

**Critique of Seven Helicopter Timber Sales**  
**With Recommendations for Improved Planning**

by

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## P R E F A C E

The focus of this study centers around the economic, technical, and environmental effects analysis of seven helicopter timber sales on four different national forests in Oregon and Washington.

This paper is a constructive critique of these seven sales based on the author's personal observations and data collected from planning documents, field visits, and interviews with forty one resource specialists who were actively involved in the planning and effects analysis of these seven timber sales.

Additionally, the study examines the effectiveness of the Forest Service's<sup>1</sup> timber sale planning process and points out there are human factors (such as politics, public involvement, and organization) as well as scientific reasons for many forest management decisions. This paper includes a review of published critiques of planning legislation and other aspects of Forest Service planning processes.

The three research questions that drove the analysis were:

- 1) How important were economic and technical issues on recent helicopter timber sales?
- 2) Were issues regarding logging systems and roads clearly described, analyzed, mitigated, and monitored in the Environmental Assessment<sup>2</sup>?
- 3) What are the main strengths, weaknesses, bottlenecks, and improvements needed in the timber sale planning process?

The final chapter summarizes the main findings and proposes several ideas that may be fairly easy to implement and have the potential to improve and strengthen the Forest Service's timber sale planning process. The findings in this study indicate that: 1) economic and technical issues are generally considered 'insignificant' in timber sale planning; and 2) the issues regarding logging systems and roads are not clearly described, analyzed, mitigated, and monitored in the Environmental Assessments.

This report does not imply that these sales were ineffective or failures. The findings and conclusions are based on the author's interpretation of the data collected on these seven case studies. The conclusions do not reflect the views of the Forest Service nor the Department of Forest Engineering at Oregon State University. These findings appear to be consistent with other research studies that evaluated federal environmental assessments and found that they could be more technically and economically informed and more precise in predicting effects and trade-offs.

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<sup>1</sup> Forest Service- largest bureau in the United States Department of Agriculture.

<sup>2</sup> Environmental Assessment (EA)- a public document required by the National Environmental Policy Act to plan actions, disclose effects, and make decisions.

## ACKNOWLEDGEMENTS

This project was indeed a most valuable learning and training experience for me. I feel that this paper shares only one-tenth of the knowledge I gained from many individuals, documents, research articles, and field trips. Assistance on this study was generous and overwhelming. All of the following people helped make this work possible and deserve credit for what is of value in it.

I feel fortunate to have had the opportunity to advance and enrich my education and profession through the two-year forest engineering and decision making program at Oregon State University. I wish to express my gratitude to the U.S. Forest Service and the O.S.U. Forest Engineering Department for their support, assistance, and encouragement.

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It is my fondest hope that this study will foster further research and interest in improving the efficiency and equity of public land management and planning.

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## **A P P E N D I C E S**

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# CHAPTER 1

## INTRODUCTION AND PROBLEM

### **1.1 Introduction**

The U.S. Forest Service is one of the most publicly accessible agencies in the federal government. At present, virtually all projects, including timber sales, involve at least four levels of planning: forest, watershed, project, and activity. There is an extensive library of critiques, reviews, debates, and arguments regarding the effectiveness of planning in the Forest Service. It is beyond the author's disciplinary competence and beyond the scope of a Master's paper to evaluate all aspects (political, social, economic, and biological) of the agency's timber sale planning process. Therefore, this paper will focus primarily on the NEPA<sup>1</sup> phase in the timber sale planning process and on two significant forest engineering questions:

**Research Question # 1 - How important were economic and technical issues on recent helicopter timber sales?**

**Research Question # 2 - Were issues regarding logging systems and roads clearly described, analyzed, monitored, and mitigated in the Environmental Assessment?**

The Forest Service has responded to controversies by developing detailed planning processes and by changing land use allocations. Despite the time, money, and effort spent on planning, critics feel that few people are satisfied with the results- there are complaints of biases, inadequacies, inefficiencies, overplanning, wasted moneys, delays, and unsolved problems (1, 2, 3, 4, 5). Several administrations have tried to "streamline" the planning process.

This paper attempts to search for possible improvements by using a broad, top-down approach which includes:

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<sup>1</sup> NEPA- National Environmental Quality Act which requires an Environmental Assessment.

- a review of published critiques of planning legislation and other aspects of planning processes;
- an empirical study of seven timber sales to identify key factors at the Forest Plan and NEPA planning levels which influence logging system decisions;
- field investigations to examine and clarify the logging and road issues identified in the EA;
- interviews to ask individual Interdisciplinary team<sup>2</sup> members the third major question in this study:

**Research Question # 3 - What are the main strengths, weaknesses, bottlenecks, and improvements needed in the timber sale planning process?**

This paper is a constructive critique<sup>3</sup> based on the author's own observations and perspective as a Forest Service employee and forest engineering graduate student and based on data collected from planning documents and from interviews with people who are experts in their field. Most of the people interviewed take their responsibilities very seriously and are concerned about the resources and customer service. This review represents the viewpoint of the field specialists, those who are planning and implementing projects.

## **1.2 Objectives**

The ultimate purpose of this paper is to enhance the long term success of the Forest Service's timber sale planning process. Study objectives are to: 1) clarify the economic and scientific basis for selecting a logging system; 2) identify the main weaknesses, strengths, and bottlenecks; 3) propose changes or courses of action that would be effective and feasible; and 4) share these findings, conclusions, and recommendations in a report.

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<sup>2</sup> Interdisciplinary (ID) team- a group of resource specialists representing several different resource areas (Wildlife, Timber, Fish, Recreation, Visuals, Watershed, Fire Management, Botany, and Cultural Resources) working together to plan a project and to analyze its effects.

<sup>3</sup> Webster's Dictionary defines critique as: "the art of evaluating or analyzing with knowledge and propriety; the scientific investigation of literary documents in regard to such matters as origin, text, composition, character, or history" (6).



### **1.3 Research Questions and Concern**

This study was structured around three closely related questions. This section elaborates on each of these three questions and discusses why they were posed.

#### **Research Question #1 - "How important were economic and technical issues on recent helicopter timber sales?"**

For the past several years, ecological and economic issues have been at the forefront in the Pacific Northwest, where the political debate about forest management has reached a fever pitch (7). However, the economic and environmental controversy over national forest timber sales is nothing new. A review of the five planning acts in Chapter 2 shows how Congress has always played a significant role in authorizing legislation and appropriations and how the Court's role in national forest management is expanding with increasing legislation and lawsuits.

Balancing land allocation and management among conflicting and competing demands, overpowering political pressures, and court challenges has become extremely difficult. Timber harvesting, especially, has faced a considerable impasse on national forests (8). Whether this is fair or a mistake has been argued from many different perspectives and philosophies. Foresters like to point out that national forests are essential to the nation's welfare. The National Timber Supply Act in 1969 estimated that the national forests contained 97 million acres of commercial forest land, or 54% of the nation's total softwood timber supply. In 1984, the national forests provided approximately one-fifth of the raw materials for the nation's total consumption of wood and paper products. In 1979, timber receipts deposited \$968 million into the federal treasury (9). Even Robert Marshall, the Forest Service's most famous wilderness advocate insisted that the national forests merited regulation:

"As sources of greatly needed raw material, the forests play a vital part in raising the physical standards of American life... Economic, physical, and social considerations all demand that we maintain a bountiful forest resource" (9).

The characteristic of wood that will make it an extremely valuable and versatile raw material in the future is its renewability, growth, and biodegradability (10). Twenty to thirty years from now, will the public be asking 'why didn't the public land foresters manage, renew, and thin many of these stands 20-40 years ago?'

The first obligation of national forest managers in planning a timber sale is to satisfy all legal requirements. If the agency does not meet these responsibilities the project is very much open to appeal and court litigation. Since 1960, most laws relating to Forest Service activities have dealt with preservation of clean air, wilderness, archaeological resources, threatened and endangered species, wild and scenic rivers, soil and water resources, fish and wildlife conservation, recreation, cave resources, wetlands, pacific yew, etc. This raises a concern for forest engineers- are interdisciplinary teams and decision-makers losing sight of economic and technical issues on national forest timber sales?

Every forest harvesting and transportation alternative results in unique financial and non-financial consequences. Decisions are based on expectations of these consequences and are rarely based on financial criteria alone (11). Since both helicopters and roads are expensive, this study examines helicopter timber sales (with road issues) to determine whether economic and technical issues influenced the logging decision.

One can find numerous references in the planning Acts (Appendices A-E) which require national forest managers to analyze cost effectiveness, supply and demand, foregone opportunities, and accountability of agency expenditures. The National Environmental Policy Act (NEPA) does not state that environmental values have priority over nonenvironmental values. The courts have held

that NEPA mandates a rational decision-making procedure that balances environmental, technical, and economic issues (12). This paper analyzes whether the timber sale planning process on seven USFS timber sales balanced environmental, technical, and economic issues.

**Question #2 - Were the issues regarding logging systems and roads clearly described, analyzed, monitored, and mitigated?**

The logging systems person and transportation planner on the Interdisciplinary Planning Team (ID team) have the responsibility for not only analyzing different logging and road systems, but also identifying the one that is most cost-effective. The decision-maker has to balance the information with environmental impacts, and may not choose the least cost alternative because of valid environmental concerns. Ideally, the planning process allows the decisionmaker to make a reasoned, supportable, and defensible decision.

The Environmental Assessment (EA) that is required by NEPA is a written, public record of decisionmaking which describes the proposed action, provides justification, and considers cumulative effects of past, present, and future actions within and adjacent to the proposed activity. Goals are to disclose information about environmental consequences and to foster excellent decision-making. One critic of NEPA believes:

"Proper scientific inquiry must proceed under the full scrutiny of a skeptical and disciplined profession. Ideally, the information should be as precise enough to enable us to make informed trade-offs... Some inadequacies always exist because knowledge is imperfect... The point is that decision-making in federal agencies is not rational in the classic sense...Even perfect understanding of all of the ecological ramifications of a project would not indicate the appropriate course of action. A wide variety of economic, social, and political variables have at least as much to do with decisions as ecological constraints" (1).

However, another NEPA commentator believes:

"The legal requirements imposed on EIS writers are not quite as strict as those of the scientific version of the rational model... The courts demand objective 'good faith' analysis and 'full disclosure' of all impacts reasonably anticipatable... They have declined to require perfect analysis ...The technical complexity of EIS analysis must be appropriate to the purposes of the document... Thus, the minimum legal version is a rational-objective model... (in other words) EISs should be technically informed, reasonably thorough, and above all else, unbiased." (12)

According to CEQ<sup>4</sup> regulations, the Environmental Assessment must concentrate on 'significant' issues (13). Issues are the discussion, debate, or dispute regarding environmental effects.

Identifying and clarifying the 'significant' issues is critical because it helps to develop alternatives and to formulate mitigation or monitoring to resolve, measure, and track effects. Units of measure should be quantitative (where possible), measurable, predictable, and linked to cause-effect relationships (14). Factors used in determining 'significance' are:

- extent- the geographic distribution of the issue;
- duration- the length of time the issue is likely to be of interest;
- intensity- the level of interest or conflict generated by the issue.

This paper evaluates the quality of science in the logging and road effects analysis of seven timber sales in terms of Question #2 - Were issues regarding logging systems and roads clearly described, analyzed, mitigated, or monitored?

**Question #3 - What are the main strengths, weaknesses, bottlenecks and improvements needed in the timber sale planning process?**

The need for and benefits of 'good' planning (which includes communication, teamwork, training, technology transfer, efficiency, and field verification) has long been acknowledged by land managers. Planning a national forest timber sale involves an ever-increasing number of issues and a concomitant

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<sup>4</sup> CEQ - Council on Environmental Quality established by NEPA for the Executive Office of the President.

increase in the quantity of information. Legal challenges often claim that a law or regulation was violated, that the effects analysis was not properly assessed, or that the planning process was deficient (8).

Some critics feel that the Forest Service's planning process is too expensive and inefficient (1). There are complaints of wasted time and money on planning documents that are short-lived due to changing information and shifting direction and guidelines (2, 3, 7, 8). Issues are difficult to resolve because each discipline analyzes different information in a different logical framework and defines the 'truth' differently (4). The amount of paperwork and number of meetings keep personnel away from actual on-the-ground analysis and management (1, 4, 15). Generally, uncertainty increases and confidence decreases as the size of the planning area expands (16).

On Forest Service timber sales, the selection of a logging system is determined at the EA and logging feasibility report planning levels. Of all the federal laws, NEPA, by far, dictates Forest Service's timber sale planning process. For this reason, this analysis concentrates on the NEPA planning phase which involves: the EA, ID teams, and analysis file which includes the logging feasibility report.

Streamlining the Forest Service's timber sale planning process needs to involve people with a bone-deep appreciation for reality and consistency. Some of this can only come from those who are working in the field. This is why the author interviewed ID team members at the District level, those who are planning and implementing projects. By seeking critique and recommendations from field personnel, not only is it possible to streamline the process but also to identify creative and innovative additions as well as impractical aspects. People are more likely to buy-into a plan of action and carry their part of the load if they had the opportunity to develop and evaluate a range of alternatives. The following paragraph is based on observations made by a team of Organization Development scientists:

When conflict is faced, critique becomes valuable. Critique is a way of identifying sound alternatives that can produce stronger results. When people are engaged in critiquing and when corporate-wide commitment to excellence is strong, the employees are able to act in a mature and adult manner with mutual trust and respect replacing competitiveness and win/lose power struggles. Since the human factor is the last barrier to excellence, effective organizations allow extensive two-way feedback and critique to assess how well human, financial, and technical resources are employed to achieve goals and quality standards. Energy is funneled into identifying why something failed and finding better ways to achieve goals (17).

Typically, Forest Service review teams consist of upper level staff officers meeting with other staff officers. This report is an exception- it presents the field specialists' viewpoint of weaknesses, strengths, bottlenecks, and improvements needed. While this study analyzes and critiques specific details at the project level, it also steps back and looks at the legislative history and multiple levels of planning. Such a strategy provides a better understanding of forest engineering details within a comprehensive framework and helps the analyst design and propose effective recommendations.

The next chapter presents a brief history of planning legislation and discusses their implications. The third chapter describes the methodology used for this study and how it evolved. Chapter 4 analyzes and discusses the data collected on seven case studies. The last chapter summarizes the findings, conclusions, and recommendations.

## CHAPTER 2

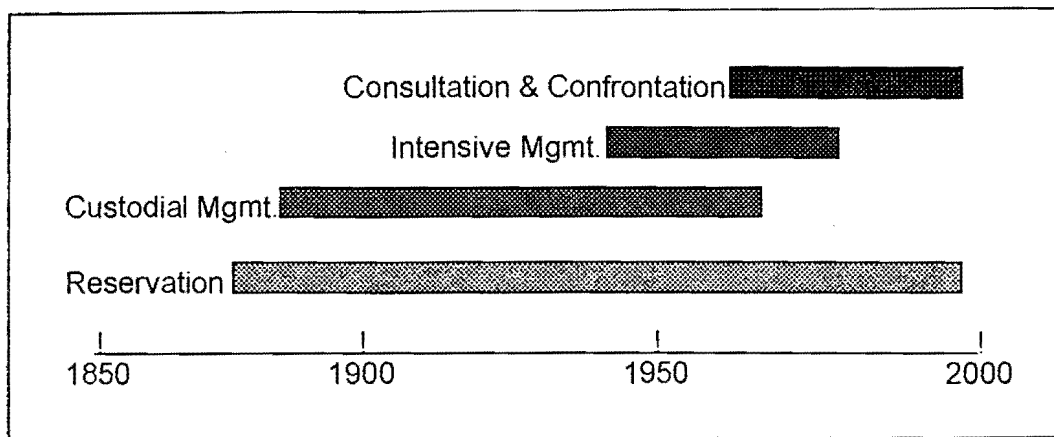
### LEGISLATIVE HISTORY

A brief discussion of the legal framework for national forest management and planning helps us understand the present situation and make suggestions for improvement. The broad timeline in Figure 2.1 depicts six major but overlapping historical eras in federal land management from 1782 to 2000 (18). One notices that the present era (from 1964 to 2000) is labeled as the period of consultation and confrontation.

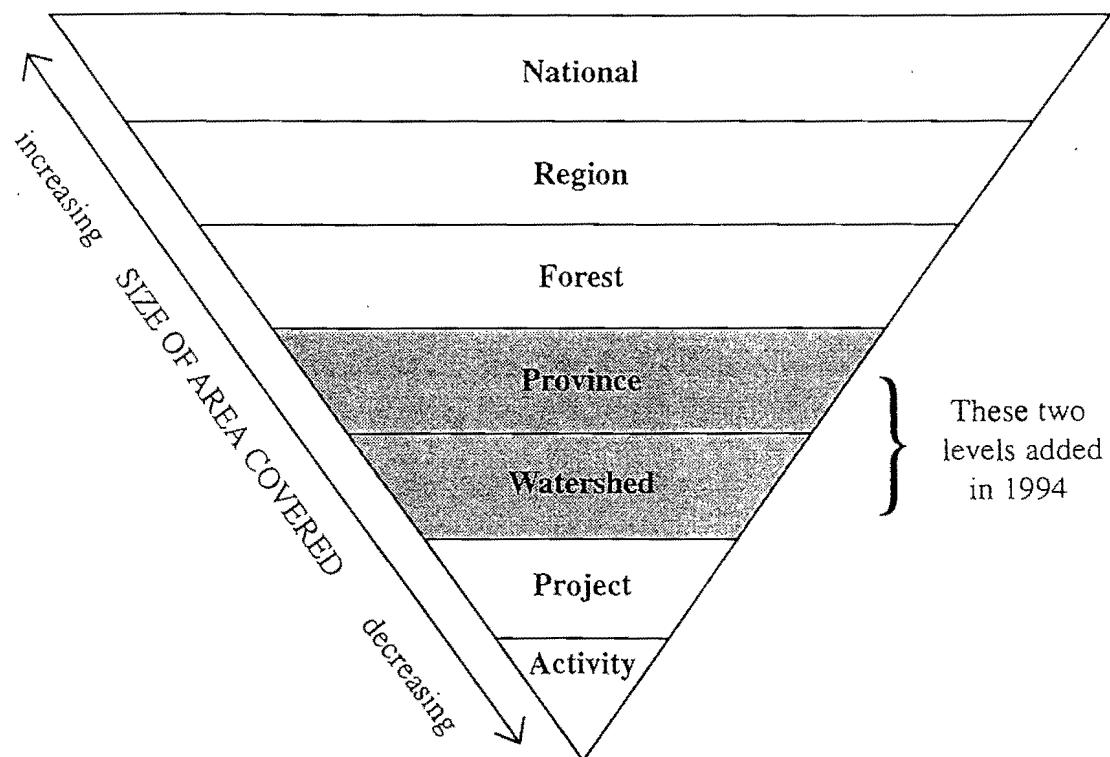
The Forest Service manages 191 million acres of national forest and rangeland (15). Congress has directed the Forest Service to manage resources under its responsibility with efficiency and equity. However, with over 250 million public stockholders with different perceptions and needs, the formulas for resolution have become very complex.

There are many laws and regulations that relate to planning and managing the national forestlands. Figure 2.2 shows the multi-level planning process the Forest Service uses in land and resource management decision making. Prior to 1994, there were five planning levels: national, regional, forest, project, and activity. Then in 1994, last year, the President's Plan added two more processes: province and watershed. Plans at the activity level (i.e., logging feasibility reports, sale layout, and other technical designs) seem to be the most unstable because they are constantly affected by broad-sweeping changes made in the upper levels.

At each level, the agency must comply with all applicable laws and regulations. This chapter provides a brief overview of how land use and project planning has changed and evolved over time. This report is divided into five sections, one for each of the major planning Acts. Copies of these five direction-setting Acts are provided in Appendices A-E. Most people are surprised to see that they are fairly short, basically just establishing the general direction and constraints for national forest



**Figure 2.1** Major eras in federal land management from 1875 to 2000 (18)



**Figure 2.2** Multiple planning levels in the Forest Service



management. Congress purposely left to the Forest Service the expertise and sound discretion to formulate, adapt, and adjust standards, criteria, and processes to changing circumstances.

## **2.1 Organic Administration Act of 1897**

The legal charter for land use planning prior to 1960 was the Organic Act of 1897. It permitted the use and development of timber, water, and mineral resources on national forestlands.

"Various techniques were used to delineate land uses but typically they involved an analysis of historical trends and an intuitive judgement as to what would be the best future use. Prior to this type of planning, management practices were largely evolutionary and based upon day-to-day occurrences. Despite the crudity of these earliest plans and management practices, they reveal some good thinking and a substantial degree of foresight." (19)

1903- "Timber sale procedures were described in detail. The two basic criteria were that removal of timber would be limited to that which would benefit the forest (or at least not be detrimental) and that local demand would have preference." (20)

## **2.2 Multiple Use - Sustained Yield Act of 1960**

Congress enacted the Multiple Use - Sustained Yield Act (MUSYA) to expand the Organic Act and to recognize five national forest uses: outdoor recreation, range, timber, watershed, and wildlife and fish. The act defined 'sustained yield' as the maintenance in perpetuity of a high level of annual or periodic output of the renewable resources without impairing the productivity of the land. Each ranger district began to prepare Multiple Use Plans and focused on coordinating the various uses to avoid or resolve conflicts. A few weaknesses were: 1) these plans seldom identified a list of outputs from a ranger district that might be optimum in terms of providing for the American people; and 2) they sometimes implied that all uses would be carried out on every acre. (19)

### **2.3 National Environmental Policy Act of 1969**

The National Environmental Policy Act (NEPA) of 1969 was a turning point. It significantly reduced the Forest Service's planning and management discretion by mandating public participation, environmental impact assessments, and interdisciplinary planning. The agency had always consulted with special interest groups but after Congress enacted NEPA, the public and the courts became directly involved in the daily operations of the Forest Service. NEPA set a precedent by expanding the citizen's standing to sue the agency in court (21).

"A residue of confrontation tactics and distrust of government agencies stemming from the Vietnam War protests, general post-Watergate cynicism, and activism in courts... NEPA constitutes one of the most sustained and frequently analyzed administration reform efforts in our nation's history... After nearly a decade of litigation... the costs of confrontation and litigation are high both in dollar terms and in terms of effort that could be more constructively employed." (21)

"Conflicts, administrative appeals, and lawsuits are becoming commonplace in the planning and management of timber resources on the national forests. Between 1983 and 1988, the total number of appeals filed annually nationwide more than doubled, increasing from 584 to 1298 (per year)... Of the total appeals filed, 42 percent were related to either timber sales or national forest plans in 1983 and rose to 60 percent by 1988." (8)

The cost of handling and processing appeals in fiscal year 1989 was \$10.1 million (15). However, relatively few of these appeals end up in court. For instance, in fiscal year 1989, only 11 of 500 forest plan appeals and 32 of 500 timber sale appeals were litigated. (15)

NEPA (and its CEQ<sup>1</sup> regulations) contain numerous references to economic analysis. Some court decisions indicate that a defective economic analysis, by itself, does not destroy the legal defensibility of an Environmental Assessment. While in other court cases, the basis for economic assertions were reviewed closely.

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<sup>1</sup> CEQ- Council on Environmental Quality

"The failure to develop understandable methods and procedures virtually guarantees capricious treatment of unquantifiable environmental and economic values. It is a serious mistake to equate economics and dollars, as is commonly done. The dollar is the principal means of economic exchange and is important for that reason. However, none of the standards of economic performance- such as 'utility', 'value', etc., are completely measurable in dollar terms." (22)

In the NEPA planning phase, the Interdisciplinary (ID) Team: 1) identifies the purpose and need; 2) clarifies the issues and determines which ones are 'significant'; 3) develops a reasonable range of alternatives; 4) discloses the effects in a rational and objective manner; and 5) proposes mitigation measures and prescribes monitoring.

In concept, NEPA provides an intellectual framework and a useful tool for decision-making. But in the opinion of some people, the ease with which a NEPA project can be appealed has: 1) led to evermore complex and intricate requirements; 2) diverted the land manager's energy, attention, and effort into preparing 'bomb-proof' reports; and 3) resulted in irresponsible public input (1, 25).

"Meaningful reform is achieved by altering the underlying premises of decisions. It cannot result from efforts which begin with the assumption that executive agencies lack diversity, sensitivity, and insight. Agencies contain interest groups and interactions of their own, and the range of view present on the inside can be fully reflective of that without. This aspect has been inadequately considered in academic literature on the subject...Would-be reformers of the administrative process have much to gain from closer attention to and fuller appreciation of the creative potential within public agencies." (21)

#### **2.4 Forest and Rangeland Renewable Resources Planning Act of 1974**

The Resources Planning Act (RPA) requires 10-year assessments of all the nation's forests and rangelands (both public and private) and 5-year national programs and annual progress reports from the Forest Service. There are numerous economic references in the Act directing the agency to analyze: supply and demand, costs and benefits, rates of return, prices, cost-effectiveness, foregone

opportunities, and accountability of agency expenditures (24). RPA strongly directs forest and rangeland managers to pursue economic efficiency (25).

"Initially, conflicts were managed by separating uses over space and time. However, demands on the resources continued to climb, and unmarketed resources are now more widely valued by our society. The principal purpose of RPA was to establish a national strategic planning process for meeting these conflicting demands while assuring the sustainability of America's renewable resources" (15).

"RPA should not be expected to eliminate or even reduce controversy. To the contrary, improvements in the process are likely to intensify controversy as the potential results of actions become clear to the various interested parties. RPA should not be expected to always produce rational decisions. Inevitably, decisions will be based on value judgments influenced by the persuasive powers of competing interests and arrived at through the political process." (26)

"There are public goods, such as maintaining the productivity of the land through watershed management, which can neither be monetized nor adequately valued economically... The problem of adequately evaluating the outcome of alternative courses of action which are uncertain... is difficult, if not impossible... These are all problems which involve the national interest...and should not be subject to veto by parochial interests at the local level." (25)

## **2.5 National Forest Management Act of 1976**

Congress passed the National Forest Management Act (NFMA) in response to several lawsuits which indicated public dissatisfaction, especially with clearcutting. NFMA amended six other laws (particularly RPA) and established the standards and guidelines for preparing a 10-year forest plan for each national forest. NFMA requires an interdisciplinary approach and consideration of a broad range of physical, economic, biological, and social factors in determining multiple use, sustained yield, and land allocations.

"To implement economic analysis...the Forest Service issued conceptual and methodological direction to planners through the Forest Service Manual, administrative policy statements, regional handbooks, and other publications. The principles of economic efficiency analysis are effectively established and integrated in these documents. The agency is to be commended for

its efforts in this area, for it represents a sharp break from past traditions and meets head-on difficult pricing and evaluation problems." (27) (A copy of the Economics Section of the Forest Service's Timber Sale Preparation Handbook is provided in Appendix F)

The act explicitly mandates public participation in the development, review, and revision of land management plans. Congress envisioned a public planning process that would reduce nationwide conflicts and resolve local controversies. But after spending an enormous amount of money and time (over 10 years) on the first-round of forest plans, Congress found out that nearly all the forest plans (and many actions under those plans) were appealed (15).

"Citizen involvement in the sense of truly effective participatory democracy is unworkable... The functions, powers, and programs of government have multiplied beyond the average citizen's comprehension. Greater expertise, specialization, and professionalism are required in the planning process. Few citizens can evaluate or intelligently or effectively comment on efficiency criteria, externalities, the provision of public services, supply and demand factors, or spatial or temporal interrelationships. Citizens provide at best a broad litmus of political acceptability, an opportunity to test the water." (25)

"To obtain good basic legislation, all the affected parties, or their representatives, need to be involved in the preliminary debate and ultimate outcome... Public participation should involve the Forest Service in two kinds of activities pursuant to its legislative mandate. One consists of reaching outside of its own cadre for specialized expertise as provided for in the legislation. The second is to consult the (consuming) public(s) to ascertain their preferences, constrained by their income, in order to obtain the information necessary for planning efficient allocation and management of forest and rangeland renewable resources." (25)

Former Forest Service Chief Dale Robertson expressed concern that: "the numerous compounding and possibly conflicting requirements make national forest planning and management an exceedingly complicated task. At the extreme, the sum total of the various protection standards and restrictions may make any on-the-ground management actions infeasible." (15)

"People typically sue only if they believe the agency is being arbitrary or unfair. Such beliefs can generally be overcome through an open, honest exchange of desires and concerns among the agency and the various interested and affected individuals and groups, leading to understanding and acceptance of the possibilities and limitations for managing the national forests." (15)

While this chapter provides a broader political perspective of national forest management and planning, the next two chapters focus on analyzing the timber sale planning process on seven helicopter timber sales in Region 6 (Oregon and Washington).

## **CHAPTER 3**

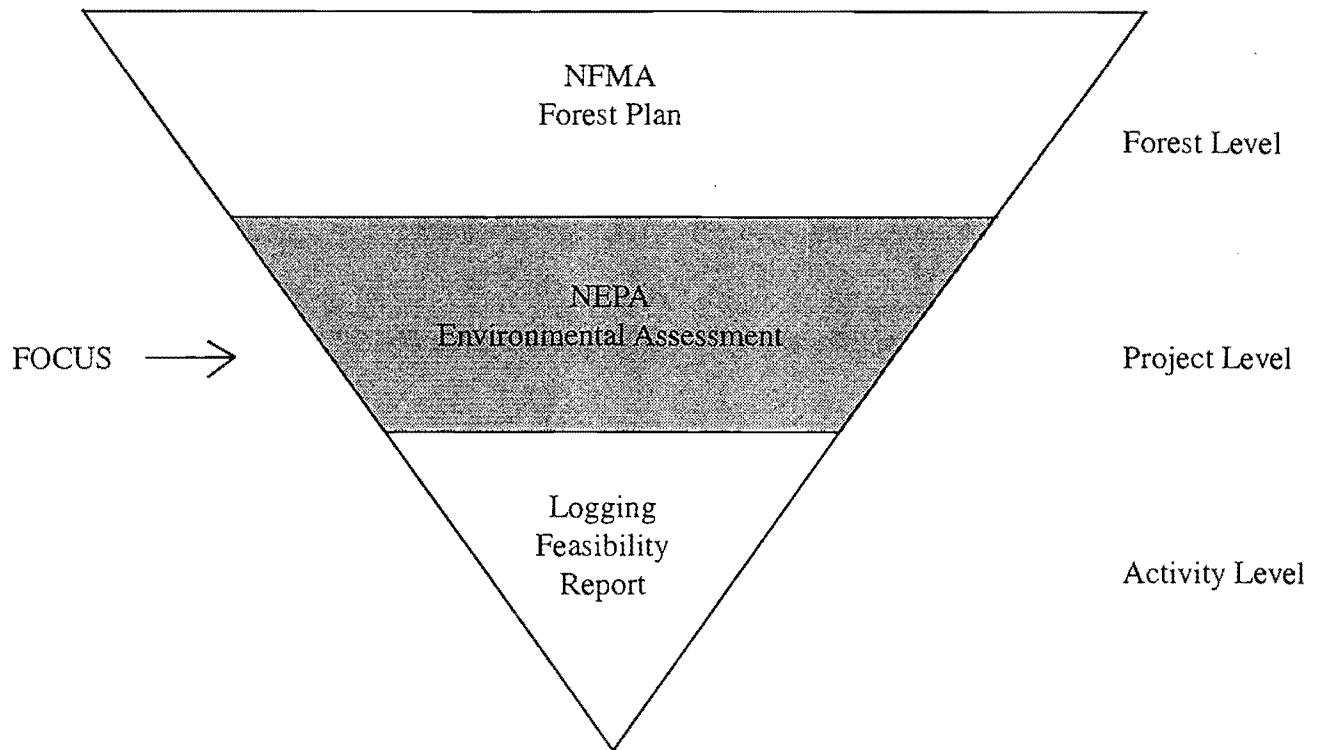
### **METHODOLOGY**

Research reports usually suggest that a project was planned and executed with precision. Few reports admit that all did not go according to a foreordained plan. Although a 17-page study plan was developed and a lot of data was collected for this project, the analysis was eventually narrowed down to three major research questions and revealed that more research was needed to understand the bureaucracy and human factors that influence project planning processes.

This chapter presents the study design and method of analysis in five chronological steps: 1) Project Origin; 2) Case Study Selection; 3) Data Collection; 4) Data Analysis; and 5) Additional Research.

#### **3.1 Project Origin**

The idea for this project originated as a question- "How many helicopter timber sales could have been logged with cable systems which would have met resource management objectives at a lower cost?". At first, the author envisioned analyzing an adequate number of helicopter units at the activity planning level. But when a preliminary survey (Appendix G) revealed that the main reason for helicopter logging was a road or access issue, the author realized that the study plan needed to focus on the project planning level (Figure 3.1). A study plan was developed which explained the purpose and need, listed questions for each planning level (Appendix H), and scheduled visits to several ranger districts to collect data from documents, interviews, and field trips.



**Figure 3.1** Scope of Study - three planning levels



### **3.2 Case Study Selection**

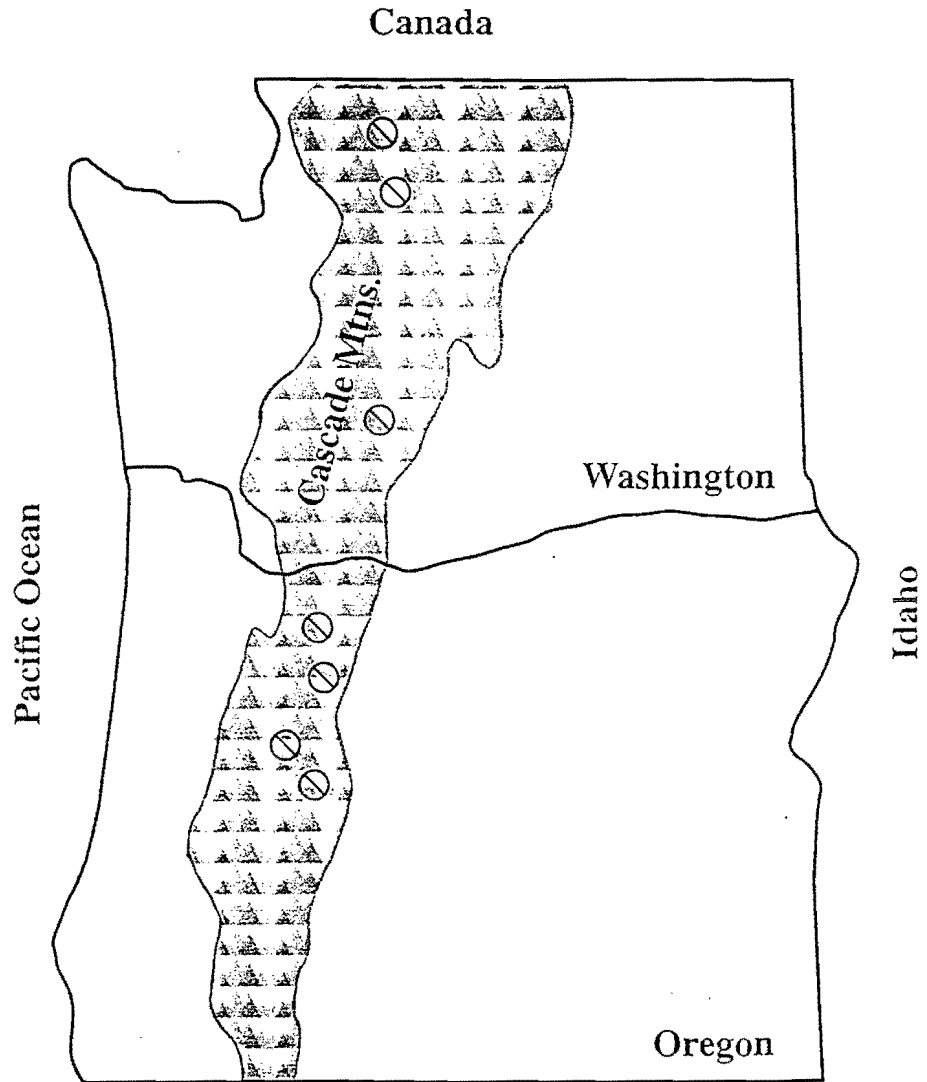
The following procedure was used to select the number and distribution of case studies:

- 1) A list of all Forest Service helicopter timber sales sold during the last three years (Fall 1990 to Fall 1993) in Oregon and Washington was obtained and sorted.
- 2) Table 3.2 shows how the salvage and non-salvage timber sales were separated and divided into four geographic categories:

<b>Mountain Range</b>	<b>No. of Non-Salvage Sales ( &gt; 1 million bd. ft.)</b>	<b>No. of Salvage Sales ( &gt; 1 million bd. ft.)</b>
Washington Cascades	6	1
Oregon Cascades	15	10
All other mountain ranges in Washington	1	1
All other mountain ranges in Oregon	12	7

**Table 3.2 Forest Service Helicopter Timber Sales sold in Region 6 (from 10/90 to 10/93)**

- 3) Salvage sales were not included in the sample since the planning process, rules and regulations are quite different. Salvage sales often need to be logged as soon as possible and may be classified as categorical exclusions, meaning an Environmental Assessment is not required.
- 4) Since the Cascades provided the largest number of candidate timber sales, a decision was made to gather basic information on 21 non-salvage helicopter timber sales in the Oregon-Washington Cascades.
- 5) A preliminary survey form (Appendix G) was mailed to twelve timber managers, asking them to provide a sale area map, unit acres and volumes, and the main reason for helicopter logging on 21 non-salvage timber sales. Results are summarized in Appendix G.
- 6) Since the preliminary survey revealed that the most common reason for helicopter logging was roads, the author decided to investigate road issues and economic analyses. Thus, only helicopter sales with road issues were selected for this study.



**Figure 3.3** Distribution of seven case studies ○

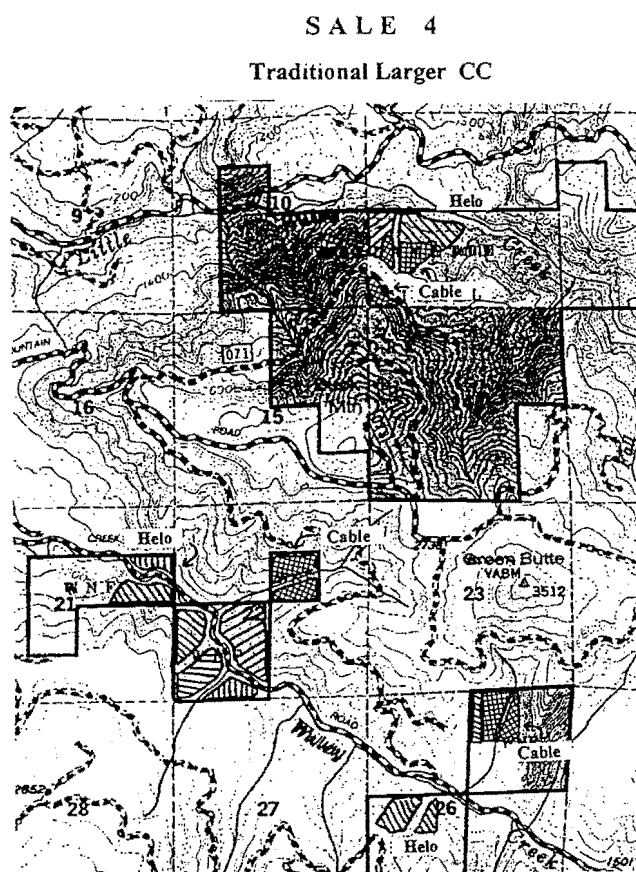
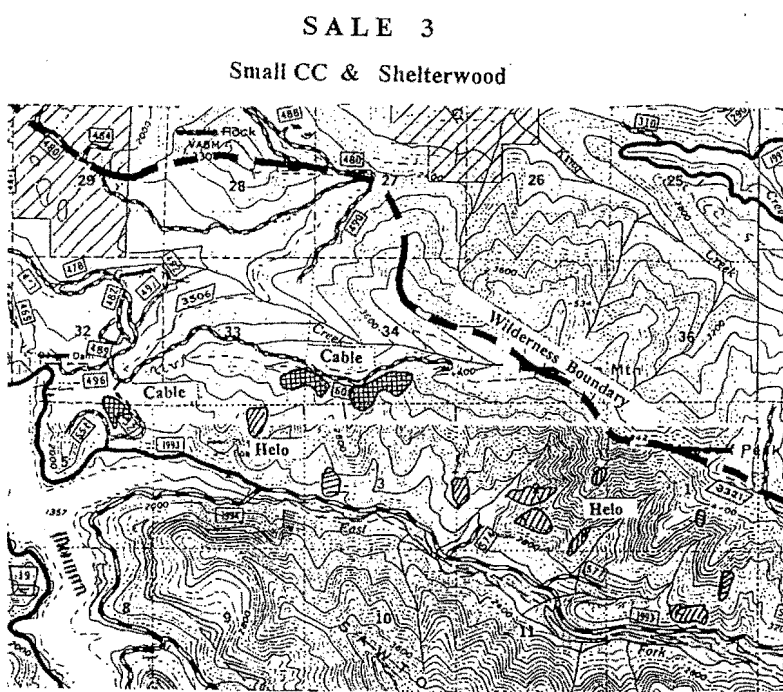
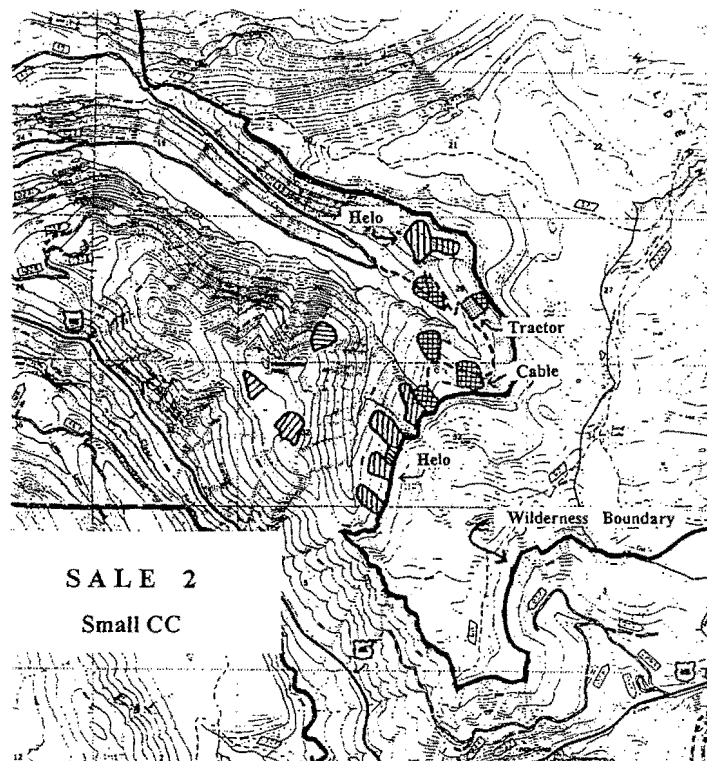
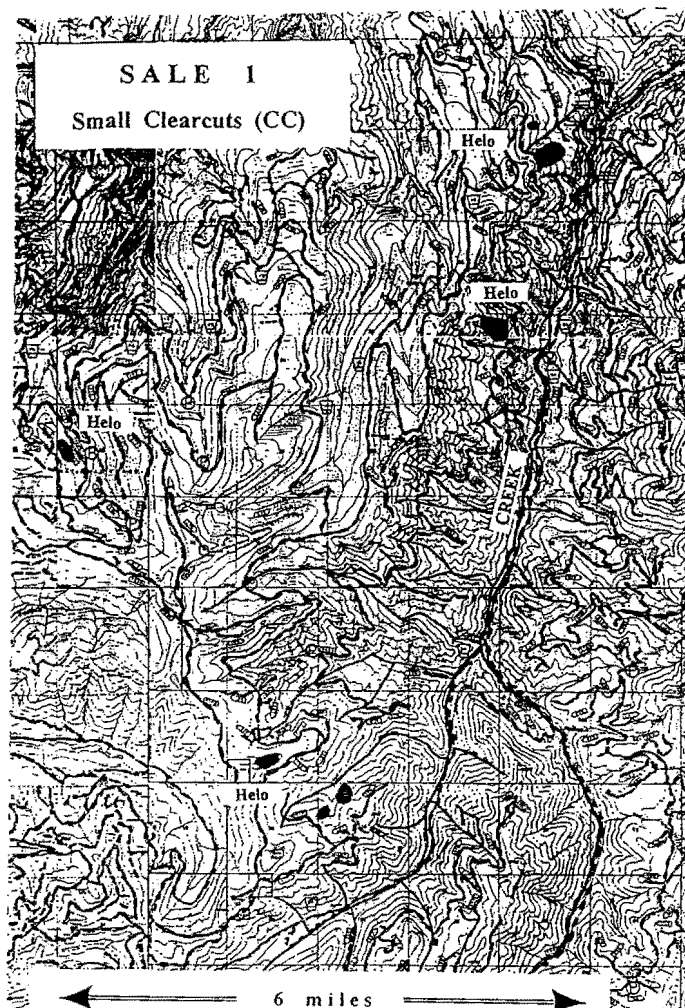
- 7) Due to time limitations, the author decided not to try to obtain a statistical sample but rather, to present a number of 'case studies'. A case study is a narrative description of interesting findings.

"The case-study technique is borrowed from the field of medicine where a report of findings is usually published to alert other doctors to watch for a phenomenon or to consider a change in treatment. Although authors often present after-the-fact conclusions, case study information is considered to be suggestive rather than a scientific conclusion based on controlled, systematic observations. Case studies are valuable as suggestions for future more controlled research." (28)

- 8) It was determined that 7-9 was a reasonable number of case studies that could be adequately examined in one summer. This number was large enough to allow the author to search for common problems, weaknesses, bottlenecks, and unique strengths among these sales.
- 9) Figure 3.3 shows how the case studies were distributed geographically (seven different ranger districts and four national forests).
- 10) When the choice was between more than one sale on a District, the selection was based on which one provided the study with a typical range of sale patterns (Table 3.4). Four of the sales had clearcut and shelterwood units; three were commercial thinning sales (Figures 3.5 and 3.6).

No. of Sales	Silvicultural Treatment	No. of Units (& Size)	Harvest Volume / Acre
3	Clearcut & Shelterwood	7- 16 scattered units ( < 10 acres in size)	High ( 45-56 mbf /acre)
1	80% Clearcut & Shelterwood; 20% Thinning	11 units within large contiguous* blocks (40-160 acres)	High (34 mbf /acre)
1	Thinning	10 units within large large contiguous* blocks (180 ac.)	Medium (16 mbf / acre)
2	80-90% Thinning; 10-20% Clearcut	8-12 scattered units (15-35 acres in size)	Medium (16 mbf /acre)

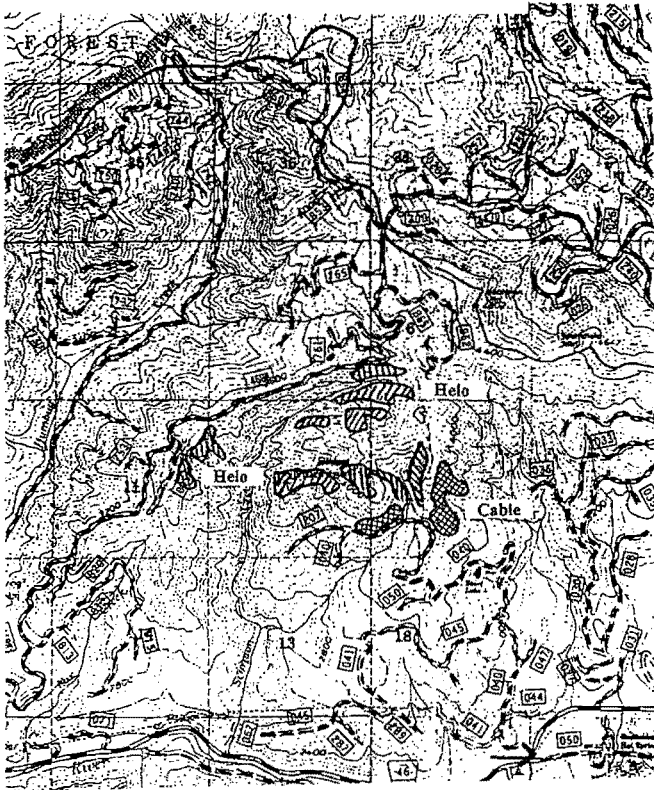
**Table 3.4** Range of sale patterns. (\* 'contiguous' means units are adjoining or separated by 100-300 ft. buffer strips)



**Figure 3.5** Four clearcut and shelterwood timber sales (map enlargements in Appendix I)

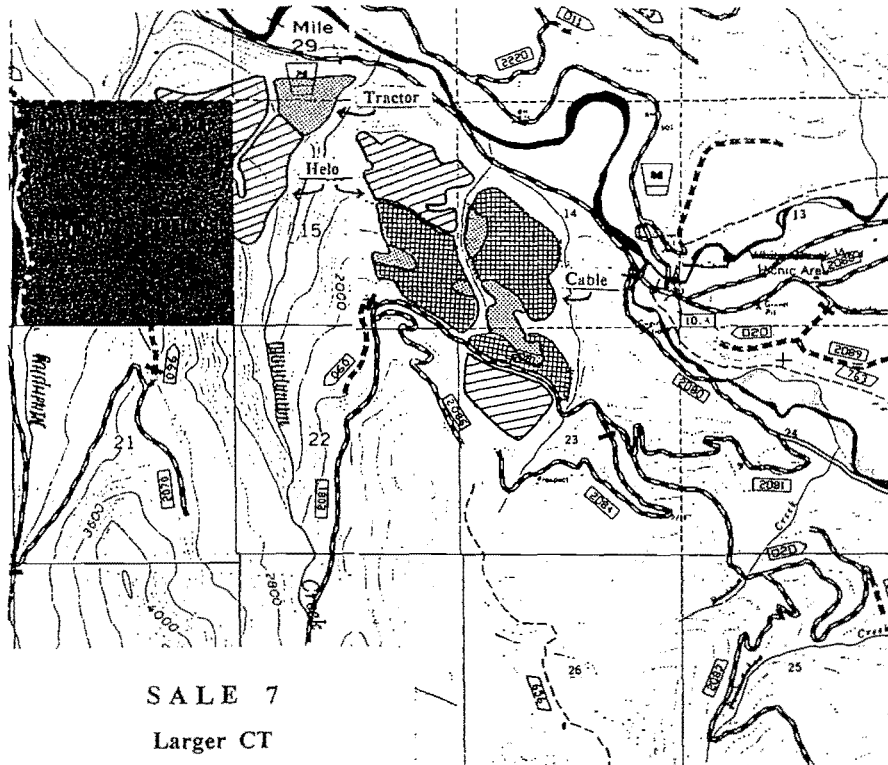
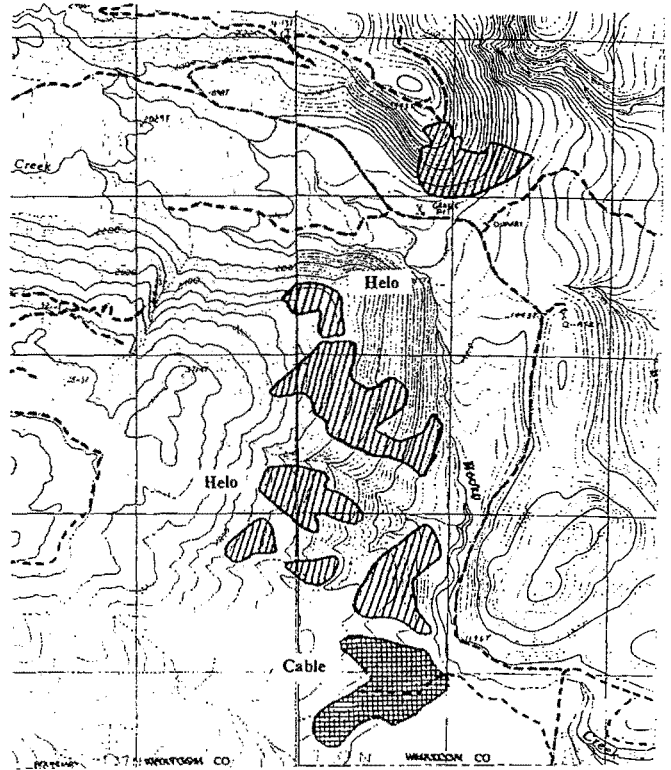
SALE 5

Small Commercial Thinning (CT)



SALE 6

Larger CT



SALE 7

Larger CT

**Figure 3.6** Three commercial thinning sales (map enlargements in Appendix I)

### **3.3 Data Collection**

Much of the information in this paper is based on data collected during the summer of 1994. Arrangements were made to spend 3-4 days at each District office to review planning documents and to schedule individual interviews (15-30 minutes) with several Interdisciplinary (ID) team members.

First, a copy of the Forest Plan was reviewed to note any management direction in terms of analyzing economic and logging feasibility in timber sale planning. The second document, the EA, was scrutinized for the following items: significant issues, logging and road effects analyses, economic analyses, transportation plan, range of alternatives, rationale for choosing helicopter logging, mitigation measures, and monitoring. The Logging Feasibility Report was examined for : cost analyses, computer analyses, technical concerns, maps, and rationale (for choosing helicopter).

Next, the author requested to interview ID team members, especially those who had mentioned a concern regarding logging and roads in the EA. The purpose of the interview was to: 1) clarify logging and road issues; 2) pinpoint site-specific examples of effects on a map or aerial photo; 3) solicit opinions regarding the importance of economic analyses in timber sale planning; 4) identify strengths, weaknesses, bottlenecks, and improvements needed in the timber sale planning process. The interviews focused on these subject areas but often expanded into other discussions about past experiences and general concerns. Although the interviews were taped, the specialists were candid and generous in answering questions. For their cooperation, assistance, and frankness, their identities (along with the sales and Districts) will be kept confidential. A total of 41 specialists were interviewed (Table 3.7).

<b><u>Resource Specialists Interviewed</u></b>	<b><u>Number</u></b>
Timber Mgmt./ Resource Mgmt. Assistants	3
Sale Prep. Foresters / Technicians	3
Logging Specialists	4
Sale Administrators	5
Silviculturists	5
Transportation Planners / Engineers	4
Hydrologists / Soil Scientists	4
Wildlife Biologists	4
Fish Biologists	2
GIS Specialists	2
Landscape Architect	1
NEPA Coordinators	4
	<u>41</u>

**Table 3.7 Number of Specialists Interviewed**

On the final day, 1-3 specialists accompanied the author to the sale area to examine and discuss environmental impacts from road and logging systems, economic and technical feasibility, and the main reason for choosing "helicopter and no roads". By the end of September 1994, all seven sales had been visited. Two hundred and fifty pages of transcribed interviews, field notes, and documents reviews were compiled into one notebook divided into seven sections, one for each timber sale.

### **3.4 Data Analysis**

The first phase of analysis involved reading all the notes and deciding how to summarize 250 pages of data collection. Six summary tables were devised: the first one compared timber sale characteristics; the next three focused on important items in each planning document (Forest Plan, EA, and LFR); the fifth table listed many of the interview comments regarding the importance of economics in timber sale planning, and the final table summarized strengths, weaknesses, bottlenecks, and improvements needed in the timber sale planning process.

The completed summary tables are included in this report as Appendices J-O. This type of organization allowed the author to compare different and related aspects for all the sales at a glance. Although this procedure is subjective, the tables reveal some common problems and areas of concern. The next chapter discusses these findings.

### **3.5 Additional Research**

During interviews conducted for this study, human factors (politics, team dynamics, public values, organization) were mentioned as often as scientific reasons for many forest management decisions. Although these factors are broad in scope, they could not be disregarded due to their significant influence on timber sale planning processes (2, 3, 4, 5, 7, 11, 14, 16, 19, 20, 21, 22, 25, 26, 29, 30, 31, 32, 33).

Complex endeavors for Master's Projects are usually discouraged due to time limitations. But if no one attempts to broaden the scope of their project to include human factors along with science, the problem may get worse. A solution that assesses human realities is much more likely to work than a scientifically correct decision. The influence of politics on forest engineering issues has received surprisingly little study, despite its evident significance (legislation and funding). Planning at the ground level is often constrained and determined by broad sweeping decisions made at higher levels.

"It is almost never the case that a decision regarding public land management is based purely on analysis. Public land managers must fully understand the advantage of using an analytical approach for guiding their actions and for allocating resources but at the same time must face the realities of politics." (16)

To obtain a better understanding of these human factors and political realities, the author not only researched the history of federal land management and planning legislation but also reviewed an extensive list of critiques, debates, and recommendations written by planning experts within and



outside the Forest Service. Many of the articles and books are listed in the bibliography section at the end of this paper. The knowledge gained from this research was then incorporated into the body of this paper, especially Chapters 1, 2, and 5.

## CHAPTER 4

### RESULTS AND DISCUSSION

The data that was collected during the summer of 1994 amounted to 250 pages of typed notes. The notes were analyzed, summarized, and organized into six Summary Tables (Appendices J-O). This chapter presents and discusses the main findings from each Summary Table.

#### **4.1 Table 1 - Timber Sale Characteristics**

It is interesting to note that although the main reason given for helicopter logging on these seven sales was a road issue, six of the sales had some road construction (average = 1.5 miles).

In the sales that were mostly clearcut or shelterwood (Sales 1-4), the average unit size was 14 acres; average sale area (area encompassing the units) was 4-10,000 acres; average number of acres treated was 165 (5% of the sale area); and the average time period between entries was 9 years. In the thinning sales (Sales 5-7), the average unit size was 45 acres; average sale area was 1500 acres; average number of acres treated = 342 (22% of the sale area); and the average time period between entries was 23 years.

The most notable finding in this table is that none of the sales were implemented according to the Decision Notice<sup>1</sup> signed by the responsible official. Decision Notices for these seven sales called for: 50% helicopter, 43% cable, and 7% tractor. The actual sale contracts offered: 65% helicopter, 31% cable, and 3% tractor.

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<sup>1</sup> The Decision Notice discloses the selected alternative, rationale, alternatives considered, public involvement, findings (significant or no significant impact), implementation dates, appeal rights, contact person, and responsible decision-maker.

Since none of the timber sale maps exactly matched the selected alternative, all of the decision notices should have had clauses stating: "Adjustments can be made for unforeseen problems that may show up on-the-ground during layout"; "Adjustments will be properly documented and evaluated for significant effects"; and "The project may be split and offered in more than one contract". Although the decision notices for Sales 3, 4, 5, & 6 included one such clause for these type of adjustments, none of them had enough clauses to cover the changes in the Decision.

#### **4.2 Table 2 - Forest Plan Direction**

There was little direction in any of the four Forest Plans (1990) for logging systems. The following statements came from two Forest Plans (Sales 3, 4, 5, 6, and 7): "All available logging systems should be considered for use. The selection of a logging system shall be based on resource considerations, economics, and technical feasibility" and "Utilize appropriate logging systems to achieve multiple use and silvicultural objectives in a cost-efficient manner."

Current management direction heavily emphasizes reservation and downplays production (23). The 1994 President's Plan changed most of the area in Sales 1-4 (where 5% of the sale area was treated about every 9 years) from land use allocations that were mostly 'Scenic Viewshed' and 'General Forest' to mostly 'Late Succession'<sup>2</sup>. Land use allocations in Sales 5-7 (where 22% of the sale area was treated about every 23 years) changed from mostly 'Scenic Viewshed', 'Wildlife', and 'Timber Emphasis' to mostly 'Matrix'<sup>3</sup>.

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<sup>2</sup> Areas designated as 'Late Succession' will have no programmed timber harvest, no thinning or other silvicultural treatments in stands that are over 80 years of age (23).

<sup>3</sup> The management objective in areas designated as 'Matrix' is to create patches of late succession and to retain 15% old growth where it remains (23).

#### **4.3 Table 3 - Environmental Assessment (EA)**

Regarding Research Question # 1, "How important were economic and technical issues?", it is obvious in Table 3 (Appendix L), that nearly all the issues are environmental. Thirty-one of the 36 issues (86%) in these seven EA's are environmental issues. Three can be considered economic issues: timber demand/supply, benefit/cost ratio, and economics.

Looking at Tables 2 and 3, it appears that it doesn't matter if the Forest Plan's land use allocation was timber production. For instance, in Sale 2, where 'Timber Production' was the land use allocation, timber growth was not identified as an issue in the EA. Likewise in Sale 5, where 'General Forest' was the land use allocation, timber growth was not listed as an issue in the EA.

On Sale 4, where the land allocation was 'High Intensive Timber Management', many of the ID team members stated: "The silvicultural treatments are prescribed to benefit something else besides timber" and "Timber production is on its way out."

Table 2 shows that the only Forest Plan that placed some emphasis on economic analyses was the one for Sales 6 and 7. The only EA's that listed economics as an issue were Sales 2 and 7. Yet, most of the comments for Sale 7 in Table 5 indicate that the ID Team's focus on economics was not influenced by any economic guidelines in the Forest Plan. Instead, the specialists felt that: "The economics emphasis comes from the foresters on the ID Team"; "We have a forest economist in the S.O.(Supervisor's Office) who provided training sessions for the district people"; and "The District Ranger was being pressured about the negative impacts of building roads. So, he instructed the ID Team to do an economic analysis comparing specified road construction (and obliteration) to helicopter logging costs. Helicopter logging doesn't look so expensive when you throw big costs into roading."

In terms of technical feasibility, all of the ID Teams had either a leader (Sales 1, 2, 3, 4, & 7) or a member (Sales 5 & 6) who was well-versed in logging systems. All seven EA's analyzed a range of alternatives that included: different logging systems, different road options, and different silvicultural prescriptions. The only EA that did not consider different roading options was Sale 3.

Referring to Research Question # 2, "Were issues regarding logging systems and roads clearly described, analyzed, monitored, and mitigated in the EA?", none of the EA's or specialist reports really quantified the effects of cable logging or roads in terms of extent, duration, and intensity. Table 3 shows that half of the specialists attempted to quantify the effects but none of the effects predictions provided sufficient evidence to strongly support a decision against 'cable logging and roads'. Examples of road effects were mentioned in Sale 6 and 7, but not in Sales 1, 2, 3, 4 & 5. Four of the EA's (Sales 1, 2, 6, & 7) proposed mitigation measures to resolve road effects but only two specialist reports (Sales 6 & 7) mentioned monitoring these issues (Sales 6 & 7).

One of the specialists commented on the value of scientific analyses: "A specialist that presents facts or who cites examples of concern has more credibility. It is less opinion and more of an objective portrayal of what the expected consequences are." Most of the reasons or descriptions of effects (related to logging systems and roads) were either not mentioned or they were vague with little or no supporting documentation. In fact, no research or documentation was cited in any of the EA's to support the primary reason for selecting 'helicopter and no roads'. In most cases, the primary reason (Table 4.1) was not mentioned in any of the planning documents. The rationale was not clear in the documents but was clarified during the interviews.

<b>Sale #</b>	<b>Primary Reason for 'Helo and No Roads'</b>
1	Time factor / Fish habitat
2	Adjacent wilderness
3	Visuals / Adj.wilderness and roadless area
4	Time factor
5	Time factor
6	Soils
7	Visuals / Economics

**Table 4.1 Primary reason for selecting 'helicopter logging and no roads'.**

'Time factor' was the most common category of road issues on these seven helicopter timber sales. Examples include: the time involved in waiting for cultural resource and protected species surveys; then the time involved in relocating proposed roads until no protected resources are found along the route, and the one-year timeline for "Section 318"<sup>4</sup> sales.

#### **4.4 Table 4 - Logging Feasibility Report (LFR)**

As stated earlier, all seven timber sales had someone on the ID Team that had logging systems training and experience. However, only one logging specialist (Sale 4), prepared a Preliminary LFR (6 pages) for the EA planning record. The 'Final' LFR's ranged from 10 to 43 pages and were written after the decision maker had selected an alternative. All of the logging specialists explained: "The purpose of an LFR is to confirm the technical feasibility of the selected alternative". It seems that a 'Preliminary' LFR would be useful when the ID team is developing alternatives by providing a general overview of logging system options and concerns. Then, after an alternative has been selected, a 'Final' LFR could be prepared to assure that the proposed logging system is feasible and meets resource objectives. It could also prescribe a detailed logging design and provide information for sale layout and timber sale contracts.

Four of the LFR's (Sales 1, 2, 3, & 4) were critiqued by another Logging Specialist or a Review Team. When asked if the suggestions in the critique were followed, specialists on Sales 3 and 4 replied: "We figured we knew what we were doing- we just had the S.O. Logging Specialist come out and write a review for formality, I guess"; and "His ideas were okay, it's just hard to break tradition sometimes".

The Review (or critique) of the LFR or Sale Layout was the only document in the planning files that really addressed technical and economic issues. Site-specific problems were identified and suggestions were made for improvement, such as: "It was difficult to find, in either the EA or LFR, the economic or

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<sup>4</sup> Section 318 of the fiscal year 1990 Appropriations Act directed federal agencies in Region 6 to sell 7.7 billion bd.ft. of timber in fiscal years 1989-90 (without appeal) to generate revenue for the national and local economies while protecting old growth forests and Spotted owl habitat. (40)

other trade-offs for using helicopter .... Several planned helicopter units can be logged with skyline, but this method was rejected because of timing considerations. While this may be a valid judgement, it is important to know what the differences are, especially the cost differences between helicopter and skyline"; "I agree with your Planners that the timber will support the cost of helicopter logging, however, I would suggest that this decision to helicopter log be supported in the EA with a good economic analysis and valid resource opinions"; "I suggest perspective plots be done on the final layout of Unit 3 to confirm that a 'notched' skyline is not created"; "There are a number of timber cutters with experience in line pulling- I can put you in touch with some."; "The roading pattern in Alternative 9 is consistent with future roading objectives and does not foreclose future logging system options"; "Do you propose to helicopter-yard the tops, and if so, how will you accomodate the slash pile on the restricted landing?"; and "Information regarding scope and timing of the next entry would have been valuable in evaluating this entry in context of the total timber harvest plans for the planning area."

The sale area in Sale 3 had a previous helicopter sale in 1987. The 1990 EA stated: "Alternatives which would require new road construction in the unroaded area were eliminated from detailed study. Roading was looked at in detail in the (1987) --- Transportation Plan. During that analysis, it was determined that additional roading would be economically and environmentally unacceptable due to the steep, deeply incised drainage occuring throughout the planning area." This raises a concern whether any previous 'helicopter and no roads' decisions will be re-evaluated in future timber sales EA's.

On the ground, the most common technical problems were:

- Not being able to leave 'old' snags in the helicopter units for safety reasons. There are no studies that show how many more 'old' snags are left in cable units vs. helicopter units.
- Slash does not get knocked down adequately in helo units, making planting more difficult and burning more risky.
- Trails are needed to provide a safe route through steep, rugged terrain for any post-sale activities (planting, piling, burning, sale adm., thinning, K-V<sup>6</sup> projects, and monitoring) resulting in higher resource management costs.

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<sup>6</sup> K-V- Knutson-Vandenberg Act of 1930 authorized additional charges on timber sales to establish funds for reforestation, silviculture, and other resource improvements in the sale area.

#### **4.5 Table 5 - Economic Comments**

Attitude is a predisposition to respond in either a favorable or unfavorable way to an object, person, or concept (34). A total of 41 specialists were asked to comment on the importance of economics. Table 5 indicates there is a common attitude in the Forest Service that profit-making is not a management objective and that costs, revenues, and other economic considerations are at the bottom of the list of issues. Although several specialists were more concerned about 'what the public wants', amenity values, ecosystems, and resource objectives, the majority of the comments reveal that most of the interviewees are frustrated that economic and technical issues are totally subordinate to overriding environmental issues and societal mores. The following sentiment expresses this viewpoint.

"One of the things that's hard about working for a government agency is that the people on the ground can really see what they think will work, but such a large part of our direction comes from legislation and you have to balance compliance with legislation with what you know from your profession. It's hard to keep the economics and technical end balanced with all the environmental legislation." (Interview comment)

Although the author did not evaluate the quality and adequacy of economic analyses which ranged from 0-13 pages on these seven timber sales, the following factors reveal that costs and economics are generally considered 'insignificant' and irrelevant: 1) lack of economic considerations in the Decision Notices; 2) very little emphasis for economic analyses in the Forest Plan; and 3) 86% of the issues in the seven Environmental Assessments were environmental.

#### **4.6 Table 6 - Timber Sale Planning Process**

Five **strengths** that made the timber sale planning process more balanced and credible were:

- Having a review team critique the EA, Sale Layout, and LFR.
- The EA planning record is well-organized and includes: road management objective worksheets, a preliminary LFR, a transportation plan, and an economic analysis.
- An aggressive program of taking the public out to look at past and recent timber sales.
- The Forest Economist provided economic training sessions on the Districts.
- Specialists present facts by citing scientific studies or site-specific examples of effects.



- Everything involved with roads and cable logging takes a lot more time than helicopter logging. The cost of time is not accounted. For example, if less time and effort is put into preparing a sale, then there will be less rework (and wasted time) when the rules change. Sale Planners also realize that people are satisfied with helicopter and are less likely to appeal.

As stated earlier, none of these seven sales were implemented exactly as planned in the EA. Possible factors include: a rush to put up sales (without appeal) under Section 318; the 1990 windstorm; and changing rules and regulations. Five of the seven sales were "318 sales" (Sales 1, 2, 3, 4, & 6).

The author estimated that Sales 2 and 7 were 90-95% implemented as planned and that Sales 3, 4, 5, and 6 were 70-80% implemented as planned in the EA's. Sale 1 (which had three EA's) was less than 10% implemented as planned. The percentage was based on how many of the units were dropped, added, or changed (boundaries or logging systems).

The explanation for Sale 1 was: "an Advisory Board substituted units in the vicinity due to blowdown and suggested combining several helicopter units from three EA's to make a 318 sale". Only one unit in Sale 1 was mentioned in one of the three EA's that covered this sale. The rest of the units were in the vicinity of those shown in the EA's. Technically, another EA should have been written. In Sales 3 and 6, an outside unit was added to the sale that was not mentioned in the EA. There was no documentation or reference to an effects analysis of these additional units (in Sales 1, 3, & 6) and whether the effects due to these changes were insignificant.

Changes (greater than 10%) made during implementation with little or no documentation indicate poor planning and not enough ground-truthing. The problem with changing the decision is that it damages the Forest Service's credibility and defeats the purpose of NEPA and planning.

The most common and most critical **weaknesses** were:

- None of the Decision Notices mentioned economic considerations.
- The decision (selected alternative) is not implemented as proposed.
- It appears there is not enough 'ground-truthing'- site-specific examples are not cited; some of the critical forecasts and controversial mitigation measures are not monitored; maps and proposed actions are not field-checked.
- Pertinent records are hard to find; important decisions are not documented; the folders and files are not organized or readily accessible (scattered).
- A great deal of data is collected but not digested into a written report, peer reviewed, and shared or published.

During the interviews the ID team members identified the following **bottlenecks** in the timber sale planning process:

- Watershed Analyses- "... the inordinate detailed analyses and multiple levels of planning".
- Changes in direction and short life-span of plans- "We spend hundreds of hours on plans that are outdated in 3-5 years"; and "the rules keep changing, we have to re-do our work too many times".
- Roads- surveying for different road options; waiting for cultural resource & plant surveys; re-routing if none of the road options are acceptable due to issues; waiting for cultural resource and plant surveys; and arguing about costs and issues.
- Lack of knowledge- "We're grasping for knowledge that's out of our realm- trying to formulate all the interactions between vegetation, wildlife, and fisheries"; "Working with trees and ecosystems is long term- often you don't see the results for years"; "Publics discredit our analyses because we don't know all the effects"; and "We can't do anything until we know everything".
- Politics- "Congress has passed numerous laws that are contradictory"; "We just can't have everything on every single acre"; "A large part of society wants a working forest, another large part of society wants a biological reserve or a national park"; and "We don't manage our own affairs - the court does".

There were many suggestions for **improvements**, the following were mentioned most often:

- "If the public wants the National Forest to be a national park, then we will need more law enforcement officers (the National Park Service workforce is 3/4 law enforcement). If the public wants a biological reserve/research center, then we will need dependable multi-year funding for monitoring and long-term research projects."
- "One of our downfalls is that when we collected timber receipts, 90% of the money went into the general treasury." "We need to look for opportunities for projects (and user fees) to generate revenue and ways to use the revenue in the USFS. The agency has the potential to pay its way."
- "I think we have more monitoring than you can believe but it's never written up. Putting it in a file is not good enough. It needs to be reviewed and published so it can be used for reference. The key is to know why something failed, document it, share it in a report, and avoid it next time."
- "On one hand, I think we need all the research we can get, and on the other hand I think there's so much research we're not paying attention to. We need some emphasis on reviewing research, designing studies, and writing reports." "Universities have Master's students who are looking for projects and need to write reports."
- "Have specialists bring facts to an ID Team and present facts in an EA. If there is a disagreement, go out to the field and look at examples and talk about what happened." "EA's and specialist reports should state any assumptions."
- "Interdisciplinary means figuring out what is best for the land, plants, animals, and people. 'Protecting your own bailiwick' is not interdisciplinary" "I would highly recommend the 'Consent and Public Participation' training session. People need to feel they've been dealt with fairly, that the process was followed, and that no basic values were infringed upon."

The findings in this chapter were used to answer the three research questions with conclusions and recommendations in the following final chapter.

## CHAPTER 5

### CONCLUSIONS AND RECOMMENDATIONS

The purpose of this chapter is to suggest several ideas that should be fairly easy to implement and have the potential to improve and strengthen the Forest Service's timber sale planning process.

The three sections in this chapter address the three questions by first, listing the findings; second, providing a conclusion; and then responding with recommendations.

#### **5.1 Research Question # 1**

##### **How important were economic and technical issues on recent helicopter timber sales?**

The findings from Chapter 4 are:

- Eighty-six percent of the issues in the seven EA's were environmental issues.
- Three of the 36 issues identified by the ID teams were economic issues.
- There was very little direction in any of the Forest Plans for logging systems.
- One Forest Plan emphasized economic analyses in timber sale planning.
- None of the Decision Notices mentioned economic considerations.
- On one forest, the forest economist provided economic training sessions for the Districts.
- All ID Teams had either a leader or a member who was well-versed in logging systems.
- All EA's analyzed a range of alternatives that included different logging systems, different road options, and different silvicultural prescriptions.
- Only one logging specialist prepared a 'Preliminary' Logging Feasibility Report for the EA.
- Four LFR's were critiqued. The LFR Review (or critique) was the only document that really addressed forest engineering issues.
- Two of the four critiques were considered 'just a formality' and not important.
- Comments from a NEPA Coordinator and two ID team leaders:
  - "The concern for economics comes from the foresters on the ID team- they have the economics background."
  - "It's hard to keep the economics and technical end balanced with all the environmental legislation"
  - "Economics has very little to do with most of this stuff."

**CONCLUSION:** These findings from planning documents and interviews on these seven timber sales indicate that economic and technical issues are generally considered 'insignificant' in timber sale planning. This is probably because the Forest Service's first obligation is to satisfy all legal requirements which are mostly environmental.

**RECOMMENDATIONS:**

- 1) Strengthen economic analyses by providing economic workshops where different ID teams would prepare a report or presentation of how they handled a challenging economic analysis. Since many non-foresters do not have an economic background, encourage non-forestry disciplines to participate by providing special recognition or cash awards for reports or presentations by non-foresters.
- 2) Provide the same incentive for technical logging analyses. For example, have two ID Team members present a riparian management "problem-solution" at a logging workshop and try to include non-foresters. These type of workshops are very effective and interesting because 'real' problems and innovative solutions are presented.
- 3) Require all timber sale EA's to include a preliminary logging feasibility report which would be a general overview of forest engineering issues and options in the sale area. The purpose is to have this information available to the ID team when they are developing alternatives. A final logging feasibility report would assure that the logging system proposed in the selected alternative is feasible and meets resource objectives. The final logging feasibility report would also prescribe a detailed logging design and information for sale layout and contracts.
- 4) Reinstate the practice of having logging feasibility reports critiqued by a highly qualified logging engineer or logging specialist. The critique would identify site-specific problems and suggestions for improvement. Someone on the ID Team or the Decision-maker should document why the suggestions cannot be followed and attach their rationale to the critique, keeping the two documents in the EA planning file. Critiqueing is a skill. If done properly, it can increase synergy dramatically and make people try to improve (17).

- 5) Develop criteria for employee performance evaluations requiring ID team members to analyze cost effectiveness, foregone opportunities, supply and demand, employment, taxes, delay costs, planning costs, and impacts to the national and local economies. Analysis assumptions, timeframe, and geographic area should be carefully specified. Due to unpredictable economic factors and political changes, shorter timeframes have been found to be significantly more accurate than longer timeframes (35).

## **5.2 Research Question # 2**

**Were issues regarding logging systems and roads clearly described, analyzed, monitored, and mitigated in the EA?**

The findings from Chapter 4 are:

- Although half of the specialists attempted to quantify the effects of logging and roads, none of the effects predictions strongly supported a decision against 'cable logging and roads'.
- Most of the reasons or descriptions of logging and road effects were vague with little or no supporting documentation.
- The primary reason (i.e., time factor, visuals) for helicopter logging was rarely mentioned in the EA or LFR.
- Four EA's proposed mitigation measures to resolve road effects.
- Debatable mitigation measures to resolve logging and road effects were not monitored.
- Two specialists planned to monitor road and logging effects.
- A great deal of data is collected but not digested into a written report, peer reviewed, and shared or published.
- Since site-specific examples of effects were rarely cited, debatable effects and controversial mitigation measures were rarely monitored, and since the selected alternative maps often changed during implementation, it appears there is not enough ground-truthing.

**CONCLUSION: These finding suggest that the issues regarding logging systems and roads are not clearly described, analyzed, monitored, and mitigated in the EA.**

## **RECOMMENDATIONS:**

- 1) Provide an incentive for ID teams to examine and disclose the economic, biological, physical, and operational feasibility and consequences in timber sale environmental assessments by offering a cash award for the 'most balanced' EA and logging feasibility report. Since there are many requests for 'model' logging feasibility reports and environmental assessments, these 'best' ones could then be shared as models. If the EA also clearly describes, analyzes, monitors, and mitigates the significant environmental, economic, and technical issues, then the Decision Maker can consider, identify, and balance the trade-offs and impacts to the natural environment with economic and technical advantages (36).
- 2) Reinstate the West Fornet, a former research library service which published an annotated listing of recent publications and allowed specialists to request a literature search using key words. This would help specialists cite supporting documentation for effects analyses.
- 3) Encourage specialists to analyze collected data and share written reports of findings regarding significant or debatable issues. Require these reports to be peer reviewed within and outside the agency. Provide special recognition for these efforts, especially published reports. Again, this would provide supporting documentation and site-specific examples of effects.
- 4) Encourage specialists to review research, propose studies, and write reports. Universities have graduate students who need to design studies, collect data, and write reports.
- 5) Three ID team leaders were well organized in filing and recordkeeping. Important decisions were easily tracked and readily accessible. Perhaps they could share their file management procedures with other ID team leaders and NEPA coordinators.

### **5.3 Research Question # 3**

**What are the main strengths, weaknesses, bottlenecks, and improvements needed in the timber sale planning process?**

Since many of the main strengths, weaknesses, bottlenecks, and improvements listed at the end of Chapter 4 were used to answer the first two research questions, they do not need to be repeated to answer this question. Instead, the following recommendations address the human factors since many specialists mentioned these political, social, and organizational bottlenecks in the timber sale planning process.

#### **ADDITIONAL RECOMMENDATIONS:**

- 1) Establish an aggressive public relations program. For example, have each resource specialist plan, invite, and lead one field trip every year to look at recent or past management activities. Offer a cash award for the one with the largest attendance. The author has seen several cases where projects did not get appealed as a result of a strong public relations program which included public field trips. Most Americans desire a balance of uses and want to know how the Forest Service is managing the national forests and rangelands.
- 2) Encourage ID members and planning folks to attend 'Consent and Public Participation' training. Several specialists highly recommended this workshop where the trainers emphasize "how people need to feel their viewpoint is understood, that the process was followed, and that basic values were not infringed upon" (quote from one specialist). Hewlett-Packard, Proctor and Gamble, and the Japanese have applied similar consensus decision making processes where every participant believes that even though they may not prefer a particular decision, they will support it because they know it was arrived at in an open and fair manner (32).
- 3) Strengthen the agency's authority by dropping or minimizing appeals. Although it seems it would be impossible to take appeal rights away from the publics after all these years, we need the courage to question these assumptions. The real constraints are not the people inside or outside the agency but the devastating, erroneous policies (33).

"The Forest Service is not required by law to offer an administrative appeals process. Nonetheless, the agency has maintained various systems for administrative appeals of agency decisions since 1906. The systems have varied in formality and complexity; some processes have... confined the right to appeal to those in a contractual relationship with the agency, while



others have permitted any person having a grievance with particular agency decisions to request administrative review." (15)

Perhaps the next step would be to ascertain the true total costs involved with appeals. Such an analysis would not only reveal the cost of handling and processing appeals (\$7-10 million per year) but also the costs and time involved with: 1) rewriting documents and redoing work in the field; 2) national and local impacts due to delay; and 3) losses in growth. It seems that if these true costs were known along with the fact that the number of appeals is increasing by 700 every 5 years (and only 7% of the appeals are litigated), the public would probably agree that a change in the Forest Service's administrative appeals process is urgently needed.

4) Streamline the multi-level planning process back to five planning levels (Figure 5.1).

An enormous amount of money, time, and effort is invested in planning documents at each level. Currently, almost all on-the-ground management activities and projects are waiting for an inordinate, detailed watershed analysis to be completed. Due to changing regulations and policies, the life-span of many documents is 1-5 years. Here again, a serious comprehensive financial and time management review of each planning level is needed and should include the amount of data collection required and amount of time spent updating documents every time rules, regulations and policies change.

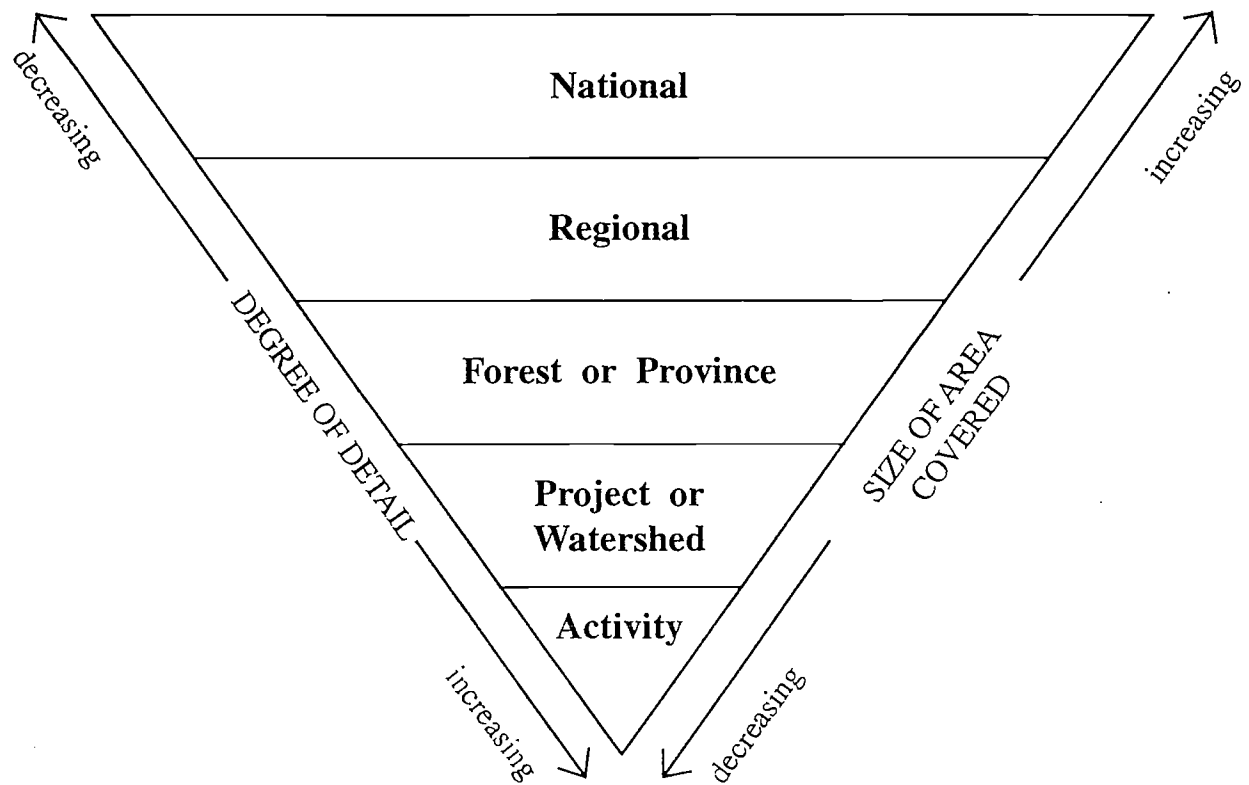
5) Re-educate upper levels and politicians to improve the agency's efficiency and consistency.

The aim of this recommendation is to have upper level managers visit the ranger districts to see what happens in reality. Comments from field-going resource specialists:

"The people in upper management, starting at the Supervisor's Office and all the way up, need to be re-educated and informed of what's really happening at the ground level. They don't see what we're going through and how often we have to re-do our work."

"Those who are giving direction don't know what's happening on the ground. The Watershed Analysis is such a massive, massive undertaking. The President's Plan requires data collection, research, and a lot of information we don't have and don't know where to find."

"We're grasping for knowledge out of our realm trying to formulate all the interactions between vegetation, wildlife, fish, etc."



**Figure 5.1** Recommendation: reduce number of planning levels with degree of detail relative to planning area size.

#### **5.4 Concluding Remarks**

These findings, conclusions, and recommendations are based on what is believed to be a valid interpretation of the data collected on these seven sales. Although the appropriateness of these observations may be limited to these seven sales, these suggestions can be applicable and useful in other geographic areas. Many of the findings appear to be consistent with several other studies that have evaluated the predictive accuracy and technical precision of government environmental impact statements (11). These findings, conclusions, and recommendations do not imply that these sales were ineffective or failures. This last chapter only suggests how the Forest Service's timber sale planning process could: 1) be more technically and economically informed; 2) improve the prediction of effects and trade-offs; 3) build a stronger public relations program; and 4) reinforce management efficiency and resource equity.

## LITERATURE CITED

1. FAIRFAX, S. K. 1978. A Disaster in the Environmental Movement. Science 199 (February 1978): 743-748.
2. CORTNER, H. J. and M. T. Richards. 1983. The Political Component of National Forest Planning. Journal of Soil and Water Conservation 38 (2): 79-81.
3. O'TOOLE, R. 1988. Reforming the Forest Service. Cascade Holistic Economic Consultants. (Washington, D.C. - Island Press)
4. Oregon Law Review Volume 64, 1985.
5. BEHAN, R. V. 1981. RPA/NFMA - Time to Punt. Journal of Forestry Vol. 79, No. 12 (December 1981): 802-805
6. Webster's Seventh New Collegiate Dictionary. 1969. G. & C. Merriam Company. (Chicago, IL - Lakeside Press).
7. RAPHAEL, R. 1994. More Tree Talk: The People, Politics, and Economics of Timber (Washington, D.C. & Covelo, CA - Island Press).
8. USDA FOREST SERVICE. 1990. Analysis of an Emerging Timber Supply Disruption. FS-460 Critique of Land Management Planning Volume 9.
9. FROME, M. 1984. The Forest Service. (Boulder, CO - Westview Press)
10. CLAWSON, M. 1975. Forests for Whom and for What? Resources for the Future, Inc. (Baltimore, MD - John Hopkins University Press).
11. GONSIOR, M. 1988. Mountain Logging Controversy: Perspective and Prospects for Technological Solutions. In: Proceedings, International Mountain Logging and Pacific Northwest Skyline Symposium (December, 1988). 167-172.
12. CULHANE, P. H., FRIESEMA, H. P., and J. A. BEECHER. 1987. Forecasts and Environmental Decisionmaking: The Content and Predictive Accuracy of Environmental Impact Statements (Boulder, CO - Westview Press).
13. COUNCIL OF ENVIRONMENTAL QUALITY. 1986. Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act. (Washington, D.C. - U.S. Government Printing Office).
14. USDA FOREST SERVICE. 1992. Forest Plan Implementation Training Course 1900: NFMA-NEPA Workbook.

15. U.S. CONGRESS. 1992. Forest Service Planning: Accommodating Uses, Producing Outputs, and Sustaining Ecosystems. Office of Technology Assessment . OTA-F-505. (Washington, D.C. - U.S. Government Printing Office).
16. QUADE, E. S. 1975. Analysis for Public Decisions. (New York - American Elsevier Publishing Company, Inc.).
17. BLAKE, R. R., MOUTON, J. S., and McCANSE, A. A. 1989. Change by Design. (Redding, MA - Addison-Wesley Publishing Company).
18. CLAWSON, M. 1983. The Federal Lands Revisited. Resources for the Future, Inc. (Baltimore, MD - John Hopkins University Press)
19. WILSON, C.N. 1978. Land Management Planning Processes of the Forest Service. Environmental Law Vol. 8 (1978): 461-477.
20. STEEN, H. K. 1991. The U.S. Forest Service History. (Seattle & London - University of Washington Press).
21. FAIRFAX, S.K. and ANDREWS, B.T. 1979. Debate Within and Debate Without: NEPA and the Redefinition of the "Prudent Man" Rule. Natural Resources Journal 19 (July 1979): 505-535.
22. APPEGATE, R. 1978. The Multiple Use Planning Process: Descent into the Maelstrom? Environmental Law Vol. 8 (1978): 427-460.
23. USDA FOREST SERVICE and USDI BUREAU OF LAND MANAGEMENT. 1994. Record of Decision for Amendments to Forest Service and Bureau of Land Management Documents Within the Range of the Northern Spotted Owl. Standards and Guidelines for Management of Habitats for Late Succession and Old Growth Forest Related Species Within the Range of the Northern Spotted Owl. (Washington, D.C.)
24. WALKER, J.L. 1977. Economic Efficiency and the National Forest Management Act of 1976. Journal of Forestry Vol. 75, No. 11 (November 1977): 715-718.
25. KRUTILLA, J.V. and J.A. HAIGH. 1978. An Integrated Approach to National Forest Management. Environmental Law Vol. 8 (1978): 373-415.
26. SHANDS, W.E. 1986. RPA at the Turning Point. Journal of Forestry Vol. 84, No. 2 (February 1986): 20-24.
27. TEEGUARDEN, D.E. 1990. National Forest Service Planning Under RPA/NFMA: What Needs Fixing? FS-462. Critique of Land Management Planning Volume 11.
28. SASLOW, C. A. 1982. Basic Research Methods. (Redding, MA - Addison-Wesley Publishing Company).

29. FRIESEMA, H. P. and P. J. CULHANE. 1976. Social Impacts, Politics, and the Environmental Impact Statement Process. Natural Resources Journal 16 (April 1976): 339-356.
30. DANA, S. T. 1956. Forest and Range Policy. (New York - McGraw-Hill Book Company).
31. CLARY, D. A. 1986. Timber and the Forest Service. (Lawrence, KS - University Press of Kansas).
32. DINSMORE, J. B. 1984. Human Factors in Project Management. (American Management Association, New York).
33. GOLDRATT, E. M. 1992. The Goal - A Process of Ongoing Improvement. 2nd edition. (Great Barrington, MA - North River Press)
34. EBERT, R. J. and MITCHELL, T. R. 1975. Organizational Decision Processes. (New York - Crane, Russak, and Company, Inc.).
35. SCHUSTER, E. G. and MEDEMA, E. L. 1989. Accuracy of Economic Impact Analysis. Journal of Forestry Vol. 87, No. 8 (August 1989): 27-32.
36. FREEMAN, A.M. and PORTNEY P.R. 1989. Economics Clarifies Choices. Journal of Forestry Vol. 87, No. 11 (November 1989): 34-38.
37. USDA FOREST SERVICE. 1993. The Principal Laws Relating to Forest Service Activities. (Washington, D.C. - U.S. Government Printing Office).
38. USDA FOREST SERVICE. 1993. RPA Assessment of the Forest and Rangeland Situation in the United States. Forest Resource Report No. 27.
39. BERGSTROM, G. 1988. Logging Feasibility Reports. In: Proceedings: Logging Systems and Transportation Planning Seminar (April 1988). 26-37.
40. USDA FOREST SERVICE. 1990. Forest Service Report to the Congress. Implementation of Section 318 of the Interior and Related Agencies Appropriations Act for Fiscal Year 1990. Ninth Report. (Washington, D.C.)

## **APPENDICES**

## **A P P E N D I C E S**

- A. Organic Administration Act of 1897**
- B. Multiple Use - Sustained Yield Act of 1960**
- C. National Environmental Policy Act of 1969**
- D. Renewable Resources Planning Act of 1974**
- E. National Forest Management Act of 1976**
- F. Economic Analysis Section of the Forest Service's  
Timber Sale Preparation Handbook**
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## Organic Administration Act

- Act of June 4, 1897 (Ch. 2, 30 Stat. 11, as amended; 16 U.S.C. 473-475, 477-482, 551)

*Note*—The following provisions originated as parts of Section 1 of the Sundry Civil Expenses Appropriation Act for Fiscal Year 1898.

(National Forests) was provided for in an act commonly referred to as the Creative Act of 1891 (Ch. 561, 26 Stat. 1103; 16 U.S.C. 471) which stated:

### Creation of National Forests

The President of the United States is authorized and empowered to revoke, modify, or suspend any and all Executive orders and proclamations, or any part thereof, issued under section 471 of this title, from time to time as he shall deem best for the public interests. By such modification he may reduce the area or change the boundary lines or may vacate altogether any order creating such national forest. (16 U.S.C. 473)

*Note*—The National Forest Management Act of 1976 contained the following:

"Notwithstanding the provisions of the act of June 4, 1897 (30 Stat. 34; 16 U.S.C. 473), no land now or hereafter reserved or withdrawn from the public domain as national forests pursuant to the Act of March 3, 1891 (26 Stat. 1103; 16 U.S.C. 471 (now repealed)), or any act supplementary to and amendatory thereof, shall be returned to the public domain except by an act of Congress. (U.S.C. 1609)"

*Note*—The original authority for creation of Forest Reserves

"Sec. 24, That the President of the United States may, from time to time, set apart and reserve, in any State or Territory having public land bearing forests, in any part of the public land wholly or in part covered with timber or undergrowth, whether of commercial value or not, as public reservations, and the President shall, by public proclamation, declare the establishment of such reservations and the limits thereof."

This section was repealed by Section 704(a) of P.L. 94-579, FLPMA.

### Authority to Conduct Surveys

Surveys, field notes, and plats returned from the survey of public lands designated as national forests undertaken under the supervision of the Director of the United States Geological Survey in accordance with provisions of this Act, chapter 2, section 1, Thirtieth Statutes, pages 34, shall have the same legal force and effect as surveys, field notes, and plats returned through the Field Surveying Service; and such surveys, which include subdivision surveys under the rectangular system, shall be approved by the

Secretary of the Interior or such officer as he may designate as in other cases, and properly certified copies thereof shall be filed in the respective land offices of the districts in which such lands are situated, as in other cases. All laws inconsistent with the provisions hereof are declared inoperative as respects such survey. A copy of every topographic map and other maps showing the distribution of the forests, together with such field notes as may be taken relating thereto, shall be certified thereto by the Director of the Survey and filed in the Bureau of Land Management. (16 U.S.C. 474)

#### Designation and Purposes of National Forests

All public lands designated and reserved prior to June 4, 1897, by the President of the United States under the provisions of the Act of March 3, 1891, the orders for which shall be and remain in full force and effect, unsuspended and unrevoked, and all public land that may hereafter be set aside and reserved as national forests under said Act, shall be as far as practicable controlled and administered in accordance with the following provisions. No national forest shall be established, except to improve and protect the forest within the boundaries, or for the purpose of securing favorable conditions of water flows, and to furnish a continuous supply of timber for the use and necessities of citizens of the United States; but it is not the purpose or intent of these provisions, or of the Act, to authorize the inclusion therein of lands more valuable for the mineral therein, or for agricultural purposes, than for forest purposes. (16 U.S.C. 475)

#### Use of Timber and Stone

The Secretary of Agriculture may permit, under regulations to be prescribed by him, the use of timber and stone found upon national forests, free of charge, by bona fide settlers, miners, residents, and prospectors for minerals, for firewood, fencing, buildings, mining, prospecting, and other domestic purposes, as may be needed by such persons for such purposes; such timber to be used within the State or Territory, respectively, where such national forests may be located. (16 U.S.C. 477)

#### Access

Nothing herein shall be construed as prohibiting the egress or ingress of actual settlers residing within the boundaries of national forests, or from crossing the same to and from their property or homes; and such wagon roads and other improvements may be constructed thereon as may be necessary to reach their homes and to utilize their property under such rules and regulations as may be prescribed by the Secretary of Agriculture. Nor shall anything herein prohibit any person from entering upon such national forests for all proper and lawful purposes, including that of prospecting, locating, and developing the mineral resources thereof. Such persons must comply with the rules and regulations covering such national forests. (16 U.S.C. 479)

#### Sites for Schools and Churches

The settlers residing within the exterior boundaries of National Forests, or in the vicinity thereof, may maintain schools and churches

within such national forests, and for that purpose may occupy any part of the said national forests, not exceeding two acres for each schoolhouse and one acre for a church. (16 U.S.C. 479)

#### Civil and Criminal Jurisdiction

The jurisdiction, both civil and criminal, over persons within national forests shall not be affected or changed by reason of their existence, except so far as the punishment of offenses against the United States therein is concerned; the intent and meaning of this provision being that the State wherein any such national forest is situated shall not, by reason of the establishment thereof, lose its jurisdiction, nor the inhabitants thereof their right and privileges as citizens or be absolved from their duties as citizens of the State. (16 U.S.C. 480)

#### Water use

All waters within the boundaries of national forests may be used for domestic, mining, milling, or irrigation purposes, under the laws of the State wherein such national forests are situated, or under the laws of the United States and the rules and regulations established thereunder. (16 U.S.C. 481)

#### Mining location and entry

Upon the recommendation of the Secretary of the Interior, with the approval of the President, after sixty days notice thereof, published in two papers of general circulation in the State or Territory wherein any national forest is situated, and near the said national forests, any public lands embraced within the limits of any such forest which, after due examination by personal inspection of a competent person appointed for

the purpose by the Secretary of the Interior, shall be found better adapted for mining or for agricultural purposes than for forest usage, may be restored to the public domain. And any mineral lands in any national forest which have been or which may be shown to be such, and subject to entry under the existing mining laws of the United States and rules and regulations applying thereto, shall continue to be subject to such location and entry, notwithstanding any provisions herein contained. (16 U.S.C. 482)

#### Rules and Regulations

The Secretary of Agriculture shall make provisions for the protection against destruction by fire and depredations upon the public forests and national forests which may have been set aside or which may be hereafter set aside under the provisions of the Act of March 3, 1891, and which may be continued; and he may make such rules and regulations and establish such service as will insure the objects of such reservations, namely, to regulate their occupancy and use and to preserve the forests thereon from destruction; and any violation of the provisions of this Act or such rules and regulations shall be punished by a fine of not more than \$500 or imprisonment for not more than six months, or both. Any person charged with the violation of such rules and regulations may be tried and sentenced by any United States magistrate specially designated for that purpose by the court by which he was appointed, in the same manner and subject to the same conditions as provided for in section 3401(b) to (e) of Title 18. (16 U.S.C. 551)

*Note*—Authority to issue permits for rights-of-way was repealed by section 706(a) of

the Federal Land Policy and Management Act of 1976. The language does not change but

FLMPA precluded issuance of permits for Rights-of-Way under this section.

## Multiple-Use Sustained-Yield Act of 1960

- Act of June 12, 1960 (P.L. 86-517, 74 Stat. 215; 16 U.S.C. 528(note), 528-531)

Sec. 1. It is the policy of the Congress that the National Forests are established and shall be administered for outdoor recreation, range, timber, watershed, and wildlife and fish purposes. The purposes of this Act are declared to be supplemental to, but not in derogation of, the purposes for which the National Forests were established as set forth in the Act of June 4, 1897 (16 U.S.C. 475). Nothing herein shall be construed as affecting the jurisdiction or responsibilities of the several States with respect to wildlife and fish on the National Forests. Nothing herein shall be construed so as to affect the use or lands or administration of the mineral resources of National Forest lands or to affect the use or administration of Federal lands not within National Forests. (16 U.S.C. 528)

Sec. 2. The Secretary of Agriculture is authorized and directed to develop and administer the renewable surface resources of the National Forests for multiple use and sustained yield of the several products and services obtained therefrom. In the administration of the National Forests due consideration shall be given to the relative values of the various resources in particular areas. The establishment and maintenance of areas of wilderness are consistent with the purposes and provisions of this Act. (16 U.S.C. 529)

Sec. 3. In the effectuation of this Act the Secretary of Agriculture is authorized to cooperate with interested State and local governmental

agencies and others in the development and management of the National Forests. (16 U.S.C. 530)

Sec. 4. As used in this Act, the following terms shall have the following meanings:

(a) "Multiple use" means the management of all the various renewable surface resources of the National Forests so that they are utilized in the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; that some land will be used for less than all of the resources; and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output.

(b) "Sustained yield of the several products and services" means the achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the National Forests without impairment of the productivity of the land. (16 U.S.C. 531)

Sec. 5. This Act may be cited as the "Multiple-Use Sustained-Yield Act of 1960." (16 U.S.C. 528(note))

## National Environmental Policy Act of 1969

- Act of January 1, 1970 (P.L. 91-190, 83 Stat. 852; 42 U.S.C. 4321(note), 4321, 4331-4335, 4341-4346, 4346a-b, 4347)

*Note*—Implementing regulations found at 40 CFR 1500

Sec. 1. This Act may be cited as the "National Environmental Policy Act of 1969." (42 U.S.C. 4321(note))

### Purpose

Sec. 2. The purposes of this Act are: To declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality. (42 U.S.C. 4321)

### TITLE I — DECLARATION OF NATIONAL ENVIRONMENTAL POLICY

#### Federal Government Responsibility

Sec. 101. (a) The Congress, recognizing the profound impact of man's activity on the interrelations of all components of the natural environment, particularly the profound influences of population growth, high-density urbanization, industrial expansion, resource exploitation, and new and expanding technological advances and recognizing further the critical importance of restoring and maintaining envi-

ronmental quality to the overall welfare and development of man, declares that it is the continuing policy of the Federal Government, in cooperation with State and local governments, and other concerned public and private organizations, to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.

(b) In order to carry out the policy set forth in this Act, it is the continuing responsibility of the Federal Government to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may—

(1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;

(2) assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;

(3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;

(4) preserve important historic, cultural, and natural aspects of our national heritage, and maintain,

wherever possible, an environment which supports diversity and variety of individual choice;

(5) achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and

(6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

(c) The Congress recognizes that each person should enjoy a healthful environment and that each person has a responsibility to contribute to the preservation and enhancement of the environment. (42 U.S.C. 4331)

#### Consideration of Environmental Impacts

Sec. 102. The Congress authorizes and directs that, to the fullest extent possible: (1) the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act, and (2) all agencies of the Federal Government shall—

(A) utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decisionmaking which may have an impact on man's environment;

(B) identify and develop methods and procedures, in consultation with the Council on Environmental Quality established by Title II of this Act, which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations;

(C) include in every recommendation or report on proposals for legislation and other major Federal

actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on—

(i) the environmental impact of the proposed action,

(ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,

(iii) alternatives to the proposed action,

(iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and

(v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented. Prior to making any detailed statement, the responsible Federal official shall consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved. Copies of such statement and the comments and views of the appropriate Federal, State, and local agencies, which are authorized to develop and enforce environmental standards, shall be made available to the President, the Council on Environmental Quality and to the public as provided by section 552 of Title 5, United States Code, and shall accompany the proposal through the existing agency review processes;

(D) Any detailed statement required under subparagraph (C) after January 1, 1970, for any major Federal action funded under a program of grants to States shall not be deemed to be legally insufficient solely by reason of having been prepared by a State agency or official, if:

(i) the State agency or official has statewide jurisdiction and has the responsibility for such action,

(ii) the responsible Federal official furnishes guidance and participates in such preparation,

(iii) the responsible Federal official independently evaluates such statement prior to its approval and adoption, and

(iv) after January 1, 1976, the responsible Federal official provides early notification to, and solicits the views of, any other State or any Federal land management entity of any action or any alternative thereto which may have significant impacts upon such State or affected Federal land management entity and, if there is any disagreement on such impacts, prepares a written assessment of such impacts and views for incorporation into such detailed statement. The procedures in this subparagraph shall not relieve the Federal official of his responsibilities for the scope, objectivity, and content of the entire statement or of any other responsibility under this Act; and further, this subparagraph does not affect the legal sufficiency of statements prepared by State agencies with less than statewide jurisdiction.

(E) study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources;

(F) recognize the worldwide and long-range character of environmental problems and, where consistent with the foreign policy of the United States, lend appropriate support to initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of mankind's world environment;

(G) make available to States, counties, municipalities, institutions, and individuals, advice and information useful in restoring,

maintaining, and enhancing the quality of the environment;

(H) initiate and utilize ecological information in the planning and development of resource-oriented projects; and

(I) assist the Council on Environmental Quality established by Title II of this Act. (42 U.S.C. 4332)

#### Conformity of Administrative Procedures

Sec. 103. All agencies of the Federal Government shall review their present statutory authority, administrative regulations, and current policies and procedures for the purpose of determining whether there are any deficiencies or inconsistencies therein which prohibit full compliance with the purposes and provisions of this Act and shall propose to the President not later than July 1, 1971, such measures as may be necessary to bring their authority and policies into conformity with the intent, purposes, and procedures set forth in this Act. (42 U.S.C. 4333)

#### Other Statutory Obligations of Agencies

Sec. 104. Nothing in Section 102 or 103 shall in any way affect the specific statutory obligations of any Federal agency (1) to comply with criteria or standards of environmental quality, (2) to coordinate or consult with any other Federal or State agency, or (3) to act, or refrain from acting contingent upon the recommendations or certification of any other Federal or State agency. (42 U.S.C. 4334)

Sec. 105. The policies and goals set forth in this Act are supplementary to those set forth in existing

authorizations of Federal agencies.  
(42 U.S.C. 4335)

## TITLE II — COUNCIL ON ENVIRONMENTAL QUALITY

### Reports to Congress; Recommendations for Legislation

Sec. 201. The President shall transmit to the Congress annually beginning July 1, 1970, an Environmental Quality Report (hereinafter referred to as the "report") which shall set forth (1) the status and condition of the major natural, man-made, or altered environmental classes of the Nation, including, but not limited to, the air, the aquatic, including marine, estuarine, and fresh water, and the terrestrial environment, including, but not limited to, the forest, dryland, wetland, range, urban, suburban, and rural environment; (2) current and foreseeable trends in the quality, management, and utilization of such environments and the effects of those trends on the social, economic, and other requirements of the Nation; (3) the adequacy of available natural resources for fulfilling human and economic requirements of the Nation in the light of expected population pressures; (4) a review of the programs and activities (including regulatory activities) of the Federal Government, the State and local governments, and non-governmental entities or individuals, with particular reference to their effect on the environment and on the conservation, development, and utilization of natural resources; and (5) a program for remedying the deficiencies of existing programs and activities, together with recommendations for legislation. (42 U.S.C. 4341)

### Council on Environmental Quality

Sec. 202. There is created in the Executive Office of the President a Council on Environmental Quality (hereinafter referred to as the "Council"). The council shall be composed of three members who shall be appointed by the President to serve at his pleasure, by and with the advice and consent of the Senate. The President shall designate one of the members of the council to serve as Chairman. Each member shall be a person who, as a result of his training, experience, and attainments, is exceptionally well qualified to analyze and interpret environmental trends and information of all kinds; to appraise programs and activities of the Federal Government in light of the policy set forth in Title I of this Act; to be conscious of and responsive to the scientific, economic, social, aesthetic, and cultural needs and interests of the Nation; and to formulate and recommend national policies to promote the improvement of the quality of the environment. (42 U.S.C. 4342)

### Staffing the Council

Sec. 203. (a) The Council may employ such officers and employees as may be necessary to carry out its functions under this Act. In addition, the Council may employ and fix the compensation of such experts and consultants as may be necessary for the carrying out of its functions under this Act, in accordance with section 3109 of Title 5, United States Code (but without regard to the last sentence thereof).

(b) Notwithstanding section 3679(b) of the Revised Statutes (31 U.S.C. 665(b)), the Council may

accept and employ voluntary and uncompensated services in furtherance of the purposes of the Council. (42 U.S.C. 4343)

### Duty and Function of Council

Sec. 204. It shall be the duty and function of the Council—

(1) to assist and advise the President in the preparation of the Environmental Quality Report required by section 201;

(2) to gather timely and authoritative information concerning the conditions and trends in the quality of the environment both current and prospective, to analyze and interpret such information for the purpose of determining whether such conditions and trends are interfering, or are likely to interfere, with the achievement of the policy set forth in Title I of this Act, and to compile and submit to the President studies relating to such conditions and trends;

(3) to review and appraise the various programs and activities of the Federal Government in light of the policy set forth in Title I of this Act for the purpose of determining the extent to which such programs and activities are contributing to the achievement of such policy, and to make recommendations to the President with respect thereto;

(4) to develop and recommend to the President national policies to foster and promote the improvement of environmental quality to meet the conservation, social, economic, health, and other requirements and goals of the Nation;

(5) to conduct investigations, studies, surveys, research, and analyses relating to ecological systems and environmental quality;

(6) to document and define changes in the natural environment, including the plant and animal systems, and to accumulate necessary

data and other information for a continuing analysis of these changes or trends and an interpretation of their underlying causes;

(7) to report at least once each year to the President on the state and condition of the environment; and

(8) to make and furnish such studies, reports thereon, and recommendations with respect to matters of policy and legislation as the President may request. (42 U.S.C. 4344)

### Obtaining Information—Using Advisory Committee

Sec. 205. In exercising its powers, functions, and duties under this Act, the Council shall—

(1) consult with the Citizen's Advisory Committee on Environmental Quality established by Executive Order numbered 11472, dated May 29, 1969, and with such representatives of science, industry, agriculture, labor, conservation organizations, State and local governments, and other groups, as it deems advisable; and

(2) utilize, to the fullest extent possible, the services, facilities, and information (including statistical information) of public and private agencies and organizations, and individuals, in order that duplication of effort and expense may be avoided, thus assuring that the Council's activities will not necessarily overlap or conflict with similar activities authorized by law and performed by established agencies. (42 U.S.C. 4345)

### Compensation for Council Members

Sec. 206. Members of the Council shall serve full time and the Chairman of the Council shall be compensated at the rate provided for

Level II of the Executive Schedule Pay Rates (5 U.S.C. 5313). The other members of the Council shall be compensated at the rate provided for Level IV of the Executive Schedule Pay Rates (5 U.S.C. 5315). (42 U.S.C. 4346)

#### Travel Reimbursement

Sec. 207. The Council may accept reimbursements from any private nonprofit organization or from any department, agency, or instrumentality of the Federal Government, State or local government, for the reasonable travel expenses incurred by an officer or employee of the Council in connection with his attendance at any conference, seminar, or similar meeting conducted for the benefit of the Council. (42 U.S.C. 4346a)

#### International Activities

Sec. 208. The Council may make expenditures in support of its international activities, including expenditures for: (1) international travel; (2) activities in implementation of international agreements; and (3) the support of international exchange programs in the United States and in foreign countries. (42 U.S.C. 4346b)

#### Authorization of Appropriations

Sec. 209. There are authorized to be appropriated to carry out the provisions of this Act not to exceed \$300,000 for fiscal year 1970, \$700,000 for fiscal year 1971, and \$1,000,000 for each fiscal year thereafter. (42 U.S.C. 4347)



## Forest and Rangeland Renewable Resources Planning Act of 1974

- Act of August 17, 1974 (P.L. 93-378, 88 Stat. 476, as amended; 16 U.S.C. 1600(note), 1600-1614)

Sec. 1. This Act may be cited as the "Forest and Rangeland Renewable Resources Planning Act of 1974". (16 U.S.C. 1600(note))

### Findings

Sec. 2. The Congress finds that—

(1) the management of the Nation's renewable resources is highly complex and the uses, demand for, and supply of the various resources are subject to change over time;

(2) the public interest is served by the Forest Service, Department of Agriculture, in cooperation with other agencies, assessing the Nation's renewable resources, and developing and preparing a national renewable resource program, which is periodically reviewed and updated;

(3) to serve the national interest, the renewable resource program must be based on a comprehensive assessment of present and anticipated uses, demand for, and supply of renewable resources from the Nation's public and private forests and rangelands, through analysis of environmental and economic impacts, coordination of multiple use and sustained yield opportunities as provided in the Multiple-Use Sustained-Yield Act of 1960 (74 Stat. 15; 16 U.S.C. 528-531), and public participation in the development of the program;

(4) the new knowledge derived from coordinated public and private research programs will promote a

sound technical and ecological base for effective management, use, and protection of the Nation's renewable resources;

(5) inasmuch as the majority of the Nation's forests and rangeland is under private, State, and local governmental management and the Nation's major capacity to produce goods and services is based on these nonfederally managed renewable resources, the Federal Government should be a catalyst to encourage and assist these owners in the efficient long-term use and improvement of these lands and their renewable resources consistent with the principles of sustained yield and multiple use;

(6) the Forest Service, by virtue of its statutory authority for management of the National Forest System, research and cooperative programs, and its role as an agency in the Department of Agriculture, has both a responsibility and an opportunity to be a leader in assuring that the Nation maintains a natural resource conservation posture that will meet the requirements of our people in perpetuity; and

(7) recycled timber product materials are as much a part of our renewable forest resources as are the trees from which they originally came, and in order to extend our timber and timber fiber resources and reduce pressures for timber production from Federal lands, the Forest Service should expand research in the use of recycled and waste timber product materials, develop techniques for the

substitution of these secondary materials for primary materials, and promote and encourage the use of recycled timber product materials. (16 U.S.C. 1600)

#### Renewable Resource Assessment

Sec. 3. (a) In recognition of the vital importance of America's renewable resources of the forest, range, and other associated lands to the Nation's social and economic well-being, and of the necessity for a long term perspective in planning and undertaking related national renewable resource programs administered by the Forest Service, the Secretary of Agriculture shall prepare a Renewable Resource Assessment (hereinafter called the "Assessment"). The Assessment shall be prepared not later than December 31, 1975, and shall be updated during 1979 and each tenth year thereafter, and shall include but not be limited to—

(1) an analysis of present and anticipated uses, demand for, and supply of the renewable resources, with consideration of the international resource situation, and an emphasis of pertinent supply and demand and price relationship trends;

(2) an inventory, based on information developed by the Forest Service and other Federal agencies, of present and potential renewable resources, and an evaluation of opportunities for improving their yield of tangible and intangible goods and services, together with estimates of investment costs and direct and indirect returns to the Federal Government;

(3) a description of Forest Service programs and responsibilities in research, cooperative programs and management of the National Forest System, their interrelationships, and the relationship of

these programs and responsibilities to public and private activities;

(4) a discussion of important policy considerations, laws, regulations, and other factors expected to influence and affect significantly the use, ownership, and management of forest, range, and other associated lands; and

(5) an analysis of the potential effects of global climate change on the condition of renewable resources on the forests and rangelands of the United States; and

(6) an analysis of the rural and urban forestry opportunities to mitigate the buildup of atmospheric carbon dioxide and reduce the risk of global climate change,

(b) To assure the availability of adequate data and scientific information needed for development of the Assessment, section 9 of the McSweeney-McNary Act of May 22, 1928 (45 Stat. 702, as amended, 16 U.S.C. 581h), is hereby amended to read as follows:

"The Secretary of Agriculture is hereby authorized and directed to make and keep current a comprehensive survey and analysis of the present and prospective conditions of and requirements for the renewable resources of the forest and range lands of the United States, its territories and possessions, and of the supplies of such renewable resources, including a determination of the present and potential productivity of the land, and of such other facts as may be necessary and useful in the determination of ways and means needed to balance the demand for and supply of these renewable resources, benefits and uses in meeting the needs of the people of the United States. The Secretary shall carry out the survey and analysis under such plans as he may determine to be fair and equitable, and cooperate with appropriate officials of each State, territory, or

possession of the United States, and either through them or directly with private or other agencies. There is authorized to be appropriated not to exceed \$20,000,000 in any fiscal year to carry out the purposes of this section."

(c) The Secretary shall report in the 1979 and subsequent Assessments on—

(1) the additional fiber potential in the National Forest System including, but not restricted to, forest mortality, growth, salvage potential, potential increased forest products sales, economic constraints, alternate markets, contract considerations, and other multiple use considerations;

(2) the potential for increased utilization of forest and wood product wastes in the National Forest System and on other lands, and of urban wood wastes and wood product recycling, including recommendations to Congress for actions which would lead to increased utilization of material now being wasted both in the forests and in manufactured products; and

(3) the milling and other wood fiber product fabrication facilities and their location in the United States, noting the public and private forested areas that supply such facilities, assessing the degree of utilization into product form of harvested trees by such facilities, and setting forth the technology appropriate to the facilities to improve utilization either individually or in aggregate units of harvested trees and to reduce wasted wood fibers. The Secretary shall set forth a program to encourage the adoption by these facilities of these technologies for improving wood fiber utilization.

(d) In developing the reports required under subsection (c) of this section, the Secretary shall provide opportunity for public involvement

and shall consult with other interested governmental departments and agencies.

*Note*—The National Forest Management Act of October 22, 1976, mistakenly added another subsection (d). This mistake is preserved in this text.

(d)(1) It is the policy of the Congress that all forested lands in the National Forest System be maintained in appropriate forest cover with species of trees, degree of stocking, rate of growth, and conditions of stand designed to secure the maximum benefits of multiple use sustained yield management in accordance with land management plans. Accordingly, the Secretary is directed to identify and report to the Congress annually at the time of submission of the President's budget together with the annual report provided for under section 8(c) of this Act, beginning with submission of the President's budget for fiscal year 1978, the amount and location by Forests and States and by productivity class, where practicable, of all lands in the National Forest System where objectives of land management plans indicate the need to reforest areas that have been cut-over or otherwise denuded or deforested, and all lands with stands of trees that are not growing at their best potential rate or growth. All National Forest lands treated from year to year shall be examined after the first and third growing seasons and certified by the Secretary in the report provided for under this subsection as to stocking rate, growth rate in relation to potential and other pertinent measures. Any lands not certified as satisfactory shall be returned to the backlog and scheduled for prompt treatment. The level and types of treatment shall be

those which secure the most effective multiple use benefits.

(2) Notwithstanding the provisions of section 9 of this Act, the Secretary shall annually for eight years following the enactment of this subsection, transmit to the Congress in the manner provided in this subsection an estimate of the sums necessary to be appropriated, in addition to the funds available from other sources, to replant and otherwise treat an acreage equal to the acreage to be cut over that year, plus a sufficient portion of the backlog of lands found to be in need of treatment to eliminate the backlog within the eight-year period. After such eight-year period, the Secretary shall transmit annually to the Congress an estimate of the sums necessary to replant and otherwise treat all lands being cut over and maintain planned timber production on all other forested lands in the National Forest System so as to prevent the development of a backlog of needed work larger than the needed work at the beginning of the fiscal year. The Secretary's estimate of sums necessary, in addition to the sums available under other authorities, for accomplishment of the reforestation and other treatment of National Forest System lands under this section shall be provided annually for inclusion in the President's budget and shall also be transmitted to the Speaker of the House and the President of the Senate together with the annual report provided for under section 8(c) of this Act at the time of submission of the President's budget to the Congress beginning with the budget for fiscal year 1978. The sums estimated as necessary for reforestation and other treatment shall include moneys needed to secure seed, grow seedlings, prepare sites, plant trees, thin, remove deleterious growth and underbrush, build

fence to exclude livestock and adverse wildlife from regeneration areas and otherwise establish and improve growing forests to secure planned production of trees and other multiple use values.

(3) Effective for the fiscal year beginning October 1, 1977, and each fiscal year thereafter, there is hereby authorized to be appropriated for the purpose of reforesting and treating lands in the National Forest System \$200,000,000 annually to meet requirements of this subsection (d). All sums appropriated for the purposes of this subsection shall be available until expended.

(e) The Secretary shall submit an annual report to the Congress on the amounts, types, and uses of herbicides and pesticides used in the National Forest System, including the beneficial or adverse effects of such uses. (16 U.S.C. 1601)

#### Renewable Resource Program

Sec. 4. In order to provide for periodic review of programs for management and administration of the National Forest System for research, for cooperative State and private Forest Service programs, and for conduct of other Forest Service activities in relation to the findings of the Assessment, the Secretary of Agriculture, utilizing information available to the Forest Service and other agencies within the Department of Agriculture, including data prepared pursuant to section 302 of the Rural Development Act of 1972, shall prepare and transmit to the President a recommended Renewable Resource Program (hereinafter called the "Program"). The Program transmitted to the President may include alternatives, and shall provide in appropriate detail for protection, management, and development of the National Forest System, including forest development roads

and trails; for cooperative Forest Service programs; and for research. The Programs shall be developed in accordance with principles set forth in the Multiple-Use Sustained-Yield Act of June 12, 1960 (74 Stat. 215; 16 U.S.C. 528-531), and the National Environmental Policy Act of 1969 (83 Stat. 852; 42 U.S.C. 4321-4347). The Program shall be prepared not later than December 31, 1975, to cover the four-year period beginning October 1, 1976, and at least each of the four fiscal decades next following such period, and shall be updated no later than during the first half of the fiscal year ending September 30, 1980, and the first half of each fifth fiscal year thereafter to cover at least each of the four fiscal decades beginning next after such updating. The Program shall include, but not be limited to—

(1) an inventory of specific needs and opportunities for both public and private program investments. The inventory shall differentiate between activities which are of a capital nature and those which are of an operational nature;

(2) specific identification of Program outputs, results anticipated, and benefits associated with investments in such a manner that the anticipated costs can be directly compared with the total related benefits and direct and indirect returns to the Federal Government;

(3) a discussion of priorities for accomplishment of inventoried Program opportunities, with specified costs, outputs, results, and benefits;

(4) a detailed study of personnel requirements as needed to implement and monitor existing and ongoing programs; and

(5) Program recommendations which—

(A) evaluate objectives for the major Forest Service programs

in order that multiple-use and sustained-yield relationships among and within the renewable resources can be determined;

(B) explain the opportunities for owners of forests and rangeland to participate in the programs to improve and enhance the condition of the land and the renewable resource products therefrom;

(C) recognize the fundamental need to protect and, where appropriate, improve the quality of soil, water, and air resources;

(D) state national goals that recognize the interrelationships between and interdependence within the renewable resources;

(E) evaluate the impact of the export and import of raw logs upon domestic timber supplies and prices; and

(F) account for the effects of global climate change on forest and rangeland conditions, including potential effects on the geographic ranges of species, and on forest and rangeland products. (16 U.S.C. 1602)

#### National Forest System Resource Inventories

Sec. 5. As a part of the Assessment, the Secretary of Agriculture shall develop and maintain on a continuing basis a comprehensive and appropriately detailed inventory of all National Forest System lands and renewable resources. This inventory shall be kept current so as to reflect changes in conditions and identify new and emerging resources and values. (16 U.S.C. 1603)

#### National Forest System Resource Planning

Sec. 6. (a) As a part of the Program provided for by section 3 of this Act, the Secretary of Agriculture shall develop, maintain, and, as

appropriate, revise land and resource management plans for units of the National Forest System, coordinated with the land and resource management planning processes of State and local governments and other Federal agencies.

(b) In the development and maintenance of land management plans for use on units of the National Forest System, the Secretary shall use a systematic interdisciplinary approach to achieve integrated consideration of physical, biological, economic, and other sciences.

(c) The Secretary shall begin to incorporate the standards and guidelines required by this section in plans for units of the National Forest System as soon as practicable after enactment of this subsection and shall attempt to complete such incorporation for all such units by no later than September 30, 1985. The Secretary shall report to the Congress on the progress of such incorporation in the annual report required by section 8(c) of this Act. Until such time as a unit of the National Forest System is managed under plans developed in accordance with this Act, the management of such unit may continue under existing land and resource management plans.

(d) The Secretary shall provide for public participation in the development, review, and revision of land management plans including, but not limited to, making the plans or revisions available to the public at convenient locations in the vicinity of the affected unit for a period of at least three months before final adoption, during which period the Secretary shall publicize and hold public meetings of comparable processes at locations that foster public participation in the review of such plans or revisions.

(e) In developing, maintaining, and revising plans for units of the

National Forest System pursuant to this section, the Secretary shall assure that such plans—

(1) provide for multiple use and sustained yield of the products and services obtained therefrom in accordance with the Multiple-Use Sustained-Yield Act of 1960, and, in particular, include coordination of outdoor recreation, range, timber, watershed, wildlife and fish, and wilderness; and

(2) determine forest management systems, harvesting levels, and procedures in the light of all of the uses set forth in subsection (c)(1), the definition of the terms "multiple use" and "sustained yield" as provided in the Multiple-Use Sustained-Yield Act of 1960, and the availability of lands and their suitability for resource management.

(f) Plans developed in accordance with this section shall—

(1) form one integrated plan for each unit of the National Forest System, incorporating in one document or one set of documents, available to the public at convenient locations, all of the features required by this section;

(2) be embodied in appropriate written material, including maps and other descriptive documents, reflecting proposed and possible actions, including the planned timber sale program and the proportion of probable methods of timber harvest within the unit necessary to fulfill the plan;

(3) be prepared by an interdisciplinary team. Each team shall prepare its plan based on inventories of the applicable resources of the forest;

(4) be amended in any manner whatsoever after final adoption after public notice, and, if such amendment would result in a significant change in such plan, in accordance with the provisions of subsections (e) and (f) of this section and public

involvement comparable to that required by subsection (d) of this section; and

(5) be revised—

(A) from time to time when the Secretary finds conditions in a unit have significantly changed, but at least every fifteen years, and

(B) in accordance with the provisions of subsections (e) and (f) of this section and public involvement comparable to that required by subsection (d) of this section.

(g) As soon as practicable, but not later than two years after enactment of this subsection, the Secretary shall in accordance with the procedures set forth in section 553 of title 5, United States Code, promulgate regulations, under the principles of the Multiple-Use Sustained-Yield Act of 1960, that set out the process for the development and revision of the land management plans, and the guidelines and standards prescribed by this subsection. The regulations shall include, but not be limited to—

(1) specifying procedures to insure that land management plans are prepared in accordance with the National Environmental Policy Act of 1969, including, but not limited to, direction on when and for what plans an environmental impact statement required under section 102(2)(C) of that Act shall be prepared;

(2) specifying guidelines which—

(A) require the identification of the suitability of lands for resource management;

(B) provide for obtaining inventory data on the various renewable resources, and soil and water, including pertinent maps, graphic material, and explanatory aids; and

(C) provide for methods to identify special conditions or situations involving hazards to the vari-

ous resources and their relationship to alternative activities;

(3) specifying guidelines for land management plans developed to achieve the goals of the Program which—

(A) insure consideration of the economic and environmental aspects of various systems of renewable resource management, including the related systems of silviculture and protection of forest resources, to provide for outdoor recreation (including wilderness), range, timber, watershed, wildlife, and fish;

(B) provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives, and within the multiple-use objectives of a land management plan adopted pursuant to this section, provide, where appropriate, to the degree practicable, for steps to be taken to preserve the diversity of tree species similar to that existing in the region controlled by the plan;

(C) insure research on and (based on continuous monitoring and assessment in the field) evaluation of the effects of each management system to the end that it will not produce substantial and permanent impairment of the productivity of the land;

(D) permit increases in harvest levels based on intensified management practices, such as reforestation, thinning, and tree improvement if—

(i) such practices justify increasing the harvests in accordance with the Multiple-Use Sustained-Yield Act of 1960, and

(ii) such harvest levels are decreased at the end of each planning period if such practices cannot be successfully implemented or funds are not received to permit such practices to continue substantially as planned;

(E) insure that timber will be harvested from National Forest System lands only where—

(i) soil, slope, or other watershed conditions will not be irreversibly damaged;

(ii) there is assurance that such lands can be adequately restocked within five years after harvest;

(iii) protection is provided for streams, streambanks, shorelines, lakes, wetlands, and other bodies of water from detrimental changes in water temperatures, blockages of water courses, and deposits of sediment, where harvests are likely to seriously and adversely affect water conditions or fish habitat; and

(iv) the harvesting system to be used is not selected primarily because it will give the greatest dollar return or the greatest unit output of timber; and

(F) insure that clearcutting, seed tree cutting, shelterwood cutting, and other cuts designed to regenerate an even-aged stand of timber will be used as a cutting method on National Forest System lands only where—

(i) for clearcutting, it is determined to be the optimum method, and for other such cuts it is determined to be appropriate, to meet the objectives and requirements of the relevant land management plan;

(ii) the interdisciplinary review as determined by the Secretary has been completed and the potential environmental, biological, esthetic, engineering, and economic impacts on each advertised sale area have been assessed, as well as the consistency of the sale with the multiple use of the general area;

(iii) cut blocks, patches, or strips are shaped and blended to the extent practicable with the natural terrain;

(iv) there are established according to geographic areas, forest types, or other suitable classifications the maximum size limits for areas to be cut in one harvest operation, including provision to exceed the established limits after appropriate public notice and review by the responsible Forest Service officer one level above the Forest Service officer who normally would approve the harvest proposal; *Provided*, That such limits shall not apply to the size of areas harvested as a result of natural catastrophic conditions such as fire, insect and disease attack, or windstorm; and

(v) such cuts are carried out in a manner consistent with the protection of soil, watershed, fish, wildlife, recreation, and esthetic resources, and the regeneration of the timber resource.

(h)(1) In carrying out the purposes of subsection (g) of this section, the Secretary of Agriculture shall appoint a committee of scientists who are not officers or employees of the Forest Service. The committee shall provide scientific and technical advice and counsel on proposed guidelines and procedures to assure that an effective interdisciplinary approach is proposed and adopted. The committee shall terminate upon promulgation of the regulations, but the Secretary may, from time to time, appoint similar committees when considering revisions of the regulations. The views of the committees shall be included in the public information supplied when the regulations are proposed for adoption.

(2) Clerical and technical assistance, as may be necessary to discharge the duties of the committee, shall be provided from the personnel of the Department of Agriculture.

(3) While attending meetings of the committee, the members shall be entitled to receive compensation at a rate of \$100 per diem, including travel time, and while away from their homes or regular places of business they may be allowed travel expenses, including per diem in lieu of subsistence, as authorized by section 5703 of title 5, United States Code, for persons in the Government service employed intermittently.

(i) Resource plans and permits, contracts, and other instruments for the use and occupancy of National Forest System lands shall be consistent with the land management plans. Those resource plans and permits, contracts, and other such instruments currently in existence shall be revised as soon as practicable to be made consistent with such plans. When land management plans are revised, resource plans and permits, contracts, and other instruments, when necessary shall be revised as soon as practicable. Any revision in present or future permits, contracts, and other instruments made pursuant to this section shall be subject to valid existing rights.

(j) Land management plans and revisions shall become effective thirty days after completion of public participation and publication of notification by the Secretary as required under section 6(d) of this Act.

(k) In developing land management plans pursuant to this Act, the Secretary shall identify lands within the management area which are not suited for timber production, considering physical, economic, and other pertinent factors to the extent feasible, as determined by the Secretary, and shall assure that, except for salvage sales or sales necessitated to protect other multiple-use values, no timber harvesting shall occur on such lands for a period of 10 years.

Lands once identified as unsuitable for timber production shall continue to be treated for reforestation purposes, particularly with regard to the protection of other multiple-use values. The Secretary shall review his decision to classify these lands as not suited for timber production at least every 10 years and shall return these lands to timber production whenever he determines that conditions have changed so that they have become suitable for timber production.

(l) The Secretary shall—

(1) formulate and implement, as soon as practicable, a process for estimating long-term costs and benefits to support the program evaluation requirements of this Act. This process shall include requirements to provide information on a representative sample basis of estimated expenditures associated with the reforestation, timber stand improvement, and sale of timber from the National Forest System, and shall provide a comparison of these expenditures to the return to the Government resulting from the sale of timber; and

(2) include a summary of data and findings resulting from these estimates as a part of the annual report required pursuant to section 8(c) of this Act, including an identification on a representative sample basis of those advertised timber sales made below the estimated expenditures for such timber as determined by the above cost process; and

(m) The Secretary shall establish—

(1) standards to insure that, prior to harvest, stands of trees throughout the National Forest System shall generally have reached the culmination of mean annual increment of growth (calculated on the basis of cubic measurement or other methods of calculation at the

discretion of the Secretary): *Provided*, That these standards shall not preclude the use of sound silvicultural practices, such as thinning or other stand improvement measures: *Provided further*, That these standards shall not preclude the Secretary from salvage or sanitation harvesting of timber stands which are substantially damaged by fire, windthrow or other catastrophe, or which are in imminent danger from insect or disease attack; and

(2) exceptions to these standards for the harvest of particular species of trees in management units after consideration has been given to the multiple uses of the forest including, but not limited to, recreation, wildlife habitat, and range and after completion of public participation processes utilizing the procedures of subsection (d) of this section. (16 U.S.C. 1604)

#### Cooperation in Resource Planning

Sec. 7. The Secretary of Agriculture may utilize the Assessment, resource surveys, and Program prepared pursuant to this Act to assist States and other organizations in proposing the planning for the protection, use, and management of renewable resources on non-Federal land. (16 U.S.C. 1605)

#### President Budget Requests

Sec. 8. (a) On the date Congress first convenes in 1976 and thereafter following each updating of the Assessment and the Program, the President shall transmit to the Speaker of the House of Representatives and the President of the Senate, when Congress convenes, the Assessment as set forth in section 3 of this Act and the Program as set forth in section 4 of this Act, together with a detailed Statement of

Policy intended to be used in framing budget requests by that Administration for Forest Service activities for the five- or ten-year program period beginning during the term of such Congress for such further action deemed appropriate by the Congress. Following the transmission of such Assessment, Program, and Statement of Policy, the President shall, subject to other actions of the Congress, carry out programs already established by law in accordance with such Statement of Policy or any subsequent amendment or modification thereof approved by the Congress, unless, before the end of the first period of ninety calendar days of continuous session of Congress after the date on which the President of the Senate and the Speaker of the House are recipients of the transmission of such Assessment, Program, and Statement of Policy, either House adopts a resolution reported by the appropriate committee or jurisdiction disapproving the Statement of Policy. For the purpose of this subsection, the continuity of a session shall be deemed to be broken only by an adjournment sine die, and the days on which either House is not in session because of an adjournment of more than three days to a day certain shall be excluded in the computation of the ninety-day period. Notwithstanding any other provision of this Act, Congress may revise or modify the Statement of Policy transmitted by the President, and the revised or modified Statement of Policy shall be used in framing budget requests.

(b) Commencing with the fiscal budget for the year ending September 30, 1977, requests presented by the President to the Congress governing Forest Service activities shall express in qualitative and quantitative terms the extent to which the programs and policies projected

under the budget meet the policies approved by the Congress in accordance with subsection (a) of this section. In any case in which such budget so presented recommends a course which fails to meet the policies so established, the President shall specifically set forth the reason or reasons for requesting the Congress to approve the lesser programs or policies presented. Amounts appropriated to carry out the policies approved in accordance with subsection (a) of this section shall be expended in accordance with the Congressional Budget and Impoundment Control Act of 1974 Public Law 93-344.

(c) For the purpose of providing information that will aid Congress in its oversight responsibilities and improve the accountability of agency expenditures and activities, the Secretary of Agriculture shall prepare an annual report which evaluates the component elements of the Program required to be prepared by section 4 of this Act which shall be furnished to the Congress at the time of submission of the annual fiscal budget commencing with the third fiscal year after the enactment of this Act. With regard to the research component of the program, the report shall include, but not be limited to, a description of the status of major research programs, significant findings, and how these findings will be applied in National Forest System management and in cooperative State and private Forest Service programs. With regard to the cooperative forestry assistance part of the Program, the report shall include, but not be limited to, a description of the status, accomplishments, needs, and work backlogs for the programs and activities conducted under the Cooperative Forestry Assistance Act of 1978.

(d) These annual evaluation reports shall set forth progress in

implementing the Program required to be prepared by section 3 of this Act, together with accomplishments of the Program as they relate to the objectives of the Assessment. Objectives should be set forth in qualitative and quantitative terms and accomplishments should be reported accordingly. The report shall contain appropriate measurements of pertinent costs and benefits. The evaluation shall assess the balance between economic factors and environmental quality factors. Program benefits shall include, but not be limited to, environmental quality factors such as esthetics, public access, wildlife habitat, recreational and wilderness use, and economic factors such as the excess of cost savings over the value of foregone benefits and the rate of return on renewable resources.

(e) The report shall indicate plans for implementing corrective action and recommendations for new legislation where warranted.

(f) The reports shall be structured for Congress in concise summary form with necessary detailed data in appendices. (16 U.S.C. 1606)

#### National Forest System Renewable Resources

Sec. 9. The Secretary of Agriculture shall take such action as will assure that the development and administration of the renewable resources of the National Forest System are in full accord with the concepts for multiple use and sustained yield of products and services as set forth in the Multiple-Use Sustained-Yield Act of 1960. To further these concepts, the Congress hereby sets the year 2000 as the target year when the renewable resources of the National Forest System shall be in an operating posture whereby all backlogs of needed treatment for their restoration shall be reduced to



a current basis and the major portion of planned intensive multiple-use sustained-yield management procedures shall be installed and operating on an environmentally-sound basis. The annual budget shall contain requests for funds for an orderly program to eliminate such backlogs: *Provided*, That when the Secretary finds that (1) the backlog of areas that will benefit by such treatment has been eliminated, (2) the cost of treating the remainder of such area exceeds the economic and environmental benefits to be secured from their treatment, or (3) the total supplies of the renewable resources of the United States are adequate to meet the future needs of the American people, the budget request for these elements of restoration may be adjusted accordingly. (16 U.S.C. 1607)

#### Transportation System

Sec. 10. (a) The Congress declares that the installation of a proper system of transportation to service the National Forest System, as is provided for in Public Law 88-657, the Act of October 13, 1964 (16 U.S.C. 532-538), shall be carried forward in time to meet anticipated needs on an economical and environmentally sound basis, and the method chosen for financing the construction and maintenance of the transportation system should be such as to enhance local, regional, and national benefits. *Provided further*, That no more than \$242,542,000 shall be obligated for the construction of forest roads by timber purchasers. (95 Stat. 1391)

(b) Unless the necessity for a permanent road is set forth in the forest development road system plan, any road constructed on land of the National Forest System in connection with a timber contract or other permit or lease shall be de-

signed with the goal of reestablishing vegetative cover on the roadway and areas where the vegetative cover has been disturbed by the construction of the road, within ten years after the termination of the contract, permit, or lease either through artificial or natural means. Such action shall be taken unless it is later determined that the road is needed for use as a part of the National Forest Transportation System.

(c) Roads constructed on National Forest System lands shall be designed to standards appropriate for the intended uses, considering safety, cost of transportation, and impacts on land and resources. (16 U.S.C. 1608)

#### National Forest System Defined

Sec. 11. (a) Congress declares that the National Forest System consists of units of federally owned forest, range, and related lands throughout the United States and its territories, united into a nationally significant system dedicated to the long-term benefit for present and future generations, and that it is the purpose of this section to include all such areas into one integral system. The "National Forest System" shall include all National Forest lands reserved or withdrawn from the public domain of the United States, all National Forest lands acquired through purchase, exchange, donation, or other means, the National Grasslands and land utilization projects administered under title III of the Bankhead-Jones Farm Tenant Act (50 Stat. 525, 7 U.S.C. 1010-1012), and other lands, waters, or interests therein which are administered by the Forest Service or are designated for administration through the Forest Service as a part of the system. Notwithstanding the provisions of the Act of June 4, 1897 (30 Stat. 34; 16 U.S.C. 473),

no land now or hereafter reserved or withdrawn from the public domain as National Forests pursuant to the Act of March 3, 1891 (26 Stat. 1103; 16 U.S.C. 471), or any act supplementary to and amendatory thereof, shall be returned to the public domain except by an act of Congress.

(b) The on-the-ground field offices, field supervisory offices, and regional offices of the Forest Service shall be so situated as to provide the optimum level of convenient, useful services to the public, giving priority to the maintenance and location of facilities in rural areas and towns near the National Forest and Forest Service program locations in accordance with the standards in section 901(b) of the Act of November 30, 1970 (84 Stat. 1383), as amended. (16 U.S.C. 1609)

#### Renewable Resources Defined

Sec. 12. In carrying out this Act, the Secretary of Agriculture shall utilize information and data available from other Federal, State, and private organizations and shall avoid duplication and overlap of resource assessment and program planning efforts of other Federal agencies. The term "renewable resources" shall be construed to involve those matters within the scope of responsibilities and authorities of the Forest Service on the date of this Act and on the date of enactment of any legislation amendatory or supplementary thereto. (16 U.S.C. 1610)

#### Limitations on Timber Removal

Sec. 13. (a) The Secretary of Agriculture shall limit the sale of timber from each National Forest to

a quantity equal to or less than a quantity which can be removed from such forest annually in perpetuity on a sustained-yield basis: *Provided*, That, in order to meet overall multiple-use objectives, the Secretary may establish an allowable sale quantity for any decade which departs from the projected long-term average sale quantity that would otherwise be established: *Provided further*, That any such planned departure must be consistent with the multiple-use management objectives of the land management plan. Plans for variations in the allowable sale quantity must be made with public participation as required by section 6(d) of this Act. In addition, within any decade, the Secretary may sell a quantity in excess of the annual allowable sale quantity established pursuant to this section in the case of any National Forest so long as the average sale quantities of timber from such National Forest over the decade covered by the plan do not exceed such quantity limitation. In those cases where a Forest has less than two hundred thousand acres of commercial forest land, the Secretary may use two or more Forests for purposes of determining the sustained yield.

(b) Nothing in subsection (a) of this section shall prohibit the Secretary from salvage or sanitation harvesting of timber stands which are substantially damaged by fire, windthrow, or other catastrophe, or which are in imminent danger from insect or disease attack. The Secretary may either substitute such timber for timber that would otherwise be sold under the plan or, if not feasible, sell such timber over and above the plan volume. (16 U.S.C. 1611)

## **Public Participation and Advisory Boards**

Sec. 14. (a) In exercising his authorities under this Act and other laws applicable to the Forest Service, the Secretary, by regulation, shall establish procedures, including public hearings where appropriate, to give the Federal, State, and local governments and the public adequate notice and an opportunity to comment upon the formulation of standards, criteria, and guidelines applicable to Forest Service programs.

(b) In providing for public participation in the planning for and management of the National Forest System, the Secretary, pursuant to the Federal Advisory Committee Act (86 Stat. 770) and other applicable law, shall establish and consult such advisory boards as he deems necessary to secure full information and advice on the execution of his responsibilities. The membership of

such boards shall be representative of a cross section of groups interested in the planning for and management of the National Forest System and the various types of use and enjoyment of the lands thereof. (16 U.S.C. 1612)

## **Regulations**

Sec. 15. The Secretary of Agriculture shall prescribe such regulations as he determines necessary and desirable to carry out the provisions of this Act. (16 U.S.C. 1613)

## **Severability**

Sec. 16. If any provision of this Act or the application thereof to any person or circumstances is held invalid, the validity of the remainder of the Act and of the application of such provision to other persons and circumstances shall not be affected thereby. (16 U.S.C. 1614)



## National Forest Management Act of 1976

- Act of October 22, 1976 (P.L. 94-588, 90 Stat. 2949, as amended; 16 U.S.C. 472a, 476, 476 (note), 500, 513-516, 518, 521b, 528 (note), 576b, 594-2 (note), 1600 (note), 1601 (note), 1600-1602, 1604, 1606, 1608-1614)

Sec. 1. This Act may be cited as the "National Forest Management Act of 1976". (16 U.S.C. 1600 (note))

### Findings

Sec. 2. The Forest and Rangeland Renewable Resources Planning Act of 1974 (88 Stat. 476; 16 U.S.C. 1601-1610) is amended by redesignating sections 2 through 11 as sections 3 through 12, respectively; and by adding a new section 2 as follows: (see P.L. 93-378)

### Reports on Fiber Potential, Wood Utilization by Mills, Wood Wastes and Wood Product Recycling

Sec. 3. Section 3 of the Forest and Rangeland Renewable Resources Planning Act of 1974, as redesignated by section 2 of this Act, is amended by adding at the end thereof a new subsection (c) as follows: (see P.L. 93-378)

### Reforestation

Sec. 4. Section 3 of the Forest and Rangeland Renewable Resources Planning Act of 1974, as redesignated by section 2 of this Act, is amended by adding at the end thereof new subsections (d) and (e) as follows: (see P.L. 93-378)

### Renewable Resource Program

Sec. 5. Section 4 of the Forest and Rangeland Renewable Resources

Planning Act of 1974, as redesignated by section 2 of this Act, is amended by striking out the word "and" at the end of paragraph (3); striking out the word "satisfy" and inserting in lieu thereof "implement and monitor" in paragraph (4); striking out the period at the end of paragraph (4) and inserting in lieu thereof a semicolon and the word "and"; and by adding a new paragraph (5) as follows: (see P.L. 93-378)

### National Forest System Resource Planning

Sec. 6. Section 6 of the Forest and Rangeland Renewable Resources Planning Act of 1974, as redesignated by section 2 of this Act, is amended by adding at the end thereof new subsections (c) through (m) as follows: (see P.L. 93-378)

### National Participation

Sec. 7. Section 8 of the Forest and Rangeland Renewable Resources Planning Act of 1974, as redesignated by section 2 of this Act, is amended— (see P.L. 93-378)

### Transportation System

Sec. 8. Section 10 of the Forest and Rangeland Renewable Resources Planning Act of 1974, as redesignated by section 2 of this Act, is amended by inserting "(a)" immediately before the words "The Congress" and inserting at the end

thereof new subsections (b) and (c) as follows: (see P.L. 93-378)

### National Forest System

Sec. 9. Section 11(a) of the Forest and Rangeland Renewable Resources Planning Act of 1974, as redesignated by section 2 of this Act, is amended by . . . (see P.L. 93-378)

*Note*—This amendment does not affect the President's authority (16 U.S.C. 473) to combine National Forests, separate a forest into two or more National Forests, or change the boundary lines of a Forest, providing such changes do not remove lands from National Forest Status. (Senate Report No. 94-898, May 14, 1976)

### Renewable Resources

Sec. 10. Section 12 of the Forest and Rangeland Renewable Resources Planning Act of 1974, as redesignated by section 2 of this Act, is amended . . . (see P.L. 93-378)

### Limitations on Timber Removal; Public Participation and Advisory Boards; Regulations; Severability

Sec. 11. The Forest and Rangeland Renewable Resources Planning Act of 1974 is amended by adding . . . (see P.L. 93-378)

### Conforming Amendments to the Forest and Rangeland Renewable Resources Planning Act of 1974

Sec. 12. The Forest and Rangeland Renewable Resources Planning Act of 1974 is amended as follows—(see P.L. 93-378)

### Amendment to the Organic Act

Sec. 13. The twelfth undesignated paragraph under the heading "SURVEYING THE PUBLIC LANDS" in the Act of June 4, 1897 (30 Stat. 35, as amended; 16 U.S.C. 476), is hereby repealed. (16 U.S.C. 476)

### Timber Sales on National Forest System Lands

Sec. 14. (a) For the purpose of achieving the policies set forth in the Multiple-Use, Sustained-Yield Act of 1960 (74 Stat. 215; 16 U.S.C. 528-531) and the Forest and Rangeland Renewable Resources Planning Act of 1974 (88 Stat. 476; 16 U.S.C. 1600 et seq.), the Secretary of Agriculture, under such rules and regulations as he may prescribe, may sell, at not less than appraised value, trees, portions of trees, or forest products located on National Forest System lands.

(b) All advertised timber sales shall be designated on maps, and a prospectus shall be available to the public and interested potential bidders.

(c) The length and other terms of the contract shall be designed to promote orderly harvesting consistent with the principles set out in section 6 of the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended (16 U.S.C. 1604). Unless there is a finding by the Secretary of Agriculture that better utilization of the various forest resources (consistent with the provisions of the Multiple-Use, Sustained-Yield Act of 1960; 16 U.S.C. 528-531) will result, sales contracts shall be for a period not to exceed ten years: *Provided*, That such period may be adjusted at the discretion of the Secretary to

provide additional time due to time delays caused by an act of an agent of the United States or by other circumstances beyond the control of the purchaser. The Secretary shall require the purchaser to file as soon as practicable after execution of a contract for any advertised sale with a term of two years or more, a plan of operation, which shall be subject to concurrence by the Secretary. The Secretary shall not extend any contract period with an original term of two or more unless he finds—

(A) that the purchaser has diligently performed in accordance with an approved plan of operation or

(B) that the substantial overriding public interest justified the extension.

(d) The Secretary of Agriculture shall advertise all sales unless he determines that extraordinary conditions exist, as defined by regulation, or that the appraised value of the sale is less than \$10,000. If, upon proper offering, no satisfactory bid is received for a sale, or the bidder fails to complete the purchase, the sale may be offered and sold without further advertisement.

(e)(1) In the sale of trees, portions of trees, or forest products from National Forest System lands (hereinafter referred to in this subsection as "National Forest materials"), the Secretary of Agriculture shall select the bidding method or methods which—

(A) insure open and fair competition;

(B) insure that the federal government receive not less than the appraised value as required by subsection (a) of this section;

(C) consider the economic stability of communities whose economies are dependent on such National Forest materials, or achieve such other objectives as the Secretary deems necessary; and

(D) are consistent with the objectives of this Act and other federal statutes. The Secretary shall select or alter the bidding method or methods as he determines necessary to achieve the objectives stated in clauses (A), (B), (C) and (D) of this paragraph.

(2) In those instances when the Secretary selects oral auction as the bidding method for the sale of any National Forest materials, he shall require that all prospective purchasers submit written sealed qualifying bids. Only prospective purchasers whose written sealed qualifying bids are equal to or in excess of the appraised value of such National Forest materials may participate in the oral bidding process.

(3) The Secretary shall monitor bidding patterns involved in the sale of National Forest materials. If the Secretary has a reasonable belief that collusive bidding practices may be occurring, then—

(A) he shall report any such instances of possible collusive bidding or suspected collusive bidding practices to the Attorney General of the United States with any and all supporting data;

(B) he may alter the bidding methods used within the affected area; and

(C) he shall take such other action as he deems necessary to eliminate such practices with the affected area.

(f) The Secretary of Agriculture, under such rules and regulations as he may prescribe, is authorized to dispose of, by sale or otherwise, trees, portions of trees, or other forest products related to research and demonstration projects.

(g) Designation, marking when necessary, and supervision of harvesting of trees, portions of trees, or forest products shall be conducted by persons employed by the Secretary of Agriculture. Such persons

shall have no personal interest in the purchase or harvest of such products and shall not be directly or indirectly in the employment of the purchaser thereof.

(h) The Secretary of Agriculture shall develop utilization standards, methods or measurement, and harvesting practices for the removal of trees, portions of trees, or forest products to provide for the optimum practical use of the wood material. Such standards, methods, and practices shall reflect consideration of opportunities to promote more effective wood utilization, regional conditions, and species characteristics and shall be compatible with multiple use resource management objectives in the affected area. To accomplish the purpose of this subsection in situations involving salvage of insect-infested, dead, damaged, or down timber, and to remove associated trees for stand improvement, the Secretary is authorized to require the purchaser of such timber to make monetary deposits, as a part of the payment for the timber, to be deposited in a designated fund from which sums are to be used, to cover the cost to the United States for design, engineering, and supervision of the construction of needed roads and the cost for Forest Service sale preparation and supervision of the harvesting of such timber. Deposits of money pursuant to this subsection are to be available until expended to cover the cost to the United States of accomplishing the purposes for which deposited: *Provided*, That such deposits shall not be considered as moneys received from the National Forests within the meaning of sections 500 and 501 of title 16, United States Code: *And provided further*, That sums found to be in excess of the cost of accomplishing the purposes for which deposited on any National Forest shall be trans-

ferred to miscellaneous receipts in the Treasury of the United States.

(i)(1) For sales of timber which include a provision for purchaser credit for construction of permanent roads with an estimated cost in excess of \$20,000, the Secretary of Agriculture shall promulgate regulations requiring that the notice of sale afford timber purchasers qualifying as "small business concerns" under the Small Business Act, as amended, (5 U.S.C. 631 et seq.) and the regulations issued thereunder, an estimate of the cost and the right, when submitting a bid, to elect that the Secretary build the proposed road.

(2) If the purchaser makes such an election, the price subsequently paid for the timber shall include all of the estimated cost of the road. In the notice of sale, the Secretary of Agriculture shall set a date when such road shall be completed which shall be applicable to either construction by the purchaser or the Secretary, depending on the election. To accomplish requested work, the Secretary is authorized to use from any receipts from the sale of timber a sum equal to the estimate for timber purchaser credits, and such additional sums as may be appropriated for the construction of roads, such funds to be available until expended, to construct a road that meets the standards specified in the notice of sale.

*Note*—P.L. 99-500, FY 1987 Appropriations bill, included the following provision relative to this subsection of NFMA: "Notwithstanding any other provision of law, the Secretary of Agriculture is hereafter authorized to use from any receipts from the sale of timber a sum equal to the cost of construction of

roads under the purchaser election program as described and authorized in section 14(i) of the National Forest Management Act of 1976."

(3) The provisions of this subsection shall become effective on October 1, 1976. (16 U.S.C. 472a)

#### Validation of Timber Sales Contracts

Sec. 15. (a) Timber sales made pursuant to the Act of June 4, 1897 (30 Stat. 35, as amended; 16 U.S.C. 476), prior to the date of enactment of this section shall not be invalid if the timber was sold in accord with Forest Service silvicultural practices and sales procedures in effect at the time of the sale, subject to the provisions of subsection (b) of this section.

(b) The Secretary of Agriculture is directed, in developing five-year operating plans under the provisions of existing fifty-year timber sales contracts in Alaska, to revise such contracts to make them consistent with the guidelines and standards provided for in the Forest and Rangeland Renewable Resource Planning Act of 1974, as amended, (16 U.S.C. 1600 et seq.), and to reflect such revisions in the contract price of timber. Any such action shall not be inconsistent with valid contract rights approved by the final judgement of a court of competent jurisdiction. (16 U.S.C. 476(note))

#### Payments to States for Schools and Roads

Sec. 16. The sixth paragraph under the heading "FOREST SERVICE" in the Act of May 23, 1908, as amended, and section 13 of the Act of March 1, 1911, as amended (35 Stat. 260; 36 Stat. 963, as amended; 16 U.S.C. 500), are each

amended by adding at the end thereof, respectively, the following new sentence: "Beginning October 1, 1976, the term 'moneys received' shall include all collections under the Act of June 9, 1930, and all amounts earned or allowed any purchaser of National Forest timber and other forest products within such State as purchaser credits, for the construction of roads on the National Forest Transportation System within such National Forests or parts thereof in connection with any Forest Service timber sales contract. The Secretary of Agriculture shall, from time to time as he goes through his process of developing the budget revenue estimates, make available to the States his current projections of revenues and payment estimated to be made under the Act of May 23, 1908, as amended, or any other special Acts making payments in lieu of taxes, for their use for local budget planning purposes." (16 U.S.C. 500)

#### Acquisition of National Forest System Lands

Sec. 17. (a) The Act of March 1, 1911 (36 Stat. 961), as amended (16 U.S.C. 480, 500, 513-517, 517a, 518, 519, 521, 552, 563), is amended as follows—

(1) Section 4, as amended, is repealed, and all functions of the National Forest Reservation Commission are transferred to the Secretary of Agriculture. (16 U.S.C. 513)

(2) Section 5 is repealed. (16 U.S.C. 513)

(3) Section 6 is amended to read as follows: (see P.L. 61-435)

(4) Section 7, as amended, is amended to read as follows: (see P.L. 61-435)

(5) Section 9, as amended, is amended by striking out the following language in the first sentence:

"the National Forest Reservation Commission and". (16 U.S.C. 518)

(6) Section 14, as amended, is repealed. (16 U.S.C. 514)

(b) For purposes of providing information that will aid the Congress in its oversight responsibilities and improve the accountability of expenditures for the acquisition of forest land, the Secretary of Agriculture may not hereafter enter into any land purchase or exchange relating to the National Forest System of \$150,000 or more for the types of lands which have been heretofore approved by the National Forest Reservation Commission until after 30 days from the date upon which a detailed report of the facts concerning such proposed purchase or transfer is submitted to the Committee on Agriculture of the House of Representatives and to the Committee on Agriculture and Forestry of the Senate or such earlier time as may be approved by both such committees. Such report shall contain at least the following:

(1) guidelines utilized by the Secretary in determining that the land should be acquired;

(2) the location and size of the land;

(3) the purchase price of the land and the criteria used by the Secretary in determining such price;

(4) the person from whom the land is being acquired; and

(5) any adjustments made by the Secretary of relative value pursuant to section 206(f)(2)(B)(ii) of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1716). (16 U.S.C. 521b)

#### Amendment to the Knutson-Vandenberg Act

Sec. 18. Section 3 of the Act of June 9, 1930 (46 Stat. 527; 16 U.S.C. 576b), is amended—(see P.L. 71-319)

#### Amendment to the Act of June 12, 1960

Sec. 19. The Act of June 12, 1960 (74 Stat. 215; 16 U.S.C. 528-531), is amended by adding at the end thereof the following new section: (see P.L. 86-517)

#### Severability

Sec. 21. If any provision of this Act or the application thereof to any person or circumstances is held invalid, the validity of the remainder of the Act and of the application of such provision to other persons and circumstances shall not be affected thereby. (16 U.S.C. 1600(note))

FSH 2409.18 - TIMBER SALE PREPARATION HANDBOOK  
WO AMENDMENT 2409.18-92-4  
EFFECTIVE 11/23/92

CHAPTER 30 - SALE AREA DESIGN - GATE 2

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FSH 2409.18 - TIMBER SALE PREPARATION HANDBOOK  
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CHAPTER 30 - SALE AREA DESIGN - GATE 2

31 - SALE AREA DESIGN PROCESS. The sale area design process in timber sale preparation shall:

1. Develop criteria and provide for the collection, analysis, and evaluation of data necessary to respond to issues.
2. Guide preparation of site-specific design alternatives for the approving officer.
3. Assist the line officer in making a decision.
4. Provide, where necessary, an appropriate document as specified by the National Environmental Policy Act policy and procedures (FSM 1950; FSH 1909.15).
5. Produce a timber sale project plan for use by those who prepare timber sales during sale plan implementation (gate 3).
6. Include lands within and adjacent to the proposed project area.

Line officers must actively participate in developing issues and must guide data collection ensuring it serves the design process in a cost-effective manner and leads to development of a cost-effective and cost-efficient alternative.

In salvage sale situations, line officers and interdisciplinary teams must know and utilize the measures available to facilitate prompt preparation of salvage sales. Catastrophic events such as fire, windstorms, or insect epidemics often result in damaged timber which requires prompt salvage activities to maximize volume recovery and minimize value losses. Timber susceptible to rapid deterioration or damage because of insects in epidemic stages or some disease also requires prompt removal to minimize value loss. Line officers shall utilize categorical exclusions and must consider recommendations for exemption from appeals to the fullest extent possible to expedite timber salvage sales. See FSH 1909.15 for direction on categorical exclusion and see Title 36, Code of Federal Regulations, section 217.4 (a)(11) and FSH 1509.12 for direction on exemption from appeal.

31.1 - Field Reconnaissance. Conduct adequate field reconnaissance to develop sale designs. Gate 2 is where the most critical decisions are reached and the greatest expense tends to occur. Avoid too much reliance on summarized data and "paper" design. Conduct a much more intensive field reconnaissance than was performed for gate 1. Leave enough flagging, stakes, marks, or other tracks in the field so that the selected alternative can be implemented with the least amount of effort and chance for error during the sale plan implementation phase. FSM 2361 includes techniques for obtaining required archeological resource clearances and FSM 2672.4 provides guidance on preparing biological evaluations.

In salvage situations, use existing data and professional judgment to quicken the analysis process. The Land and Resource Management Planning Handbook, FSH 1909.12 and Title 36, Code of Federal Regulations (36 CFR 219.27(d)(2)(iii)) direct that unit size limitations shall not apply to the size of areas harvested as a result of natural catastrophic conditions such as fire, insect and disease attack, or windstorm. Follow Regional guidelines for exceptions to unit size limitations in these situations.

31.2 - Documentation. Include in sale area design documents sufficient site-specific information, preliminary sale design, and management guidance to permit a smooth transition to gate 3, sale plan implementation. Include such details as the following:

1. Approximate cutting unit location and size.
2. Nature and condition of timber stands proposed for harvest.
3. Silvicultural prescriptions.
4. Selected logging systems information.
5. Locations of key local roads.
6. Planned fuel treatments.
7. Locations of key resource values.
8. Preliminary design for resource improvements.
9. Zones or areas with specific management requirements, constraints, or mitigation requirements.

Use of locally or Regionally developed forms, marking guides, cutting unit cards or check-lists is encouraged to insure a more complete transfer of information. Avoid excessive use of jargon, codes or abbreviations that could be misinterpreted.

31.3 - Area Analysis. In sale area design, consider the development of the entire drainage, the adjacent area, the transportation analysis area, and other logical units, even though a proposed sale may affect only a portion of the area. Consider the pattern, methods, and timing of treatments for the entire area to ensure that future treatments and options continue to meet management objectives.

31.4 - Interdisciplinary Skills. The efforts and skills needed to assess a project area vary, depending on the complexity of the sale proposal, its possible environmental impact, the status of land and resource management plans applicable to the area, current issues, and specific management concerns. Based on these variables, develop the levels and types of inventory information and resource specialist involvement needed for environmental analysis.

32 - ECONOMIC ANALYSIS AT GATE 2. Analyze the costs and benefits of project alternatives.

32.1 - Analytical Procedures. Choose procedures to emphasize differences among project alternatives. When developing alternatives to meet management objectives, including cost-efficiency, consider variations in activities and methods, but also, variations in scheduling, location, or size of the project (volume or acres).

For salvage sales, conduct the economic analysis to assess the alternatives related to reducing the loss of value of the timber. In the analysis procedures, focus on maximizing value more than least-cost or cost-efficiency objectives. To save time, use applicable existing analyses, such as those performed by the Forest Pest Management staff, and limit the scope of the analysis.

Select the following analysis procedures as appropriate for the scope and complexity of the decision. See FSH 1909.17 for more detail.

1. Efficiency Analysis. To compare benefits and costs, use one or more of the following:

- a. Use cost-effective, or least-cost analysis, only when all decision unit options under consideration (or all project alternatives) achieve the specified objective(s) equally or adequately well or when they produce essentially the same benefits and effects.
- b. Use financial analysis to compare expected gross revenues to estimated Forest Service costs, resulting in an estimate of net revenues. A timber financial analysis is a comparison of direct timber benefits with direct timber costs.
- c. Use analysis of cost efficiency to compare all costs and benefits relevant to the decision, some of which may be nontimber, non-Forest Service, or nonmonetary.

2. Impact Analysis. Conduct a socioeconomic impact analysis if an environmental impact statement is prepared (FSM 1970 and FSH 1909.17).

3. Tradeoff Analysis. If meeting a specified objective limits, reduces, or precludes achievement of some other objective(s), consider it a binding constraint. Use trade off analysis to compare what is gained with what is given up in meeting this objective or constraint. Compare the monetary and nonmonetary results of a scenario with the constraint, to the results of a scenario without the constraint.

4. Sensitivity Analysis. Perform a sensitivity analysis within any of the preceding methods if uncertainty about a value or underlying assumptions constitutes an issue important to the decision. Use sensitivity analysis to determine the consequences of varying the value of one input variable (or assumption) while holding all other analysis

factors constant. For example, recalculate present net value (PNV) with a 10-percent discount rate instead of 4 percent, keeping all other values unchanged. If sensitivity analysis is used, document and discuss the range of values tested and their implications with respect to the decision to be made.

32.2 - Analytical Standards. A number of standards may be applicable to the economic analysis.

32.21 - Efficiency Measures. In comparing project alternatives, use present net value and benefit-cost ratio as the principal measures of cost-efficiency. If alternatives differ greatly in scale, the benefit-cost ratio provides a more valid measure of cost-efficiency than does present net value. If future management of the stand(s) is an issue at time of the timber sale, it may be appropriate to calculate a soil expectation value (SEV) to provide the decision maker with additional information.

32.22 - Time Period. Ensure that schedules of costs and benefits cover the same period of time in all project alternatives. The length of time for analyzing timber sale project alternatives must encompass sale preparation through regeneration of the stand(s). If capital investments are an important factor, consider the design life of the investment in determining the time frame. However, if the timber sale decision encompasses stand management activities beyond regeneration, the appropriate time frame includes sale preparation through one full rotation. For calculation of soil expectation value only, the time begins with the new stand(s) and extends through an infinite series of rotations.

32.23 - Monetary Costs. Include direct costs for all Forest Service activities encompassed by the decision to be made. Direct timber costs begin with sale preparation and administration and always include necessary regeneration and mitigation measures.

If specified roads are to be part of the sale decision, include in the analysis total costs of any planning, design, construction, reconstruction, operations, and maintenance that occur within the time frame, regardless of funding source.

Provide the following additional information, when applicable:

1. If road construction to a higher standard than needed for harvest and removal of timber is under consideration, identify the difference between total transportation costs and the lowest transportation costs for the immediate sale. Display this difference for each project alternative or as a fixed cost among alternatives, whichever is appropriate. Discuss the relationship of these increased costs to expected benefits and management objectives.

2. Reference the analysis of the transportation network in the area, when applicable (FSM 7710). If road design and location choices remaining at the sale level include consideration of future uses or entries, reflect this in the time frame and included costs and benefits. However, if transportation costs are likely to increase or to vary



significantly among project alternatives because of future benefits that are uncertain or impossible to value monetarily, identify the cost differences and discuss their relationship to management objectives and expected or potential benefits.

3. If total costs of Forest Service activities (excluding roads) are greater than the direct costs of timber production (excluding roads) and if these nontimber direct costs are important to the decision, identify the difference between these total costs and the lowest direct timber costs for the immediate sale (excluding roads). Display this difference for each project alternative or as a fixed cost among alternatives, whichever is appropriate. Discuss the relationship of these increased costs to management objectives and expected benefits.

4. If sale requirements would cause particularly high purchaser costs or would cause purchaser costs to vary significantly among project alternatives, incorporate logging, hauling, and other relevant purchaser costs into the analysis. This may be done implicitly by adjusting stumpage values, or explicitly, by identifying and displaying purchaser costs as a cost item separate from Forest Service costs. Document which purchaser costs, if any, were explicitly included in total costs of the project alternatives, and ensure that timber benefits are consistently valued. Discuss the relationship between increased purchaser costs and management objectives.

32.24 - Monetary Benefits. Include direct benefits from the project that occur within the time period affected by the decision to be made.

Express direct timber benefits as estimated total high bid value (estimated advertised stumpage value plus local average bid premium), or its equivalent. The bid premium shall be a 5-year average, using real dollar values. Adjust average bid premiums, if necessary, to reflect sale length, salvage and deficit sales, logging systems, and other factors that may influence bidding behavior. Recognize measurable differences in timber benefits among project alternatives that may be caused, for example, by variations in total volumes, species composition, and product size, type, or quality.

Include relevant nontimber monetary benefits when appropriate, based on the scope and complexity of the decision and in accordance with Regional direction.

In an efficiency analysis, value the costs and the benefits at the same stage of processing. The Forest Service produces stumpage, which represents a processing stage. Costs of producing stumpage are direct timber costs, which include specified roads. Use of high bids produces consistent valuation of the direct benefits of producing stumpage. If, however, costs included in the analysis differ from the costs of production of stumpage, then the benefits must differ equivalently. Consider the following, when appropriate:

1. If Forest Service costs include purchaser-built roads, use of statistical high bid (SHB) values is inconsistent and undervalues the timber because SHB does not reflect the timber value exchanged for purchaser-built roads. In effect, SHB represents an earlier stage of processing than high bid. The high bid accounts for the value added by providing access; SHB does not.

2. If purchaser costs are included in total costs, using high bid is inconsistent and undervalues the timber. Each logging activity represents further processing beyond stumpage and thus adds value to the product. Incorporate equivalent benefit value for each purchaser activity cost explicitly included. If all logging costs are included in the analysis, timber benefits should reflect the full value of logs delivered to the mill. Document assumptions and values used. Display both total timber benefits and total stumpage value for each project alternative, because purchaser cost variations cause stumpage values to vary also.

3. If nontimber outputs are monetarily valued in the analysis, ensure that these, too, are valued at the same stage of processing for which costs are incurred.

32.25 - Nonmonetary Benefits and Costs. Identify relevant benefits and costs not monetarily valued in the analysis and describe how they vary among project alternatives. Discuss the relationship between the monetary analysis and relevant nonmonetary or nonquantified resource values, environmental effects, amenities, and other qualitative considerations. Assess measurable tradeoffs when practicable and appropriate to the scope and complexity of the decision, and in accordance with Regional direction.

32.26 - Discounting. Discount all costs and benefits to an initial year. The initial (or zero) year is usually the present year or the first year of expenditures. Assume that all transactions occur at the end of the year. Use a 4-percent real discount rate (FSM 1970). Discounting make future values comparable to present values. A dollar received today is worth more than a dollar received in the future, because a dollar can earn interest.

Do not use discounting for salvage sales, because of the rapid loss of value associated with most of these sales.

32.27 - Inflation and Trends. Express all monetary values in constant real dollars for a given base year; if multiyear historical data are used, remove the effects of inflation so that all values reflect the same purchasing power of the dollar. When adjustment is necessary, use the Gross National Product Implicit Price Deflator.

Assume that prices and costs will remain constant in real terms throughout the time period; do not adjust future values for inflation. Real trends may be used if there is sufficient, supportable evidence that within the time period, some value(s) will significantly increase or decrease relative to other values used in the analysis. Document assumptions.

32.28 - Risk and Uncertainty. Recognize uncertainty about projected future values used in the analysis (costs, benefits, and outputs). If any projected values constitute an issue important to the decision, conduct a sensitivity analysis. In addition, consider the following:

1. If there is some probability of regeneration failure, estimate the number of acres that are likely to need retreatment(s) to achieve adequate restocking within 5 years of final harvest (FSM 2470). Incorporate retreatment activities and costs into the analysis. Document assumptions. Do not overestimate regeneration costs or plan for fail-safe regeneration when natural regeneration is probable.

2. If high costs are estimated for an activity (for instance, slash disposal) by assuming very low risk (for instance, no risk with 100-percent cleanup), consider alternative treatment methods that could reduce costs by allowing a higher (but still acceptable) degree of risk, in accordance with Regional standards and the forest plan. Regional Foresters may establish risk analysis guidelines to evaluate these tradeoffs.

3. If yield projections are included in the analysis, document assumptions concerning volume or value losses due to fires, insects, diseases, or storms.

32.3 - Display of Economic Analysis.

32.31 - Each Alternative. At gate 2, display the total discounted costs, the total discounted benefits, the present net value, and the benefit-cost ratio for each project alternative. Display discounted costs for each decision unit. Identify those costs that do not vary among project alternatives. Document assumptions. Display additional information as appropriate, in accordance with Regional direction and standards.

Discuss the relationship between the monetary analyses and relevant qualitative considerations.

For salvage sales, limit the economic analysis to the short term.

32.32 - Recommended Alternative. In addition to the preceding information, include a narrative that addresses the following:

1. How the alternative contributes to meeting forest plan objectives.
2. Which management requirements were imposed to meet other resource objectives, and the resulting trade-offs.
3. If it is not the most cost efficient alternative, why was it selected.

33 - TRANSPORTATION PLANNING. If transportation planning or analysis has not been completed for the sale area as part of the forest plan or a previous effort, complete it as part of the analysis for gate 2. It is usually crucial to a good economic analysis, as discussed in 32.2.

33.1 - Transportation Planning in Project Design. Plan integrated transportation and logging systems for the analysis area. Ensure that the requirements for construction, operation, and maintenance of roads for commercial timber sale use are consistent with harvesting procedures and with the forest plan and that they are likely to achieve resource management objectives. Apply the following rules:

1. Integrate the transportation planning process with other resource analyses to ensure that the road system requirements meet documented resource management objectives.
2. Consider alternative road systems and timber harvest methods in the transportation planning process.
3. Document system roads selected in planning on the National Forest transportation plan as long-term or short-term facilities.
4. Analyze existing forest development roads to ensure that before timber sale use, the roads meet the requirements of FSM 7720.
5. Justify recommendations for exclusions of commercial use of forest development roads by a statement of the reasons for exclusion, other alternatives considered and the costs involved.
6. Consider using low-standard or controlled temporary road construction when salvaging timber resulting from catastrophic damage.

33.2 - Planned Capacity. Plan for timber sale haul roads with the capacity to handle the scheduled traffic safely. Apply the following rules:

1. Permit no road use if the use would cause irreparable damage to the road or unacceptable impacts to adjacent resources. Damage does not include normal wear and tear correctable by maintenance activities.
2. If the additional traffic generated by an individual sale exceeds the operational limits of a road, authorize the additional use only if one or more of the following conditions apply:
  - a. Road construction occurs in advance of the sale.
  - b. Traffic management controls can be implemented within the limits of the facility. For public safety, restrict public access in situations where low-standard or temporary roads are used for quick access to salvage.
  - c. Road reconstruction occurs as a requirement of the sale.
3. Use funds other than purchaser credit to finance that portion of the reconstruction needed to accommodate the traffic on the road prior to the sale.

4. Design roads constructed on National Forest lands to standards appropriate for the intended uses; consider safety, cost of transportation, and impacts on lands and resources. Design and construct roads as stable and durable structures to facilitate maintenance during and after use. Include necessary drainage facilities, adequate erosion control, gates or other closure devices, and resource protection devices.

33.3 - Purchaser Credit. Plan to use purchaser credit for the following:

1. Road requirements necessary to minimize temporary impacts on resources; especially, land, water, wildlife, and air.
2. Construction of a quality that permits future use without need to reaccomplish or replace work that is currently in satisfactory condition. Construction should minimize repeated impacts and avoid unacceptable risks to resources. It should not result in higher future capital expenditures, that could be required if, for example, roads had to be rebuilt or relocated for each sale.
3. Pavement structures, when needed for structural support to prevent erosion from traffic or natural elements, with sufficient depth for wear and maintenance during and at the termination of the sale.
4. Construction requirements that result in the lowest total transportation cost (construction, hauling, and maintenance) for the sale, while ensuring safety and minimizing temporary or extended resource impacts.

34 - ENVIRONMENTAL ANALYSIS. The methods used for environmental analysis vary from situation to situation and among the various administrative units. In every case, conduct the environmental analysis so that the sale is based on field reconnaissance, meets management objectives and addresses the issues identified at gate 1, or during the analysis for gate 2 (FSH 1909.15).

For salvage situations, refer to section 31 for direction on facilitating prompt timber sale preparation and removal to prevent additional volume and value losses.

35 - TRACKING AND REPORTING GATE 2. The sale process passes gate 2 when a decision maker selects a preferred alternative through the environmental analysis or assessment process and signs the decision notice.

35.1 - Documentation. As a minimum, requirement for the process to pass this gate, documentation must include:

1. A signed decision notice by official authorized to approve the project.
2. An analysis file documenting the analysis and the information used in the analysis.
3. A sale implementation plan (project plan), which provides field instruction for carrying out the selected alternative.

35.2 - Sale Tracking and Reporting. Update the gate accomplishment to show completion of gate 2.

Update or establish the various data elements that the Region has included in the TMIS data base. Those that are often useful as part of the sale implementation plan include:

1. Volume detail.
2. Area description.
3. Sale remarks.
4. Activity scheduling.
5. Engineering.
6. Engineering estimate.
7. Sale unit.
8. Skill code.
9. Fund code.

Every data element will not be equally useful in every sale, but track the critical activities. On some sales, cultural resources or endangered species may require specific activities. Tracking the activities will assist in their timely completion. Record enough information to help complete the sale implementation plan, but not so much that updating the information becomes a burden.

Document specific reasons a sale is withdrawn or delayed, such as the need for an environmental analysis or assessment.

Track activities to individual cutting units or stands within payment units or subdivisions of a timber sale area when useful. This allows activities that may have been addressed in general terms during the environment analysis to be planned for specific locations in the field.

## TIMBER SALE PREPARATION HANDBOOK

★- 31 - SALE AREA DESIGN PROCESS31.2 - Documentation1. Guidelines for Preparation of Logging Feasibility Reports

a. Objectives of Logging Feasibility Report. The ultimate objective of the logging feasibility report is to insure the operability of the timber sale. It is a reference document which provides direction through the planning, layout, appraisal, and harvesting operations. The document is intended to provide guidance in the design of future sales.

The preparation of the report will span Gates 1, 2, and 3 of the timber sale planning process. The final product will be completed prior to the sale appraisal. The Forests are permitted flexibility in fitting the logging feasibility report into their planning process; however, the report should satisfy the following objectives:

## (1) Prior to the completion of Gate 1:

Assure that the Position Statement is realistic.

## (2) Prior to the completion of Gate 2:

(a) Assure that the project proposal is integrated with long-term logging and transportation needs.

(b) Assure that the logging plan is viable and that no major changes to the Environmental Assessment (EA) will be required.

(c) Assure land manager that resource management objectives can be met.

(d) Provide documentation supporting environmental analysis.

(e) Provide guidance for sale layout.

(f) Assure cost effectiveness of the proposed logging/transportation system.

(g) Provide information for road design and management.

(h) Reduce the amount of field work that has to be redone or corrected.

## (3) Prior to the completion of Gate 3:

(a) Assure that the sale is completely operable as designed.

(b) Reassure land manager that resource objectives can be met.

(c) Provide information for timber sale appraisal.

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## TIMBER SALE PREPARATION HANDBOOK

★ 3. Specific Design Elements to be Included in Logging Feasibility Reports:

	TO BE COM- PLETED PRIOR TO PASSING GATE 2	TO BE COM- PLETED PRIOR TO PASSING GATE 3
Cover sheet with signatures.	Optional	X
Table of contents.		X
Vicinity map.	X	X
Brief narrative description of sale.		X
Resource management objectives.	X	X
Critical elements and problem areas.	X	X
Results of area analysis logging and transportation design including maps.	X	X
a. Design elements for all settings:		
(1) Aerial photo overlays and topographic maps of the proposed setting(s) showing the following:	OPT	X
(a) Identified locations of all landings, cold decks, YUM decks, special processing sites (delimber-buckers), chippers, portable sawmills, and all truck roads.		
(b) Yarding directions.		
(c) Cutting unit boundaries.		
(d) Skidding and yarding boundaries reflecting yarding systems, suspension requirements and silvicultural prescriptions which affect acceptable yarding equipment.		
(e) Property boundaries and ownership.		
(f) Stream buffer strips and streamside management units.		
(g) Locations of wildlife tree management zones.		



## TIMBER SALE PREPARATION HANDBOOK

	TO BE COM- PLETED PRIOR TO PASSING GATE 2	TO BE COM- PLETED PRIOR TO PASSING GATE 3
(3) Log weight and silvicultural data. Include items needed for determination of yarding payloads and/or production rates.		X
(4) Logging system requirements and recommended system. Describe the recommended system and rationale. Where needed, include a cost analysis or refer to sections of the environmental document where cost comparisons show the selected system to be the most cost efficient system which will meet management objectives. Describe alternate systems considered and reason for rejection or acceptability.	X	X
(5) Descriptions and drawings as appropriate: <ul style="list-style-type: none"> <li>-Temporary roads.</li> <li>-Critical landings.</li> <li>-Cold deck areas.</li> <li>-YUM pile sites.</li> <li>-Special processing sites (delimber, log makers, portable chippers, portable sawmills).</li> </ul>		X
(6) Production estimates. Except for systems covered by Agency average cost and adjustment factors, include estimates of hourly volume production for appraiser's use. A separate estimate of hours required for move in, move out, initial rig up and rig down, landing construction, and any other fixed costs associated with the logging system component or groups of components as appropriate should be made. Production estimates may apply to components of a mechanized logging system such as felling, bunching, delimbing, bucking, and skidding or yarding of prebunched stems.		X

## TIMBER SALE PREPARATION HANDBOOK

	TO BE COM- PLETED PRIOR TO PASSING GATE 2	TO BE COM- PLETED PRIOR TO PASSING GATE 3
<p>(4) List of recommended equipment not included in Agency average costs such as forwarders, clambunk skidders skidding prebunched stems, or shovel logging machines.</p> <p>Type: _____ Make: _____ Model: _____</p>		X
<p>c. Additional elements for mechanized harvest settings: (Mechanized harvest is defined as harvesting operations employing the use of one or more machines, other than chainsaws, for felling, delimbing, and bucking operations.)</p>		
<p>(1) Additions to photo overlays and maps:</p>	OPTIONAL	X
<p>(a) Representative felling or bunching pattern.</p>		
<p>(b) Feller-buncher or harvester travel path and minimum spacing in relationship to designated skid trails or skyline corridors.</p>		
<p>(2) Special machine requirements or limitations such as feller-buncher boom reach, and so forth.</p>	OPTIONAL	X
<p>(3) Recommended equipment:</p>		X
<p>(a) Feller-buncher: Type _____, Make _____, Model _____</p>		
<p>(b) Delimber-bucker: Type _____, Make _____, Model _____</p>		
<p>(c) Harvester: Type _____, Make _____, Model _____</p>		
<p>(d) Other: Type _____, Make _____, Model _____</p>		
<p>(e) Crew: _____, _____, _____</p>		

## TIMBER SALE PREPARATION HANDBOOK

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	TO BE COM- PLETED PRIOR TO PASSING GATE 2	TO BE COM- PLETED PRIOR TO PASSING GATE 3
(4) Spar and lift tree analysis: The vertical spar guyline force analysis computer program should be used to analyze guyline tensions and compression forces for all vertical spar setups where guyline angles approach or exceed 50 degrees from horizontal, or where spar or lift tree sizes are questionable.	OPTIONAL	X
(5) Plotted profiles and appropriate computer printouts or other payload analysis for all critical skyline roads coordinated with map and photo identifiers and referenced to field control points. Show source of data for each profile (topographic map, aerial photos, field survey).	OPTIONAL	X
Standards:		
Profiles from maps or photos which develop marginal payloads should be field surveyed and reanalyzed.		
To qualify as acceptable, cable spans should develop payloads equivalent to the greater of two to three average logs or one largest diameter butt log of shortest acceptable length.		
Complete tabulation of skyline logging systems payload data.		
e. Additional elements for helicopter settings:		
(1) Additions to photo overlays and maps:	OPTIONAL	X
(a) Locations of fueling areas, water sources, flight hazards, and flight restricted areas.		
(b) Tagline lengths.		
(2) Class of helicopter.		X

## TIMBER SALE PREPARATION HANDBOOK

	TO BE COM- PLETED PRIOR TO PASSING GATE 2	TO BE COM- PLETED PRIOR TO PASSING GATE 3
f. Additional elements for balloon settings:		
(1) Additions to photo overlays and maps identify balloon bedding ground.	OPTIONAL	X
(2) Scale drawing of balloon bedding ground(s)		X
(a) Show anchors, including hard point.		
(b) Show bedding ground gradient.		
(c) Show prevailing wind direction.		
(d) Show access to and from.		
(3) Descriptions of anchors for tail blocks, corner blocks, and sucker down blocks.		X
(4) Describe recommended balloon logging equipment.		X
(5) Unit and landing elevations and expected payload capabilities.		X

4. Format of Logging Feasibility Reports. The Logging Feasibility Report should be a combination of maps, tables, computer analysis data, and brief narrative descriptions. Although each Forest has flexibility in formatting the report, the use of a consistent Forest-wide format is recommended for sales with similar logging systems. Summary tables are recommended as an efficient method of displaying data for appraisers, sale administrators, and operators. See Exhibits 1 and 2 for examples of tables for anchors and payloads.

## TIMBER SALE PREPARATION HANDBOOK

★ Exhibit 1 - Continued

C. <u>Tail Trees (No.)</u>	10	0	0	9				
Field Verified	Y			Y				
Species	DF			DF				
Diameter	36"			34"				
Total Height	180			160				
Height to Rigging	40'			40'				
Rigging Diameter	18"			16"				
Guyline Stumps Verified	Y			Y				
Buckle Guys Needed (Lateral Yarding)	N			N				
Machine Accessible	N			N				
Work Road Feasible	N			N				

10. Unit Summary: Guyline; Skyline Anchors; Tail Trees; OtherA. Guylines:

- Multiple-Stump Anchors Needed (No.) 0
- Man-Made Anchors Needed (No.) 2

B. Skyline Anchors:

- Multiple-Stump Anchors Needed (No.) 2
- Man-Made Anchors Needed (No.) 1
- Tail Trees Needed (No.) 19
- Stump Anchors Needed (No.) 15

D. Other Details Not Adequately Covered Above:  
(Diagram if Possible)

UNIT #2 LANDING #2 WILL REQUIRE MULTIPLE  
STUMP SKYLINE ANCHORS IN NW CORNER  
OF UNIT (SEE UNIT MAP). 2 TREES PER  
MULTI-STUMP ANCHOR WILL BE SUFFICIENT

## TIMBER SALE PREPARATION HANDBOOK

31 SALE AREA DESIGN PROCESS31.2 Documentation

2. Review and Approval Process. This supplement establishes the review and approval process for Logging Feasibility Reports on the Siuslaw National Forest.

All Logging Feasibility Reports will be reviewed by a qualified individual. This review will be done by a Forest Engineering Institute (FEI) graduate other than the preparer, or by the Forest Logging Specialist.

The Forest Logging Specialist will be required to review the logging feasibility reports which contain the following sale conditions:

- \* Access roads over 20 % grade.
- \* Skylines with downhill full log suspension.
- \* Skyline load capacity below capacity to yard largest logs in 17' segments during downhill yarding.
- \* Multi-span Yarding.
- \* Cable Swings.
- \* Helicopter Yarding.
- \* Balloon Yarding.
- \* Landings with guyline angles greater than 50 degrees.
- \* Anchors other than stumps, deadmen, or crawler tractors.
- \* Mechanized harvest operations where feller-bunchers, delimbers-buckers, harvesters, or in-woods chippers are planned.
- \* Unusual landings (i.e. cribbed or tight landings).
- \* Tailtree configurations outside the State Safety Code.

**USFS Helicopter Timber Sales**  
**Preliminary Survey**  
**(March-April 1994)**

Please select one or two main reasons for each helicopter unit from the following categories:

Economics, Terrain-limited, Time-limited, Equipment-limited, Soils-limited, Visual Issue, Water Quality Issue, Roads Issue, Wildlife Issue, Access-limited, Other (please explain).

<u>Timber Sale Name</u> Season/Year Harvested	<b>Helicopter</b> Unit #	Unit Acres	Volume (MBF) Harvested	<b>Main Reason for Helicopter Logging</b>
Example Summer 1992	3A	23	941	Other- Cultural Resources
Example Summer 1992	5	21	780	Access-limited
Example Summer 1992	8	31	1120	Roads Issue

<u>Timber Sale Name</u> Season/Year Harvested	<b>Skyline</b> Unit #	Unit Acres	Volume (MBF) Harvested
Example	3B	12	621
Example	2B	15	718

**Preliminary Survey Results**  
**(May 1994)**

Twelve Forest Service forest managers were contacted (by telephone and computer mail) and asked to provide a sale area map, unit acres and volumes, and the main reason for helicopter logging.

The following table lists the reasons given for 128 helicopter units on 21 non-salvage timber sales (sold during the period from Fall 1990 to Fall 1993) in the Oregon-Washington Cascades. The forest manager selected one or two main reasons for each helicopter unit.

<u>REASONS GIVEN FOR HELICOPTER LOGGING</u>	<u>Number</u>
Access-limited	44 (27 %)
Road issues	38 (23 %)
Visual issues	20 (12 %)
Wildlife issues	16 (10 %)
Soils-limited	10 ( 6 %)
Economics	9 ( 5 %)
Cultural Resources	7 ( 4 %)
Wetlands/Riparian	5
Time-limited	5
No landings	3
Purchaser's choice	3
Terrain-limited	2
Advanced regeneration	<u>2</u>
	164



## ***Data Collection***

### ***Planning Process Documents:***

#### ***Forest Plan***

*Management Direction, Standards & Guidelines for Harvest-Transportation (H-T) System Planning.*

*Information Needs and Monitoring Plans specific to H-T System Planning.*

#### ***NEPA (Environmental Analysis)***

*What were the significant issues (full description of any related to economics, harvest-transportation systems and resource mgmt. access)?*

*Is there a range of logging and road options in the alternatives (long term considerations?)*

*Which mitigation measures are specific to logging systems & road issues?*

*Did the EA include a Harvest-Transportation (H-T) economic analysis?*

*Are there any monitoring plans specific to logging systems & road issues?*

*Specific wording in the Decision Notice related to harvest systems, roads, economics, or resource mgmt. access.*

#### ***Logging Feasibility Report - Transportation Plan***

*Were different logging systems & road options considered?*

*Are there aerial photo overlays, topographic maps, or GIS maps showing the harvest method and road systems planned for all commercial forest land contiguous to the proposed sale area?*

*Are there HELIPACE, LOGGERPC, SNAP, PLANS, or network analyses? Reference to past harvest method & road system analyses?*

*Was there ground profile data, road location and design for helicopter units?*

*Does the report mention future resource management access needs within the planning area?*

*Rationale for the selected harvest system and/or rationale for rejecting other alternatives considered.*

*Was there any cost analysis?*

*Does the transportation maps show settings, landings, haul route, & accessibility problems?*

**Interview Questions:** (several questions from the following list were selected for each interview depending on the person's involvement in the H-T planning process)

*Does the selected alternative provide access for future silvicultural needs and other resource management activities within the planning area?*

*What % of the planning area contained stands at maximum density (SDI)? What % of this area was not treated in the timber sale? Why not? Did the silviculture effects analysis mention the effects (direct, indirect, & cumulative) of not treating these stands?*

*Does helicopter logging preclude future options for other harvest systems & roading?*

*Did a previous helicopter sale and road decision set a precedent for the next sale's harvest method - road system?*

*What is the average existing road density on the Forest and in the planning area? What is the desired road density for each of the resource areas? What is the threshold?*

*Do the specialists monitor how resource compatible the roads are before and after closure? If so, how?*

*What are some of the problems with road closures?*

*What questions do you ask to decide whether a road should be closed or not?*

*Weren't watershed, recreation, visual, and wildlife issues addressed when the IDT planned to build the road in the first place?*

*How important is economics? Do the activity costs include the cost of doing business (project implementation, administration, and monitoring) with fewer roads?*

*Have you seen any publications on methods or processes used to evaluate/balance the costs, benefits, and impacts of roads?*

*Do you prefer helicopter logging? Maximum road closures? Why or why not?*

*After a decision is made to close a road or not build a road, what are the chances that they will reopen or build a road in the future?*

*Was the Logging Systems person or the Transportation Planner involved early on in the Forest Plan and NEPA planning phases to identify significant issues and to develop alternatives?*

*What are the major bottlenecks in the timber sale planning process?*

*Are you optimistic that all the professionals in the different disciplines can compromise on the significant issues?*

*Which computer programs do you use to display the effects or to generate alternatives?*

*Was the logging system, roads, and landings implemented as planned? How often are changes made?*

*Did you have a problem leaving snags in the helicopter units? Are the snags monitored- how long do they last?*

*Do you document or monitor how well the specific harvest system addressed the issues or achieved the objectives?*

*Could you fully describe your concern with the harvest method and roads? Do you have or could I take a picture of these issues? Which studies or data quantifies or verifies the significance of this issue? What mitigation measures are possible?*

*Which Forest Engineering skills (logging systems, hydrology, transportation planning) do you think the Forest Service will need in the future?*

### ***Field Data Collection:***

*The specialists were also asked to pin-point on a map or aerial photo any site-specific examples of road and logging effects for me to check during the field trip. Two-three days were spent in the office reviewing documents and interviewing ID team members. On the final day, 1-3 specialists accompanied me in the field and we discussed and looked at: environmental impacts from roads and logging, economic and technical feasibility, and the main reason for choosing 'helicopter logging and no roads'.*

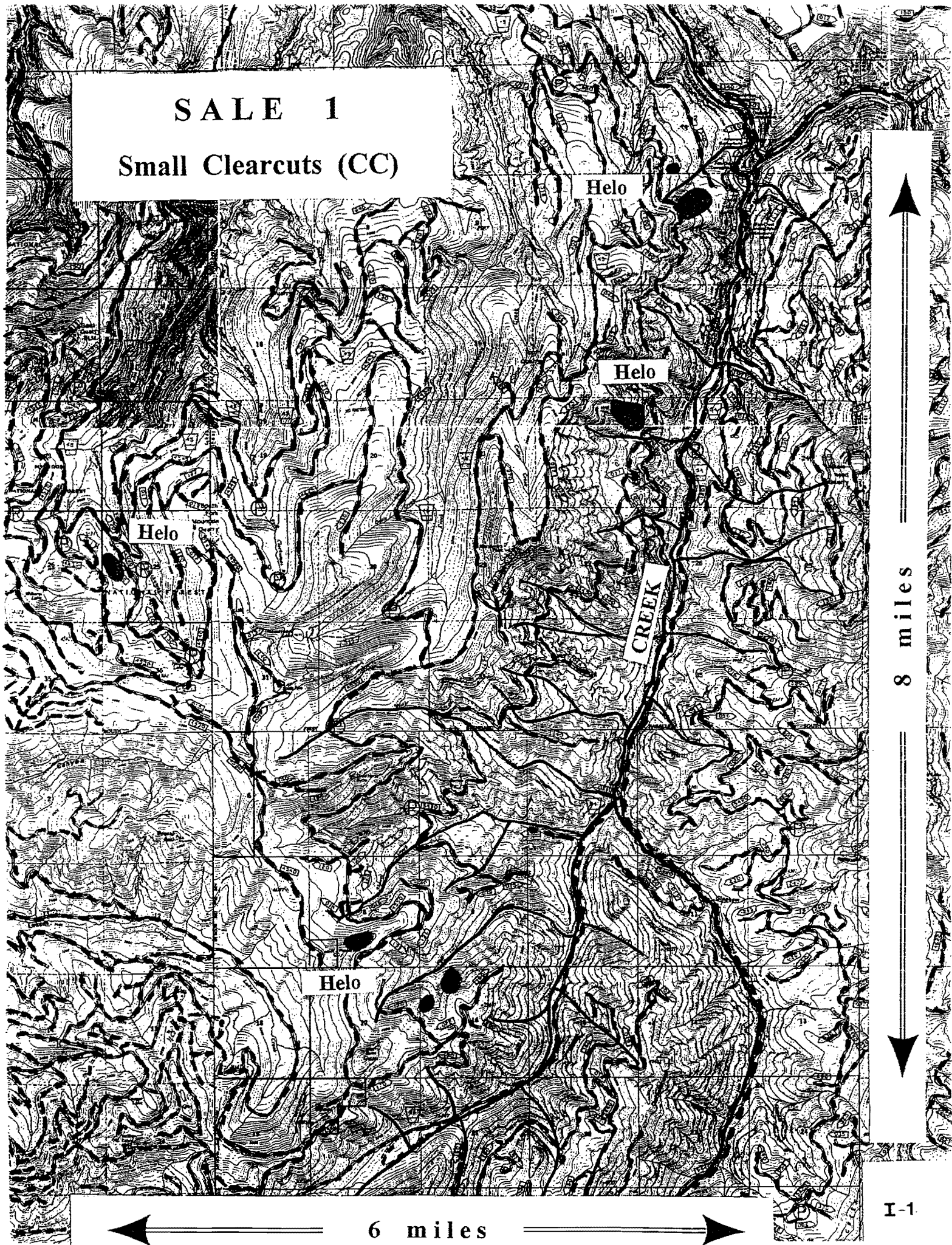
### ***Possible Outcomes***

*A critique or evaluation of the Forest Service's timber sale planning process.*

*Possible ways of streamlining the process (reducing the paperwork).*

*A list of findings from the interviews that indicate problems that need further research.*

**SALE 1**  
**Small Clearcuts (CC)**



8 miles



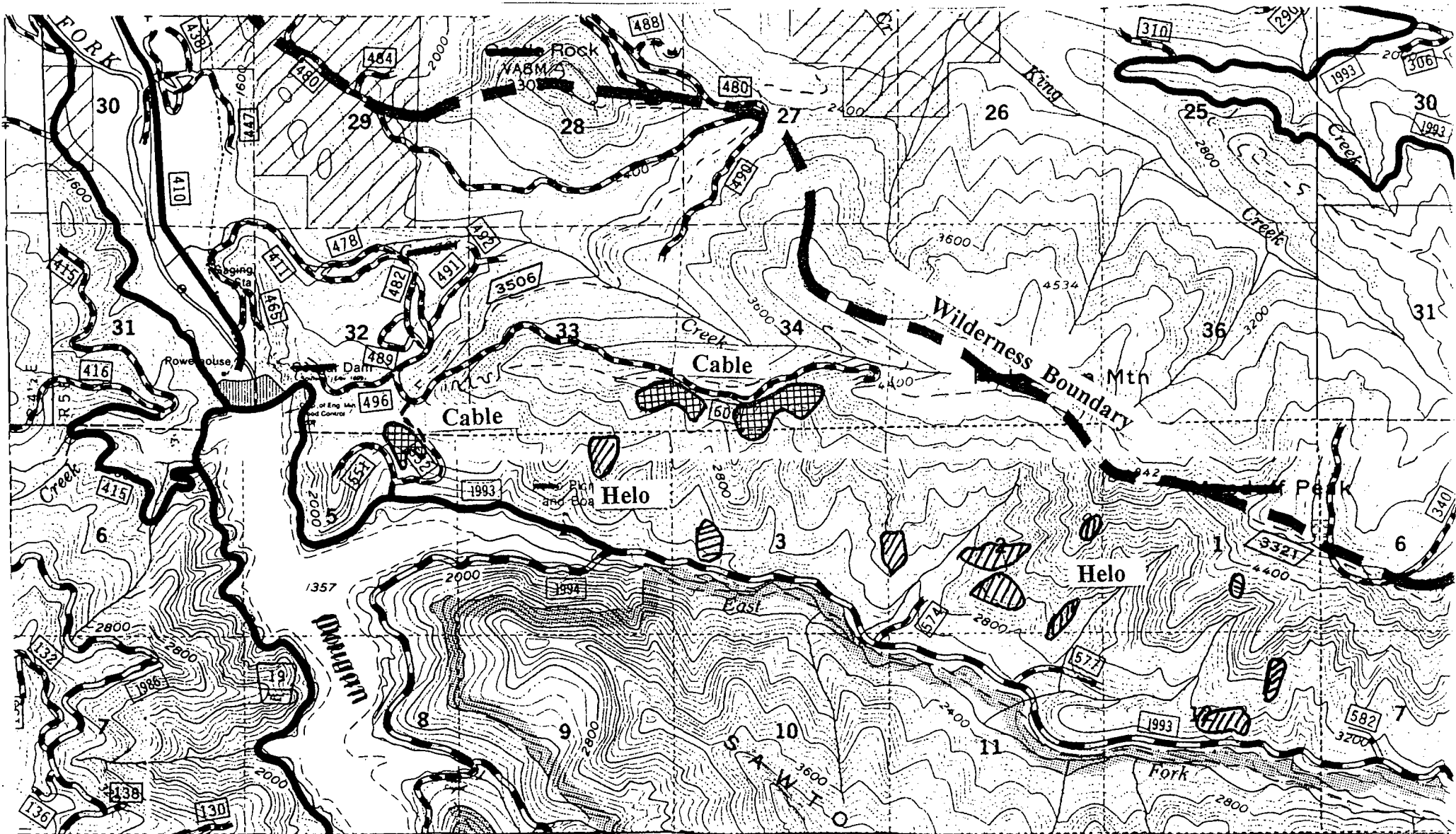
6 miles





# SALE 3

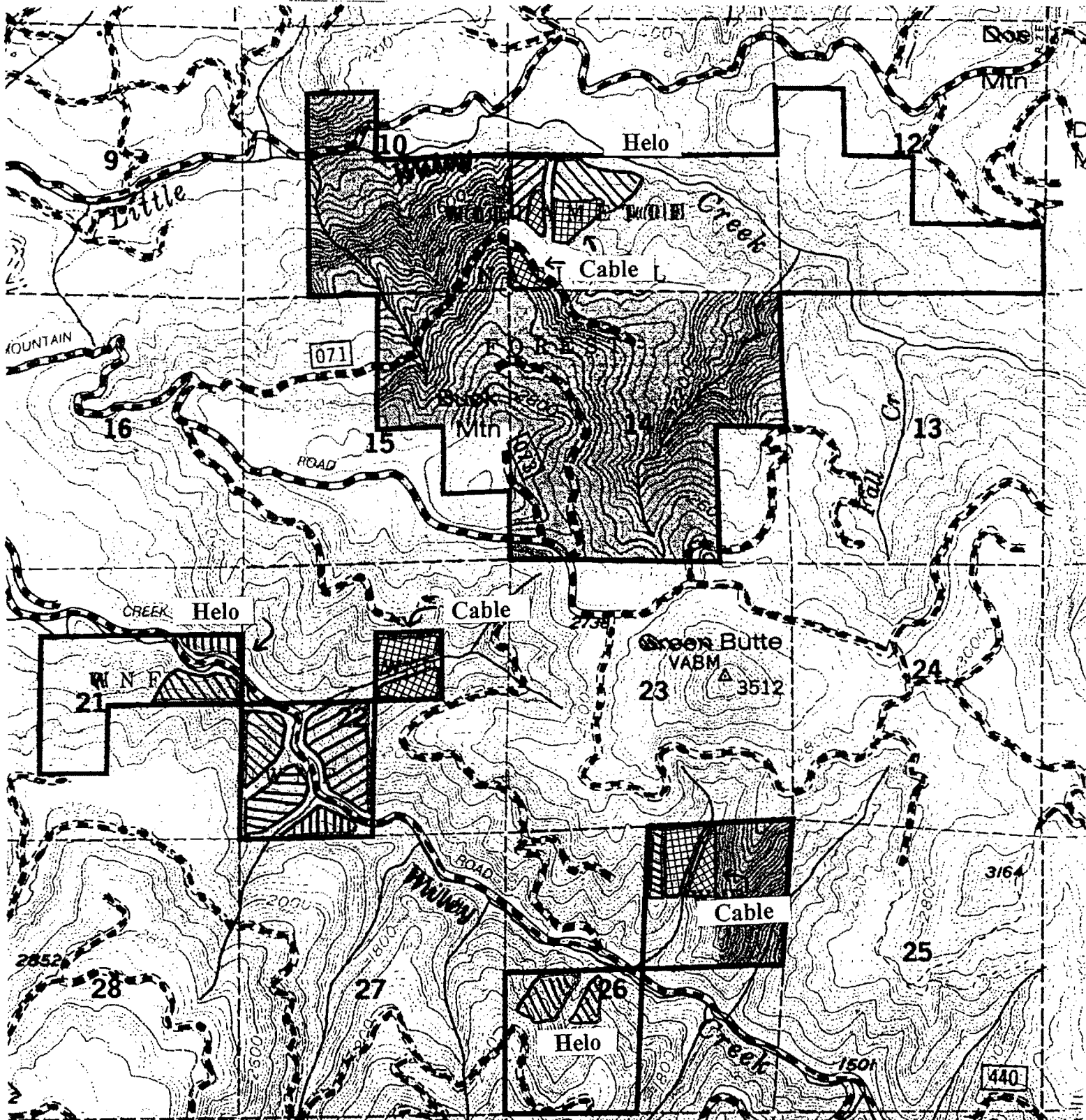
## Small CC & Shelterwood





# SALE 4

## Traditional Larger CC



# SALE 5

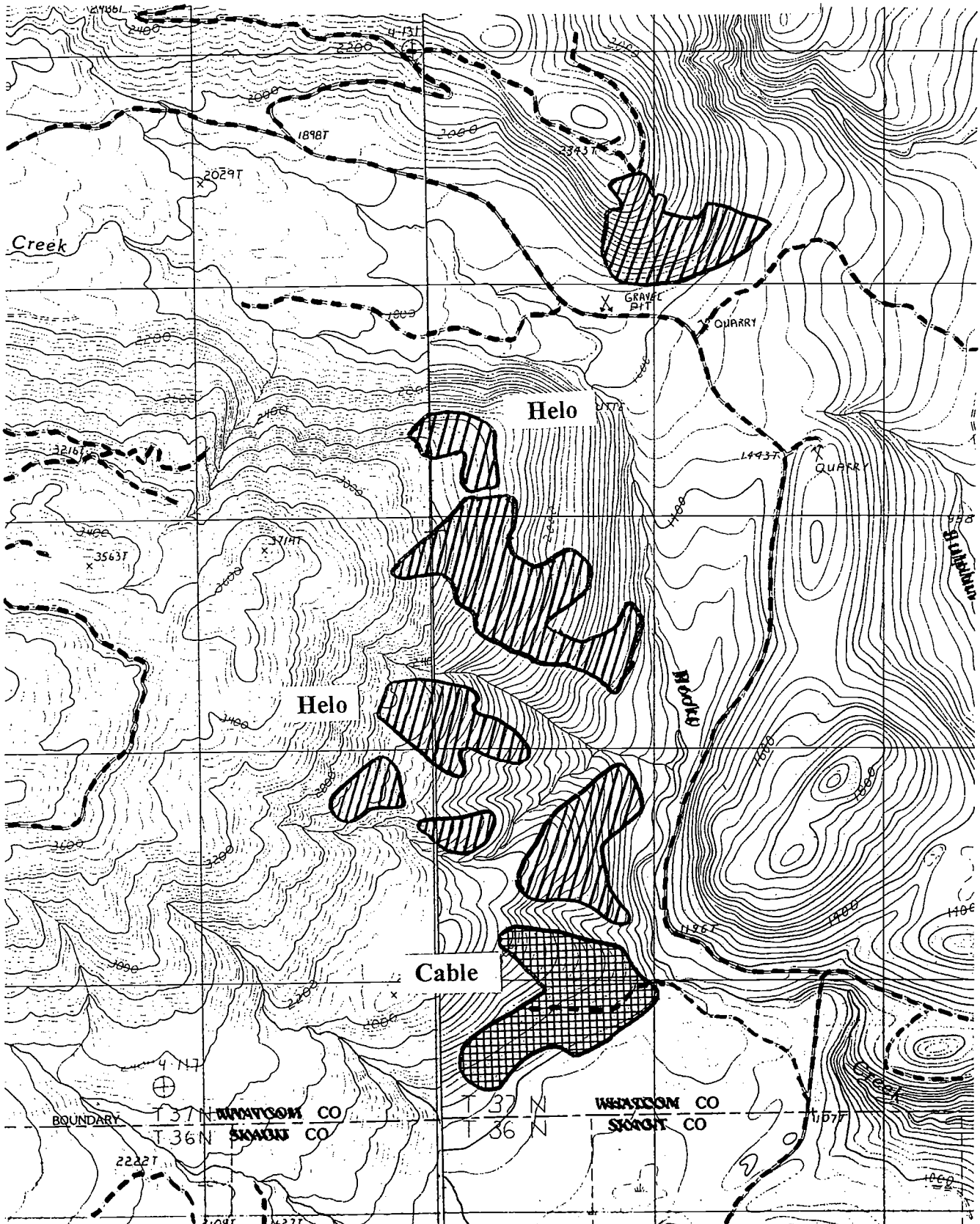
## Small Commercial Thinning (CT)

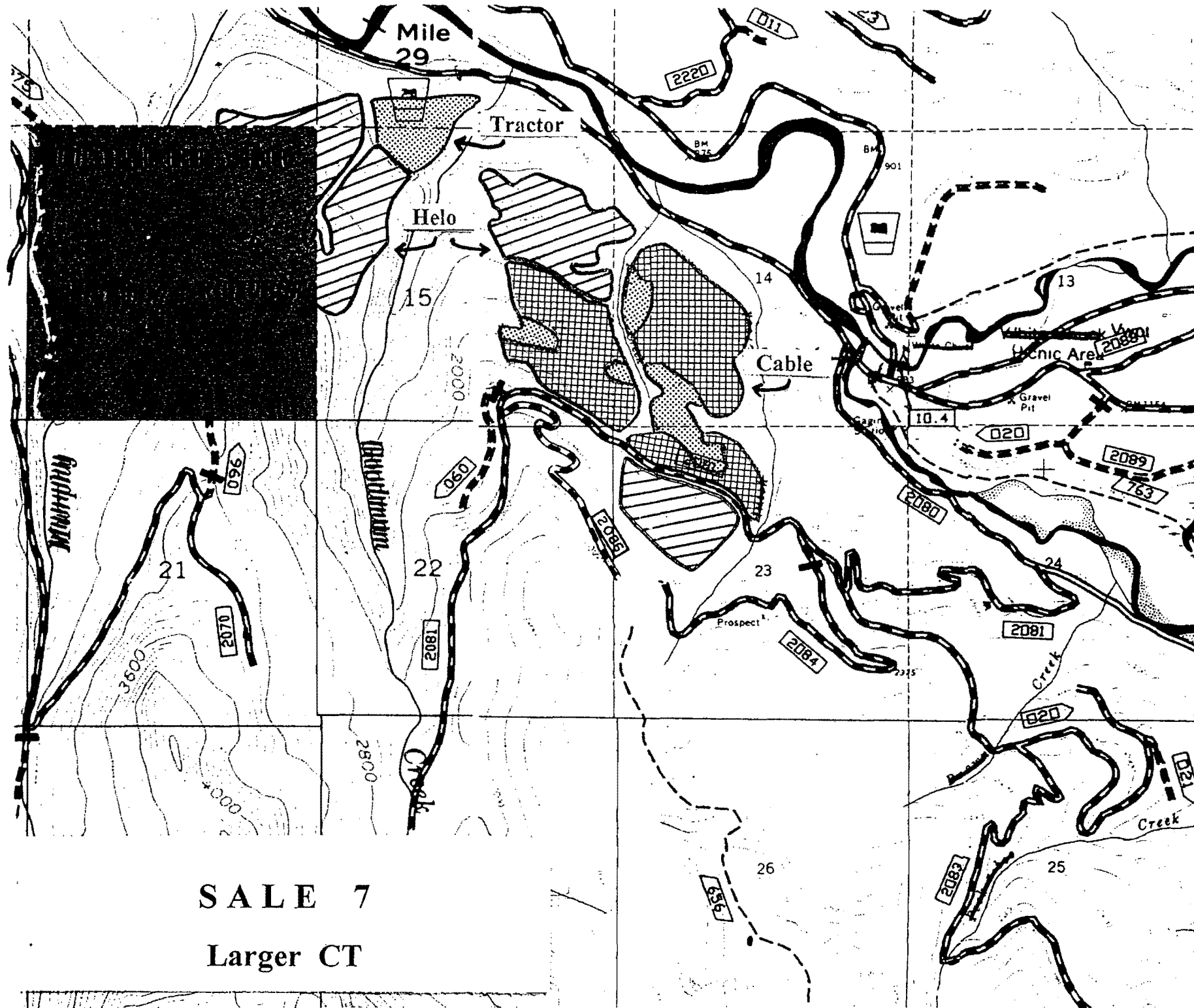




# SALE 6

## Larger CT





SALE 7

Larger CT

**TABLE 1 : TIMBER SALE CHARACTERISTICS** - The seven timber sales in this study were selected to represent a range of typical sale patterns. Average unit size and harvest volume per acre increases from Sale 1 to Sale 7. Silvicultural treatments also range from clearcuts (Sales 1-4) to commercial thinnings (Sales 5-7). Road issues were the main reason for helicopter logging. These helicopter timber sales (sold in 1990-1993) are located on seven USFS Ranger Districts in the Cascades (Population = 21).

<b>SALE</b>	<b>Total Acres Road Const.</b>	<b>Total Units</b>	<b>% Helicopter &amp; Cable % clearcut (cc)</b>	<b>Avg. Unit Size</b>	<b>Avg. Vol./Acre Logging System</b>	<b>Road Issues</b> (Note: primary reason for helo is underlined)
1  small cc  318 sale	78 acres  0 miles	8 units  Old growth	Decision: 45% helo; 52% cable; 3% tractor  Implemented: 100% helo  80% cc; 20% shelterwood	10 acres (VQO, wildlife, and watershed reasons)  VQO= visual quality objectives	56.5 MBF/acre Douglas fir (DF)  17,600 lb. payload Sikorsky Skycrane Elev. 1680-3760	(Sale area = 8 mi. x 6 mi.; Road density = 4 mi./sq.mi.). <u>Road density</u> issue = concern about the visibility of skyline corridors, spur roads, & landings; and the effects on wildlife, soils, & <u>fisheries</u> . Some units had inadequate road & landing locations for cable. <u>Time factor</u> (318 sale).
2  small cc  318 sale	176 acres  3.1 miles	15 units  2nd growth (after fire)	Decision: 48% helo; 48% cable; 4% tractor  Implemented: 56% helo; 40% cable; 4% tractor  75% cc; 25% shelterwood	12 acres (silvicultural reasons)	50 MBF/acre DF & Silver fir  10,000 lb. payload Boeing Vertol Elev. 4000  High Lead	(Sale area = 2 mi x 1.5 mi.; Road density = 0.4 mi./sq.mi.). Cable logging would require road construction in <u>wilderness</u> , and across critical soils, steep unstable terrain, streams, and mountain goat summer range.
3  small cc & shelterwd.  318 sale	127 acres  2.6 miles	16 units  2nd growth (after fire)	Decision: 60% helo; 40% cable Implemented: 76% helo; 24% cable  28% cc; 72% shelterwood	8 acres (VQO reasons)	48 MBF/acre- DF  9,900 lb. payload Boeing Vertol Elev. 3400  Standing Skyline	(Sale area = 4 mi. x 2 mi.; Road density = 1.4 mi./sq.mi.). Adjacent wilderness. <u>Visuals</u> , steep dissected terrain would require full bench road construction in a scenic viewshed.
4  traditional larger cc  318 sale	373 acres  0.4 miles	11 units  Old growth	Decision: 53% helo; 47% cable Implemented: 60% helo; 40% cable  80% cc; 20% comm.thin	avg. unit size = 25 acres  eleven 9-60 acre units within 40-160 ac. blocks	34 MBF/acre- DF  18,000 lb. payload Chinook (Boeing Vertol for smallwood) Elev. 2200  Live Skyline	(Sale area = 2.5 mi. x 2.5 mi.; Road density = 3 mi./sq.mi.). Checkerboard parcels (isolated from other NF land); surrounded by private timber industry lands. Main road is closed year-round except during hunting season. Since USFS does not control roads, road investment is avoided. <u>Time issue</u> - 318 sale; USFS negotiations for road & landing access can take 2 years.

**TABLE 1: TIMBER SALE CHARACTERISTICS, Page 2**

<b>SALE</b>	<b>Total Acres Road Const.</b>	<b>Total Units</b>	<b>% Helicopter &amp; Cable % clearcut (cc)</b>	<b>Avg. Unit Size</b>	<b>Avg. Vol/Acre Logging System</b>	<b>Road Issues</b> (Note: primary reason for helo is underlined)
<b>5</b>  small ct  ct=comm. thinning  Not a 318 sale	204 acres  .2 miles	12 units  2nd growth (after fire)	Decision: 62% helo; 38% cable Implemented: 82% helo; 18% cable  10% cc; 90% comm.thin	17 acres (riparian, wildlife, & fragmented OG reasons)	15 MBF/acre DF & Silver Fir  6,200 lb. payload; Bell 214-B Elev. 3200-4300  Multi-span	(Sale area = 2 mi. x 1 mi.; Road density = 1 mi./sq.mi.). <u>Time factor</u> - potential for cultural resources (requires relocating road and resurveying). Road construction is technically feasible but high cost. Signs of soil movement on existing roads. Road density issue for elk. Visual impact of full bench road.
<b>6</b>  larger ct  318 sale	280 acres  1.0 mile	8 units  2nd growth (after fire)	Decision: 46% helo; 54% cable Implemented: 82% helo; 18% cable  18% cc; 82% comm.thin	35 acres	22 MBF/acre- DF/Hemlock/Silver Fir  5000 lb. payload Sikorsky 58T Elev. 2000  Running Skyline	(Sale area = 2mi. x 1 mi.; Road density = 1 mi./sq.mi.). Several major draws are mapped as <u>S-8 soils</u> (deep soils with low internal strength when wet and by debris slides along the channel walls). Forest Plan states: "areas classified as irreversible soils (S-8) will generally be considered unavailable for road construction and timber harvest". Road would require a <u>bridge</u> (400' long) across S-8 soils & Class 3 stream
<b>7</b>  larger ct  Not a 318 sale	541 acres  3.3 miles (to be closed)	3 blocks  2nd growth (after railroad logging)	Decision: 44% helo; 36% cable; 20% tractor Implemented: 49% helo; 42% cable; 9% tractor  100% comm.thin	avg. unit size = 54 ac.  ten units within three 180-acre blocks	16.5 MBF/acre - DF/Hemlock/ Cedar  4,750 lb. payload; Bell 214 & Lama Elev. 2000  Running Skyline	(Sale area = 2 mi. x 1.5 mi.; Road density = 1 mi./sq.mi. ). <u>Economics</u> of specified road construction and road maintenance. Roads alter hydrology on slopes. Increased <u>road density</u> provides easier access for hunting & decreases the area used by deer. The steep dissected terrain would require many switchbacks in a <u>scenic viewshed</u> .

**TABLE 2 : FOREST PLAN DIRECTION -** *The four Forest Plans examined in this study were signed in 1990. This table shows how the land use allocations changed in 1994 and also shows whether the Forest Plan provided any general direction for logging systems, roads, and economics in timber sale planning.*

<b>Sale #</b>	<b>Forest Plan Land Use Allocation</b>	<b>President's Plan Land Use Allocation</b>	<b>Forest Plan Direction related to logging systems, roads, and economic analysis (standards &amp; guidelines, management goals, &amp; monitoring)</b>
1	Special Emphasis Watershed General Forest Scenic Viewshed	Mostly: Tier 1 Key Watershed  (managed to recover at-risk stocks of fish species. Timber harvest, including salvage, cannot occur without a watershed analysis)	(Information Needs) Effects of roads on fish & wildlife; site-specific info to evaluate possible effects of new roads on the adjoining physical environment. Methods & processes to evaluate, display, & account for the benefits of roads to all resources. Effectiveness of mitigation measures to preserve water quality in roaded drainages including sediment control. (Goal) Provide for construction and maintenance of roads at a level that will minimize environ.damage. (Monitoring) Is an efficient & economical transp. system provided that responds to all other resources? Is the Forest Transp. system responsive to land mgmt. goals and public needs?
2	Timber Production	Late Succession  (no programmed timber harvest; no thinning or other silv. treatments in stands over 80 years of age)	(Timber ) Provide a positive economic return. Plan, design, operate, and maintain a safe and economical transp. system providing efficient access for the movement of people and materials involved in the use and protection of National Forest lands.
3	Scenic Modif. Middleground Scenic Partial Retention	Late Succession	Roading would provide access for mgmt. of resources, including timber harvest, and would allow for the enjoyment of scenic and recreational values associated with motorized access. Forest development roads are constructed, operated, and maintained for the administration and protection of NF lands. They are not intended to meet the transp. needs of the public at large. (continued below in 4 & 5)
4	General Forest	Matrix Late Succession	Forest roads shall be located, designed, constructed, and reconstructed based on the following criteria: resource mgmt. objectives, environmental needs, safety, traffic requirements, traffic levels, vehicle characteristics, road users, season of use, & economics. The primary public concerns are that road construction and timber harvest may result in long term effects of increasing suspended sediment, water temperature, chemicals, and bacterial contaminations. The selected harvest method must be practical and economical in terms of transportation, harvesting, preparation, and administration of timber sales. (continued below in 5)

**TABLE 2: FOREST PLAN DIRECTION , Page 2**

<b><i>Sale #</i></b>	<b><i>Forest Plan Land Use Allocation</i></b>	<b><i>President's Plan Land Use Allocation</i></b>	<b><i>Forest Plan Direction related to logging systems, roads, and economic analysis (standards &amp; guidelines, management goals, and monitoring)</i></b>
5	High Intensive Timber Mgmt.	Matrix  (Mgmt. objective- to create patches of late succession. Need to retain 15% old growth where it remains)	(Direction) All available logging systems should be considered for use. The selection of a logging system shall be based on resource considerations, economics, and technical feasibility. Implementation monitoring is to determine if plans, prescriptions, projects, and activities are implemented as designed and are in compliance with the FP. Is FP direction incorporated into project level planning and decisions? Is the transportation system meeting the planned resource objectives?
6	Scenic Viewshed Deer Elk Winter Range	Late Succession	(Information Needs) Determine the effects of vehicular traffic on species other than elk, which have been well researched. Determine the effectiveness of all stated mitigation measures addressing effects on fish and water. (Direction) Utilize appropriate logging systems to achieve multiple use and silviculture objectives in a cost-efficient manner. Build and maintain transportation system facilities to the minimum standard needed to support uses and activities. Minimize adverse effects of vehicular traffic on wildlife. The goal of road management is to provide and manage the road system to serve the long-term resource needs and objectives of the management areas. As funding levels vary, primary priority will be given to resource mgmt. and protection, with secondary priority given to user convenience. Economic efficiency will be a consideration in forest and project level planning and development. Improve net benefits of all resources by reducing unit costs through improved management efficiency and new & emerging technology. Areas classified as irreversible soils (S-8) will generally be considered as unavailable for road construction and timber harvest.  (continued below in 7)
7	Scenic Viewshed Scenic & Wild River Timber Emphasis Watershed, Wildlife, and Fisheries Emphasis in Riparian Areas	Matrix	Logging systems should be used that meet the minimum objectives of timber harvest and cause the least ground disturbance. Landings should be located outside the seen areas or rehabilitated within one year of operation if they must be located in seen areas. Economic efficiency analysis shall be completed before the decision is made to use commercial thinning. Maintain soil productivity by insuring that the effects of displacement, compaction, and erosion within harvest units when added to the lands dedicated to system roads and landings do not exceed 20% of the area. In timber emphasis areas, access will generally be by road.

**TABLE 3 : ENVIRONMENTAL ASSESSMENT** - This table lists the issues, the range of alternatives, and ID Team make-up. The last column examines the helicopter logging decision: whether logging and road system effects were quantified, whether supporting documentation or site-specific examples of logging and road effects were cited, and whether any mitigation or monitoring was recommended to resolve logging system and road issues.

<b>Sale #</b>	<b>Issues</b> <i>Economic issues are underlined.</i>	<b>Range of Alternatives</b>	<b>Interdisciplinary Team</b> <i>(Note: logging systems expertise is underlined)</i>	<b>Logging System &amp; Road Effects Analysis</b> <i>(Note: primary reason for selecting 'helicopter logging and no roads' is underlined)</i>
1	<p>Fish habitat / stream morphology Soil movement in unstable areas Old growth habitat High road densities &amp; hydrologic processes Forage, hiding &amp; thermal cover, and travel corridors Wildlife trees Wild &amp; Scenic River Visual quality <u>Timber supply/demand</u></p>	<p>Three EA's: Range of Alternatives (5-6) included different logging systems, different roading options, different silv. prescriptions, and 1-2 alternatives with no timber sale.</p>	<p><u>Sale Prep.Forester</u> (Leader) Fisheries Wildlife Biologist Engineer</p>	<p><b>Water Quality, Fish Habitat, Wildlife:</b> extent, duration, and intensity of effects somewhat quantified; supporting documentation was cited; site-specific examples of effects not cited; mitigation measures were recommended; no monitoring mentioned. <b>Soils &amp; Hydrology:</b> extent, duration, &amp; intensity of effects somewhat quantified; supporting documentation and a few site-specific examples of effects were cited; mitigation measures were recommended; no monitoring mentioned. <b>Visuals:</b> extent, duration, &amp; intensity of effects not quantified; supporting documentation or site-specific examples of effects not cited; mitigation measures and monitoring not mentioned. <b>Time factor:</b> although time was not identified as an issue in the EA, it is why the sale changed from 45% helo to 100% helo.</p>
2	<p>Adjacent wilderness Visual quality objectives Advanced regeneration Steep, incised, high elevation, wet slopes Adjacent spotted owl habitat Mountain goat summer range <u>Benefit/cost ratio</u></p>	<p>EA covered two timber sales (adjacent to each other). Range of Alternatives (nine) included different logging systems, different roading options, different silv. prescrip's, and one alternative with no timber sale.</p>	<p><u>Sale Planner</u> (Leader) Transportation Planner Biologist Hydrologist Silviculturist</p>	<p><b>Wilderness, Visual Quality:</b> extent, duration, &amp; intensity of effects not quantified; supporting documentation or site-specific examples of effects not cited; mitigation measures were recommended; no monitoring mentioned. <b>Soils &amp; Hydrology:</b> extent, duration, &amp; intensity of effects not quantified; supporting documentation not cited; a few site-specific examples of effects were cited; mitigation measures were recommended; no monitoring mentioned. <b>Adv. Regen.:</b> extent, duration, &amp; intensity of effects not quantified; supporting documentation or site-specific examples of effects not cited; mitigation measures were recommended; no monitoring mentioned. <b>Spotted Owl &amp; Mtn. Goat:</b> extent, duration, &amp; intensity of effects not quantified; supporting documentation or site-specific examples of effects not cited; mitigation measures &amp; monitoring were recommended. <b>Economics:</b> extent, duration, &amp; intensity of effects somewhat quantified; supporting documentation was cited; site-specific examples not cited; mitigation measures were mentioned; no monitoring mentioned.</p>

**TABLE 3 : ENVIRONMENTAL ASSESSMENT (EA) , Page 2**

<i>Sale #</i>	<i>Issues</i>	<i>Range of Alternatives</i>	<i>Interdisciplinary Team</i>	<i>Logging System &amp; Road Effects Analysis</i>
3	Adj. wilderness & roadless area Highly sensitive visual area Big game habitat FP outputs & desired age class distribution Blowdown & soil stability	Range of Alternatives (five) included different logging systems, roading options not analyzed, different silv. prescription's, and one alternative with no timber sale.	<u>Sale Planner (Leader)</u> Planner trainee Silviculturist  Other specialists served as consultants, attending IDT meetings when needed.	<b>Visuals &amp; Adjacent Wilderness:</b> extent, duration, & intensity of effects not quantified; supporting documentation or site-specific examples of effects not cited; mitigation measures and monitoring not mentioned. <b>Big Game Habitat:</b> extent, duration, & intensity of effects not quantified; supporting documentation or site-specific examples of effects not cited; mitigation measures were recommended; no monitoring mentioned. <b>Blowdown &amp; Soil Stability:</b> extent, duration, & intensity of effects somewhat quantified; supporting documentation or site-specific examples of effects not cited; mitigation measures were recommended; no monitoring mentioned.
4	Fisheries Fragmentation of old growth Access - adjacent private land and shared roads	Range of Alternatives (five) included different logging systems, different roading options, different silv. prescrip's, and one alt. with no timber sale.	<u>Sale Planner</u> (two diff. IDT Leaders)  Other specialists served as consultants, attending IDT meetings when needed.	<b>Fisheries:</b> extent, duration, & intensity of effects not quantified; supporting documentation or site-specific examples of effects not cited; mitigation measures were recommended; no monitoring. <b>Soils:</b> extent, duration, & intensity of effects not quantified; supporting documentation and site-specific examples of effects were cited; mitigation measures were recommended; no monitoring. <b>Old Growth:</b> extent, duration, & intensity of effects not quantified; supporting documentation and site-specific examples of effects not cited; mitigation measures and monitoring not mentioned. <b>Access (time delays for easements):</b> extent, duration, & intensity of effects not quantified; supporting documentation and site-specific examples of effects not cited; mitigation measures and monitoring not mentioned.



**TABLE 3: ENVIRONMENTAL ASSESSMENT, Page 3**

<i>Sale #</i>	<i>Issues</i>	<i>Range of Alternatives</i>	<i>Interdisciplinary Team</i>	<i>Logging System &amp; Road Effects Analysis</i>
5	Elk winter range Fragmented old growth Impacts on Recreation Roads (environmental concern)	EA covered several timber sales (integrated resource analysis); range of Alternatives (three) included different logging systems, roading options, different silv. prescrip's, and one alternative with no timber sale.	Sale Planner (Leader) Hydrologist Soil Scientist Recreation Specialist Engineer / Road Systems Silviculturist Biologist <u>Logging Systems</u> Pre-sale Specialist	<b>Recreation:</b> extent, duration, & intensity of effects somewhat described; supporting documentation not cited; a few site-specific examples of effects were cited; mitigation measures were recommended; monitoring not mentioned. <b>Big Game Habitat:</b> extent, duration, & intensity of effects not quantified; supporting documentation or site-specific examples of effects not cited; mitigation measures were recommended; no monitoring mentioned. <b>Roads &amp; Soil Stability:</b> extent, duration, & intensity of effects somewhat quantified; supporting documentation and site-specific examples of effects were cited; mitigation measures were recommended; no monitoring mentioned. <b>Time factor:</b> not mentioned as an issue but was reason for helo.
6	Water quality & fisheries habitat Deer & elk habitat	Range of Alternatives (three) included different logging systems, different roading options, different silv. prescrip's, and one alternative with no timber sale. action' alternative.	Engineering Tech.(Leader) Silviculturist Wildlife Biologist <u>Recon. Forester</u> Transportation Planner Watershed/Geologist Landscape Architect	<b>Soils, Water Quality, &amp; Fisheries:</b> extent, duration, & intensity of effects somewhat described; supporting documentation not cited; a few site-specific examples of effects were mentioned; mitigation measures and monitoring were recommended. <b>Wildlife:</b> extent, duration, & intensity of effects somewhat quantified; supporting documentation or site-specific examples of effects not cited; mitigation measures were recommended; monitoring not mentioned.
7	Visual impact <u>Economics</u> Hydrology, water quality, and fish habitat Biological diversity Impacts on wildlife Impacts on recreation	Range of Alternatives (seven) included different logging systems, different roading options, different silv. prescrip's, and one alternative with no timber sale.	<u>Logging Engineer</u> (Leader) Silviculturist Recreation Technician Soil Scientist Wildlife Biologist	<b>Visuals &amp; Recreation:</b> extent, duration, & intensity of effects some-what described; supporting documentation not cited; a few site-specific examples of effects were cited; mitigation measures and monitoring were recommended. <b>Economics:</b> extent & duration of intensity of effects somewhat quantified; supporting documentation and site-specific examples were cited; mitigation and monitoring were not mentioned. <b>Hydrology, Water Quality, &amp; Fisheries:</b> extent, duration, & intensity of effects somewhat described; supporting documentation not cited; examples of effects were cited; mitigation measures and monitoring were recommended. <b>Wildlife &amp; Biodiversity:</b> extent, duration, & intensity of effects somewhat quantified; supporting documentation and examples of effects were cited; mitigation measures and monitoring were recommended.

**TABLE 4: LOGGING FEASIBILITY REPORT** - In 1988, a Regional Task Force listed over 50 specific design elements to be included in Logging Feasibility Reports (39). This table shows which logging design elements were addressed on these sales and some of the technical problems found on-the-ground during the field review.

Sale #	Ground Profiles ?	Cost Analysis?	LFR ? Rationale? significant issues?	Computer Programs ?	Implemented as Planned in EA and Decision?	Prev. helo sale? Helo precludes future harvest & roading options?	Transp. Plan addressed future silv. access needs?	Technical problems with harvest-transportation decision (Technical issues refer to project implementation, physical & operational feasibility)
1	No.	No.	29-pg. LFR plus 2-pg. Review  Yes.  Yes.	None	< 10% implemented as planned. (diff. units due to blow-down & 318)	Yes (1973, 1977, and 1979).  No.	Yes.  (transp. plan = 2 pages)	Large sale area (8 miles x 6 miles) for eight small units (10 acres). Helo- three different landings & many different roads would make it difficult to account for all truckloads (40 per day). Since units were small (avg. = 10 ac.) and far apart (up to 10 mi.), cable loggings costs (equip. move-in & rigging) would not have been cost-effective. Some units had inadequate road and landing locations for cable.
2	No.	In the EA.  Econ. analysis = 12 pages, 2 entries	17-pg. LFR  Yes.  Yes.	None	90% (modified unit bdry's)	No.  "Once we've committed to helo, it will be very difficult in the future to build roads."	Yes.  (transp. plan = 12 pages)	Helo- too costly to yard unmerch. & tops (result = heavy fuel load) Difficult to reduce fuel load (adv. regen. & no roads). Cable- could have eliminated spur roads by using intm. supports. Using intm. supports would've cost more than high lead & spur road. Helo- "difficult to leave old single snags (safety issue)." No roads- higher resource mgmt. costs (fire, silv., monitoring, etc.).
3	Yes, on 3 cable units	EA referenced an 80-yr. econ. analysis & preliminary appraisal	28-pg. LFR plus 3-pg. Review  No.  No.	Old version of LoggerPC (HP-9000)  Helipace	70% (half of the unit acres & boundaries were changed.)	Yes (1987).  Prev. decision (helo & no road) was not analyzed	No transp. plan for this sale.  Plan to use helo for silv. activities.	Helo- difficult to leave old single snags (safety issue). No roads to units made it costly & risky to reduce heavy fuels. Helo- "burning (to reduce fuels & site prep.) killed the residual trees in one shelterwood unit." No roads- "may have to forego pre-comm. thinning & other silv. needs." Helo- one outside unit (15 miles away) was not mentioned in EA.
4	Yes, on cable units	Yes, included rigging downtime estimates, equipment move-in, landing constr., skyline production rates, etc. (econ. analysis = 13 pages, one entry)	43-pg. LFR plus 3-pg. Review  No.  No.	Old version of LoggerPC (HP-9000)	80% (changed logging system on 42 acres; spotted owl injunction on 93 acres)	No.  No. Plan to exchange these isolated NF parcels in the future.	Yes.  (transp. plan, road mgmt. obj's, haul network map = 10 pages)	Helo- "slash doesn't get knocked down adequately, making it difficult to plant enough trees per acre in deep slash." Helo- "rotor wash from large helo will knock 20-30 feet out of older trees with dead tops. We had to cut snags (safety issue)." Cable- "would have taken 1-2 years to obtain easements from adjacent private land owners. Need to include internal prep. costs (negotiations, road surveys, profiles, etc.) in cost analysis. This Section 318 sale had to be sold in 1990 (time issue)." Cable- could have cable logged a bottom portion of one unit but didn't have time to obtain easements. Helo- purchaser had to pay \$57,000 to compensate for changing the logging system on one unit (34 acres) to cable. (\$57,000 was the difference in appraised yarding costs.) Helo- difficult to count & measure all dead & down logs in deep slash (contract specifications for wildlife). Helo- sale was in a sensitive smokeshed. Tops were yarded in some units to reduce slash (for reforestation purposes & fire prevention).

**TABLE 4 : LOGGING FEASIBILITY REPORT (LFR) , Page 2**

<b>Sale #</b>	<b>Ground Profiles ?</b>	<b>Cost Analysis?</b>	<b>LFR ? Rationale, significant issues?</b>	<b>Computer Programs ?</b>	<b>Implemented as Planned in EA and Decision?</b>	<b>Prev. helo sale? Helo precludes future harvest &amp; roading options?</b>	<b>Transp. Plan addressed future silv. access needs?</b>	<b>Technical Problems with harvest-transportation decision</b>
5	Could not find.	Econ. analysis = 10 pages, over an 80-year period.	10-pg. LFR  No.  No.	None	70% (modified one fourth of the unit boundaries, changed logging system from helo to cable on 37 acres and from skyline to helo on 24 acres.)	No.  No, when it's comm. thinning, the bulk of the volume is left and will pay for road in future.	Yes.  (transp. plan = 12 pages, including road & traffic mgmt. worksheets)	Need a higher than avg. road density for intensive timber mgmt. Cable- "In the last 4-5 years, we haven't had enough time to survey, design, & engineer roads. Either we don't put anything on the market or we put up a helo sale." Cable- "The reality is that most of the road system is in place and a lot of the unroaded areas are some of the toughest place to get a road in (steep, rocky, high elev.). A lot of the roads in steep terrain require full bench construction." Helo- purchaser ran profiles & analyzed two helo units for multi-span. There was no change in the appraised yarding costs. Helo- due to the lack of road access, several units required an access trail to facilitate post-sale activities. Such trails are needed to provide a safe route through steep, rugged terrain.
6	On one unit. Ground profiles are done only if logging system is marginal.	Econ. analysis= 13 pages, over a 200-year period, used costs from other local NF sales.	No LFR	Helipace	70% (no. of acres stayed the same but half of the unit boundaries and locations changed)	No.  Yes. "That's our anticipation how we'll harvest it in the future."	Yes. (transp. plan = 16 pages, including history of past logging systems & roads, road maintenance appraisals, etc.)	Gates on roads- 1) "gates are a long term maintenance problem and 2) even if roads are gated, it's still an invitation for people to walk up the road and disturb wildlife. Don't get me wrong, there are a lot of roads that make sense, it's just the amount of roads that I'm concerned about." Obliterating roads- What are the chances of needing a road in the future? "Very low, it is now in late succession reserves, there won't be any harvesting." Helo- one 'outside' unit (1 mile away, 49 acres) could have been cable-logged (multi-span). It had roads above, below, and on one side. (This unit was not mentioned in the EA). Cable- "When timber prices are high, fuel costs fairly low, and when wood product industries need wood quick, it's tough to talk people out of helo. Many people are satisfied with helo."
7	Yes.  Map & notes for twelve ground profiles	In the EA  Econ. analysis= 10 pages, one entry, states assumptions.	18-pg. LFR  For one unit, other alt's were mentioned & reasons for rejection (more expensive)  No.	LoggerPC  Helipace	95% (contractor used running skyline on multi-span unit; slight change in unit boundaries)	No. (was clearcut and railroad-logged in the 1930's)  No. Plan to have thinning entries every 40 years.	Could not find transp. plan.  The EA has a map for each alternative showing the existing roads and proposed construction.	Helo- "had to fly a cache of marking paint to the top of the unit." Cable/swing yarder (downhill yarding)- had to cut additional trees in the corridors; landings should have runout room (safety issue)- can't control siwashing logs unless they're fully suspended. Helo- "damage depends on size of helo (payload) and pilot." Cable- "If they didn't have running skyline, it would have been to the purchaser's advantage to rig intermediate supports. They probably spent more time figuring out how to avoid multi-span. Where we've used multi-span, the corridors are a lot narrower." Multi-span- "Their biggest hangup with m-s is less production." Roads- "Culverts look like they will plug up & cause a sluice-out." No studies show more snags are left in cable vs. helo units.

**TABLE 5 : ECONOMIC COMMENTS -** *The Forest Service has often been criticized for 'money-losing' timber sales and deficit spending (3). The following quotes portray the general attitude and concern regarding economic issues on these seven timber sales.*

Sale #	Quoted comments made by ID Team members in response to one of the main interview questions: "How important is economics?"
1	<p>I think it's a mistake to jump out and state: 'helicopter or nothing!'. The approach I always take, and it's the job I'm paid to do, is to evaluate all the options and to layout the risks, costs, and benefits of various alternatives. In this case, it would involve looking at the environmental risks of different logging system options vs. the cost effectiveness for logging economics and return on the stump.</p> <p>You see, it's a balancing act- while we all hold our own opinions and weigh the costs and benefits, it's the line officers that make the final decisions. What we're trying to do is find some middleground between the extreme timber interests and the extreme environmental interests.</p> <p>It's a tremendous cost when you look at the investment in roads and how we're closing them now. People don't realize how much money is wasted. I first look at which roads have the highest problems and then look at costs. I can think of a couple roads that were falling down the hillslope and we just had to walk away because we don't have the kind of money to deal with them. Sometimes when we figure out the standard of road needed to minimize sediment production, the engineers will say 'Why are we building this standard of road if we'll probably have to pull it out in 5 years?' We fail to analyze all the actual dollar costs. I think we need to portray the trade-offs better and list the costs of all future projects that follow - rehabilitation, maintenance, mitigation measures, monitoring, along with the initial construction costs- that becomes your true realized costs.</p> <p>It's costing more and more for overhead, reviews, and all the planning process costs. And then, if one of these sales end up in court, the costs are astronomical.</p>
2	<p>Are we going to make allowances in our appraisal system to cover these more expensive logging systems? Or, are we going to do what's traditional and show them on the low end? That's been my experience- we show them on the low end, like the cost of hand-piling, firelines, planting, and K-V projects. If we showed the actual costs then we wouldn't have a problem paying for them.</p> <p>The original planning one one sale here was done about 4 years ago. Part of the sale was sold and logged with cable. The Suitable Owl Habitat portion was not. It was originally proposed for cable. An existing road which has grown up in alder goes through one unit and almost to the other unit. The ground is gentle and road building is easy. The decision was made to helicopter for several reasons: 1) this is better ecosystem management; 2) we cannot effectively close roads once built; and 3) the road is a barrier to amphibians. An economic analysis was not done and no logging feasibility report was done. These type of decisions bother me.</p>
3	<p>Economics always plays a part to some degree. It depends on the area and other values. There's a major price on amenity and scenic values. That's what is important now.</p> <p>Since we don't have roads in that sale area, we'll have to depend on helicopter. Tree seedlings can be flown in. If something happens to the price of timber or the costs of helo, we will have to forego the pre-commercial thinning.</p> <p>Right now, there are so many people valueing the ecosystem as a whole. And the price of that (if it could be measured) is shooting up so high that the people will force us pay more to harvest less trees. The value of a roadless area is higher than the value of having a road.</p> <p>Economics is becoming less of an issue in the Forest Service.</p> <p>In the past, helicopters were not used as much, mainly because of economics. But now, the price of wood is so high, it doesn't make any difference if it's helo-logged. Economics is of concern but it's mostly a 'below-cost' issue. Economics is an issue when it costs more to extract the timber than what the timber is worth. The highest value here is the resource values. If it is visuals or soils and if it demands a higher cost logging system, then we'll do it that way. It's more important to achieve objectives than to achieve low costs.</p>
4	<p>There are many facets to economics. This sale may have been easier to log with cable but the time and effort it would've taken to go through all the legal negotiations for easements do not show up in an economics analysis. It would have taken us 1-2 years longer. Sometimes the economic gain is more internal than external. Helo take less time. One way to put up a sale before the rules change is to plan it for helo.</p> <p>In the past, we tended to look more at economics than we do now. The pendulum has swung to the environmental side and we look much more at the environmental side than we do the economics. There's no doubt in my mind about that.</p> <p>In the past, log accountability was paramount in sale administration. Now we've got to spend most of our time on environmental concerns because they are scrutinized. What I've found over the years is if you give a realistic view of the costs, you'll come up with a pretty good answer.</p>

**TABLE 5: ECONOMIC COMMENTS, Page 2**

Sale #	Quotes from ID Team members in response to interview question: "How important is economics?"
5	<p>The loggers will tell us when a helo sale is economically infeasible.</p> <p>In the past 4-5 years, we haven't had enough time to survey, design, and engineer roads- plus, wait for the cultural resource and plant surveys. Either we don't put anything on the market or we put up a helo sale.</p> <p>Economically, we want a sale that is positive and meets resource objectives.</p>
6	<p>The cost for just an EIS document itself is \$60-100,000. We probably spent more than that to do the sale planning, sale layout, and marking. All that to put up less than four million bd.ft.! You have to say- 'where's the economics to that?'!</p> <p>I don't think the Forest Service's primary objective is to earn money. That's not where we're coming from. The reason we're losing money is because the restrictions are set to the point where timber sales are going to be small and we have to maintain a certain amount of overhead to administer these sales, cruise them, lay them out, to do an EA, and all that. So, the unit costs go way up. The reason 'below-cost' sales are an issue is because there are groups that want to stop timber harvesting on the national forests. They think we have timber sales strictly to provide timber to timber industry. It has less to do with how much we're spending and more to do with people wanting to use that to stop timber harvesting.</p> <p>Back when we had payloads of 20,000 plus, the helo expenses were tremendous. But what has evolved is- we're getting into 2nd-growth timber and smaller ships are available for one-tenth the cost-per-hour that some of the larger ships are. So, helo is very workable for getting things done. There's very few sales that I've appraised that have come out to <u>not</u> be feasible for helo. The value of wood is so high now.</p> <p>One of the things that's hard about working for a government agency is that the people on the ground can really see what they think will work, but such a large part of our direction comes from legislation and you have to balance compliance with legislation with what you know from your profession. It's hard to keep the economics and technical end of it balanced with all the environmental legislation.</p> <p>Roads are a tremendous investment to just throw away. Decommissioning a road costs \$6000-10000 per mile; road maintenance = \$300 per mile every 5 years.</p>
7	<p>Who says timber sales need to balance economics and technical issues with environmental issues? In this day and age, the environment comes first.</p> <p>If you're not going into an area for 20-30 years, I think it's a waste of money to keep the road open and maintained every 5-10 years.</p> <p>It's not whether we look at economics or not but it's 'what is the politics' and 'what is the view of the public?'. Having the National Forest as a timber source is not a priority to them. The question whether we can pay our way gets into the social values of the public. If the social values that are now promoted are that 'the National Forest should provide a biological reserve and recreation opportunities', then I don't think the forests can pay their way- unless we start charging for some of the recreation opportunities.</p> <p>Economics was always strong on our districts. It doesn't mean we didn't consider wildlife and other things. Every one of the timber sale ID Teams had a forester on the ID Team. The economics emphasis comes from the forestry background- I think that's a big part of whether economics is looked at.</p> <p>We have a forest economist in the Supervisor's Office who provided training sessions for the district people to look at economics in timber sales and other projects like K-V and watershed.</p> <p>Helo was not used as an option just because we wanted to use helo. We looked at physical and economic factors. Helo was our last option. If all the other options won't work for environmental or political reasons, then we lean toward helo.</p> <p>What were the political reasons?- the Audubon groups were dead set against road building. They basically indicated they would appeal the sale. The District Ranger was being pressured about the negative impact of building roads. So, he instructed the ID Team to do an economic analysis comparing specified road construction (and obliteration) to helo logging costs. Well, when you do it that way, helo logging doesn't look so expensive when you throw big costs into roading. (Specified road was needed due to the 'complexity'.) That's the kind of game that is played. Economics has very little to do with most of this stuff.</p> <p>I was trying to push the economic point of view. That did not sit well with some of the folks on the ID Team.</p>

**TABLE 6: TIMBER SALE PLANNING PROCESS COMMENTS** - This table summarizes many of the interview comments (in quotes) regarding the timber sale planning process's strengths, weaknesses, bottlenecks, and improvement possibilities. A total of forty-one Interdisciplinary Team members were interviewed.

<b>Sale #</b>	<b>Strengths</b>	<b>Weaknesses</b>	<b>Bottlenecks</b>	<b>Improvements &amp; Skills Needed</b>
<b>1</b>	<p>Forest Plan emphasized the need to study and monitor road effects &amp; mitigation measures.</p> <p>Specialists were very articulate and knowledgeable.</p> <p>Soil scientist devised a spreadsheet to compare ground disturbance from different logging systems (past and present) based on a surface erosion model called WATSED (hybridized with local monitoring information). Although the data is not validated with statistics, it's the best info available.</p> <p>LFR included recommended equip., flight statistics for each unit, contract provisions, landing profiles &amp; maps.</p> <p>LFR was reviewed.</p>	<p>Nothing in the Forest Plan provides direction in logging systems.</p> <p>Records are here and there, not easy to find.</p> <p>Too many issues in the EA.</p> <p>EA does not emphasize the purpose &amp; need for a timber sale and objectives.</p> <p>"Hard to plan for long-term when mgmt. direction keeps changing."</p> <p>"50% of the stands that need to be treated (to improve health &amp; growth) do not get treated in timber sales."</p> <p>"There is a rush to close roads, many 2nd-growth stands will need to be entered more often for intermediate thinning."</p> <p>No Network Analysis (Logging &amp; Transp. Cost Analysis).</p> <p>Sale was not implemented as planned in the EA and Decision. (90% different- another EA should have been written.)</p> <p>Decision Notice (DN) did not mention economic considerations.</p>	<p>"The bureaucratic process - the inordinate, detailed analyses &amp; multiple levels of planning &amp; reviews."</p> <p>"The Watershed Analysis is the longest phase. It will require mgmt plans for peregrin falcon, pileated woodpecker, pine martens, etc. We don't have the time, money, or resources to do everything."</p>	<p>"Forest Plan monitoring plan should be more specific because time, funding, and commitment hinges on forest plan direction."</p> <p>"Need more funds for monitoring."</p> <p>EA should list what effects will be monitored.</p> <p>"Need to look at problems more intensively, otherwise, we're going to still be guessing. Providing incentives for specialists to work on a Master's Degree would help them design statistically sound experiments to validate hypotheses."</p> <p>Need pictures and documentation of cable vs. helo logging effects (visual, soils, habitat degradation).</p> <p>"Need to portray the tradeoffs of different logging systems &amp; roading. Economic analysis should include road mitigation and maintenance costs."</p> <p>"Need skills to look at more ecological ways to build roads and culverts."</p> <p>"Need more law enforcement for road closures."</p> <p>"Need expertise to stretch logging systems to their technical and physical capabilities."</p> <p>"Need transp. planning skills to handle challenges."</p> <p>"Need to diversify learning in the college natural resource mgmt. fields."</p>
<b>2</b>	<p>EA and LFR were well organized, concise, &amp; logical.</p> <p>Transp. Plan was a thorough, long-term plan; covered a large area (several timber sales) and compared the different routes in terms of impacts (soils, watershed, visual, and wildlife), management access, and dispersed recreation.</p> <p>Thorough comparison of Alternatives Review Team (Supervisor's Office) critiqued EA and sale layout.</p> <p>Mixed logging systems (helo, tractor, &amp; cable).</p> <p>LFR stated why additional road construction was infeasible.</p>	<p>Sale objectives, purpose &amp; need not emphasized.</p> <p>FP does not provide much direction in logging &amp; transp. planning.</p> <p>Records are here and there, not readily accessible.</p> <p>"A lot of records get lost."</p> <p>"Forest health &amp; growth concerns are at the bottom of the list."</p> <p>No long-term silvicultural plan because mgmt. direction keeps changing.</p> <p>"Appraisals show low end of costs."</p> <p>"Less work gets accomplished on the ground."</p> <p>Decision Notice did not mention economic considerations</p>	<p>"Getting the specialists' input &amp; scheduling."</p> <p>"Getting the IDT to agree."</p> <p>"Trying to keep GIS updated."</p> <p>"Changes in direction."</p>	<p>Need to document rationale for decisions and to keep records in one place.</p> <p>"Need more law enforcement."</p> <p>"Appraisals need to show higher costs to cover extra mgmt. costs due to longer walking distances."</p> <p>"Need strong managers (who don't beat around the bush)."</p> <p>"Need to ground-truth units by ID Team to ensure that planned leave trees and logging system capabilities are compatible and to ensure that appropriate contract provisions are incorporated in the TS contract."</p>



**TABLE 6: TIMBER SALE (TS) PLANNING PROCESS, Page 2**

<b>Sale #</b>	<b>Strengths</b>	<b>Weaknesses</b>	<b>Bottlenecks</b>	<b>Improvements &amp; Skills Needed</b>
<b>3</b>	<p>FP provides direction in logging system &amp; transp. planning.</p> <p>S.O. logging specialist critiqued LFR and sale layout.</p> <p>"District and S.O. has an on-going timber sale monitoring program."</p> <p>"District has all the old harvest units, roads, &amp; logging systems on GIS. Some records date back to the 1930's."</p> <p>"Logging specialist mapped (in GIS) the logical logging settings and roads for the entire district."</p>	<p>Sale objectives, purpose &amp; need not clear. Records not readily accessible. Logging/transp. cost analysis lacking.</p> <p>"At present, since there are no District or S.O. logging specialists, there's a potential for logging/transp. problems to fall through the cracks."</p> <p>District evaluates fuel load after harvest.</p> <p>Decision on previous sale (helo and no roads) precluded many forest mgmt. options in this sale and in the future.</p> <p>Decision Notice (DN) did not mention economic considerations.</p>	<p>"Bottleneck in the past was roading. The transp. planners had a different boss / different priorities. Often they waited until the logging specialist flagged in the roads."</p>	<p>LFR and EA should explain why the previous decision (helo &amp; no road) is the best choice for this sale also.</p> <p>"Need more first hand experience to know all the capabilities of helo, long span, and multi-span."</p> <p>"Skills are needed to assure that roads are in the correct place from a wildlife &amp; visuals standpoint"</p> <p>"Might need a specific FP standard &amp; guideline that addresses the economic implications of long-term logging &amp; transp. system planning."</p> <p>"Need a method of comparing the value of having roads vs. not having roads (in terms of veg. mgmt., fire, recreation, wildlife, water quality)."</p>
<b>4</b>	<p>FP provides direction in logging system &amp; transp. planning.</p> <p>EA emphasized sale objectives but purpose &amp; need for TS is not clear.</p> <p>Road Mgmt. Objective Worksheets (a checklist of each resource area's access needs, cost-share, &amp; issues) were included in the EA.</p> <p>"Transp. planner goes specifically to each resource specialist &amp; asks if they will need to use certain roads (proposed for closure) in the next 10-20 years."</p> <p>A Preliminary Logging Feasibility Report was prepared for the EA.</p> <p>Project Record included a Haul Network Map &amp; IDT meeting notes.</p> <p>S.O. logging specialist critiqued LFR and sale layout</p> <p>LFR included: rigging downtime, landing constr., equip. move-in, production rates, contract provisions, etc.</p> <p>Purchaser was charged \$57,000 to compensate for the change in logging systems (from helo to cable).</p>	<p>Project record not well organized; certain reports were not easy to find.</p> <p>"Need a lot of analysis because the public doesn't trust us."</p> <p>"The public has the impression that the USFS is an agency that just cuts trees."</p> <p>"There's a mindset out there that thinks one more road will destroy the earth."</p> <p>"There's no protocol for doing the surveys, nobody knows what kind of habitat the critters want."</p> <p>"We don't get money for long-term monitoring- it comes out of our hides or we take it out of other appropriations."</p> <p>"Can't have everything (no roads, five snags, wildlife, rec., large trees, etc.) on every acre- it's just not workable."</p> <p>"The info in GIS just isn't correct."</p> <p>"The w-shed analysis is done on such a large scale, you don't get the details."</p> <p>"I've seen people write a lot but don't go out in the field to see what did not work and figure out why not."</p> <p>Decision Notice did not mention economic considerations.</p>	<p>"Not sure we can get all the w-shed analysis done, someone will say- 'you didn't look at that part in depth.'"</p> <p>"It doesn't really matter how much analysis we do, some people just don't want to see any timber cutting."</p> <p>"Rules keep changing. We have to re-do our work too many times."</p> <p>"The bottleneck is not with the USFS, the bottleneck is that society &amp; Congress keeps changing what they want us to do. It's just political. Congress has passed numerous laws that are contradictory. Nobody said democracy is efficient- the alternative is an authoritarian gov't."</p> <p>"We'll need more time and people to do the surveys called for in the President's Plan adequately."</p>	<p>"More public involvement, there's a lot of environmental groups (Elk Foundation, Ducks Unlimited, Wildlife Society) that are willing to help us."</p> <p>"The upper level (S.O. and up) in our agency needs to understand what we've gone through and have to go through. They may have been on the ground 10-20 years ago but everything has changed. If they spent more time studying the activity, they could see what is really going on and what is not working."</p> <p>"If the public wants the NF to be a national park, then we will need more law enforcement officers. (the NPS workforce is 3/4 law enforcement). If they want research, then we can spend a lot of money designing long-term research. If we could fund the Districts stewardship fashion, 10 million bd.f.t of timber (\$500/mbf) and rec. user fees could fund this District and help fund others."</p> <p>"The whole ID Team should go out to the field and see what and how much can be done realistically. Sometimes the ID Teams expect and promise too much."</p> <p>"Need to change the timber beast attitude- 'A billion bd.ft. or bust!' "</p>

**TABLE 6: TIMBER SALE PLANNING PROCESS, Page 3**

<i>Sale #</i>	<i>Strengths</i>	<i>Weaknesses</i>	<i>Bottlenecks</i>	<i>Improvements &amp; Skills Needed</i>
5	<p>FP provides direction in logging system &amp; transp. planning. EA covered a decade of timber harvests for a large planning area (32,000 acres). GIS was used to display overlays and help evaluate cumulative effects.</p> <p>EA emphasized sale objectives and purpose &amp; need.</p> <p>Logging specialist delineated the logical logging settings for 312 units in the Planning Area.</p> <p>Road &amp; Traffic Mgmt. Worksheets were signed (agreed to) by all the resource specialists.</p> <p>"All the soils on the District have been classified and verified."</p>	<p>Records are here and there, not easy to find. Some maps (i.e. the road route maps) are on microfiche.</p> <p>Nothing in EA or Decision Notice mentions a time issue (preferring helo because roads take too much time.)</p> <p>"Loggers will tell us when a helo sale is economically infeasible."</p> <p>Map of proposed roads and landing don't show the contour lines.</p> <p>Many alternatives were considered but only three alternatives were analyzed in detail for 32,000 acres (several timber sales).</p> <p>"I feel we didn't take care of all the silv. needs (i.e. dense stands)."</p> <p>Decision Notice did not mention economic considerations.</p>	<p>"Biggest reason for having helo is politics and the time frame we have."</p> <p>Roads take a lot of time, especially waiting for cultural resource and T&amp;E species surveys.</p> <p>When you have either one, the roads have to be re-routed and then you have to wait again for a cultural resource survey, etc. Those costs aren't shown in the economic analysis."</p> <p>"Don't know how we can do watershed analysis without GIS."</p>	<p>"Need to document the effectiveness of helo and other logging systems."</p> <p>"Photos are invaluable, maps are great but photos are better."</p> <p>"EA's and specialist reports should state any assumptions."</p> <p>"We need dependable multi-year funding for watershed analysis and monitoring."</p>
6	<p>FP provides direction in logging systems.</p> <p>EA and analysis file well organized, everything was easy to find.</p> <p>IDT meeting notes documented key discussions, decisions, and rationale.</p> <p>Economic analysis listed assumptions. Sale Prep. forester used info from previous sales to base costs, prices, profit, &amp; overbid estimates for this sale.</p> <p>Harvest scheduling map.</p> <p>Tagline review- "IDT &amp; decision maker ground-proof the proposed action before the final decision is made. Prior to making this a requirement, we got burned a few times."</p>	<p>Purpose and need for timber sale is not clear. Sale objectives not emphasized.</p> <p>No LFR - "The S.O. figured we had enough years of experience that we didn't need to do an LFR."</p> <p>"Duplication of efforts in various planning levels."</p> <p>"The biggest downfall is 3 problems:</p> <ol style="list-style-type: none"> <li>1) data is collected but not digested into a written report;</li> <li>2) reports are not peer reviewed and published.</li> <li>3) there is no reward for doing it."</li> </ol> <p>"The cost for just an EIS document itself is \$60-100,000."</p> <p>"The lifespan of plans and documents are getting shorter while paperwork, waiting periods, &amp; requirements keep expanding."</p> <p>Half of the unit boundaries in the sale changed during implementation.</p> <p>Decision Notice did not mention economic considerations.</p>	<p>"I don't think the planning process is the problem, we can do all the planning &amp; research, and use whatever process, if we don't come up with the outcome the publics want, they can discredit it by saying: 'you haven't studied all the effects.' "</p> <p>"The watershed analysis is a very intensive process, it requires many more meetings (interdisciplinary, interagency &amp; public), an enormous amt. of data collection, research, &amp; GIS, all under the pressure of crunched timelines for projects waiting in line. It scares me to think upper mgmt. uses GIS maps. How can the data &amp; end product be worth much under such pressure?"</p>	<p>"I think we have more monitoring than you can believe but it's never written up. Putting it in a file is not good enough. It needs to be reviewed and published so it can be used for reference. The key is to know why something failed, document it, share it in a report, and avoid it next time."</p> <p>"I think we should stay with the EA's rather than add the watershed analysis (which is basically just a cumulative effects analysis). We can improve the cumulative effects analysis in the EA's."</p> <p>"On one hand, I think we need all the research we can get, and on the other hand I think there's so much research we're not paying attention to. I spend 90-95% of my time on administration, budgets, &amp; planning. We need some emphasis on reviewing research, designing studies, and writing reports."</p> <p>"Universities have Master's students who are looking for projects and need to write reports."</p> <p>"One of our downfalls is that when we collected timber receipts, 90% of the money went into the general treasury. We need to be proactive on sources of funding- like road users, I think they're willing to pay."</p> <p>"Interdisciplinary means figuring out what is best for the land, plants, animals, &amp; people. 'Protecting your own bailiwick' is not interdisciplinary."</p>



**TABLE 6: TIMBER SALE PLANNING PROCESS, Page 4**

<b>Sale #</b>	<b>Strengths</b>	<b>Weaknesses</b>	<b>Bottlenecks</b>	<b>Improvements &amp; Skills Needed</b>
7	<p>Forest Plan provides direction for logging systems and economics. EA was well written &amp; organized; records were readily accessible. ID Team proposed many logging mitigation measures &amp; monitoring (including a silviculture/ wildlife administrative study). "ID Team looked for ways to save time and dollars thru: purchaser marking; contracting plant surveys &amp; biological eval.; and having one timber crew that works on all the Districts." Economic analysis included assumptions. "Forest economist provided econ. training session for Districts." "S.O. collects monitoring reports and puts out an annual monitoring report." "District has an aggressive program of taking groups from the public out to look at thinning sites and other projects."</p>	<p>Purpose &amp; need for sale and sale obj's were not clear nor emphasized. "We're not managing for timber production anymore. Protecting the environment comes No. 1. It doesn't bother me that a stand has reached Maximum SDI because we're meeting our wildlife, fisheries, &amp; visual obj's. The thinning was done for wildlife, not growth- the next entry is in 40 years." "Who says we should balance economic and technical issues with environmental?" "The majority of the specialists and publics have pushed us to look at environmental issues more than economic and technical." "It's pretty hard to be efficient when you're going one direction and then something changes &amp; you have to re-do your work." "The planning process is going to be very expensive in order to meet all our obligations under NEPA and the President's Plan. If we don't meet the requirements, then the project is very open to litigation." "One of the biggest criticisms from the public is that we don't know all the effects. The funding to do monitoring has not been there. We need to monitor to see how well we predicted the expected impacts in the EA. Requesting for monitoring funds is not popular with upper mgmt. because they want to see us accomplishing projects." "We're still dependent on old databases and there's a lot of difference from one district to the next on how well that database was maintained. All we can do is put forth our assumptions and go from there." "It's very difficult to keep up with all the new requirements. I want to keep on top of it but there's so much. Most of the specialists are very concerned about the resources and take their responsibilities very seriously, sometimes to the point that it affects their health." Decision Notice did not mention economics.</p>	<p>"I don't think there are any bottlenecks- we have to jump through certain hoops because that's the law." "The reason the EA takes so long is because we have to wait for certain plants to bloom at different times of the year to find threatened plants and two-year surveys for spotted owls and murrelets." "The President's Plan has added tremendously, in my point of view, to more planning efforts. We have more surveys of mgmt. species (amphibians, mollusks, bryophytes, fungi, etc.). All of these take additional time &amp; effort to try to address to some satisfaction." "The main bottleneck is that our plans and documents become out-of-date with broad sweeping changes." "We're grasping for knowledge that's out of our realm- trying to formulate all the interactions between vegetation, wildlife, and fisheries. We can't do anything until we know everything." "Working with trees and ecosystems is long term, often you can't see the results for many years."</p>	<p>"We can't streamline the planning process, we've been told from the Cabinet level that we will do more planning &amp; analysis and that we'll have less people to do it with." "I don't see how we can shortcut the planning process, we just can't take on as many projects as we did in the past." "Specialists have to have thicker skin and say that they can only do so much and let people see their schedule and priorities." "We need to look for opportunities for projects to generate revenue and ways to use the revenue on the Districts. I think the agency has potential to pay their way." "Have specialists bring facts to an IDT and present facts in the EA. If there is a disagreement, go out to the field and look at examples and talk about what happened." "A specialist that brings to the IDT examples of concern or pictures of what they are talking about has more credibility. It's less opinion and more of an objective portrayal of what the expected consequences are." "It would help if someone listed all the research articles on logging system and road effects on the environment." "If specialists document their observations and have their report reviewed, it would certainly be more credible in an EA than saying 'some, less, or probably'." "One way to get more emphasis on monitoring is to make it a performance evaluation criteria where you don't get your automatic step increase if you didn't evaluate the effectiveness of a mitigation measure or if you didn't meet the timeframe for providing input on other projects." "I would highly recommend the Consent and Public Participation training session. People need to feel they've been dealt with fairly, that the process was followed, and that no basic values were infringed upon."</p>