

A Systematic Approach to Monitoring Skeena Region Plans

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Introduction

MSRM Skeena Region considers monitoring to be a critical component of the planning cycle. The region monitors plans exclusively and in partnerships with other ministries and industry. Monitoring is defined by the needs of the value set (plan, certificate, policy etc), by availability of appropriate indicators and by available of data. Monitoring Committees, Industrial organizations, the InterAgency Management Committee (IAMC) and the Ministry of Sustainable Resource Management all have a role in monitoring. This paper discusses the relationship between four types of monitoring and the role played by organizations in the region.

Provincially the LRMPs and Regional land use plans are the only plans that are fully integrated for social, economic and environmental considerations. They are perhaps unique in the world for the extent of land covered and because they are based on a wide consensus. Industry has had detailed input into the integration of land and resource uses and has agreed to live by the consensus. Perhaps \$100 million have been spent on these plans and so monitoring them is very important. In fact, monitoring and adapting existing plans may be cheaper than re-planning from the beginning.

BC's Strategic Land Use Plans are the only true sustainability plan. Other plans do not fully integrate all land and resource uses.

This document is Skeena Region's contribution to the current discussion of a provincial monitoring framework. The five completed LRMPs will be monitored at the highest

level possible within the resources available for this activity. The intent is to put monitoring resources where they are most effective according to the principles outlined below.

Methods of Monitoring

The direction in Skeena Region monitoring is from general to detailed, from manual to automatic and from stewardship to sustainability monitoring. As a result 4 methods of monitoring are practiced: implementation monitoring, stewardship monitoring, sustainability monitoring and effectiveness monitoring.

Monitoring can be divided into two general types: project status and indicator measurements. Monitoring a project' status is reporting the progress towards completion, i.e. determining the extent to which a project has been implemented. Called **implementation monitoring**, this is the present standard for LRMPs in the Skeena Region.

Monitoring with the use of indicator measures can be divided into two sub-categories: indicators that measure each resource separately and indicators that measure all social, environmental and economic concerns.

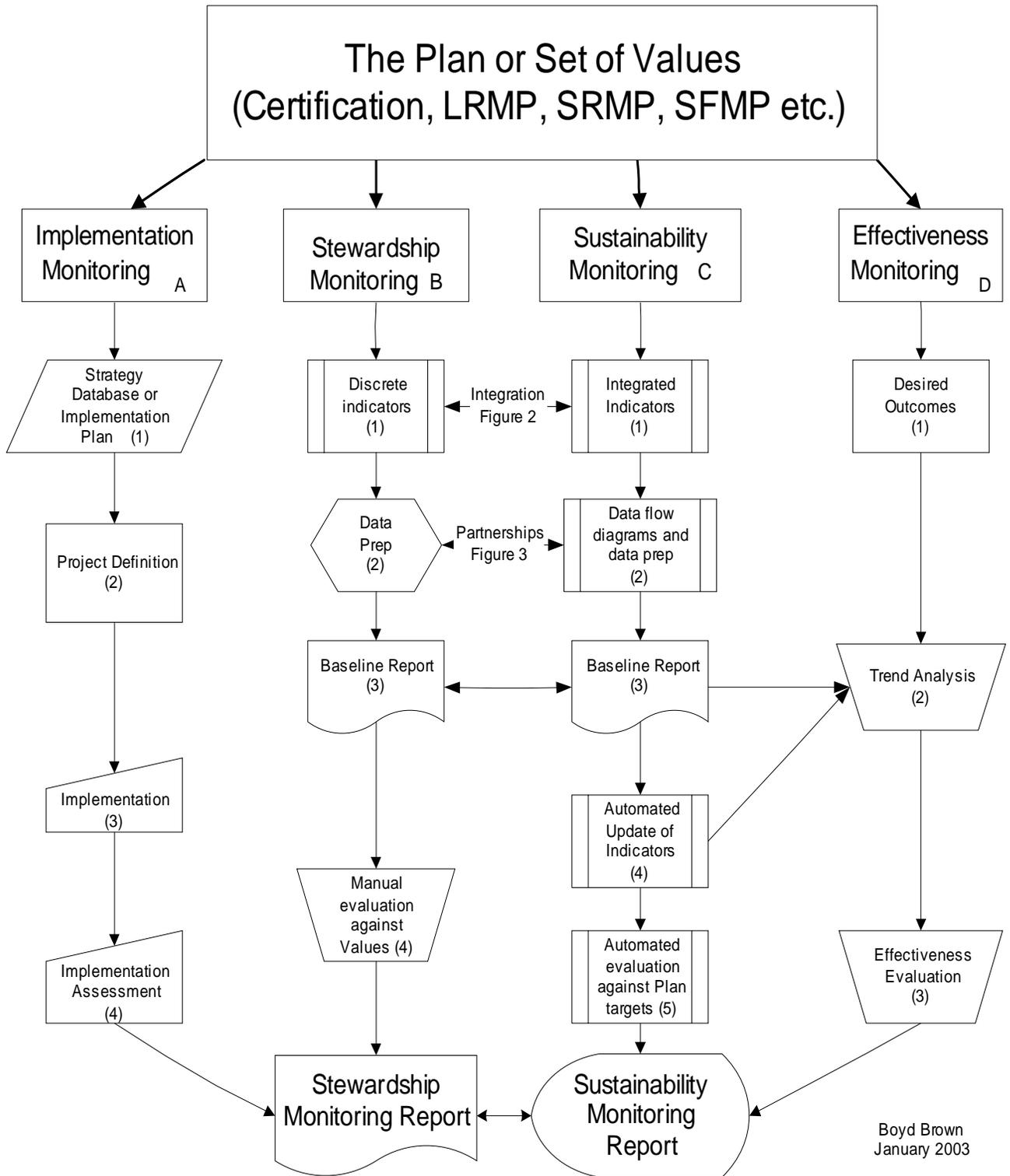
If the indicators are used to report on the health of separate resources (such as wildlife, water and/or timber) then **stewardship monitoring** is occurring. These indicators are called discrete.

If the indicators are monitoring a comprehensive plan that balances social, environmental and economic concerns the plan is considered a sustainability plan. Monitoring these plans is **sustainability monitoring** and the indicators are said to be integrated.

Effectiveness monitoring is a special case of sustainability monitoring. This type of monitoring asks the question "Are we closer to the desired future state envisioned in the plan?" It analyses trends after several re-measured sustainability monitoring reports.

Please see Figure 1 for the relationship between these four different methods of monitoring. As you move from left to right the complexity, detail and time requirements increase.

Figure 1 Methods of Monitoring



A. Implementation Monitoring: Least Detailed Method

Implementation monitoring is the standard for monitoring of all LRMPs in MSRMS Skeena Region. This standard is based on the framework document, “The Strategic Land Use Plan Monitoring Procedures” (Zweck and Reay 2000). Implementation monitoring documents on the completion status of projects. Therefore

The standard monitoring report in the Skeena Region starts with every strategy in the LRMP appearing in a strategy database or an implementation plan (A1 on Figure 1). Which ministry leads the implementation of each strategy is negotiated through the Interagency Management Committee (IAMC). The responsibility for each strategy falls on the ministry with the appropriate mandate. Of course some strategies are not funded in the ministry’s service planning each year because they are not high priority.

The actual performance on a given strategy is reported biannually. Ongoing strategies, by definition, can not be assessed as to their completion. These strategies may not be reported or reported as ongoing. A general statement on the condition of these ongoing responsibilities may appear in the introductory remarks of the monitoring report.

Some strategies can be grouped into projects for implementation and reporting. The completion status of these strategies is usually reported. Ministries also can report on completion status by grouping strategies into objectives if they desire. These objectives/strategies are assessed to their progress towards completion in 5 categories: Not Started, Initiated, Midway, Substantially Complete and Complete. Each category has an associated completion percentage range.

The monitoring report is a paper or digital publication that is distributed through the post office or by e-mail. It is a one time “snapshot” report of interpreted information on progress towards resource stewardship.

B. Stewardship Monitoring: Discrete Indicators Method

State of the Resource monitoring reports and Certificate monitoring reports on a single resource or a group of resources. They are not reports on fully integrated social, economic and environmental plans so usually reflect the stewardship of a particular resource. Value sets are often a single resource, specific resources or certification requirements. The benefit of this type of reporting may include supporting the case for special care of a resource or satisfying a certification requirement. Determining indicators (B1 on Figure1) may not require as rigorous a process as required for a fully integrated value set. The output is a stewardship monitoring report.

The Ministry of Forests in the Bulkley is producing a State of the Forest (SoF) report to satisfy the information needs of the District Manager. The Ministry of Water, Land and Air Protection produces a State of the Environment report on the provincial level with

certain indicators based on local measurements. Both West Fraser and Canfor are exploring certification systems which require monitoring.

Important differences between our present implementation monitoring standard (A) and the State of the Resource (SoR) and certification reports (B) are the use of indicators, the use of detailed data and the use of maps, charts and tables for displays. The ministry or certification body usually defines indicators. SoR monitoring is grounded in resource inventories. Detailed data about the state of a resource are compiled (B2) and displayed as baseline information (B3) about the indicators chosen to represent stewardship of values. When updates to the inventory are done they are displayed on the maps, and in the charts and tables. The trend between the baseline and the update is then available for each member of the public to interpret. The ministries may also provide interpretative comment (B4). The information available to the public is greatly increased over monitoring report from standard implementation techniques.

Unfortunately SoR reporting has some difficulties. The report is data heavy and may require considerable manual work. In an era of government down sizing this is a serious drawback but not necessarily limiting if monitoring is given a high priority. Another drawback of manual SoR monitoring is the difficulty of comparing reports. Repeating exact replica of previous reports is made difficult because not only do inventories change but also changes in personnel and data handling systems can impact outputs in an unknown manner.

A wide range of reporting media is used for SoR reports. Published reports and summaries are found in paper, digital and web based formats.

C. Sustainability Monitoring: Integrated Indicators Method

How do we tell if lands and resources are managed sustainably? Determining stewardship practises for single or separate resources is less demanding than determining if all resources are sustainable from economic, social and environmental perspectives. The Ministry of Sustainable Resource Management is charged with this greater challenge.

Strategic land use plans (SLUP) which are integrated sustainability plans are presently completed or soon to be completed for about 85% of the land for British Columbia. Tactical plans such as Sustainable Resource Management Plans (SRMP) and Landscape Unit Plans (LUPs) define the spatial details of sustainability for monitoring purposes and are monitored in conjunction with SLUPs. Both strategic and tactical plans are monitored at the same time. The tactical plans are essential to provides greater detail for the strategic plan. To efficiently monitor these plans in an era of diminishing budgets and staff is a challenge that requires harnessing the latest technology to automate as many processes as possible.

The core to the automated monitoring approach is agreements on how spatial data and indicators are processed. This agreement is made among scientific experts in the disciplines important to monitoring i.e. data acquisition; indicators of sustainability; values articulated in plans and reporting of monitored results (C1 in Figure 1). Data flows through various processes, which are grouped into data models and values models for clarity among experts and to impose discipline on the data flow documentation.

In a chain of reasoning, the plan determines what information is important to monitor, the monitoring needs drive the selection of indicators and the indicators determine which raw data is selected for processing. But is the data flow logic realistic? Each indicator is then tested against data availability and the plan rationale to determine its worth in the monitoring report. Only the best indicators appropriately supported with data end up in the monitoring report. The data flow logic is then documented (C2) in a technique common to systems analysis called data flow diagrams.

The data model (C3) is that portion of the data flow logic that creates indicators from the raw inventory data. By applying the data model to a database for the first time a baseline report (C4) is created. This is the foundation for comparison of future measurements. When the inventory is updated then the data model updates the indicators (C4).

Updating the monitoring report automatically each time the inventory is updates, is the purpose of the automated monitoring protocol (AMP). The data flow logic is scripted into computer language and activated at the end of each inventory update. New indicators are automatically supplied to a second model to evaluate targets. The values model is built from the values expressed in a plan. For example an LRMP has a series of strategies to achieve land use goals. Each of these strategies could be seen as an expression of the balancing of competing resource opportunities or as a statement of the relative value of each resource. Values expressed as targets, can be compared to actual performance of indicators generated in the data model (C5).

Several data models may be accessed to satisfy the needs of a single plan. Partnerships between industry, government and other organizations may be necessary to satisfy the data needs of a single land use plan.

Can managers change their approach to increase the potential for sustainability? Accurate, detailed and timely monitoring information affects how decision makers think about their activities. Automated monitoring forms the foundation of adaptive management and is another reason to promote this technology.

D. Effectiveness Monitoring: Assessing Sustainability Method

Effectiveness monitoring assesses the sustainability of a plan. It asks the question “How effective have the statements in the plan been at achieving the desired future condition?” This type of monitoring not only must develop a “desired future condition”. Several iterations of information must be available for the assessment. The information must not

only have solid baseline metrics on indicators but also must have control or understanding of the reasons for change. For example, if the change in an indicator is due to redefining the data, changing the measurement technique or false original data, effectiveness of plan statements can not be assessed.

“The effectiveness monitoring includes the following steps:

1. identify desired outcomes
2. select indicators
3. conduct effectiveness assessment
4. prepare monitoring report
5. recommendations” (Zweck & Reay 2000)

These steps will take three to five years to complete the first iteration. Perhaps only the most obvious trends can be determined in these limited time frames. Effectiveness monitoring is a practice that may be around for a very long time.

At the present time we have a mix of monitoring levels from the least detailed in the first round of monitoring for all 5 approved LRMPs in the region to stewardship and sustainability monitoring in the Bulkley.

Integration of Indicators and Partnership Potential

Stewardship monitoring and Sustainability Monitoring arise from the same landbase but have different goals. Stewardship refers to resources viewed from a specific perspective. Sustainability refers to all stewardship concerns balanced for economic, social and environmental considerations. At the same time, measurements made for an indicator may be the same for both stewardship and sustainability monitoring. Opportunities for partnerships may exist for several organizations involved in monitoring.

Integration of Indicators

Stewardship and Sustainability monitoring differ in their treatment of conflict between resource values. Both may reference the same resources and the same landbase, but sustainability monitoring indicators have been integrated in such a way that the interface between uses is clear.

For example the wildlife habitat for grizzly bear may conflict with timber harvesting landbase. Without integration, stewardship monitoring reports can provide an overly optimistic view of resources available from an untouched landbase by measuring the landbase twice. Stewardship of timber reports the number of hectares in the timber harvesting landbase as an indicator. At the same time wildlife habitat reports the number of hectares of grizzly bear habitat as an indicator. Both indicators measure the same land.

Each stewardship monitoring report may lament the lack of sustainability of their resource but the expectations for sustainability are unfounded. Only a fully integrated set

of values such as SRMP or LUP resolves the conflicts so can lead to sustainability monitoring.

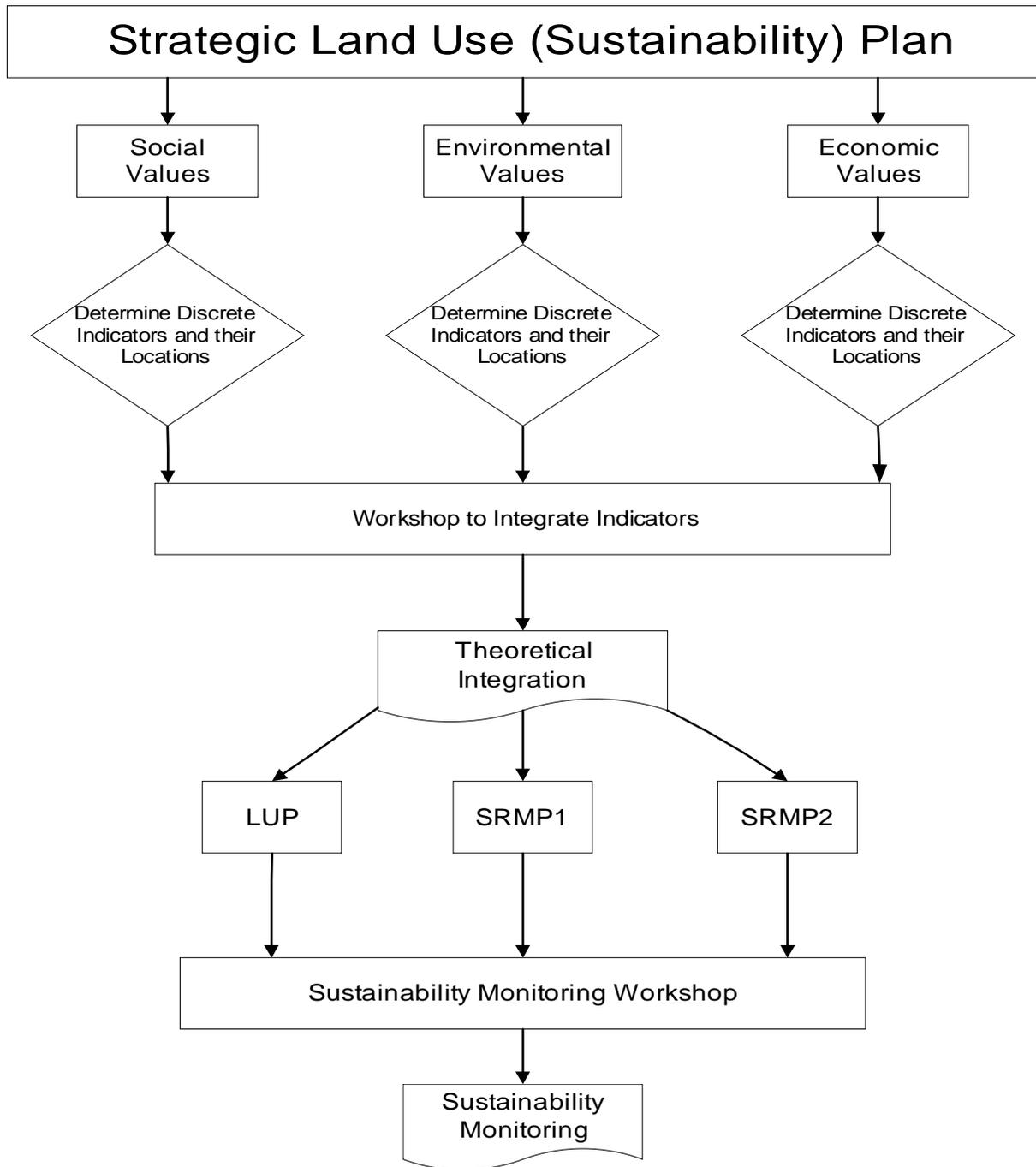
Integrating the expectations of land use (and therefore the indicators spatial extent) will provide a clearer picture in a sustainability monitoring report.

From SoR reports (B in Figure 1) to automated monitoring reports (C) the land and resource uses are integrated. This is indicated on Figure 1 by going from discrete indicators (B1) to integrated indicators (C1).

Appropriate integration of land and resource use is the hallmark of a good SLUP. But getting geographically specific with land use conflicts/priorities is often difficult. Only 17% of SLUPs have landscape unit plans (LUP) available with spatially explicit value statements.

Integration is a benefit of tactical plans such as Sustainable Resource Management Plans (SRMP) and Landscape Unit Plans (LUP). Tactical plans receive their context from the SLUP.

Figure 2 The Integration Process



As indicated in Figure 2 above, the process starts with the existing Land and Resource Management Plan or the Regional land use plan. These strategic land use plans which

cover 73% of the province, are the only plans in British Columbia that balance social, economic and environmental concerns. To be considered for sustainability, monitoring must not only consider the strategic direction and value statements in the plan but also the detailed information on fully integrated indicators.

Each plan is handled separately because each plan area differs in local data, information details and statements of value.

Based on the plan, discrete indicators are determined by scientific experts in each of the three disciplines. The answers to a few simple questions for each resource will help define the best indicator:

1. What indicators are scientifically best for evaluating resource sustainability?
2. What information is available?
3. What is needed to satisfy the public that their plan is being respected?
4. Where do the indicators apply: i.e. the specific geographic area?

The number of indicators should be minimized yet cover the full intent of the SLUP.

Every resource from every issue addressed should be handled at the same time. .

The ground location of indicators, if applicable, must also be mapped

Once every value in the plan is addressed then the next step is to integrate the indicators in light of the choices made in the SLUP. Integration then is consistently guided by the wording in the SLUP. Of course tough choices will have to be made but they have guidance in not only what is realistic from a data perspective but also what is realistic from the plan perspective.

With the theoretical integration of indicators clearly stated, SRMP processes are more “do-able”. SRM planning will become a series of steps to satisfy a goal. This mock integration provides the best possible link between SLUP and SRMPs. When the entire LRMP area is covered with detailed planning of all resources, sustainability monitoring can begin. The Bulkley LRMP and Landscape Unit Plans provide an example of fully integrated indicators.

Until all tactical plans for an area are complete the SLUP should be monitored using implementation or stewardship monitoring. Until full integration of indicators is complete unknown overlaps and conflicts may occur. Without these conflicts resolved the sustainability of a resource specified in the LRMP may be in doubt.

The Kalum and Cassiar Iskut-Stikine LRMPs will need to have integrated indicators before sustainability monitoring can occur. The Lakes and Kispiox LRMPs have SRMPs completed or nearing completion for part of their areas and the creation of a theoretical integration should occur soon. The Bulkley has a fully integrated set of indicators and sustainability monitoring is underway.

Partnership Potential

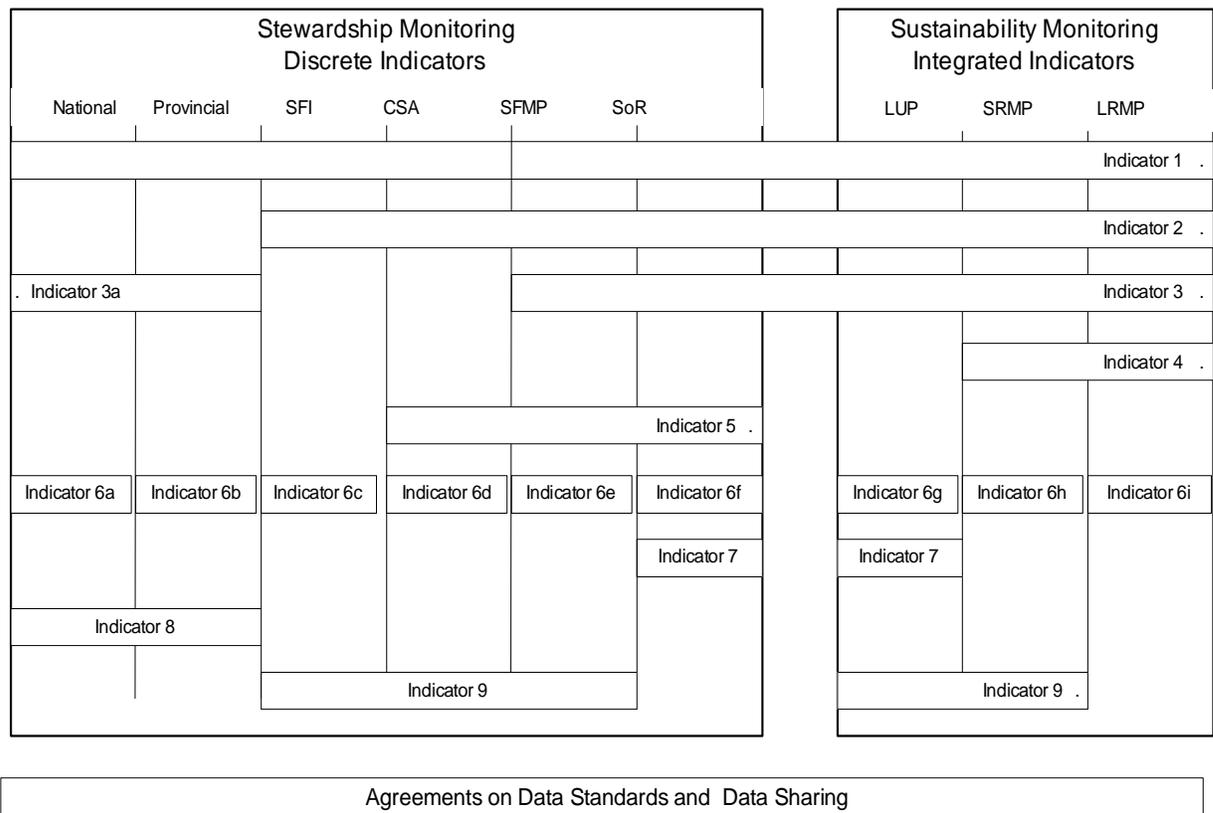
Together Everyone Achieves More (TEAM) concepts may provide opportunities for government and industry to support each other in monitoring. Government wants to monitor SLUPs and industry is required to monitor for certification. The Internet can be used to help maximize the use of information and avoid duplication of effort.

Communication between suppliers of information and the users of monitoring results could reduce workloads. Internet communication of detailed or summarized information provides a new opportunity for synergy among team members without the need for close proximity.

Partnerships are potential where all the components that make up an indicator are equivalent. Figure 3 following below must be considered in context of Figure 1 above. Each box represents the opportunity to share indicators.

Figure 3

Potential Partnerships: Conceptual Design



Boyd Brown Jan 2003

Notes from Figure 3 follow:

- Indicator boxes symbolize opportunities to share data

- National and Provincial refers to indicators that are required for national or provincial programs.
- SFI is the Sustainable Forestry Initiative adopted by the American Forest & Paper Association for forest management certification
- CSA is the Canadian Standards Association standards which are a voluntary national sustainable forestry management standard developed for Canada.
- SFMP is Sustainable Forest Management Plan, a tactical planning process initiated by industry to satisfy forestry needs.
- SoR is the State of Resource Reporting system initiated by Ministries of the provincial government to report on their stewardship of resources under their mandate
- SRMP is Sustainable Resource Management Plan, a tactical planning process initiated by the Ministry of Sustainable Resource Management to satisfy the needs of integrating resource uses at the local level.
- LRMP is Land and Resource Management Plan, a consensus-based strategic planning process designed to balance economic, social, and environmental concerns as a means of defining sustainability.
- This is not an all inclusive diagram as other plans for monitoring and certification schemes may be required for consideration.

To determine the opportunities for sharing indicators the following should be considered:

1. the data standards for data collection,
2. the data flow logic for metrics of the indicator,
3. the temporal compatibility,
4. the spatial reference for each indicator.

For an example from the Bulkley LRMP area please refer to Appendix A

Some indicators may apply to the entire landbase and may be unique to the value being measured and therefore are both discrete and integrated including indicators required for the provincial and national level (indicator 1). For example, a social indicator, such as public participation, refers to the entire landbase of the plan and can not be subdivided so is both discrete and integrated.

Indicators may only be useful at the local level but be useful for all certification schemes (indicator 2). Other indicators may not be required by one of the certification schemes but may be useful for other certification schemes and integrated plans (indicator 3). At the same time a similar indicator may be useful at the provincial and national scale but may be sufficiently different as to require different data and therefore not be eligible for data sharing.

Some indicators may be useful for purposes limited to sustainability monitoring such as indicator 4 and others may be useful for purposes of stewardship monitoring only.

At other times similar indicators are collected but they are sufficiently different that they can not be shared (indicator 6). This may happen when the four criteria for matching can not be met.

Other opportunities for matching indicators may be found. Negotiations centered on who has the most to lose if the indicator is not collected and how they can trade indicators with other organizations may be initiated.

Conclusions

The Skeena Region monitoring methods meet the challenge of creating monitoring reports that capture detailed data and display it appropriate to the monitoring report's audience. This includes the challenges of creating a data process sensitive to "New Era" government policies and to the current organizational structures and norms. Our view is that a bottom up approach is needed at this time. Partnerships can provide opportunities for government and industry to support each other in monitoring.

Sustainable resource management is built on knowledge of activities impact on the environment, the economy and society. Good monitoring provides the foundation for effectiveness assessments and the direction for adaptive management. It is to everyone's benefit to create resource use monitoring reports that can be used to guide effective and sustainable resource management.

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