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ABSTRACT

Although much of the literature on the National Environmental Policy Act of 1969 has concentrated on the role of environmental analysis documents in federal agency decision-making, very little attention has been devoted to the role of these documents in carrying out land management policies. This study examines USDA Forest Service timber sale environmental assessments (EA) as policy communication tools for sale implementation.

Implementation is part of the policy process - a process which involves the establishment of policies (goals), the construction of plans (objectives), and the initiation of projects (actions). This policy concept is used to explain the role of the EA in timber sale implementation.

Face-to-face interviews were conducted with 30 district rangers from USDA Forest Service Regions 1, 4, and 6. Their comments indicate how Forest Service administrators in the National Forest System view the role of timber sale EAs in the Forest Service policy process. Results indicate that timber sale EAs should be used to communicate timber sale policy-relevant information, rather than specific methods, to personnel who carry out timber sale activities.

Content analysis of 88 timber sale EAs indicates the extent that policy-relevant information is included in EAs. Results show various problems which may hinder effective implementation: 34% of the EAs analyzed did not contain timber sale goals and 16% did not have objectives; 29% of the mitigation measures analyzed did not state reasons for the measures; 86% did not have monitoring information associated with them; and 40% did not include an indicator of mitigation accomplishment or effectiveness.

The results will help those who write timber sale EAs to emphasize policy-relevant information in the documents. Recommendations are given for the preparation of timber sale EAs to make them more useful communication tools for personnel implementing timber sale policies.

Additional Key Words: National Environmental Policy Act of 1969 (NEPA), policy analysis, mitigation measures

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NOTE TO THE READER

This report has been prepared for federal land-management agency personnel involved with timber sale EA preparation and review as well as individuals interested in forest policy research.

The report is divided into 4 sections for easy reference. The EA preparer and reviewer interested in recommendations for EA preparation may wish to review Section 4. Section 1, a literature review, explains the reasoning behind these recommendations. Section 2 presents a practical study of USDA Forest Service timber sale EAs as implementing tools and is presented for those interested in an assessment of how district rangers perceive the use of timber sale EAs as well as the potential of EAs to fill that role as presently written. Finally, Section 3 is included for the forest policy researcher interested in further EA research.

It is hoped that this report will provide both the land-manager and researcher with new insights to the preparation and use of the timber sale environmental assessment.

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INTRODUCTION

Many Americans have become aware of major natural resource legislation that has shaped national public land policy the past 15 years. Controversy over the implementation of this legislation is in the spotlight of the national environmental policy arena. While national policies are important, many other less visible, but still important, natural resource policies are made at local administrative levels of federal land management agencies. Policies determining where, when, and how timber will be harvested and how natural resources will be protected continually shape land allocation and natural resource use and protection on the local level. This study addresses one communication tool used to carry out USDA Forest Service timber sale policies: the Environmental Assessment (EA).

The National Environmental Policy Act of 1969 (NEPA) (PL 91-190) requires the analysis of potential environmental impacts for proposed timber sales. This analysis is documented in EAs and used to guide decision-making during the development of alternative timber sale and resource protection policies and actions. This study examines EAs as tools for communicating conceptual policy goals to those who carry out timber sale activities on national forest lands.

PURPOSE AND OBJECTIVES OF STUDY

To explore the practical application of the use of timber sale EAs as policy implementing tools it was necessary to understand how timber sale EAs are presently used to carry out policies. It was also desirable to know the policy communication potential of timber sale EAs which have been written. These questions are presented in the following two overall research goals, each with specific objectives to be met.

GOAL 1:

Understand how USDA Forest Service National Forest System administrators view the role of timber sale EAs in the Forest Service policy process.

Specific objectives designed to meet this goal are:

A. Determine how Forest Service administrators view the role of the timber sale EA in the Forest Service policy process.

B. Determine who Forest Service administrators view as the timber sale EA audience and why the EA is written for this audience.

C. Determine if Forest Service administrators use timber sale EA documents to implement and monitor mitigation measures[1] addressed in the EA.

D. Determine if, and how Forest Service administrators would like to see EAs changed.

E. Determine what Forest Service administrators feel are good qualifications for timber sale EA "coordinators or facilitators" and the kind of training they receive.

F. Collect biographical information about the Forest Service administrators who provide the above information.

GOAL 2:

Examine the content of USDA Forest Service timber sale environmental assessments to determine the potential of these documents to communicate information which will lead to effective policy implementation.

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[1]Mitigation measures are actions to be taken with the intention to "reduce, moderate, or prevent adverse effects on nontimber resources" (Schuster, Keegan, and Benson 1984).

Specific objectives designed to meet this goal are:

A. Determine if timber sale EAs contain project goals and objectives and if objectives are specific enough to ensure their accomplishment.

B. Determine if the mitigation measures presented in timber sale EAs are tied to overall project goals and objectives.

C. Determine if there appears to be an underlying rationale behind mitigation measures as they are presented in timber sale EAs.

D. Determine if timber sale EAs contain specific direction for implementing and monitoring mitigation measures.

E. Test for statistically significant regional differences in the above results.

STUDY LIMITATIONS

This study did not attempt to test the "effectiveness" of timber sale EAs in communicating project implementation information for successfully meeting project goals and objectives. It tested the potential of timber sale EAs to communicate implementation-relevant information and therefore can only assess the "potential" for timber sale EA goals and objectives to be carried out successfully.

No attempt has been made to determine if the Forest Service has complied with the provisions of NEPA or to rate individual EAs as being well or poorly prepared. None of the information contained in this report is attributed to any particular national forest, ranger district, or Forest Service administrator in an effort to maintain confidentiality for those units and persons providing information for this study.

SECTION 1

LITERATURE REVIEW

The extensive literature related to the National Environmental Policy Act of 1969 (NEPA) primarily stems from the role the courts have played in implementing the Act's procedural mandates involving environmental analysis and its documentation. A closer look at both policy analysis theory and the NEPA process indicates that the NEPA "process" mirrors established decision and policy analysis techniques, but more is involved than analysis and decision-making. Policies must be conveyed to those who implement policy decisions to gain results reflecting the intent of decision-makers. Timber sale EAs can be used to communicate policy-relevant information to Forest Service personnel who implement decisions. People who prepare timber sale plans, carry out actions, and monitor results need to know the goals and objectives of the timber sale and the underlying rationale if timber sales are to accomplish the stated policy. The policy analysis literature allows one to explain how timber sale EAs can be written as a communication tool to convey this information.

IMPLEMENTING NEPA

Although NEPA (Sec. 102 (2)(c)) requires an Environmental Impact Statement (EIS) for many USDA Forest Service land management actions, a large number of timber sales do not significantly affect the quality of the human environment. In such cases, the Forest Service still carries out an "environmental analysis" to assess the effects of alternative

actions and assist in the choice of a preferred alternative and often records the results in a document called an Environmental Assessment (EA) (USDA 1981).

EAs are reviewed at various levels within the Forest Service as well as by other federal and state agencies, environmental and industry groups, concerned members of the public, and decision-makers. The environmental assessment considers alternative proposals which address impacts on resources such as timber, wildlife, recreation, forest fuels, water quality, and aesthetics. Each alternative can also establish many policies addressing resource management, mitigation requirements, and the monitoring of results. These policies are formulated as part of a chosen course of action. If any one policy is not implemented as originally planned, the alternative is altered and may be unacceptable to groups interested in the outcome of a particular project.

Most judicial review involving NEPA has concerned the "applicability" and "preparation" of environmental impact statements as to:

(1) whether a major federal action is involved;

(2) whether the action will "significantly affect" the environment;

(3) which agency should file the EIS;

(4) when the statement must be filed;

(5) who must prepare the statement; and

(6) what the statement must contain (Cortner 1976).

Litigation, and therefore agency emphasis, has usually addressed procedures (See Anderson 1973, Andrews 1976, Cortner 1976, Fairfax 1978, Sax 1973, Shaw 1976, and Wichelman 1976). However, there is an element

of NEPA implementation which has not been adequately addressed - that of carrying out decisions made under the "NEPA process." Edwards (1980) emphasizes that "a brilliant policy poorly implemented may fail to achieve the goals of its designers." Rowen (1976) recognized this when he wrote: "Perhaps the greatest current need, a need that organization theorists and students of bureaucratic functioning have only begun to meet, is the systematic study of policy implementation. We often refer to 'a policy decision' as the end product of the analytic process." A note in a 1979 Yale Law Journal points out that the courts "have emphasized the requirement that agencies include relevant information in the EIS, but have not focused on the use made of the EIS in implementing the agency action."

While NEPA establishes specific "action-forcing" procedures for environmental decision-making, it assumes decisions will be implemented. To gain some insight on implementing decisions related to the environmental analysis process and EA documents, the literature from the applied social science discipline of policy analysis will be explored.

POLICY ANALYSIS

Policy analysis generally calls for "an investigation of the effects of policy alternatives in order to identify at the earliest possible time an agency's preferred broad course of action toward its goals" (Starling 1979). Policy analysis includes "impacts on society and its environment" and "problems of administrative implementation" (Starling 1979). Dror (1971) defined policy analysis as "an approach and methodology for design and identification of preferable alternatives in respect to complex policy issues." These statements about policy

analysis are closely related to what the NEPA Procedures Handbook (USDA 1981) says about environmental analysis:

> Environmental analysis uses a systematic interdisciplinary approach to examine a proposed action and alternatives, and their effects, as an aid to identify a preferred course of action. The process is an integrated component of planning and decision-making for actions ...

Lasswell and Kaplan (1950) provide the classic definition of policy: "Policy is a projected program of goal values and practices...." Starling (1979) adds to their definition as follows: "A policy it should be said immediately, is not quite the same thing as a plan, which is best thought of as a specified means for achieving the goals of policy. Thus a policy is a kind of guide that delimits action; it is much more open-ended than a plan." Starling then goes on to "ideally" link "policies", "plans", and "programs": "A policy is a list of goals in order of priority ... a plan is a set of measurable objectives to attain a goal ... (and) a program (or project) is a set of specific actions to attain an objective."

Anderson (1979) explains that "decision-making involves the choice of an alternative from among a series of competing alternatives," and "policy-making typically involves a pattern of action, extending over time and involving many decisions, some routine and some not so routine." Thus, policies are developed through a series of decisions about what is to be accomplished, when and how it is to be accomplished, and who is to accomplish it. Decisions are closely linked with policy, for they reaffirm, add to, and establish policies.

Edwards (1980) addresses communication as one critical factor associated with successful policy implementation. Simon (1976) points

out that: "Only in the case where the man who is to carry out a decision is also the man best fitted to make that decision is there no problem of communication."

In the early days of national forest management the local Forest Service managers seldom relied on written communication to carry out decisions because often they were both the decision-maker and implementer. In 1905, foresters often shared a common woodsman-like background (and later, a forestry education) and management direction was obtained from the "Use Book" of regulations - a 142-page book, "four and one-quarter by six and three-quarters inches" (Steen 1976). This allowed them to carry out their tasks with little question about how decisions should be implemented. Increases in Forest Service size and responsibility later caused the 'Use Book' to grow into a multivolume looseleaf encyclopedia of procedures (Steen 1976). Likewise, another change within the Forest Service - "The advent of resource specialists - biologists, hydrologists, soil scientists, landscape architects, recreation planners, and archaeologists - implies that foresters no longer have all the answers and tends to threaten their decision-making confidence" (Frome 1984). With more diversified decisions based on volumes of information from various professionals, the Forest Service must rely more on interpersonal communication if on-the-ground results are to reflect the intent of administrative policy decisions.

With Starling's (1979) basic concept of policy as "policy", "plan", and "program" (or project) we approach natural resource policy (national or local) as being much more than just an institutional goal to meet particular needs. It must also be a plan of action to meet those needs and carry out those actions. Without "actions" policies are merely

wishes, and without plans, actions (or projects) may never bring about desired goals. This study links the NEPA process (as it applies to USDA Forest Service timber sale environmental analysis) to the policy process. Each element of the policy process is presented in detail in the following sections.

GOALS

Starling (1979) states, a policy is a list of goals. A goal is defined as:

> A concise statement of an organization's central strategy in addressing a problem expressed in terms of a desired state or process that operating programs are designed to achieve.
>
> A goal is normally expressed as a broad, general statement, is usually not quantifiable, and is timeless in that it usually has no specified date by which it is to be completed. . . . The goal is the principle statement from which objectives must be developed. (USDA Off. Manage. and Finance 1974, from Schwartz et al. 1976)

Timber sale goals are expressed in EAs by identifying a purpose and need for action. For example, the goal for a timber sale may be stated as the need to put timber stands under management, the need to salvage dead and dying timber, the need to diversify wildlife habitat, or the need to harvest timber to meet an assigned volume to be sold. Although goals such as these may be broad, they must not be so vague or conflicting that they do not provide any direction. This is often the case when goals are designed to appease several groups of people. "Different people or groups can support the same policy for different reasons. Each may hold its own conception of the goal or goals the program (or project) is designed to achieve" (Edwards 1980). Because timber sale EAs are written as decision documents to provide information

for the public and other agencies as well as various Forest Service specialists and administrators, this problem is of particular concern.

OBJECTIVES

While goals are not usually quantifiable, objectives are. Starling's (1979) concept of a plan as a "set of measurable objectives" parallels the NEPA process of defining decision criteria: "Forest Service objectives established in policies and plans should be considered in establishing criteria and standards" (USDA 1981). An objective is defined as follows:

> An objective is measurable and implies precise time phased steps to be taken and resources to be used which, together, represent the basis for defining and controlling the work to be done.
>
> An objective must include four essential elements:
>
> 1. It must state the desired outcome - i.e., what is to be accomplished.
>
> 2. It must indicate the time period within which the expected outcome is to be achieved.
>
> 3. It must include measurement factors, such as quantity, quality or cost so that the fact that the objective has been accomplished can be verified.
>
> 4. It must indicate who is responsible for achieving the indicated results. Desirable, but not absolutely essential, elements of objectives are a description of how it will be achieved and an indication of who will determine whether the result has been achieved. (USDA Off. Manage. Finance 1974 from Schwartz et al. 1976)

Decision criteria in EAs can be considered as objectives. They should be measurable because they are the basis for evaluating alternative actions. If a course of action does not meet the objectives, it may not accomplish the goal. The development of objectives, or decision criteria, are an important step in choosing

actions to accomplish goals. For example, timber sale goals may include both the sale of timber and the maintenance of elk habitat. Specific timber sale objectives would state the district timber staff officer and wildlife biologist shall see that a total of 20 to 30 MMBF of timber is harvested by the year 1990 and that elk habitat is maintained at 60% or better of potential for 10 years.

ACTIONS (PROGRAMS OR PROJECTS)

Starling (1979) defines a "program' or "project" as a set of specific actions to attain an objective. In the NEPA process, alternative actions are formulated and evaluated to determine if they meet the objectives.

By documenting goals (policies), objectives (plans), and actions (programs/projects) in a timber sale EA, the USDA Forest Service has written records to use throughout timber sale planning and implementation phases which can take up to 10 years to complete (USDA FSM, 11/82, R-1 Supp.,298, 2431.2). Edwards (1980) offers a good perspective on the importance of goals and objectives for implementing policies:

> Implementation instructions that do not specify the goals of a policy and how to achieve them are common. If communications ... are not clear, implementers will have more discretion to exercise in interpreting policy requirements. This discretion will not necessarily be used to further the aims of those who originally decided upon the policy.

LOGIC AND ARGUMENT IN ENVIRONMENTAL ASSESSMENTS

While goals, objectives, and plans of action are essential to timber sale implementation, so are the underlying reasons for particular actions and requirements specified in the EAs.

> Policy analysis is an applied social science discipline which uses reason and evidence to clarify, appraise, and advocate solutions for public problems. Yet to use reason and evidence is to follow certain procedures in an effort to produce rational arguments about policy; and it is in the area of the logic of inquiry where the most important methodological problems of policy analysis are found. (Dunn 1981)

The use of reason and evidence is important in environmental analysis to tie scientific, economic, and social analysis to a chosen course of action, because "information and data can never be understood in isolation from the context of ideas which give them meaning" (Rein 1976). Using logic and argument in EAs leads to better policy implementation. With reason and evidence for a course of action included in an EA, those who carry out the actions do so with the intent to achieve specific goals and objectives. To illustrate this, we will turn to the structure of arguments as developed by the English logician, Toulmin (1958) and applied by Freeley (1976) and Dunn (1981). Toulmin analyzes arguments by using a "claim" or conclusion; "data" or evidence; and "warrant" or supporting arguments, which allows one to go from "data to claim" (Freeley 1976). He also suggests that in addition to these elements (data, claim, and warrant) any one or all of the following "supporting elements" may be used:

> "Backing" - Consists of additional argument, supporting evidence, or evidence aliunde[1], needed to establish the "warrant" when the warrant will not be accepted (as being credible) . . .
>
> "Rebuttal" - indicates exceptions, limitations, special considerations, counter argument, or counter evidence

[1]Evidence aliunde is evidence which supports or contradicts a document, but is not derived from that document itself. For example, a report from a wildlife biologist may support a statement in an EA that road closures will increase elk habitat effectiveness.

> that may refute the "claim", discount it, or restrict or qualify it in some way.
>
> "Qualifier" - indicates the degree of cogency that may be attributed to the "warrant" (Since warrants vary considerably in their value). (Freeley 1976)

To illustrate the use of claims, data, warrants, backing, rebuttals, and qualifiers, each element is presented with examples.

First, a "claim" is a statement of an action or requirement that needs to be done. Timber sale EAs contain many claims besides the obvious ones involving timber harvest. Examples of these claims are mitigation measures. For example, if building a logging road will increase vehicular traffic in an area that will impact an elk herd, a mitigation measure such as a road closure may be recommended once the logging is completed.

"Data" are evidence or "policy-relevant" information (Dunn 1981) that supports a claim. Data are supported by "warrant" and "backing" statements.

Warrant statements are assumptions that state why a particular action will be effective in meeting a goal or objective. For example, a statement that road closures will decrease human disturbance on the elk population is a warrant statement supporting the mitigation measure of closing a road. The role of the warrant statement is to provide "reason" for a mitigation measure to be used to meet a particular objective (adapted from Dunn 1981).

Dunn (1981) states that: "The backing for a warrant consists of additional assumptions or arguments that may be used to support warrants which are not accepted at face value. The backing for warrants may also take various forms which include scientific laws, appeals to the authority of experts, or ethical and moral principles." For example,

backing in timber sale EAs takes the form of specific reference to the Forest Service Manual, handbooks, research literature, regional guidelines, laws, regulations, and specialist reports.

Mitigation measures may also be supported by a "rebuttal". A rebuttal is an option or action that can be taken to achieve the same goal or objective. For example, the EA may call for a logging road to be closed to reduce the amount of sediment produced on a watershed. The goal may also be achieved through the option of surfacing the road.

Although Toulmin (1958), Freeley (1976), and Dunn (1981) present "qualifiers" as a part of the policy argument model, these are difficult to pinpoint in a policy argument, if they exist at all. These are mainly a degree of probability or certainty that an action will be needed. For example, research may show that a certain percent of the time, road closures have been effective in mitigating the effects of human disturbance on elk during hunting season.

A comprehensive example of a structured policy argument is shown in Figure 1, which illustrates the argument for implementing a road closure policy to protect water quality in a proposed timber sale area.

While EAs do not structure arguments in the "physical" sense that Toulmin (1958) proposes, they should contain the essential elements of that structure to aid in carrying out policy decisions. This is important for those who carry out timber sale actions because it demonstrates the reasons for their actions. It also allows an administrator to reject or substitute an action if the need arises when carrying out the project, while understanding the consequences of the decision in relation to the timber sale goals and objectives. For example, suppose a timber sale EA expresses a policy to protect water

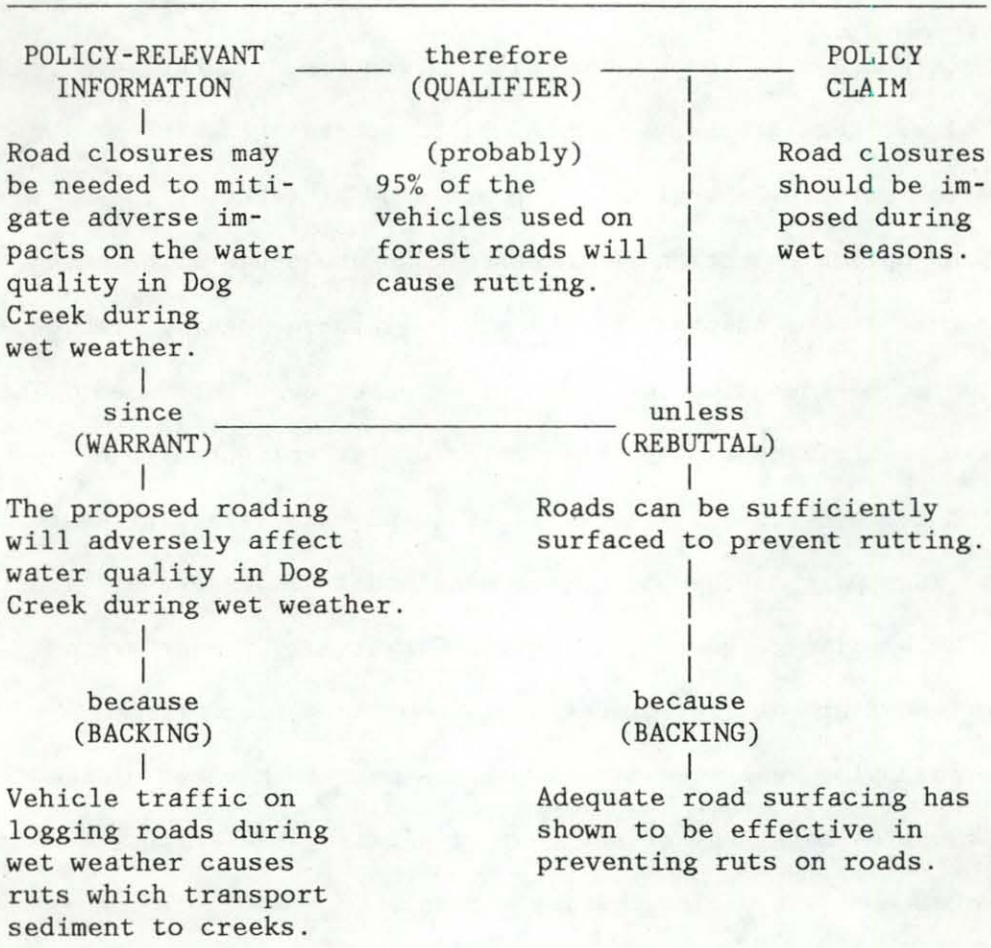

Figure 1. Example of a theoretical policy process model using elements of a policy argument for implementing a road closure policy to protect water quality in a proposed timber sale area. (Model from Toulmin, 1958; Freeley, 1976; and Dunn, 1981).

quality and calls for road closures to be imposed during wet seasons. If the timber sale purchaser wishes to operate on a portion of road during the wet season, an agreement may be made to surface the road to prevent rutting and erosion. An administrator may make the decision to do this and still meet the policy, which is to protect water quality. If the EA only stated that roads will be closed during wet seasons without warrant and backing, the administrator would be forced to follow

the direction in the EA and close the road or modify the EA. With the warrant and backing giving reason and evidence for this restriction, the administrator can use this information to examine the situation and make a logical decision to change the plan of action and still meet the policy. This kind of flexibility is important during implementation because even the best made plans will need adjustment once they are carried out on the ground. These adjustments can be made with little risk to the goals if they can be made with the same logic and evidence with which the project was designed.

USING ENVIRONMENTAL ASSESSMENTS

The Forest Service develops several operating plans for timber sales and can use the EA as a starting point to ensure that plans do reflect the goals, objectives, and supporting information outlined in the EA. These plans "typically" include: "(1) Direction to layout crews (cutting boundaries and marking guidelines); (2) Specific silvicultural prescriptions for (the) preferred alternative; and (3) Other information as necessary for sale layout (road and logging systems and burning plans)" (USDA FSM 11/82 R-1, Supp. 298, Sec. 2431.2--8). Plans outline the specifics of the timber sale and give "how-to-do" information to those carrying out timber sale activities. If it becomes necessary to adjust plans to meet unforseen circumstances such as--changes in road location or design, unit boundaries, silvicultural prescriptions, seasonal operating restrictions, and mitigation measures- these adjustments can be made based on the logic of the environmental analysis shown in the timber sale EA.

Another important use of the timber sale EA during sale implementation involves evaluating and monitoring sale activities to

ensure that both overall sale goals and mitigation objectives are met - essentially, to compare project goals to their outcomes (Edwards 1980) by measuring the impacts the sale has on such things as soils, water quality, wildlife, and scenic quality. The Code of Federal Regulations (40 CFR Sec. 1505.3) states that "agencies may provide for monitoring to assure that their decisions are carried out and should do so in important cases." It also states that "a monitoring and enforcement program shall be adopted and summarized when applicable for any mitigation" (40 CFR Sec. 1505.2(C)). Timber sale EAs can only be used as a monitoring tool during the various phases of carrying out the sale if they contain measurable objectives, reason, and evidence. This allows administrators to monitor the achievements in terms of goals and objectives rather than specific actions. For example, it may be more important for a watershed specialist to monitor the amount of sediment in the streams than to monitor the miles of road being seeded to grass if the objective in the EA was to keep sediment below a specified level.

The use of goals, objectives, evidence and reason have been presented to show how timber sale EAs can communicate information to those who develop timber sale plans, carry out actions, and monitor results. The following sections present a study of the role of timber sale EAs in policy implementation and an analysis of timber sale EA content for policy information.

SECTION 2

THE USE OF TIMBER SALE EAs AS IMPLEMENTING TOOLS

This phase of the study examined how USDA Forest Service administrators view the use of EAs as implementing tools.

METHODS

Thirty district rangers in USDA Forest Service Regions 1 (Northern), 4 (Intermountain), and 6 (Pacific Northwest) were surveyed using face-to-face interviews and primarily open-ended questions to better understand how district rangers view the role of timber sale EAs in carrying out timber sales[1]. Since district rangers "translate the words of policy statements - of federal statutes, departmental regulations, and Forest Service directives - into action" (Kaufman 1960), they were chosen as a unit of analysis. Although district rangers may not have the same expertise in the NEPA process as other staff members, it was assumed that they have a perception of the overall function and interrelationships of the process, the resulting EAs, and their use in day-to-day timber sale activities. Also, as the administrative head, the district ranger is ultimately responsible for successful implementation.

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[1]See Carbone, 1985 for a complete description of the sampling and survey methods used.

INTERVIEW RESULTS

Generally, the district rangers interviewed were interested in the study, and felt it to be pertinent to Forest Service activities today. The district rangers who were interviewed averaged 46 years of age, 21 years experience with the Forest Service, 9 years experience as district rangers, and 6 years as district rangers on their present districts.

The district rangers were first asked for whom, in their opinion, is the timber sale EA written? No response categories were read to the respondents in order to keep from biasing the responses. Responses were broken into the categories displayed in Table 1.

Table 1. Regional percentage of respondents indicating who timber sale EAs are written for by category.

	Percent of Responses/category			
	R-1	R-4	R-6	Combined
Legal requirement	25	33	1	20
USFS decision maker	50	11	62	43
USFS personnel who implement	63	44	92	70
USFS personnel who monitor	13	22	23	20
Other agencies	13	22	15	17
Interest groups and general public	38	33	77	53

Other responses which did not fit into these categories included the use of timber sale EAs by specialists both within and outside the agency (such as wildlife biologists from state fish and game departments), the land use planner at the forest supervisor's office, the courts, and the timber staff to set up the 5-year management programs.

The information gained through the interviews indicates that besides using timber sale EAs for decision-making and information-sharing, district rangers do perceive a use for timber sale EAs to carry out timber sale activities. Further questioning found that

90% of the district rangers use EAs for timber sale activities which include the preparation of timber sale plans, sale layout and preparation, contract appraisal, sale administration, post-sale activities, and sale monitoring. Generally, the timber sale EA is used during these stages as a tool that explains the "intent" of the actions to be carried out. This is a very important finding for this study because it demonstrates that district rangers perceive the timber sale EA as being important in policy implementation.

District rangers generally feel that it is important that mitigation measures are included and explained in timber sale EAs to ensure that objectives will be met during implementation and that mitigation effectiveness can be reviewed or monitored (see Table 2).

Table 2. Percentage of respondents indicating the importance of mitigation measures in EAs for decision-making, implementation, and monitoring.

	Percent of Responses/category		
	Decision-making	Implementation	Monitoring
Extremely Important	33.3	30.0	33.3
Very Important	33.3	50.0	53.3
Moderately Important	6.7	13.3	7.0
Somewhat Important	3.3	3.3	3.3
Not Important	20.0	3.3	3.3
No Response	3.3	0	0

Some of the Region 6 comments indicated that mitigation measures are fairly standard and do not really enter into the decision process. If a ranger district or national forest has well-developed and time-tested mitigation measures there may be little question of their effectiveness and feasibility. This may explain why many Region 6 respondents rated mitigation measures as "not important" for decision-making.

Eighty-seven percent of the district rangers interviewed stated that timber sale EAs do contain sufficient direction for carrying out mitigation measures and emphasize that this direction should leave flexibility so that different methods can be employed to achieve the "intent" indicated in the EA. This further shows that district rangers view the EA as a document which emphasizes the expected end results, or policy, rather than the methods of achieving them.

Interview responses dealing with "policy" followed the general trend in the policy literature. A copy of the following definition developed from Dye (1978), Starling (1979), and Webster's (1981) was given to the respondents to read and comment on:

POLICY

> A policy is a definite course or method of action selected from among alternatives (one of which may be to do nothing) and is used to guide and determine present and future decisions. Strictly speaking, a policy does not become a public policy until it is adopted, implemented, and enforced by some governmental institution. The policy process includes three sets of information:
>
> 1. A kind of guide that delimits action (a list of GOALS).
> 2. A specified means for achieving the goals of a policy (a set of measurable OBJECTIVES).
> 3. A set of specific actions to attain an objective (PROJECTS).

The respondents were asked if they generally agreed with this definition. Overall, 40% of the district rangers interviewed agreed. The following comments are paraphrased from some of the responses to this question about the policy definition presented:

> Policy does not include action. It may include objectives. It is a brief, broad long-term guide.
>
> Policy is more flexible. "Definite course or method of action" is too concrete. "Specified means of achieving goals" is too specific. Need more "wiggle room."
>
> Yes, but the definition goes a little too far. Policies are not always selected from formally established alternatives. Policy does not always include all three sets of information. Policy is S.O.P. - standard operating procedure.
>
> Policy varies from case to case. Basically, policy is direction provided from the supervisor's, regional, and the Washington offices or Congress.
>
> This is a good way of portraying a policy. Policy is just B.S. until someone puts some money with it. In the Forest Service, if you get funded, then it is an important policy.
>
> Policy is: "Here is what I want you to do; but, I don't care how it is done."

An analysis of all interview comments related to the policy definition revealed that as a whole, the district rangers interviewed felt that a policy is a guide (or list of goals), is flexible, and gives direction. A policy can be direction from the Forest Service Manual or land-use plans. They see that a policy is not a definite method of action, is not selected from among alternatives, and is not specific actions. Objectives may or may not be a part of policy.

A wide variety of opinions exist on exactly what policy is and how it should be defined. Some district rangers see EAs as a part of policy and that EAs can be used to set and carry out policies. To determine the connection between timber sale EAs and Forest Service policy, district rangers were asked if they view the environmental assessment process as playing a role in the Forest Service policy process.

Seventy-three percent of the rangers interviewed believe that EAs do play a role in the policy process. But some of the rangers who generally agreed with this connection only agreed to the point that it is "policy" that the Forest Service "uses" the NEPA process. This response corresponds with the comments about the policy definition, for many district rangers see policy as a rather broad and ambiguous concept that has some flexibility. Many see a difference between EA decisions and policy decisions. This is perhaps due to the inconsistencies in respondents use of the term policy. Although the district rangers agree with Starling's (1979) definition of a policy as a list of goals, Starling recognized the need to link policy (goals) with plans (objectives) and programs (actions) to form a policy process. The role of the timber sale EA as a policy document can be better understood if policy is viewed as a part of a process rather than a separate entity.

A majority of district rangers foresee a change in the current role or format of timber sale EAs once the forest land managemant plans are implemented. These rangers are optimistic that the plans will reduce the length of EAs by allowing them to "tier" or tie to the plans, and perhaps initiate the use of more categorical exclusions[1] when EAs are not necessary. Other rangers say that the plans will be too broad for application to specific timber sales and that EAs will still be needed. Regardless of the differences in optimism, either EAs or the forest land management plans will need to fill the role that the EA has been playing

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[1]Categorical exclusions are "actions which, based on previous experience, have been found to have limited context and intensity (40 CFR 1508.27 (a) and (b)) and produce little or no environmental effects, individually or cumulatively, to either the biological or physical components of the human environment (40 CFR 1508.14).

as a policy implementing tool. Forest Service personnel who develop timber sale plans and lay out, administer, and monitor timber sales will still need policy guides so that they know the goals and corresponding objectives which are to be achieved as well as the reasoning behind them.

The kinds of training that the Forest Service provides ranger district EA coordinators have been summarized in Table 3. These results indicate possible avenues for passing on the results of this study.

Table 3. District ranger responses to the question: What kind of training does the Forest Service provide for EA coordinators?

	Percent of Respondents Answering/Category			
Response Category	R-1	R-4	R-6	Combined
Writing courses.....	0	0	15	7
Shiply Associates EA writing course.	63	44	69	60
USFS workshops in EA preparation....	38	56	46	47
On-the-job training.....	38	33	46	40

Other training that was not incorporated into these categories includes timber workshops on EA analysis, Forest Service decision analysis and forest planning workshops, routing examples of "model" EAs through the districts on the forest, details at the regional office to work on appeals, communications training, and self-study courses.

District rangers also were asked to list the qualifications they look for when selecting EA coordinators. Table 4 shows the responses. Overall, these responses show that the district rangers viewed the ability to work well with people and good writing and communication skills as the more important qualifications for an EA coordinator,

Table 4. District ranger responses to the question: What qualifications would you use in selecting someone for a position as an EA coordinator?

Response Category	Percent of Respondents Answering/Category			
	R-1	R-4	R-6	Combined
Analytical skills	13	11	23	17
Ability to work well with people	38	0	77	43
Good writing or communication skills	13	44	31	30
Need to be expert or competent in the function the EA deals with	38	11	15	20
Knowledge of the NEPA process	13	33	23	23
Good organizer or leader	25	0	15	13

although district rangers interviewed in Region 4 did not consider the former as an important qualification.

A knowledge of the NEPA process and analytical skills should help ensure that goals and objectives are included in the EAs. The on-the-ground knowledge and experience in the particular resources involved in the project will ensure that overall objectives and mitigation objectives are feasible.

THE POTENTIAL OF TIMBER SALE EAs AS IMPLEMENTING TOOLS

The second phase of the study examined the content of timber sale EAs sampled from USDA Forest Service Regions 1, 4, and 6 to determine the presence of implementation information for timber sale policies. The timber sale EA content analysis focused on goals, objectives, warrants, and backing.

METHODS

First, 25% (12) of the national forests in Regions 1, 4, and 6 were randomly selected and contacted to obtain lists of all timber sale EAs approved on the forest for the 3-year period between August 1, 1980, and July 31, 1983. This period was used to provide a long enough period to include a sample of EAs from those forests with a relatively small annual timber sale program, while keeping the sample fairly current. August 1, 1980 was chosen as a starting date because it is one year after the USDA Forest Service NEPA guideline changes were presented in the Federal Register (July 30, 1979).

Ninety EAs were randomly selected approximately proportional to the number of EAs written in each region. Eighty-eight EAs were used in the content analysis: 19 from Region 1, 30 from Region 4, and 39 from Region 6.

EA content analysis examined each of the 88 EAs to determine if certain variables were present which would make the documents useful as implementing tools. Based primarily on Dunn's (1981) policy argument model, there were 7 implementation elements (or variables) to be identified in the EAs: project goals and objectives, mitigation measures, the presence of warrant and backing statements, the presence of monitoring information for mitigation measures, and the presence of implementation plans or strategies. To standardize the search for the 7 implementation elements in all 88 EAs, an instruction book was developed to guide the content analysis process. This book included a background and explanation of the content analysis goals and objectives, instructions for conducting the analysis, questions about each implementation element, and a glossary of terms.

The EA content analysis process involved 2 separate analyses of each of the 88 EAs. One analysis was done by the project's investigator, while the other was done by a graduate student at the University of Idaho. Although there may have been some agreement by chance (Krippendorff 1980), the percentages of agreement between the 2 analysts for the EA content analysis was above 80% for most variables.

The data was compiled and analyzed statistically using SPSSx (1983). Chi-square tests were run to test for significant statistical differences among regions. Because some of the tests resulted in minimum expected cell frequencies of less than 5 in more than 20% of the cells, all results are not presented with statistical differences tested among regions. When appropriate, some of the coding categories were combined to test statistical differences. Actual levels of significance are given in the few cases where significant regional differences occur.

EA CONTENT ANALYSIS RESULTS

Goals. The first content analysis element examined whether timber sale goals were identifiable. Goals were usually found on or about the first page of the EA or in the decision notice. The analysis results are shown in Table 5.

Table 5. Percentage of EAs which contain timber sale goals.

	R-1	R-4	R-6	Combined
Goals Identified	73.7	93.3	64.1	76.1

(chi-square = 8.05442, significance = 0.0178)

Only EAs which actually stated goals were recorded as having goals. Some EAs referred to documents such as timber management plans or forest land management plans for direction. This was particularly true in

Region 6. While "tiering" to other documents does reduce the size of EAs, the inclusion of goals would only need 2 to 10 lines or at the most, one page. References to other documents can still be used to show the origin of goals, but it is important to include timber sale goals in the EAs if EAs are to be used as implementation tools showing decision intent.

Information was also coded as to whether goals were easy, somewhat easy, or difficult to identify. An easily identifiable goal was one which had a specific title or heading such as "goals", "purposes", "needs", "need for action", or "nature of the project". Goals that were somewhat easy to identify were not under a specific title as shown above, but were connected with such words within the text. For example: The purpose of this sale is to provide pulp and saw timber for the local timber industry. A goal that was difficult to identify was one that was not connected with any of the words given above, but did convey a reason for the sale. For example: This timber sale is designed to increase elk winter range. Table 6 displays the ease of goal identification for those EAs which had goals.

Table 6. Percentage of EAs with goals which are easy, somewhat easy, and difficult to identify.

	R-1	R-4	R-6	Combined
Easy to Identify	57.1	57.1	32.0	47.8
Somewhat Easy I.D.	0	17.9	12.0	11.9
Difficult to I.D.	42.9	25.0	56.0	40.3

(Chi-square showed no significant differences at .05 level.)

Sixty percent of the EAs studied had goals which were at least somewhat easy to identify. These results show that some improvement is

needed in identifying goals in timber sale EAs if EAs are going to be used as policy communication tools.

Objectives. The content analysis examined timber sale objectives as they were identified in EAs. Table 7 shows these results.

Table 7. Percentage of EAs which contain timber sale objectives.

	R-1	R-4	R-6	Combined
Objectives Identified	94.7	60.0	97.4	84.1

(Chi-square exceeds minimum expected cell frequency.)

As was done for goals, objectives were rated as to whether they were easy, somewhat easy, or difficult to identify. This was based on the use of the terms "objectives", "evaluation criteria", or "decision criteria" either as a title or section heading or within the text. Objectives were usually presented as either evaluation or decision criteria. Decision criteria were used as objectives because usually the criteria resembled objectives in one way or another. Some EAs stated that decision criteria were objectives. The results are shown in Table 8.

Table 8. Percentage of EAs with objectives which are easy, somewhat easy and difficult to identify.

	R-1	R-4	R-6	Combined
Easy to Identify	72.2	83.3	92.1	85.1
Somewhat Easy I.D.	27.8	11.1	5.3	12.2
Difficult to I.D.	0	5.6	2.6	2.7

(Chi-square exceeds minimum expected cell frequency.)

As presented in the earlier definition, objectives must include 4 essential elements: The desired outcome; the time period to achieve the

Table 9. Percentage of EAs with all, one or more (but less than all), or no objectives which state desired outcomes, time periods, measurement factors, and the person/s responsible for achievement.

	R-1	R-4	R-6	Combined
--- STATES DESIRED OUTCOME ---				
All Objectives	94.4	72.2	100.0	91.9
One or More Objs.	5.6	27.8	0	8.1
No Objectives	0	0	0	0
(Chi-square not possible)				
--- INDICATES TIME PERIOD ---				
All Objectives	0	0	0	0
One or More Objs.	55.6	38.9	65.8	56.8
No Objectives	44.4	61.1	34.2	43.2
(Chi-square showed no significant differences at .05 level.)				
--- INDICATES MEASUREMENT FACTOR ---				
All Objectives	11.1	0	2.6	4.1
One or More Objs.	66.7	77.8	76.3	74.3
No Objectives	22.2	22.2	21.1	21.6
(Chi-square exceeds minimum expected cell frequency.)				
--- INDICATES WHO IS RESPONSIBLE ---				
All Objectives	0	0	0	0
One or More Objs.	0	0	0	0
No Objectives	100	100	100	100
(Chi-square not possible)				

it appears that objectives assigned to specific persons, groups, or functions would be more likely to be accomplished.

All EAs that contained objectives had more than one objective. Table 10 shows whether these objectives were ranked or given any priority.

expected outcome; measurement factors such as quantity, quality, or cost to verify the accomplishment of the objective; and assigning responsibility to those who will see the objective is achieved. The EA content analysis examined each EA objective to see whether these 4 elements were present. The results are shown in Table 9.

Most EA objectives did state desired outcomes for timber sale objectives, but 43% of the EAs that had objectives did not state a time period for any objectives to be completed in. Some of the objectives included a time period in actual years or months, while others used phrases such as "prior to sale", "during sale", or "after sale closure". EAs that used the first two phrases were counted as having time frames; however, "after sale closure" does not constitute a time frame because it does not specify the number of days, months, or years after closure.

In the analysis, measurement factors were assumed in some cases. For example, if the objective was to treat 90% of the project area it was assumed that this could be verified by "acres" treated. Timber volumes were assumed to be in board feet, cubic feet, or some other common measurement factor. Such terms as "maximize" and "minimize" were not considered as being measurement factors. These terms may help one decide among alternative actions, but they do nothing to show whether an alternative will meet a given objective. Such terms as "state water quality guidelines" and "wildlife objectives stated in the forest land management plan" were counted as measurement factors because it was assumed that one could tell if these were being met.

None of the objectives indicated a responsible party. Obviously it is not Forest Service practice to assign responsibility in timber sale EAs. Although responsibility could probably be assumed in some cases,

Table 10. Percentage of EAs with objectives which had ranked objectives.

	R-1	R-4	R-6	Combined
Objectives Ranked	61.1	16.7	50.0	44.6

(chi-square = 8.11891, significance = 0.0173)

Region 4 had statistically significantly fewer EAs with ranked objectives. Since most objectives were presented as evaluation or decision criteria to be used to decide on a preferred alternative, many of them were ranked according to importance. Aside from this use of ranking, ranked objectives can also be useful for carrying out timber sale activities when it is apparent that achieving one objective may jeopardize others. The EA can be referred to for direction to determine which objectives are most important to meet.

Timber sale mitigation measures (actions). The EA content analysis examined mitigation measures presented in EAs because these measures represent management activities that are to be implemented. All but two of the EAs contained mitigation measures.

Mitigation measures were identified as being easy to identify, somewhat easy to identify, and difficult to identify in the same manner as goals and objectives. Titles which were used to define ease of identification were: "mitigation measures", "management requirements", and "management constraints". The results are shown in Table 11.

This analysis looked at one mitigation measure per EA. To be consistent, if more than one mitigation measure was presented in an EA (which was usually the case), the following mitigation categories were used to choose a measure to analyze: wildlife, water, visual, soil,

Table 11. Percentage of EAs with mitigation measures which are easy, somewhat easy, and difficult to identify.

	R-1	R-4	R-6	Combined
Easy to Identify	94.7	58.6	73.7	73.3
Somewhat Easy I.D.	5.3	31.0	23.7	22.1
Difficult to I.D.	0	10.3	2.6	4.7

(Chi-square exceeds minimum expected cell frequency.)

fish, recreation, cultural, and range. A wildlife-related mitigation measure was chosen first; if one was not present then a water-related mitigation measure was chosen, and so on. If there was more than one mitigation measure per mitigation category, the first one was chosen to be analyzed.

The EA content analysis looked at whether the mitigation measure being analyzed related to the overall project goals or objectives. These results are shown in Table 12.

Table 12. Percentage of EAs with mitigation measures which had mitigation measures which were apparently related to overall timber sale goals or objectives.

	R-1	R-4	R-6	Combined
Apparently Related	94.7	51.7	71.1	69.8

(chi-square 10.12207, significance = 0.0063)

For implementation purposes, it is important that mitigation measures are related to the overall timber sale goals or objectives because presumably, those who carry out timber sale activities do so to meet the sale objectives. Mitigation measures which do not clearly contribute to those objectives may not be implemented. Mitigation implementation is in greater jeopardy if the measures themselves

conflict with overall timber sale goals or objectives. The content analysis looked at this factor and found that only one analyzed mitigation measure appeared to conflict with a timber sale objective.

The EA content analysis also examined mitigation measures as specific objectives to be achieved. The four essential elements of objectives are presented in Table 13 with the corresponding analysis results.

Table 13. Percentage of mitigation measures analyzed which stated desired outcomes, time periods, measurement factors, and responsibility assignments.

	R-1	R-4	R-6	Combined
Desired Outcome	94.7	100.0	100	98.8
(Chi-square exceeds minimum expected cell frequency.)				
Time Period	84.2	69.0	84.2	79.1
(Chi-square showed no significant differences at .05 level.)				
Measurement Factor	73.7	55.2	57.9	60.5
(Chi-square showed no significant differences at .05 level.)				
Person Responsible	31.6	13.8	39.5	29.1
(Chi-square showed no significant differences at .05 level.)				

All but one of the mitigation measures analyzed stated the desired outcomes. Seventy-nine percent of the mitigation measures analyzed indicated time periods, about 60% indicated measurement factors, and 29% indicated a responsible party.

During the analysis of mitigation measures, assumptions were made for time periods just as they were when analyzing objectives. For example, "wildlife snags will be marked prior to the sale" and "additional snags will be marked by the timber sale administrator", were

assumed to have designated time periods. If a measure such as a road closure was to be implemented after sale closure, it was not identified as a time period unless it stated how soon after sale closure.

Measurement factors were difficult to assess and some were assumed because some factors were measurements of mitigation effectiveness and others were measures of accomplishment. For example, a road closure may be required for Roads A and B. The measure of accomplishment was assumed to be either the road is closed or it is not. If the road closure was required to maintain a measure of elk habitat effectiveness, the measurement factor had to show what that habitat effectiveness was to be to show a measure of mitigation effectiveness.

While timber sale EAs can give very specific direction for implementing mitigation measures such as the desired outcome, a time period for accomplishment, measurement factors, and responsible parties, they may leave the actual "how to do" information up to those who write timber sale plans and contracts, and those who carry out the work on the ground. This allows for flexibility in implementation, while still providing direction for mitigation intent. For example, a requirement to close a logging road may allow some flexibility as to how it will be closed (gate, earthen barrier, logs). This analysis found that only 15% of the mitigation measures analyzed apparently left one or more options open for implementing mitigation measures. These results indicate little flexibility for implementation. If EAs are to be used as documents which show only intent, more flexibility may be desired for how that intent will be met.

Two examples are given which show the difference between mitigation measures with flexibility and those without.

> The transportation system will be managed as closed once the sale is closed. Only the main artery, X Road 80264, will remain open. This will mitigate the negative effect an open road has on the level of use in adjacent habitat.

This measure does not leave any options open for future use of these roads. What if salvage operations are needed? What about the need for administrative access for tree planting or timber stand improvement activities? As this measure is written, administrators will have to go through an EA addendum before they can alter the decision to close the roads. Contrast this requirement with one found in another EA: "All alternatives are subject to the following management constraints: 1. Control access to promote Elk Habitat Effectiveness of 50%. . . ." In this case a manager has several options available to achieve the desired outcome (50% elk habitat effectiveness). Although this measure fails to specify a time frame or responsible individual, it does give a measurable outcome and leaves options open to achieve it.

Warrants and backing. The justification for using reason and evidence in EAs was presented earlier. The EA content analysis examimed two elements of reason and evidence: warrants and backing statements.

Warrant statements are assumptions which state why a mitigation measure will be effective in meeting a goal or objective. Warrants were identified in 71% of the mitigation measures analyzed. These statements were often difficult to locate. In some cases the reason for particular mitigation measures was given when the mitigation measure was presented, while in others it was given in a section of the EA titled "Effects of Implementation." Generally, credit was given for warrants if there was a link between mitigation measures and the reason for them somewhere in the EA. Warrants are necessary and should be easy to identify if the EA

is to be used as a document showing decision intent and why mitigation measures are needed. For example, a mitigation requirement that states that Road B will be closed one year after timber sale closure without stating the reason for the closure, may not allow for future decisions regarding that road. Future decisions about the use of that road will not have the benefit of the original reason to close the road. Years after sale closure a district ranger may find that there is public demand for using Road B for firewood cutting. The ranger should know why the road was closed in the first place before deciding whether to open it.

The EA content analysis also examined EAs for backing statements and identified the source of backing statements. Overall, only 43% of the mitigation measures analyzed had backing statements. The source of all the backing was identified as being "authoritative" in nature. Backing consisted of documentation from the Forest Service Manual, regional guidelines, handbooks, or specialist reports. Most of the backing was in EA appendices in the form of USDA Forest Service or state agency reports from natural resource specialists. When a warrant was identified, credit was given for backing if a specialist connected with a particular mitigation measure was listed as one of the EA preparers or person consulted during the environmental analysis.

Monitoring information. EAs were examined as potential monitoring tools for the mitigation measure analyzed in each EA (see Table 14).

Although 26% of the Region 1 mitigation measures had monitoring information connected with them, overall only 14% of the mitigation measures analyzed had monitoring information. If timber sale EAs are to be used as monitoring tools, more monitoring information is needed.

Table 14. Percentage of mitigation measures analyzed which contained monitoring information; the percentage of those which were easy, somewhat easy, and difficult to identify; the percentage of mitigation measures with measures of effectiveness; and monitoring time frames.

	R-1	R-4	R-6	Combined
Monitoring information	26.3	3.4	15.8	14.0
	--- EASE OF IDENTIFICATION ---			
Easy to Identify	40.0	0	66.7	50.0
Somewhat Easy to I.D.	20.0	100	33.3	33.3
Difficult to I.D.	40.0	0	0	16.7
	--- SPECIFICITY ---			
Measures of Effectiveness	0	0	20.0	9.1
Monitoring Time Frames	0	0	40.0	18.2

(Chi-square exceeds minimum expected cell frequency.)

Monitoring information which was presented in the EAs was usually at least somewhat easy to identify. This is important because it makes it easier for Forest Service personnel to see that monitoring should be an important aspect of carrying out timber sale decisions.

Only Region 6 EAs indicated measures of mitigation effectiveness and monitoring time frames. This information is important because it indicates that at the time of decision the Forest Service was interested in seeing that decisions are carried out to achieve specific objectives within the specified time frame.

Implementation plan or strategy. The EA content analysis included a search for implementation strategies or plans. This was a difficult element to look for because it was not anticipated that this information would be presented in any particular form. Some EAs displayed implementation strategies in several sections such as, the "management

requirements and constraints" and the "silvicultural prescription" sections. Only 14 percent of the EAs contained a specific section outlining an implementation strategy or plan. This does not mean that other EAs do not give implementation direction; it only indicates that this information was not compiled in a comprehensive and identifiable form.

DISCUSSION AND MANAGEMENT RECOMMENDATIONS

Using concepts from the policy analysis field, the policy process was defined as involving the establishment of policies (goals), the construction of plans (objectives), and the initiation of projects (actions). However, the 30 Forest Service district rangers interviewed indicated that they generally view policy as a flexible guide which gives direction. Few district rangers interviewed see policy as a process. This implies that in many cases timber sale EAs are not being considered as tools to bring policies through plans and into action. Although 23% of the district rangers interviewed did not directly connect timber sale EAs to the Forest Service policy process as it has been defined here, 70% stated that, among other purposes, timber sale EAs are written for Forest Service personnel who carry out timber sale activities. This indicates that these district rangers view the EA as more than just a decision-making document required by NEPA and that timber sale EAs are used as implementation tools. However, the content analysis of 88 timber sale EAs indicates deficiencies when using these documents as implementation tools.

Many of the district rangers indicated that timber sale EAs should be used to communicate "decision intent" to those who carry out timber sale activities, rather than specific methods on how to get the job done. Using the elements presented in the policy process, we can understand how the timber sale EA can be used to communicate timber sale policies, or goals, throughout the policy process.

The content analysis of timber sale EAs showed that 24% of these EAs did not contain goals, the first step in the policy process. If timber sale EAs are to be used to communicate policy information to those who carry out sale activities, those people must have the benefit of knowing the policies they are trying to implement. Also, because 40% of the EAs with goals had goals which were difficult to identify, there are problems with relying on EAs to communicate timber sale policies as they are presently written. If the use of timber sale EAs is to be encouraged during sale implementation, policy-relevant information needs to be present and more easily identifiable.

It is important that objectives also be included in timber sale EAs because they provide specific direction for timber sale activities. Ninety percent of the district rangers interviewed stated that timber sale EAs are used during presale activities, contract appraisal, sale administration, and post sale activities - all involving the preparation and/or use of timber sale plans. It is difficult to imagine how specific plans can be written for the EAs which did not contain objectives (16%).

Of those EAs which contained objectives, many were missing one or more of the essential elements--desired outcome, time period, measurement factor, and responsible party. The implication of this is

that unless objectives have these essential elements, they may never be accomplished, it may never be known whether they have been accomplished, and there may not be someone responsible for seeing that they are accomplished.

One possible reason that some EAs did not contain time frames and responsible parties is because objectives were usually presented as decision criteria. Timber sale EAs may be more useful as implementation tools if objectives are presented with all 4 essential elements to link timber sale policies to plans. If timber sale objectives are listed in EAs as "objectives to be used as decision criteria" rather than merely "decision criteria", more emphasis could be placed on developing objectives to be used in both decision-making and implementation.

Some methodical information is needed in timber sale EAs to show how objectives may be accomplished. However, according to many of the district rangers interviewed, those methods should not be obligatory and should allow for implementing alternative methods.

To achieve some goals and objectives, it may be necessary to implement mitigation measures. Ninety-three percent of the district rangers interviewed indicated that it is important to include and explain mitigation measures in timber sale EAs to communicate information to those who carry out timber sale activities. Most importantly, many respondents indicated that this information should include or explain the reasons (warrants) for the mitigation measures. Eighty-seven percent of the district rangers felt that EAs do contain sufficient direction for implementing mitigation measures and many felt that EAs have given too much direction because they have included methods to be carried out rather than goals and objectives to be met.

The EA content analysis does not substantiate the district ranger's views of the EAs. About 85% of the mitigation measures analyzed appeared to focus on only one method for implementing the mitigation measures rather than suggesting methods of accomplishment in timber sale EAs which provide flexibility and emphasizing the reasons for the measures (warrants).

The EA content analysis results also indicated that about 30% of the mitigation measures analyzed did not relate to the overall timber sale goals or objectives and 29% did not contain warrants. The assumption is that if it is not apparent that a mitigation measure will contribute to a goal or objective, it may have less potential to be implemented. In almost 30% of the time, mitigation measures will be required without knowing the reasons for them. This is of particular concern in the Forest Service because personnel frequently change both positions and work stations. A mitigation measure may need to be changed at some point in the timber sale to accomodate unanticipated problems. Adjustments in sale unit boundaries, timber marking guides, contract clauses, and burning plans are quite common as timber sale activities commence on the ground. It is important that the timber sale EA is referred to when changes are necessary so that changes will reflect timber sale goals and objectives. If changes do not reflect the policies established at the time of decision, the policy process comes to a halt and we may be left with actions unrelated to policies.

Like objectives, mitigation measures should be presented with specific time frames, measurement factors, and responsible parties if they are to have a good potential to be carried out. Approximately 20% of the mitigation measures analyzed did not include specific time

frames, 40% did not include measurement factors, and 70% did not include responsible parties. It would behoove us to consider these essential elements in timber sale EAs to better ensure the implementation of mitigation measures.

This study also looked at the use of timber sale EAs as a tool for monitoring timber sale results. Ninety-four percent of the district rangers interviewed in this study indicated that it is important that mitigation measures be included and explained in the timber sale EA so that the EA can be used as a monitoring tool. However, the EA content analysis results showed that only 14% of the mitigation measures analyzed had monitoring information associated with them. Also, of those mitigation measures which did provide monitoring information, only 9% indicated a measurement factor to be monitored, and only 18% indicated time frames for when the monitoring was to take place. If timber sale EAs are going to be used as monitoring tools, there is a need for more monitoring information in the EA. In many cases the objectives themselves can be monitored rather than specific mitigation measures. For example, a road closure may be recommended to mitigate adverse effects on elk populations. Although the number of miles of closed road may be used as a measurement factor for monitoring the road closure, a more useful measurement to accomplish the objectives and monitor results might be a desired level of elk habitat effectiveness.

Many of the district rangers in Regions 1 and 4 were optimistic that the forest land management plans (FLMP) will reduce the environmental analysis time as well as the size of timber sale EAs. They expressed a hope that there will be more categorical exclusions and more tiering of information to the plans, whereas many of the Region 6

rangers felt that site-specific EAs still will be needed. If EAs are to be used as policy communication documents for timber sale implementation, the Forest Service should consider the implications of reducing the content of these documents. It may wish to analyze the potential of the FLMP to be used as a policy document. This could be done using the content analysis procedure designed for this study to determine the presence of policy related information in the FLMP. Also, in the case of categorical exclusions, a short summary of the timber sale goals and objectives could serve as a policy communication document for those who carry out sale activities.

Several methods appear to be employed by the Forest Service to train personnel in EA preparation. Forest Service workshops and the Shiply Associates EA writing course are good opportunities to stress the importance of the EA communication and implementation role. The NEPA process addresses the EA as a decision tool; however, there appears to be a need for more emphasis on the EA as an implementation tool. If we view EAs as useful tools, rather than simply tasks to be accomplished according to NEPA, we will not only carry out the letter of the law, but also its intent - to not only make well informed natural resource policy decisions, but also to implement them. Forest Service personnel involved with timber sale EA preparation can use the EA content analysis approach developed for this study to ensure the inclusion of policy-relevant information in EAs and to increase the usefulness of the EA as a policy communication tool. It is apparent that many of the district rangers interviewed for this study feel that EAs should be used by those who carry out timber sale activities. As one forest supervisor wrote in an EA cover letter to a district ranger: "Your men in the

field should be familiar with this report and especially the 'Management Requirements and Constraints.' I'm sure you will find this a good tool in accomplishing a quality job." However, to do so the EA must communicate the important policy-related information.

SECTION 3

RECOMMENDATIONS FOR FURTHER RESEARCH

This research examined the potential of timber sale EAs to communicate policy information for implementation, but it did not determine if existing EAs contribute to successful policy implementation. Further research is needed to determine the relationship between the presence of policy information in timber sale EAs and actual implementation of timber sale policies.

District rangers interviewed for this study indicated that personnel involved with writing sale plans, presale personnel, contract specialists, and timber sale administrators use timber sale EAs during sale implementation. These people need to be surveyed to ascertain the kind of policy information needed, their reliance on the EA for that information, and whether EAs sufficiently provide that information.

Fifty-three percent of the district rangers interviewed for this study commented that timber sale EAs are written for public review. An analysis of timber sale EAs to determine how well these documents communicate the type of policy information the public desires will help the Forest Service prepare EAs containing useful information for the public.

SECTION 4

RECOMMENDATIONS FOR EA PREPARATION

Much of the policy-relevant information sought in this study was found in many of the 88 timber sale EAs that were analyzed; however, it was often incomplete or not specific enough to be used for implementation and monitoring. It does not appear that more lengthy EAs are needed, but that the existing information be presented in a more useful manner. Improvements could be made in the following areas to better ensure that timber sale EAs will be more useful policy implementing tools:

1. Prepare EAs as implementing and monitoring as well as decision-making documents.

2. Include timber sale goals in every EA.

3. Include explicit objectives in every EA which:

    a. state the desired outcome;
    b. state a time period for achievement;
    c. state a measurement factor which can be used to show whether an objective has been achieved; and
    d. when possible, assign each objective to responsible parties.

4. Relate mitigation measures to overall timber sale goals and objectives.

5. Make certain that mitigation measures emphasize:

    a. a desired outcome;
    b. a time period in which it is to be accomplished;
    c. a measurement factor which can be used to measure mitigation effectiveness; and
    d. responsible parties for implementing the mitigation measure.

6. Maintain flexibility for choosing specific mitigation methods. Specific methods should only be suggested as a way of showing feasibility.

7. Clearly show the rationale for implementing mitigation measures and where possible, back the rationale with citations from sources such as the Forest Service Manual, specialist reports, and scientific research.

8. Organize and present goals, objectives, and mitigation measures so they can be easily identified and used by those who use the EA for timber sale implementation and monitoring.

In conclusion, timber sale EAs play an important role in the National Forest policy process. We have seen that they are useful in ensuring well informed policy-making. It is hoped that the results of this study and the suggestions made will contribute to a better understanding of how EAs can be used to improve National Forest policy implementation.

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