____
Health: _____
Other: _____

25. Of the fish you catch, how much of the total annual catch:

	Percent (%) of annual catch
Is eaten by you and members of your household?	
Is given away or sold to others for their consumption?	
Is fed to dogs or other animals?	

26. How many pounds or kilograms of caught fish does a typical person in your household consume in an average week?

_____ Pounds **OR** _____ Kilograms **OR** _____ Number of fish eaten

Subsistence trapping

If you or members of your household do not participate in subsistence trapping, go to Question 32.

27a . List the three main species of furbearers and indicate how many of these animals you and members of your household actually trap in an average year.

Name of species	Average annual catch *(specify pounds or kilograms)*	Average number of animals trapped per year
#1		
#2		
#3		

27b. Of these three furbearers that you trap, which would you prefer to trap. *(List in order of importance.)*

Preference	Name of species
#1	
#2	
#3	

28. Describe the location of your trapping area or if you are a registered trapper, indicate your registered trapline number. *(To help describe the area, use the nearest major landmark that people would know.)*

_____

_____

_____

29. Do you or members of your household trap within 10 kilometres (6 miles) of the mainstems of the Athabasca, Peace or Slave Rivers or any of their major tributaries?

_____ Yes _____ No

If yes, please indicate the three most important locations along these rivers and indicate the proportion of total catch that comes from each location. *(To help describe the area, use the nearest major landmark that people would know.)*

Importance	Name or Description of Site	Percent (%) of annual catch
#1		
#2		
#3		

30. Over the past 10 years, have you or any members of your household noticed any changes in the number, quality or health of the furbearers you trapped?

_____ Yes _____ No

If yes, describe the types of changes you have noticed.

Number: _____
Quality: _____
Health: _____
Other: _____

31. Do you or members of your household eat any parts of the animals you trap?

_____ Yes _____ No

If yes, please indicate the type of animal you trap, all portions of the animal you eat, and the number of animals that your household eats in an average year.

Type of Animal	Parts eaten	Number eaten per year

Subsistence hunting

If you or members of your household do not participate in subsistence hunting, go to Question 39.

32. In an average year, about how many animals do you or members of your household kill for food (subsistence hunting) each year?

_____ Animals killed

33a. List the three main species of animals and indicate how many of these animals you and members of your household actually hunt and kill in an average year:

Type of animal	Number killed per year
#1	
#2	
#3	

33b. Of these three species of animals, which would you would prefer to hunt? *(List in order of importance.)*

Preference	Type of animal
#1	
#2	
#3	

34. Do you or members of your household hunt within 10 kilometres (6 miles) of the mainstems of the Athabasca, Peace or Slave rivers, or any of their major tributaries?

_____ Yes _____ No

If yes, please indicate the three most important sites along these rivers and indicate the proportion of total kills from each location. *(To help describe the area, use the nearest major landmark that people would know.)*

Importance	Name or Description of Site	Percent (%) of animals killed
#1		
#2		
#3		

35. Over the past 10 years, have you or any members of your household noticed any changes in the number, quality or health of animals killed for food?

_____ Yes _____ No

If yes, describe the types of changes you have noticed.

Number: _____
Quality: _____
Health: _____
Other: _____

36. Of the animals that you have killed, what proportion of the meat:

	Percent (%) of animals killed
Is eaten by you and members of your household?	
Is given away to others for their consumption?	
Is fed to dogs or other animals?	

37. How many pounds or kilograms of wild game meat does a typical person in your household consume in an average week?

_____ Pounds **OR** _____ Kilograms

General questions

38. While you are subsistence fishing, trapping or hunting, do you ever consume or use river or lake water?

_____ Yes _____ No

If Yes, do you treat this water in any way before drinking it?

_____ Yes *(describe how)* _____
_____ No _____

Part V. Recreational Activities

39. For each of the following recreational activities, please indicate how often you or members of your household participate in the activities listed below. Also indicate the average length of trips in days and the average number of household residents participating on these trips.

Main Activity	Number of trips in an average year	Average length of trip (days)	Average number of household members on the trip
Fishing			
Boating			
Swimming (lakes/rivers)			
Canoeing			
Camping			
Hunting			
Other			

40. List in order of preference, the sites on rivers and lakes that you and members of your household visit most often for recreational purposes. Also, indicate the usual recreational activity on these trips, the number of trips to each site in an average year, and the main reason for preferring this site. *(To help describe the area, use the nearest major landmark that people would know.)*

	Site #1	Site #2	Site #3
Site name or description			
Usual activity			
Number of trips per year			
Main reason for preferring site			

41. Do you or members of your household use the mainstems of the Athabasca, Peace or Slave Rivers, or any of their major tributaries for recreational purposes?

_____ Yes _____ No *(If No, go to Question 45.)*

If yes, please describe the three locations along these rivers that you use most often, indicate the usual recreational activity at each site, and state the number of trips taken to each site in an average year. *(To help describe the area, use the nearest major landmark that people would know.)*

	Site #1	Site #2	Site #3
Site name or description			
Usual activity			
Number of trips preferring site			

42. List, in order of importance, the three species of fish that you prefer to catch recreationally from themainstems of the Athabasca, Peace or Slave Rivers or any of their major tributaries and indicate how many pounds or kilograms of these fish you and members of your household catch in an average year from these locations. *(Include the numbers of fish you keep and release.)*

Importance	Type of fish	Average annual recreational catch *(specify pounds* **OR** *kilograms)*
#1		
#2		
#3		

43a. On average, about how many pounds or kilograms of fish caught from these locations do you and members of your household consume per year?

_____ Pounds **OR** _____ Kilograms **OR** _____ Number of fish eaten

43b. Which, of these fish species you catch recreationally, do you eat?

44. On average, about how many pounds or kilograms of fish caught from these locations is given away to others?

_____ Pounds **OR** _____ Kilograms **OR** _____ Number given away

45. Over the past 10 years, have you or any members of your household noticed any changes in the water, fish, animals or plants along the mainstems of the Athabasca, Peace or Slave Rivers or any of their major tributaries?

_____ Yes _____ No

If yes, describe the types of changes you have noticed.

Water: _____
Fish: _____
Animals: _____
Plants: _____
Other: _____

46. When involved in water-based recreational activities in the region, do you ever consume river or lake water?

_____ Yes _____ No

If yes, do you treat this water in any way before drinking it?

_____Yes *(describe how)* _____
_____No _____

Part VI. Agricultural Water Use

47. Are you or any members of your household involved in farming of any sort?

_____ Yes
_____ No ———> *(If No, go to White Section, Page 15 Question 57.)*

48. Which of the following terms best describes your farming operation? *(Circle one answer.)*

A. Grains/oilseeds
B. Mixed farming (grain and livestock)
C. Specialty crops *(describe)*_____
D. Livestock only ———> *(Go to question 55.)*

49. How many acres do you plant or harvest in an average year? _____ acres

50. Please list the types of crops you grow.

_____
_____
_____

51a. Do you irrigate any of these crops?

_____ Yes _____ No
If yes, what is the source of this water? *(Name the waterbody.)*_____

51b. Do you have a water license? _____ Yes _____ No

51c. Home many acres of land do you irrigate in an average year? _____ acres

51d. How much water (total volume) do you use in an average year?_____ acres-feet **OR**
_____ inches/acre/year

52. Do you use any herbicides?

_____ Yes _____ No

If yes, please list the types of herbicides you normally use and the amount (by weight or by volume) applied in an average year.

Name or brand of herbicide	Amount applied in an average year *(specify weight or volume)*
1.	
2.	
3.	
4.	
5	
6.	
7	
8.	

53. Do you use any pesticides?

_____ Yes _____ No

If yes, please list the types of pesticides you normally use and the amount (by weight or by volume) applied in an average year.

Name or brand of pesticide	Amount applied in an average year *(specify weight or volume)*
1.	
2.	
3.	
4.	
5	
6.	
7	
8.	

54. Do you use any fertilizers?

_____ Yes _____ No

If yes, please list the types of fertilizers you normally use and the amount (by weight or by volume) applied in an average year.

Name or brand of fertilizers	Amount applied in an average year *(specify weight or volume)*
1.	
2.	
3.	
4.	
5	
6.	
7	
8.	

Farmers without livestock, go to Question 57.

55. How many of each of the following types of livestock do you have?

Type of livestock	Number
1. Cattle	
2. Horses	
3. Pigs/swine	
4. Sheep	
5. Poultry	

Other livestock *(specify)*	Number
6.	
7.	
8.	
9.	
10.	

56. Please describe how you normally dispose of livestock manure.

_____

_____

_____

Part VII Water Management Values and Issues

57. Although this section appears to be lengthy, the answers to these questions are very important. We appreciate you taking the time to complete these questions. In your opinion, what three factors have had the greatest effect on the amount or the quality of water in the major river basin in which you live (Peace, Athabasca or Slave) over the last 20 years?

Factor 1. _____
Factor 2. _____
Factor 3. _____

Thinking about the <u>first factor</u> you mentioned:

58. Describe the ways in which it has affected water quality, fish, wildlife, vegetation or the health of the river.

Factor 1. _____
_____

59. Describe the ways in which it has affected you or members of your household.

Factor 1. _____
_____

60. If no steps are taken to control your Factor 1, describe how you think the health of the rivers will be affected over the next 10 years.

Factor 1. _____
_____

61. If no steps are taken to control your Factor 1, describe how you think the health of members of your household will be affected over the next 10 years.

Factor 1. _____
_____

62. If the Northern River Basins Study were to suggest ways for managing this problem, what actions do you think they should recommend?

Factor 1. _____
_____

Thinking about the <u>second factor</u> you mentioned:

63. Describe the ways in which it has affected water quality, fish, wildlife, vegetation or the health of the river.

Factor 2. _____
_____

64. Describe the ways in which it has affected you or members of your household.

Factor 2. _____
_____

65. If no steps are taken to control your Factor 2, describe how you think the health of the rivers will be affected over the next 10 years.

Factor 2. _____
_____

66. If no steps are taken to control your Factor 2, describe how you think the health of members of your household will be affected over the next 10 years.

Factor 2. _____

_____

67. If the Northern River Basins Study were to suggest ways for managing this problem, what actions do you think they should recommend?

Factor 2. _____

_____

Thinking about the <u>third factor</u> you mentioned:

68. Describe the ways in which it has affected water quality, fish, wildlife, vegetation or the health of the river.

Factor 3. _____

_____

69. Describe the ways in which it has affected you or members of your household.

Factor 3. _____

_____

70. If no steps are taken to control your Factor 3, describe how you think the health of the rivers will be affected over the next 10 years.

Factor 3. _____

_____

71. If no steps are taken to control your Factor 3, describe how you think the health of members of your household will be affected over the next 10 years.

Factor 3. _____

_____

72. If the Northern River Basins Study were to suggest ways for managing this problem, what actions do you think they should recommend?

Factor 3. _____

_____

73. Below are three groups of potential threats to water quality and water quantity in the northern river basins. For each of the three groups, please indicate in the side boxes:

the **one** that you are **most** concerned about **and**
the **one** that you are **least** concerned about.

(Answer each group on its own. Overlap among groups has been done on purpose.)

Group 1:

Most concern *(check only one)*	Threat to water quality/quantity	**Least** concern *(check only one)*
	1. Agricultural run-off (pesticides, herbicides, fertilizers)	
	4. Draining wetlands and muskeg	
	5. Discharges of municipal sewage	
	7. River flows controlled by dams	

Group 2:

Most concern *(check only one)*	Threat to water quality/quantity	**Least** concern *(check only one)*
	1. Agricultural run-off (pesticides, herbicides, fertilizers)	
	2. Groundwater contamination	
	5. Discharges of municipal sewage	
	8. Discharges from pulp mill	
	9. Airborne pollutants	
	11. Industrial wastes/tailing ponds	

Group 3:

Most concern *(check only one)*	Threat to water quality/quantity	**Least** concern *(check only one)*
	4. Draining wetlands and muskeg	
	5. Discharges of municipal sewage	
	6. Seismic exploration/road and pipeline development	
	7. River flows controlled by dams	
	8. Discharges from pulp mills	
	9. Airborne pollutants	
	10. Uranium contamination (e.g. Lake Athabasca)	
	11. Industrial wastes/tailing ponds	

74. For each of the three groups of management actions listed below, please indicate in the side boxes:

the **one** that you think would be the **most** effective in dealing with current problems and
the **one** that you think would be the **least** effective.

(Answer each group on its own. Overlap among groups has been done on purpose.)

Group 1:

Most effective ***(check only one)***	Management action	**Least** effective ***(check only one)***
	1. Change land use practices (forestry, agriculture) to reduce erosion and pollution	
	4. Protect traditional fishing, hunting & trapping	
	5. Enforce existing pollution laws	
	7. Preserve and maintain ecosystems	

Group 2:

Most effective ***(check only one)***	Management action	**Least** effective ***(check only one)***
	1. Change land use practices (forestry, agriculture) to reduce erosion and pollution	
	2. Improve municipal wastewater treatment	
	5. Enforce existing pollution laws	
	8. Make polluters pay an annual fee based on the volume they produce	
	9. Improve treatment of municipal drinking water	
	11. Develop a management plan for the entire basin	

Group 3:

Most effective ***(check only one)***	Management action	**Least** effective ***(check only one)***
	4. Protect traditional fishing, hunting & trapping	
	5. Enforce existing pollution laws	
	6. Reduce industrial effluent loads	
	7. Preserve and maintain ecosystems	
	8. Make polluters pay an annual fee based on the volume they produce	
	9. Improve treatment of municipal drinking water	
	10. Increase monitoring of water quality	
	11. Develop a management plan for the entire basin	

75. One of the responsibilities of the Northern River Basins Study is to assess the health of northern rivers. Describe the three most important ways that you would measure the health of a river. *Please write in your response to the first question in the boxes provided. For the other questions, circle <u>one</u> answer per box.*

Measure 1	Measure 2	Measure 3

76.

	Measure 1	Measure 2	Measure 3
A. How do you think this measure of <u>river health has changed over the last 20 years?</u>			
B. How often do you think this measure of river health should be monitored?	A. Hourly B. Daily C. Weekly D. Monthly E. Yearly F. Every 5 years G. Every 10 years	A. Hourly B. Daily C. Weekly D. Monthly E. Yearly F. Every 5 years G. Every 10 years	A. Hourly B. Daily C. Weekly D. Monthly E. Yearly F. Every 5 years G. Every 10 years
C. Who do you think should be responsible for monitoring this measure of river health?	A. Government B. Industry C. Universities D. Independent agency E. Public F. Other	A. Government B. Industry C. Universities D. Independent agency E. Public F. Other	A. Government B. Industry C. Universities D. Independent agency E. Public F. Other
D. Who do you think should be responsible for paying for monitoring this measure of river health?	A. Government B. All water users C. Industrial water users D. Other	A. Government B. All water users C. Industrial water users D. Other	A. Government B. All water users C. Industrial water users D. Other

77. What are the three most important recommendations you would like the Northern River Basins Study to make?

#1 _____

#2 _____

#3 _____

78. Please list any recreational, environmental, agricultural or professional organizations to which you or any members of your household belong.

_____

_____

_____

79. Do you have any other comments that you would like to make to the Northern River Basins Study?

_____

_____

Thank you for completing this survey. Please return it in the self-addressed stamped envelope provided <u>before February 15th, 1995.</u>

Prepared by Praxis, Inc. and Drobot Data Services

January, 1995.

Canada Alberta Northwest Territories

Northern River Basins Study
Household Questionnaire

Part I. Introduction

Your telephone number _____

Thank you for agreeing to answer this questionnaire. One of the objectives of the study is to find out how Northerners use and value the Peace, Athabasca and Slave Rivers. Your household was selected at random to help provide this information. We need your cooperation to answer a series of questions about how you and members of your household make use of the water resources of the region. We are collecting information from about 1,200 households. Individual responses will be kept confidential.

Part II. General Questions

1a. Where are you currently living? *(Circle one answer.)*

A. Town/city (specify) _____ *(Go to question 2.)*
B. Farm
C. Cottage/rural subdivision
D. Native reserve
E. Metis settlement
F. Other (specify) _____

1b. ***(if B to F selected)*** What is the name of the closest city, town, hamlet or village?

_____

2. How long have you been living in this location? *(Circle one answer.)*

A. Less than 1 year
B. Between 1 and 5 years
C. Between 5 and 10 years
D. Between 10 and 15 years
E. Between 15 and 20 years
F. More than 20 years

3. How long have you been living in the Peace, Slave or Athabasca River basins? *(Circle one answer.)*

A. Less than 1 year
B. Between 1 and 5 years
C. Between 5 and 10 years
D. Between 10 and 15 years
E. Between 15 and 20 years
F. More than 20 years

4. Which one of the following major rivers is nearest your current residence? *(Circle only one answer.)*

A. Athabasca River
B. McLeod River
C. Pembina River
D. Peace River
E. Wapiti River
F. Smoky River
G. Little Smoky River
H. Wabasca River
I. Slave River

73. Below are three groups of potential threats to water quality and water quantity in the northern river basins. For each of the three groups, please indicate in the side boxes:

the **one** that you are **most** concerned about **and**
the **one** that you are **least** concerned about.

(Answer each group on its own. Overlap among groups has been done on purpose.)

Group 1:

Most concern ***(check only one)***	Threat to water quality/quantity	**Least** concern ***(check only one)***
	2. Groundwater contamination	
	6. Seismic exploration/road and pipeline development	
	7. River flows controlled by dams	
	9. Airborne pollutants	

Group 2:

Most concern ***(check only one)***	Threat to water quality/quantity	**Least** concern ***(check only one)***
	1. Agricultural run-off (pesticides, herbicides, fertilizers)	
	6. Seismic exploration/road and pipeline development	
	10. Uranium contamination (Lake Athabasca)	
	11. Industrial wastes/tailing ponds	

Group 3:

Most concern ***(check only one)***	Threat to water quality/quantity	**Least** concern ***(check only one)***
	1. Agricultural run-off (pesticides, herbicides, fertilizers)	
	2. Groundwater contamination	
	3. Forestry harvesting practices	
	5. Discharges of municipal sewage	
	6. Seismic exploration/road and pipeline development	
	7. River flows controlled by dams	
	8. Discharges from pulp mills	
	10. Uranium contamination (Lake Athabasca)	

74. For each of the three groups of management actions listed below, please indicate in the side boxes:

the **one** that you think would be the **most** effective in dealing with current problems and
the **one** that you think would be the **least** effective.

(Answer each group on its own. Overlap among groups has been done on purpose.)

Group 1:

Most effective *(check only one)*	Management action	**Least** effective *(check only one)*
	2. Improve municipal wastewater treatment	
	6. Reduce industrial effluent loads	
	7. Preserve and maintain ecosystems	
	9. Improve treatment of municipal drinking water	

Group 2:

Most effective *(check only one)*	Management action	**Least** effective *(check only one)*
	1. Change land use practices (forestry, agriculture) to reduce erosion and pollution	
	6. Reduce industrial effluent loads	
	10. Increase monitoring of water quality	
	11. Develop management plan for the entire basin	

Group 3:

Most effective *(check only one)*	Management action	**Least** effective *(check only one)*
	1. Change land use practices (forestry, agriculture) to reduce erosion and pollution	
	2. Improve municipal wastewater treatment	
	3. Provide more flood protection	
	5. Enforce existing pollution laws	
	6. Reduce industrial effluent loads	
	7. Preserve and maintain ecosystems	
	8. Make polluters pay an annual fee based on the volumes they produce	
	10. Increase monitoring of water quality	

Canada Alberta Northwest Territories

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1a. Where are you currently living? *(Circle one answer.)*

A. Town/city (specify) _____ *(Go to question 2.)*
B. Farm
C. Cottage/rural subdivision
D. Native reserve
E. Metis settlement
F. Other (specify) _____

1b. ***(if B to F selected)*** What is the name of the closest city, town, hamlet or village?

_____

2. How long have you been living in this location? *(Circle one answer.)*

A. Less than 1 year
B. Between 1 and 5 years
C. Between 5 and 10 years
D. Between 10 and 15 years
E. Between 15 and 20 years
F. More than 20 years

3. How long have you been living in the Peace, Slave or Athabasca River basins? *(Circle one answer.)*

A. Less than 1 year
B. Between 1 and 5 years
C. Between 5 and 10 years
D. Between 10 and 15 years
E. Between 15 and 20 years
F. More than 20 years

4. Which one of the following major rivers is nearest your current residence? *(Circle only one answer.)*

A. Athabasca River
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C. Pembina River
D. Peace River
E. Wapiti River
F. Smoky River
G. Little Smoky River
H. Wabasca River
I. Slave River

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the **one** that you are **most** concerned about **and**
the **one** that you are **least** concerned about.

(Answer each group on its own. Overlap among groups has been done on purpose.)

Group 1:

Most concern ***(check only one)***	Threat to water quality/quantity	**Least** concern ***(check only one)***
	3. Forestry harvesting practices	
	7. River flows controlled by dams	
	8. Discharges from pulp mills	
	11. Industrial wastes/tailing ponds	

Group 2:

Most concern ***(check only one)***	Threat to water quality/quantity	**Least** concern ***(check only one)***
	1. Agricultural run-off (pesticides, herbicides, fertilizers)	
	3. Forestry harvesting practices	
	4. Draining wetlands and muskeg	
	6. Seismic exploration/road and pipeline development	
	8. Discharges from pulp mills	
	9. Airborne pollutants	

Group 3:

Most concern ***(check only one)***	Threat to water quality/quantity	**Least** concern ***(check only one)***
	2. Groundwater contamination	
	3. Forestry harvesting practices	
	4. Draining wetlands and muskeg	
	5. Discharges of municipal sewage effluent	
	6. Seismic exploration/road and pipeline development	
	11. Industrial wastes/tailing ponds	

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the **one** that you think would be the **most** effective in dealing with current problems and
the **one** that you think would be the **least** effective.

(Answer each group on its own. Overlap among groups has been done on purpose.)

Group 1:

Most effective *(check only one)*	Management action	**Least** effective *(check only one)*
	3. Provide more flood protection	
	7. Preserve and maintain ecosystems	
	8. Make polluters pay an annual fee based on the volumes they produce	
	11. Develop management plan for the entire basin	

Group 2:

Most effective *(check only one)*	Management action	**Least** effective *(check only one)*
	1. Change land use practices (forestry, agriculture) to reduce erosion and pollution	
	3. Provide more flood protection	
	4. Protect traditional fishing, hunting & trapping	
	6. Reduce industrial effluent loads	
	8. Make polluters pay an annual fee based on the volumes they produce	
	9. Improve treatment of municipal drinking water	

Group 3:

Most effective *(check only one)*	Management action	**Least** effective *(check only one)*
	2. Improve municipal wastewater treatment	
	3. Provide more flood protection	
	4. Protect traditional fishing, hunting & trapping	
	5. Enforce existing pollution laws	
	6. Reduce industrial effluent loads	
	11. Develop management plan for the entire basin	

Canada Alberta Northwest Territories

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D. Native reserve
E. Metis settlement
F. Other (specify) _____

1b. ***(if B to F selected)*** What is the name of the closest city, town, hamlet or village?

_____

2. How long have you been living in this location? *(Circle one answer.)*

A. Less than 1 year
B. Between 1 and 5 years
C. Between 5 and 10 years
D. Between 10 and 15 years
E. Between 15 and 20 years
F. More than 20 years

3. How long have you been living in the Peace, Slave or Athabasca River basins? *(Circle one answer.)*

A. Less than 1 year
B. Between 1 and 5 years
C. Between 5 and 10 years
D. Between 10 and 15 years
E. Between 15 and 20 years
F. More than 20 years

4. Which one of the following major rivers is nearest your current residence? *(Circle only one answer.)*

A. Athabasca River
B. McLeod River
C. Pembina River
D. Peace River
E. Wapiti River
F. Smoky River
G. Little Smoky River
H. Wabasca River
I. Slave River

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the **one** that you are **most** concerned about **and**
the **one** that you are **least** concerned about.

(Answer each group on its own. Overlap among groups has been done on purpose.)

Group 1:

Most concern *(check only one)*	Threat to water quality/quantity	**Least** concern *(check only one)*
	3. Forestry harvesting practices	
	5. Discharges of municipal sewage	
	9. Airborne pollutants	
	10. Uranium contamination (Lake Athabasca)	

Group 2:

Most concern *(check only one)*	Threat to water quality/quantity	**Least** concern *(check only one)*
	2. Groundwater contamination	
	4. Draining wetlands and muskeg	
	8. Discharges from pulp mills	
	10. Uranium contamination (Lake Athabasca)	

Group 3:

Most concern *(check only one)*	Threat to water quality/quantity	**Least** concern *(check only one)*
	1. Agricultural run-off (pesticides, herbicides, fertilizers)	
	2. Groundwater contamination	
	3. Forestry harvesting practices	
	4. Draining wetlands and muskeg	
	7. River flows controlled by dams	
	9. Airborne pollutants	
	10. Uranium contamination (e.g. Lake Athabasca)	
	11. Industrial wastes/tailing ponds	

74. For each of the three groups of management actions listed below, please indicate in the side boxes:

the **one** that you think would be the **most** effective in dealing with current problems and
the **one** that you think would be the **least** effective.

(Answer each group on its own. Overlap among groups has been done on purpose.)

Group 1:

Most effective *(check only one)*	Management action	**Least** effective *(check only one)*
	3. Provide more flood protection	
	5. Enforce existing pollution laws	
	9. Improve treatment of municipal drinking water	
	10. Increase monitoring of water quality	

Group 2:

Most effective *(check only one)*	Management action	**Least** effective *(check only one)*
	2. Improve municipal wastewater treatment	
	4. Protect traditional fishing, hunting & trapping	
	8. Make polluters pay an annual fee based on the volume they produce	
	10. Increase monitoring of water quality	

Group 3:

Most effective *(check only one)*	Management action	**Least** effective *(check only one)*
	1. Change land use practices (forestry, agriculture) to reduce erosion and pollution	
	2. Improve municipal wastewater treatment	
	3. Provide more flood protection	
	4. Protect traditional fishing, hunting & trapping	
	7. Preserve and maintain ecosystems	
	9. Improve treatment of municipal drinking water	
	10.Increase monitoring of water quality	
	11.Develop a management plan for the entire basin	

PART VIII FUTURE RIVER BASIN MANAGEMENT OPTIONS

Currently, the fish, wildlife and water resources of the Peace, Athabasca and Slave river basins are managed separately by the governments of Alberta, the Northwest Territories and Canada, and each government has different management priorities. The Northern River Basins Study would like to determine if some sort of group or committee consisting of representatives of the three governments and various stakeholder groups should be established to help coordinate resource management in the three basins and to provide a way for northern residents to participate in management decisions.

80. Would you or members of your household support the idea of establishing an ongoing, inter-governmental and stakeholder committee responsible for the protection and use of the river basins? *(Check one)*

YES ☐ NO ☐ Don't Know ☐

81. If such a committee were established, should it play the lead role to:
(Check only one answer for each question)

	YES	NO	Don't Know
a. Develop resource regulations in the basins?			
b. Oversee enforcement of existing regulations?			
c. Conduct and coordinate research?			
d. Issue licences and permits?			
e. Prepare resource management plans for the basins?			
f. Provide policy advice to provincial, federal and territorial governments?			
g. Develop education programs for basin residents?			

82. Would you or members of your household be willing to participate on this committee? *(Check one)*

YES ☐ NO ☐ Don't Know ☐

If yes, describe how you or members of your household would be prepared to be involved:

_____

_____

_____

APPENDIX C

NORTHERN RIVER BASINS STUDY

HOUSEHOLD QUESTIONNAIRE

SUMMARY OF CODES

Note: Written responses were converted into numeric codes with an attached label. The label consisted of the response, if short, or the essence of the response based on the actual wording. Short written answers were recorded verbatim, although obvious spelling mistakes were corrected. However, for some place names, the spelling was recorded as received and any reinterpretation of the information is left for subsequent data analysis.

1 Where are you currently living?
1b What is the name of the closest city, town, hamlet or village?

1. Blue Ridge	2. Peace River	3. Sexsmith	4. Valleyview
5. Beaverlodge	6. Berwyn	7. Ft. Vermillion	8. LaCrete
9. Debolt	10. Hines Creek	11. Grimshaw	12 Wanham
13. Keg River	14. Manning	15. Nampa	16. Mayerthorpe
17. Edson	18. Wandering River	19 . Athabasca	20. Ft. Assiniboine
21. Goose Lake	22. Smith	23. Flatbush	24. Colinton
25. Breynat	26. Slave Lake	27. High Prairie	28. Drayton Valley
29. Niton	30. Boyle	31. LacLa Biche	32. Perryvale
33. Rycroft	34. Jenn Cole	35. Spirit River	36. Eaglesham
37. Fairview	38. Bonanza	39. Whitecourt	40. Cadotte Lake
41. McLennan	42. Fox Creek	43. Grande Prairie	44. High Level
45. Grande Cache	46. Clairmont	47. Ft. McMurray	48. Ft. Chipewyan
49. Blue Sky	50. Hinton	51. Falher	52. Barrhead
53. Jasper	54. Swan Hills	55. Rocky Lane	56. Dixonville
57. Evansburg	58. Kinuso	59. Entwistle	60. Jarvie
61. Westlock	62. Busby	63. Neerlandia	64. Violet Grove
65. Plamondon	66. Caslan	67. Wildwood	68. Grovedale
69. Peers	70. Atmore	71. Red Earth	72. Clyde
73. Jarvie	74. Barrhead	75. Robb	76. Donnelly
77. Girouxville	78. Gordondale	79. Anzac	80. Meanook
81. Cherrhill	82. Buck Creek	83. Sangudo	84. Rocky Rapids
85. Trout Lake	86. Wabasca Desmarıs	87. Ft. Assiniboine	88. Chisholm
89. Island Lake	90. Whitelaw	91. Little Smoky	92. Hythe
93. Wembley	94. Canyon Creek	95. Brownvale	96. Worsley
97. Hotchkiss	98. Lake Isle	99. MacKay	100. Ft. Smith
101.Carrot Creek	102. St. Isodore	103.Gift Lake	104. Pibroch
105. Joussard	106. Ft. Resolution	107.Ft. McKay	108. Cynthia
109. Bear Canyon	110. Rainbow Lake	111.Dawson Creek	112. Loon Lake
113. Wood Lake Creek	114. Little Buffalo	115.Jean d'Or Prairie	

2. How long have you been living in this location?

1. Less than 1 year
2. Between 1 and 5 years
3. Between 5 and 10 years
4 Between 10 and 15 years
5. Between 15 and 20 years
6. More than 20 years

3. How long have you been living in the Peace,Slave or Athabasca River basin?

1. Less than 1 year
2. Between 1 and 5 years
3. Between 5 and 10 years
4. Between 10 and 15 years
5. Between 15 and 20 years
6. More than 20 years

4. Which one of the following major rivers is nearest your current residence?

1. Athabasca River	2. McLeod River	3. Pembina River	4 .Peace River
5. Wapiti River	6. Smoky River	7. Little Smokey River	8. Wabasca River
9. Slave River			

5. About how far away is this river from your current residence? Kilometer

6. Do you identify yourself as?

1 Aboriginal **Are you on a registered Tribal Roll?** 1. Yes 2 No
2. Metis
3. Non-native

7. Which of the following categories best describes your household?

1. Single person	2. Couple with no children	3. Couple with children	4. Extended Family
5. Single parent family	6. Two or more unrelated adults	7. Two or more related adults	8. Widow

8. Including yourself, how many people are in your household? Total Number of People

9. Of these, how many are in the following age categories? Total Number of People in Each Category

10. How old are you? Age of Respondent

11. Are you?

1. Male 2. Female

12. In which industries are you and members of your household currently employed?

1. Agriculture	2. Trapping/commercial fishing	3. Oil and gas
4. Forestry(logging)	5. Manufacturing(lumber,paper,etc)	6. Construction
7. Transportation/Communications/Utilties	8. Retail or wholesale trade	9. Finance,insurance,other services
10. Government(health,education)	11. Unemployed	12. Student
13. Hospitality, Hotel	14 Not Used	15. Retired
16. Homemaker	17. Not Used	18. Water/Sewer Works
19. Not Used	20. Not Used	21. Artist
22. Not Used	23. Self Employed	24. Recreational
25. Not Used	26. Not Used	27. Not used
28. Not Used	29. Missionary/Church	30. Not used
31. Not Used	32. Plumber	33. Not used
34. Ski Patrol	35. Not Used	36. Hospitality
37. Forestry	38. Outfitter	39. Not Used
40. Alberta Special Waste Treatment	41. Delivery	42. School Bus Driver
43. Village Assoc.	44. Librarian	45. Not Used
46. Welder/Mechanic	47. Survival Instructor	48. Not Used
49. Secretarial	50. Electrical	51. Not Used
52. Not Used	53. WCB	54. Crisis Intervention
55. Hair Shop	56. Listorian	57. Auto Tech
58. Banker	59. Maintenance Worker	60. Not Used
61. Surveyor	62. Consulting	63. Painter
64. Piano/Music Teacher	65. Environment Services	66. Not Used
67. Refractory Tech.	68. Janitor	69. Baker
70. Councilor	71. Forest Fire Program	72. Glass Industry
73. Alberta Forestry	74. Forest Products	75. Park Service
76. Band Council	77. Postmaster	78. Administration/Management
79. Laborer		

13. What is the source of your households everyday drinking water?

1. Municipal water plant
2. Bottled water
3. Well
4. Lake water
5. River water
6. Dug out
7. Spring water
9. Rain water or snow
10. Hauled into system
11. Distilled
13. Artesian well
14. Pulp mill water treatment plant
15. Filtration
16. Town water

Which Lake?

1. Sturgeon Lake
2. Victor Lake
3. Beaver Lake
4. Skeleton Lake
5. Cadotte Lake
6. Victor Lake
7. Slave Lake
8. Lac La Biche Lake
9. MacLeod Lake
10. Lesser Slave Lake
11. Amisk Lake
12. Great Slave Lake
13. Athabasca Lake

Which River?

1. Athabasca River
2. Slave River
3. Little Smoky River
4. Heart/West Prairie River
5. Red Earth Creek
6. Wapiti River
7. Peace River
8. Trout River

14. Do you treat this water in any way before drinking it?

1. Yes
2. No

Describe ways treated

1. Remove iron and soften
2. Filter
3. Add minerals
4. Chlorine
5. Don't drink it
6. Reverse osmosis
7. Britta
8. Water softener
9. Iron,conditioner,distiller
10. Copper sulfate
11. Distilled
12. Boil
13. Chlorinated
14. Water treatment center at pulpmill
15. Filter and chlorinate
16. Water conditioner
17. Filter,aerate,water softener
18. Reglone A
19. Treated by town
20. Filter,ozonate
21 Bluestone,reglone
22. Bluestone,Pundaind,aeration,filter
23. Lime filter

15. Are there any problems with the amount of water available from this source thoughout the year?

1. Yes 2. No

Describe:

1. Spring run-off
2. Summer restrictions
3. Well lower in Feb/March
4. Slow recovery if overdrawn
5. Well go down in late fall
6. Run short
7. Lower water level
8. Too much chlorine
9. Drought problems
10. Freezes
11. Well goes dry
12. Less snow fall,no run-off
13. Spring,water colored
14. Mercury
15. Water table drops summer
16. Have to travel to get
17. Occasionally during hot spells
18. Water is periodically cut off
19. Drys up (river)

16. Are there any problems with the quality of water available from this source throughout the year?

1. Yes 2. No

Describe:

1 High in sodium
2. Taste bad
3. Colored yellow,green,brown
4. Color,taste,smell
5 Iron, hard
6. Too many chemicals
7. Unfit to drink
8. Polluted
9. Spring taste,smell terrible
10. Industrial pollution
11. Water quality down
12. Smell chemicals in the water
13. Over chlorinating
14. Water hard
15. High minerals
16. Run off
17. Algae,smell
18. Heavy smell of bleach
19. Poor quality
20. Rusty/hard
21. Spring/heavy rain water is colored musty smell
22. Gas taste after seismic activity
23. Sediment in water
24. Murky in spring
25. Not sure what chemicals
26. Sometimes smells and tastes bad
27. Calcium
28. Winter becomes stale or stagnant
29. Too many minerals
30. Pulpmill water treatment plant
31. Earthy taste
32. Beavers
33. Excess iron and sulfur
34. Seepage from septic fields
35. Too much chlorine in spring
36. Has improved
37. Boiling order put out Fall 1994
38. Algae taste,sometimes metallic during warm months
39. Causes diarrhea with children, algae occasionally
40. Spring/fall water stagnate
41. River drys up
42. Only once couldn't drink it

17. Over the last 10 years, have there been any noticeable changes in the quality or amount of water available from your usual water supply?

1. Yes 2. No

Describe changes you have noticed:

1. Summer rationing
2. Smell bad, taste,color,hard
3. Rusty color
4. Clarity
5. Less odor
6. Smell during run-off
7. Color,taste have improved
8. Algae,green in color
9. Chlorine,hard
10. Murky in spring
11. Rotten smell
12. Drop in water table
13. Sulfurous taste when seismic test nearby
14. Lower water tables
15. Too much chlorine
16. Seasonal taste and odor
17. More chemical taste
18. Clarity and amount
19. Color,clarity
20. Chlorine,smell and taste
21. Rusty,calcuim increased
22. Getting lumps that look and feel like coal/more phosphates
23. Chlorine smell in spring
24. The older the dugout the more maintenance it takes
25. Need to aerate now
26. Boiling order put out in Fall 1994
27. Better treated
28. More sediment in water filter
29. Pulpmills
30. Water polluted
31. Gone down hill,worse
32. 20 years ago we could drink water from the Peace River
33. Too much chlorine,weedy taste in summer
34. Beavers spoiling water

18. Do you agree or disagree with each of the following statements?

1. Totally agree
2. Agree
3. Disagree
4. Totally Disagree
5. Unsure

19. Do you or any members of your household use any water resources for subsistence?

1. Yes
2. No

20. How often do you or members of your household participate in the following subsistence activities?

Numeric Answers , Daily, Weekly, Monthly, Yearly

21a List the three main species of fish and indicate how many pounds of these fish you and members of your household actually catch in an average year.

1. Rainbow Trout
2. Grayling
3. Mountain Whitefish
4. Dolly Varden
5. Northern Pike/Jack Fish
6. Walleye/Pickerel
7 Perch
8. Whitefish
9. Goldeye
10. Brook Trout
11. Ling Cod
12. Lake Trout
13. Burbot
14. All
15. Jack/Perch
16. Bull Trout
17. Loche
18 Tulibee
19. Suckers
20. Cooney
21. Dore

Average annual catch: LBS or KG

21b Of these species of fish,which would you prefer to catch? Same list as 21a

22. In which three main bodies of water do you and members of your household usually fish and what proportion of your total catch comes from each?

1. Wapiti
2. Two Lakes
3. Rake River
4. Sturgeon Lake
5. Smoky River
6. Spring Lake
7. Winagami Lake
8. Cummings Lake
9. Peace River
10.Athabasca River
11 Lesser Slave Lake
12.Atikimeg
13.Mink
14.MacLeod Lake
15.McLeod River
16.Berland
17.Maskuta Creek
18.Jarvis Lake
19.Gregg River
20.Bitscho Lake
21.Slave Lake
22.Baptise Lake
23.Notikewin River
24.Hay River
25.Figure Eight
26.Winagami Lake
27.Skeleton Lake
28.Sharon Lake
29.Dug out
30.Lawrence Lake
31 Calling Lake
32.Goose Lake
33.Nine Mile Lake
34.Valley of Five Lakes
35.Long Lake
36.Shining Bank
37.Chip Lake
38.Millers Lake
39.Carson Lake
40.Smoke Lake
41.Swan Lake
42.Fawcette Lake
43.Slave River
44.Wabasca River
45.Notikewin River
46.Pigeon Lake
47.Roche Lake
48.Mitsue Lake
49. Busk Lake
50.Hope Lake
51.Beaver Lake
52.Fork Lake
53.Venice
54.Clear Lake
55.Wabasca Lake
56.Rock Island Lake
57.Orloff Lake
58.Wadlin Lake
59.Blue Lake
60.Edson River
61.Thunder Lake
62.Peanut Lake
63.Crucked Lake
64.Medicine Lake
65.Brazeau Resevoir
66.N. Sask River
67.Marce Lake
68.Chump Lake
69.Missawawi Lake
70.Clearwater Lake
71 Engstrom Lake
72.Gregoire Lake
73.Colin Lake
74.Christina Lake
75.Small streams Hinton
76.Island Lake
77. Wanagami Lake
78. Lower Chain Lakes
79.Athabasca River Town
80.No Entry
81. Sulphur Lake
82.Utikima Lake
83.Hilliards Bay
84.Wabamum Lake
85.Snipe Lake
86.Pembina Rive
87.Wildhay River
88.Pembina Lake
89.Creeks
90.Irish Lake
91.Touchwood
92.Lobstick River
93.Unnamed Streams
94.Surprise Lake
95.Twin Lakes
96.Little Smoky River
97.Lakes Valleyview
98.Story Lake
99.Richardson River
100.Athabasca/Clearwater
101.Herb Lake
102.Bear Lake
103.Sturgeon Lake
104.Saskatoon Lake
105.Tamarack Lake
106 Athabasca/Berland
107.Slave Lake/River
108.Lake Isle
109.Mile 7
110.Fickle Lake
111.Murray River
112.Buffalo Lake
113.Graham Lake
114.Jack Fish Lake
115.Wapiti/Smoky Rivers
116.Various River/Lake
117.Cache/Graveyard
118.Obed Lake
119.Mamawi Lake
120.Athabasca Lake
121.Trout Lake
122.Great Slave Lake
123.Taltson River
124.Caribou River
125.Gift Lake
126.Little White Fish Lake
127.Haig Lake
128.Russel Lake
129.Sandy Lake
130.Clair Lake
131.Cutforest River
132.Tazin system
133.No Entry
134.Utikimas Lake
135.Peerless Lake
136.Ingstrom Lake
137 Willow Creek
138.Salt River

23. Do you or members of your household fish in the mainstems of the Athabasca,Peace or Slave Rivers or any of their major tributaries?

1. Yes 2. No

If yes,please indicate the three most important sites along these rivers:

1. Smoky River
2. Dunvegan Bridge
3. Wapiti River
4. Grande Cache
5. MM Bridge
6. South Blakeley Ferry
7. Smoky/Peace River
8. Hart River
9. McLeod River
10. Athabasca River
11. Brille Lake
12. Around Hinton
13. Cadotte River Mouth
14. Whitemud River Mouth
15. Islands on Peace River
16. Notikewin/Peace River
17. Sunny Valley
18. MacKenzie
19. Jasper National Park
20. Ansel Tower
21. Pembina River
22. MacLeans/Slave Lake
23. Wabasca River
24. Slave River/Weir
25. Etnas Landing
26. LaCrete Landing
27. Salteaux Tributary
28. Freeman River
29. Cold Lake
30. Athabasca River
31. Bridge to Nowhere
32. Clearwater/Athabasca
33. Slave River
34. Wildhay Airstrip
35. Sink Hole Creek
36. Pembina/Dismala
37. N. Sask River
38. Long Lake
39. Mercoal
40. Athabasca/Pembina
41. Pembina/Bear Creek
42. Athabasca/Calling River
43. Bridge to Nowhere
44. Fire Bag River
45. Richardson River
46. Stepbank/Athabasca
47. Richardson/Athabasca
48. Hudson Hope
49. Lobstick/Chip Lake
50. Lobstick River & Trib.
51. Holmes Crossing
52. Cadotte River
53 Whitemud River
54. Wildhay River
55. Maligne River
56. McLeod River
57 Athabasca Park Gates
58. Hay River airport
59. Orloff Lake
60. Baptiste Lake
61 Kakwa River Falls
62. Red Willows
63. Beaver Lake
64. Touchwood Lake
65. LacLa Biche
66. Smoky/Simonette
67. Slave River Ft. Smith
68. Slave River Bell Rock
69. Salt River Thebacha C.
70. Ft Smith boat launch
71. Ft. Vermillion
72. Peace River
73. Quatre Forches
74. Athabasca Lake Ft Chip
75. Tompkins Landing
76. Vermillion Falls
77. Wentzel River
78. Swan River
79. Athabasca/town
80. No Entry
81. Sulpher Lake
82. Lesser Slave Lake
83. Hilliards Bay
84. Dog Camp
85. Fox Creek
86. Hay Camp
87. Wabasca Lake

24. Over the past 10 years, have you or any members of your household noticed any changes in the number,quality or health of fish you have caught?

1. Yes
2. No

If yes, describe the types of changes you have noticed:

Number:
1. Lower, decreased
2. Over fishing
3. More Jack fish
4. Smaller
5. Last 20 years all forms of life disappearing
6. More

Quality:
1. Same
2. Sores on them
3. Smaller
4. Not as fleshy or meaty
5. Poor
6. Less tasteful
7. Softer meat
8. Bony, bland, slimy
9. None left
10. Softer,spongy,not as tasty

Health:

1. Growths
2. Look sick
3. 50% Jack lumps, spots, disfigured
4. Soft flesh
5. Sores, ulcers
6. Size, taste not as good
7. Smaller
8. Polluted
9. Poor color
10. Weaker
11 OK
12. No feed for them
13. Same
14. Livers are damaged
15. Dead fish floating
16. Pericites

Other:

1. Taste
2. Fish are dying younger
3. Government warning regarding mercury levels in fish
4. No good for consumption
5. No feed for larger fish to feed on
6. Smaller fish
7. Fish tastes oily
8. Dollies are in trouble

25. Of the fish you catch, how much of the total annual catch : Numeric Value Percentage

26. How many pounds or kilograms of caught fish does a typical person consume:
Numeric Value Pounds, Kilograms or Number of fish eaten

27a List the three main species of furbearers and indicate how many of these animals you and members of your household actually trap in an average year.

1 Beaver
2. Lynx
3. Marten
4. Coyote
5. Muskrats
6. Wolf
7. Fisher
8. Squirrels
9. Otter
10. Retired from trapping
11. Mink
12. Weasels
13. Fox

Average annual catch: LBS/KG

Average number of animals trapped per year: Numeric

27b Of these three furbearers that you trap, which would you prefer to trap. Same list as Question 27a

28. Describe the location of your trapping area:

1. Trapline #152 Swan Hills
2. SW 27-64-22 W4
3. 1946
4. Athabasca Area 2246
5. Obed Lake 1255
6. Township South of Wood Buffalo Park west of Athabasca
7. TWP 83 84 85 86 RNG 17 Athabasca River
8. Ferguson Lake Near Clairmont
9. 2273
10. Whitemud Creek
11 Private Land
12. Trapline#1518
13. 1516 Robb
14. East of Winagami Prov. Park to Heart River Dam
15. Area 1209 Peace Point Wood Buffalo Park
16. Peerless Lake area
17. 173
18. 1456
19. Ft. Resolution to McConiel Island on Slave River Little Rat River to Taltow River
20. Taltson River area
21. Gift Lake area
22. 2547
23. Martin Hills area
24. 1205
25. Fox Creek
26. 1037
27. 1207/1205
28. 2093

29. Do you or members of your household trap within 10 Km of the mainstems

1. Yes 2. No

If yes, indicate the three most important locations along these rivers and indicate the proportion of total catch that comes from each location

1. Freeman River
2. Tamarack River
3. Freeman Creek
4. Athabasca River and Camp 20 Road
5. Home
6. West end of Chip Lake
7. Jackfish River
8. McConiel Island
9. Little Rat River
10. Birch River
11. Sweet Grass
12. Lousy Creek

Percent of annual catch: Numeric Value

30. Over the past 10 years, have you or any members of your household noticed any changes in the number quality or health of the furbearers you trapped?

1. Yes 2. No

Number:

1. Fewer animals
2. More animals
3. More lynx, less fishers
4. More beavers
5. Less lynx
6. More Martin

Quality:

1. Same
2. Fur and meat poor

Health:

1. Same
2. Mange in coyotes
3. Larger
4. Poor all animals declining

Other:

1. Nothing out of bush seems to be as good
2. Less habitat

31. Do you or members of your household eat any parts of the animals you trap?

1. Yes 2. No

If yes, indicate the type of animal you trap,all portions of the animal you eat

1. Beaver
2. Muskrat
3. Lynx

Parts eaten:

1. Hind quarters
9. All

Number eaten per year: Numeric Value

32. About how many animals do you or members of your household kill for food? Numeric Value

33a List the three main species of animals and indicate how many of these animals you and members of your household actually hunt and kill in a average year

1. Moose	2. Deer	3. Elk	4. Geese/Duck
5. Mule Deer	6. WT Deer	7. Grouse	8. Black Bear
9. Duck/Geese	10.Sheep	11.Upland Birds	12.Spruce Grouse
13.Ruffed Grouse	14.Caribou	15.Beavers	16.Snowshoe Hare
17.Buffalo Bison			

Number killed per year: Numeric Value

33b Of these three species of animals, which would you prefer to hunt? Same as 33a

34. Do you or members of your household hunt within 10 km of the mainstems?

1. Yes 2. No

If yes, indicate the three most important sites along these rivers and proportion of total kills from each location

1. Peace River above Dunvegan	2. Smoky River	3. Own Land
4. Blakeleys Ferry	5. MacLeod River 20m Whitecourt	6. Athabasca 30M Whitecourt
7. WMU 346,348,347	8. Bushland along Chinchaga River	9. Bushland along Peace River
10.Along 24th Baseline	11.Smoky/Peace Area	12.Whitemud area
13.Calling Lake area	14.Hawk Hills/Manning	15.Sunny Valley
16.Bald Hill	17.East of National Parks to Hinton	18.Economy Tower
19.Windfall	20.Nojack	21.Fawcette Lake
22.Moose Portage	23.Zone 524	24.Zone 525
25.Zone 537	26.Berlin Tower	27.Blue Ridge
28.Improvement Dist.19/20	29.Dunvegan to B.C. border	30.3 Creek Junet
31 Little Cadotte	32.Connors Creek Grazing Lease	33.Corbit Creek
34.Ft. Chip Winter road	35.Aostra Road	36.Obed Basin
37.Athabasca River	38.Wildhay and Berland	39.Peers
40.Pembina River west of Drayton Valley	41.Hwy 44	42.Martin Hills
43.Hamlet of Chisholm	44.Clearwater	45.6th Median
46.Peace River/Manning	47.Whitemud Creek	48.Kimiwan River
49.Chip Lake Private Land	50.30-61-4-5	51.Cadotte River mouth
52.Kalimas Flats	53.Wapiti River	54.Athabasca / Oldman Creek
55.Athabasca/Niton Junction	56.Athabasca Hills	57.Keg River cabins
58.Daishowa Mills area	59.Red Willow River	60.Earth River
61.Hines Creek/Canfor Road	62.Thebacha NWT	63.Trout Lake
64.Gene River	65.McConiel Island	66.Grand Detour
67.High Level	68.Drift Pile River	69.Dog Camp
70.Birch River	71.Athabasca South Ft. Chip	72.Slave River NWT
73.Pipeline Crossing Zone 518	74.Fish Creek Road /Athabasca River	75.Bighorn Range
76.Sweetgrass		

35. Over the past 10 years,have you or any members of your household noticed any changes in the number,quality or health of animals killed for food?

1. Yes
2. No

If yes, describe the types of changes you have noticed.

Number:

1. More moose/deer in settled areas
2. More deer less elk moose
3. Fewer moose
4. Declined, less
5. High grouse population
6. More
7. More bull moose
8. Low grouse numbers
9. Less bulls
10. Deer number down

Quality:

1. No older bull moose
2. Smaller animals
3. Good
4. Down
5. Same
6. Meat and fur quality is poor
7. Not as food as they use to be

Health:

1. Thin,fleas,worms and ticks
2. Moose have bald spots
3. Good
4. Same
5. Animals sick,growths
6. Poorer
7. Unsure

Other:

1. Year ticks
2. More deer
3. Caribou only get in hunting range during winter
4. Scarce,skinny,smaller, all round poor quality
5. No rabbits around
6. Poor quality of water in rivers effecting health of all animals

36. Of the animals that you have killed,what proportion of the meat eaten etc. : Numeric Value

37. How many pounds or kg of wild game meat household consume: Numeric Value

38. While you are subsistence fishing,trapping or hunting do you ever consume/use river/lake water?

1. Yes
2. No

If yes, do you treat this water in any way before drinking it?

1. Yes
2. No

Describe:

1. Boil it
2. Avoid polluted rivers
3. Filter
4. Wash dishes
5. Use to be able to drink water out of river/lake,not any more
6. Treatment plant
7. Halazone tablets
8. Look for good water

39. Recreational Activities: How often,number of members,average length: Numeric Values

40. Sites on rivers and lakes that you and members of household visit most often for recreation

1 Harmon Valley	2 Whitemud River	3 Bear Lake	4 Wapita River
5 Lesser Slave Lake	6 Little Smokey River	7 Valleyview Nature	8 Sturgeon Lake
9 Cadotte River	10 Saskatoon Lake	11 Peace River	12 Winagami Lake
13 Spruce Point	14 Pipestone Cr Park	15 Burnt River	16 Snipe Lake
17 Smoke Lake	18 Iosegun Lake	19 Ctooje River	20 Goose River
21 Pipestone creek	22 Smoky River	23 Two Lake	24 Williston Lake
25 Nar Dam Ground	26 Spring Lake	27 Kakwa River	28 Mussive Lake
29 National Parks	30 O'Brien Park	31 Spruce Point Park	32 Hilliards Bay
33 Shaws Point	34 Bull Creek	35 Hinton	36 Bear Creek
37 Dunvegan Park	38 Slave River	39 Athabasca River	40 Carter Camp
41 Fiqure 8 Lake	42 Pine Lake	43 Alexander Falls	44 Twin Lakes
45 Wabasca River	46 Wadlin Lake	47 Chinchaga River	48 Rainbow Lake
49 Hutch Lake	50 Tompkins Landing	51 Foother Lake	52 Canyon Creek
53 LaCrete Ferry Site	54 Ft Vermillion Boat lan	55 Youngs Point Prov Pk	56 Big Berland
57 Blue Brigel Hell Gate	58 Grande Cache Lake	59 Grande Prairie	60 Long Lake Prov Pk
61 Wandering River	62 Engstrom Lake	63 Ft McMurray	64 Christina Lake
65 Gregoire Lake	66 Athabasca Lake	67 Snye	68 Cold Lake
69 Conklin	70 Ruth Lake	71 Simonette River	72 Pierre Grey
73 Jarvis Creek	74 Muskeg	75 Lesser Slave River	76 LaCardinal Park
77 Berwyn	78 Goose Lake	79 Sa Heux	80 Tangent Park
81 Smoky/Peace	82 Stoney Lake	83 Many Lakes	84 Running Lake
85 Richardson River	86 Fire Bag River	87 Clearwater River	88 Hanging Stone
89 Leddy Lake	90 Notikewin Park	91 Hawk Hills	92 Baptiste Lake
93 Sunny Valley	94 Muskwa Creek	95 Macleod River	96 Petite Lake
97 Berland	98 Cadomin	99 Martin River	100 Lake Iisle
101 Pembina	102 Carson Lake	103 Shining Band	104 Pyamid Lake
105 Edith Lake	106 Annette Lake	107 Nordegg	108 Nine Mile Lake
109 Fort Point Bridge	110 Sask River Cross	111 Lawrence Lake	112 Cross Lake
113 Peppers Lake	114 Jarvis Lake	115 Calling Lake	116 Maligne Lake
117 Poachers Landing	118 Sir Winston Church	119 Round Lake	120 Devonshire Beach
121 Sawridge Rec Area	122 Pigeon Lake	123 Virginia Hills	124 Fawcette Lake
125 Assinve Lake	126 Medicine Lake	127 Brazeau Dam	128 Eagles Nest
129 Thunder Lake	130 Swan Hills	131 Freeman Lake	132 FoFar
133 Peerless Lake	134 Rock Island Lake	135 Riverside Rec	136 Jasper
137 Lac La Biche	138 Buck Lake	139 Candy Meadows	140 Rocky Lane
141 Atlas Landing	142 Tangent Park	143 Margaret Lake	144 Clear Lake
145 Mosquito Lake	146 Carson Lake Prov	147 River Boat Park	148 Wabasca Lake
149 Cotillion Park	150 Kieyo Park	151 Beaver Lake	152 Fork Lake
153 Ml7 Lake	154 Chain Lake	155 Skeleton Lake	156 Hope Lake
157 Pembina River	158 Seba Beach	159 Prov Park	160 Connors Ck Grazing R
161 Fickle Lake	162 Miller Lake	163 Peanut Lake	164 Raven River
165 Emerson Lake	166 Lambert Creek	167 End of Reno Rd.	168 Long Island Lake
169 FairFax Lake	170 Hastings Lake	171 Chip Lake	172 Lobstick River
173 N Sask River	174 Crooked Lake	175 Pinhurst Lake	176 Elenor River
177 Wild Horse Lake	178 Muskiki Lake	179 Shining Bank Lake	180 Hay River
181 Lucene BC	182 Machesis Lake	183 Pinto Creek	184 Nose Creek
185. No Entry	186 Honeymoon Lake	187 Ram River	188 Maqua Lake
189 Maqua Lake	190 Hook Lake	191 Gardiner Lake	192 Colin Lake
193 Obed Lake	194 Moose Lake	195 North Buck Lake	196 Chump Lake
197 Missawawi Lake	198 Graham Lake	199 Cache Lake	200 West Willie
201 Marrie Lake	202 Sulfur Lake	203 Camp Many Trees	204 Camp Nakamum
205 Sandy Lake	206 Touchwood	207 Beaver Dam Pasture	208 Irish Lake
209 Zetta Lake	210 Bratue Dam	211 Wolf Lake	212 Sink Hole Lake

213 Grave Flats
214 Wild Hay Airstrip
215 Cut Bank
216 Ft. Providence
217 Silver Lake
218 Wanogam Lake
219 Long Lake
220 Martin RV Camp
221 Athabasca Bridge
222 Rock Lake
223 Island Lake
224 Athabasca Golf Club
225 Vega Ferry
226 Clear Lake Camp
227 Clearwater Athabasca
228 Athba N to Ft. Chip
229 Mitiouton Camp
230 One Island Lake
231 Kakwa Rec Area
232 Pigeon Lk PP
233 Macleod Lake Prov.Pk
234 Kakut Creek
235 Shast Point
236 Rainbow Chow Farm
237 Freeman River
238 Edmonton Beach
239 Paddle River Dam
240 West of Hwy 22
241 Dahlburg Lake
242 Mink Lake
243 Joker Lake
244 Haig Lake
245 Windfall Creek
246 Cadotte Lake
247 Vandersteen
248 Freeman River
249 Area Jasper
250 Cascades Clearwater
251 Whitemud Falls
252 Orloff Lake
253 Loon Lake
254 Winifred Lake
255 Anzac The Gates
256 Josephine Lake
257 Peace/Whitemud
258 Peace at Cadotte
259 Diamond Willow Lk
260 Sask Lakes
261 Jerry Lake
262 Iosegun Lake
263 Hommy Park
264 Saskatoon Island
265 Smokey Wapiti
266 Redwillow RV
267 Holme Crossing East
268 Home Property
269 Edson Camp
270 Talbot Lake
271 Fraser River
272 Hawk Hills
273 Six Lakes
274 Athabasca Near
275 Ft Sask River
276 Athabasca River
277 Martin Lk near Chisholm
278 N Sask River
279 Thunder Lake P.P.
280 Erith Group Camp
281 Lake Lessard
282 Pembina at Dapp Br.
283 Pembina
284 Private Land
285 Little Paddle River
286 Athabasca Ft. Ass
287 Sask River
288 Beaver River
289 Buffalo Lake
290 Jasper
291 Tawatinaw River
292 Churchill Pk Lac La Biche
293 Boyne Lake
294 Never same twice
295 Steep Bank Lake
296 Switzer Park
297 Fox Creek Area
298 Slave /Moose River
299 Wolverine River
300 Buffalo River
301 Shaftsbury Ferry
302 Sylvan Lake
303 Peace/Hart River
304 McCraikens
305 Joussard Camp
306 Peace River Bridge
307 Moon Shine
308 Gull Lake
309 Kinuso Falls
310 Tumbler Ridge Area
311 Lily Lake
312 Crimson Lake
313 Amisk Lake
314 Evansburg Camp
315 Radium BC
316 Heart River Dam
317 Various Camps
318 Murray River
319 Swan Lake
320 Many Islands
321 Pratts Landing
322 Old Man Ck Hinton
323 Wildhay River
324 Lucerne Camp
325 10Faust Dock
326 Graham Lake
327 Lone Lake
328 Mirrors Landing
329 Carrot Creek
330 Entwistle
331 Francis Lake
332 Bacha Camp
333 Ghost Lake
334 Cumming Lake
335 Elk Island
336 Charlie Lake
337 Moberly Lake
338 Shining Banks Lake
339 Slave Lake
340 Rapids of the Drowne
341 Bell Rock NWT
342 Kozo Lake NWT
343 Cabin NWT
344 Keone Creek NWT
345 Jack Fish
346 Ft Smith NWT
347 Pine Lake NWT
348 Jackfish Lake
349 Mameo Beach
350 Jackfish River
351 Lake Clair
352 Salt River Camp
353 Eagle River
354 French Creek
355 Back 40
356 Smith
357 McKenzie River
358 Dog Head Area
359 Burntwood Island
360 Big Island
361 Slave RiverIslands
362 4 Mile Lake
363 Haycamp Island
364 Kulthili Lake
365 Germain Lake
366 Piers Lake
367 Athabasca/Horse R
368 Embarass RV
369 Slave River Delta
370 Grene River NWT
371 Foot of the Rapids
372 Rapids NWT
373 Salt River NWT
374 Trout Lake
375 Lubicon Lake
376 Alberta Beach
377 Bistcho Lake
378 Losers Falls
379 No Entry
380 Kakisa Lake
381 Taltson River
382 LittleBuffaloRiver
383 Little Rapids
384 Moose Island
385 Camp 3
386 Tea Lake
387 Canim Lake
388 Lake Athabasca
389 Dog Camp
390 Birch River
391 Swan River
392 Utikuma Lake
393 Lac Saint Ann
394 Boyer Lake
395 Hay/Alexander Falls
396 Good Fish Lake
397 Sowan Lake
398 Carribean Islands
399 Lady Grey
400 Sunset House
401 Sandy Point NWT
402 Point LaSrie
403 No Entry
404 Bison Lake
405 Mission Farm
406 to 455 No Entry
456 Utikimis Lake
457 Muskeg River
458 Keane Creek
459 Tsu Lake
460 O'Conner Lake
461 to 998 No Entry
999 Various Others

40. Usual Activity

1. Camp	2. Everything	3. Fish	4. Fish/camp
5. Boating	6. Picnic	7. Fish/hunt	8. Water-ski/boat
9. Swimming	10.Fish/swim	11.Hunting	12.Fish/boat
13.Fish/picnic	14.Day use	15.Camp/swim	16.Walking
17.Picnic/swim	18.Fish/boat/hunt	19.Hunt/fish	20.Cabin
21.Hiking	22.Golf/camp	23.Swim/boat	24.Camp/hunt
25.BQ	26.Skidooing	27.Wash Truck	28.Boat/camp/fish
29.Camp/fish/swim	30.Live year round	31 Boat/Fish/Swim	32.Visit/swim/playground
33.Camp/picnic	34.Picnic/nursery	35.boat/swim/picnic	36.berry picking
37.canoeing	38.Sailing	39.Photography	40.Horseback riding/camp
41.Picnic/walking	42.Siteseeing	43.Camp, ATV	44.Fish/hike
45.Recreation	46.Camp/fish/ATV	47.Canoeing/skiing	48.Swimming/suntan
49.Canoe/swim	50.Canoe/camp	51.Resting/relaxation	52.Swim/boat/hunt
53.ATV	54.Fish/boat/snowmobile	55.Cook outs	56.Canoe/ski/camp
57.Camp/swim/waterski	58.Country Fair	59.Camp/hike	60.Beach/camp
61.Camp/hunt	62.Leisure drive	63.Hunt/trap	64.Hunt/fish/boat/camp
65.Cross country skiing	66.Water activities	68.Group function	69.Land activities
70.Boat/swim	71.Horseback	72.Horse outing	73.River tour
74.Supper cruise	80.Hiking/swim	81.Watch kayaking	82.Fish/camp/waterski
83.Fish/waterski	84.Fish/tubing	85.Fish/canoe/hunt	86.Fish/hunt/swim
87.Fish/canoe/swim	88.Hunt/boat	89.Canoe/fish/hunt	90.Scenery/wildlife
91.Fish/gold panning	92.Other	93.Horseback/birdwatch	94 to 103 No Entry
104.Tradition way of life	105.ATV/fish		

Number of trips per year: Numeric Value

Main reason for preferring site

1. Clean	2. Close home	3. Little boat activity	4. Good fishing
5. Used to be good fish	6. Cabin	7. Nice spot	8. Good hunting
9. Like campsite	10.Unpopulated/quiet	11.River	12.Hunting/fishing
13.Sport fishing	14.Fast water	15.Launching boat	16.Beach/swim
17.Group camping	18.Facilities	19.Nostalgia	20.Access to water
21.Fresh air	22.Big lake	23.Wilderness experience	24.Relaxing
25.Visiting	26.Swimming	27.Site/fishing/location	28.Close/clean
29.Clean water	30.Cold water	31 Own property	32.Canoeing
33.Challenge of river	34.Berry picking	35.Boating/swimming	36.No ATV's
37.Lost	38.Hiking	39.Waterskiing	40.Beach
41.Recreation	42.Horseback riding	43.Snowmobiling	44.Playgrounds
45.Good quality fish	46.ATVing	47.Clean quiet	48.Scenery
49.Country fair	50. Enjoy challenge of	51. Accessibility to public	52.Camping bad roads
53.Work related	54.Rapids	55.Picnic/hiking	56.Bird watching/kayak
57.Traditional way of life	58.Berry picking	59.Swim/fishing	60.Fish/ATV
61.Boating			

41. Do you or members of your household use the mainstems or any of their tributaries for recreation?

1. Yes 2. No

If yes,describe the three locations along these rivers that you use most often,usual recreational activity,and number of trips in an average year.

1 Athabasca River	2 Lesser Slave Lake	3 Shaws Point	4 Peace River Hudson Hope
5 Sand Hills	6 McLeod River	7 Pembina	8 Bruig Lake
9 Eagle Creek	10 Snye River	11 Clearwater River	12 Jarvis Creek
13 Wildhay River	14 Carson Lake	15 Cold Lake	16 Klondike Ferry Athabasca River
17 Peace River town	18 Peace R Strong Creek	19 Outlook Point	20 Sunny Bird Garden
21 Dunvegan Camp	22 LacLa Biche	23 Athabasca/Pembina	24 Smoky River
25 Little Smoky River	26 Slave River	27 Slave Lake Weir	28 Wapiti River
29 Smoky River/Blue Bridge	30 Twin Lakes	31 Notikewin Park	32 Sunny Valley
33 Wabasca River	34 Wabasca Lake	35 Riverside Rec. Area	36 N. Sask River
37 Peace/Notikewin	38 Cadotte River	39 McLeod RV Robb Rd	40 Hwy 40
41 Cadomin	42 Athabasca/Whitecourt	43 Athabasca/Ft. McMurray	44 Snye Park
45 Whitemud/Peace	46 Whitemud River	47 Peace River	48 Hillards Bay
49 Martin River	50 Peace Riverfront Park	51 Tangent Park	52 Calcoyou
53 Carter Camp	54 Shining Bank	55 Tompkins Landing	56 LaCrete Ferry
57 Atlas Landing	58 Many Islands	59 Dunvegan	60 Dunvegan Bridge Pr.Pk
61 Smoky/Peace	62 Athabasca/Ft. Assinaboine	63 Muskec River	64 Muskec/Smoky
65 Smoky/Sheep Creek	66 Wildhay Airstrip	67 Athabasca/Calling River	68 Hay River
69 Paddle River Barrhead	70 Greentree Campground	71 Mistiouton Campground	72 Whitemud Falls
73 Kakwa Rec. Area	74 Burnt River	75 Shaftsbury	76 Smoky/ Bad Heart
77 Grande Cache Lake	78 HwyCamp/Donnelly	79 Freeman River	80 Riverboat Park/Whitecourt
81 Windfall Creek	82 Cadotte Lake	83 Loon Lake	84 Peace River Ferry
85 Peace/Cadotte	86 O'Brian Park	87 Rat Cabin	88 Cottilion Island
89 Young's Point	90 Slave River/Slave Lake	91 Slave River/10km from weir	92 Holmes Crossing
93 Home Property	94 Lobstick River	95 Smoke Lake Campground	96 Little Smoky R Camp
97 Whitecourt	98 Peace east of Manning	99 PoPolarPoint/Athabas	100 Bridge to Nowhere
101 Firebag River	102 Richardson River	103 Calling River Mouth	104 MacLeod Campsite
105 Berland River Camp	106 Rock Lake/Wildhay River	107 Pembina/Antonsons Beach	108 Athabasca/Pembina R
109 LacLa Biche River	110 Owl River	111 Yellowknife	112 Tawatinaw River/Perryvale
113 Kalinas Flats	114 Jasper	115 Athabasca/Cold Creek	116 Birch Island/Fawcette Lake
117 Slave /Moose River	118 Slave/Athabasca River	119 Forfar Park	120 Orloff Lake
121 Hanging Stone River	122 House River	123 Wolverine River	124 Buffalo River
125 Torrins River	126 Thunder Lake Park	127 Snipe Lake	128 Sturgeon Lake
129 Erith River	130 Pine Point	131 Various others	132 Pratts Landing
133 Athabasca west of Hinton	134 Hay River airport	135 Peace R.Ft Vermillon	136 Richmorel Park
137 Poachers Lodge	138 Norms Walleye Camp	139 McLeod/Pembina River	140 Thebacha Camp/Salt River

141 Peace Point NWT	142 Rapids of the Drowned NWT	143 Bell Rock NWT	144 Keene Creek NWT
145 Jack Fish NWT	146 Ft. Smith	147 Leddy Lake	148 Jackfish River
149 Quatre Forches River	150 Lake Claire	151 Ft. Vermillion	152 Smith
153 Great Slave Lake	154 Richardson River	155 Gray Wavey Creek	156 Slave River Islands
157 Hay Camp Island	158 Athabasca/Clearwater River	159 Athabasca/Horse R.	160 Embaras River
161 Greene River NWT	162 McConiel Island NWT	163 Mountain Rapids NWT	164 Casset Rapids
165 Boyer River	166 Chinchaga River	167 Wolverine River	168 Taltson River
169 Little Buffalo River	170 Salt River	171 Dog Camp	172 Birch River
173 Rapids	174 Islands	175 Berland River	176 Kieyo/N Eaglesham Park Peace
177 Wanagan Lake	178 Atikameg	179 Slave River Boat Launch NWT	180 Slave River airport
181 Mission Farm	182 Athabasca Lake	183 Jack Fish Creek	184 to 220 No Entry
221 Athabasca River Bridge	222 to 275 No Entry	276 Athabasca River/Chisholm	277 to 387 No Entry
388 Athabasca Lake	389 to 998 No Entry	999.Not any more	

Usual Activity

1. Picnic/camping	2. Camp/fish	3. Hiking
4. Canoeing	5. ATV/camp	6. Fishing
7. Boating	8. Site seeing	9. Boating/camping
10.Hunting	11.Swimming	12.Hunt/fish
13.Camp/fish/swim	14.Snowmobiling/boat	15.ATVing
16.Berry picking	17.Horse back riding	18.Fishing/Swimming
19.Camping	20.Swim/fish/boat/camp	21.Resting
22.Fish/hiking	23 Boating/waterski	24.Fish/canoe
25.Swim/snowmobiling	26.Sailing/fish/diving	27.Hiking/diving/swim
28.Snorkeling/hiking	29.Music festival	30.Water skiing
31.Canoe/hiking	32.Recreation	33.Hunt/boat/camp/skidoo
34.White water rafting	35.Birdwatching/kayak	36.Birdwatching/hiking
37.Hunting/camp	38.Hike/camp	

Number of trips preferring site: Numeric Values

42. List in order of importance, the three species of fish that you prefer to catch recreationally and indicate how many pounds or kilograms of these fish you catch in an average year from these locations.

1. Pickerel	2. Jack/Pike	3. Dolley Varden	4. Whitefish
5. Perch	6. Rainbow Trout	7. Whitefish Mountain	8. Goldeye
9. Grayling	10.Ling Cod	11.Chub	12.All/any
13.Bull Trout	14.Quit told not to eat	15.Cut Throat	16.Not any more
17.Brook Trout			

Average annual recreational catch: Numeric Value

43a How many pounds or kilograms of fish caught do you and member of your household consume per year: Numeric Value

43b Which of these fish species you catch recreationally, do you eat?

1. Pickerel	2. Jack/Pike	3. All	4. None
5. Perch	6. Whitefish	7. Rainbow Trout	8. Jack/Walleye
9. None sick/mercury	10. All except unhealthy	11. Walleye/Pike	12. Whitefish/Rainbow
13. Catch and release			

44. On average, about how many pounds/kilograms of fish caught from these locations is given away to others? Numeric Value

45. Over the past 10 years, have you noticed any changes in the water,fish,animals or plants along the mainstems or tributaries?

1. Yes 2. No

If yes, describe the types of changes you have noticed:

Water:

1. Foamy scum/edges	2. Reluctant to drink water due to pollution	3. More muddy dark polluted look
4. Polluted	5. Smell	6. Levels higher
7. Dirtier	8. Rise and fall of levels	9. Film sawdust/junk floating
10. Ice breakup not like used to be	11. Color,dull	12. More algae
13. Slimy,green color	14. Lower levels	15. 30 years ago would drink not now
16. Lower levels and foamy	17. Quality down	18. Smells,colored dirty brown,black,green
19. Scum,oil slicks,foam	20. Lower levels not clear	21. Dirty,stinks,foamy
22. Takes until fall for rivers to clear	23. Alot of the duck disease in Gregoire Lake	24. Quality up or better
25. Changes year to year	26. Higher levels	27. Not as good as it use to be
28. Taste,additions of chemicals	29. Looks polluted,levels dropping	

Fish:

1. Reluctant to eat fish	2. Less/smaller	3. Fewer/growths,sores,blisters
4. Dead	5. Polluted fish	6. Warned not to eat by Fish Wildlife
7. Inedible	8. Taste/texture not as good	9. More suckers less others
10. Soft in some lakes	11. Wouldn't eat the fish so stopped fishing	12. Color
13. More fish	14. Fish don't come up creek anymore	15. Soft, watery,less
16. More have worms	17. Poor quality,less	18. Deformed
19. Spawning grounds gone	20. Discoloration	21. Muddy

Animals:

1. Few,dark smelly water	2. Dead	3. Not as plentiful
4. Smaller/mangy	5. Moose not as plentiful	6. No bear,reduced deer and moose
7. Won't drink water cattle	8. Taste and health not as good	9. Animals won't drink river water
10. More mice,coyotes,beavers	11. More bear fewer others	12. More wildlife
13. More deer and bears	14. More mosquitoes	15. OK, no change
16 Animals not feared by man	17. Less,poor quality,sick	18. Less duck, don't taste as good
19. Too many beavers	20. No rabbits	21. More bears

Plants:

1. Dead or dying
2. More growth
3. Fewer
4. Algae
5. Tree diseased,discolored,unhealthy
6. Over logged
7. More weeds
8. Berry bushed woody,dry
9. Not much
10. Trees gone by logging
11. Rivers turning into swamps
12. OK
13. Not as thick and full
14. Berries ripen early
15. Beavers knocking down trees
16. Plants not mulched

Others:

1. More garbage
2. Driftwood
3. Noxious fumes
4. Unsightly due to clear cutting
5. No trees left
6. Never really took time to look
7. More natives less wildlife
8. Water levels lower
9. More seismic lines followed by ATV
10. Hardly any goldeye
11. More people
12. Only been boating 2 years
13. Flooding more due to poor drainage
14. Less slime on rocks
15. At times large amounts of foam on water
16. People have a negative attitude towards develop
17. Bush growing where we had lakes
18. Haven't noticed any change
19. Trees have budworms
20. River basins are drying out
21. Not much wildlife left around

46. When involved in water-based recreational activities in the region,do you ever consume river/lake water?

1. Yes 2. No

If yes, do you treat this water in any way before drinking it?

1. Yes 2. No

Describe How:

1. Boil it
2. Take water with us
3. Would not drink unless treated
4. Would not let dog drink it
5. Not any more
6. Boil and filter
7. Iodine,filters
8. Use water pumps from wells
9. Bleach
10. Water treatment plant
11. Filter
12. Use to be drinkable,not any more
13. Look for good water

47. Are you or any members of your household involved in farming of any sort?

1. Yes 2. No

48. Which of the following terms best describes your farming operation?

1. Grains/oilseeds
2. Mixed farming (grain and livestock)
3. Specialty crops
4. Livestock only

Describe specialty crops:

1. Honey/Beekeeping 2. Greenhouse/Nursery 3. Garden

49. How many acres do you plant or harvest in an average year : Numeric Value

50. Please list the types of crops you grow:

1. Hay	2. Oats	3. Barley	4. Wheat
5. Canola	6. Peas	7. Fescue Seed	8. Alfalfa
9. Timothy	10.Flax	11.Grass	12.Rape
13.Rye	14.Potatoes	15.Legumes	16.Soft fruits
17.Alsike	18.Grass seed	19.Beans	20.Clover
21.Flax	22.Nursery	23.Saskatoons	24.Honey/wax
25.Garden			

51a Do you irrigate any of these crops?

1. Yes 2. No

If yes, what is the source of this water?
1. Well

51b Do you have a water license?

1. Yes 2. No

51c How many acres of land do you irrigate in an average year? Numeric Value

51d How much water do you use in an average year? Numeric Value

52 Do you use any herbicides?

1. Yes 2. No

If yes, list the types of herbicides and the amount applied in an average year

1. Round-up	2. 2-4D	3. Avadex	4. Assert
5. MCPA Amine	6. Poast	7. Tretlan	8. Tordon
9. Edge	10.Treflan	11.Lontrel	12.Truimph
13.Avenge	14.Pursuit	15.Lawntrel	16.Target
17.Asure	18.Banvel	19.Refine extra	20.MCPB Ester
21.Achivie	22.Venture	23.Fusilade	24.Select
25.Puma	26.Fusion	27.Dival	28.Ally
29.Clethodim	30.Clopyralid	31.Glyphosate	32.Dicamba
33.Hoe grass			

Amount applied in an average year: Numeric Value, Tons/Litre/Pounds

53. Do you use any pesticides?

1. Yes 2. No

If yes, list the types of pesticides you normally use and the amount applied in an average year

1. Nequvon	2. Lysoff	3. Diagnon	4. Rotomo
5. Mosquito dope	6. Round-up	7. Malothion	8. Vitavax
9. Some	10.Dicamba	11 Glyphosate	12.Clopyralid
13.Clethodim			

54. Do you use and fertilizers?

1. Yes 2. No

If yes, list the types of fertilizers you normally use and the amount applied in a average year

1. Nitrogen	2. 27-14	3. 34-0-0-10	5. Phosphorus
6. Potash	7. Sulphur	8. 54-12-8	9. Phosphase
10.NH3	11.Annydrous Ammonia	12.Grandular	13.Not sure
14.Potassium	15.Weed killer	16.Ammonia Hydrus	17.151 Blend
18.Blackgold	19.Phos/Sulfates	20.Osmocot	21.Compost
22.Some	24.00-00-60	25.Blend NDKS	26.16-20-20-4
27.Copper Sulphate			

55. How many of each of the following types of livestock do you have? Numeric Value

Other livestock

56. Please describe how you normally dispose of livestock manure:

1. Spread out on field	2. Rain/flies/winter	3. Compost	4. Pushed into piles to decay
5. Sell it	6. Naturally	7. Stock pile, spread on lawns	

75. Describe the three most important ways that you would measure the health of a river

1. Quality of water	2. Oxygen level
3. Contamination of fish	4. Health of fish, plants, insects, wildlife
5. Take samples of water Re: contamination	6. Monitor fish population
7. Monitor pollutants	8. Clarity, color
9. Monitor water silts/phosphates	10.Regular testing
11.Level of sewage wastes	12 Test for, measure toxicity/chemicals
13.Amount of water, water levels ,flow, dam control	14.Monitor chemicals
15.Monitor industrial, agricultural, municipal waste	16.Protection of natural resources
17.Study of ecosystem quality	18.Vegetation along rivers, plant, algae growth
19.Number of roads, pipelines seismic	20.Pollutants from mills should be monitored industrial
21.Meat quality in fish, test fish	22.Wildlife using river area
23.Chemical analysis before dumping	24.Thriving ecosystems within river basin
25.Look at water appearance	26.Taste water odor, suitable for human use
27.Smell water, odor	28.Climate quality, quantity
29.Amount used recreationally	30.Bio Away testing
31.Ability to support aquatic life	32.Air quality pollutants
33.Litter	34.Ask people who fish and use regularly
35.Temperature	36.Public awareness
37.Recreation abuse	38.Health problems of people
39.Community opinions	40.Water management
41.Lands use practices	42.Food chains constant motion
43.Think about all wildlife, ecosystem	44.Reduce effluent and industry waste, entering river
45. Erosion	46.Nutrients of rivers
47.Independent agency on site to test mills, plants, industry	48.Fines
49.Loss of water holding and purifying lost through de-forestation	50.Test for agriculture waste, runoff
51.Test for toxic sub and chemicals in sediment etc.	52.Stay in touch with recreation users

53.Oppose dam building
54.Pollution from clear cutting
55.Reproductivity
56.Test where rivers run into lakes
57.Reforestation
58.Visual appearance of forests and valleys
59.River valley environment
60.Heavy metals mercury, PCB's etc.
61.Effective enforcement of laws
62.Health of traditional hunters and fishers
63.Erosion
64.Everthing that can be checked
65.Comprehend historical evidence, written and verbal from elders and compare to present
66.Use common sense
67.Use your senses
68.Water table
69.Biological status
70.Shutdown
71.Self reporting
72.Survey users
73.Test ground water for contamination
74.Establish a base line data
75.Enforce regulations
76.Determine what other factors have done to river
77.Oil in the water
78.Test fish for disease

77. What are the three most important recommendations you would like the NRBS to make?

1. Monitor regularly
2. Clean up water entering rivers, prohibat toxins and chemicals
3. Control industrial water entering rivers
4. Decrease pollution, water purification
5. Monitor industrial use
6. Stricter waste regulations
7. Correct water quality/quantity problems
8. Make a basin plan and use it
9. More research
10.Stop logging/farming so close to rivers
11.Clean up or pay up, heavy fines
12.Enforce very strict laws on polluters and raise fines for offenders
13.Control municipal/industrial waste
14. Quality of water monitoring
15.Increase legislation to control pollution levels/water
16.Protection of natural water sources/wetlands
17.More control of water users
18.Higher standards for industry using water
19.Supervision of industrial/municipal dumping
20.Clean up pulp mill dumping
21 Reduce number of road, pipeline crossings
22.Industry/agriculture/government work together
23.Government becomes more involved in monitoring/measuring river health
24.Greater control of land users re: development
25. Management plan
26 If you don't know what damage it will do say no
27.No more dams
28.Control logging to avoid erosion
29.Public awareness
30.Fish levels/health
31.Monitor hot spots, mill, discharges industry
32.Stop illegal dumping chemicals toxins sewage from entering river
33.Don't mess with nature
34.Agriculture on drainage system chemical by farmers environmentally friendly products
35.Identify sources of pollutants
36.Agricultural pollutants from entering water ways
37.Catch/release fish in all flowing rivers
38.1 km boundary on all drainage's for clear cutting monitor forestry close to rivers
39.Stop motor boats restrict pleasure boating high power motors
40.Preserve river systems at any cost take polluters rights to do business away
41.Close ALPAC
42.Food chain relationships
43 Monitor sediments
44.Reduce clear cutting to maintain water levels
45.Health of fish/wildlife
46.No more mills, plants reduce size of existing ones
47.Control of flooding/water levels
48.Air pollutants
49.Educate our children make them mad and general public
50.Household contaminants to be discouraged
51 Water controlled by dams allowed to flow more freely
52.Monitor run-off
53.Stop Swan Hills from pumping into the ground
54.Better sewage treatment plants

55.Regulate agriculture/forestry practices in drainage basin
56.Stop considering northern rivers as a waste disposal
57.Regular survey of wildlife
58.Water authority to regulate water flow and levels
59.Industrial users should sponsor studies such as this and pay for monitoring
60.Increase pollution standards
61.Honesty interpret findings and make public
62.Publicize findings offer reasonable solutions
63.We have to be concerned of the environment
64.Enforce regulation of existing laws
65.Pollution of lakes, dumping to stop
66.Restock fish to rivers and lakes, improve spawning grounds
67.Control fishery, cut down fishing and hunting
68.Industries using water should cover cost or big percent of clean up
69.Responsibility in hands of local people
70.Independent agency to inspect, water,fish,wildlife
71 Protect rivers from straightening
72.Check for other things that may effect health of rivers
73.Must consider economic as well as environmental factors
74.A reasonable amount of time for change clean up no more pollution damming
75.No more development on river
76.Overuse from recreational activities
77. Encourage development for those who do it responsibility
78.Be proactive,get on natures side
79.Zero tolerance on second infraction industry should be shut down
80.Everyone has to help, tell people to help, imput from everyone
81 Eliminate all forms of chlorine use
82.Polluters pay for costs of cleanup, industry and municipal
83.Get general public involved at various points
84.Keeping land for wildlife
85.Less bureaucracy
86.No over fishing by any groups
87.Control mining procedures
88.Monitor all industry closer
89.User fee
90.Limit logging and oil/gas development
91.Use effluent water for oil/gas
92.Septic tanks for all gray water at lakes, campgrounds etc. everywhere
93.Determine impact of logging before approving more
94.Set priorities i.e.: health human/other before profit
95.Advertise the beauty of NRB for tourism
96.To have better quality water
97.Effective and empowered inspection, police
98.To prevent the destruction of rivers, streams
99.Open and public chastising of abusers/polluters
100.less or limited clear cutting
101.Pulpmills and industry not near rivers to be tested for seepage
102.No more clear cutting, enforce select cutting
103.No chemical usage by public, or industry spraying, ditch road sides
104.Take action
105.When will action be taken
106.How will action be taken
107.Quit draining muskeg
108.Determine the health of rivers
109.Industry should not come first, economic development shouldn't come first
110.Regulation for oilfield injections
111.Within 5 years
112.Encourage environmental scientists in their practiced research
113.Set aside pristine lake and rivers and allow no development
114.Water conservation of some kind
115.Make sure government cleans up too
116.Get disposal well checked out
117.Clean up as much as possible now
118.More responsible people
119.Industry to recycle their own water
120.Keep farms/ranches away from river banks
121 Amount of trees not being replanted
122.Treatment of municipal water should be maintained and improved
123.Preservation of wildlife
124.Reports on river study results and updates on action taken inform basin residents
125.More water treatment plants for drinking water
126.To find out how bad the water is

127. Use common sense
128. Keep costs down
129. Monitoring to be done by clubs
130. Input from all concerned
131. Locate industry away from water
132. No taxpayer money or tax breaks for industry
133. The use of municipal sewage for agriculture
134. To be aware that the growth of human population leads to decline in water quality
135. In-depth study of all potential threats to water, monitor
136. Listen to the elders they are valuable resources and probably have seen changes and could be helpful on deciding what to do
137. Tax on farmers using chemicals
138. Increase levels of oxygen
139. Establish baseline data and update regularly
140. Effective monitoring
141. Running water for settlements
142. No Entry
143. Uncontrolled pollution in the groundwater should be monitored
144. To make our waterways like they were 30 years ago
145. Study should include all of Western Canada
146. Clean up the garbage
147. Stop the studies
148. Make polluters pay annual fee
149. Obtain information from fishermen and farmers living in the watershed

78. List any recreational, environmental, agricultural or professional organizations to which you or any members of your household belong.

1. Alberta Cattle Commission
2. United Farmers of Alberta
3. Nordic Club
4. Alberta Society of Eng. Tech.
5. Scouts Canada
6. Ducks Unlimited
7. Volunteer RCMP
8. Alberta Assoc. of Reg. Nurses
9. United Nurses of Alberta
10. Alberta Institute of Crigologists
11. Hunters Education Trainer
12. Prog. Dev. Chairperson
13. Alta Prehospital Professions Assoc.
14. Wheat Growers Assoc.
15. Cattleman Assoc.
16. Crime Watch
17. Fish and Game
18. Fire Dept. Deputy Chief
19. 4-H
20. Students Assoc.
21. Enviro Kids Clubs
22. Engineers/Geologist/Metallogy
23. Institute of Mining/Metallurgy
24. Golf Club
25. AFGA
26. Golden Years Society
27. Medical Lab Tech.
28. Minor Hockey
29. Alta. Fish & Wildlife Officers Club
30. Ag Society
31. Fish & Wildlife Club
32. Canadian Public Workers
33. Alberta Trappers Assoc.
34. Church of Latter Day Saints
35. Canadian Kennel Club
36. Alpining Club of Canada
37. APEGGA
38. CPAWS
39. AUPE
40. ATA
41. FOTA
42. Outfitters of Alberta
43. Chamber of Commerce
44. World Wildlife Fund
45. Snowmobile Club
46. Nature Conservancy
47. Wandering River Dev. Society
48. Seed Cleaners
49. Community League Board
50. Electrical Assoc.
51. Municipal Water Treatment
52. Pembina Flood Plan
53. CMA
54. North American Hunting Assoc.
55. Girl Guides
56. Alberta Wheat Pool
57. Alberta Institute of Agrologists
58. West Central Forage Assoc.
59. Gardening Club
60. Alberta Physio Therapists
61. Legion
62. Lions Club
63. Earthkeeper
64. SCAM
65. Rocky Mountain Elk Foundation
66. AFS
67. AFO Assoc of Forest Officers
68. Outdoors Club
69. FNSAS Member
70. Junior Forest Wardens
71. Dental Assoc.
72. ATV Society
73. Recreational Board
74. Ontario Professional Foresters Assoc.
75. Gun Club
76. Non Smokers Rights
77. CMA
79. River Rats
80. SHORC
81. NNSA
82. Canadian Wildlife Federation
83. Feathercare AGT
84. Crime Watchers
85. Canadian Figure Skating

86.Curling Club
87.Gymnastic Club
88.Music Assoc.
89.Volunteer Ambulance
90.Tourism Committee
91.Law Enforcement
92.Swim Club
93.Ukranian Society
94.Green Peace
95.World Wildlife Fund
96.Oilmen and Oilwives Assoc. Club
97.BPOE/OORP
98.Friends of the Environment
99.Wildlife Advisory Board
100.Dog Racing Club
101.Fire Fighters
102.Band Council
103.Delta Comm.
104.School Boards
105.Wildlife Advisory Community

57. What three factors have had the greatest effect on the amount or quality of water in the major river basin in which you live.

1	DAMS	21	MERCURY
2	PULP MILL	22	PESTICIDES/HERBICIDE
3	AGRICULTURE	23	PUBLIC APATHY/ATTITUDES
4	POLLUTION GENERAL	24	OIL RIGS/WELLS
5	LOW WATER LEVELS	25	BEAVER
6	LACK OF POLLUTION TO	26	EROSION
7	REGULATIONS	27	OILSANDS
8	MUNICIPAL SEWAGE/SEP	28	AIR POLLUTION
9	FERTILIZER	29	SEISMIC/EXPLORATION
10	FEED LOTS	30	DEVELOPMENT RES/COMM
11	LOGGING/CLEAR CUTTIN	31	DRAINING
12	INDUSTRIAL WASTES	32	GARBAGE
13	WATER DIVERSION/USE	33	SWAN HILLS
14	RECREATION/TOURISM	36	POOR MANAGEMENT
15	WEATHER	37	FLOODING
16	DEBRIS	38	NATIVE HUNTING /FISH
17	CONTAMINENTS	40	FOREST FIRES
18	LACK OF ENFORCEMENT	41	NO PULP MILLS
19	ROAD BUILDING	50	NO CHANGE
20	CATTLE GRAZING		

58, 63, 68 Describe the ways in which this factor has affected water quality, fish, wildlife, vegetation or the health of the river.

1	UNSURE/UNKNOWN	22	NO WATERSHED/NO WILDLIFE
2	WATERDIRTY,FEWER\ANIMALS,SIZE, ALGAE,DEAD ANIMALS , DEBRIS	23	WEATHER LESS SNOW/RAIN TO LITTLE / TO MUCH
3	EROSION,ROADWAYS,DEV,AGRIC,CONTAMINATS,NO SPAWNING	24	MORE PEOPLE/MORE GARBAGE, MORE FISHING
4	FEWER POLLUTERS, WATER CLEAN	25	VERY LITTLE,NONE
5	REGULATIONS HAVE HELPED, KEEP WATER CLEAN	26	DO NOT TAMPER WITH NATURE
6	POLLUTION IN GENERAL	27	SEWAGE,MORE PEOPLE PROBLEM WORSENS WITH DEVELOPMENT
7	DIRTY RUNOFF,AGRIC CHEMICALS, LOGGING DIRT, SALT, OIL/GAS,MUN EFFULENTS	28	FLOODING DAMAGE TO LIFE AND VEGETATION
8	WATER LEVELS REDUCED, DIVERSION, EXTRACTION,UNSTABLE	29	TOXIN LEVELS HIGH WATER, UNHEALTHY FOR COMSUMPTION
9	FISH MERCURY/CONTAMINENTS, UNFIT TO EAT, GROWTHS, NO SPAWNING	30	WARM WATER/INCREASED VEGETATION, LESS FISH
10	SERIOUS OVERALL EFFECT ON ECO-SYSTEM	31	IMPACT WATER QUALITY, POLLUTANTS, EROSION
11	TIGHTER LAWS REQUIRED, POOR MGMT, PUBLIC AWARENESS	32	VEGETATION THINNER/NOT HEALTHY
12	GARBAGE/OUTBOARD MOTOR DISCHARGE	33	MORE CHEMICALS NEEDED TO CLEAN WATER, THEREFORE MORE MONEY
13	DEBRIS MAKING A MESS OF NATURE AND NATURAL SURROUNDINGS	34	WATER/AIR POLLUTION
14	HOW CAN WE DETERMINE LONG TERM EFFECTS, TIME FACTOR, HYPOTHETICAL	35	GREATER PLANT GROWTH, ALGAE, SUFFOCATION OF MARINE LIFE

15 WATER UNFIT/CHEMICAL SEEPAGE, DIRTY, SMELL
16 REDUCED NUMBER OF FISH, WILDLIFE SOME SPECIES GONE COMPLETELY
17 INDUSTRY DESTROYING ENVIRONMENT, WATER QUALITY DOWN
18 DESTROYS ANIMAL HABITAT, VEGETATION
19 BIRTH DEFECTS/HEALTH
20 AIR NOT PURE/ACID RAIN
21 WATER STALE/DIRTY/LOW LEVELS
36 RIVER CAN HANDLE PROBLEM
37 DISTURBING OF CREEK AND RIVER BEDS
38 NO SPECIAL RIGHTS FOR NATIVES
39 STAY AWAY
40 NOT NOTICABLE
41 VENTURE INTO AREAS THAT SHOULD BE PRESERVED
42 OVERFISHING COMMERCIAL

59, 64, 69 Describe the ways in which this factor has affected you or members of your household.

1 WATER LEVELS LOW/CANNOT USE BOAT
2 LESS FISH,LESS CONSUMABLE, WON'T DRINK WATER
3 ENJOY RECREATION,CLEAN WATER TO DRINK, GOOD FISH
4 LOSS OF PLANT/ANIMAL LIFE, POOR HUNTING AND FISHING
5 CAN'T SWIM,FISH,DRINK WATER, NO WATER BASED ACTIVITIES
6 MORE PROBLEMS DURING SPRING BREAK UP
7 CANNOT DRINK WATER,DECLINE IN WATER QUALITY, MORE CHEMICALS, COST
8 FLOODING EVACUATION, DESTROYS COMPLETELY, EROSION
9 NO WATER BASED ACTIVITIES EXCEPT FISHING
10 CANT ENJOY NATURAL RESOURCES, RUINED FOR FUTURE USERS, EDUCATION NEEDED
11 MAD, FRUSTRATED
12 DIRTY,GARBAGE,WILL NOT USE, AFFECTED WATERS
13 NOT AT ALL/UNKNOWN
14 LESS RESPECT FOR GOVERNMENT, INDUSTRY, MONITORING NEEDED
15 STREAMS DRYING UP/WATER TABLE LOW
16 DON'T GO NEAR MILL WATER, IGNORE PROBLEM
17 TOO MANY PEOPLE, TRAFFIC, DEVELOPMENT
18 AIR/LEAD POISONING
19 HEALTH CONCERN, QUALITY OF LIFE
20 WATER FILTH,SMELL, BOTTLED WATER, POOR DRINKING QUALITY
21 DAMAGE TO VEHICLES, GUARD RAILS, BRIDGES
22 CHANGING WEATHER SYSTEMS, CHANGE IN NATURE
23 DETERIORATION OF STREAM WATER QUALITY, CHEMICAL SEEPAGE
24 POLLUTION OF AIR AND WATER
25 LOSS OF INCOME TRAPPING AND LODGING
26 RECREATION AREAS NOT AS NICE, NO APPEAL, GO FURTHER AWAY
27 INCREASED HUNTING, FISHING, FARMING AREAS, OIL LEASES
28 ANIMALS MOVING CLOSER TO TOWN, DEVELOPMENT
29 LOGGING, NO WIND BARRIER, WATERSHED
30 ENCOURAGED TO DO MORE TO SOLVE PROBLEM
31 CAUSES STAGNENT WATER POOLS
32 NATIVE ABUSE OF HUNTING AND FISHING

60, 65, 70 If no steps are taken to correct this factor, describe how you think the health of rivers will be affected over the next 10 years.

1. UNSURE/UNKNOWN
2. FISH POP DECLINE, ANIMAL, ALGAE, VEG
15. GENERAL HEALTH OF POPULATION
16. DEPENDS ON WEATHER/ NO CONTROL

INCREASE WHOLE ECOSYSTEM
3. GENERAL POLLUTION INCREASE, DETERIORATION OF RIVER
4. INDUSTRY/MUNICIPAL/ AGRICULTURE POLLUTION INCREASE, RIVERS ARE DYING
5. INCREASE USE OF CHEMICALS TO PURIFY, INCREASE DISEASE
6. TREES HELP KEEP RIVER CLEAN, STOP BANKS FROM SLIDING
7. RIVER LEVELS CONTINUE TO DROP KILLING MARINE LIFE, VEGETATION
8. UNKNOWN EFFECTS OF FISH CONSUMPTION, FISH NOT CONSUMABLE
9. DON'T THINK IT CAN BE CONTROLLED, LIVE WITH IT
10. WON'T CHANGE/WON'T MAKE A DIFFERENCE
11. MAJOR EROSION/DEPLETED ECOSYSTEM
12. FURTHER DAM DEV WILL DESTROY RIVER VALLEY THROUGH FLOODING
13. OIL/GAS SPILLS
14. BEAVERS MAJOR PROBLEM
17. MUN WATER STANDARDS SET, PUBLIE AWARENESS, GOVERNMENT CHECK
18. DAMAGE DONE/TIME WILL HEAL, CAN'T CONTROL NATURE, A LOT TO BE DONE
19. RUNOFF INCREASED LEVELS AND SPEED
20. AIR, WATER THEREFORE SOIL ETC
21. FEW WILDERNESS AREAS
22. INCREASED COSTS TO CLEAN WATER, SHORT OF CLEAN WATER
23. PUBLIC LIED TO IN THE NAME OF PROGRESS TO PROVIDE JOBS
24. CONTROL SEWAGE, RUN OFF THEN IT WILL BE OK
25. WATER HARDER TO TREAT
26. WILL IMPROVE
27. HARVESTING DECLINE FOR LIVELIHOOD

61, 66, 71 If no steps are taken to correct this factor, describe how you think the health of members of your household will be affected over the next 10 years.

1. UNSURE
2. CANCERS/DISEASES
3. MULTIPLE SCLEROSIS
4. DEATH
5. HEALTH NOT AFFECTED
6. UNKNOWN EFFECTS OF FISH CONSUMPTION, WATER, LESS, WON'T USE
7. NO POSITIVE EFFECTS, DANGER, WORSEN, CONCERN
8. MORE COST
9. CONSUME ONLY DISTILLED WATER, ANYTHING BUT RIVER
10. MORE AIR POLLUTION
11. NOTHING TO LEAVE FOR OUR CHILDREN, NO RECREATION, ECOSYSTEM
12. NO CHANGE, WILL NOT AFFECT, DON'T USE, LIVE WITH IT
13. FLOODING
14. WILL MOVE
15. LONG TERM EFFECTS UNKNOWN

62, 67, 72 If the Northern River Basins Study were to suggest ways for managing this problems, what actions do you think they should recommend?

1. UNSURE/UNKNOWN
2. TIGHTER CONTROL IND/MUN/AGRIC HIGHER FINES ENFORCEMENT
3. DO NOT WASTE WATER
4. AGRICULTURE/ANIMALS/NO SPRAYING
5. SELECTIVE LOGGING/NO CLEAR CUTTING
6. STUDY EFFECT OF POLLUTION IN RIVER, ENVIRONMENTAL STUDY
8. PUBLIC EDUCATION, PLAN, EDUCATE
9. WATER DIVERSION HAS TO STOP, CONSTANT LEVEL
10. RESTRICT MOTORIZED VEHICLES
11. THERE IS NO PROBLEM/
12. MAINTAIN FISH POPULATIONS, CATCH RELEASE, STOCKING
13. REGULAR TESTING/MONITOR CLOSELY

7. REDUCE WASTE DISPOSAL IN RIVER, DEVELOPMENT TO CLOSE, BUFFER ZONE

73. Threats of greatest/least concern to water quality and quantity in the basins.

1. AGRICULTURAL RUN-OFF
2. GROUNDWATER CONTAMINATION
3. FORESTRY HARVESTING PRACTICES
4. DRAINING WETLANDS AND MUSKEG
5. DISCHARGES OF MUNICIPAL SEWAGE
6. SEISMIC EXPLORATION
7. RIVER FLOWS CONTROLLED BY DAM
8. DISCHARGES FROM PULP MILL
9. AIRBORNE POLLUTANTS
10. URANIUM CONTAMINATION
11. INDUSTRIAL WASTES/TAILING PONDS

74. Most/least effective management actions.

1. CHANGE LAND USE PRATICES TO REDUCE EROSION AND POLLUTION
2. IMPROVE MUNICIPAL WASTEWATER TREATMENT
3 PROVIDE MORE FLOOD PROTECTION
4. PROTECT TRADITIONAL FISHING, HUNTING AND TRAPPING
5. ENFORCE EXISTING POLLUTION LAWS
6. REDUCE INDUSTRIAL EFFLUENTS
7. PRESERVE AND MAINTAIN ECOSYSTEMS
8. MAKE POLLUTERS PAY AN ANNUAL FEE BASED ON VOLUME THEY PRODUCE
9. IMPROVE TREATMENT OF MUNICIPAL DRINKING WATER
10. INCREASE MONITORING OF WATER QUALITY
11. DEVELOP A MANAGEMENT PLAN FOR THE ENTIRE BASIN
99. MORE THAN ONE ANSWER

76B. How often should this measure be monitored?

1. HOURLY
2. DAILY
3. WEEKLY
4. MONTHLY
5. YEARLY
6. EVERY 5 YEARS

76C. Who should be responsible for monitoring this measure?

1. GOVERNMENT
2. INDUSTRY
3. UNIVERSITIES
4. INDEPENDANT AGENCY
5. PUBLIC
6. OTHER
9. ALL OF THE ABOVE

76D. Who should be responsible for paying for monitoring this measure?

1 GOVERNMENT
2. ALL WATER USERS
3. INDUSTRIAL WATER USE
4 OTHER
9. ALL OF THE ABOVE

79. Do you have any comments you would like to make to the Study?

1. KEEP WATER CLEAN/STOP POLLUTION
2. PUBLIC INVOLVEMENT IN MONITORING,
5. IS THERE A PROBLEM?/BEING AWARE OF THEM
6. DON'T GIVE UP,BETTER FUTURE,

EDUCATION, MANGEMENT PLAN

3. STOP STUDING /ACT NOW/DON'T SPEND ANYMORE MONEY
4. KEEP CANADA'S WATER IN CANADA

GOOD LUCK

7. ENFORCEMENT OF CURRENT LEGISLATION, REGULATIONS
10. UNSURE