



**Northern Yukon**

**Ecological Knowledge Co-operative**

**Second Annual Gathering**

**March 18-19, 1997**

**Whitehorse, Yukon**

Web Address: [www.taiga.net/coop](http://www.taiga.net/coop)

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The Northern Yukon Ecological Knowledge Co-op is part of the national Ecological Monitoring and Assessment Network (EMAN). The purpose of the Co-operative is to monitor and assess ecosystem changes in the Northern Yukon. The main sources of change that are of concern for this area are: climate change, contaminants transported through the atmosphere and oceans, and regional development.

As its name implies, the program involves a co-operative effort among scientists, governments and community organizations to collect, interpret and communicate ecological information. Sharing of information and integration of scientific data with local knowledge are key components of the Eco Knowledge Co-op.

**Tuesday, March 18, 1997**

The second gathering of the Northern Yukon Ecological Knowledge Co-operative began at the Westmark Whitehorse in downtown Whitehorse. The focus of the first day was to review the purpose of the Co-op, examine what had been accomplished in the past year, and evaluate the pilot community monitoring program. The gathering began with a prayer by Roy Moses and was followed by introductions of all participants. Doug Urquhart, the meeting facilitator, introduced the gathering and reviewed the agenda. In his introduction, Doug stressed that we need to focus our discussions on why we are here, and what we are trying to accomplish. He noted that we, as humans, worry about change, but the environment is changing all the time and we need to keep that in mind. He also reminded participants to remember the Co-op guidelines:

<p><b>GO SLOWLY</b></p> <p><b>KEEP IT SIMPLE</b></p> <p><b>BE RELEVANT</b></p> <p><b>THINK LONG TERM</b></p> <p><b>ECONOMIZE</b></p>
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**1. Welcome Back - Joan Eamer, Environment Canada**

Joan welcomed all participants back to the second annual gathering of the Northern Yukon Ecological Knowledge Co-op and followed with a discussion of the purpose of the Co-op and how it fits in to the national Ecological Monitoring and Assessment Network (EMAN) program.

The purpose of the national EMAN program is to keep track of (monitor and assess) important changes in the environment that are happening, or may be happening. This involves pulling together monitoring information and synthesizing material wherever possible. An important role of EMAN is to provide monitoring information to the public and to political systems. This information must be in a form that can be used to improve peoples' understanding of environmental changes and decision-making by governments and co-management boards. At a national level, EMAN needs to increase its involvement in the economic and cultural aspects of environmental change and it needs to improve community involvement in monitoring and assessment. We can influence the national program by building on our strengths in these areas.

The Ecological Knowledge Co-operative was developed during planning meetings in 1994 and 1995. Participants at these meetings determined the main issues the Co-op would address: contaminants, development and climate change. The area selected was the range of the Porcupine Caribou Herd and the ocean along the Northern Yukon coast. This includes parts of Alaska and NWT, as well as the northern Yukon Territory.

At the first annual gathering of the Co-op in February, 1996 in Whitehorse, working groups were formed for each ecosystem type (land, rivers/lakes, coast/ocean) and, through discussion by those groups, lists of indicators that might be used for each of the three issues (contaminants, development and climate change) were produced.

Following that meeting, a team figured out how good these indicators would be by looking at what information exists and by discussing the proposed indicators with local experts and researchers from other areas. Recommendations about the usefulness of each indicator were made for most of the items on the list. Environment Canada also began a pilot project for community-based ecological monitoring. Over the past year, work was also carried out on communications. Presentations about the Ecological Knowledge Co-op were made to community organizations and locals. An Internet web site is now in place which includes current information on several indicators that were chosen at last year's meeting. *Web Address: [www.taiga.net/coop](http://www.taiga.net/coop)*

## **2. So? How was this year? Part I: Presentations from the communities.**

Presentations were made by four community workers who did interviews for the community-based monitoring pilot project. Information was gathered by each worker through 12 to 28 interviews with people from Aklavik, Fort McPherson and Old Crow. The pilot program was coordinated by Gary Kofinas, who provided some background on the project and the community presentations.

Serving as community workers were Glenna Tetlich and Joe Tetlich ( Old Crow), Carol Arey (Inuvialuit of Aklavik), Dolly Peterson, (Aklavik, Gwich'in) and Myrna Nyersoo (Fort McPherson/Tet'it Gwich'in). Community summaries included information on berries, fish, caribou, other animals, and weather. These reports included a great deal of specific information about local observations for the 1996-97 year. A full report on the community monitoring pilot project, including a summary of community observations and a project evaluation, has been prepared. *Web Address: [www.taiga.net/coop/reports](http://www.taiga.net/coop/reports)*

A general discussion period followed the presentations, during which people talked about their reactions to the community monitoring program and shared observations on the topics covered in the survey. A selection of these comments is found in Appendix I.

## **3. So? How was this year? Part II: Indicator highlights**

The Environment Canada team presented some of the information on Co-op indicators that had been gathered since the last meeting. This included graphs of climate variables, caribou, waterfowl and seal populations, community population sizes and measures of human activity in the Northern Yukon. All of these graphs are also presented on the Co-op's web site. Joan Eamer also included a brief summary on contaminants issues in the Northern Yukon, and stressed that while contaminants monitoring should continue, current contaminants levels in wild game and fish species were very low and considered unlikely to pose a health hazard to harvesters. The highest levels of contaminants are found in marine mammals.

## **4. Breakout groups to discuss the community monitoring program.**

Gary Kofinas introduced the discussion of the community monitoring program by providing questions to be addressed in the breakout groups:

- *Is community monitoring worth the time and the money?*
- *If yes, how shall information be collected?*
- *What are the best roles for various organizations (First Nations government, Environment Canada, local organizations)?*
- *Who should assume the costs?*

Summaries of discussions that occurred in the working groups are presented in Appendix I, Section B.

## **5. Plenary discussion of community monitoring: ideas from the gathering**

Is community monitoring worth the time and the money?

- The working groups reported general support for the community monitoring program. It was noted that carrying out monitoring in several communities provides a good regional picture of environmental conditions.
- It is important that the monitoring program provide information that can be used in the communities.
- The program should remain independent, but could be carried out in co-operation with already existing programs.
- There is a need to improve communication, keep working together, and keep the focus of the program.

#### How shall we collect the information?

- Interviewing techniques are very important to obtaining information. When interviewing elders, it was recommended that a story format be used. Questions from the survey not answered from stories can be asked at the end. Younger people that are interviewed may not mind a direct question-and-answer type of interview. The number of topics and questions should be limited; interviews should be long.
- Interviewers need a month to conduct interviews.
- All interviewers should be using the same method and questions in the different communities so results can be compared.
- It would be good to have the same people doing the interviews each time. There was uncertainty about training people to do specialized work for the Co-op program. It may be a good idea, but there questions about costs, and how long people would be likely stay at a job.
- There also needs to be some form of compensation to the people who are being interviewed and giving their information.

#### What are the best roles for various organizations?

- The community monitoring program needs to be independent to some degree so it is flexible.
- Work should be co-ordinated with partner organizations, like the harvest survey programs in the NWT and the Renewable Resource Council in Old Crow. The Co-op can also develop partnerships with other organizations. Schools should be involved.
- Environment Canada can work as an initiator, provide a link between people and programs, and be the home of the database of information, but the information itself belongs to the communities. Therefore an agreement on the use of information and protection of sensitive information needs to be developed.

#### Who should assume the costs?

- There was some discussion of what funding resources were available in the communities, and at what stage it would be appropriate to ask the communities for money to support the community monitoring program. It was suggested that first the Co-op needs to demonstrate the value of the program and provide information to the communities before asking for financial support.
- Funding support may also be available from "the greater community," such as government agencies or other funding sources that are interested in what we are doing.
- Environment Canada will fund the community-based monitoring program for the short term. It is hoped that communities will also support the program in time.
- It was suggested that a cost-recovery be achieved by charging for the use of Co-op information by other individuals or organizations. Money earned in this manner could be turned back to the communities to pay people for the information they have given.
- There was a suggestion of putting information onto a CD-ROM disk that could be marketed to schools and libraries.

### **Wednesday, March 19, 1997**

The second day of the gathering was held at the Ayamadigut Campus of Yukon College. The focus of the second day was on examining how the Knowledge Co-op fits in with other research programs operating in the range of the Porcupine Caribou Herd, figuring out which indicators to keep, and examining communications via a pilot World Wide Web site. The morning session began with a prayer by Roy Moses.

#### **6. Proposal for community monitoring of effects of contaminants on ecosystems: Joan Eamer, Environment Canada.**

Joan Eamer described a proposal submitted to the Northern Contaminants Program on the behalf of the Northern Yukon Ecological Knowledge Co-op. The proposal requests funds to be used in supporting the community-based monitoring program over a two year period. Information from local observations about the body conditions of fish, bird and wildlife species in the different communities would be gathered as part of the Co-op monitoring program. Observations that suggest a potential problem with contaminants would then be followed up by sending samples to a lab. Monitoring results would be presented in the second year in a report produced by the Co-op and funded through the Northern Contaminants Program.

After a general discussion, it was decided that this meeting will recommend to the Northern Contaminants Program that this proposal be funded. A recommendation was prepared by Doug Urquhart and signed by community representatives following the meeting.

#### **7. Links with other monitoring programs**

- a. *Sustainability of Arctic Communities: Interactions between Global Changes, Public Policies, and Ecological Processes.* Presented by Brad Griffith (Alaska Cooperative Fish and Wildlife Research Unit and Institute of Arctic Biology, Univ. Alaska, Fairbanks), Bob White (Institute of Arctic Biology, Univ. Alaska, Fairbanks) and Jack Kruse (Institute of Social and Economic Research, Univ. Alaska, Anchorage).

This project is a U.S. National Science Foundation-funded interdisciplinary project that draws on research and local knowledge to look at how environmental change affects the sustainability of northern communities. Forces of change that the study is investigating include oil development, climate change, tourism, and non-local hunting. The focus of the study is on the range of the Porcupine Caribou Herd (in Alaska and Canada). Four Porcupine Caribou user communities have been invited to participate in the study.

Jack Kruse, Bob White, and Brad Griffith presented information on one part of the project--how satellite imagery is being used to understand how wildlife choose where to go based on where food is and when it is available. The project will make use of what has been observed for the Central Arctic Caribou Herd near Prudhoe Bay to estimate how caribou respond to oil development. From this information, researchers are trying to predict for the Porcupine Caribou: 1) changes in plants and habitat that would result from changes in climate, 2) effects of potential oil development scenarios, and 3) resulting changes in numbers and distribution of caribou and other wildlife. By pulling this information and knowledge together, people participating in this project hope to understand better how change in the future might affect the relationship of communities and caribou.

**b. Research in the Arctic National Wildlife Refuge.** Presented by Fran Mauer (U.S. Fish and Wildlife Service)

The U.S. Fish and Wildlife Service has been monitoring populations of several wildlife species in the Arctic National Wildlife Refuge (ANWR), including snow geese, muskox, caribou, dall sheep and moose. Fish and Wildlife are developing an ecological monitoring plan for ANWR that would involve five major components:

1. large mammal surveys
2. monitoring of sites to represent the five general ecoregions in the refuge (coastal marine, inland tundra, alpine, taiga and boreal forest), where data on vegetation, soils, small mammals, birds, invertebrates and weather may be collected
3. collection of baseline information for areas of the refuge where there is no ecological information available
4. maintenance of ongoing, long-term studies of how the environment responds to disturbance
5. data management so that this information can be synthesized.

Because caribou, moose, snow geese and other animals migrate between Alaska and the Yukon, this research is likely to be of interest to ecological monitoring in Canada. It may be possible to integrate some of the research done in Alaska with research and monitoring that is being looked at through the Northern Yukon Ecological Knowledge Co-op.

**c. Monitoring in Ivvavik National Park.** Presented by Vicki Sahanatien (Parks Canada)

The goal of ecological monitoring within Canada's National Parks is to read the "vital signs" of ecosystems, to provide an early warning of environmental change. This is especially important in parks, because they often serve as the core protected areas in many regions. Parks has been trying to standardize its methods of monitoring across the country. A monitoring plan has been developed for Ivvavik National Park that involves the following measurements:

1. biodiversity: snow track counts, land bird surveys, lemming counts, vegetation plots, aerial counts for large mammals
2. weather: two automated weather stations
3. landscape: remote sensing of landscape change
4. water quantity and quality: monitoring at selected sites
5. plant phenology: monitored through an International Tundra Experiment site in the park
6. human use: monitoring effects of visitors
7. cultural resources: monitoring of human relations with the environment

Permanent plots have been selected for repeated observations. Research that should be underway at Ivvavik Park in 1997 includes plant phenology measurements, landbird monitoring, climate measurements at two stations, water flow at the Firth River, and monitoring of visitor camp sites along the Firth River.

**d. Man and the Biosphere program.** Presented by Don Russell (Environment Canada)

The United States Man and the Biosphere Program (MAB) is currently funding research on the effects of hunting on population dynamics and co-management of the Porcupine Caribou Herd. The project is designed in two phases. The first phase will use computer models to examine harvest levels and boundaries in predicting sustainable harvests on the Herd. The models will look at the effects of harvest levels on different age and sex classes in the herd and on increasing or declining populations. In phase two the project will design a harvest information system that can be the vehicle for communication among communities and between users and managers/researchers of the herd.

At a harvest workshop last November, a first version of a caribou information system was shown and discussed. (*Web Address: [www.taiga.net/caribou](http://www.taiga.net/caribou)*) This information system includes a simplified caribou model that looks at the effects of harvesting at different levels and from different sex classes (bulls only, bulls and cows, or cows only).

Don presented a brief account of Porcupine caribou mortality and birth rates and noted that although the Bluenose, Western Arctic and Porcupine caribou herds all were at the same population levels in the early 1970s, populations in the George River and Western Arctic herds are now much larger than those of the Porcupine herd. This suggests the natural rate of increase is less for the Porcupine Caribou.

Plans for next year will be to refine the caribou model and develop the caribou information system. Through this project, researchers and communities will also look at the potential to provide communities with Internet training opportunities so that people can make good use of the caribou information system.

### **8. Breakout groups to tinker with indicators**

Two separate groups were formed to discuss some indicators which needed 'tinkering.' Discussion in the first group focused on four indicators:

1. organochlorines and metals in snow,
2. permafrost and soil temperatures,
3. water quality and discharge levels, and
4. reported harvest patterns and activities.

The second group also discussed four indicators:

1. abundance and distribution of coastal birds,
2. arrival and departure dates of migratory birds,
3. broad patterns of caribou annual movements, and
4. flowering timing of plants.

The comments of each working group are summarized in Appendix II, Tables 1 and 2.

### **9. Breakout groups: Introduction to the Internet and further discussion of indicators**

Participants split into two groups for this session. People that were not already familiar with use of the Internet and World Wide Web system joined an introductory session on Internet use, led by Mike Dehn in the Yukon College computer room. The rest of the participants took part in a discussion of remaining issues involving indicators to be used in the Co-op monitoring program. A summary of comments on indicators discussed in this session is provided in Appendix II, Table 3. Some new indicators were proposed, and are listed in the table.

### **10. Experimentation with the Co-op web site**

Computer terminals in the Yukon College computer room were available for participants to explore the web site developed for the Northern Yukon Ecological Knowledge Co-op by the team at the Environment Canada. *Web Address: [www.taiga.net/coop](http://www.taiga.net/coop)*

## 11. Responses to the web site

The Knowledge Co-op site on the World Wide Web (WWW) is intended to be the main communications resource for the Co-op. It was noted that the web site is useful for keeping up-to-date on information and providing people with information when they need it. It was suggested that, for people in the communities to use this means of communicating and getting information, training in the use of the Internet, including email and the World Wide Web is needed. Delegates at the meeting agreed to act as contacts for arranging such programs in their communities. Details of the computer facilities in each community will have to be assessed in order to arrange Internet access.

During the discussion of the web site, questions on information security were raised. It was noted that information security for individual web sites is the responsibility of the site manager, which in this case would be Environment Canada. There were also concerns about what type of access the public will have to information collected by the Co-op. Some information that is used by the Co-op is already public, such as the data which is obtained from government organizations. Community information, however, may be more sensitive and perhaps not all of it should be provided to the public. It was suggested that information should be returned to the communities so that they could review it and decide what information should be made publicly available. This community approval process could be made easier by asking people during interviews what material they do not want presented to the public.

## 12. Closing remarks

There were closing comments from the participants. After experience with last year's report, it was suggested that the report be sent back to the communities to get verification that the information in it was correct before being published (*Note: this has been done*). Another comment was that although they enjoyed this year's and last year's gatherings, not everyone remembers them during the year. One way to keep the Knowledge Co-op in people's minds would be through more media coverage (community-based and other) to let people know what's going on here. It was suggested that the Co-op should put together a press release discussing the program and the results of this year's gathering and submit it to local and regional newspapers and radio stations.

Thanks were given to the Wildlife Management Advisory Council (North Slope) for their support in organizing the meeting. Doug Urquhart reminded us to keep the monitoring program simple and working well, and closed the meeting with a prayer.

### 13. Action items from the gathering

Plans for action for several items were discussed at the second annual gathering. Table 1 below lists the tasks that were discussed at the meeting and provides details of the actions planned for the next year.

**Table 1:** Tasks for the coming year established at the second annual gathering of the Northern Yukon Ecological Knowledge Co-operative.

<b>Project</b>	<b>Task</b>	<b>Comments</b>
<b>Web site</b>	develop indicator pages	finish those we have information for and keep everything up to date
	Finalize graphics, fill in information for other categories	
	Copies of site for community review	send out with gathering report
<b>Community monitoring program</b>	Develop policy for access to community information	Environment Canada will need to meet with people in the communities
	Refine survey methods	community consultation, meeting of this year's interviewers and organizers
	Develop co-operative efforts with other organizations	links with schools, harvest surveys, local organizations, Parks, etc.
	Community workshops on Internet use	assess computer resources, organize funding
<b>Other monitoring programs</b>	Plant monitoring	application for start-up funds in Old Crow
	Bird survey	adaptation of NWT survey - pilot project?
	Permafrost and soil temperature	application for start-up funds in Old Crow
<b>Follow-up from gathering</b>	Production of gathering report	implement a community review process through gathering participants
	Publicity	send out a press release to local newspapers and radio stations

## **Appendix I Community Monitoring**

### **A. General discussion**

#### **1. Comments on the community monitoring project**

- Several people commented that community interviewers need to be given more time to gather their information, and should interview more people.
- Park wardens should be included in the community monitoring survey since they are out on the land making observations.
- When people talk about “not much of this,” – compared to what? We need something to compare with. We need to measure some things to provide a context for community observations.
- It is important to highlight the relationships that are part of local knowledge, like the observation made in Old Crow that when the horseflies come, the king salmon come a week later. Another observation was that the amount of cottongrass is related to the berry crops. These observations help us understand how different things in the environment are related to each other.
- Too many studies are being conducted that don't have anything to do with what the communities want to know. Reports that come back from these studies often aren't useful. Would like to have some studies on the foods eaten by animals that are important to the communities.
- It has been noted that people in the communities want science that is useful. The community observations reported here help fuel communications between scientists and communities, and help us identify where the gaps are that science could help study.
- The Gwich'in Harvesters Assistance Program is trying to get people out on the land again. There may be some way to get the Harvesters Assistance Program and the Ecological Knowledge Co-operative working together on the community monitoring project.

#### **2. Observations on environmental change**

- Gwich'in Delta and Northern Yukon areas: People have changed the places where they pick berries and fish, usually to places along the highway, and traditional sites are not being used as much anymore. This is important to observations of how things have changed year to year. Caribou are hunted from the highway now. Caribou came early in the fall migration this year, and migrated further south. Problem bears may be related to people not staying at camps to protect them, also people may not be hunting bears as much. Management of the Bennett Dam is important to water flow in the Mackenzie Delta region, and can affect things like ice conditions.
- Inuvialuit area: Whitefish disappeared for about 6 years but have come back now. Herring (cisco) numbers have decreased over the past 2 years, maybe increases in strong east winds could be driving the herring to Alaska. Ducks are not as plentiful as years ago, but geese and swans are increasing. One opinion was that there were more bear problems because people no longer stay year-round at camps. A response was that people never did stay at camps all year.
- Vuntut Gwitchin area: Prairie falcons and strange ducks have been seen in the Old Crow region. Also saw a drop in the numbers of seagulls when the Alaska oil spill happened. Songbirds have gotten scarce lately.
- Relationships between blueberries and bears have been studied in southern Canada. Berry crops are either: no berries (when flower buds are killed in the winter), good in some areas and bad in others (when weather is variable) or bumper crops (when weather is good for berry production everywhere). Black bears feed heavily on blueberries. In low berry years, young bears

and females will go into hibernation early, but not big male bears. Sometimes large male bears will eat the early-denning bears. Also in low berry years, pregnant females will abort their young because of poor body conditions. This can result in most bears getting pregnant in the same year, rather than half one year, half the next. These patterns have been observed in southern Canada, and the question was asked if the same thing has ever been seen in the Yukon.

**B. Comments recorded in working group discussions of the community monitoring program, 18 March, 1997.** These comments were in reference to the questions summarized in Section 4 of this report (“Breakout groups to discuss community monitoring”).

### Reports to the Plenary Session

#### Group A

Facilitator: Doug Urquhart

Rapporteur: Rae Moses

#### a. Is community monitoring worth the time and the money?

- Yes.

#### b. How shall we collect information?

- If monitoring is going to happen, we need to get feedback from the experienced interviewers. We need to be organized, and have a standardized method that can be used in the process. For example, we need to tailor the questionnaire to how people answer questions.
- We should make sure that the information obtained in the survey is useful for an ecological interpretation. Maybe there would be some possibilities for greater involvement in the schools as a learning experience, projects that would help to quantify variables and answer the question, “in relation to what?”
- Some indicators in the community monitoring survey are already being monitored in some of the communities, through harvest study programs (Inuvialuit and Gwich’in). The harvest studies do not include monitoring on weather. There are data for harvested species (how many harvested, where, etc.), but what is not there is observations and interpretations (good years vs. bad years, etc.).
- With regards to training someone to do the monitoring program: Training is not effective if you have to re-train each year because people drop out for various reasons. It is difficult to get commitment.
- We need to equip interviewers with some preparation, and maybe equipment like tape recorders.
- Quality control for information can be obtained from the interviews.
- It is important to get information in the same format from all the communities.

#### c. What are the best roles for various organizations?

- On the Delta side, we have harvest studies. However, not all the information in the studies is used. It would be good to look at the overlap between the existing harvest studies and the Co-op community monitoring program. Harvest studies are not yet in place in the Yukon.
- It should be noted that the present harvest studies will not necessarily be funded on an ongoing basis.
- In Old Crow, the primary renewable resource management organization is the Renewable Resources Council (RRC). The RRC has a mandate to know what the harvest is, what plants are

there, new sightings of animals. One problem is community commitment. Getting people involved is very hard. The few people that are involved are over-worked. The questionnaire is very good, the best seen so far. If members of the RRC went out and talked to 5 people each, once a month, we could get good coverage of information. That would give the RRC information it needs, and information could be funneled to the Co-op. The RRC also has a mandate to involve school children. There may be potential for the RRC to hire someone to work on the community monitoring program.

- Monitoring through the Co-op should be an independent program, but coordinated with existing programs (Wildlife Management Advisory Council for the North Slope, Joint Secretariat, Inuvialuit Game Council, Gwich'in Renewable Resource Board, Renewable Resource Councils, Hunters and Trappers Committee). The program may need to be modified to fit into other programs
- The role of Environment Canada should be to provide a link to the greater world, and generate a central database. The community monitoring program needs to be a co-operative effort. We all need to discuss protection of information and who gets access to information. If the program continues, we will have to draw up an agreement on research and information use.
- Who is the community? If we can demonstrate the value of this research to a 'broader community,' we may be able to get broader support and involvement. This might include the Parks, and other government organizations.

**d. Who should assume the costs?**

- The Inuvialuit Harvest Study would support this program, because it is parallel to their own.
- In terms of funding, the communities have the fewest resources, but community support can lead to funding from larger organizations.
- The Co-op should look for funding in stages. We need to take information back to the communities to gauge their interest in continuing the program.

**Group B**

Facilitator: Don Russell  
Rapporteur: Billy Archie

**a. Is community monitoring worth the time and the money?**

- Community monitoring information can be useful to direct what should be studied by scientists and co-management groups, to provide information focused on community interests and missing gaps in knowledge. If the program is ongoing, some issues will come out as being important and can be used to stimulate additional research.
- Community information often provides an 'early warning' of environmental change or important environmental issues.
- Information from all the communities can be used to give a regional picture of what and how things are changing.
- The 'end use' of each user group will be different but with enough overlap of interest it is worth doing.

**b. How shall we collect information?**

- The questions used in the community monitoring program need to be developed so the program can become more comprehensive.
- We need to be more specific with what "more", "less" and "average" refer to. Sometimes you may get 'negative' results, not 'average' on good years (i.e., nothing different).
- The study needs to be on-going, not lingering on a shelf. The more valuable to the community it is, the more successful it will be.

- Feedback should be provided to those that are contributing to the program. The timing of the survey is important to how well it works. March is a bad time (people are out hunting muskrats because prices are good right now). The best time for interviews would be late fall and early spring, which would separate out winter and summer observations.
- Based on experiences with the Gwich'in Harvest Study, it is hard for people to remember information, even if you interview on a monthly basis.
- Would a calendar-type survey be better? The cost can be high.
- Maybe a permanent sign could be put up that reminds people to respond to the survey (birders do this).
- One possibility for interviewing would be to pick 10-12 people that are active out on the land and have a general group discussion. However, some variability in reported observations may be lost if they are discussed in a group session. A strong-opinioned person may also sway the reports of others. Discussion groups may not be so good for those reasons.
- Would it be worthwhile to get "historic" information as well (one time only)?
- It is important to get not only observations, but also suggestions of why things are happening as well.

### **c. What are the best roles for various organizations?**

- It is hard to get volunteers because incomes are low and people need to be reimbursed for their time.
- Maybe the program could be tied in to the Gwich'in Subsistence Harvest Incentive Program.
- The Renewable Resource Councils and Hunters and Trappers Committee could handle asking questions for the monitoring program at the local level.
- Schools should be a big part of this, including community colleges.
- The Gwich'in Renewable Resource Board is trying to use both local and scientific knowledge to complement each other. For example, moose populations were reported to be low in the community, and a scientific survey supported the local knowledge. The Board also looked at char because of community concerns.
- The Northern Yukon Ecological Knowledge Co-operative is part of the national Ecological Monitoring and Assessment Network program that Environment Canada is involved with. Environment Canada is the co-ordinator, but only has funding to get the Knowledge Co-op program started. It should not be a costly program to maintain, however.

### **Group C**

Facilitator: Jack Kruse

Rapporteur: Renie Arey

### **a. Is community monitoring worth the time and the money?**

- Yes.

### **b. How shall we collect information?**

- The survey questionnaire used this year was too specific. Some elders that were interviewed had not been out on the land.
- Based on previous experiences with community interviews, at the start of the interview you should tell the elders all the questions you will be asking and then the elders will tell you stories which answer your questions. You can't just ask rapid fire questions.
- We need to be careful interviewing elders. Elders teach by telling stories. It is very hard to use this questionnaire format as there are too many questions and it is frustrating to interrupt elders to move on to the next question.

- It is possible that you could use two interview approaches, one for elders and one for younger people or elders who are comfortable with the detailed questionnaire approach.
- There is pressure (urgency) to interview elders before they pass away, and their knowledge is lost.
- At the Anchorage workshop there were two reasons for recording local ecological knowledge: 1), to obtain current information needed for management and 2), to capture the stories of elders.
- We should pay for elders time.
- To conduct the interviews you need to be a good listener. A month would be a good time, not necessarily full time, but to allow convenient times for interviews and follow-ups.
- People in Old Crow and Aklavik were supportive of community interviews after Gary Kofinas gave his presentations in the communities. This feedback is important.

**c. What are the best roles for various organizations?**

- The community monitoring program is a good idea but the local organizations don't have the money to fund it.
- It might be a good idea to get older grades from school involved in interviewing - "can't refuse youth." Elders could be interviewed when they accompany school trips out on the land. Yukon College students in Old Crow could also get involved.
- Some of the questions for the Co-op program could be added to existing harvest surveys, recognizing that some harvest studies are of limited duration.

**d. Who should assume the costs?**

- Perhaps we could get a small group in the communities to seek for funding sources.

## Appendix II: Tinkering with indicators

**Table 1: Indicators discussed in morning break-out group II, Wednesday, March 19, 1997. All the indicators were classed as needing work (bright green).**

Indicator	Current status	Working group comments
Coastal birds: abundance and distribution	<ul style="list-style-type: none"> <li>• lots of research on coastal bird populations, but no long-term, annual data sets</li> <li>• possibility of getting some data by initiating a survey like the NWT bird survey</li> </ul>	<ul style="list-style-type: none"> <li>• Getting information on bird population sizes is difficult to do and not something the Co-op can reasonably take on.</li> <li>• Could use harvest survey records to give information on game bird locations.</li> <li>• Could borrow the NWT bird checklist and try using it in the N. Yukon, with ecotour groups, parks staff, other non-residents, and communities. In the NWT survey, a single survey is completed for each day. Also, the format may not work in the communities. Maybe we can modify the methods in the survey to better suit our needs.</li> </ul>
Migratory birds: arrival and departure dates	<ul style="list-style-type: none"> <li>• Except for possibly some observations recorded by parks staff, we have no information on this</li> </ul>	<ul style="list-style-type: none"> <li>• Harvest surveys record date of harvest, which would be an indication of arrival times for birds harvested in the spring.</li> <li>• Hunters could be interviewed as they return from spring hunting to see what birds they saw.</li> <li>• Perhaps there could be a poster put up in the schools or communities that people could use to record first sightings of birds. Would have to find out which birds are known in the communities, and use pictures to ensure common understanding. Snow buntings were suggested as one bird which could be monitored.</li> <li>• Monitoring of this sort might work best in the schools, where it could be combined with science or native language programs.</li> <li>• Arrival dates are easier to take note of than departure dates.</li> </ul>

Table 1 (continued)

Indicator	Current status	Working group comments
Caribou: broad patterns of annual movements	<ul style="list-style-type: none"> <li>• Good past record on caribou movements from radio-collaring research, but those programs have stopped</li> <li>• Continuing research on use of calving grounds</li> <li>• Need information on year-round movements of caribou, near communities and also away from communities</li> </ul>	<ul style="list-style-type: none"> <li>• There will be 12 Porcupine Herd caribou collared this year, but that is a short-term project.</li> <li>• Could use incidental information on caribou locations and numbers whenever someone from the communities is out flying over the surrounding areas.</li> <li>• Community monitoring survey will provide some information on movements.</li> <li>• Could have maps put up each year in a community office or home where people could come and mark down locations, dates and numbers whenever caribou are seen. These maps would be collected each year.</li> </ul>
Plantwatch (first flowering)	<ul style="list-style-type: none"> <li>• plant phenology is useful indicator, but so far will only be monitored at ITEX site in Ivvavik Park</li> <li>• Plantwatch is a national program to look at first flowering and full flowering dates for 2 northern species</li> </ul>	<ul style="list-style-type: none"> <li>• There is interest in getting the Co-op involved with the Plantwatch program.</li> <li>• Perhaps the best way to do this is through the schools. Some individuals in the communities may also be willing to take measurements. It may be possible to measure other plants in addition to the two specified in the Plantwatch program (mountain avens and purple saxifrage).</li> </ul>

**Table 2: Indicators discussed in morning break-out group II, Wednesday, March 19, 1997.**

Indicator	Current status	Comments
Snow: organochlorines and metals	<ul style="list-style-type: none"> <li>• hoping to establish some contaminants sampling programs</li> </ul>	<ul style="list-style-type: none"> <li>• Snow is likely to be a good indicator of atmospheric contaminants. Joan Eamer is hoping to obtain funding to support a program of measuring organochlorines and metals in snow in the Northern Yukon, in collaboration with Fisheries and Oceans Canada. Measurements would be made with grab samples from the snowpack, once per year.</li> <li>• There is potential for getting schools involved with sampling.</li> </ul>
Permafrost and soil temperatures	<ul style="list-style-type: none"> <li>• 10-year record for Eagle Plains</li> <li>• some monitoring in Ivvavik</li> </ul>	Soil temperatures and depth of thaw in permafrost are likely to be good indicators of changes in temperature associated with climate change. There is a 10-year record of soil temperatures from Eagle Plains (Agriculture Canada). Ivvavik Park may be measuring soil temperatures at one site through the ITEX program. If Herschel had a permafrost grid established, the park rangers could probably take thaw depth measurements. There also is a possibility of establishing some community monitoring programs.
Water quality and discharge levels	<ul style="list-style-type: none"> <li>• DIAND / Env. Canada water monitoring network has been greatly reduced</li> <li>• Water quality sampling probably only on the Porcupine River</li> </ul>	<ul style="list-style-type: none"> <li>• Changes in water quality and discharge levels will be important factors in determining how ecological systems respond to climate change. However, measurements of water quality are expensive to make and there is lots of local and regional variation.</li> <li>• Parks may make some water quality measurements on the Firth River.</li> <li>• Parks and Environment Canada are re-establishing the Firth River discharge station with funding assistance from WMAC (NS).</li> </ul>
Reported harvest: patterns and activities	<ul style="list-style-type: none"> <li>• some harvest studies in place in NWT communities</li> </ul>	<ul style="list-style-type: none"> <li>• There are harvest studies collecting data in Fort MacPherson and Aklavik. Some data are currently available from these programs.</li> <li>• There may be some information that is not being collected that would be useful. Would like to use the data to characterize the distribution and abundance of wildlife species, also abnormal conditions of interest to the contaminants program.</li> </ul>

**Table 3: Indicators discussed in afternoon break-out groups, Wednesday, March 19, 1997.**

<b>Indicator</b>	<b>Previous status</b>	<b>Current status</b>	<b>Comments</b>
Tree-ring analysis for metals	suggested to be dropped	red (dropped)	Scott Gilbert explained some of the problems that are associated with this method of looking at metals in plants, which include difficulties in using un-proven methods, and the lack of research in the Northern Yukon (see the collection of Assessment Reports for details). If we change our minds later, we can always measure it in the future.
Lake sediment cores	suggested to be dropped	red (dropped)	No data are currently available in the Northern Yukon, and techniques are expensive. We can always pick this one up again later with no loss of data.
Human land-use patterns	white (no information, needs community initiation)	yellow (some data available from the communities)	Harvest studies in the NWT communities record harvest locations and thus can be used to monitor land use patterns. In addition, the NWT has been monitoring locations of cabins in the Delta and into the N. Yukon. This database is in a GIS format, and could provide information on patterns of use on the land.
Human-bear encounters	suggested to be dropped	yellow (may be possible to use)	Data on cabin locations were originally monitored in the NWT in response to increased reports of problem bears, and problem bear occurrences at camps have been recorded for the past 6-7 years. Park rangers also record instances of human-bear encounters, but these range from simple sightings of bears to more "interactive" encounters. It was noted that data on bear encounters must be interpreted very cautiously, as changes could be related to changes in bear populations, human populations and use patterns, and other factors.
Beavers/muskrats: contaminant levels (metals)	suggested to be dropped	yellow (wish to gather baseline data)	This indicator was suggested to be dropped because there is no data available for the Northern Yukon. However, because these animals are used in the communities, it was suggested to investigate the possibility that a single set of samples could be taken that could provide a baseline measure for these animals.

Table 3 (continued)

Indicator	Previous status	Current status	Comments
Ptarmigan populations	green (ptarmigan)	bright green (needs work)	Population numbers of ptarmigan and gyrfalcons may be good environmental indicators because they are year-round residents in the Northern Yukon. Surveys on the coastal plain were last done in 1992 by Renewable Resources, Yukon Territorial Government (YTG). It was recommended that the Co-op express its interest in these measurements to YTG, and request them to continue the monitoring. Ptarmigan and falcon surveys could be done in the same survey.
Peregrine falcons/gyrfalcons	green	bright green (needs work)	Gyrfalcon populations were suggested to be a good indicator because they are year-round residents and are at the top of the food chain. There is a need to stimulate the continuation of monitoring programs (see comments on ptarmigan, above). Fran Mauer also noted that annual surveys of peregrine falcons have been done on the Porcupine River in Alaska since 1979.
Fur prices		new	Fur prices might be useful in explaining changes in land use patterns. There should be existing long-term records of this.
Migratory birds: abundance and distribution		yellow (some data available)	Species abundance for songbirds are going to be monitored in the Arctic National Wildlife Refuge, which could provide some useful data. This indicator also discussed in another group session.
UV monitoring	white (no data)	green (program starting)	A station to monitor ultra-violet radiation will be installed this year at Sheep Creek in Ivvavik Park.
Moose population and abundance	yellow (limited data)	yellow (limited data)	Unlikely that YTG will spend money to monitor moose in the Northern Yukon. Some data available for moose in Old Crow Flats for migratory population coming from Alaska (US monitoring).
Ice-thickness	suggested to be dropped	bright green (needs work)	Change focus of indicator to lakes. It was suggested that monitoring of what lakes freeze to the bottom and what lakes don't could be useful, as well as ice-thickness. It may be possible to measure these variables with remote sensing. Lake ice break-up information can also come from satellite data.

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