

“Conservation Science in the Yukon”

Workshop Report

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Hosted by:

Yukon Chapter of the Canadian Parks and Wilderness Society

With the support and participation of the:

Wildlife Conservation Society

&

Denver Zoological Society



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YUKON CHAPTER

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We thank Dr. Alan Rabinowitz of the Wildlife Conservation Society, and Dr. Brian Miller of the Denver Zoological Society for their continuing interest in Yukon conservation. We appreciate their leadership in supporting this workshop; and, their encouragement and conviction that the Yukon has a remarkable opportunity to protect boreal and sub-arctic ecosystems of global importance.

We thank the visiting and Yukon scientists for participating in this timely workshop, and for offering your collective knowledge and wisdom to help CPAWS and the Yukon scientific community achieve our conservation goals through applied conservation science.

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Workshop Summary and Recommendations

This workshop on conservation science in the Yukon Territory was hosted by CPAWS-Yukon, with the support of the Wildlife Conservation Society and Denver Zoological Society. The two-day forum explored challenges and opportunities in applying conservation science in the Yukon's boreal and sub-arctic landscapes. Topics ranged widely over Yukon ecosystems, the status of biodiversity conservation and protected areas; key issues in conservation biology and conservation area design; representation of ecosystems and protection of focal wildlife species. The scientists present generated lively discussion and offered a range of recommendations about applications of conservation science, designing and implementing a conservation strategy, and potential conservation science partnerships in the Yukon.

Prominent discussion themes included the remarkable conservation opportunities presented by vast and diverse undisturbed landscapes, along with a globally significant array of special ecological elements. In contrast, a sense of urgency pervaded the discussion because large-scale energy developments, expanded forestry operations, and renewed mineral exploration loom on the immediate Yukon horizon— while land use and conservation planning remain incomplete.

The workshop resulted in the identification of specific conservation research priorities, commitments to further develop partnerships among those agencies present, and agreement to re-convene the workshop or similar forum to act on the recommendations.

This summary outlines the key conservation science questions, themes and recommendations that arose out of the workshop and subsequent comments from participants. Thank you in particular to Craig Groves, Alan Rabinowitz and Brian Miller for their suggestions. Additional topics of interest appear throughout the report under the various discussion headings. Many of these issues and recommendations are interrelated.

I. The Most Important Questions

A) Basic Biological Information and Mapping: Which Gaps Are Most Important?

Knowledge of the species, ecosystems, and ecological processes in the Yukon is incomplete. Suggested priorities for advancing our understanding of the Yukon's ecology include:

1. classification and mapping of vegetation, soils, and ecosystems
2. biological inventories of regions where little or no work has been done,
3. studies of pristine freshwater ecosystems,
4. inventory and evaluation of special ecological elements,
5. boreal forest ecosystem studies,
6. enhanced effort on species taxonomy.

B) Priority Research:

What Research Is Most Useful To Support Conservation Goals?

From neighbouring provinces and states there is much information on the same wildlife species, similar boreal forests, and northern oil and gas development. How critical is it for there to be Yukon studies? Will policy makers in the Yukon pay attention to scientific information from other areas, or must the information be home grown?

Participants acknowledged that information from comparable regions could support Yukon conservation planning, but that specific Yukon research was also needed to address gaps in the available data. Priorities should include a synthesis of existing information, identifying major knowledge gaps, identifying perceived threats and filling information gaps where the risks are greatest.

Suggested specific research priorities from the workshop, that also relate to the above priorities include:

1. research first on the areas at greatest risk from industrial development and global climate change,
2. completion of focal species studies; use focal species modeling, combined with development scenarios to predict a range of cumulative impacts and the effects of climate change,
3. predator-prey dynamics, such as within the range of woodland caribou herds,
4. assessment of conservation objectives and the optimum configuration of conservation plans in the southeast Yukon region in Kaska traditional territory,
5. assessment of alternative national park candidate sites and protected area configurations in the Yukon-BC trans-boundary region,
6. determination of ecological and development thresholds in proposed development areas; e.g., with respect to hydrocarbons in the Peel watershed,
7. assess the impacts of climate change on Yukon's conservation strategies.

II. Guidance on Conservation Strategy

A) Approach

Workshop participants recommended an approach to a conservation strategy. The group emphasized the need to empower community people with scientific knowledge to complement local knowledge and sense of place.

B) Key Ecological elements in a Yukon conservation strategy

- Special elements
- Representation
- Ecologically functional populations
- Natural disturbance dynamics and regimes
- Evolutionary and ecological processes
- Functional connectivity

C) Threats

As part of an over-all conservation strategy, workshop participants addressed the need to predict the impacts of development in areas outside of protected areas. Research work should include:

1. development of models to anticipate/predict the consequences of alternative development scenarios. A variety of tools exist and actual modeling is not difficult or expensive. Use maps to communicate the results.
2. modeling to encourage best management practices amongst alternative scenarios.

D) Reverse Matrix¹:

What Work Is Needed To Further This Concept In The Yukon?

Is the Yukon a good place to invest more effort in the reverse matrix approach to conservation, focusing on where development should be allowed to take place and under what conditions, instead of our usual methods of figuring out where development won't be allowed through the establishment of protected areas? Suggested priorities for further work include:

1. assessment of how best to realise the reverse matrix opportunity in the Yukon,
2. development of new tools for conservation planning in the context of a reverse matrix approach,
3. a synthesis on threats such as oil and gas, mining, and forestry and field work to look experimentally at the thresholds of development with respect to the integrity of wildlife and biodiversity and other conservation parameters,
4. determination of acceptable levels of development in boreal ecosystems, using "dose-response" curves to demonstrate how ecosystems will change with increasing development.

E) Ecological Integrity and Monitoring

Maintaining ecological integrity received considerable attention in the workshop, given the largely intact ecosystems that characterize most of contemporary Yukon. Participants indicated that we need to:

1. apply the precautionary principle, in light of the paucity of data and the inability to predict cumulative impacts, to help maintain ecological integrity, define areas of development when applying the reverse matrix approach, and complete conservation-oriented land use plans,
2. improve capacity to carry out ecological monitoring, and in turn define the characteristics of ecological integrity in the Yukon,
3. develop quantifiable objectives and benchmark standards for ecological integrity,
4. use the Yukon as an international benchmark for ecological health.

¹ **Editor's Note:** The *reverse matrix model* referred to throughout this workshop summary, is based on the idea of connected nodes of human habitation and development within a greater matrix of intact ecosystems. The model is considered by many to be more appropriate to a place like the Yukon, where the existing landscape is approximately 77% wilderness now, as defined by the Yukon State of the Environment Report. Protected areas may still be embedded in a reverse matrix model, and there would still be progressive zones of human activities ranging from development, through lower impact activities to strict protection of biological or other values.

F) Land Use Planning

Land use planning was highlighted several times as an important process through which to influence conservation outcomes. What is missing from the land use planning process that could advance conservation? Suggested improvements in the land use and conservation planning process include:

1. clear terms of reference on regional conservation goals and objectives,
2. improved use of conservation data in land use planning,
3. planning commissions and related processes that are transparent and open to data and perspectives from a variety of sources,
4. better communication of the conservation aspects of planning,
5. political acceptance of conservation science information in land use planning,
6. conservation planning expertise enlisted in the preparation of land use plans.

G) Communications

The importance of effective communications in achieving conservation goals was emphasized throughout the workshop. Participants recommended that we:

1. prepare a communication strategy for making scientific information available and understood,
2. put scientific information in the hands of ordinary people and communities,
3. make conservation science in the Yukon relevant to decision makers and politicians; try to translate scientific information into public policy,
4. improve public communications on the role and importance of ecological communities,
5. provide clear links between conservation, communities and economics,
6. ensure scientific information is pitched at a level appropriate for each audience,
7. emphasize ecological features that are of global significance.

III. Partnerships and Research Forums

How can we enhance conservation science capacity in the Yukon generally, and specifically build on the Yukon's Northern Research Institute? Participants recommended that the Yukon:

- A) make the NRI a permanent home for conservation science research and partnerships in the Yukon,
- B) use the NRI facilities to funnel in graduate students, post-doctoral studies, and folks on sabbaticals who can work on science in the Yukon.
- C) transform the role of the Yukon from a frontier in boreal science to a center of excellence for northern and mountain boreal research,
- D) enhance the capacity of the Yukon scientific community by developing partnerships with NGOs and universities, in both Canada and the U.S.
- E) repatriate information collected in Yukon but archived elsewhere.

Participants further recommended that we engage communities in conservation science research and develop partnerships with First Nations, with particular attention to the role of local and traditional ecological knowledge. Offer community-based science courses and equipment to bring science to the people living in the communities.

What is the best role for organizations such as the Wildlife Conservation Society? Organizations such as the Wildlife Conservation Society and other national and international NGOs could assist with:

1. capacity building of First Nations, and non-government organizations,
2. cooperative conservation planning,
3. training,
4. collaborative field studies and inventories.

IV) Next Steps: Science Advisory Group

Participants had many different perspectives on the utility of independent scientific advisory panels or other approaches to furthering conservation science, such as on-going conservation science working groups or “think tanks”, annual forums or conferences. No clear consensus was reached, but key points included:

- the importance of independent scientific advice,
- continuity of participation is key, coupled with the use of additional expertise as required,
- there are advantages to remaining flexible and informal,
- annual workshops with a focused agenda are a very good alternative to a science panel,
- key roles of an annual conservation science forum are facilitating partnerships, assessing progress, obtaining research funds,
- combine the annual workshop with an annual conference where research results could be presented and discussed

In response to this discussion, CPAWS-Yukon proposes to:

1. support the organization of an annual invitational conservation science workshop, in partnership with other organizations such as the Northern Research Institute, Wildlife Conservation Society and others,
2. prepare a focused agenda for the next workshop (fall of 2004) that will further explore research priorities and develop specific projects as outlined in these proceedings,
3. secure funding to support the proposed conservation science workshops.

Background to the Workshop

In the fall of 2002, Dr. Alan Rabinowitz of the Wildlife Conservation Society, and Dr. Brian Miller of the Denver Zoological Society visited the Yukon at the invitation of CPAWS-Yukon. Both organizations had expressed interest in supporting conservation science in northern Canada, in particular in the Yukon. The purpose of the visit was to explore ways to upgrade our capacity in conservation science. Drs. Rabinowitz and Miller gave public lectures on their work and held meetings with CPAWS-Yukon and Yukon government biologists to determine how their organizations might assist ongoing conservation research in the Yukon.

During these meetings, CPAWS-Yukon identified several objectives:

- Obtain the best advice available on the most effective use of conservation science in our work,
- Obtain assistance with our overall approach to landscape scale conservation design and protected areas research such as field surveys and mapping, peer review of our analysis and conclusions;
- Carry out applied conservation biology research and analysis on specific protected area proposals;
- Hire field survey biologists to help carry out required protected area technical assessment work;
- Add a strong conservation biology component to our GIS mapping work.

Subsequent grants from the Wildlife Conservation Society and Denver Zoological Society enabled CPAWS-Yukon to host the invitational workshop to explore conservation science research and planning strategies in the Yukon Territory.

Public Forum

Prior to the invitational workshop, visiting North American scientists and conservation leaders attended a public forum in Whitehorse, the capital of the Yukon Territory. Close to 100 people turned out to hear five of the visiting scientists speak at the forum. Dr. Fiona Schmiegelow of the University of Alberta and Dr. Brian Miller of the Denver Zoological Society and Southern Rockies Ecosystem Project gave presentations on recent conservation research and planning projects in the western mountains region of North America. Dr. Katherine Parker and Dr. John Weaver provided insights into important wildlife conservation research in the boreal forest, and Dr. Mark Boyce outlined ways to predict large-scale environmental impacts from mega-projects such as in the diamond mining region of the Northwest Territories.

For more information on the public forum presentations listed below and other aspects of northern conservation science, contact CPAWS-Yukon at cpaws@cpawsyukon.org or communicate directly with the respective authors. Their e-mail addresses are listed in the Appendix.

Dr. Fiona Schmiegelow, University of Alberta: "Setting Targets for Conservation: Of Science, Society and Strategy." Dr. Schmiegelow spoke on the scientific basis for establishing conservation targets, and how societal influences have shaped these strategies.

Dr. Brian Miller, Denver Zoological Society and Southern Rockies Ecosystem Project: "A Science-Based Approach to Rewilding the Southern Rockies." Dr. Miller presented a new science-based conservation plan and protected areas design for the Southern Rockies, including the Grand Teton National Park region. The plan includes provisions for "rewilding" this increasingly fragmented landscape.

Dr. Katherine Parker, UNBC: "Applying Science Towards Maintaining Large Mammal Predator-Prey Systems in Northern BC" Dr. Parker described her work in the Muskwa-Kechika Management Area, one of North America's most important and innovative conservation areas, located in northern B.C.

Dr. Mark Boyce, University of Alberta: "The Use of Large Mammal Habitat Models for Conducting Cumulative Effects Assessment." Dr. Boyce explained his work to assist in predicting and managing the long term impacts of development projects.

Dr. John Weaver, Wildlife Conservation Society: "Transboundary Conservation of Grizzly Bears in the Greater Nahanni National Park Ecosystem." Dr. Weaver described how human use management and potential boundary changes to Nahanni National Park could be supported by research into grizzly bear habitat use.

Invitational Workshop Notes

The two-day invitational workshop followed the public forum, with the eight visiting scientists joined by twelve Yukon biologists and conservationists. Participants included representatives from government, NGOs, Yukon College and independent researchers.

The following notes are a summary of presentations, comments and questions. CPAWS did not transcribe the verbatim proceedings. Although detailed notes were taken during the meeting, we streamlined and paraphrased many of the comments. For this reason, the text is not attributed to individuals. We also organized comments by topic to make it easier to find information.

The Conservation Science Questions

The issues and questions that CPAWS posed to the participants prior to the workshop were:

- What do NGOs need to know about northern boreal landscapes to help design effective conservation strategies? What are the key paradigms for this landscape?
- From the perspective of northern boreal species, what does the ideal conservation and protected areas strategy look like?
- What are the best approaches to integrate traditional ecological knowledge in conservation area planning?
- How much protection is enough?
- How can we use applied conservation principles to achieve the best effect in the Yukon?
- What key conservation science questions need to be asked to help us design protected area networks in the Yukon?
- What are the most important research priorities given the data that we have now?
- What role could an on-going scientific advisory group play to support conservation research and planning in the Yukon?

These questions were distilled into 4 key workshop objectives:

1. Identify the most important conservation science questions for the Yukon;
2. Seek guidance on a conservation strategy;

3. Identify potential partners for research (who needs to be involved, who else is doing this kind of research);
4. Would a scientific advisory group be beneficial, and what would it do?

Workshop Results Overview

The workshop explored challenges and opportunities in applying conservation science in the Yukon's boreal and sub-arctic landscapes. Topics ranged widely over Yukon ecosystems, the status of biodiversity conservation and protected areas; key issues in conservation biology and conservation area design; representation of ecosystems and protection of focal wildlife species. The scientists present generated lively discussion and offered a range of recommendations about applications of conservation science, designing and implementing a conservation strategy, and potential conservation science partnerships in the Yukon.

The workshop resulted in the identification of specific conservation research priorities, commitments to further develop partnerships between those agencies present, and agreement to re-convene the workshop participants in the fall of 2004. The key themes and recommendations are outlined in the workshop summary at the beginning of the report. Additional suggestions and topics of interest are covered in the report on each discussion.

Introductory Presentations

Yukon Conservation Overview

Juri Peepre, CPAWS-Yukon

Since 1999, the percentage of formally designated protected areas in the Yukon increased from 8.7% to about 11.8%, with 8 more pending protected areas that will bring the total to about 13.8% in the near term. The CPAWS-Yukon chapter contributed to the protection of 2.8 million acres, including 3 new territorial parks. The Yukon Protected Areas Strategy was completed in 1999 after years of effort and public consultation. In 2003, work on YPAS was suspended by the current government.

Even though the Yukon government stopped worked on new protected areas, candidate areas pending through land claims agreements and land use planning could increase the percentage of conservation lands to more than 23% during the next five to seven years. Land use planning processes will contribute to the conservation lands matrix through the identification of important wildlife habitat, riparian corridors, ecological links between protected areas, and management of buffer zones. Parks Canada has identified the Wolf Lake region in southern Yukon as the leading area of interest to establish a new national park in Natural Region #7.

*For more detailed information and photographs on the Yukon landscape, conservation opportunities and ecoregion status, visit: www.cpawsyukon.org or obtain a copy of *Yukon Wild, Natural Regions of the Yukon*, available by ordering through cpaws@cpawsyukon.org, or phone 867-393-8080. (\$20.00 including postage.)*

CPAWS-Yukon Conservation Goals

Although suspended by the current government, the Yukon still benefits from the Protected Areas Strategy goal and scientific framework to complete a protected areas system. In addition, through land claims negotiations and existing land claims agreements there are a range of tools available for designating protected areas. The degree of support for protected areas in the communities is variable, but the majority of communities in the region are in various stages of planning for conservation. Recent surveys demonstrate strong public support for conservation and increasing the amount of protected lands. Public interest focuses on conserving clean water, wildlife populations, boreal forests, and the continued opportunity to hunt, fish and recreate in the outdoors.

CPAWS Goal

The current long-term goal of CPAWS-Yukon is:

To protect for all time the variety of life and wilderness values of the Yukon through a network of protected areas and special management zones, supported by the maintenance of ecological integrity on all lands and waters outside of protected areas.

Objectives

The long term objectives of the CPAWS-Yukon protected areas initiatives are to complete a protected areas system that:

- has representative and ecologically viable examples of all the ecoregions, supplemented by ecological linkages between conservation lands,
- protects special ecological elements, hydrological and geological features,
- includes complete watersheds as large wilderness areas,
- protects a full range of critical wildlife habitats including wetlands,
- fully protects at least three intact examples of large mammal ecosystems in their entirety, for example the range of a woodland caribou herd,
- protects special cultural features and cultural landscapes,
- provides for the on-going maintenance of the full range of northern biodiversity through a system of connected protected areas, wildlife movement routes and special management zones.

Conservation Outlook

These are some of the basic conditions within which conservation science and planning will take place in the Yukon:

- Vast areas of wilderness, including ecosystems with their full complement of carnivore guilds and prey species are still intact, allowing room for conservation choices before lands are allocated to industry. This condition is juxtaposed against government policies encouraging rapid and extensive dispositions for oil and gas leases, mining, new roads to resources, and timber harvesting;
- The final ratification of further Yukon land claim agreements are expected, and the agreements will have strong provisions for protected areas, environmental assessment, wildlife conservation, and land use planning.
- CPAWS-Yukon has developed cooperative working arrangements with some First Nations where significant conservation opportunities are apparent. First Nation capacity building, use of science in decision-making, conservation training, planning, and employment related to conservation are needed to support these arrangements.
- The Protected Areas Strategy for the Yukon has been suspended. It will take a concerted effort to complete the network of protected areas on a sound scientific and local knowledge foundation. Even without the Strategy, however, the Yukon possesses all the legal tools and processes necessary to complete a protected areas network – what is missing is the government leadership needed to advance the conservation of biodiversity and wilderness;
- The population based in small communities is still relatively connected with the land and its wildlife, coupled with improved local control over decisions affecting the disposition of renewable resources. The Renewable Resource Councils are exercising their influence in an increasingly public way, providing an opportunity for cooperation with ENGOs and the scientific community;
- Continued unstable base metal prices, distance from markets and a relatively “poorly” developed infrastructure are disincentives to development. This will help provide a bit more time to implement conservation goals;
- Government economic policy remains fixated on mega-projects and resource extraction, particularly hydrocarbons - in order to support implementation of a conservation agenda, there is an urgent need to develop and prove the case for economic alternatives;
- Local conservation organizations have the ability to carry out sustained and effective protected area initiatives;
- Notwithstanding the many serious conservation and environmental concerns relating to environmental and community impacts, energy and climate change, the prospect of

gas pipelines in Yukon and NWT may provide the opportunity to leverage a protected areas network. The formal application and review process for the Yukon pipeline remains uncertain, but if market conditions permit, either proposal could move forward to assessment and permitting;

- There are gaps in the existing capacity of NGOs and governments to carry out the necessary site-specific scientific research and assessments to implement conservation plans. The lack of biological data in a form suitable for mapping has also hinders conservation planning.

Summary of Selected Special Elements and Ecosystem Characteristics of the Yukon

This list of selected special elements and ecosystem characteristics of the Yukon is by no means complete. We intend only to provide the reader with a sense of the landscape and its features.

- 23 distinct ecoregions many of which are shared with neighbouring jurisdictions, with portions of 4 ecozones; 7 of 23 ecoregions are represented in protected areas larger than 2,000km²;
- Diverse and intact mountain boreal, sub-arctic taiga, arctic tundra biomes. There are no large protected areas in the Yukon's most productive forest region, in the Southeast;
- Major North American flyways including the Tintina Trench and Shakwak Trench, continentally important staging areas, internationally important breeding areas for waterfowl; approximately 50 major wetlands of importance, of which 5 are protected;
- Continentally important populations of migratory species including Peregrine Falcon, Trumpeter Swans, Tundra Swans, and many other waterfowl;
- Intact predator-prey ecosystems on a vast scale, including intact carnivore guilds of global importance;
- Continentally important resident populations of grizzly bear, Dall sheep, woodland caribou, grey wolves, wolverine;
- Hundreds of intact watersheds with pristine water quality and aquatic habitat;
- Yukon River and its tributaries harbour the longest salmon run in the world;
- Endemic fish species resulting from ancient patterns of continental glaciation;
- 23 woodland caribou herds, 3 large herds free of disturbance, a feature now increasingly rare in North America;

- Critical habitat for the 125,000 animals of the Porcupine Caribou herd;
- Vast Beringian landscape with numerous endemic species and unusual ecological conditions;
- Rare plant species and species assemblages, often linked to Beringia, and the merging effects of coastal, interior boreal and sub-arctic biomes;
- Unusual and extensive grasslands in boreal forest ecosystems;
- Nationally significant warm and cool mineral springs, with associated tufa formations and rare plant assemblages;
- Internationally significant complex of large pristine mountain lakes and associated ecosystems;
- Numerous biological hotspots with unusually rich biodiversity, including for example, the far Southeast Yukon in the lower La Biche and Beaver watersheds; Kluane National Park region; Old Crow Flats, a wetland of international importance; Fishing Branch watershed;
- Vast intact wilderness areas, encompassing entire mountain ranges and large watersheds, free of roads or permanent human habitation. These wilderness areas are reservoirs of biodiversity and evolutionary processes, significant on a global scale.

CPAWS Priority Areas of Interest for Conservation Work

CPAWS-Yukon works toward conservation goals throughout the territory, but these are the three priority regions:

SE Yukon and NE British Columbia (Kaska Traditional Territory)

This vast region encompasses much of the spine of the Yukon and NWT, and extends well into BC in the Liard basin. The Kaska Nation has a working protocol with CPAWS-Yukon and B.C. The Kaska are interested in completing resource plans and a Conservation Area Design for their whole traditional territory, and work is underway to realize that goal. Conservation groups will participate in the process. In the Yukon, a major obstacle to ecosystem-based forest planning was removed when the federal Minister accepted a consultant's report in the spring of 2002 laying out a planning framework for the SE Yukon. The Kaska have a Bilateral Agreement with the Yukon Government that will provide a window of opportunity to complete resource and conservation planning in the region.

Peel River Watershed (Nacho Nyak Dun & Tetl'it Gwitch'in Territories)

A formal Regional Planning Commission through the Umbrella Final Agreement will be starting its work in 2004. CPAWS supported and worked with the affected First Nations to help achieve this milestone. This will be the platform through which much of the broader conservation planning will take place. The Yukon Protected Areas Strategy also identified this region as a priority even though there has been a subsequent suspension of YPAS by the current government. The Snake River has been identified as a candidate for protection, and the Bonnet Plume is already a Canadian Heritage River. CPAWS-Yukon has worked for many years on biological research, intervening in development proposals, and hosting research and community trips in the Peel watershed.

Wolf Lake Area of Interest for a National Park (Teslin Tlingit Territory)

CPAWS-Yukon completed three field seasons of basic biodiversity survey work in the Wolf Lake ecosystem, and also carried out several trips for community representatives and government staff. The Teslin Tlingit Council and Teslin Renewable Resource Council indicated a preference to link any park studies to the land use planning process. The land use planning commission has now completed a draft land use plan. Parks Canada has a plan to move forward on national park completion in Canada, including Natural Region #7, which covers the Wolf Lake area. The first step will be to garner support for completing a national park study. If accepted, such a study would entail detail conservation assessments in the Wolf Lake ecosystem.

Status of Representation & Ecological Land Classification in the Yukon

John Meikle, Department of Environment, Yukon Territory

John Meikle works with the Yukon Government in ecosystem assessments, protected area planning, and the establishment of protected areas through land claims. The main points of his presentation are outlined below. For a copy of the full paper on the Yukon government's approach to representation and ecological land classification, contact John at john.meikle@gov.yk.ca

The types of protected areas in the Yukon include: National Park, Territorial Park, Heritage River, Habitat Protection Area, National Wildlife Area, Ecological Reserve, National Wildlife Area, Map Notation. All of these types of designations may be established as Special Management Areas under First Nation Final Agreements.

The Umbrella Final Agreement applies to First Nations in the Yukon, and provides for Special Management Areas that allow protected areas to be established through land claims negotiations. Most First Nation final agreements have schedules attached that outline Special Management Area provisions. Special Management Areas may be designated as parks or other type of protected area depending on the First Nation's conservation objective. SMAs may also be managed without an additional legal designation. Virtually all protected areas in the Yukon have been established through

land claims negotiations. Even those that will be established through public processes in the future must have the consent of First Nations, and will likely be designated SMAs.

First Nations will own about 10% of the Yukon Territory, but retain considerable influence over 100% through mandated boards and councils that have both advisory and decision-making powers.

Our newest parks are the Fishing Branch Wilderness Preserve and Tombstone Territorial Park, fitting into the IUCN Category 3 & 4 classification.

There are 23 ecoregions in the Yukon. Seven have adequate representation in protected areas, 4 partial to moderate representation, and 12 little to none.

The framework ends at the ecodistrict level right now. The Yukon does not yet have good mapping of ecosystem types.

First Nations have often selected wetlands for conservation purposes. The First Nations will have a key role in management planning for wetlands. Over half of key wetlands will have some protection.

With respect to woodland caribou, the Wolf Lake herd, Bonnet Plume herd, and Tay herd are potential candidates for protection.

We are working towards building an ecosystem classification and mapping framework for the Yukon. There is general agreement to make use of the national ecological framework, including ecozones, ecoregions and ecodistricts. We are using the 1995 framework. We are also now working on ecodistricts at a scale of 1:250,000. We propose to eventually develop the framework to include ecozones, ecoregions, ecodistricts, bioclimatic zones, ecosystem types, and ecosystem unit at a scale of 1:50,000. It will be very difficult to find the funds to map at that scale.

Development of the classification and mapping system is in a fledgling stage with an ad hoc group. We are trying to get it going. The initiative is going to focus first in the SE Yukon.

We would like to map at the ecosystem unit level. The bioclimatic layer will be simple stratification based on elevation. The ecosystem type will be based on vegetation.

Comments

There is a great deal of potential for a trans-boundary chain of protected areas across Alaska and into the Yukon. We have 11 protected areas that share contiguous boundaries and 17 altogether that are in close proximity. Yet, nothing is being done to explore that potential.

The land claims negotiations are a three party process, mainly between Canada and First Nations. YTG sits in and has a voice at the table. Negotiators are the only ones at the

table. Briefing packages go to cabinet from the departmental staff, then to negotiators. Scientists are not generally involved.

The Yukon Protected Areas Strategy was one of the best in Canada – very comprehensive. The claims that it was not based on consultation are untrue. There was extensive First Nation and Renewable Resource Council consultation and broad public participation. However, the Yukon government failed to communicate what it was doing with YPAS, especially the benefits. Secondly, the government converted the strategy from a bottom-up community based approach to a technically and politically driven top-down process. That was the death-knell of YPAS.

The public advisory group consensus collapsed even though there was strong public support for conservation. The mining industry, oil & gas, and forestry were supportive of the original YPAS agreement, but the mining industry capitalized on an opportunity to erode the political support for the Strategy. The previous approach to a YPAS is on the shelf, yet there is now the opportunity to expand on the principles of the strategy. We can now think beyond what the strategy would have been able to do. YPAS was a critical building block but it was self-limiting due to the undue and singular focus on representation, and the political desire for a minimalist approach to conservation.

YPAS was not formally tied to land use planning – it preceded the concerted effort to complete land use planning. There are no approved land use plans in the Yukon. A land use plan was completed for Kluane region many years ago, but was never approved by all parties. The Land Use Planning Council has been set up for a decade, and we have 4 Planning Commissions underway in various stages.

Perspectives on Conservation Science in the Yukon

Dave Mossop, Conservation and Wildlife Biologist, Yukon College

My field is conservation biology and I come from a government background. I've been at the college for 8 years, spending half my time teaching, and half time on biodiversity research, mostly using birds as focal species.

I would like to present some ideas on the state of conservation science here in the Yukon.

Science is in its infancy in the Yukon. This is good because we can grow, bad because we don't know things we should know. There is a burning need to build a science community outside of government. It's a government driven society here. We have a little college, and a little research institute – we have the embryo. Yet, there is no natural history museum, conservation taxonomy, no science publication, no steady funding. We need to nurture that.

There is no place to set up partnerships, and everyone wants to build their own research program. The First Nation land claims have given us an excellent structure based on democracy – such as boards, and councils.

We need to put scientific information into the hands of individuals on the street. We need to employ and empower people in the communities.

We need more scientific conferences.

We need to put scientific research teams together with strong local participation. Most research has been done by teams coming in from the outside.

We have a very disjointed picture of Yukon ecosystems systems. We need to have all the aspects considered. There is widespread alienation between professionals in geology and biology - no working together. We need to share information across disciplines.

We need to develop a tradition of ecological monitoring. We must keep our thumb on the pulse of the natural systems. The Conservation Data Centre is starting up, but is controlled by government.

The public buy-in for conservation biology is still focused on endangered species. Yet species are not being tracked in the Yukon. We need to begin speaking about focal species, keystone species. We should get them onto the public agenda – they speak for ecosystems.

Taxonomy is missing here. You can't monitor until you know what's here. It's a poorly known place even in terms of normally well known things like birds. We need more monitoring research to keeping track of things.

We need to begin putting together a better understanding of ecological communities. The public never hears about communities, how they function, how important they are. We are just at the beginning of trying to understand. There is also a poor understanding of the effect of humans on the environment. Whitehorse is among the worst cities in the world for urban sprawl. We are killing wolves to protect people's dogs. Data needs to go into the hands of people. There are snow machines everywhere, and we are just now studying the effect of snowmobiles on caribou.

We need understanding of winter habitat, the strategies animals use to survive in the winter here. We need to understand their strategies – why do they live here?

We need to get special places in the boreal forest onto the public agenda. We must start talking about wetlands, old dead trees and old growth.

The impacts of global climate change and related research should be on the public agenda. Most people here are receptive to things that affect their lives, such as pesticides.

We live in a big world, and birds live and move in a big world. In the Yukon they are bringing things, including toxins, back with them from their winter habitat.

We need to begin putting together a better understanding of the physical parts of the environment. For example what is the ecological role of ice?

An important theme is society building. There's something missing in the Yukon - an objective, separate science community that serves the greater interests of society.

Comments and Questions

What are the climate change effects in Old Crow Flats?

The dropping water level is a concern for Old Crow. There is a drying out of land, more land is exposed.

In Kluane National Park, there is a monitoring program on the outbreak of spruce bark beetle. The beetle is killing spruce over a very large area. This is a 20th century phenomenon for Kluane. Its related to a series of dry summers.

What is the sense of productivity for northern ecosystems as compared to elsewhere? Is my assumption of low productivity correct – there may be different considerations here.

Wetlands on the prairies have high productivity. Here, the Old Crow flats have very high productivity– its not true that it's a uniformly lower productivity region. The biological hot spots here are almost all recognized by First Nations.

The cyclic behaviour of populations is a hallmark of Yukon ecosystems – its amazing and has a profound effect on ecology. Everything seems to have these cycles. There is no “usually it's this way” in the Yukon. With respect to global warming – with early springs but miserable and hot summers, the birds come back, but the seasonal timing is off. As a result nest parasites and biting insects have an increasing impact on nesting birds. The spruce bark beetle is on the rise due to a lack of extreme cold. The beetles are not killed off in winter. Hot summers are allowing the beetles to mature more quickly.

In the Tetons area we have same problem with Redtail Hawks.

What is the status of biological inventories?

There is not enough knowledge of what exists here– there are big holes in our understanding.

The Fish & Wildlife Branch has focused mostly on big game animals, there is little information on other species or ecosystems in general. There has been work done on non-game species, but the data has often left the Yukon. For example, insect researchers come up here and there are collections all over the world from the Yukon, of plants,

insects, small mammals and birds. There is virtually no information on human impacts on ecosystems in the Yukon. Moose, caribou, fish and wolves are the four things that are studied in communities. The Canadian Wildlife Service has done work on songbirds, and ofcourse migratory waterfowl. The Yukon is just starting Nature Serve and now we have a biodiversity biologist. We have population data for game species but not good habitat data.

Reactions to the introductory presentations– from visiting scientists

Ecological baseline and climate change

What is the real ecological baseline? What were the pre-exploitation numbers? I liked the reminder of the value of clusters of large protected areas (a network of protected areas and corridors) Climate change is happening – we need to reconsider criteria for protected areas networks.

Disturbance and resiliency

I'm intrigued by the paradigm of disturbance and resiliency, human activities as certain kinds of disturbance – is it novel, in terms of rate, scope – think of the particular environment and what drives it. Environment here is influenced by weather, long term cycles, weather is changing. In terms of conservation strategy – set up strategy to allow animals to respond to change, plant communities. Further north, the animals will need more room to have more options to try to respond to these changes.

Lack of information, yet globally important opportunity

I'm struck by the void of information. It used to be that good information put you in a better place to contribute to planning – hopefully it's still true that a good information base will further conservation efforts. We should get information as quickly as we can. Second, opportunities here for research are similar to what Kathy Parker at UNBC is doing. It should focus on natural and human caused disturbances, in a pristine environment. Third, build a scientific community. Last, there are not many places in the world with this much land and water not altered – a lot is at stake globally. For Alaskan conservation, other places in the United States got involved and pushed. We need more local, Canadian, and global push for conservation in the Yukon.

Large scale multiple species cycles

I'm learning more about conservation values here. I'm intrigued by the large scale cycles with multiple species in each cycle. The protein pulse interesting.

Research priority in areas of greatest diversity

In the Muskwa-Kechika area of BC, we chose research areas with the greatest diversity of habitat types coming together in one place. It's important to have all the players in an ecosystem and extrapolate data for other places with each player. Can you take components of a system and apply it elsewhere? We don't know yet. Seeing the diversity of the Yukon, I have the same idea as what we went through in the M-K. All conservation targets on the map are on the border. Why have those been selected?

Probably it is because of the topographical variety, mix of diversity. At the larger conservation scale, go for the safety net. There is a linear trend now in terms of global warming. What scale do you try to protect at? It has to be a safety net for critters and landscapes in view of changes they will have to deal with.

Boreal landscape and the reverse matrix

From the boreal perspective, you are much further ahead than other regions. You have sparse data but still more than some areas. There are tremendous opportunities here. We need to do more research because development is coming. I suggest the reverse matrix model would be appropriate here. Look at the boreal as an entire system across the country. We need to shift the philosophy of burden of proof. Put the onus on development proponents – those who will benefit economically. Push that on the public agenda. The pace of research can't get ahead of development pressures. With climate change and foreseeable consequences – think long term and buffer for those kind of changes.

Connection to First Nations

First Nations people all across the Yukon have lived here for long time. The population has a low density but has close ties to the land. Impassioned pleas like Gwich'in on behalf of the Porcupine Caribou herd will carry weight as much or more than science. It's important to sell research projects to community members first – get people involved. Empower First Nations with more information and a better basis for sound management.

Independent science panels, large mammal ecosystems

Independent science and advisory panels can provide quite a bit. Can it be nested here at the College? A panel could also address questions about partners – who could partner? Make connections. Partnerships should be made for specific tasks, not just institutional. Identify important areas politically, and give knowledge to communities. Focal species, large wide ranging mammals and birds, need critical resources at different times of the year. It's a good way to look at these conservation questions. Representation might miss that. In the Rockies, we found high overlap between expert opinion from people who knew the area and what the models predicted. We met 95% of our goals with a wide ranging mammal approach. Is the science located in universities and traditional knowledge in communities? Get the communities doing the science.

Traditional knowledge

We have taken steps to address the use of traditional knowledge and science in conservation, for example at the recent Yellowstone to Yukon northern workshop. In the Yukon there has been broad general acceptance of representation as a useful conservation tool. Yet, in my experience First Nations see little utility for representation alone. Protected areas have been established due to a confluence between biological hotspots and what was selected through representation assessments. A reverse matrix approach I would argue is more consistent with the thinking of many First Nations people.

How fast is traditional knowledge being lost?

Research oversight

In some First Nations, research oversight committees have been set up. They want all research to go through that committee.

First Nations and protected areas

What constitutes a protected area to CPAWS and how does that relate to what First Nations want?

With First Nations, there is respect for the conservation values that they bring to the table, either to land claim negotiations or other established planning processes. CPAWS accepts and embraces the traditional activities of First Nation people in protected areas. The word “park” has some baggage here, but that has been overcome by the designation of Special Management Areas in land claims agreements. These areas can be managed in a variety of ways, as agreed to by the First Nations and other governments. All rights that First Nations have are fully embraced in Yukon protected areas. There is certainly room for improvement in communicating the objectives and conservation science principles behind modern protected areas to First Nation communities. Through improved information we could see greater convergence of purpose behind the completion of a network of protected areas in the Yukon. With respect to First Nations involvement, protected areas established north of 60 are a little different from those set up further south. We also have a national policy on this topic that helps guide all CPAWS chapters across the country.

The First Nation connection is essential. The audience has to care about what they’re hearing. If you come in as outsiders with an outside agenda in Yukon, it won’t go anywhere. Conservation needs to be built from the grassroots level.

Science to decision-makers

Is science going to make a difference at all or are we just documenting the decline? How do we get our science to reach the decision makers? We’re not making a difference. How do we make our science good and relevant?

It’s a different game to get science injected into the policy process. We have to be objective but not neutral. We should get the good information out and injected into the public conscience, and in turn into government policy.

The Yukon is perfect place for putting this right – because of the decision-making processes we’ve been given.

Fish Bowl Discussion - Getting to the fundamental conservation science questions

The group participated in a “fish bowl” discussion for two hours. Four seats were set in the middle of a circle, with the larger group looking in. Two to three participants started the focused discussion in the middle, but people from the circle joined at various times to pose a question or add a comment. Once the question or points were made, visitors to the centre re-joined the outer circle. The debate is organized by sub-title topic, to give the reader a sense of the participant’s perspectives.

The discussion was lively and wide-ranging, starting with the following question to prompt the debate:

What are the key conservation paradigms for the northern boreal and sub arctic landscapes?

Conservation paradigm in the northern mountain boreal

There are no conservation paradigms here, it has to be entrenched to be a paradigm. Its dangerous to take southern system paradigms and impose them here.

The popular protected area paradigm is dangerous, expecting little postage stamps to achieve our goals. Reverse matrix model is good.

[**Editor’s Note:** The *reverse matrix model* referred to throughout this workshop summary, is based on the idea of connected nodes of human habitation and development within a greater matrix of intact ecosystems. The model is considered by many to be more appropriate to a place like the Yukon, where the existing landscape is approximately 77% wilderness now, as defined by the Yukon State of the Environment Report. Protected areas may still be embedded in a reverse matrix model, and there would still be progressive zones of human activities ranging from development, through lower impact activities to strict protection of biological or other values.]

Protected area paradigms can not be expect to do it all. Every area needs to be managed with conservation in mind, protected areas are the insurance.

How much is too much, where are developments going to have the least impact and how can they be done well? Development can be done in ways that are better – socially and environmentally.

The aboriginal view of conservation has been here for a long time – does that make it a paradigm? From my experience, First Nations have often said that 100% of the landscape needs to be protected. The questions revolve around who are we protecting it for and from what? If we don’t accept the core protected area and connectivity model here, isn’t the reverse matrix model a paradigm too?

Role of CPAWS

These two days are about getting advice to help set CPAWS priorities, but maybe CPAWS is doing a great job – it's an active and productive chapter. I would like to hear about what the greatest frustrations of the chapter are, the inadequacies.

Our selfish interest is certainly to get your help with our strategy but this meeting isn't just about CPAWS. CPAWS is facilitating this forum to engage a variety of partners and the community. We made a decision in 1989 to adopt the representative protected area model as did every other jurisdiction in Canada. Since then we got engaged in the very broad Wildlands Project vision and are also partners in the Yellowstone to Yukon Initiative. We are now in a different place, with respect to our perspective on a conservation paradigm. The representative protected area approach led to some gains, but nothing has really resonated long enough or at a level where we're getting the steady results that are needed in the Yukon. Aside from the three national parks, only two large territorial protected areas are legally designated – the progress has been incredibly slow. Fortunately, implementation of land claims agreements will deliver the bulk of conservation gains in the near future. Can we use science to break through impasses? The paradigms we're used to are not working well and massive development, such as oil and gas pipelines, are right there on the doorstep.

The British Columbia example

In the BC example, some things took a long time. We need to be patient. Politics cycles as well. A lot of the protected area game is timing, sometimes the timing is right. We need to take a long view of the whole process.

In B.C., how were scientists able to make their information relevant to the public and decision makers? What are the lessons?

Planning processes were the key that led to local resource management plans. 30 years ago it was just top down decisions, without much community involvement. Public involvement was a key to the success of the BC protected areas strategy. As a public servant, and working as a scientist I was able to pass information and knowledge upwards to immediate managers (who then move up in government), then work downwards, choosing the bright lights and influencing them as they in turn influence others. Laterally, teaching students and imparting information to green organizations, First Nations and industry was also important. Many of the best conservation solutions evolved outside of government. We spread information to the larger public through writing books and articles.

Getting scientific information to the public and decision-makers

Is there a way to encourage and do the needed science to answer the questions that government is asking, even if they don't know they're asking. Science is usually done for other scientists – research is aimed at other scientists. Scientists need to know how decisions are made, and reach decision makers with a format that speaks their language.

To improve public awareness, we need to get visiting scientists out on nature walks. Get the media to come out, get articles in the paper and on the web. People know the important oil and gas, mining and timber areas, but do they know where the important conservation areas are? We've seen a slow change, for example with Swan Haven, and the importance of McClintock Bay. People in community are aware now that it's an important area.

Information is the most important thing I'm hearing – putting information on the public agenda

Disturbance regimes and climate change

If we are trying to set up protected area networks, how do we deal with the boreal disturbance regime and climate change - is it the reverse matrix model? We would like advice on an approach that accommodates these changes. A working model on how to use the precautionary principle is needed. For example, allocating certain development zones, and if a permit application is outside of that zone it doesn't get considered for development, or only after appropriate assessment work, including cumulative impacts have been completed.

Regional planning examples elsewhere

We have looked at regional planning exercises – what makes some of them work? There are examples of systematic biodiversity planning processes that have worked, for example the Sonoran desert, South Africa, parts of Australia. Success is related to a person or group of people who've stuck with it for a long time. Also, very public, participatory processes are essential. The data and information are there for everyone to see and understand. Put the plan out in a variety of formats that a variety of people can work with. Look at other examples for answers.

In the Yukon, we have made some significant conservation gains, if you include land claims agreements. Unfortunately, there is a lack of a history of success and engagement with protected areas for communities in the Yukon. Territorial protected areas have no history of providing benefits – the large ones are only a few years old, and government has not yet invested what is need to foster local benefits and greater economic impacts. We need to build up a culture of success and real benefits so that protected areas and conservation can be seen to be beneficial to communities. People relate best to their home place -how do you jump from going after specific areas to the reverse matrix? First Nations have considered that view all along, but governments seem to demand limits on conservation, and there is a lot to be said for the measurable progress made by gaining one new protected area at a time.

In Belize, 28% of land is allocated to parks, and the people seem to be happy with that, because they have direct benefits, money has gone into the communities. Local people are being hired as guides.

How many of these were areas that conservationists would pick? Do they represent the best of what conservationists would have gone for or were they just left behind as unusable for other industrial purposes?

That depends on where you're talking about. In Australia it was a legal process. In the Sonoran and South Africa – yes, the best areas were selected. Conservation happens in unusual ways – Michael Fey of the Wildlife Conservation Society did hikes, got published in National Geographic and appeared on TV. The president of the country watched and read these and realized what his country had and created new parks. Conservation sometimes happens when you least expect it. Greater publicity and global attention for Yukon would be good.

Unfortunately, in some of these examples everything outside of protected areas is being logged or otherwise developed.

The unrelenting onslaught of development in that country would have been there even without the “postage stamp” protected areas. For a reverse matrix to work people need to restrain themselves within ecological limits.

In national parks we need to build more along notions of land management where different uses can be accommodated over space and time. More restrictive protected areas work until economic pressures come into play – then decision makers cannot resist allowing resource extraction or other activities in parks. In the absence of protective legislation or a strong land ethic, the perceived economic benefits of development win out.

There are laws about how much you can use water before it is illegal, and there are laws around water quality before companies have to back off further pollution. Couldn't we have those same legal tools for wildlife?

The settlement pattern in various places in the world is characterized by a concentration of development, then buffered areas with less use. There are negotiations between groups involved in protected areas and buffer zones – it's a different approach than what we use for wildlife. Many of the tools for conservation used around the world are forgotten in our society – we need to bring them into our way of thinking. We need to foster partnerships, accept trade-offs. We need to understand the needs of long established cultures - all the different needs have to be on the table.

We need a community based process. Communities have to change their self-image and their idea of what's possible for them and how they go about it. We have to offer economic alternatives, and these have to emerge from what they're interested in locally. We need to provide the support.

Reverse matrix as a model for the Yukon

With respect to the reverse matrix – you've got some areas that everyone feels are more threatened by development. Maybe those are places and the opportunity areas to get into

participatory planning process. Develop a new vision besides the protected area strategy. Take the reverse matrix and turn it into a new strategy. Pick the places or regions that are most threatened or where you have opportunity. Is there a way to engage different people in these processes?

I would recommend keeping the protected areas goal but add to it. Ensure that ecosystem-based management takes place outside of protected areas.

My concern with the reverse matrix is that it might be co-opted by industry and government, and turned into some form of “total” ecosystem management over the entire landscape, with no embedded protected areas at all. Is it not better to say, ‘let’s have lots of big parks and relatively large development areas too? What are the impacts? If we simply plan for indicators and thresholds over the entire landscape – is that not just ecosystem management? Is the black and white of clearly defined protected area boundaries better? What’s the cost to ecosystems if you lose the battle of maintaining ecological integrity with the reverse matrix approach?

In a productive forest biome, where you want to log will be where there are the most ecological values. Forest companies will say they only want 30%, and the rest can be for conservation. But ofcourse, it’s the same 30% that you want for protection.

With the reverse matrix model, we are still going to be going for the same valleys as the loggers. The model now is based on a protected areas system with best practices outside. The reverse matrix is one level up – nodes of development and links between them.

The reverse matrix may work well. If we only have big protected areas but then you have climate change, the protected areas will only capture certain values and some species will move north out of the protected areas. We need to look at the north in a different context, the need for bigger protected areas is greater, and the industrialized part of the forest needs to be smaller. What happens to biodiversity values with climate change? How do we deal with that?

The reverse matrix is not the same as ecosystem management. Ecosystem Management – we’re seeing it applied in Alberta. The natural disturbance paradigm has been adopted but it’s still a concept. We have violated the principles. RMM is about applying adaptive management in those areas that you open for development, realizing that we have little knowledge of impacts. In Alberta, impacts have been rapid but not there for long. Thresholds shouldn’t become a target. We need careful monitoring and application of science. Climate change follows some predictable patterns. We want to set up a north/south gradient so things can move. Little islands without connectivity will not work.

I am not knocking the goals of the reverse matrix, but—if it’s not a strict legislated approach then it will be co-opted. Is it more risky than going for the black and white of a legally protected network of conservation lands.

The reverse matrix model is a concept right now, it needs to be spelled out more clearly. We are trying to work on how to implement it. We want to invest time in that –it’s just a concept to explore.

I see your vision as a primary matrix of undeveloped lands, with small areas of development. For it to succeed we would need have cultural buy in –no areas that were pristine in that area.

Protected areas would still remain within the reverse matrix model. Parks are a management strategy – we should get more creative in how we think about management.

We will need to get agreement on the scope and pace of human activities.

In Canada, its different than many other places - the majority of land is crown land. You are in a real bind in ecosystems in the US when they are private lands. Here they’re public lands.

However, even on crown land, single purpose roads are often punched in to an unroaded area for a single exploration. The mine doesn’t work out, the road stays, and unregulated public access follows – all kinds of things happen on crown land.

Access control measures are certainly an issue. If there’s a road there, it’s a perceived right to use it.

Respect for scientists

The public in the Yukon trusts scientists more than politicians, according to recent polls.

That’s not unique to Yukon. Their word is highly respected. The problem lies in communicating science to decision makers and showing people what science has to offer.

Ecological thresholds

To get the science, we need controls and good experimental design. We can learn from other experience. For example, our group is doing comparisons pan boreal landscapes, with data from Sweden and Finland.

There is always pressure to change thresholds.

We need to provide better information so trade offs are well thought out.

There are two thresholds in Yukon – for mining and everyone else. This is part of the mythology that mining alone will drive the economy now and into the future.

Oil is sold first and then environmental review is done. We are left trying to find a way for the drilling to happen in a way with less impact. There are not many clear examples of what the thresholds should be.

I'm thinking about activity thresholds, not ecological. We want to know what happens if you increase the disturbance.

Landscapes don't die, but they change. Is that acceptable for us?

Day Two Opening Session

**What are the most important conservation science issues in the Yukon?
What are the most important questions?
What partners could be involved?**

Responses from Participants

Biodiversity

Maintain biodiversity, maintain northern way of life, and establish protected areas.

We don't want to confuse biodiversity with vertebrate species richness.

In the SE Yukon's La Biche watershed, there is a greater diversity of plant species than areas on the coast. It's rich, but localized.

From a global perspective on biodiversity global hotspots, Canada is not even on the list.

Predator-prey systems, focal species

Maintain predator-prey systems, for example with complete herds, protect ways of life of First Nations on the landscape.

I'm interested in the Yukon caribou herd map as a spatial map for a focal species. Caribou, both ecologically and culturally, play a key role as an umbrella species, both for other species and many cultural interests.

What are appropriate focal species? Disturbance dynamics and resilience are key factors.

We should think about taking what the Deh Cho of the Northwest Territories did and extend it. Maintain intact large mammal systems – caribou and grizzly bear – as a prime objective. What do we need to know about caribou populations and grizzly bears, based on conservation biology? We need to take what is known from elsewhere and find out what further information we need here to put it on a map.

We need to move beyond viable populations. It's possible to have enough land protected to maintain a population, but not enough to have an effect on the ecosystem as a whole. How do you measure functional densities? With focal species, define what kind of

species and for what purpose. A focal species has to be something that represents the system, umbrella species need to cover large areas. They should be interactive species. Some are just flagship species – to be used in conservation campaigns and public education.

We should aim for a higher level of articulating goal – conservation of predator prey systems would become criteria. We need to aim for ecological integrity, with focal species as one element. The goal is ecological integrity - break it down into quantifiable objectives and benchmark standards.

Precautionary principle

In the absence of data in the Yukon, we make a lot of assumptions about focal species. We should also look at pristine aquatic systems to measure base line conditions and potential disturbance. Here, land chunks are being allocated to industry. Under the time pressure to identify protected areas, we should be thinking, where is it okay for development to go? However, in light of the paucity of data, and the inability to predict cumulative impacts we need to be governed by the precautionary principle. A high priority region is the SE Yukon, where there are both imminent industrial development pressures and important conservation opportunities. In this light, we have to be aware that communities want jobs – there is going to be some development before conservation areas are established, in spite of best efforts to have planning precede resource extraction.

Intact Yukon ecosystems as a benchmark, reverse matrix context

We need to focus on what is unique about the Yukon – how intact the entire system is. It's a metaphor for ecological health. The Yukon might be one of the better places on the planet for a baseline for ecological health. This metaphor could help capture the public's interest on the values of their homeland. We can scientifically list some attributes of intact, healthy ecosystems. The paper by John Meikle talked of a number of conservation biology principles and concepts. These could be used to define what constitutes the health of the ecosystem. What are the wounds that would occur from human activity that would affect ecosystem health? With the reverse matrix model, what are the unacceptable wounds from human activity? This knowledge might help prevent unacceptable wounds. It would give some soul to the idea of the reverse matrix; capture the public's attention. Focus in on what would be acceptable levels of development, with "dose" response curves. This would be a useful framework for directing questions. I support the notion of reverse matrix, but am looking for another metaphor.

Conservation science information

What is the scientific information that CPAWS and other organizations are going to be most in need of to further conservation in the Yukon? There appears to be a real void of information. What are the highest priority topics that you need?

Priority areas

One example of a priority is the Kaska traditional territory – they are starting a resource and land use planning process. The Kaska have veto power over development for two years. They want to work cooperatively with CPAWS and several other NGOs to help

determine the future shape of conservation and protected areas. We want to be sure that we're asking the right questions about where these areas should go.

Communications

Where do we stumble? It's our failure to get the value of conservation across to the public. People want to hear about generating wealth. We need to inform the public on the economics of protected areas. The public will protect the things they know.

I heard the announcement from the Tr'ondek Hwech'in. The Yukon created the Tombstone Park and yet they only have half a job. Tombstone is now a chunk of civilization in the middle of the wilderness. I am concerned that drumming up economic benefits and creating more recreation will wreck the park.

Ecological integrity

We should put some substance on the concept of ecological integrity. A priority should be maintaining resilience in the face of changes – climate change, fire, insect, human changes – design a plan that's resilient. We need to plan for special elements, representation and focal species. Let's get more specific about special elements in the Yukon. With representation, are you happy with how it's been quantified? What else might you pursue? With respect to focal species – what datasets are there for caribou and other species? We need to incorporate disturbance in system.

The last protected area policy fixated on representation. It didn't resonate in communities, but the idea of ecological integrity did. People talked about sustaining wildlife. We need to look at the broader picture and how to have core protected areas – this is still worth pursuing. There have been blocks with communication – we have had good science, but there have been some significant bottlenecks with managers and politicians who don't get or understand the information. The communication of what we do know is a key component.

During the proceedings of the Panel on the Ecological Integrity of National Parks, we felt that if you pursue science to achieve ecological integrity alone, you could still have more highways and development in protected areas. However, wilderness and other social values could be lost as a result, even though strictly speaking, ecological integrity was being maintained. If ecological integrity is a goal, we need a strict definition of ecological integrity.

This is an important point, maintaining wilderness is a valid value, but science can't tell you how to maintain that – it's related to human values.

Community engagement and science

The Deh Cho process was a successful, non-science approach that started in the community based on what was important in the community. There are legitimate questions about what science can bring to the process. A bottom up approach has been successful. We need to take what people want to see, then give them the best advice and

go from there. Communicate the science effectively, work with partners. How do we use science?

We should be asking the questions that should be asked in the communities – how science can provide answers that couldn't be answered more efficiently by the communities. Have we been trying to answer the easy questions instead of the important ones?

In the Yukon, we have a pretty good handle on special elements, for example rare plant communities. Communities know the special areas. But we have to put it into global context.

On the Northwest Territories side, if you look at their protected areas strategy, it is designed as a bottom-up process. The Yukon PAS was originally bottom up, but the government flipped it, causing a widespread collapse of support among our natural allies. In the NWT, science is not the driving force, but it's used effectively to enhance protected area selection, define or expand boundaries.

I agree that providing technical information is critical but if you go to a First Nation with a map of good potential protected areas, it will be perceived that someone else wants to make a decision for what will happen on OUR land. A top down approach is not going to work in the Yukon, we need to provide support to enable a bottom up process.

The Umbrella Final Agreement gave First Nations in the Yukon the opportunity to employ a bottom up approach to land use decision-making.

Role of science

I'm uncomfortable in the way we're using the word science – education, decision making, planning, etc – help science but they are not science. What do we mean by science? People want jobs. Look at the trade-offs in terms of what we want, trade offs that come with decisions. Science can help with that. If science can make those trade offs explicit, then society may make a rational decision with the best available information.

I worry about relying too much on science. Society wants to conserve vast areas of the Yukon and science can help lay the groundwork. I'm uncomfortable with the idea that science can always provide a rationale for conservation. Scientists could come in and say what we should conserve and this could still allow for resource extraction that may be inappropriate for social or other reasons. Science will only take you so far. What's the scientific information that you need to get, what are the most important research topics, who can you work with?

If the goal is to maintain the ecological health of lands and waters, the principles of conservation biology could form one arm of a matrix, another arm could be possible developments over the next ten years. We could focus on gaps in information.

A discussion of partners is important. The change from ecological integrity to representation came when the PAS went from bottom up to top down.

Science can only go so far. We need to pay adequate attention to species that people care about. The scientific agenda should be somewhat driven by what the communities' gaps are.

Science can help inform communities about what's coming. Things are coming and science might be able to help shift it a bit but not change it. Science won't stop it. Science should inform decision making at all scales.

Threats

Research on threats is essential. Where science ends, planning starts and information needs to be on the public agenda.

The focus on where would it be okay or least risky to develop— where science can enter — is challenging because we don't really understand what the effect of development activities will be. We can learn by using an adaptive management approach. We need more thought into where it would be okay to have development activity. Pay people to monitor. This creates jobs and provides huge opportunity for us to learn how development is affecting the ecosystem.

We need to focus on research that would further our agenda, for example on focal species population and habitat mapping. This could take different scenarios (such as roads) and model impacts on caribou herds, build in mortality rates based on what we know, predict what would happen over time. We could do that according to several scenarios and superimpose climate change.

This approach has not been taken yet. There has been no such modeling in the Yukon, or spatial consideration of cumulative effects.

I have a sense that there are two major streams — thresholds and achieving goals. Conservation organizations tend to be more interested in goals that are measurable, and for which governments can be held accountable. On a day-to-day basis, we are more interested in the idea of healthy ecosystems and how to maintain them than guessing how much disturbance your system can handle before it collapses.

Habitat is essential. What questions are we asking about the focal species? What are the appropriate measures?

Thresholds could be a tool to help you protect your goal. It's not one or the other. If your goal is keeping intact ecosystems, there are lots of tools.

We need to pay more attention to threats. There is not enough focus on ecological integrity, and we are not putting enough thought into assessing threats. Oil & gas keeps coming up. It would be a useful exercise for CPAWS to gather information from existing

studies on the impacts of development on biodiversity. With respect to focal species, people have done a lot of work on modeling species, habitat models etc. However, there is not a lot of good information on habitat in the Yukon. We need to have better information on habitat mapping for species.

There seems to be consensus that to protect ecological integrity you need protected areas and then in the areas where you're going to allow development, you need thresholds. It's useful to think in terms of indicators of ecological health – things people can relate to, things people can do themselves. Bring the discussion back to what people know.

Some of the very best work around thresholds is actually coming from the National Park Service. Typically, we establish protected areas and then love them to death. The cumulative effects tools applied in protected areas are just as effective outside conservation areas.

A big question in Yukon relates to the optimum size of conservation areas. Should our thinking about area and size be different in the Yukon? Is there research work that could be done on the topic?

The Yukon is unique in the boreal, with portions of 4 major ecozones. It's a good focal area for significant work. We need case studies, demonstration projects – good to have those in Yukon.

Partnerships

What can the Yukon contribute to southern research? What agencies in the Yukon could be effective partners in meta data analysis?

Are there examples where industry has helped to fill in information gaps?

In Alberta, government is trying to build relationships in support of sustainable forest management. There is a program to share funding, participation, research – it's pitched so it's relevant to industry and environment. Industry sometimes approaches the University of Alberta to help with research. The reality is that resource industry activities are happening on public lands.

Conservation goals

It's not clear to me what your overarching objectives are. Where do you see yourselves? CPAWS will have to go through a strategic planning process. This workshop will help inform that thinking.

The vision of CPAWS in the early 90's emerged as one of great hope. We could be leading the country, a global center of excellence. Our vision was to help create a society that is unique in the world, with healthy sustainable communities within a largely intact landscape. We got off track by having to create protected areas to fend off industrial development. Even though it's a big vision, the discussion is two way – from the

communities, between the communities, and within the territory as a whole. Why can't we be world leaders? How can science help inform the big vision?

Economics and social sciences

We should talk more about social science. Who's benefiting from economic development activities, what are the subsidies that aren't transparent.

We can't propose protected areas without talking about community economies.

The bigger questions such as where, how big, are social decisions. Science should be contributing the supporting information on trade offs, values etc.

Bring in speakers on alternative economics; convince people we care about the economy.

What we end up with as parks and protected areas is largely a social decision, but doing planning for those areas can be technical. We would be abdicating responsibility if we didn't get involved and say where the most important areas are.

Identification of hotspots isn't going to stop the pipeline but it might reroute it.

Role of NGOs

NGOs should focus on providing information to support the community in their land use decisions. Avoid showing up with a map based on representative areas. Provide support for First Nations to gather their traditional knowledge, summarize technical information. Tie together information in a way that's usable for communities. Science should be aimed at providing tools for people to evaluate trade offs.

Convene the conversations on protected areas, and then fade into the background.

The ideal is to be working closely with First Nations wherever possible. We are not bound by political boundaries – for example, NGOs are well positioned to be the facilitators of conversations on the Yellowstone to Yukon Conservation Initiative.

Theme Discussion Results

The first day of the workshop set the context for conservation science in the Yukon. Although the discussion covered a very broad range of ideas and scientific questions related to conservation in the Yukon, a few dominant themes emerged.

On the second day after the general discussion, workshop participants divided into 3 groups to work on the themes of:

- Public communications
- Ecological elements of a conservation strategy
- Threats

Each group was asked to suggest the most important themes within these topics, pose the key questions, and indicate potential partners.

Public Communications

Themes

- Foster public's right to know – open and transparent, access to information
- Reliable source for information needed – should be an unbiased clearing house
- Research and communication needed on economics of protected areas and alternative economies
- Effective and varied types of public communications are essential
- Develop a communication strategy for getting information to public
- Build on relationships with natural allies

Notes on Themes

Get the information and advice out to communities. Provide summaries of information that are understandable to average people. Provide ways to evaluate trade offs and enable communities to make their own decisions. Provide support for communities to gather their own information. Travel to other communities to make presentations.

In a communication strategy, include such elements as:

- explanation of conservation and protected area objectives,
- demonstration of benefits of protected areas (jobs and ecological component),
- celebration of the Yukon – what it has to offer, put things in context,
- international value of Yukon's natural environment,
- clarify that parks and protected areas do not necessarily curtail usual activities,
- facilitate information sharing forums.

Questions

- What are the information gaps, what kind of information isn't getting out, how do we get that out to the people?

- What kind of information would be most useful for communities as well as CPAWS and other NGOs?
- How do opposing groups get their message out?

Potential Partners

First Nations, communities, Renewable Resource Councils, Yukon College, successful individuals who've chosen alternative way to make a living,

Ecological Elements

The key themes were borrowed from the emerging paradigm of conservation biology. The group tried to add a Yukon flavor, and pose questions pertinent to the North.

Ecological elements in a Yukon conservation strategy should include:

- Special elements
- Representation
- Ecologically functional populations
- Natural disturbance regimes
- Evolutionary and ecological process
- Functional connectivity

Part of the challenge is to build Yukon's social capacity to understand conservation. Communication packages could feed into land use planning. The group listed important attributes for a communications strategy. Emphasize landscape-scale ecosystems, and the notion of creating an ecological safety net.

Threats

Themes

- Models can be developed to anticipate the consequences of alternative development scenarios. A variety of tools exist and actual modeling is not difficult or expensive. Map products can be very effective for communication
- Tools can be used for protected area planning as well as development scenario evaluation
- We can use modeling to encourage best management practices amongst alternative scenarios

Questions

- Would a coarse scale exercise be useful as a demonstration project for example in the Kaska region?
- Can we ensure that such a demonstration project would be followed up with a better example of resource planning and development?
- How can models for like the Peel watershed be funded early enough to be proactive?

Potential Partners

Yukon Energy, Mines and Resources Department, Kaska Tribal Council and other First Nations, external consultant for modeling, Pembina Institute, ACCRU and SFMN, Environment Canada, Yukon Environment, CPAWS, Canadian Boreal Initiative , Wildlife Conservation Society, Yukon Trappers Association.

Group Response to the Theme Discussion Results

Transboundary cooperation

There is an opportunity to strengthen connections among different territories and provinces, in the trans-boundary regions of the Yukon. CPAWS should help foster those discussions.

Global significance and urgency

Emphasize ecological features that are of global significance. Local people appreciate the ecology of their area for a variety of reasons, but it would be helpful to add in global importance. Also, put a priority on gathering information to address larger spatial scale issues, such as connectivity or long range migrations.

I am impressed with the intact natural systems of the Yukon as world class, as something Yukoners can be proud of and can attract people to visit. This region will become more precious worldwide over the coming years. It will be important to consider First Nations knowledge and conservation biology principles, empower communities to discover more of their homeland and build social capacity, which may influence government. There is real opportunity here! I also note a sense of urgency – a concern with new roads and uncontrolled access on roads no longer maintained.

Unique ecosystems

Avoid adopting paradigms from other ecosystems. Ecosystems are unique here, create a made in the Yukon solution.

Information priorities

The discussions produced a long set of lists, it's up to CPAWS and others to decide on the priorities. I would suggest priorities include a synthesis of existing information,

modeling, pointing out major gaps – perceived threats and where information gaps are in being able to respond to those.

Information to serve opportunity to conserve large ecosystems

There is an opportunity here to conserve big scale systems, a full complement of what should be in an ecosystem. Things will change globally, for example through global warming. Our landscape will change through industrial development. Pick the areas at greatest risk from either of these. People here seem to understand connections of the land, the systems and how they work. We need to encourage people to listen to what the scientists have to say, provided there is a foundation of trust. People start to rely on you then to tell them what they can do. A missing link in BC is that people don't have a link to the regulator, there is no attempt to bring them into the loop. In the Yukon, consider putting the emphasis into trying to close the information loop. Get the information to the decision makers so they know.

Empower local people

Do everything possible to empower local people with knowledge and appreciation for what they've got. Local people will probably have a lot to say about the changes that are coming. Planning is key – it would be great if the Yukon could do good planning.

Conservation science and cultural heritage

Conservation science can be a vehicle to restore cultural heritage as well. Transfer conservation science to the communities - make people aware of the global significance of the Yukon. Ensure people understand the legacy of Beringia and how important that is as the oldest place for humans in this hemisphere.

Appreciate capturing local knowledge with an emphasis on history. Use ethnoecology. Look at the variation in hard times, where critters go. These are some of the dimensions we can get from local folks. Participation from local people in capturing conservation information is essential. We need to figure out what the confluence is between science and traditional and a new way of conversing

Are large scale studies worthwhile?

Do the visiting scientists think we need a case study of some large scale ecosystem and focal species study in parts of Yukon that are transcontinental zones but have special Yukon features. Do we need Yukon specific case studies in biomes?

We can get a lot of information from Alaska, but Yukon is quite unique.

You may, but people may be suspect of studies from outside the region.

In northern Alberta there has been a lot of research on access management, but no Alberta example. Even though the effects are predictable, policy makers say, "What relevance does that have here?"

Look at areas of greatest threat and focus your initiatives there. Long term comprehensive research (like Kathy Parker's), might not be necessary to assess risks that are on the doorstep now. Large scale assessments may not be the highest priority for initial work. If people in Yukon buy into a vision of building a socially sustainable future for Yukon that includes ecological factors, that work is the responsibility of government. A truly different model is needed here, with buy-in at all levels, including government, and then it becomes core research priority.

We need to direct research efforts into answering questions, create models to help direct research.

The endeavour needs to go beyond research, towards a true adaptive management model.

Yukon as a “centre of excellence”

I would like to see the Yukon go from being a frontier in boreal science to a center of excellence for northern and mountain boreal research. Why can't we move beyond being a frontier? We have unique ecological features of global significance in Yukon. Developing a centre of excellence for conservation research would also produce more jobs, educational and social benefits as an alternative to sole reliance on subsidizing exploration for resource extraction.

Conservation science and economics

Research brings economic value. We should assess what are appropriate developments and what aren't.

The Yukon needs better support for others who come up and do research. There are gaps, more basic research is needed, more partners are needed.

The reality is that we don't have a lot of biologists and they don't spend their time on research. There is no money. Most time is spent on management plans, land use, timber harvest plans, etc. We need to foster partnerships, need more graduate students to come in, more outside money.

Perspectives On An Advisory Group for the Yukon

Comments from Open Discussion on the Merits of an Advisory Group

Background to advisory group idea

The notion of an Advisory Group came out of a meeting with the Wildlife Conservation Society and Denver Zoological Society in 2002. A scientific advisory group consisting of local biologists and selected outside scientists was proposed as a way to get advice, build bridges between the scientific and NGO communities. This basic idea then evolved into this exploratory workshop. WCS is looking for guidance as to whether the Advisory Group is a good idea. There are many different perspectives about having an advisory group. Is it a good use of time and resources? From an NGO perspective, we want improved capacity, better science, and the ability to use the information to affect change and sound decision-making in governments.

Yukon College and “Centre of Excellence”

At Yukon College, we need information towards describing what the small steps are to get to a “center of excellence”.

Experience in Smithers, BC

We set up a research institute in Smithers after we experienced similar thoughts. We had a critical mass of skilled people – yet there were worrying trends in the town, people were leaving, fewer jobs. We got together and decided to mobilize the human capital present by starting a not-for-profit institute. The institute includes people from the community in a three way partnership with academia, industry, government sector representation. The Centre obtains grants to do research, for example applied adaptive management. The goal is for it to keep growing, provide more opportunity for employment. Initially we were able to hire summer students.

Enhance the Northern Research Institute

That’s all here, we’ve got it, including graduate students doing work here. But how do we capture the other stuff that’s going on? It’s a shame that CPAWS has had to create their own research initiatives. It would be great if CPAWS could feed into the Northern Research Institute and help nurture it.

Northern Research Institute

I recommend doing the work through the NRI. There are college links in every community, and then it wouldn’t be an NGO bringing in outside people.

The Northern Research Institute is great but think beyond boundaries of the Yukon. It needs to be more if you want it to be a hub of activity going beyond our borders.

Is the NRI in its mandate, able to accept and embrace the scale and focus of landscape scale conservation research as one of its underpinnings?

There are a number of researchers that come here every year. I would be surprised if they didn't want to help.

Yukon needs more creative thinkers

We need to get the creative thinkers here, to get momentum on science and conservation. We need to demonstrate the global significance of the Yukon. How do we get out of our small world?

Maintain flexibility

There are advantages to remaining informal and flexible, to leave space for others to be involved.

Annual workshops a good alternative

We may be better served by having a workshop like this once a year rather than having a panel. How would you decide on panel membership? Annual workshops would follow up on these ideas, what's working, what's not. We could bring more scientists up to do research.

I support the idea of an annual conference. We need to get together and talk to people and get ideas from elsewhere. On campus we have a biodiversity working group – their vision is to have annual conferencing of results. I strongly suggest that we partner.

This kind of gathering is relatively easy to fund. I visualize a focused think tank, and annual workshop – not a conference. However, it could be linked to a conference.

There are big research opportunities in the Yukon and we need to capitalize on this. How can we better connect with the larger group? An annual workshop is good idea.

On the question of an advisory group, maybe there's middle ground. With an annual workshop we fly in a group, then they leave. There is something to be said for having a group who come in from the outside and understand and have knowledge and ownership of an area. We need overlap with people who have concerns about the area. We won't get that with rotating scientists.

Scientific permits are issued by the Heritage Branch, scientists are supposed to have a permit to be here. Their results should be discussed at an annual conference.

Bring in some new people, but bring in the same people too.

Think about workshops or advisory groups – scientists, conservation practitioners – learn from other people who have conservation experience in other places.

Politics of advisory group

Is that group immune from politics? No, but we want to go this other route; we need to be drawn away from government. People have pulled away from the government agenda; quickly clear that government feared this.

More local research capacity

The WCS is interested in Yukon - what about having a few people working in the Yukon?

It has to have a Yukon flavor for it to fly here. I like the idea of a multi agency group. Draw from a number of backgrounds and sources.

Independence and trust are important

We have big, intact ecosystems – government is not good at developing a strategy around those. Its too bad that most of the scientists here work for government. Researchers need to be able to carry out their work in “safe” environment, free of politics.

It is important to gain a level of trust and respect in the community when you live there. Try to have the research tied to a community. Get graduate students to come up here and live and work in the communities.

We need an independent advisory group – another group to respond other than CPAWS. Credibility of independent advisory group would be beneficial. They should be willing to comment on policy decisions.

If it's an advisory group to CPAWS, it will still be perceived to have the bias.

Information sharing

There is opportunity through co-management processes to get information out. There should be no limitation on information sharing.

When resources are perceived to have high economic value, everything changes.

The hub of research and the audience are not Yukoners, it's outsiders – we need to build around our global significance. Maybe we can link into circumpolar initiatives. The work of WCS already reaches a global audience. Is the Yukon just for us? Or is it for Canada?

Partners

The Arctic Institute has little connection to Yukoners – its outside researchers.

We need to pick our partners carefully and set the criteria. Are we doing something for society? We have to be perceived to be doing something or we won't get the recognition.

Decisions are not going to be made by Yukoners, we're along for the ride.

Y2Y started as an advisory group. A subset of the advisory group took the questions and went back to where they came from and worked on them. At the annual meeting the scientists came back to discuss the work that had been done. Had a group but resulting research consortium was the real benefit.

The advisory group could be linked to the Northern Research Institute. BNGO – the big NGOs – might be able to bring big exposure and bigger money. There are pros and cons but you need more resources here. Any of the big organizations have the potential to do it.

Closing Comments and Recommendations

What has workshop meant to you?

Non-government conservation science

I am excited about the opportunity to increase the amount of non-government conservation science in Yukon.

Send out a positive message

I am optimistic and amazed at how much we need to talk to people from somewhere else, amazed how deep the message is on what we have and what a poor job we're doing communicating that. We need to change our message from negative to positive

We need to focus on optimism, a real hopeful message, and find a new level where we can offer what's valuable and counter development. This would open the way that has to be framed.

Yukon opportunity and potential capacity

I'm working on a Canada-wide boreal initiative and wanted to learn more about the Yukon. There are incredible conservation opportunities here, good capacity and commitment among governments. Keep fostering that. I'm looking for ways to stay more involved

Yukon as a benchmark

When I started with reading the material, I was taken aback by huge amount of undisturbed landscapes and the diversity of landscapes that are fairly pristine - 77% wilderness. There is a big opportunity for the scientific community to do work that informs the rest of the world. This could be a benchmark of places to do work on pristine landscapes. The Yukon has an enormous amount to offer it is a well kept secret and that's not good anymore from a conservation perspective.

I'm thankful there is an Alberta, with all of its mistakes, to compare ourselves against. My hope is that people will remain engaged and provide us with advice so we can keep it pristine.

Planning is important

I hope that Yukon remains beautiful and wonderful, but I see development threats, and am afraid for what will happen. We need to coordinate a careful planning effort. Pay attention to what's coming.

Global significance and urgency

I think about Yukon a lot, the large geography here, connectivity, the wounds on the southern lands, and am starting to appreciate the contribution of Yukon to the cordilleran system and its global significance. There are terrific opportunities for conservation and research here.

Yukon needs help

When we started CPAWS in 1990, it was a time of hope and consensus on conservation goals - we thought we could do it all ourselves here in the Yukon, all Yukoners thought that. It's apparent now that we need help. In the past, through our international partners, we were able to ask people in the Netherlands to help CPAWS-Yukon. This workshop is a renewed call for help. We have the tools, we see the opportunity, and we would appreciate the help. With this workshop, we have achieved all that we hoped. Our assumptions have been challenged, and we have gotten good advice. The workshop has had a big impact on our thinking, and we look forward to your continued contributions.

Rapid change

In Alberta in the 1990s, we thought we had a 5-10 year window; but there are still intact forests in Alberta. There will be some rapid changes but you have more time than you think from a systems perspective

This is an extraordinary place of global significance, amazing opportunity, rivals every other place. But this in itself isn't enough – the near future looks pretty dark, the reality is brutal. I believe we have less than a decade to shape future of Yukon.

Empower and respect communities

I've gone from being focused on academics, to work in a small community. I would emphasize the importance of working with First Nations and communities and assist them in gaining the power to make decisions. Given the opportunity, people will make the right decision.

There is a different perspective here. Once you've been in the north, you gain that different perspective, and understand the value of knowing the land. Local participation is important as well as the global link. Local people know what they have, and have to promote those values.

Sometimes, the voices for conservation in the communities are lonely. It's good to talk to others. The ace in the hole is the link with First Nation people. I hope we can look back on this time and think we did a good job.

Research Institute

I support enhancing the capacity of the research institute that is attached to Yukon College. We need to make the connections between jobs, investment, and conservation in the Yukon. We need to act quickly, but there is already a lot of positive momentum too.

Improve communication

People who are passionate about this place have a sense of nervousness. We need to broaden the number of spokespeople for conservation in the territory.

Intact ecosystem and cultural strengths

There is a lot of savvy in this room about the big picture, what it takes to achieve conservation. My hope is drawn from the fact of the intact ecosystem, but also the cultural perspective that brings different values to help drive the conservation work.

Next steps

I was glad to be able to participate in this activity with mostly scientists and not many government planners! I will do my best to address the issues and opportunities mentioned so far.

Appendix 1

Workshop Participants

Visiting Scientists

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Marcy Mahr (Y2Y Initiative)	marcy@y2y.net

Visiting Advisory Scientists Unable to Attend the Workshop

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Yukon Scientists and Conservationists

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Appendix 2

Potential Approaches to Improve the Conservation Science Capacity of CPAWS-Yukon – as proposed by CPAWS-Yukon in the fall of 2002.

Scientific Advisory Panel

Objective:

- Provide over-all strategic guidance and scientific advice along with peer review to support the conservation research and planning work of CPAWS-Yukon and its partners in the effort to implement a protected areas network in the Yukon.

Notes:

- Invite qualified senior scientists to participate in the panel for a specified time period, combining local, national and where appropriate international expertise related to conservation planning in the boreal forest and mountain ecosystems of the Yukon
- Provide a stipend and travel expenses to the panel to facilitate meetings and project reviews.
- Develop links with conservation research and northern conservation planning work being undertaken in universities, Yukon College, Canadian Wildlife Service, Parks Canada and the Yukon government.
- Use the findings and recommendations of the Panel to support public communication efforts by CPAWS-Yukon, where appropriate.

Research Intern

Objective:

- In the short term, provide CPAWS-Yukon with the ability to complete literature reviews, synthesis and recommendations on specific questions relating to protected area research and planning in high priority regions.

Notes:

- Hire an intern in the Yukon for specific short-term assignments related to data collection for SE & NE Yukon conservation planning.
- Hire a qualified intern (or use time available to an existing intern), under the supervision of a scientist outside the Yukon, to complete a literature review on specific questions relating to conservation planning in the Yukon.
- Liaise with existing graduate students working on Yukon projects, along with staff of the Yukon government and others to avoid duplication of effort.

Graduate Student Research & University Partnerships

Objective:

- Engage graduate students from selected universities in conservation biology research work that will help answer specific questions pertinent to implementation of a protected areas network in the Yukon. Focus the effort on high priority regions in the Yukon.

Notes:

- Seek out university programs and encourage participation in Yukon research work. Support this work where feasible.

Post-doctoral Appointments or Senior Advisor

Objective:

- Provide in-house senior advice and scientific support for specific protected area planning projects in the Yukon.

Notes:

- Senior in-house advice (or at least available by phone and electronic means on a regular basis), will greatly enhance our ability to carry out day-to-day conservation planning work that has a strong scientific component.
- In-house expertise will allow us to engage more directly in the conservation area design work now underway.

Specific Projects

These are the specific projects that would benefit from improved science capacity. Background information on these projects is outlined in the discussion paper introduction. These notes outline the areas where we would benefit from improved scientific capacity.

SE Yukon: Kaska Nation/CPAWS Protocol

- Participate directly in the Conservation Area Design (CAD) being developed now by the Kaska Nation, in partnership with CPAWS-Yukon and B.C. and other NGOs
- Assist with the assessment of suitable focal species in the SE Yukon, with a view to enhancing the protected area and forest planning work
- Assist in developing scientifically based planning guidelines needed to help design corridors, buffers, and other ecological links within a landscape context in the SE

Yukon.

- Review the scientific research work undertaken by graduate students in the SE Yukon.
- Assist with field research and reconnaissance biological surveys in the SE Yukon.
- Assess the impacts of linear disturbance and habitat fragmentation in the SE Yukon ecosystem.

Peel River Watershed

- Assist in the design of a conservation proposal for the Peel watershed, based on protection of the large mammal ecosystem delineated by the Bonnet Plume Caribou Herd.
- Develop a scientific approach to predicting the effects of linear disturbance in the Peel watershed ecosystem

Wolf Lake

- Assist in the design of an optimum protected area and conservation lands design for the Wolf Lake ecosystem, based on the parameters of the Wolf Lake Caribou Herd and its attendant carnivore population

Yellowstone to Yukon Conservation Initiative

- Assist with the development of an approach to broad scale data collection and regional conservation design parameters to be used within the Y2Y north region (roughly north of the 60th parallel)