The FRPA Evaluator

Developing and Implementing Effectiveness Evaluation Indicators

Introduction

The FRPA Resource Evaluation Program (FREP) is designed to assess the effectiveness of the Forest and Range Practices Act (FRPA) in meeting government's objectives for each of the forest and range resource values under the Act, and to evaluate the appropriateness of the objectives themselves. This is accomplished primarily through effectiveness evaluations that use selected indicators or attributes of a particular resource value to determine the effects of forest management on that resource.

There are three basic types of effectiveness evaluations conducted under FREP. Routine evaluations are relatively general evaluations that use simple visual estimates or measurements, often to answer yes/no type questions. Routine evaluations usually sample at a lower level of intensity, and may use checklists or categorical data collection. Extensive evaluations are generally more rigorous and quantitative than routine evaluations, and involve categorical data collection using visual estimates or more detailed measurements. Extensive evaluations can use similar checklists to routine evaluations, but with a higher frequency of data collection in a given area. Intensive evaluations are detailed examinations involving quantitative measurements of attributes or categorical data collected on a repeated schedule over time in order to detect long-term trends.

During 2003, routine and extensive indicators for three resource values (riparian, soils and stand-level biodiversity) were developed and tested as a basis for gaining experience in developing and implementing scientifically valid indicators for effectiveness evaluations. Each of these projects developed a set of draft routine and extensive indicators, which were tested in the field by the Forest Practices Board. The results from these routine/extensive indicator projects were discussed at a workshop held in January 2004.

The objective of the FRPA Resource Evaluation Program is to determine if forest and range policies and practices in British Columbia are achieving government's objectives for the resource values identified in FRPA, with a priority on environmental outcomes and consideration for social and economic parameters, where appropriate.

The Workshop

The workshop began with a brief overview of the FRPA Resource Evaluation Program (FREP) and an explanation of some of the terminology related to effectiveness evaluations. For detailed information on FREP, and some of the concepts and terminology associated with the program, see http://www.for.gov.bc.ca/hfp/frep

An indicator is a measurable attribute or component of a resource value that can provide reliable information on the sustainability (or state) of that value.

The next section of the workshop consisted of team members from each project presenting the results and experience gained from developing their specific indicators, followed by presentations on the results of the field testing for each project. A copy of each of these presentations can be viewed at the above external ftp site.

The final component of the workshop focused on group discussions, where project team members collaborated to come up with recommendations for developing and implementing indicators for routine, extensive or intensive effectiveness evaluations. This information is intended to serve as a guide for future resource value teams involved in developing indicators for effectiveness evaluations under FREP.

The following is a summary of the recommendations from the workshop.
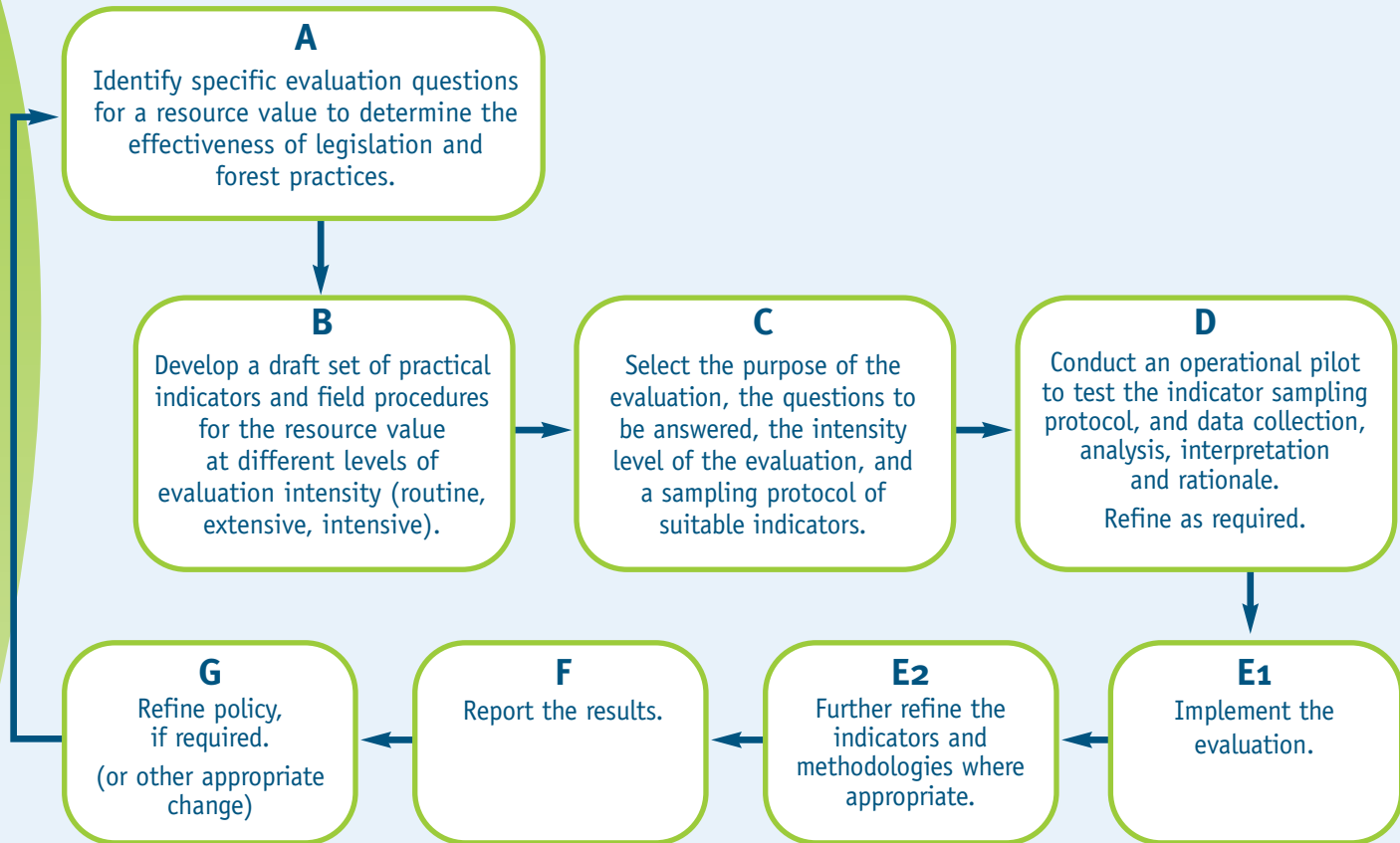
Characteristics of a Good Indicator

Based on their individual experience, workshop participants were able to determine what worked and what didn't work when it came to developing useful indicators. After considering input from all parties, the group defined a good indicator as having the following characteristics:

- Focused on answering a specific evaluation question;
- Correlated to what you want to measure;
- Based on valid scientific research and literature;
- Relevant at various scales (feature, site, landscape);
- Responsive to forest and range practices in a predictable way;
- Low naturally occurring variability;
- Well documented (rationale, methodology, analysis);
- Peer reviewed;
- Understood and supported by stakeholders;
- Practical, easy to measure, interpretable;
- Cost effective;
- Baseline data available; and
- Part of a suite of indicators for evaluating a resource value.

Guidance for Developing and Implementing Indicators

Workshop discussions revealed many lessons learned by team members of the different projects. Through these discussions, a process began to unfold by which indicators could be developed, implemented and continually improved in a consistent and effective manner. This process is illustrated graphically in Figure 1.

Figure 1: Evaluation Indicator Development and Implementation Process

A
Identify specific evaluation questions for a resource value to determine the effectiveness of legislation and forest practices.

B
Develop a draft set of practical indicators and field procedures for the resource value at different levels of evaluation intensity (routine, extensive, intensive).

C
Select the purpose of the evaluation, the questions to be answered, the intensity level of the evaluation, and a sampling protocol of suitable indicators.

D
Conduct an operational pilot to test the indicator sampling protocol, and data collection, analysis, interpretation and rationale.
Refine as required.

G
Refine policy, if required.
(or other appropriate change)

F
Report the results.

E2
Further refine the indicators and methodologies where appropriate.

E1
Implement the evaluation.

Step A – Identify Priority Evaluation Questions for the Resource Value

Resource Value Team Leaders, in consultation with internal and external stakeholders, compile a list of relevant evaluation questions to determine the effectiveness of legislation and forest practices under FRPA in managing a specific resource value. These evaluation questions are forwarded to the FRPA Resource Evaluation Working Group (FREWG), which reviews the questions and recommends priority projects to the FRPA Joint Management Committee (JMC). The JMC decides which priority projects to fund in consultation with the Evaluation Program Sponsor (Chief Forester).

Step B – Develop a Draft Set of Indicators for the Resource Value

The Resource Value Team Leader assembles a Resource Value Team comprised of experts and stakeholders (e.g., researchers, consultants, academics, regional/district staff, licensees). In a workshop setting, the Resource Value Team develops a comprehensive set of draft indicators and field methodologies for the resource value, encompassing all three levels of evaluation intensity (routine, extensive and intensive).

The initial set of draft indicators is further refined by removing indicators that are unreliable, unnecessary, impractical, too costly to measure, etc. (see Characteristics of a Good Indicator). It may take more than one workshop to develop and refine the list of indicators.

The rationale and supporting scientific literature is documented for the refined list of selected indicators. Methodologies for data collection, data analysis, and data interpretation are developed for all levels of evaluation intensity (routine, extensive and intensive) for each indicator.

The master list of indicators and supporting rationale is submitted for a thorough peer review, and then forwarded to internal and external stakeholders for their input. The support of external stakeholders (e.g., the academic community, forest industry, First Nations) is particularly important in order to gain credibility and momentum for the evaluation program. Review comments are considered and incorporated where appropriate.

Step C – Selecting Appropriate Indicators for a Specific Type of Evaluation

Effectiveness evaluations can be conducted for a number of purposes (e.g., FREP evaluations, Forest Practices Board audits, district monitoring programs, industry monitoring). Methodologies for different applications may need to address different evaluation questions, different levels of acceptable risk, different levels of confidence in the results, or different levels of evaluation intensity.

The purpose of an evaluation will determine which questions need to be asked (refined from Step A) and the appropriate level(s) of intensity of the evaluation (routine, extensive or intensive). An effectiveness evaluation sampling protocol can then be developed by selecting indicators from the master list to match the needs of an evaluation based on the purpose of the proposed evaluation, the questions to be answered, and the chosen intensity level(s) of the evaluation.

Step D – Pilot Test the Indicators in the Field

Conduct a pilot test of the effectiveness evaluation sampling protocol and associated data collection methodologies, data analysis, data interpretation, and rationales to ensure results adequately answer the evaluation questions. Include representatives from the team that developed the indicators and those who will eventually be responsible for collecting the field data, whenever possible. If the team conducting the pilot testing is different from the team that developed the indicators, provide appropriate training to the pilot testing team. If required, refine the indicators and field procedures as appropriate.

> An effectiveness evaluation sampling protocol is selected from the master list of indicators for a resource value based on the purpose of the evaluation, the questions to be answered, and the intensity level(s) of the evaluation.

Step E1 – Implement the Evaluation

Include members from the team that developed the indicators on the evaluation project teams whenever possible. Provide training to implementation team members prior to implementing the evaluation so that they thoroughly understand the indicators and the procedures for data collection, analysis and interpretation. Employ quality assurance mechanisms for data collection, entry and storage.

Step E2 – Continuous Improvement

Based on the experience and lessons learned during implementation of the evaluation, further refine the indicators and field methodologies where required.

Step F – Report Evaluation Results

Present the results of the evaluation in a final report, including recommendations for continuous improvement. The Resource Value Team Leader will present the report to the FRPA Resource Evaluation Working Group.

Step G – Policy Refinements

Based on the results of the evaluation, the Resource Value Policy Specialist or the Joint Management Committee may recommend changes to policy or forest practices.

Additional Recommendations/Insights from the Workshop

A number of other recommendations and suggestions arose from workshop discussions that will assist resource value teams in developing and implementing indicators more efficiently:

- It is important to clearly identify the purpose of an evaluation in order to determine the intensity of the evaluation (routine, extensive, intensive) and for selecting the appropriate indicators.

- The process for developing and implementing indicators can take a significant amount of time to complete (our experience has shown six months or more).

- Quality assurance is a critical component in the development and implementation of indicators. A quality assurance protocol for all deliverables under the FRPA Resource Evaluation Program will be completed in 2004/05 and will address quality control for indicator development, testing and implementation.

- Methodologies for measuring indicators should be clear and understandable to assist implementation teams in conducting evaluations. Whenever possible, use existing methodologies for data collection.

- In some cases, existing standards may be used for evaluating the resource value (e.g., % compacted soils). If existing standards are used, consider how to accommodate potential changes in the standards over time.

- At all levels of evaluation intensity, data from harvested sites (i.e., implemented practices) should be compared against "control" data collected from nearby unharvested sites or other baseline information to assess whether policies or practices are achieving desired outcomes.

- The collection of qualitative and quantitative data should follow the field methodologies developed for each indicator to ensure consistency between different evaluators.

- Calibration of rating levels (i.e., through training of data collectors) is recommended prior to implementation to ensure consistency in visual estimations and rankings.

- It is critical that indicators be agreed upon by all stakeholders, and that methodologies, analysis methods, interpretations and rationales are scientifically valid. The rationales for surrogate indicators in particular need to be well documented.

- Staff at all levels can provide value-specific technical expertise in the development and testing of indicators and field methodologies. Field-based staff can provide valuable operational advice during indicator development and testing.

- Routine evaluations are valuable for indicating trends in general terms and pointing out high-risk areas where more detailed evaluations are required – they raise red flags.

- Effective communication between indicator development teams and implementation teams is essential.

- Implementation teams need expertise and training from the indicator development team prior to using the indicators in the field to ensure data collection, analysis and interpretation methods are understood and consistently applied.

- Implementation teams will need to rely on professional judgement when interpreting indicator data.

- Implementation teams should consider using hand-held electronic data collectors in the field, as they can help reduce data entry and compilation time and data transfer errors.

- Carry out continuous improvement of the indicators, sampling protocols and field methodologies during field testing and implementation.

- Ensure the indicators selected provide appropriate feedback to senior management/policy makers as part of the continuous improvement process (to facilitate decision making).

- Allow sufficient time for data analysis and interpretation, and develop consistent data management and quality control mechanisms.

- Where possible, the indicators for FRPA evaluations should link, or be complementary to, indicators used for the various certification schemes in British Columbia. The potential for building certification linkages is currently being investigated.

Conclusion

A number of sets of indicators are at various stages of development at this time. In addition to the indicators for soils, riparian and stand-level biodiversity, draft indicators for visuals, water and karst will be developed by March 31, 2004. Field testing the indicators for visuals, water and karst will occur during the field season of 2004.

District-level monitoring protocols and training for at least three of the above resource values will be pilot tested this year.

For more information on the FRPA Resource Evaluation Program please visit our web site at (http://www.for.gov.bc.ca/hfp/frep).

BRITISH COLUMBIA

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Ministry of Water, Land and Air Protection
Ministry of Sustainable Resource Management