PART 1: Monitoring for Effectiveness

Effectiveness Evaluations – A primer for making them truly effective

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Abstract

In British Columbia, a one-day workshop has been created to provide the background and steps needed to design effectiveness evaluations, and to help practitioners differentiate them from other types of evaluations or monitoring. Recent regulatory changes (e.g., the Forest and Range Practices Act [FRPA]) have placed greater emphasis on outcomes and results rather than process. This new regulatory framework is intended to promote innovation, which in turn requires assessment and validation. The BC Ministry of Forests and Range, within its FRPA Resource Evaluation Program (FREP), has begun a series of effectiveness evaluations to assess the key FRPA values identified in legislation. The workshop is meant to provide an understanding of these evaluations and provide a common terminology and description of the essential steps in the process. This paper describes the workshop flow and contents using examples from the presentation materials. The workshop focuses on a process to develop effective indicators. Case studies are used to highlight successful approaches. The workshop is made up of modules that cover a series of questions. Why monitor or evaluate? The initial module provides an introduction on why we monitor or evaluate and how important framing the initial question is. What is it we want to know? The question drives the approach. The second module 'the monitoring continuum' covers how the various types of monitoring, compliance,

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implementation, effectiveness and validation, are related to one another and form a continuum. The third module covers the design of good indicators for effectiveness monitoring. Selection of appropriate indicators is the key to any successful monitoring or evaluation program. The critical factors in choosing good indicators are covered, using examples.

Case studies of effectiveness evaluations include the Weyerhaeuser Forest Strategy, effects of fuel treatments on wildfire severity, and habitat restoration – a full scale effectiveness evaluation program, routine evaluations for stand-level biodiversity and Proper Riparian Function in BC.

Background

In British Columbia, a one-day workshop has been created to provide the background and steps needed to design effectiveness evaluations, and to differentiate them from other types of evaluations or monitoring. The workshop and associated poster is a joint initiative of the BC Ministry of Forests, Forest Practices Branch (MOF), Ministry of Lands, Water & Air Protection (MWLAP) and the Centre of Applied Conservation Research, University of British Columbia (UBC). With the advent of the Forest and Range Practices Act (FRPA) and regulations there will be a greater emphasis on outcomes and results versus procedure and policy. The new reliance on results brings with it an obligation for assessment and evaluation, and the ability to use the subsequent data to learn and adapt procedures or policy.

To address this challenge, a joint steering committee was established (organizations mentioned above) consisting of: Peter Bradford (MoFR), Richard Thompson (MWLAP), Laurie Kremsater (UBC), Shawn Morford (FORREX), Craig Sutherland (MoFR), Wayne Martin (MoFR), and Eric Lofroth (MWLAP). The steering committee was tasked with organizing a process to facilitate active participation in understanding and implementing effectiveness evaluations. The learning process is ongoing. This paper outlines a training session on 'effectiveness evaluations – a primer for making them truly effective', one part of the process of making evaluations effective and part of the new forest stewardship model. More information on the FREP program and FRPA is provided at http://www.for.gov.bc.ca/hfp/frep/index.html. The workshop is not limited to FRPA-related objective setting and can be used to help any resource manager choose an appropriate monitoring approach.

Workshop Structure

The workshop is made up of five modules[7]. Module 1 consists of an introduction to the subject matter and describes the rest of the workshop. Module 2 addresses why monitoring is undertaken, providing a general discussion of what we hope to achieve through monitoring or evaluation (setting the stage). Module 3 describes the evaluation continuum and places effectiveness evaluations in that continuum. Module 4 reviews the process of choosing good indicators as they relate to effectiveness evaluations. Finally, Module 5 uses case studies to show the steps in creating a good effectiveness evaluation.

[7] Each module other than Module 1 is further described.

Why monitor/evaluate? – Module 2

Module 2 explores when and why we would choose to monitor or evaluate. Specifically, monitoring or evaluations are based on the desire to know the answer to a question. When a practice or treatment is chosen there is a need to determine first if it was done correctly (implementation evaluation) and, secondly, if it achieved the objective that it was designed for (effectiveness evaluation). The workshop promotes the need to spend time clearly defining the question you are interested in answering. This step is essential in focusing future actions and choosing the type of monitoring most suited to the identified issue.

An example using the question “Are Wildlife Tree Patches (WTPs) working?” is explored using the five points below. The key element is to clearly state the question. In this case, a valid query would be what is meant by working. The module looks at a number of aspects of the exploration process. What is the ultimate goal? This is often referred to as the monitoring starting point or the impetus for the monitoring. In our example of whether WTPs are working, we look at the underlying concern, the monitoring endpoint. What is it that we mean by working and what societal issue or concern is linked to this question? For example, the key issue may be species loss or reduction in species diversity. If this is the underlying concern, the monitoring endpoint must address that concern.

The next stage is to identify the key issues or barriers for addressing the monitoring endpoint? Do we understand the process involved? What should we measure to get an answer to our underlying concern? Next, it is necessary to examine how easy or difficult it is to get to the ultimate monitoring endpoint. Can we collect data directly or will we need to make assumptions, run models, what is needed? The level of difficulty may limit what questions you can answer. Finally, other constraints are considered. For example, security of long-term funding may be critical. Some questions make take a relatively long period to provide good answers. Is funding going to limit options?

Module 2 sets the stage for all good monitoring but the focus is on effectiveness evaluation questions.

Evaluation Continuum – Module 3

Evaluation can take many forms and intensities. This module highlights the range of evaluation approaches and nomenclature. The four types of evaluations presented are:

- Compliance – Does it meet the legal requirements?
- Implementation – Did you do what was intended?
- Effectiveness – Are the desired outcomes being met?
- Validation – Is our hypothesis correct?

These are further subdivided into monitoring intensities. The levels include: routine – relatively simple using yes/no questions; extensive – more detail is used, for example categories are used such as good, fair and poor; intensive – more detailed yet and requires quantitative data collection; and applied research – where a controlled replicated experimental design is used. Each of the four types of evaluation are explored with respect to intensity to show the continuum of type and intensity as they relate to a varying array of questions.

Designing good indicators for effectiveness evaluations – Module 4

The choice of indicators is a key element in creating successful effectiveness evaluations. Where there are many options, choosing the right indicator can be confusing. This module provides a structured procedure for assessing indicators and ensuring that those chosen will answer the question that has been posed. The choice of indicators is presented within the Monitoring/Evaluation Framework. The framework is as follows:

1. Clearly define the question (s) / objective (s) (as described in Module 2)
2. Build indicators and performance criteria – the performance criteria help tell us how we know when we have change, and whether the change is considered good or bad.
3. Design the data collection approach
4. Plan the monitoring program
5. Implement the monitoring program
6. Check results against performance criteria
7. Make recommendations – i.e., feedback to management.

It is stressed that the process of monitoring and learning is ongoing. New answers may promote new questions and with that, new indicators. To ensure this process is effective requires a concerted effort in quality assurance at all steps and attention to detail with respect to information management.

Choosing the right question (point 1 above)

The choice of the indicator should relate directly to the question posed. For example, using a relatively simple forest management question—“Are my vegetation management treatments effective?”—we may ask “effective for what?” In translation from a management or societal perspective, the actual question that drives the choice of indicator is: “Are my vegetation management investments worthwhile?” This question provides a monitoring endpoint from which to choose indicators. The key transition to the actual question is the underlying concern based on a true societal value or benefit of the treatments (Noon 2003). By themselves, vegetation management treatments may pose no clear benefit to society. However, if we can describe what a worthwhile investment is relative to vegetation management treatments, they can be assessed and evaluated. We then move to step 2 – building indicators.

Building Indicators (from point 2 above)

There are four steps to the creation of a good indicator. The first step is the choice or creation of the indicator to answer the question – methods of choosing or creating indicators is discussed, for example brainstorming, literature reviews, comparison of similar jurisdictions and the like. The second step is to test the initial indicators – specifically to assess if they are representative, reliable and feasible. These three tests are then explored. For representative indicators, the basic question is, “Does the indicator address the scope of the question?” This question is explored by reflecting on how well it covers the key aspects of the underlying concern. Other questions to ponder may include how well it shows differences between geographic units (if required), whether there geographic differences that will affect the results, and how well does it shows trends over time (if required). For example, if the indicator chosen for vegetation management example is tree growth, how does it relate to the investment? How long should it be measured? What measures should be used: height, diameter, or both? Will different species result in different answers and does this make sense?

For reliability, does the indicator readily capture the underlying concern? Is the link well founded in science? Is it responsive to the actions that we are concerned about – e.g., treatments or management practices? Is the response persistent in a manner consistent with the underlying concern? Can it be measured in a scientifically credible manner? Will the results have acceptable variability and sampling error? Height response to vegetation management treatments is discussed using the above questions as considerations.

Feasibility is the third concern. Is the indicator practical to monitor? Are the data readily available? If not, can the data be obtained at a reasonable cost and time frame? The third step is to replace, adjust or add more indicators and then to retest. If the indicator fails one or more of the three tests, then the indicator should be dropped and replaced with another, or it should be adjusted to better address the question or objective, or additional indicators should be added to more thoroughly address the question or objective.

Performance criteria and indices should be designed to allow for conclusions to be drawn from the data. A discussion on performance criteria and indices is provided. Once indicators are chosen, one needs to determine when to change management practices based on that indicator. Performance criteria can help provide context for indicators by creating categories of 'goodness' or 'badness' based on their ability to provide good or bad, acceptable or unacceptable outcomes. These categories can then be used to provide feedback to managers. Examples are provided.

Additionally, indicators come in many forms – examples relating to structure, function and species-based indicators are described. Module 4 is centered on the importance of linking clearly described and well thought out questions (based on objectives) and cost efficient, feasible and reliable indicators. Good and less good examples are sought from participants.

Case studies – Module 5

A set of case studies has been created to allow participants to observe how various groups have approached effectiveness evaluations. The case studies cover a range of detail and completeness. Some have results; others are in the earlier stages. All case studies are presented against the seventh step, the 'Monitoring / Evaluation framework' described earlier. Four examples have been chosen to illustrate the mechanics of an 'effective' effectiveness evaluation. The four case studies are:

Weyerhaeuser BC Coast Forest Strategy
(http://www.forestry.ubc.ca/conservation/forest_strategy/)
The Coast Forest Strategy uses stand-level variable retention and landscape zoning to maintain biological diversity and ecological processes on Weyerhaeuser Coastal Timberlands. To assess whether the approach is indeed meeting its goals, an aggressive monitoring and adaptive management program was implemented. The module covers the process as it relates to the seven points for a successful strategy. The Forest Strategy case study allows participants to see the level of commitment and detail that is required when a full-scale adaptive management program is put into place.

The forest strategy used the four-step approach for indicator development and utilizes all seven points of the monitoring framework in creating the effectiveness evaluation program. Detailed monitoring protocols are used and five-year results are available. A section summarizing the lessons learned is provided. The approach is summarized and results provided on the above weblink. This is considered a good example of effectiveness evaluation.

Effect of Fuels Treatment on Wildfire Severity
(http://www.cnr.colostate.edu/frws/research/westfire/FinalReport.pdf)
An evaluation of fuels treatment on wildfire severity was undertaken by Omi and Martinson (2002) from Colorado State University. Their study looked at wildfire severity in areas where fuel treatments had occurred followed by unplanned wildfires. The final report is found on the web (address above). The report outlines the steps taken, from "identifying the question" to the "results and recommendations". Indicator development for this project followed the scientific studies from the literature, and therefore did not specifically follow the four-step approach for this project. The evaluation approach followed the seven-point monitoring framework resulting in useful management feedback. The report provides an instructive example on how to put together a practical retrospective evaluation that can provide results in a timely fashion.

Monitoring and Evaluation Strategies for Habitat Restoration and Acquisition, Washington State Salmon Recovery Funding Board (2003)
(http://www.iac.wa.gov/Documents/SRFB/Monitoring/SRFB_Monitoring_Strategy.pdf)
The Washington State Salmon Recovery Funding Board, as a follow-up from recommendations on the assessment of habitat restoration projects, has created a detailed monitoring strategy. At this time, nine protocols have been created for a range of issues relating to habitat restoration (found at http://www.iac.wa.gov/srfb/docs.htm), including: Fish Passage Projects, In-stream Habitat Projects, Riparian Plantings, Livestock Exclusions, Constrained Channels, Channel Connectivity, Spawning Gravel, In-stream Diversions, and Habitat Protection. Each of these protocols contains a set of steps to provide for an effective evaluation. An example protocol is described to show the level of detail that the protocol uses. Additional information and specifics are provided on the above web address. The present protocols are relatively new and have yet to provide data or recommendations. The format and thought process closely follow the seven-point framework with significant direction within the protocols on providing management feedback as specific performance criteria have been identified.

Routine Evaluations for Stand Level Biodiversity and Proper Riparian Functioning in BC
http://www.for.gov.bc.ca/hfp/frep/index.htm
The objective of the Ministry of Forests Evaluation Program (FREP) is to determine if forest and range policies and practices in British Columbia are achieving the British Columbian government's objectives for FRPA resource values, with a priority on environmental parameters and consideration for social and economic parameters, where appropriate. This will be accomplished by evaluating the status or trends of resource and ecosystem values and determining causal factors; determining whether resource values are being managed in a sustainable manner through proven or alternative forest practices; and recommending options for changes to forest and range policies, practices and legislation, where required.

Descriptions of the Stand Level Biodiversity and Proper Riparian Functioning protocols, are included in this module to highlight the steps taken along the seven-point framework. Riparian functioning has a complete set of indicators and performance criteria that can be used to rate stream reaches. The approach closely follows the seven-point framework. The Stand Level Biodiversity monitoring is working on creating performance criteria. The first phase is collecting 'Implementation' level data, i.e. what is being retained. Work is underway to relate the data to baselines from which to rate effectiveness. The workshop is meant to help standardize evaluation terminology and sensitize participants to the importance of well thought out questions, indicators and feedback mechanisms when creating an evaluation strategy.

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