

**Assessment of Quality Management Framework
Forest and Range Evaluation Program
Ministry of Forests and Range and
Ministry of Environment**



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Executive Summary

The Board was asked by the Chief Forester of British Columbia, and the Director of Forest Practices Branch of the Ministry of Forests and Range, to conduct an independent review of the developing quality management framework of the Forest and Range Evaluation Program (FREP). They asked the Board because we could provide an external, arm's length evaluation and the Board has similar experience and expertise through enforcement auditing. The purpose of the assessment is to identify strengths and weaknesses with respect to the program structure and framework.

A key point of clarification is that the Board was only asked to assess the quality management aspects of FREP, not the FREP program as a whole. That would be a much larger and onerous task. Another point of clarification is that this assessment is at a point of time – the end of 2006 – and the Board cannot predict what processes will be in place in the future.

Overall the Board is pleased with the quality management systems and processes that have been implemented by the Forest and Range Evaluation Program.

Although the FREP program has been in place for only three years, it has made good progress in building capacity and developing processes to examine the effectiveness of the *Forest and Range Practices Act*. The FREP program is one link in governments' "plan-do-check-act" cycle of continuous improvement of forest legislation. The FREP program represents the "check" part of that cycle and the Board hopes that over time, as more monitoring is completed on the ground, they will be able to affect the "act" part of the cycle by recommending options for changes to forest and range policies, practices and legislation, if required.

The Board also notes that FREP has achieved level 1 of the Progressive Excellence Program with the National Quality Institute in September 2006. The Board encourages FREP to continue through with their goal to achieve all four levels of this program.

Introduction

The Forest Practices Board was asked to perform a review of quality management in the Forest and Range Evaluation Program (FREP) of the Ministry of Forests and Range and the Ministry of Environment.

In order to assess quality management, we had to consider its objectives and components and its place in the context of the FREP program. Quality assurance¹ and quality management² are terms that are sometimes used interchangeably. They reflect the fact that there are aspects of organizational and process design and behaviour that are far broader than quality control, but contribute to precisely the same objectives as the more commonly understood quality control processes. Both terms are used in this report, with quality management being used as the broader term.

To perform the assessment, auditors designed criteria addressing quality management in a comprehensive way. The model establishes three broad groupings, based on their connection to, and influence on, quality management. The first group contains those aspects of overall organizational capability to support the program, such as strategic focus, leadership and clarity of objectives, which therefore contribute indirectly but ultimately in a significant way to the success of a program, including its quality. The second group contains functions/elements/processes that directly contribute to quality, but that also contribute to other objectives, such as training, instructions and rules for gathering data. The third group contains the elements typically associated with quality control, such as data review, quality assurance site visits and edit checks. This assessment included all three criteria groups, but focused on the second and third groups.

The criteria were provided to FREP management for comment. They are presented for information in appendix 1.

¹ The main goal of quality assurance is to ensure that the product fulfills or exceeds stakeholder expectations around quality. It therefore covers all program activities from design, development, delivery, reporting and documentation.

² Quality management is a method for ensuring that all the activities necessary to design, develop and implement a product or service are effective and efficient with respect to the system and its performance.

Background

The objective of the Forest and Range Evaluation Program³ is to determine if forest and range policies and practices in British Columbia are achieving government's objectives for *Forest and Range Practices Act* (FRPA) resource values, with a priority on environmental parameters and consideration for social and economic parameters, where appropriate.

FREP is a long-term commitment designed to:

- assess the effectiveness of FRPA and its regulations in achieving stewardship objectives
- identify issues related to the implementation of forest policies, practices and legislation in achieving stewardship objectives, and
- implement continuous improvement of forest management in British Columbia.

In order to accomplish these objectives, FREP will:

- develop specific monitoring and evaluation questions
- evaluate the status or trends of resource values and determine causal factors
- determine whether resource values are being managed in a sustainable manner through proven or alternative forest practices
- communicate the results of evaluations, and
- recommend changes to forest and range policies and legislation, where required.

There are two integrated primary components of FREP – intensive evaluations and resource stewardship monitoring.

- Intensive evaluations are carried out at the provincial, regional or district level to assess, in detail, either red-flags raised through resource stewardship monitoring or other priority concerns or issues areas that are often require focusing on a narrower set of issues, location or period of time than is commonly done under overview monitoring.

³ Background of the FREP program is more fully described on their website:

<http://www.for.gov.bc.ca/hfp/frep/about/index.htm>

- Resource stewardship monitoring (RSM) consists of overview type monitoring of on-the-ground forest practices to assess whether resource value objectives and/or Forest Stewardship Plan (FSP) results and strategies are being achieved, and whether the results and strategies can be improved. Resource stewardship monitoring is performed extensively, across large areas of the province and in all forest districts.

The Ministry established the FRPA Resource Evaluation Working Group (FREWG), representing the Ministry of Forests and Range (Field Services Division, Research Branch and Forest Practices Branch), as well as the Ministry of Environment, and began developing the FREP program in May 2003. The team has been responsible for the development of the FREP structure and framework, resource value indicators and monitoring/ evaluation protocols for FRPA resource values.

A FREP Quality Management Team was established to ensure that all aspects of the FREP and RSM meet high quality standards. It was recognized that quality assurance and quality control mechanisms were required to ensure the integrity and usefulness of data collected during resource stewardship monitoring and intensive evaluations.

Scope of Review & Main Points of Examination

Status of Development at Time of Review

Resource Stewardship Monitoring was pilot-tested for three values - soils, biodiversity and riparian in 2004/05. In 2005/06, stand-level biodiversity (SLB) and riparian monitoring was introduced in eight districts, and in 2006/07, monitoring for these two values was required in all forest districts. Development of evaluation approaches and pilot testing for other resource values is ongoing. The evaluation methods for the remaining values are at various stages of development and implementation.

Our assessment of the quality management aspects of the FREP program focused primarily on the resource stewardship monitoring for the stand-level biodiversity (SLB) and riparian values, because these were in an advanced stage of implementation. Also, because these values are subject to extensive monitoring, and are sampled by all districts and therefore delivered by numerous data gatherers, the quality assurance risks are greater than for a

typical intensive project where data gathering is confined to a smaller group, and accordingly requires more effort in achieving assurance of consistent interpretation and recording.

A number of intensive evaluations are in progress, including: partial cutting in south eastern British Columbia, Genetic tree species diversity, Tree species diversity, Forage (range) functioning, Worker Safety, and an assessment of post free growing stands. A description of these projects can be found on the FREP website under: <http://www.for.gov.bc.ca/hfp/frep/publications/index.htm> However, the Board was able to review the quality assurance aspects of only the one report at the final draft stage – the “Recreation Site Effectiveness Evaluation Project”. Also, the resource stewardship monitoring data for this first full year of provincial coverage has yet to be reported, and so those aspects of quality assurance related to the reporting process were not examined.

Work Performed

To conduct this assessment, the Board established assessment criteria, describing aspects of organization, systems and processes required to achieve and support quality, but also tailored to suit the business of the program being examined (see appendix 1). The work performed included:

- Interviews with program managers and staff involved in the quality management process;
- Review of a substantial volume of documents, including plans and reports, some available on the web-site;
- Attending field training sessions, and the provincial workshop on resource monitoring;
- Review of reports and data summaries for the data validation process for the 2005/06 season of riparian and SLB monitoring;
- Review of the draft report for the Recreation Site Effectiveness Evaluation Project.

In assessing the program against the criteria, we performed the analysis necessary to provide sufficient evidence to support our conclusion on quality management in the FREP management framework.

Limitations of This Review

One of the main elements of the system: – the design of the technical questions required to properly assess trends and issues in resource values – is beyond the scope of this assessment. The design of the right evaluation questions, and the design of the data required to answer the questions, are in themselves major undertakings and potentially subject to considerable debate among resource experts.

The ability of the protocols and indicators to meet operational needs at the district level, and the linkage between data collected and its use to improve practices, policies and legislation has yet to be demonstrated in such a young program. In some cases, years of data will be required before scientifically valid answers can be provided for some resource questions.

The Forest Practices Board, amongst others, is participating with the FREP working group in commenting and testing resource value monitoring approaches (and questions) on an individual resource value basis.

Assessment Findings

Overall

The program management framework is well developed. Program plans lay out the ongoing implementation of evaluation activity for all eleven FRPA resource values.

The main elements of an effective quality management system are in place or under development. Areas for improvement are identified and addressed in the program plans.

Section A - Strategic focus, people and infrastructure

- The program focus relates directly to FREP's mandate and business, and to the values laid out in the legislation
- The objectives of the program are clear and consistently presented in program documentation
- There is executive support and committed resources appear to be reasonably sufficient

- The design of the program elements is logical in relation to the intended results
- There is a plan appropriate to the objectives and tasks, and progress against the plan is measured
- Key participants have been identified at each level, location and specialty
- There is evidence of involvement and commitment at appropriate levels in the organization.

The program has identified its internal and external stakeholders, whose involvement or buy-in is required for long-term success. *Achieving this item is in progress. Further attempts are being made to engage all potentially interested parties.*

Section B - Processes that directly affect quality

- There is an understanding of the management systems and processes required to deliver the program. Key elements of the management system have been identified, and are in place or under development.
- The program has invested significantly in the design of the approach and rules for gathering data, including clear instruction sets, and valid and sufficient sampling strategies. This was assessed for two values – Riparian and SLB.
- Processes supporting implementation, including program information, training, logistics and equipment (and safety) were in place.
- There are established processes for analysis and interpretation of results, including use of appropriate specialist expertise and referrals.
- There was ample evidence of the program evaluating its activities and progress, and working to improve where potential areas for improvement were identified.
- A communication plan has been developed, identifying stakeholders (government, industry and interest groups) and program participants, and communication processes. There is regular feedback to program participants, including other government agencies.
- There has been limited formal reporting of results to outside stakeholders. *Further attempts are being made to engage all potentially interested parties.*

- Preliminary measures of success have been identified, and their application is beginning. *Further development is required to achieve a complete and effective way of assessing program performance.*
- A data management system is under development, including systems and processes for data maintenance and storage, data standards, and controls over retention of data. *The quality of data retained for ongoing trends analysis is key to the success of the program.*
- *One of the main elements of the system: -the technical design of resource value evaluation questions is beyond the scope of this assessment. We were able to observe processes employed in the development of these questions, including the use of experts, and drafts being sent to referral agencies, including other jurisdictions. There is also a process for prioritizing evaluation questions.*
- *The Board has commented on the risk of incomplete populations of interest, and on the need to consider targeted populations for specific questions.*
- *The Board provided comments and advice related to the instruction sets, including some aspects of organization, and the need for specific instructions for indicators where judgements need to be made.*

Section C - Quality management processes

- Quality management exists as a framework that recognizes the elements contributing to quality. There is a plan appropriate to the task, and responsibilities have been assigned.

Resource Stewardship Monitoring

- There are mechanisms to ensure consistent application and data reasonableness. Quality control processes exist in the completion of field data and transmittal of data. Data validity is tested through first line edit checks, and by data cleaning. Experts are involved in the review of data validity.
- Monitoring and review mechanisms include a substantial level of field monitoring and quality review.

- Quality processes address data analysis, interpretation and reporting. - *It is too early to see the process of considering the implications of results (how the results of each evaluation are interpreted and used.)*

Intensive Evaluations

- The data analysis activity undertaken for the Recreation Site Effectiveness project identified a number of issues related to the design of the evaluation questions and the data collection methods: - specifically criteria or thresholds to assist in determination of certain conditions, guidelines to assist in data collection and processes to achieve more consistency among evaluators. These issues affect the reliability of some of the data and therefore the usefulness of the report.

The data analysis phase of the quality assurance system was effective in that it correctly identified that an earlier (quality assurance) focus on the structure and design of questions and data sought can significantly improve the usefulness of the data. It also correctly identified some resulting limitations in the use of the data.

Conclusion

The Board has performed a review of FREP's management framework as it relates to quality management. The review was performed using criteria designed for the assessment.

Quality management in FREP exists as a framework that recognizes the elements contributing to quality. The main elements of an effective quality management system are in place or under development.

Based on the Board's review, nothing came to the Board's attention that would cause it to believe that the quality management systems and processes examined are not a suitable design for managing quality in the Forest and Range Evaluation Program.

The assessment of the design of the technical questions required to properly assess trends and issues in resource values, one of the main elements of the FREP program, is beyond the scope of this assignment. The design of the right

evaluation questions, and the design of the data required to answer the questions, are in themselves major undertakings and potentially subject to considerable debate among resource experts.

The assessment was made during the second year of program implementation. Many processes were seen to be in place, and some were seen to be working effectively. However, the Board was not able to examine the operation of the whole quality system, because little has been reported, and so the Board is unable to provide assurance that the quality management processes were effective. Also, because the assessment was made at a point in time, our review cannot provide assurance that the processes will continue to operate as designed in the future.

Appendix 1:

Resource Stewardship Monitoring - Criteria for Assessing Quality Management

These draft criteria have been designed to enable assessment of the FREP RSM program's quality management system. The criteria are organized into three groups. The third group contains the elements typically associated with quality control, such as data review, QA site visits and edit checks. The second group contains processes that directly contribute to quality, but that also contribute to other objectives, such as training, instructions and rules for gathering data. The first group contains those aspects of overall organizational capability to support the program, and which therefore contribute indirectly but ultimately in a significant way to the success of the program, including its quality.

Section A – Mandate and Organization

1. Strategic focus

- The program focus relates directly to FREP's mandate and business, and to the values laid out in the legislation (relevance)
- The objectives of the program are clear and accepted
- There is leadership and executive support
- Committed resources (human & financial) are reasonably sufficient
- There is involvement of all parties whose buy-in is required for long-term success

2. Business Processes and Infrastructure

- There is an understanding of the management systems required to deliver the program (all elements of the management system have been identified)
- The design of the program is logical in relation to the intended results(e.g. assessment method and intensity - use of routine, intensive, extensive, other)
- The program structure is in place and makes sense in relation to the needs and activities of the program
- There is a reasonable degree of organizational stability
- There is a plan appropriate to the objectives and tasks, and which establishes priorities
- Progress against the plan is measured

3. People

- Key participants have been identified at each level, location and specialty
- There is involvement and commitment at all appropriate levels in the organization
- Specialists are used to train, monitor and interpret results
- Local leaders are engaged to drive activities

Section B - Processes That Directly Affect Quality

1. Technical design

- Design of the right questions (relative to the assessment of status of values)
- Design of the data required to answer the questions
- Ability of the protocols and indicators to meet operational needs at the district level
- Linkage between data collected and its use to improve practices, policies and legislation

2. Population identification and completeness

- There is a process for properly identifying the population of interest in each assignment
- There are (effective) processes for ensuring that populations are complete

3. Design of the approach and rules for gathering data

- There are adequate instruction sets (clarity, consistency etc)
- Sampling strategies are appropriate (including sufficiency of data)
- Aspects ensure statistical validity
- Consideration is given to the level of detail, precision, and accuracy and the link to practices
- Specific instructions for indicators where judgements and compromises need to be made (NB - there are numerous in riparian – e.g. reach selection)
- Aspects address sufficiency of data

4. Processes supporting implementation

- Program information is readily available
- Training – preparation and implementation
- Logistics and equipment (and safety)
- Existence and composition of working groups

- Help function, answering questions from the field
- Internal communication processes

5. Data analysis

- There are established processes for analysis
- There are processes for ensuring results relate to issues, objectives
- Processes for interpreting results are appropriate
- Specialist expertise is used as required

6. Management of the change process

- The organization evaluates and works at improving
- Issues requiring change are identified
- Changes are controlled

7. Communication/reporting to stakeholders

- Regular feed back to participants – data specific and general
- Periodic reporting of results to government, industry and interest groups
- There is active participation of all potentially interested parties to achieve buy-in

8. Measuring success

- Measures of success have been identified
- The measures are a complete and effective way of assessing program performance
- Measures are being used in assessing performance

9. Data management system

- There are systems and processes for data maintenance and storage
- There are data standards
- Data is retained for ongoing trends etc

Section C - Quality Management Processes

1. Quality management as a framework

- A framework exists which recognizes the elements contributing to quality
- There is a plan appropriate to the task, and responsibilities have been assigned

2. Quality control processes

- Instructions for field data completion have internal checks
- Transmittal of data – controls
- Data validity – first line edit checks
- Data cleaning – assignment of responsibility, expert review, clear process and sign-off
- Mechanisms ensuring consistent application and data reasonableness (including data standards)
- Data validity – expert review

3. Monitoring and review

- There are processes for field monitoring and quality review (e.g. re-performance in the field)
- There is a plan that addresses program needs
- The sample size of the review is sufficient
- Quality processes address data analysis, interpretation and reporting
- The implications of results are considered (the results of the review are appropriately interpreted and used)

4. Controls over data

- There are controls over retention of data



PO Box 9905, Stn Prov Govt
Victoria, British Columbia
Canada V8W 9R1

Phone: 250-387-7964
Fax: 250-387-7009
Toll free: 1-800-994-5899
E-mail: fpboard@gov.bc.ca

Information on the Board is on the
internet: <http://www.fpb.gov.bc.ca>