The Evolution of Policy and Adaptive Management in the Foothills Model Forest

MSc Thesis Proposal

Michael den Otter
Department of Rural Economy
University of Alberta
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Introduction:

A case study is proposed to examine the evolution of policy development and management in the Foothills Model Forest (FMF) in order to assess to what degree policy and management can be termed adaptive. Adaptive management is a flexible management strategy that permits quick response to ecosystem changes as well as changing scientific knowledge and social values. This study will focus on four different management zones; Jasper National Park, William A. Switzer Provincial Park, Willmore Wilderness Park, and the Yellowhead corridor. The data collected will be analyzed and synthesized with a concurrent, parallel project being conducted on the Weldwood Forest Management Agreement area. Qualitative evaluation methods will be employed using the criteria of adaptive management as a framework for analysis. The objectives of the study are to examine historical changes in policy, to assess whether adaptive management took place, and to investigate how well the current management structures balance the diverse range of users and uses of the landscape. This thesis will attempt to explain the social forces behind the development of policy and management in the Foothills Model Forest. A review of forestry issues, ecosystem management and adaptive management concepts are provided followed by a discussion of evaluation methods and potential social theory that might be used to explain policy development. This document provides a somewhat brief overview of my research strategy for the summer of 1998, not an exhaustive review of the literature, nor the first few chapters of my thesis.

Forestry issues, ecosystem management and adaptive management:

Modern land managers deal with many troublesome issues in trying to balance the different uses of the land with the biological requirements of ecosystems. Allen and Gould (1986) distinguished between what they termed complex and wicked problems. Land managers
are accustomed to dealing with complex ecological problems that can be managed by the application of formulas and equations to arrive at an optimal solution. For example, a forester may be able to determine the best cutting and regeneration methods to optimize timber yield in a certain type of stand. Wicked problems are not so straightforward. There is no single solution to these problems, no true or false but rather a range of good or bad outcomes. Wicked problems are complicated by human values that may run contrary to what appears to be a ‘rational’ choice (Allen and Gould 1986). Different members of society may have greatly conflicting views on how the land should be managed. But as the Allen and Gould point out, humans are what make these problems wicked and humans are the ones to solve them.

One framework to deal with these types of wicked problems is ecosystem management. Parks Canada has adopted this management philosophy as its mandate for administrating the national parks (Parks Canada 1998). Many other resource managers claim to perform ecosystem management although the definition of the term is often unclear. Grumbine (1994) performed a literature review to identify common themes among various author’s use of the term to produce a working definition. From these themes he arrived at the following definition: Ecosystem management integrates scientific knowledge of ecological relationships within a complex sociopolitical and values framework toward the general goal of protecting native ecosystem integrity over the long term (Grumbine 1994). One of the key themes identified in this work was the need for adaptive management. Because ecosystems are dynamic and constantly in a state of change and renewal, a flexible approach is required to address uncertainty. New scientific and social research must be continually incorporated into management plans to most effectively adapt to changing conditions. Ecosystem managers must define goals for what they want to accomplish and to anticipate changes in values, politics, and biological knowledge in attempting to make the best policy choices (Agee and Johnson 1988).

Adaptive management has been proposed as a system to optimize the use of natural resources in the face of uncertainty by treating management as an experiment. The term, like ecosystem management, has different meanings to different people. It first appeared in the literature in work by Holling (1978) and Walters (1986). These original works propose to more closely link management and research by changing the piecemeal approach to gathering data. Managers have traditionally gathered information by examining various components of the ecosystem and then integrating them to provide direction for policy. Once these policies are in
place, they are infrequently changed except perhaps for minor alterations. The status quo is maintained. Under an adaptive management regime, managers would continually monitor the results of their decisions and seek ways to improve them by searching for other policy directions. They would not be afraid to take calculated risks in order to improve production but would rather view risk as an opportunity to increase yield (Walters 1986). Policy is regarded as one big experiment with a continual potential for learning. Adaptive management is a way of planning for unanticipated outcomes by gathering information from every possible source. Often the most surprising outcomes provide the greatest opportunity for learning (Lee 1993).

The individual works of Holling and Walters are both very prescriptive and detailed in their use of statistical procedures. They view adaptive management as a strategy to be implemented and followed with the use of mathematical models. It would be impossible to analyze historical management of the FMF by adaptive management criteria because this type of management scheme has not be in place. In a joint work, these authors provide a more useful framework for the purposes of this study. They identify three ways to structure management as an adaptive process: evolutionary or ‘trial and error,’ passive adaptive, and active adaptive (Walters and Holling 1990). Evolutionary managers would at first make haphazard choices and then choose from outcomes that proved most successful. Passive adaptive management would use historical data to construct a single best model that is assumed to be correct from which policy directions would be established. This has been criticized because it may fail to uncover different strategies that could prove better. Active adaptive takes this method to the next level by using all available data to construct a range of alternate response models. Policy is designed to best reflect the model that maximizes short and long-term objectives (Walters and Holling 1990). The policy is altered as new information becomes available through constant monitoring and feedback. These three types of adaptive management will be examined in the context of policy development and management in the FMF to determine which type, if any, has been practiced. There may also be opportunity to expand on these theoretical categories if a different adaptive strategy is discovered.

More recently, the definition of adaptive management has changed to reflect more broadly defined management goals. For example Haney and Power (1996) define it as “a heuristic process coupling science and social values to promote the sustainable management of natural systems.” The President’s Forest Plan in the United States sees it “based on a continuing
process of action based on planning, monitoring, evaluation, and adjustment” (Forest Ecosystem Management Assessment Team 1993). Feedback and adjustment are key in both the social and ecological dimensions of management and are incorporated in all definitions of adaptive management. Figure 1 illustrates the resulting adaptive management cycle (Bormann et al. 1994). The first step is to arrive at a plan based on clearly defined goals using the best knowledge and technology available. This plan is then put into action with constant monitoring and evaluation. Feedback comes not only from scientists but also through effective public participation. Alternative management schemes arise from the feedback generated by the process which in turn creates new initiatives and therefore new plans. Adaptive management should reduce the time needed to fix problems with a policy because it promotes ‘rapid learning’ (Bormann et al. 1994). Problems are recognized quickly and even risky alternatives may be implemented. This differs from ‘reactive learning’ which is the traditional method of changing only after lengthy and formal reviews.

Figure 1: Adaptive Management Cycle (Bormann et al. 1994)

There is a strong emphasis on social values and processes in many definitions of adaptive management. It is recognized that societies, like ecosystems, are continually evolving and that management must be adaptive to those processes as well (Haney and Power 1996). The framework of adaptive management seeks to incorporate societal values directly into the planning stage because without public support, policy directives may be more likely to fail. McIain and Lee (1994), based on their review of the concept, state that adaptive management
should increase knowledge acquisition, facilitate information flow, and promote shared understanding among stakeholders. Information flow is aided by the feedback mechanisms built into the system which in turn leads to shared understanding because the various stakeholders must communicate and work together to try to reach consensus. McLain and Lee analyzed policy and management in three areas where this approach had been implemented using knowledge acquisition, information flow, and shared understandings as their criteria. Their results showed that these are not always improved. This study will also use these three criteria as part of the policy analysis.

Adaptive management has been shown to have different meanings to various agencies. The following is a list of questions that summarize the different criteria that will be used in the analysis. They provide a guideline for what could be considered adaptive management.

- Were many options identified at the time of a major decision?
- Was there room for feedback and adjustment?
- What was the quality of monitoring?
- Was the system flexible and reactive enough to permit rapid change from new learning?
- Were risky or experimental options considered?
- Did the framework incorporate public participation at every stage of planning, implementation and monitoring?
- Was there good information flow between researchers, policy makers, and the public?
- Were shared understandings created as a result?
- What type of adaptive management (evolutionary, passive adaptive, or active adaptive), if any, was practiced?

**Methods**

Evaluation research has been defined as “the systematic application of social research procedures for assessing the conceptualization, design, implementation, and utility of social intervention programs” (Rossi and Freeman 1993). It provides a method for carefully examining public policy or social programs to determine how effective they have been. There have been
practitioners of evaluation from many different disciplines including political science, policy analysis, education, and sociology. There has not, however, been extensive evaluation research done in the field of natural resource policy on which to model this project. Wallace et al. (1995) reviewed the literature and discovered that the disciplinary journals are concerned with theory and process whereas the natural resource journals are usually more applied. Because of the diverse range in policies and programs, evaluators from the different fields have necessarily employed a wide range of social research methods to investigate their subject. Therefore, there exists no universal approach that can be taken to study the development of policy but rather a host of flexible strategies. Each evaluation is unique and many designs could be employed though none can be perfect (Cronbach 1982). As will be seen, there are competing philosophies on the general nature of the approaches that can be taken. Currently there is a strong movement in the field away from positivist, quantitative methods toward more naturalistic ones, because they potentially have more explanatory power and acknowledge the biases inherent in research (Guba 1990; Greene 1994).

One of the most distinctive characteristics of evaluation research is its political nature. This point has been widely explored in the literature (Greene 1994; Patton 1997; Weiss 1972). Evaluations often investigate policies that are in the public domain that brings in a broad range of stakeholders with vested interests in the evaluation. The sponsoring agency funding the research has a particularly strong interest in the work and may try to influence the findings. Even the selection of criteria on which to base the evaluation has a political component. The different stakeholders may have contradicting opinions on the standards by which the policy should be judged. The researcher must be aware that evaluation is “intelligently intertwined with political decision making about societal priorities, resource allocation, and power” (Greene, 1994). This study, like any evaluation, has its political context. The criteria for evaluation, the principles of adaptive management, have been selected by the funding agency. There is however, a general story of policy evolution to be told. It is imperative that during the research process all interests are given their due voice to paint an accurate, well-balanced picture. It is hoped that when complete, this work will show how policy developed in the FMF and how it might best work in the future.
Greene (1994) provides an overview of the four major approaches to program evaluation:

1. *Postpositivism:* This has been the historically dominant approach which utilizes systems theory to promote efficiency and accountability. Quantitative methods are preferred including experiments and casual modeling. These evaluations are generally performed for high-level policy and decision makers.

2. *Pragmatism:* This philosophical stance is oriented more toward mid-level program managers and administrators. It promotes values of practicality and utility in methods and in outcomes. The methods are eclectic and flexible with each different evaluation and can include structured and unstructured surveys, questionnaires, interviews, and observations.

3. *Interpretivism:* This approach is the traditional domain of qualitative methodology using case studies, interviews, and document reviews. It promotes pluralism and understanding by acknowledging the different values of stakeholders. These evaluations are directed to program directors and beneficiaries.

4. *Critical, normative science:* Feminist, neo-Marxist, and critical theorists have developed this type of evaluation to prompt social action and change. They use participatory methods to include the ‘powerless’ directly in the research.

This study will use a combination of the pragmatic and interpretivist approaches. Part of the research is utilization focussed, in that very specific questions have been asked by the project leaders. Criteria have been established and a pragmatic selection of appropriate methods is required to find the answers. In addition, there is a story to be told because of the many different stakeholders who helped influence and shape the current framework. To fully appreciate their contributions an interpretivist approach is necessary. Both of these approaches employ qualitative methods in the form of case studies with interviews, observations and document review. These will be the methods of choice because they best serve the purpose of this study; the determination of how social forces shaped policy and management in the FMF. I will conduct interviews with stakeholders who witnessed the evolution of policy to determine their perception of how adaptive the process was. Secondary sources will be explored for any written
information that will further illuminate the topic. Michael Patton (1997; 1990) is an important exemplar for this type of evaluation and this study will follow his work.

According to Patton (1990), there are many theoretical traditions that utilize qualitative methods. He identified ten differing perspectives including phenomenology, symbolic interactionism, ethnomethodology, and chaos theory. Each of these traditions have different ways of approaching their research and of formulating theory. Theory can be built either from the ground up through inductive reasoning or from guiding concepts that are tested in the real world in a deductive process. Grounded theory is an example of inductive reasoning in that the researcher enters the field with no major theoretical framework in mind (Neuman 1997). Instead, the researcher builds theory based on what the data reveals. In addition, during the research process he or she may also search for established theories that help inform their findings. I partly intend to follow this line of reasoning by continually looking for theory that sheds light on the social forces at work. During the early stages of research, I hope to uncover reoccurring themes and ideas for which I can find relevant social theory. This can then help to guide interview questions and align my research focus for the remainder of the study period. Qualitative methods have the flexibility to allow for theory generation in the field and can stand on their own as a reasonable way of discovering what is happening in a program (Patton 1990). Following this review of methods, a theory section will outline some potential avenues of thought that may prove valuable in analyzing the data.

Having reviewed the general guiding concepts of evaluation research, I will shift focus to specific strategies for fieldwork. Krause (1996) outlines several steps necessary for effective evaluation. These are modified and outlined below to show the research plan in place for this project:

1. **Background research**: Much of the background research in terms of literature review and research design has already been completed and is presented in this document. The next step will be to create concise timelines for each of the four regions. From these timelines, major turning points will be identified for detailed investigation. Turning points in this instance are loosely defined as times when major changes or times of controversy took place. It would be impossible to examine every management and policy decision due to the potentially massive amount of material. These points can provide specific focus to times when issues were at the
foreground. It will also be necessary to investigate times without controversy and why some policy decisions were never an issue. Why certain things did not happen may be just as significant and interesting as why others did. The timelines will be constructed from existing historical documents and from informal interviews with key informants. These interviews will not be in-depth but will serve to help select some of the most significant turning points. When this is completed the turning points will be reviewed by my supervisors for final selection.

2. *Specifying the program’s goals:* The type and degree of adaptive management has been specified as the criteria for evaluation that has already been defined in this document. It is also important to look at the goals that these jurisdictions have set for themselves both today and in the past. Public policy is shaped by changes in societies and must be judged by the standards of the times in which they were created. The historical context must be accounted for by not putting unrealistic expectations on the policy makers of the day (Fox 1987; Wallace et al. 1995). Parks Canada for example strives for successful ecosystem management as their mandate. Has the Park been successful in fulfilling this goal? Have they been adaptive to changes in ecosystems and societies? Were the broader issues of the day reflected in their policy making? One of the greatest challenges of this project will be to account for the historical context of management decisions and to gauge the social action behind the process.

3. *Selecting the research design:* The justification for the selection of a case study using qualitative evaluation has been already been reviewed. Interviewing and document review will be the primary methods used with less emphasis on observation. Once the turning points have been identified, the detailed investigation will begin. Purposeful sampling techniques will be used to find key informants to interview. Three of these techniques that are most applicable are snowball, opportunistic, and politically important sampling (Patton 1990). Snowball sampling involves asking each person interviewed to name others who have firsthand knowledge and special experiences regarding the issue. The effect is like a snowball rolling down a hill where the number of potential interviews grows until most of the significant informants have been discovered. The sampling will also be opportunistic to
take advantage of new discoveries as they arise. There are no specific guidelines for the size of a qualitative sample, however it will be necessary to hear the stories from representatives of each stakeholder group. These may be people from Parks Canada, the local communities, aboriginal groups, environmentalists, business groups, government officials, and others. My goal is to complete approximately 35-40 interviews over the research period although the true test of a proper sample size will be repetition of responses. The interviews will be tape recorded in addition to extensive note taking although I do not plan to transcribe the interviews.

Document review will also be a major portion of the study. Historic policy documents, management plans, personal journals, internal memos, diaries, newspapers, magazines, as well as other writing on the areas are all invaluable sources of information. There are libraries and archives in Jasper, Edmonton, and Hinton to explore. Any document that can help explain the social conditions and thinking of an era will be used. Using multiple sources improves the quality and validity of results by the process of triangulation. Qualitative research in a case study framework allows for flexibility in data collection and minimizes the chance of misinterpretation (Stake 1994). The more sources of information used, the more accurate the findings will be.

4. **Data Collection:** Data collection will occur primarily in the summer of 1998 from the Palisades Research Center in Jasper National Park. In early June I will travel to Jasper to work on the initial timelines and to identify the turning points for investigation. There will be opportunity to discuss my work with Dr. Eric Higgs who has done extensive work on the history of Jasper and area. At the end of June I will have identified turning points, explored theory to explain social change, and developed some themes to guide interviews. This will all be reviewed by my committee and project leaders. Extensive interviewing will begin in July and continue through until the end of August. There should be opportunity for further data collection on weekends throughout the first semester as my course work permits.

5. **Analysis:** It is premature at this point to discuss in-depth how the data will be analyzed. Patton (1990) explains that there are no absolute rules to follow during analysis of qualitative data, only general guidelines. All qualitative researchers do look for recurring themes from
their data sources that they can corroborate through triangulation. They review interviews, historic documents, and other people's research to uncover connecting ideas. I will use a method of analysis to extract themes from the interview data and compare this to existing documents.

6. **Interpretation:** As interpretation follows analysis it is also premature to discuss this step. However, I have stated that there is a broader story to be told about policy development then just whether or not it is adaptive. Kaplan (1986) writes that in the absence of defining criteria, a narrative can often be the best way of “imposing order on complexity, considering relevant factors.” Stories explain changes over time, describing events as many people have experienced them. They are pervasive in our lives and many people, including political policymakers think in these terms. There are criteria by which they must abide; they must be true in that they account for differing perspectives and need to accurately reflect these, they must be rich and tell of actors and their settings, and they must be consistent, congruent, and unified (Kaplan 1986). Narrative may prove to be an effective way of communicating the complexities of policy development in these areas.

One of the prime concerns in social research is to protect the participants who graciously take part in the project. People share their stories and expose important details of their lives. Most concern over ethics arises from issues of harm, consent, deception, privacy, and confidentiality (Punch 1994). There should be no issues regarding harm or deception in this project. If I intend to quote someone by name permission will have to be granted first by that individual. Most interviews will be completely anonymous and no one will be identified in the written reports, either by name or by identifying characteristics such as their occupation or activities. Written transcripts and notes will not carry identifying labels that show who made the statements. The Faculty of Agriculture, Forestry, and Home Economics Ethics Committee has granted permission to carry out the research and their guidelines will be followed.

**Social theory**

The following section is a brief introduction to some potential avenues of theory that might inform the policy analysis. As stated in the methods section, theory should arise from the
field work and data analysis. However it will be useful to enter the field with some guiding concepts and theoretical background. Several authors have demonstrated that the literature is not rich with sociological theory relating to natural resource policy analysis. (Fairfax and Ingram 1990; Francis 1990; Wallace et al. 1995). Students of natural resource policy have approached the subject from many different perspectives but there has yet to emerge a unified paradigm. In addition, much of the literature deals with policy concerning the extraction of natural resources and little with national parks policy. It will be necessary to import different strands of thought to fill the “missing threads of theory” in natural resource policy studies (Fairfax and Ingram 1990).

The most promising line of thought comes from state theory, a field with roots in both sociology and political science. State theories can be traced back to the works of macro-theorists such as Max Weber and Karl Marx (Craib 1997). These theories explore the relationship between societies and bureaucracies. Both Weber and Marx were concerned with how bureaucracies function in society and for whom they really operate. Defining the exact nature of state theory is difficult, however, because there are competing ideas of what state theory actually is. According to Barrow (1993), “there are many different, sometimes overlapping, and often incompatible concepts of the state prevalent in the theoretical literature.” In this research the state will mean the Canadian federal government in the case of Jasper National Park and the Alberta government in the other jurisdictions.

There are three main competing schools of thought on the relationship between public bureaucracies and their constituencies according to West (1994). These camps disagree primarily on the basis of the power and influence of the state. The environmental, or institutional school, believe that powerful interests control and manipulate public bureaucracies. Large-scale capitalistic interests are able to dominate the public agenda with their power and influence, rendering the state as a mere tool for their use. There are both Marxist and non-Marxists who subscribe to this theory. In contrast, the bureaucratic autonomy school would contend that well organized bureaucracies are powerful enough to withstand external domination. Somewhere between these perspectives is the contingency, or relational school, whose proponents argue that the degree of domination is based on the power relations between the state and its constituency. According to these theorists, a powerful bureaucracy is able to withstand the strength of external forces while a weak one is not. This framework could prove useful in examining policy evolution and how the interests of the public and the state were or were not realized. The tools
of domination used by the external forces are also of interest. West (1994) described five forms of domination which are outlined in Table 1. These forms of domination can be fluid, changing over time or coexisting with each other.

Table 1. Forms of Domination [based on West (1994)]

<table>
<thead>
<tr>
<th>Domination by...</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>External sanctions</td>
<td>Exertion of external power, usually as threats, and if necessary carrying out those threats; more like Weber’s concept of power then domination.</td>
</tr>
<tr>
<td>Informal Cooptation</td>
<td>Granting real power to external constituency without recognizing responsibility; gives external force an inside track without publicity.</td>
</tr>
<tr>
<td>Power-sharing cooptation</td>
<td>Sharing of responsibility and perhaps power; example is formal advisory boards where powerful local interests can dominate.</td>
</tr>
<tr>
<td>Constellation of ideas</td>
<td>Influence gained by resource control; those with the greatest resources can dominate others by their need for them.</td>
</tr>
<tr>
<td>Cooperative domination</td>
<td>This occurs when the interests of the bureaucracy are in line with external pressures and they work together in their domination.</td>
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An integral aspect of political theory is the study of power. Power structure research explores the role of power in decision-making to illustrate who really controls policy outcomes. It is concerned with the problem of decisionalism; to what degree was the outcome a choice of an individual(s) in conflict or cooperation with others (King 1986). Lukes (1974) described power as occurring on three different levels; pluralist, elitist, and hegemonic. In the pluralist model power is shared equally by individuals in what could be called an ideal democracy. Under the elitist model power is held by a select few who have the economic clout to impose their will on others and suppress their interests. The hegemonic form of power is similar to the elitist model in that a dominant class exists but they have convinced the lower classes through the use of powerful symbols that they are better off that way. Power structure research can reveal key networks and channels of power that influence public policy. I have previously done work in Jasper on power structure and believe that this could be a key theoretical component.

Freemuth (1989) devised a framework for analyzing policy issues specific to the national parks. His framework, illustrated in Figure 2, shows that there are two different philosophical continuums along which people’s interests can lie. One is the degree of expert or political
control over policy while the other continuum is use value. There are two competing beliefs here; one that parks should be for enjoyment and recreation while the other views parks as essential preservation areas, unimpaired by human intrusion. Freemuth applied his framework to the American parks system but this could just as easily be used for the Canadian example. It may help to frame the arguments of competing interests by acknowledging where they lie on the continuum. For example, the issue of development in Jasper National Park has clearly shown the cleavages in resident’s values. Business groups, environmentalists, and park managers each come from different perspectives on how the park should be managed and to what degree the park should be developed.

![Diagram](image)

**Figure 2**: National Park Policy Continuums; based on Freemuth’s (1989) American example.

As demonstrated, there is sociological theory that can inform the study of natural resource policy. The challenge is to find the most appropriate school of thought and apply it to this case. Currently state theory seems to offer the most potential. Freemuth’s (1989) continuum would also appear very useful in helping to frame stakeholder interests and the competing philosophies of park management. There are other theories that may prove useful such as works on social movements which seek to understand why, when and where conflict occurs (Beckley...
and Korber 1995). The global environmental movement has influenced parks externally and internally. It remains to be seen what line of theory will be most relevant to the policy analysis.

References


