Exploring the Opportunity for Structured Decision Making in support of Yukon Regional Land Use Planning

Prepared for

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1 Introduction

This summary has been prepared as a follow up from the Yukon Land Use Planning Conference, *From Claim to Plan (and Beyond!)* held in Whitehorse January 30th and 31st, 2013. The purpose of this document is to provide a summary of the key findings and to examine the potential for Structured Decision Making (SDM) as an approach to regional land use planning in the Yukon.

In preparing this short document, workshop notes were provided to SDM practitioners and invited presenters Lesley Cabott, (Morrison Hershfield) and Dan Ohlson (Compass Resource Management) by the Yukon Land Use Planning Council office.

2 Background

In 2004 the Yukon Land Use Planning Council adopted the Common Land Use Planning Process (CLUPP) as a way of implementing Chapter 11 of the Yukon First Nations' Umbrella Final Agreement. (CLUPP was updated in 2008 – post devolution.) Chapter 11 provides key elements for regional land use planning including: the establishment of a common approach, minimizing land use conflicts, promoting Yukon First Nation's cultural values, using traditional knowledge, recognizing First Nation rights in the management of land and ensuring sustainable development. The CLUPP has been used to complete the North Yukon Plan, prepare the Draft Peel Plan and establish the Dawson Regional Planning Commission and Terms of Reference.

The Land Use Planning Council has expressed their intention to update the CLUPP and used the Planning Conference as an opportunity to solicit critical and constructive feedback for the existing process as well as to introduce SDM.

The planning conference was attended by Yukon First Nation's members (both with settled and unsettled land claims), planning commission members, Yukon Government representations, Yukon planning practitioners and Yukon Land Use Planning Council and staff.

3 Summary of Conference Findings

To examine if SDM is an approach the Land Use Planning Council, the parties and the commissions could adopt to better facilitate the development of regional plans, it was important the conference participants share their experiences using the CLUPP. From the presentations and small group discussions several themes evolved highlighting the opportunities and challenges for land use planning in Yukon (Yukon Land

Use Planning Council, 2013). The discussions focused around the existing opportunities and challenges for regional planning in Yukon.

Opportunities:

- Finding the appropriate balance between today's needs and tomorrow's choices;
- Collective ability to manage change;
- Collaborative partnerships with all the parties;
- Excellent resource information;
- Transparent, inclusive and public processes;
- A regional plan for all regions in the Yukon – seamlessly coming together;
- Capacity building and common understanding; and
- Common vision and clear objectives; and
- Opportunity to build trust with Yukoners and amongst the Parties.

Challenges:

- Plans take too long to complete;
- Plans cost too much to complete;
- Lack of consistent and meaningful evaluation criteria throughout the process;
- Too much technical information ('paralysis by analysis');
- Parties need to agree on principles - 'the big things' - upfront;
- Poor communication amongst the parties;
- Planning with uncertainty;
- Process needs to be transparent and inclusive;
- Understanding of the parties differing values;
- Not enough community involvement;
- Revisit the vision regularly through the process;
- FN's without agreements need to able to participate (inclusive); and
- Planning process needs to build trust.

The findings suggest that a planning process is required that is structured, respects and articulates the diverse interests of stakeholders, uses good information and explores the risks, opportunities and trade-offs in an inclusive and transparent approach. Structured Decision Making embodies these characteristics. Good technical information, inclusive and public processes, clear objectives, and accessible resource modelling and decision assisting tools can help support regional planning that addresses the opportunities and challenges and allows for flexibility and planning with uncertainty.

4 An Overview of Structured Decision Making

This overview of SDM is based on the book *Structured Decision Making: A Practical Guide to Environmental Management Choices* (Gregory et al. 2012).

4.1 Introduction

Structured Decision Making, or SDM, is a framework for thinking critically about decisions. It provides an organized approach to identifying and evaluating creative alternatives and making defensible choices in difficult decision situations. SDM is designed to engage stakeholders, technical experts and decision makers in a decision process that is both analytical and deliberative, using best practices in decision making. Its goal is to both inform and actively aid decision makers, not to prescribe a solution.

A decision framework will not by itself select a preferred management option, but it will provide insights about the decision by clarifying the things people care about, identifying creative alternatives, and exploring the trade-offs or choices that need to be made. SDM is designed to deliver insight to decision makers about how well their objectives may be satisfied by alternative courses of action, how risky some alternatives are relative to others, and what the core trade-offs or choices are. A structured decision making process is designed to make complex choices more explicit, better informed, more transparent and more efficient.

The following sections describe both a set of general principles (Section 4.2) that support the process, as well as the core steps of SDM (Section 4.3).

4.2 Principles

SDM is based on the following core principles.

Recognized Best Practices. SDM relies on the principles and tools of decision analysis, which in turn is based on multi-attribute utility theory and behavioural decision research. Core elements of SDM include defining objectives and performance measures, identifying and evaluating alternatives, and making choices based on a clear understanding of uncertainties and trade-offs. These general methods are adapted for use in applied decision making situations and have a strong track record in North America and elsewhere.

Value-Based Choices. The decision making process should begin by developing a clear understanding of what matters to participants in the decision – their values – and by clarifying the process and the criteria that will be used to assess the performance of different alternatives with respect to these values. It is understood that different parties will attach different importance to different values. The process should ensure that all values, even those that are hard to quantify, are addressed explicitly as part of the decision making process. Deliberations about difficult choices will be based on seeking an acceptable balance across multiple values.

Informed Choices. All participants should have a full understanding of the issues, the alternatives proposed to address them, and the likely consequences of the alternatives. They should have access to the same information (e.g., data, studies, reports, reviews) and work toward building a common understanding of technical findings. The presentation of technical information in a manner that is accessible to non-technical participants is essential and its role in the decision making process must be clearly articulated and understood. It is not necessary that every finding of a study be endorsed fully by every party; only that the findings be accepted as relevant to the decision and its role be understood. The contribution of both science and local or traditional knowledge should be clarified and respected, with knowledge from both scientific and local or traditional sources incorporated as part of the decision framework and with all sources of knowledge subject to agreed-upon quality checks.

Collaborative Process. Decisions will respect the different views of participants and will be made on the basis of shared discussions. Although it is recognized that different viewpoints – both technical and value-based – may exist among participants, a collaborative process requires that these views be clearly expressed and be open to discussion as to their origins, strength, relevance and implications. The process will be solutions-oriented, with the goal of finding alternatives that are mutually acceptable. In general, an SDM process will strive for and support the development of consensus. However, it is explicitly not required. Areas of agreement and disagreement will be clearly documented along with reasons for each.

Learning and Adaptive Management. Recognizing that uncertainty will always be present, provision should be made for ongoing review and refinement of the understanding of social/cultural, economic and ecological systems and their response to management actions. The timing of, and participation in, review processes should (so far as possible) be established in advance. Data needs in support of future decisions should be clarified before monitoring is initiated.

Transparency and Accountability. The decision making process will follow a defined set of steps designed to ensure that participants and observers know what to expect at each stage of the process. The use of clear objectives and evaluation criteria will improve the quality of the decision making process and help to ensure that the rationale for the resulting decision is clear. Timely communication to the larger community of interested parties, including management agencies and potentially affected communities, will be provided; in some cases, additional communication with legal interests or with the media also will be required.

4.3 Core Steps

SDM is centred on a set of core steps (Figure 1) that serve as a guide for working through a decision, and supported by structuring tools from the decision sciences that help groups deal with the complexities of

technically intensive decisions and difficult group dynamics. What exactly is done at each step, to what level of rigour and complexity, will depend on the nature of the decision, the stakes and the resources and timeline available. In some cases, the appropriate analysis may involve complex modeling spanning months or years; in others it will involve structured elicitations of expert judgment conducted over several days. In still others, a careful structuring of objectives and alternatives may be all that is needed to clarify thinking around a particular decision and a qualitative analysis will suffice. A key point is that structured methods do not have to be time consuming; even very basic structuring tools and methods can help to clarify thinking, minimize biases and counter the negative effect of simplifying heuristics adopted by decision makers who are otherwise rushed through complex judgments.

Figure 1 **Steps in Structured Decision Making**

1) Clarify the Decision Context

The first step is to clearly establish the process and clarify the decision context. This involves:

- Defining the decision that will result from the process and who will make it
- Defining the scope and bounds for the process and decision(s) to be made (what's in and what's out)
- Identifying the constraints within which the process will be undertaken (timelines, budgets, legal constraints, etc.)

- Clarifying the roles and responsibilities of the participants and how they will work together (will there be technical working groups, and if so how will they interact with decision makers?)
- Sketching the objectives and alternatives under consideration and clarifying information needs.

This step establishes the nature of the analysis that will be required to inform the decision and lays out a road map for the deliberations that will follow so that all parties understand what will be expected of them.

A key tool at this stage is “decision sketching”. Decision sketching involves working quickly through the first four steps of SDM at a scoping level. This creates a vision of what the decision is about and what will be required to make an informed choice. The key is to treat the process as a multi-dimensional decision from the start, rather than a technical analysis or engagement exercise, and to establish a plan for how analysis and dialogue will be integrated to inform the decision. Success depends on gaining commitment to the overall SDM process during this first step.

2) Define Objectives and Evaluation Criteria

The core of SDM is a set of well-defined objectives and evaluation criteria. Together they define "what matters" about the decision, drive the search for creative alternatives, and become the framework for comparing alternatives.

In simple terms, objectives reflect the things that matter or the felt needs of the people affected. Clearly stated objectives need to state the outcome that matters. The process for developing sound objectives begins with simple brainstorming, followed by the use of two key structuring tools:

- Objectives hierarchies that group objectives by category and organize sub-objectives that provide a fuller description, and
- Means-ends diagrams that visually show the relationship between policy alternatives (means) at one end and fundamental objectives (ends) at the other. These are useful for developing a conceptual understanding of a system, for helping separate interests (objectives) from positions (means), and for identifying potential evaluation criteria.

A good set of planning objectives should be **complete** (fully addressing all the things that matter when evaluating alternatives within the defined scope), **concise** (with no redundancy or double counting), **controllable** (meaning that they are sensitive to or affected by the range of alternatives under consideration), **meaningful** (understandable and relevant to all participants), and **preferentially independent** (meaning that the importance assigned to one objective does not depend on the values taken on by other objectives).

Evaluation criteria are defined normally for each sub-objective within the objectives hierarchy. Collectively, the evaluation criteria represent the information that decision makers will have for choosing among policy alternatives; they should cover all the important aspects of the decision.

They play a central role in the decision process as they are used to:

- Compare alternatives accurately and consistently;
- Expose trade-offs including trade-offs among different degrees of uncertainty;
- Generate productive discussion about better alternatives;
- Prioritize information needs;
- Communicate the rationale for and improve the transparency of decisions.

Like objectives, evaluation criteria should be complete, concise, controllable and meaningful. They should also be **direct** (in that they accurately and unambiguously report as directly as possible on the endpoint itself), **measurable** (in the sense of being able to consistently report expected difference in performance across alternatives, but not excluding qualitative measures), and **explicit about uncertainty** (in that they expose the risk profiles or range of possible outcomes of different alternatives).

It isn't easy to define good evaluation criteria that are widely agreed upon by stakeholders, experts and decision makers. However, the up-front investment pays off in streamlined decision making, for two principal reasons:

- Because data, modeling and expert judgment processes are focused on producing decision-relevant information;
- Because large numbers of complex options can be consistently and efficiently evaluated by multiple decision makers.

3) Develop Alternatives

Once objectives are clear, SDM is fundamentally about the search for creative solutions. Rather than allowing the decision process to devolve into an economic valuation exercise or a scientific stand-off about uncertainties, SDM focuses on identifying, comparing and iteratively refining alternatives. Alternatives should reflect substantially different approaches to the problem or different priorities across objectives, and should present decision makers with real options and choices. It is usually important to search for alternatives that are robust to key uncertainties or that reduce them over time.

Developing good alternatives is an iterative task. Initially, the task will be to develop a range of exploratory alternatives that may reflect substantially different approaches to the problem or different priorities across

objectives. In environmental management/land use planning, the number and diversity of alternatives can be overwhelming, and specific actions may need to be thoughtfully combined into packages or portfolios that represent a comprehensive response to the decision situation.

Alternatives are iteratively refined by eliminating alternatives that are "dominated" and combining desirable elements of preliminary alternatives to create composite alternatives. Early alternatives may include a wish list of both well and poorly thought-out alternatives. However, short-listed alternatives should be:

- **Value-focused**, meaning that they are explicitly designed to address the fundamental values or ends of the decision - the "things that matter" or "felt needs", as defined by the objectives and the evaluation criteria;
- **Technically sound**, meaning that in developing alternatives for achieving the objectives, the process has drawn on the best available information about cause and effect relationships and has designed creative and diverse alternatives based on sound analysis;
- **Clearly and consistently defined**, meaning that all alternatives are defined to a sufficient and consistent level of detail using logically consistent assumptions, and that a base case against which all alternatives can be compared has been clearly established;
- **Small in number and high in quality**, meaning that poor (dominated) alternatives have been eliminated and those remaining have been iteratively refined to incorporate new ideas and joint gains;
- **Comprehensive and mutually exclusive**, meaning that individual elements or components of a strategy are combined into complete packages, and that the packages are directly comparable;
- **Able to expose fundamental choices,** meaning that they emphasize rather than hide difficult but unavoidable value-based trade-offs and present real choices.

4) Estimate Consequences

This step integrates the previous two, where estimated consequences of the alternatives are presented in terms of the objectives and evaluation criteria using available knowledge and predictive tools. The assignment of consequences is an analytical task. It does NOT involve the assessment of value-based judgments about the relative importance of those consequences or the identification of a preferred alternative. This task is generally undertaken by scientists, economists and other subject specialists including holders of local and/or traditional knowledge.

There are, in a social and ecological context, inevitably more uncertainties than budgets and timelines can address. One of the key challenges involves identifying which uncertainties are critical to decision making,

prioritizing and scoping studies accordingly, and ensuring an honest exploration of key risk factors. An important principle for ensuring decision quality and for managing project timelines and budgets is a commitment to **decision-focused** information.

Data collection and analysis resources should be allocated across the evaluation criteria in proportion to the extent to which they are expected to contribute useful information for decision making. Expert judgment is an important tool for addressing data gaps, but must, like modeling and data collection, be performed according to accepted standards, incorporating best practices related to expert selection, elicitation protocols, bias avoidance, treatment of uncertainty, documentation and peer review.

Proposed studies should be scoped to deliver information directly relevant to the decision process; in most cases this will be by improving the estimates of impacts with respect to stated objectives and evaluation criteria, or in some cases, by identifying which criteria are most relevant. Models must be designed as decision aids, not as complex mechanistic models of ecological or economic processes.

Ultimately, objectives, evaluation criteria and alternatives will be linked in a consequence table (Figure 2). A consequence table is a succinct summary matrix illustrating the performance of each alternative on each objective. It exposes key choices and trade-offs among objectives across the alternatives under consideration.

Objectives	Evaluation Criteria	Alternative 1	Alternative 2	Alternative 3
Environmental	Habitat Area			
Social	Recreation User-Days			
Economic	Mitigation Costs			

Figure 2 Consequence Table

5) Evaluate Trade-Offs and Make Choices

The goal is to choose an alternative based on achieving a balance across multiple objectives. Although the SDM process often delivers "win-wins," most decisions will still involve trade-offs of some kind and hence will require value-based choices. Evaluation tools such as consequence tables (along with other supporting technical information) will help to inform choices, but will not make them. Participants in the process will acknowledge and openly discuss difficult trade-offs and review options for achieving an acceptable balance across all objectives. The SDM process requires that participants make explicit choices about which alternative is preferred based on their own values and their understanding of the values of those affected. This can be done holistically by reviewing the trade-offs in the consequence table and assigning ranks or preferences to the alternatives directly. In this approach, participants implicitly think about which impacts are more or less important, and which set of trade-offs is more or less acceptable.

In some cases formal preference assessment methods may be used to help groups work through these productively. This generally involves explicitly assigning weights to the evaluation criteria, and scoring and ranking the alternatives. These methods can be used to focus deliberations on productive areas and maintain a performance-based dialogue, rather than a positional one. But SDM is not a black box; the emphasis is on group deliberations and collaborative decision making. Structured methods can be demanding, but participants are generally enthusiastic about exploring their own trade-offs, learning about the values and choices of others, and systematically recording the range of preferences for policy/decision makers.

Where uncertainty plays a significant role, the issue of risk tolerance becomes of central importance at this stage. Risk tolerance refers to the amount of risk people are willing to take. Most people are "risk averse," but everyone has different degrees of risk aversion, and in a group decision making setting, it is this difference in risk tolerance that can be the greatest impediment to agreement.

At a minimum, an emphasis on deliberative quality requires that participants involved at this stage should be expected to:

- Demonstrate an understanding of the decision scope and context, how it is related to other decisions, why the problem matters, and for whom the consequences are most relevant;
- Demonstrate an understanding of the evaluation criteria, the alternatives and the key trade-offs among the alternatives;
- Demonstrate an understanding of key uncertainties and their impact on the performance of the alternatives;
- Articulate their preferences for the alternatives in terms of the choices that are presented in the consequence table.

While stakeholder consensus is desired and supported by SDM, it is not mandatory. Areas of agreement and disagreement among participants and the reasons for disagreement should be documented and presented to decision makers.

6) Implement and Monitor

A structured decision process should promote learning and build management capacity--in terms of technical information, human resources and institutional capacity--to make better decisions in the future. A key challenge is to both reduce critical uncertainties through monitoring and review and build in institutional flexibility to respond to new information without overextending management and political resources.

4.4 Tools

Structuring tools and techniques, many of which stem from the decision sciences, help to distinguish an SDM approach. These tools provide discipline and decision-focus both to technical analysis and to value-based deliberations. A small sample of them are briefly described here.

Influence Diagrams

Influence diagrams are a conceptual modeling tool that graphically represents the causal relationships between decisions, external factors, uncertainties and outcomes. Influence Diagrams are a common decision structuring or modeling tool that graphically represents the relationship between decisions, uncertainties and outcomes, using nodes and arrows. They emphasize the causal variables over which managers have some control, although other variables may also be represented. The influence diagram plays an important role in defining evaluation criteria and determining modeling and information needs directly related to the evaluation criteria. It facilitates communication among technical experts, decision makers and stakeholders about how a system works and what information is important in a decision. When constructed under more formalized rules to describe inter-related conditional probabilities, influence diagrams become Bayesian Networks.

Figure 3 provides an example of an influence diagram constructed for the Visual Quality objective of an air quality management process.

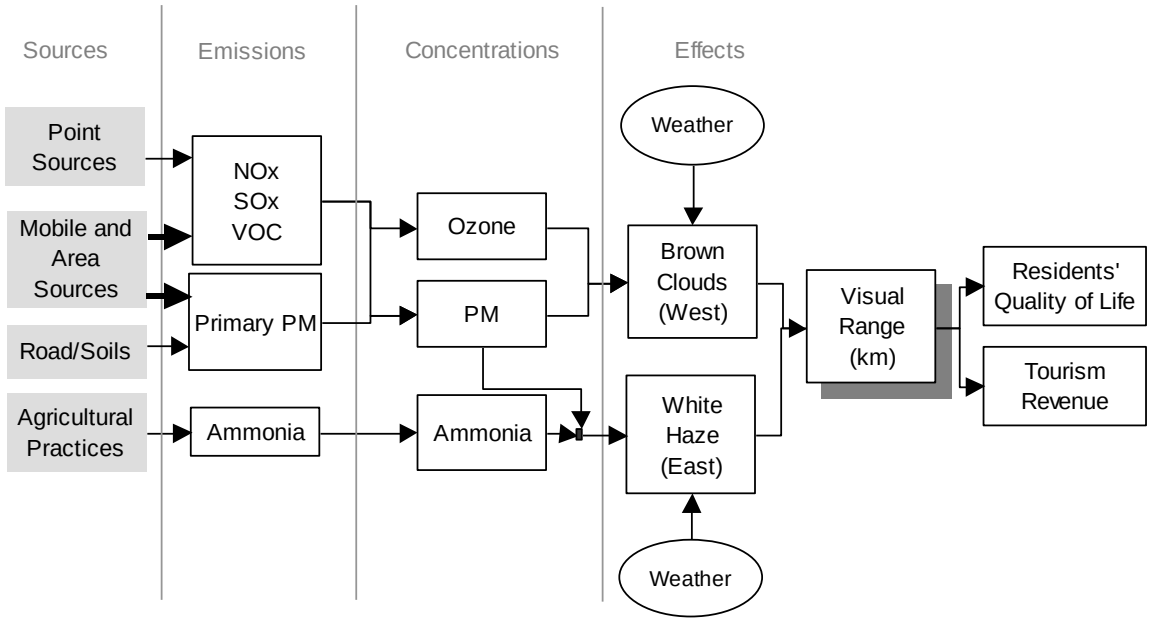

Figure 3: Example Influence Diagram for Visual Quality Management

The influence diagram shows the relationship between major pollutant sources and the ultimate effects or endpoints. The effects are shown at the far right. To the left of the effects, the major ambient air concentrations that most directly contribute to the effects are shown. To the left of concentrations are the major emissions that cause them, and at the far left, are the broad categories of major sources. Dominant pathways are shown with bold lines; very minor pathways are not shown at all. Ovals represent factors outside the influence of an air quality planning process. The shadowed box indicates the proposed evaluation criterion. In this case, Visual Range, reported in kilometres, represents visual quality, and is proposed as a proxy for two more fundamental objectives: residents' quality of life and tourism revenue. Alternatively, it might be possible to develop constructed scales for these more fundamental objectives.

Value Tree or Objectives Hierarchy

A value tree, like an objectives hierarchy, shows how higher order objectives are linked to sub-objectives and eventually to performance measures or attributes. Figure 4 provides an example of a value tree for evaluating operating alternatives at a hydroelectric facility. Higher-order objectives at the left of the hierarchy are linked ultimately to performance measures (evaluation criteria) at the right.

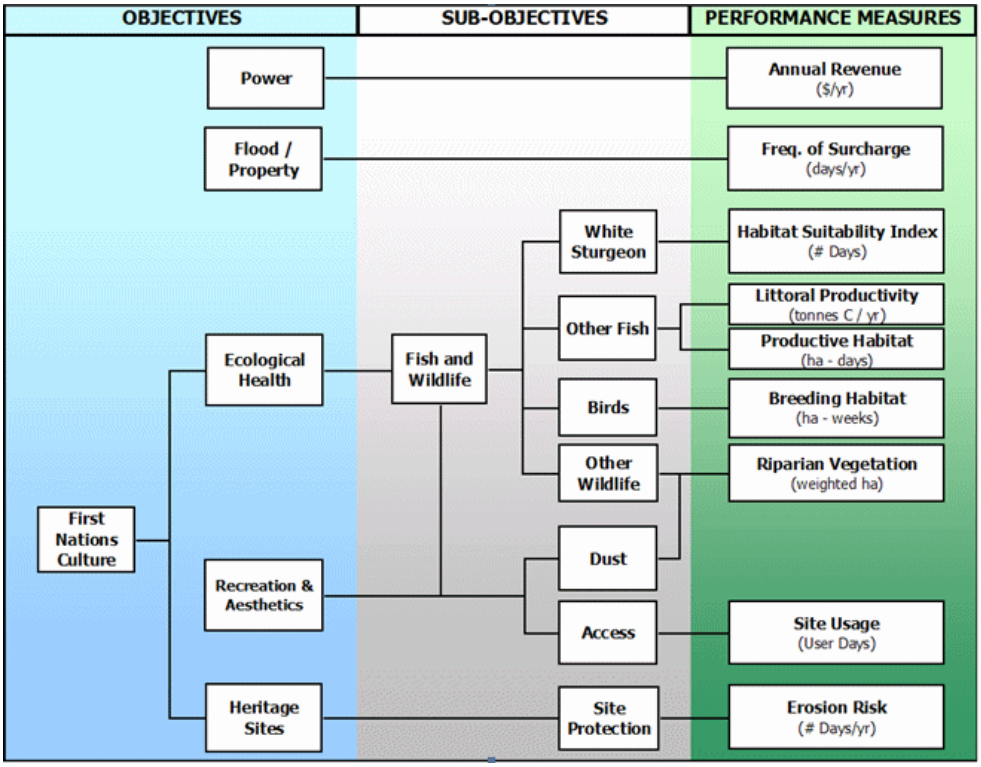

Figure 4 **Example Objectives Hierarchy for Hydro Facility Operations**

Strategy Table

In an SDM context, a ”strategy” is a logically consistent set of individual actions combined to create a comprehensive policy response. Usually there are several categories of possible management actions, and creating a strategy involves selecting one or more actions from each category and combining them to create a comprehensive strategy, normally with a recognizable theme or approach.

A strategy table is a logical and visual way of describing the definition of alternatives in terms of specific selections made from various categories of actions.

Consider the recovery planning process for a species at risk. A comprehensive recovery plan may encompass several categories of actions (represented by the columns below).

For each of these categories, we can create a shopping list of candidate **actions** to choose from (Table 1).

Table 1 Example of Categories and Actions for Species Recovery Planning

Habitat Protection	Predator Control	Population Enhancement	Monitoring
Status Quo Establish no-logging zones in critical habitat Develop linkage corridors	Status Quo Harvest Increase Harvest to reduce population by 10% Lethal Control to reduce population by 20%	None Maternity Pens Captive Breeding Translocation	None Basic Monitoring Enhanced Monitoring

Now there are a multitude of possible combinations, but not all of them logically go together, or alternatively, some may need to be done in concert. In the above case for example, translocating animals without concurrent predator control would not likely be considered. Depending on the decision context, it is usually useful to define 2-8 logical combinations or strategies.

In the example show below (Table 2), three strategies are developed for recovery of a species at risk. The first two explore different strategies for maintaining the existing population. The first (**red**) is largely the status quo, with more intensive monitoring. The second (**blue**) involves increasing the harvest of predators thought to threaten the population. The third strategy (**purple**) aims at increasing the herd size up to the carrying capacity of the region, involving both protection of threatened habitat, and implementation of a captive breeding program.

These strategies provide a good starting point. Subsequent modeling should facilitate a helpful learning process from both a technical basis (what would better achieve the objectives) and a value-basis (which solutions offer the most desirable balance of outcomes).

Table 2 Example Strategy Table for Species Recovery Planning

Strategy Theme	Habitat Protection	Predator Control	Population Enhancement	Monitoring

Maintain Existing Population (A)	**Status Quo** Establish no-logging zones in critical habitat Develop linkage corridors	**Status Quo Harvest** Increase Harvest to reduce predators by 10% Lethal Control to reduce predators by 20%	**None** Maternity Pens Captive Breeding Translocation	None Basic Monitoring **Enhanced Monitoring**
Maintain Existing Population (B)	**Status Quo** Establish no-logging zones in critical habitat Develop linkage corridors	Status Quo Harvest **Increase Harvest to reduce predators by 10%** Lethal Control to reduce predators by 20%	**None** Maternity Pens Captive Breeding Translocation	None **Basic Monitoring** Enhanced Monitoring
Increase Population to Carrying Capacity	Status Quo **Establish no-logging zones in critical habitat** Develop linkage corridors	Status Quo Harvest Increase Harvest to reduce predators by 10% **Lethal Control to reduce predators by 20%**	None Maternity Pens **Captive Breeding** Translocation	None Basic Monitoring **Enhanced Monitoring**

Expert Judgment Elicitations

In an ideal world, uncertainties are reduced quickly and efficiently with research, monitoring, or modeling, and information is provided in time to aid decision making. However, it is not always possible to conduct new research to address key uncertainties, and it is seldom possible to eliminate them even with new research. In such cases, decision analysis suggests the elicitation of subjective technical judgments. There is well-established literature on the methods that are required for eliciting defensible and transparent judgments in the face of significant uncertainty and on the opportunities and limitations for using such judgments as aids to improved management.

The steps associated with best practice in structured expert judgment include:

- Identify multiple experts based on an explicit selection process and criteria, and including experts from different domains and disciplines of knowledge (e.g., science versus local knowledge).
- Clearly define the question for which a judgment will be elicited, making sure that the question separates (as much as possible) technical judgments from value judgments.
- Decompose complex judgments into simpler ones. This will improve both the quality of the judgment and, to the extent it helps to separate a specific technical judgment from the management outcomes of that judgment, its objectivity.
- Document the expert's conceptual model. Not only will this help the quality of the judgment and its communication to others, but it will create a clear and traceable account that will facilitate future peer review.
- Use structured elicitation methods to guard against common cognitive biases that have been shown to consistently reduce the quality of judgments.
- Express judgments quantitatively where possible. The use and interpretation of qualitative descriptions of magnitude, probability or frequency vary tremendously among individuals. This seems likely to be amplified in a cross-cultural setting.
- Characterize uncertainty in the judgment explicitly, using quantitative expressions of uncertainty wherever possible to avoid ambiguity.
- Document conditionalizing assumptions. Differences in judgments are often explained by differences in the underlying assumptions or conditions for which a judgment is valid.
- Explore competing judgments collaboratively, through workshops involving local and scientific experts, with an emphasis on collaborative learning.

5 The Opportunity to Integrate SDM into the CLUPP

Regional land use planning in the Yukon is mandated to be a transparent and inclusive process. Designing processes that support both the technical and political considerations, as well as ensuring room for public and stakeholder participation suggests a collaborative process supported by evidence. So the question here is – *is there an opportunity for SDM as summarized above to support regional land use planning in the Yukon?*

From a broader perspective, planners will most likely need to call upon a number of planning theories and practice stories to assist with their work with stakeholders, governments/parties when planning for large regions where there is a large degree of uncertainty and sometimes limited information. A mixed planning approach incorporating transactive, rational and collaborative planning theory is flexible, inclusive and structured and can be argued to respond well to the opportunities and challenges identified during the YLUP Conference.

Regional planning in the Yukon is based on a modern, rational approach. The present society in which planning operates is defined as postmodern (Dear 2000). This era of postmodernity where "nothing is certain save for uncertainty itself" (Sandercock, 1999 p.535) suggests that planners need to develop processes and use resources where some level of certainty can be predicted. Planning theorists such as Alexander supports this argument suggesting that predicting the future is required for evaluating alternatives in plan making and that prediction can only be done when supported by quality information (1992). SDM is a planning practice that provides structure to decision making and provides methods to incorporate and assess uncertainty.

Collaborative Planning

The collaborative planning model gives a voice to the public, stakeholders and governments and provides a method for inclusive, transparent planning. The diversity of the voices and the varied interests are challenges for regional land use plans in the Yukon. However, collaborative planning processes can provide a platform for recognizing differences, framing those differences within common interests and then with truth (sharing of values/objectives upfront in the process), and good information, diversity can be celebrated and consensus can be reached.

Using a collaborative planning approach that examines alternatives to meet desired goals is very similar to the work that planning theorists, Davidoff and Reiner were advocating in the 1960's. Now in 2012, Integrated Resource Managers are calling it 'structured decision making' (Gregory et al. 2012). The use of the charrette planning model (transactive) along with the structured decision making process (rational approach) mixes theoretical approaches and can responds well to the pluralistic, postmodern society in which planners, parties and commissions are being asked to create regional plans in the Yukon.

Through collaborative structured decision making planning processes community members, stakeholders, and experts can come together and share both scientific and traditional/local knowledge to create a shared vision, respond to the challenges and opportunities identified above, make decisions and build local capacity.

The ***Plan Preparation*** Step of the CLUPP identifies five stages for each regional commission to follow:

1) Identify Issues and Interests
2) Develop Plan Goals
3) Gather Information
4) Develop Scenarios / Options
5) Draft the Plan

From the perspective of planning theory, these stages largely adhere to a rational planning model. Process-wise, it would be relatively simple to integrate many of the tools and techniques of SDM as described above into these stages without fundamentally changing the intent of each stage of the CLUPP. Below we outline five key opportunities for consideration.

1) Role for a Multi-Party Planning Group

SDM, as articulated in Gregory et al. (2012), has largely been developed to support "groups of people working together on solutions in a way that is rigorous, inclusive, defensible and transparent". There are many examples and success stories of multi-party planning groups working collaboratively through challenging planning processes using an SDM process.

In most successful SDM processes, a core 'planning committee' is established as the main planning process body, supported by technical sub-committees and a broader public consultation strategy. The planning committee should have representation from all key parties with a stake in the outcome – e.g., Governments, Non-governmental Organizations, industry, community.

The opportunity for the regional commissions themselves to serve this role as envisioned by the SDM process is worthy of exploration, particularly at the front-end of a new planning process where a specific Terms of Reference could be developed to help articulate detailed roles and responsibilities.

2) Authentic Input into Objectives and Scenarios / Options

Concerted effort should be put toward articulating all the interests of all key participants as stated planning objectives. If something matters, then it should be included on the list of objectives, whether it is easily

measured or not. Too often planning processes falter by focusing the majority of effort on stated objectives like economic resource value or environmental values like habitat that can be supported by hard data and measurable indicators. But other more hard-to-quantify objectives such as recreation or traditional use interests should also be included if the process is to authentically address all the issues that matter.

SDM offers a suite of structuring tools including influence diagrams, objectives hierarchies, constructed scales and proxy measures that, with discipline, can be used to level the playing field toward the incorporation of all interests.

The same can be said for garnering authentic input into the identification of scenarios and options for consideration in a plan. There are few tasks that are as validating for participants in a planning process than having tangible input into the brainstorming of options that are subsequently analysed and considered in the process. In can even be helpful in this regard to include 'extreme' or 'bookend' options (e.g., major expansion of protected areas, full industrial development, etc.) early in the process to focus the discussion of difficult choices to be faced by all participants.

3) Integration of Analysis and Deliberation

SDM has the stated intention of fostering deliberation informed by analysis. This point builds on the point above, as participants have meaningful input into the development of objectives, criteria and options.

How this is achieved as part of a planning / decision making process is through rigorous attention to facilitated discussions where care is taken to separate the discussion of 'facts' and 'values'. In a land use planning context, facts are largely focused on the expected outcomes of alternative policies and management actions (e.g., as generated from resource assessments, GIS-based modelling exercises, etc.). Values-based discussions are structured through thoughtful consideration of alternatives and their consequences and the trade-offs and choices under consideration. A good SDM process seeks to translate complex technical analyses into language and decision-relevant messages that allow people without technical expertise to meaningfully understand and participate in the choices at hand.

4) Iteration

The importance of iteration in an SDM process cannot be overstated. Each step of the SDM process will inform both subsequent and preceding steps – e.g., thinking through the development of good evaluation criteria helps to refine the understanding of objectives as well as the development of alternatives that may achieve preferred outcomes. Encouraging iteration fosters learning, and learning often results in better options for consideration.

Yet iteration does not need to be a time (and budget) consuming ordeal. As a specific iterative technique, SDM suggests the use of "Decision Sketching" early in a process in order to frame the overall process and educate the participants regarding the steps ahead. Decision sketching involves running through the first few steps of the SDM process in a quick, overview manner – at minimum defining the context, identifying preliminary objectives and a range of potential alternatives. Participants are encouraged to roughly estimate consequences as a means of highlighting critical uncertainties and potential trade-offs. Experience has shown that by quickly mapping out the decision and process in this way, considerable insight can be gained into the most important aspects of the planning process where resources should be focussed.

Compare this to the 'study culture' that pervades many agencies and land use planning processes where enormous efforts are placed up-front into resource inventories and information gathering exercises prior to critical and collaborative thinking first about what matters most (i.e., objectives), how it might be measured (i.e., criteria) and what management opportunities are within scope and on the table (i.e., alternatives). Experience in regional land use planning in the Yukon appears to have suffered from this problem, where a significant amount of time and effort have been expended in early information gathering efforts, leaving less time available for the critical tasks of exploring alternatives with participants and wrestling with the challenging choices that lie at the root of regional land use planning.

5) Face Up to Explicitly Making Choices

The focus on explicitly examining trade-offs and making deliberate choices is what distinguishes SDM from most other rational planning models. As a case in point, the current CLUPP offers little guidance on how to move from the *Options* to the *Draft Plan* stage of planning.

Whether we like it or not, 'seeking the best balance' across competing interests involves making trade-offs. SDM offers a range of methods for exploring trade-offs in a deliberative setting with the goal of providing insight to participants and decision-makers. Making land use planning choices in an explicit, informed and transparent manner is entirely consistent with the principles underlying all approaches to collaborative land use planning.

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