

**FISHLAKE
NATIONAL FOREST**

**FINAL
ENVIRONMENTAL IMPACT
STATEMENT
FOR THE
LAND AND RESOURCE**

INTERMOUNTAIN REGION



FOREST SERVICE



UNITED STATES

DEPARTMENT OF AGRICULTURE

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I. PURPOSE AND NEED

A. INTRODUCTION

The Fishlake National Forest, addressed in this Final Environmental Impact Statement and accompanying proposed Forest Plan, contains 1,424,479 acres of National Forest System lands. The total area contained within the proclaimed boundaries is 1,525,668 acres; however, 101,189 acres are in other ownerships. Decisions made in the Forest Plan cover only National Forest System lands.

Preparation of the Forest Land and Resource Management Plan (Forest Plan) is authorized by the Multiple Use-Sustained Yield Act of 1960 and is required by the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA), as amended by the National Forest Management Act of 1976 (NFMA). The implementing NFMA regulations, found in 36 CFR 219 and cited throughout this Final Environmental Impact Statement (FEIS), specify that a Forest Plan be accompanied by an EIS. The EIS must conform to the requirements of the National Environmental Policy Act of 1969 (NEPA) and implementing regulations found in 40 CFR 1500.

The EIS is not a decision document; it discloses significant physical, biological, economic and social effects on the human environment of implementing the proposed action and the alternatives to that action which were considered in developing the Forest Land and Resource Management Plan. The net public benefits that reflect the long-term value to the Nation of benefits less costs measured by both quantitative and qualitative criteria are considered. The issues, concerns, and opportunities identified through the public involvement process are addressed in the EIS.

The Fishlake National Forest is only one of the 154 National Forests 1/ involved in the planning process following the same National directives. The total National Forest planning effort is three-tiered: 2/

1. The National Level
2. The Regional Level
3. The Forest Level

The National level deals primarily with National Forest planning, policy making, funding, monitoring, and legislative activities. The Regional role is one of clarifying and interpreting policy, providing additional direction and coordination, as well as providing expertise upon request. Individual Forests are charged with Forest land and resource management, within National and Regional direction, from a local perspective.

1/ Some of the Forests are combined for planning purposes, resulting in 121 different Forest Plans.

2/ See Glossary of Definitions in Appendix.

A separate document, the Record of Decision, accompanies the final EIS.

The purpose of the Forest Plan is to provide a management program that reflects a mix of management activities allowing use and protection of the Forest's resources, that fulfills legislative requirements, and that addresses local, regional, and national issues. To accomplish this, the Forest planning process:

1. Establishes management direction and associated long-range goals and objectives for the Forest for the next 10 years.
2. Specifies standards, guidelines, and approximate timing and locations of practices necessary to achieve that direction.
3. Establishes monitoring and evaluation requirements needed to ensure that management direction is carried out and to determine how well outputs and effects were predicted.

B. PLANNING PROCESS AND LINKAGES

Forest planning occurs within the framework of National and Regional planning, which are structured by the laws cited above. Guided by the National RPA program, the Regional Guide establishes regional management standards and guidelines, addresses regionally significant issues and concerns, and distributes tentative resource output targets to Forests in the Region. Questions of meeting assigned targets and addressing local issues and concerns are addressed in the Forest planning process.

Passage of the Utah Wilderness Act (Public Law 98-428) in 1984 resolved the roadless area issue on the Fishlake National Forest. Roadless and undeveloped areas of National Forest System Land within the State of Utah were released from required evaluation for wilderness designation during this first planning cycle. They will be reconsidered during the next planning iteration. No areas of the Fishlake National Forest were designated as wilderness or as further planning areas for wilderness. Because this act resolves the issue of roadless and undeveloped areas on the Forest, the planning process and alternatives have been modified to be in conformance with this law.

The planning process is based on 14 planning principles stated in the NFMA regulations (36 CFR 219.1); these are:

1. Establishment of goals and objectives for multiple-use and sustained yield management of renewable resources without impairment of the productivity of the land.
2. Consideration of the relative values of all renewable resources, including the relationship of nonrenewable resources, such as minerals, to renewable resources.
3. Recognition that the National Forests are ecosystems, and their management for goods and service requires an awareness and consideration of the interrelationships among plants, animals, soil, water, air, and other environmental factors within such ecosystems.

4. Protection and, where appropriate, improvement of the quality of renewable resources.
5. Preservation of important historic, cultural, and natural aspects of our National heritage.
6. Protection and preservation of the inherent right of freedom of American Indians to believe, express, and exercise their traditional religions.
7. Provisions for the safe use and enjoyment of the Forest resources by the public.
8. Protection, through ecologically compatible means, of all Forest and rangeland resources from depredations by Forest and rangeland pests.
9. Coordination with the land and resource planning efforts of other Federal agencies, State and local governments, and Indian tribes.
10. Use of a systematic, interdisciplinary approach to ensure coordination and integration of planning activities for multiple-use management.
11. Early and frequent public participation.
12. Establishment of quantitative and qualitative standards and guidelines for land resource planning and management.
13. Management of National Forest System lands in a manner that is sensitive to economic efficiency.
14. Responsiveness to changing conditions of land and other resources and to changing social and economic demands of the American people.

Forest Service planning is a continuous, iterative process carried out on three levels:

1. National--RPA Assessment and program.
2. Regional--Regional Guide.
3. Local--Forest Land and Resource Management Plans for the National Forest System lands; Statewide comprehensive plans for fish and wildlife management and outdoor recreation; and State Forest resource plans that are developed by the States with Forest Service assistance for State and private lands and that provide information used at the Regional and National levels.

Management direction becomes increasingly specific as planning progresses from the National to the local level.

National RPA Assessment and Program

Every 10 years, a comprehensive, nationwide assessment is made of the Forest and rangeland renewable resources in the United States. Using information generated at the local and Regional levels, this RPA Assessment covers timber, range, minerals, water, wildlife and fish, outdoor recreation, and wilderness. Long-range projections are made of future supply and demand for each of these resources. The findings are then used to help determine the desired level of future Forest Service programs. Alternative levels of outputs and associated costs are examined in the RPA program, which is prepared every 5 years. Based on an analysis of these alternatives and consideration of public views, the Secretary of Agriculture selects a National Forest System Program. The recommended program and a presidential statement of policy are transmitted to Congress, which may accept, reject, or revise the statement of policy. The final Statement of Policy and program together guide the framing of future Forest Service budget proposals. Actual program implementation is directed by annual appropriations.

Regional Guide

Regional planning links the RPA assessment and program with the local Forest and State planning. It plays a dual role by channeling management direction from the National to the local level and information from the local to the National level. The Regional Guide is tiered to National direction.

1. It provides standards and guidelines for various management activities that may be carried out on the National Forests. These standards and guidelines specify the actual criteria to be applied to the management activities.
2. It provides planning direction for developing individual Forest Plans, including those issues or concerns raised at the National or Regional level that can only be assessed or resolved by the Forests. Planning direction essentially defers the final decision on an issue to the individual Forest, within limits established by the Region.
3. It displays the Regional RPA program and distributes tentative resource targets among the individual National Forests. RPA-assigned objectives are used as the basis for one of the alternatives examined in the Forest planning process.
4. It reflects the general coordination of National Forest System programs, State and Private Forestry programs, and research programs.

Forest Planning

National Forest land and resource management planning considers a broad range of reasonable management alternatives. To the extent practicable, Forest Plan alternatives reflect the full range of major commodity and environmental resource uses and values that could be produced from the Forest. All alternatives are formulated to provide different ways of addressing the major public issues, management concerns, and resource opportunities identified during the planning process. One alternative is designed to meet the Forest's tentatively assigned share of the 1980 RPA program; others have resource outputs that are above or below the RPA program levels. The emphasis in both the RPA program and National Forest Plan is on the future and how the Forest can best be used and managed to meet people's needs. The Forest's Final Environmental Impact Statement (FEIS) is tiered to the Region Four Regional Guide.

The Forest Plan replaces all previous resource management plans prepared for the Forest. Subsequent to final approval of the Forest Plan, all management activities affecting the Forest, including budget proposals, must comply with the Plan. In addition, all permits, contracts, and other instruments for the use and occupancy of Forest lands must agree with the Forest Plan (36 CFR 219.10 (e)).

Forest Planning Process

The planning process specified in implementing NFMA regulations is followed in developing Forest Plan alternatives; it uses an interdisciplinary approach in developing the alternatives (36 CFR 219.5). The steps or planning actions described in the regulations and used in this Forest planning process are:

1. Identification of purpose and need.
2. Development of planning criteria.
3. Collection of inventory data and information.
4. Analysis of the management situation.
5. Formulation of alternatives.
6. Estimation of effects of alternatives.
7. Evaluation of alternatives.
8. Recommendation of preferred alternative.
9. Approval of plan.
10. Monitoring and evaluation of Forest Plan.

This FEIS is prepared and circulated for comment as a result of planning actions 1 through 8. A preferred alternative is identified through the process of planning action 8. The preferred alternative, referred to as the "proposed action" in this FEIS, is the basis for the proposed Forest Plan detailed in the accompanying document. For the purpose of NEPA disclosure, the FEIS and the proposed Forest Plan are treated as combined documents, as permitted by Council on Environmental Quality (CEQ) regulations (40 CFR 1506.4).

After the close of the 90 day comment period on this FEIS, planning actions 1 through 8 will be reviewed and modified as necessary to respond to public comment. A final EIS will then be prepared, filed with the Environmental

Protection Agency, and made available to the public. The Regional Forester will use the final EIS in making a decision under NFMA regarding approval of the Forest Plan (36 CFR 219.12(j)). This will be documented in the Record of Decision, which will be available to the public.

The final EIS, prepared in conjunction with the Forest Plan, will be used as a tiered Environmental Impact Statement, by providing general Forest guidelines for project development. Site-specific detail will be included in separate environmental analyses for individual project-level decisions. Future environmental assessments and decision notices or Environmental Impact Statements and Records of Decision will be tiered from the final EIS.

The Forest Plan may be revised as needed on a 10-year cycle. It must be revised at least every 15 years. The Plan may also be revised whenever the Forest Supervisor determines that conditions or demands covered by the Plan have changed significantly or when changes in RPA policies, goals, or objectives would have a significant effect on Forest level programs. The Forest Supervisor will review the conditions that might require revision of the Forest Plan at least every 5 years.

C. LOCATION

The Fishlake National Forest encompasses 1,424,479 acres of National Forest System lands in south central Utah. The town of Richfield, surrounded by and headquarters for the Forest, is about 140 air miles south of Salt Lake City (See Vicinity Map, Fig. I-1). The Forest includes parts of the Wasatch, Awapa, Sevier, and Fishlake Plateaus, as well as all of the Tushar Mountains and Canyon and Pavant Mountain Ranges. Portions of the nine Utah counties covered by the Forest are: Beaver, Garfield, Iron, Juab, Millard, Piute, Sanpete, Sevier, and Wayne.

Major access to the Forest is provided by two interstate highways and one U.S. Highway. I-70 crosses the Forest in an east-west direction through Salina and Clear Creek Canyons; I-15, linking Salt Lake City with Las Vegas, passes roughly north-south through the Forest, east of the Canyon Range, through Scipio Pass, then west of the Pavant Range and Tushar Mountains (Fig. I-2). U.S. Highway 89, also running south from Salt Lake City, traverses the Sevier River Valley, which separates the eastern and western halves of the Forest.

The Fishlake National Forest that exists today is the result of consolidations of four smaller National Forests. These Forests, established from 1899 to 1907, were Fishlake, Beaver, Fillmore, and Glenwood. By 1923 all these Forests were combined to promote administrative efficiency.

FIGURE I-1
VICINITY MAP

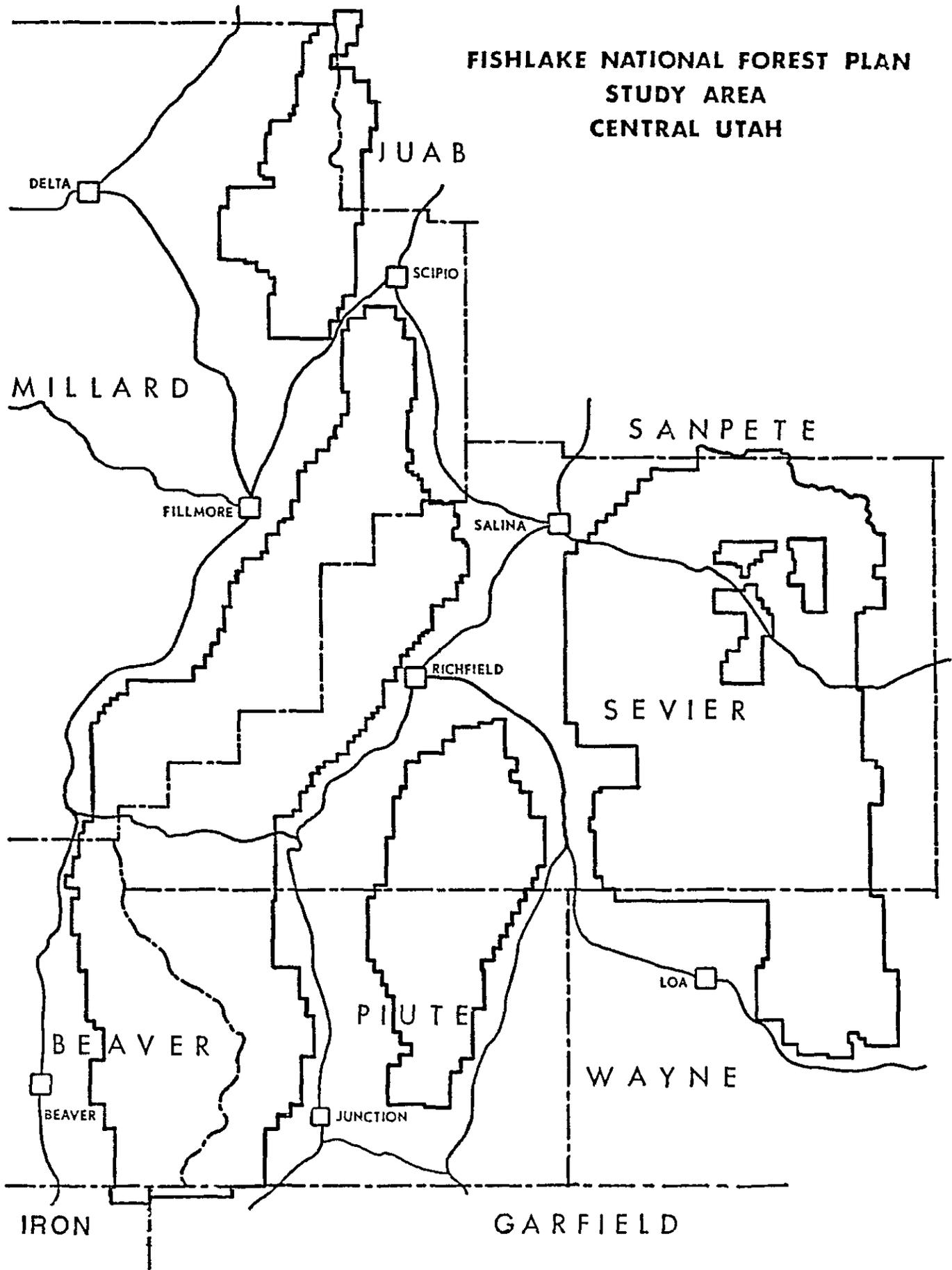
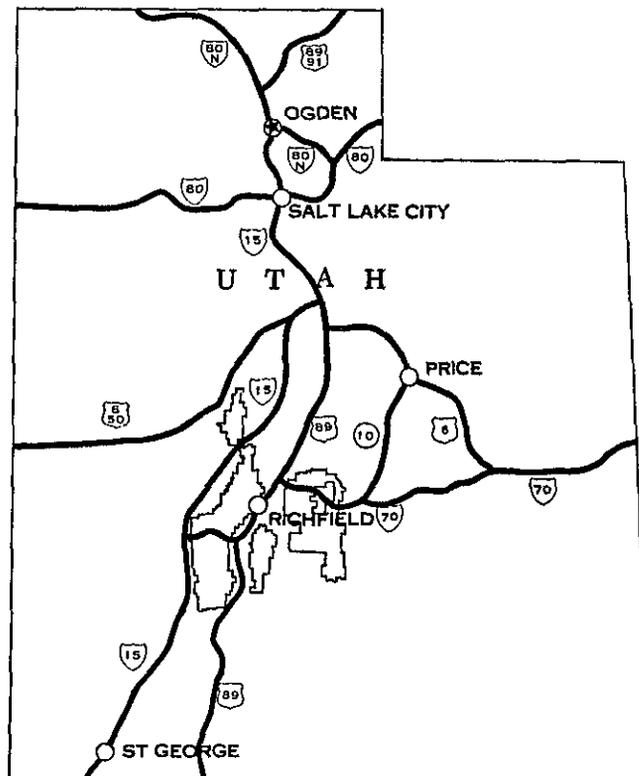


FIGURE I-2
VICINITY MAP - STATE OF UTAH

KEY MAP



D. ISSUES, CONCERNS, AND OPPORTUNITIES

An initial list of public issues and management concerns regarding Forest management was developed from comments solicited at public meetings, from written responses to news media articles, from written comments received on the Forest's Issues and Concerns Statement, from written comments received from Citizen Involvement Groups, and from the Forest's Management Team. These issues and concerns were aggregated into general statements of public issues and management concerns. The general issue and concern statements were then grouped into broad resource topic categories and summarized in nine planning problems. The planning problems, then, represent the major public issues and management concerns identified. A detailed discussion of this process can be found in the Planning Action 1 document (Issues, Concerns and Opportunities), the Planning Action 2 document (Planning Criteria), and in Appendix A.

These are the topics that must be addressed if the Forest Plan is to provide appropriate and effective management direction. This same process was used to establish the scope of this environmental impact statement (40 CFR 1501.7). The Final Environmental Impact Statement Notice of Intent was published in the Federal Register: Vol. 45, No. 154, Thursday, August 7, 1980, page 52434; and revised and published in Federal Registers: Vol. 46, No. 15, Friday, January 23, 1981, page 7418; and Vol. 38, No. 185, Thursday, September 22, 1983, page 43200.

Based on a 1982 Ninth Circuit Court of Appeals decision regarding RARE II, the Secretary of Agriculture directed a reevaluation of National Forest roadless areas for proposed wilderness designation. This directive was incorporated into the planning process, and a tenth planning problem was added to the previously aggregated issues and concerns. A summary statement of each planning problem follows:

1. RECREATION SITES

Development of new sites and facilities, especially for large groups and destination visitors, and also rehabilitation of existing facilities, are needed to meet increasing public demand for developed recreation sites.

2. RECREATION USE

The Forest will experience more user conflicts, resource damage, and administrative costs unless greater efforts are made to regulate ORV use and provide other dispersed recreational opportunities.

3. MINERAL AND ENERGY DEVELOPMENT

Mineral and energy developments will increase social and economic impacts, and conflicts with other resource uses. Existing law limits the Forest Service role in mineral activities to assuring protection of the public interest, other resource uses, and the environment.

4. LIVESTOCK AND WILDLIFE FORAGE

The Forest is over-obligated for livestock, given present forage production, requiring increased range maintenance and restoration allowances or decreased grazing obligations; appropriate levels of forage treatment and grazing numbers must be determined.

5. HABITAT FOR GAME AND NONGAME SPECIES

The Forest must manage habitat to maintain viable wildlife populations and provide guidance for resolving conflicts between wildlife and other resource uses.

6. ROAD SYSTEM EXPANSION AND CLOSURES

Projected road use shows the Forest will experience adverse effects to its existing road system and continued expansion of its non-system roads unless it initiates seasonal road closures, limits ORV access in some areas, and expands or improves roads in others.

7. COMMERCIAL AND FUELWOOD TIMBER MANAGEMENT

Current commercial timber demand can be met, but increased production would require extensive access road construction. Increasing fuelwood demand requires additional administrative, planning, and road maintenance resources.

8. WATERSHED CONDITION, WATER QUALITY, AND WATER PRODUCTION

Some Fishlake watersheds need to be stabilized; Forest resource uses must be managed to prevent watershed degradation.

9. MIXED PUBLIC AND PRIVATE LAND OWNERSHIP

Problems of limited public access and interference with use of Forest resources posed by private and state ownership of lands inside Forest boundaries need to be alleviated through the land exchange/right-of-way program.

10. ROADLESS AREA REEVALUATION

Roadless area reevaluation, issue 10, was resolved during the planning process by the Utah Wilderness Act (P.L. 98-428) of 1984. No area within the Forest was designated as part of the National Wilderness Preservation System. Non-designated lands were released for such non-wilderness uses as determined during this planning process. Further evaluation for wilderness will be considered in the next planning cycle, 10 to 15 years after implementation of this Plan. (Appendix A contains additional material)

E. PLANNING RECORDS

Chapter II of this FEIS displays comparisons of how planning problems are addressed by alternative. The planning problems provide the focal points for the planning process. Consequently, each alternative in the FEIS addresses these problems to varying degrees.

All records for the Forest's planning process are available for inspection during regular business hours at the Fishlake National Forest Supervisor's Office, 115 East 900 North, Richfield, Utah 84701. These documents, known as planning records, contain detailed information and decisions used in developing the Forest Plan. Planning records are incorporated by reference at appropriate points in the text and appendices of this FEIS and in the proposed Forest Plan.

Appendix C contains a glossary of analysis, management, and resource terms used in the FEIS. A bibliography, following the Appendices, references many of the source documents used in developing the FEIS.

II. ALTERNATIVES, INCLUDING THE PROPOSED ACTION

A. INTRODUCTION

The Council on Environmental Quality (CEQ) regulations (40 CFR 1502.14) require rigorous exploration and objective evaluation of a broad range of reasonable alternatives to issues, concerns, and opportunities, including a "no action" alternative, as well as alternatives outside the agency's jurisdiction. NEPA regulations also require identification and discussion of alternatives eliminated from detailed study.

An alternative is the statement of a desired level of Forest-wide outputs and Forest-wide management goals. In contrast, a prescription is a specific set of management direction and Standards and Guidelines that are applied to specific pieces of land to achieve the outputs and goals of the alternative. An alternative is Forest-wide, while a prescription is land specific. Many combinations of prescriptions are possible in formulating a reasonable range of alternatives for evaluation as possible Forest Plans.

Each alternative is measured in terms of its net public benefit (NPB). Net public benefit is the total benefit to the public of priced and nonpriced outputs produced, minus the costs of producing them. For example, timber and range are priced benefits because users pay a certain amount for them, while there is no quantification for such nonpriced benefits as seeing an eagle or knowing there are deer on the mountain. Prices can be figured for certain production costs, including manpower and equipment to plant trees, build roads, improve wildlife habitat, and to do chaining to clear rangeland. Nonpriced costs might include disruptive impacts of certain management practices on other resources or on a segment of society--for instance, detrimental impact on watershed, fisheries, and fishermen from a road built for timber access.

Alternatives of varying costs, emphasizing different outputs of goods and services, are formulated. Then they are analyzed to determine which produce maximum net public benefits--priced and nonpriced benefits produced for the public at the least amount of cost. This analytical process is detailed in Appendix B.

Forest Service regulations 36 CFR 219.12(f) establish criteria for guiding the development of alternatives. These criteria are:

(1) Alternatives shall be distributed between minimum and maximum resource potentials to reflect, to the extent practicable, the full range of major commodity and environmental resource uses and values that can be gained from the forest. Alternatives shall reflect a range of resource outputs and expenditure levels.

(2) Alternatives shall be formulated to facilitate analyses of opportunity costs, and of resource uses and environmental compromises among alternatives, and between production levels (benchmarks) and alternatives.

(3) Alternatives shall be formulated to facilitate evaluation of effects on present net value (PNV), benefits, and costs of achieving various outputs and values that are not assigned monetary values, but that are provided at specified levels.

(4) Alternatives shall provide different ways to address and respond to major public issues, management concerns, and resource opportunities identified during the planning process.

(5) Reasonable alternatives, which may require changes in existing law or policy to implement, shall be formulated, if necessary, to address major public issues, management concerns, or resource opportunities identified during the Planning process (40 CFR 1501.7, 1502.14(c)).

(6) At least one alternative shall be developed that responds to and incorporates Resource Planning Act (RPA) program tentative resource objectives for each Forest, which are displayed in the Regional Guide.

(7) At least one alternative shall reflect the current level of goods and services provided, and the most likely amount of goods and services expected to be provided in the future if current management direction continues. Pursuant to NEPA procedures, this alternative shall be deemed the "no action" alternative.

(8) Each alternative shall represent, to the extent practicable, the most cost efficient combination of management prescriptions examined that can meet objectives established in the alternative.

(9) Each alternative shall state at least: conditions and uses that will result from long term application of the alternative; goods and services to be produced, and timing and flow of these resource outputs, together with associated costs and benefits; resource management Standards and Guidelines; purposes of proposed management direction.

In order to comply with NEPA regulations for rigorous examination of alternatives and NFMA criteria for alternatives (listed previously), alternatives were developed step-by-step, using information derived from the NFMA planning process. Pertinent laws and regulations were considered not to be a significant issue in this planning process; therefore, analysis of legal mandates was unnecessary.

B. STEPS IN ALTERNATIVE DEVELOPMENT

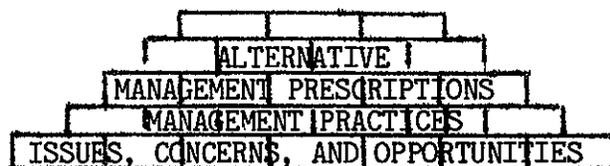
The process for the formulation of alternatives is described in 36 CFR 219.12(f). It began in Planning Action 1 with the identification and evaluation of public issues and management concerns and the resource management opportunities available to address these issues and concerns. The planning problems addressed by the Forest were developed from these issues and concerns.

Management practices were then identified that specified actions, treatments, or measures that could be carried out by the Forest Service in the management of National Forests, and that could address the planning problems. Groupings of compatible management practices were assembled into management prescriptions which defined a specific type of resource management emphasis. Management direction includes requirements designed to protect Forest resources and mitigate adverse impacts. Prescriptions were designed to address certain outputs/effects from the National Forest land where they would be applied.

An additional step was formulation of benchmarks--maximums a Forest can produce of given resources if all management activities were devoted to producing those resources, and minimums it would produce without direct management activities. Two additional benchmark levels (Maximum Present Net Value considering only Market Outputs and Maximum Net Value considering all outputs, using assigned prices) were formulated to determine the most economically efficient management of the Forest.

The next step in the alternative formulation process was the Analysis of the Management Situation, (AMS, Planning Action 4). The AMS addressed the following: range of goods and services supplied; kinds of demands existing for goods and services; potential to address issues, concerns, and opportunities; potential to meet long range assigned RPA targets; any need for change in management direction. By helping to determine which elements of management direction were in need of change, the AMS guided the nature and extent of formulated alternatives.

Development of an alternative can be likened to assembling building blocks. In the first row of blocks are the issues, concerns, and opportunities derived from the scoping process and from the standards, guidelines, and objectives of the Regional Guide. The second row of blocks is management practices--specific actions, treatments, or measures available to the Forest Service for the management of the National Forest. The third row of blocks is management prescriptions, or groupings of practices which can be applied to areas of land and which are consistent with legislation and Forest Service policy and goals. These prescriptions are also responsive to issues and concerns. The final block is an alternative, or a combination of management prescriptions applied in different locations to produce varying amounts of each resource or use on the Forest. This is illustrated as follows:



Several types of past and proposed land use decisions remained constant in all the alternatives formulated and considered in detail. They are discussed in the following section.

Mineral Withdrawal

Currently 12,367 acres are withdrawn from appropriation under the mining laws, but not from leasing under minerals leasing laws. These lands are mainly administrative and developed recreation sites and roadside zones. Other lands of the Fishlake National Forest have been withdrawn by other agencies for various reasons, as shown in Table II-1. Some of the withdrawals overlap at places, so the total area withdrawn is not equal to the sum of the acres listed in the table. Of the 60 Forest Service withdrawals, 11 are scheduled for review in 1985, 3 in 1986, and 46 in 1987. All withdrawn areas are given the same consideration in each alternative, and are summarized as follows:

TABLE II-1
EXISTING WITHDRAWALS

<u>Type</u>	<u>Authority</u>	<u>Acres</u>
Administrative Sites	a. Act of 6/4/1894, E.O. 10355	2,743
	b. GLO 11/18/07	80
	c. GLO 1/9/07	23
	d. GLO 8/22/07	160
	e. GLO 11/17/06	200
	f. Sec. of Int. 8/23/06	200
Recreation Sites	Act of 6/4/1894, E.O. 10355	6,634
Roadside Zones	Act of 6/4/1894, E.O. 10355	1,447
Watershed	Act of 6/4/1894, E.O. 10355	880
Federal Power Commission (Federal Energy Regulatory Commission)		1,007
Power Site Classification		800

Resource management Standards and Guidelines applicable to mineral activities on nonwithdrawn National Forest System lands are contained in the Forest Direction section of the proposed Forest Plan. Site-specific stipulations for mitigation measures are assigned when lease applications are processed. These minerals withdrawals are appropriate at this time, and are considered as constant for each alternative considered.

Areas Unsuitable for Coal Mining

The unsuitability criteria contained in 43 CFR 3461 have been applied to the approximately 433,300 acres of coal-bearing lands within the Forest. The area to which the criteria were applied (assessment area) is identified as having a high to moderate potential for coal development, but does not include lands which are covered by existing coal leases. The assessment area contains no lands determined as unsuitable for underground mining. However, on some of the area, surface disturbing activities will either be prohibited or allowed only through special protective stipulations. None of the reserves within the assessment area have been determined to be minable by surface methods.

Special Areas

Approximately 1,204 acres of Fishlake National Forest Lands are subject to special laws, regulations, executive orders, or public land orders. These areas have specific management requirements or restrictions which limit the kinds and extent of resource management activities within their boundaries. These land areas are listed in Table II-2.

TABLE II-2
SPECIAL AREAS WITH CONSTANT MANAGEMENT DIRECTION

<u>Area</u>	<u>Acres</u>
Existing Research Natural Area Partridge Mountain	1,200
Existing National Recreation Trails Fish Lake-Lake Shore (1.4 miles)	1
Skyline (8.5) miles)	3
TOTAL	1,204

A review of these land uses in the Forest planning process determined them to be appropriate. They are carried forward into the Forest Plan and considered constant in all alternatives examined in detail.

Wild and Scenic Rivers

No river on Fishlake National Forest lands has been nominated for classification as a Wild and Scenic River. A review of streams on the Forest indicates none is eligible. Thus none is considered in alternative formulation.

National Natural Landmarks

There are no existing ones on the Forest. A survey of Natural Landmarks Areas of the Northern portion of the Colorado Plateau (Welsh and others 1980) identified Seven Potential National Natural Landmarks on the Fishlake National Forest.

These seven sites are:

Bicknell - Shingle Mill Creek Alluvial
Monroe Hot Springs
Niotche Creek Glacial Features
Salina Canyon Angular Unconformity
Sevemile Cirques
Skinner Canyon Ignimbrite
Sunglow Campground

The first three sites were rated as needing further information while the latter four sites were rated as appearing to be rationally significant.

No action of the proposed Plan will impair their integrity prior to evaluation. In fact, the proposed Plan and other factors will work to maintain their integrity. For example, the Bicknell - Shingle Mill Creek alluvial fan and the Sunglow Campground area were deemed to be in danger from off road vehicles. However, the Plan proposes non-motorized recreation for these areas. An example of another factor is the Skinner Canyon Ignimbrite. This potential site was thought to be in danger since it could be used for material to build I-70 in Clear Creek Canyon. However, I-70 construction is now nearly complete and the area has not been used. The only other sites thought to be in danger are the cones and spring areas of Monroe Hot Springs. However, these features of the site are located off the Forest. None of the other sites were thought to be in danger (Welsh and others, 1980).

After determination of capability, availability, and need for these special areas, the next step in the alternative formulation process was specification of the goals and objectives of management to be accomplished by each alternative. Goals and objectives were designed to respond to major issues and concerns (planning problems), and to needed changes in management direction pointed out by the AMS.

Restrictions and boundaries (constraints) were then formulated for the vicinity, timing, and criteria of application of management prescriptions to the land base for each alternative. These constraints included outputs, species mix for vegetation manipulation, budget levels, and spatial feasibilities of management prescription applications. Specific details of this process are contained in the Forest's planning action documents and planning records at the Supervisor's Office.

C. BENCHMARK LEVELS

Several benchmark levels (levels of outputs or production) were considered for comparison purposes with the alternatives. The benchmark levels were developed in Planning Action 4 (the AMS) to show the range of outputs possible from the Fishlake National Forest: minimum and maximum outputs. Benchmarks are displayed and analyzed in detail in Appendix B. In making the calculations, the following outputs were modeled in the FORPLAN computer program: timber, livestock forage, elk forage, deer forage, aspen production, increased water yield, and soil loss. Other outputs such as fuelwood, developed recreation, dispersed recreation, and mineral production were modeled outside FORPLAN. Developed recreation was modeled using MIVEST; its effect on efficiency was deemed insignificant due to the small amount of the land base involved in developed recreation sites. Minerals outputs were assumed to be constant across the benchmark levels and alternatives. Finally, fuelwood and dispersed recreation were considered functions of the degree of development in any level or alternative.

All benchmarks were used to define the upper and lower limits for production of each resource. Following are descriptions and statements of purpose of the benchmarks developed and considered in Forest planning. Wilderness benchmarks were not evaluated because the Utah Wilderness Act of 1984 (PL 98-428) resolved the wilderness issue for this generation of plans.

Minimum Level - Benchmark #1

This benchmark level represents fixed costs needed to maintain the Fishlake National Forest unit as part of the National Forest System, to manage uncontrollable outputs without impairment to productivity of the land and within established laws and regulations. It is also used to analyze incremental outputs (those within the discretion of the Forest Service). Examples of management activities that would occur at this level include fire suppression, insect and disease management, law enforcement, and management of special uses. Incidental outputs would include dispersed recreation use, as people will visit the Forest, and water yield, as water will continue to flow from the Forest. (See Table II-3 next page)

1. Minimum Level

Objective:

This benchmark is intended to display the minimum cost to maintain the National Forest status of the Fishlake Forest. It is, in effect, a custodial or near custodial management philosophy.

Objective Function: Maximize for present net value for 20 decades.

Constraints and Assumptions:

No commodity outputs were derived except minerals and some firewood. Recreational use was limited and hunting and fishing severely restricted. The point is to create an analysis framework upon which to compare other benchmarks and alternatives.

Table II-3 shows a detailed list of the outputs, benefits and costs of minimum level.

TABLE II-3
MIN LEVEL

Output/Activity		1	2	3	4	5
Recreation						
Dev. recreation Use						
Rural	MRVD	0	0	0	0	0
Rd. Nat.	MRVD	0	0	0	0	0
Disp. recreation Use						
Rural	MRVD	0.1	0.1	0.1	0.1	0.1
Rd. Nat	MRVD	10.2	10.2	10.2	10.2	10.2
S.P. Mot.	MRVD	20.7	20.7	20.7	20.7	20.7
S.P.N.Mot.	MRVD	4.0	4.0	4.0	4.0	4.0
Wildlife						
Struct.Hab.Imp.	Struc	0	0	0	0	0
N.Struct.Hab.Imp.	M AC	0	0	0	0	0
Wld.&Fish Use	MWFUD	14.5	14.5	14.5	14.5	14.5
Range						
Grazing Use	MAUM	0	0	0	0	0
Tmb. Sales Offered						
SawTmb.Softwood	MMCF	0	0	0	0	0
SawTmb.Hardwood	MMCF	0	0	0	0	0
Fuelwood	MCF	2,312	2,600	2,600	2,600	2,600
Reforestation	M AC	0	0	0	0	0
TSI	MMAC	0	0	0	0	0
Water						
Mtg.St.Standards	MACFT	611.0	611.0	611.0	611.0	611.0
Incr. Over.Nat.	MACFT	0	0	0	0	0
Protection						
Fuel B&S & Trt.	Acres	0	0	0	0	0
Minerals						
Leases & Permits	Cases	200	200	180	180	160

TABLE II-3 (cont)
MIN LEVEL

Output/Activity		1	2	3	4	5
HC&D						
Human Res.Prog.	ENRY's	0	0	0	0	0
Lands						
Pur.& Acq.	Acres	0	0	0	0	0
Soils						
S.&Wat.Res.Imp.	M AC	0	0	0	0	0
Facilities						
Trail Const./						
Reconst.	Miles	0	0	0	0	0
Road Const./						
Reconst.	Miles	0	0	0	0	0
(Art.&Collect)						
Rd.Betterment	Miles	0	0	0	0	0
LocalRd. Const.	Miles	0	0	0	0	0
LocalRd.R.Const.	Miles	0	0	0	0	0
T.M. Parch Rd.						
Const.	Miles	0	0	0	0	0
T.M. Purch. Rd.						
R. Const.	Miles	0	0	0	0	0
<u>Benefits M\$</u>						
Recreation						
Developed	M \$	0	0	0	0	0
Dispersed	M \$	43.8	43.8	43.8	43.8	43.8
Range	M \$	0	0	0	0	0
Timber	M \$	96.4	10.8	10.8	10.8	10.8
Wildlife (WFUDs)	M \$	438.7	438.7	438.7	438.7	438.7
Water Yield Incr.	M \$	0	0	0	0	0
Minerals	M \$	9,292.7	9,292.7	9,292.7	9,780.0	9,780.0
<u>Cost M\$</u>						
Total Frst. Budget	M \$	983.0	983.0	983.0	983.0	983.0
Fixed Costs						
Protection	M \$	576.0	576.0	576.0	576.0	576.0
Gen.Admin.	M \$	407.0	407.0	407.0	407.0	407.0
Variable Costs						
Investments	M \$	0	0	0	0	0
Tot.Rds.	M \$	0	0	0	0	0
App.FundRds.	M \$	0	0	0	0	0
Purch.Credt						
Rds.	M \$	0	0	0	0	0
Operational	M \$	0	0	0	0	0
Gen.Admin.	M \$	0	0	0	0	0
Non-F.S. Costs	M \$	0	0	0	0	0
Returns to Tres.	M \$	9,315.8	9,318.7	9,318.7	9,806,.0	9,806.0

Maximum Present Net Value Levels - Benchmarks #2 and #3

These benchmark levels represent the schedule of outputs, benefits, and associated costs that will maximize present net value of: Benchmark #3 - timber, range, and developed recreation; Benchmark #2 - all resources assigned values. These levels meet all requirements of laws and regulations, do not impair productivity of the land, and do not use nondeclining flow or budget as constraints.

The purpose of the maximum PNV benchmark level 3 is to provide a basis for computing opportunity costs (net benefits) of the alternatives. The difference between the PNV of each alternative is the opportunity cost of each alternative. PNV analyses, economic impact analyses, and cost-efficiency summaries of the alternatives are displayed in Section G of this Chapter; they provide measured quantifiable NPB's of benchmark #3 and the compared alternatives.

2. Maximum Present Net Value (all values)

Objective: The objective of this benchmark is to show the maximum present net value of managing the Fishlake National Forest.

Objective Function: Maximize present net value for 20 decades.

Constraints and Assumptions:

All prescriptions were allowed to come into the solution. The major constraint in place was a non-declining yield provision for timber harvest, and an ending inventory constraint. Non development prescriptions were allowed. There were no budget constraints. Table II-4 shows the detailed list of the outputs, benefits and costs of this benchmark.

3. Maximum PNV (market values)

Objectives:

This benchmark is intended to display the maximum present net value of valuing only timber, range, minerals and developed recreation.

Objective Function: Maximize present net value of market values for 20 decades.

Constraints and Assumptions:

Only market valued resources were valued. Non-declining harvest flow and the ending inventory constraint were in place for timber. There were no budget constraints. Aspen projected outside FORPLAN at an average annual output of 300 MBF, which approximates current and foreseeable markets.

Table II-5 shows the detailed list of the outputs, benefits and cost of this benchmark.

TABLE II - 4
MAX PNB (ALL VALUES) B M.

LTSYC SOFTWOOD 8.30 MMBF
HARDWOOD 1.38 MMBF
TOTAL 9.68 MMBF

AVERAGE ANNUAL OUTPUT OR ACTIVITY		1	2	3	DECADE		10	15
					4	5		
RECREATION								
DEV REC USE								
RURAL	MRVD	345.2	418.4	483.7	560.8	634.3		
RD. NAT.	MRVD	230.1	278.9	322.5	373.8	422.8		
DISP REC. USE								
RURAL	MRVD	84.2	102.1	118.0	133.9	149.9		
RD NAT.	MRVD	739.3	896.0	1035.8	1175.6	1315.4		
S P MOT	MRVD	237.3	287.7	322.5	377.4	422.3		
S.P N. MOT	MRVD	21.2	25.6	32.9	33.5	37.5		
WILDLIFE								
STRUCT HAB IMP	STRUC	394	394	394	394	394		
NSTRUCT. HAB IMP.	M AC	026	0	0	0	0		
WLD & FISH USE	MWFUD	193.7	204.5	205.0	205.4	205.5		
RANGE								
GRAZING USE								
	M AUM	130.2	123.2	119.2	119.5	118.9		
TIMBER AVAILABLE SALE QUANTITY								
SAW T SOFTWOOD	MMBF 1/	7.1	7.1	7.1	7.1	7.1	7.1	8.6
SAW T. HARDWOOD	MMCF	1.37	1.37	1.37	1.37	1.37	1.37	1.66
ROUNDWOOD PRODUCTS	MCF	06	06	06	06	06	06	06
FUELWOOD	MCF	0	0	0	0	0	0	0
	MCF	3350	3850	3850	3850	3850	3975	4100
REFORESTATION								
	M AC	606	317	278	155	276	262	127
TSI								
	M AC	0	44	184	327	64	330	220
WATER								
MGT ST. STANDARDS								
INCR. OVER NAT	M AC FT	611.0	611.0	611.0	611.0	611.0		
	M AC FT	143	143	143	143	143		
PROTECTION								
FUEL BKS. & TRT.								
	ACRES	100	0	0	0	0		
MINERALS								
LEASES & PERMITS								
	CASES	200	200	180	180	160		
HC&D								
HUMAN RES. PRDG.								
	ENRY'S	13	11	11	11	11		

LANDS							
PUR & ACQ.	ACRES	110	110	0	0	0	
SOILS							
S & WAT. RES IMP	AC	61	137	151	151	151	
FACILITIES							
TRAIL CONST./RECONST	MILES	2 2	2 5	2 8	3 2	3 5	
ROAD CONST./RECONST (ART. & COLLECT)	MILES	0	0	1		. 1	
RD BETTERMENT	MILES	13 0	13 0	13 0	13 0	13 0	
LOCAL RD CONST	MILES	0	. 1	2	2	1	
LOCAL RD RCONST	MILES	3	2	1	1	2	
TM PURCH RD CONST	MILES	14 0	14 0	13 0	9 0	9 0	
TM PURCH RD RCONST	MILES	0	0	0	2 0	2 0	
AVERAGE ANNUAL BENEFITS							

RECREATION							
DEVELOPED	M \$	2399 0	2907 7	3361 8	3897 3	4408. 1	
DISPERSED	M \$	4531 7	5491 0	6346 7	7204 1	8062. 4	
RANGE	M \$	1546 7	1463 2	1415 9	1419 2	1413 1	
TIMBER	M \$	2364 9	2386 7	2428. 7	2506 7	2506 7	
WILDLIFE (WFUDS)	M \$	4803 6	5178 2	5282 5	5375 3	5463 4	
WATER YIELD INCREASE	M \$	8 3	8 3	8 3	8. 3	8 3	
MINERALS	M \$	9292. 7	9292 7	9292 7	9780 0	9780 0	
AVERAGE ANNUAL COSTS							

TOTAL FOREST BUDGET	2/	M \$/YR	4287 4	4357 0	4466 3	4693 0	4691 6
FIXED COSTS							
PROTECTION		M \$/YR	576 0	576 0	576 0	576 0	576 0
GEN ADMIN		M \$/YR	407 0	407 0	407 0	407 0	407. 0
VARIABLE COSTS							
INVESTMENTS	3/	M \$	692 3	636 8	663 2	196 8	705. 5
TOT RDS		M \$	409 6	419 3	403 1	408 5	479 5
APP. FUND RDS.		M \$	72 6	82. 3	95 1	109 5	123 5
PURCH CREDIT RDS	4/	M \$	337 0	337 0	308 0	371 0	356 0
OPERATIONAL		M \$	1989. 5	2104 9	2175 0	3253 7	2329 6
GENERAL ADMIN		M \$	423 0	423 0	423 0	423 0	423 0
NON-F S COSTS		M \$	1438 0	1432 0	1481. 0	2088 0	1462 0
RETURNS TO TRES		M \$	9733 4	9746. 1	9755 1	10258 2	10272 3

- 1/ BOARD FOOT/CUBIC FOOT RATIOS- SAWTIMBER 5 TO 1, FUELWOOD 4 TO 1
- 2/ DOES NOT INCLUDE NON-F S PURCHASER CREDIT ROADS NOR HUMAN RESOURCE PROGRAMS
- 3/ DOES NOT INCLUDE ROAD COSTS
- 4/ INCLUDES F S ENGINEERING COSTS.

TABLE II - 5
MAX "PNV" MARKET VALUES B M

LTSYC SOFTWOOD 7 20 MMBF
HARDWOOD 1 38 MMBF
TOTAL 8 58 MMBF

ANNUAL AVERAGE OUTPUT OR ACTIVITY		1	2	3	4	5	10	15
RECREATION								
DEV REC USE								
RURAL	MRVD	300 3	364 0	420 8	487 9	551 8		
RD NAT	MRVD	200 2	242 6	280 6	325 2	367 8		
DISP REC USE								
RURAL	MRVD	27 8	33 7	38 9	44 2	49 5		
RD NAT	MRVD	244 0	295 7	341 8	387 9	434 1		
S.P MDT	MRVD	78 3	94 9	109 7	124 5	139 4		
S P N MDT	MRVD	17 0	19 9	22 9	26 3	29 8		
WILDLIFE								
STRUCT. HAB IMP	STRUC	30	55	55	55	55		
NSTRUCT HAB IMP	M AC	013	0	0	0	0		
WLD & FISH USE	MWFUD	177 6	175 9	175 0	175 1	175 0		
RANGE								
GPazing USE	M AUM	113 1	113 1	113 1	113 1	113 1		
TIMBER AVAILABLE SALE QUANTITY								
SAW T SOFTWOOD	MMCF	6 1	6 1	6 1	6 1	6 1	6 1	6 1
SAW T HARDWOOD	MMCF	1 16	1 16	1 16	1 16	1 16	1 16	1 16
ROUNDWOOD PRODUCTS	MCF	06	06	06	06	06	06	06
FUELWOOD	MCF	0	0	0	0	0	0	0
		3350	3850	3850	3850	3850	3975	4100
REFORESTATION	M AC	451	433	176	171	236	167	058
TSI	M AC	015	0	. 132	060	0	060	060
WATER								
MGT ST STANDARDS	M AC FT	611 0	611 0	611 0	611 0	611 0		
INCR OVER NAT	M AC FT	. 121	121	. 121	121	121		
PROTECTION								
FUEL BKS & TRT	ACRES	260	260	260	260	260		
MINERALS								
LEASES & PERMITS	CASES	200	200	180	180	160		
HC&D								
HUMAN RES PROG	ENRY'S	13	11	11	11	11		

LANDS							
PUR & ACQ	ACRES	110	110	0	0	0	
SOILS							
S & WAT. RES IMP	AC	0	0	0	0	0	
FACILITIES							
TRAIL CONST /RECONST	MILES	0 7	0 8	0 9	1 0	1 2	
ROAD CONST /RECONST. (ART. & COLLECT)	MILES	0	0	0	0 1	0 1	
RD BETTERMENT	MILES	13 0	13 0	13 0	13 0	13 0	
LOCAL RD. CONST	MILES	0	0 1	0 1	0 2	0 2	
LOCAL RD RCONST.	MILES	0 2	0 1	0 2	0 1	0 1	
TM PURCH RD. CONST	MILES	12 0	11 9	10 8	7 7	8 8	
TM PURCH PD. RCONST	MILES	0	0	0	0 8	0	
AVERAGE ANNUAL BENEFITS							

RECREATION							
DEVELOPED	M \$	2087 1	2529 5	2924 8	3390 9	3834 7	
DISPERSED	M \$	1607 2	1939 9	2241 6	2547 2	2854 9	
RANGE	M \$	1343 9	1343 9	1343 9	1343 9	1343 9	
TIMBER	M \$	2040 9	2034 7	2073 7	2144 7	2144 7	
WILDLIFE (WFUDS)	M \$	4233 1	4226 0	4234 9	4263 4	4289 1	
WATER YIELD INCREASE	M \$	7.1	7.1	7 1	7 1	7 1	
MINERALS	M \$	9292 7	9292.7	9292 7	9780 0	9780 0	
AVERAGE ANNUAL COSTS							

TOTAL FOREST BUDGET	2/	M \$/YR	3759 2	3836 9	3917 2	3998 3	4062 1
FIXED COSTS							
PROTECTION		M \$/YR	576 0	576 0	576 0	576 0	576 0
GEN ADMIN		M \$/YR	407 0	407.0	407.0	407 0	407 0
VARIABLE COSTS							
INVESTMENTS	3/	M \$	421 9	411 7	425 3	456 5	447 7
TOT. RDS		M \$	352 5	456 6	347 6	406 8	336 3
APP FUND RDS		M \$	47 5	57 6	66 6	72 8	82.3
PURCH CREDIT RDS.	4/	M \$	305 0	399 0	281 0	334 0	254 0
OPERATIONAL		M \$	1756 8	1834 6	1892 3	1936 0	2002 1
GENERAL ADMIN		M \$	423 0	423 0	423 0	423 0	423 0
NON-F S COSTS		M \$	1219 0	1209 0	1251 0	1661 0	1254 0
RETURNS TO TRES		M \$	9686 4	9704 1	9715 5	10216 2	10229 0

- 1/ BOARD FOOT/CUBIC FOOT RATIOS SAWTIMBER 5 TO 1, FUELWOOD 4 TO 1
2/ DOES NOT INCLUDE NON-F S PURCHASER CREDIT ROADS NOR HUMAN RESOURCE PROGRAMS
3/ DOES NOT INCLUDE ROAD COSTS
4/ INCLUDES F S ENGINEERING COSTS.

Current Level - Benchmark #4

This benchmark specifies management implemented following current direction; refer to the No-Action Alternative (alternative 8) which is described later in this chapter.

Maximum Resource Output Levels - Benchmarks #5 to #8

These benchmark levels represent different resource emphases. They are subject to minimum standards of laws and regulations--without impairment to land productivity. For timber and range, they approximate maximum biological potential output levels. For developed and dispersed recreation, they approximate maximum use capacity potentials.

5. Maximum Timber for the First Decade

Objective: This benchmark is designed to display the maximum timber production.

Objective Function: Maximize Timber for one decade. After this objective value was frozen, the run used maximum present net value (all values).

Constraints and Assumptions:

The non-declining and ending inventory constraints were used. There were no budget constraints. There are a variety of means of determining the maximum timber production. The objective function may vary from maximum timber from 1 to 20 decades. Harvest flow constraints may be non-declining, sequential lower and upper bounds, or non-existent. The results may either be "rolled over" or not "rolled over" in a maximum present net value function after locking in the results of the original objective function. Each constraint and assumption used will yield a different pattern of outputs. Aspen is projected outside FORPLAN at an average annual output of 300 MBF, which approximates current and foreseeable markets.

Table II-6 shows the detailed list of the outputs, benefits and costs of this benchmark.

6. Maximum Range

Objective:

This benchmark is intended to display the maximum range production on the Fishlake National Forest.

Objective Function:

Maximize range for 5 decades. After this objective value was frozen, the run used maximum present net value (all values).

Constraints and Assumptions:

There were no budget constraints. This benchmark shows the maximum development of this Forest for livestock production (subject to the MMR constraints). Conifer lands were not converted. Nondeclining yield and ending inventory constraints were applied.

Aspen projected outside FORPLAN at an average annual output of 300 MBF, which approximates current and foreseeable market. Table II-7 shows the detailed list of the outputs, benefits and costs of this benchmark.

7. Timber Sequential Upper and Lower Bounds

Objective: This benchmark is designed to display the effects of relaxing the non-declining yield on present net value.

Objective Function: Maximize present net value for 20 decades.

Constraints and Assumptions:

Lower and upper sequential harvest flow constraint of 25 percent was used. An ending inventory constraint was used. There were no budget constraints.

Aspen projected outside of FORPLAN at an average annual output of 300 MBF, which approximates current and foreseeable market. Table II-8 shows the detailed list of the outputs, benefits and costs of this benchmark.

8. Timber Departure Analysis

Objective: The goal of the departure analysis is to maximize present net value and increase net public benefits by emphasizing a mixture of market and nonmarket opportunities in response to issues, concerns, demand, and the Forest's capabilities.

Specific objectives of the departure analysis include: examining the effects of a change in timber harvest when there is no non-declining, even flow constraint; constructing range improvements to obtain better management of livestock and to increase capacity above present but not up to currently permitted numbers; constructing developed recreation sites near local communities, managing existing sites at full service, and increasing maintenance; eliminating the soil and watershed backlog by 2020; rehabilitating orphan mines; increasing road and trail maintenance to prevent sediment production from these sources; shifting the emphasis of the wildlife program from projects to benefit big game to those that benefit fisheries and non-game animals.

Objective Function:

Maximize present net value for 20 periods.

Constraints and Assumptions:

Budget constraints were used in the first decade for all functions. The timber budget constraint is relaxed in the second decade. All other constraints were the same as alternative 11 below except for harvest flow constraints which were modified to produce a large increase in timber output for the second decade.

Aspen projected outside FORPLAN at an average annual output of 300 MBF, which approximates current and foreseeable market. Table II-9 shows the detailed list of the outputs, benefits and costs of the departure analysis.

Benchmark Decision Space

Figures II-1 through II-4 show the decision space the benchmarks indicate is available for developed recreation, dispersed recreation, range, and timber. The decision space is the range of the indicated output an alternative can fall within and be realistic.

TABLE II - 6
MAX TIMBER FOR 1 B M

LTSYC

SOFTWOOD 13 54 MMBF
HARDWOOD 1 38 MMBF
TOTAL 14 92 MMBF

AVERAGE ANNUAL OUTPUT OR ACTIVITY		1	2	3	DECADE 4	5	10	15
RECREATION								
DEV REC USE								
RURAL	MRVD	334 8	405 8	469 2	544 0	615 3		
RD NAT	MRVD	223 2	270 5	312 8	362 6	410 1		
DISP REC USE								
RURAL	MRVD	78 3	95 0	109 7	124 5	139 4		
RD NAT	MRVD	487 5	833 3	963 3	1093 3	1223 3		
S P MOT	MRVD	220 7	267 6	309 2	351 0	392 7		
S P N MOT	MRVD	17 4	21 0	24 3	22 6	30 8		
WILDLIFE								
STRUCT HAB IMP	STRUC	357	357	357	357	357		
NSTRUCT HAB IMP	M AC	025	0	0	0	0		
WLD & FISH USE	MWFUD	184 5	192 2	191 4	191 4	191 3		
RANGE								
GRAZING USE	M AUM	126 9	118 8	113 6	113 8	113 4		
TIMBER AVAILABLE SALE QUANTITY								
SAW T SOFTWOOD	MMCF	2 114	2 114	2 114	2 114	2 114	2 114	2 114
SAW T HARDWOOD	MMCF	06 *	06	06	06	06	06	06
ROUNDWOOD PRODUCTS	MCF	0	0	0	0	0	0	0
FUELWOOD	MCF	3350	3850	3850	3850	3850	3975	4100
REFORESTATION								
	M AC	846	808	418	391	456	263	222
TSI								
	M AC	247	64	284	398	376	362	289
WATER								
MGT. ST STANDARDS	M AC FT	611 0	611 0	611 0	611 0	611 0		
INCR OVER NAT	M AC FT	220	220	220	220	220		
PROTECTION								
FUEL BKS & TRT	ACRES	260	260	260	260	260		
MINERALS								
LEASES & PERMITS	CASES	200	200	180	180	160		
HC&D								
HUMAN RES PROG	ENRY'S	13	11	11	11	11		

LANDS PUR & ACG	ACRES	110	110	0	0	0	
SOILS S & WAT RES IMP	AC	119	239	239	239	239	
FACILITIES							
TRAIL CONST /RECONST	MILES	2 0	2 2	2 4	2 7	2 8	
ROAD CONST /RECONST (ART & COLLECT)	MILES	0	0 1	0 1	0 1	0 1	
RD BETTERMENT	MILES	13 0	13 0	13 0	13 0	13 0	
LOCAL RD CONST	MILES	0	0 1	0 2	0 2	0 1	
LOCAL RD RCONST	MILES	0 2	0 1	0 1	0 1	0 2	
TM PURCH RD CONST	MILES	29 8	19 7	35. 2	16 6	19 3	
TM PURCH RD RCONST	MILES	0	0	0	13 5	4 1	
AVERAGE ANNUAL BENEFITS							

RECREATION							
DEVELOPED	M \$	2326 9	2820 2	3260 9	3780 5	4275 9	
DISPERSED	M \$	4188 9	5077 0	5868 6	6660 9	7452 9	
RANGE	M \$	1507 5	1410 9	1349 4	1352 4	1346 7	
TIMBER	M \$	3646 8	3597 7	3658 7	3781. 7	3777 7	
WILDLIFE (WFUDS)	M \$	4670 2	4954 3	5016 6	5095 7	5174. 5	
WATER YIELD INCREASE	M \$	12 8	12 8	12 8	12 8	12 8	
MINERALS	M \$	9292 7	9292 7	9292 7	9780 0	9780 0	
AVERAGE ANNUAL COSTS							

TOTAL FOREST BUDGET	2/	M \$/YR	4497 1	4697 1	4794 3	4903 9	5009 6
FIXED COSTS							
PROTECTION		M \$/YR	576. 0	576 0	576 0	576 0	576 0
GEN. ADMIN		M \$/YR	407. 0	407. 0	407 0	407 0	407 0
VARIABLE COSTS							
INVESTMENTS	3/	M \$	787 3	891 6	909. 9	930 6	950 6
TOT RDS.		M \$	632 0	1225 0	791 0	723 7	826 2
APP FUND RDS		M \$	65 0	78 7	91. 0	104 9	118 2
PURCH CREDIT RDS	4/	M \$	567 0	1147 0	700 0	619 0	108 0
OPERATIONAL		M \$	2006 8	2130 8	2197 4	2272 4	2344 8
GENERAL ADMIN		M \$	423 0	423 0	423 0	423 0	423 0
NON-F S COSTS		M \$	2272 0	2615 0	3359 0	3344 0	2464 0
RETURNS TO TRES		M \$	9802 5	9813 6	9821 0	10323 5	10337 3

- 1/ BOARD FOOT/CUBIC FOOT RATIOS SAWTIMBER 5 TO 1, FUELWOOD 4 TO 1
- 2/ DOES NOT INCLUDE NON-F S PURCHASER CREDIT ROADS NOR HUMAN RESOURCE PROGRAMS
- 3/ DOES NOT INCLUDE ROAD COSTS
- 4/ INCLUDES F S ENGINEERING COSTS

* AN ESTIMATE OF THE BIOLOGICAL POTENTIAL FOR HARDWOOD (ASPEN) IS 13.7 MMBF (OR 5.48 MMCF) FOR WHAT THERE IS NO CURRENT MARKET THE BUDGET ESTIMATE FOR THIS BENCHMARK DOES NOT REFLECT THE BIOLOGICAL POTENTIAL ASPEN HARVEST BOARD FOOT/CUBIC FOOT RATIO USED FOR ASPEN IS 2.5 TO 1

TABLE II - 7

LTSYC

SOFTWOOD 8 76 MMBF

HARDWOOD 1 38 MMBF

MAX RANGE B M.

TOTAL 10 14 MMBF

AVERAGE ANNUAL OUTPUT OR ACTIVITY		1	2	3	DECADE			
					4	5	10	15
RECREATION								
DEV. REC USE								
RURAL	MRVD	300 3	364 0	420 8	487 9	551 8		
RD NAT	MRVD	200 2	242 6	280 6	325 2	367 8		
DISP REC. USE								
RURAL	MRVD	74 9	90 9	105 0	119 2	133 4		
RD. NAT	MRVD	658 0	797 4	921. 9	1046 3	1170 7		
S P MDT.	MRVD	211 2	256 1	295 9	335 9	375 0		
S P N MDT	MRVD	17 7	21 4	24. 7	28 1	31 4		
WILDLIFE								
STRUCT HAB IMP								
NSTRUCT. HAB. IMP	STRUC	340	340	340	340	340		
WLD & FISH USE	M AC.	2 11	58	1 97	58	1 97		
	MWFUD	179 0	186 5	186. 1	184 9	184 7		
RANGE								
GRAZING USE								
	M AUM	163 0	161 7	162 3	163 5	163 6		
TIMBER AVAILABLE SALE QUANTITY								
SAW T SOFTWOOD	MMBF 1/	7 8	7.8	7 8	7 8	7 8	8 6	9 1
SAW T HARDWOOD	MMCF	1 51	1 51	1 51	1 51	1 51	1 67	1 75
ROUNDWOOD PRODUCTS	MMCF	06	06	06	06	06	06	06
FUELWOOD	MCF	0	0	0	0	0	0	0
	MCF	3350	3850	3850	3850	3850	3975	4100
REFORESTATION								
	M AC	517	276	311	216	236	274	148
TSI								
	M AC	0	333	333	357	355	561	444
WATER								
MGT ST. STANDARDS								
INCR OVER NAT.	M AC FT	611. 0	611. 0	611. 0	611 0	611 0		
	M AC FT	157	157	157	157	157		
PROTECTION								
FUEL BKS & TRT.								
	ACRES	100	100	100	100	100		
MINERALS								
LEASES & PERMITS								
	CASES	200	200	180	180	160		
HC&D								
HUMAN RES. PRDG								
	ENRY'S	13	11	11	11	11		

LANDS							
PUR & ACQ	ACRES	110	110	0	0	0	
SOILS							
S & WAT RES. IMP	AC	159	318	318	318	318	
FACILITIES							
TRAIL CONST /RECONST	MILES	1 9	2 1	2 3	2 5	2 7	
ROAD CONST. /RECONST. (ART & COLLECT)	MILES	0	0	0.1	0 1	0.1	
RD BETTERMENT	MILES	13 0	13 0	13 0	13 0	13 0	
LOCAL RD CONST.	MILES	0	0 1	0 2	0 2	0 1	
LOCAL RD RCONST.	MILES	0 2	0 1	0 1	0 1	0 2	
TM PURCH. RD. CONST.	MILES	13 9	23 7	23 0	38 5	5 0	
TM PURCH RD. RCONST.	MILES	0	0	0	0	18 3	

AVERAGE ANNUAL BENEFITS

RECREATION							
DEVELOPED	M \$	2087 1	2529 5	2924. 8	3390 6	3834 7	
DISPERSED	M \$	4020 5	4872 5	5632. 3	6393. 3	7153. 5	
RANGE	M \$	1935 9	1920. 4	1927. 8	1942. 7	1943. 0	
TIMBER	M \$	2594 9	2678 7	2684 7	2744 7	2744. 7	
WILDLIFE (WFUDS)	M \$	4542 2	4793. 7	4860 0	4906 7	4975 8	
WATER YIELD INCREASE	M \$	9 2	9. 2	9. 2	9. 2	9. 2	
MINERALS	M \$	9292. 7	9292. 7	9292. 7	9780 0	9780. 0	

AVERAGE ANNUAL COSTS

TOTAL FOREST BUDGET	2/	M \$/YR	6342 3	5252 8	5919 8	5925 8	5693 6
FIXED COSTS							
PROTECTION		M \$/YR	576 0	576 0	576 0	576 0	576 0
GEN ADMIN		M \$/YR	407. 0	407. 0	407 0	407. 0	407 0
VARIABLE COSTS							
INVESTMENTS	3/	M \$	2500 0	1330 3	1924. 7	1849 6	1539. 8
TOT. RDS		M \$	413 4	573. 7	592. 3	1355 9	408 2
APP FUND RDS		M \$	59 5	71. 7	83. 3	95 9	108 2
PURCH CREDIT. RDS	4/	M \$	354 0	502 0	509. 0	1260 0	300. 0
OPERATIONAL		M \$	2228 8	2296 8	2357. 8	2426 3	2491. 6
GENERAL ADMIN		M \$	423 0	423 0	423 0	423 0	423 0
NON-F S COSTS		M \$	1581 0	1587. 0	1710 0	2631 0	1665 0
RETURNS TO TRES		M \$	9771 3	9787 7	9799 7	10301. 6	10314. 5

- 1/ BOARD FOOT/CUBIC FOOT RATIOS SAWTIMBER 5 TO 1, FUELWOOD 4 TO 1
- 2/ DOES NOT INCLUDE NON-F S PURCHASER CREDIT ROADS NOR HUMAN RESOURCE PROGRAMS
- 3/ DOES NOT INCLUDE ROAD COSTS
- 4/ INCLUDES F S. ENGINEERING COSTS

TABLE II - B
SEQUENTIAL LOWER AND UPPER BOUNDS B M

LTSYC SOFTWOOD 7 98 MMBF
HARDWOOD 1. 98 MMBF
TOTAL 9 36 MMBF

AVERAGE ANNUAL OUTPUT OR ACTIVITY		1	2	3	DECADE 4	5	10	15
RECREATION								
DEV REC USE								
RURAL	MRVD	331.4	405.8	483.7	560.8	634.3		
RD NAT.	MRVD	220.9	270.5	322.5	373.8	422.8		
DISP. REC. USE								
RURAL	MRVD	81.7	99.0	118.0	133.9	149.9		
RD NAT.	MRVD	717.1	869.1	1035.8	1175.6	1315.4		
S.P. MOT.	MRVD	230.2	279.1	332.5	377.4	422.3		
S P N. MOT.	MRVD	20.6	24.7	29.3	33.4	37.4		
WILDLIFE								
STRUCT HAB IMP.	STRUC	405	405	405	405	405		
NSTRUCT HAB. IMP.	M. AC.	0 ²⁶	0	0	0	0		
WLD. & FISH USE	MMFUD	185.4	194.5	194.1	194.3	194.3		
RANGE								
GRAZING USE	M AUM	130.2	123.2	119.2	119.5	118.9		
TIMBER AVAILABLE SALE QUANTITY								
SAW. T. SOFTWOOD	MMBF 1/	14.5	11.0	8.3	6.3	4.8	4.8	14.1
SAW. T. HARDWOOD	MRCF	2.84	2.13	1.60	1.20	.90	.90	2.76
ROUNDWOOD PRODUCTS	MRCF	.06	.06	.06	.06	.06	.06	.06
FUELWOOD	MCF	0	0	0	0	0	0	0
	MCF	3350	3850	3850	3850	3850	3975	4100
REFORESTATION								
	M AC	.681	.700	.289	.185	.123	.105	.050
TSI								
	M AC	0	.131	.113	.310	.151	.314	.150
WATER								
MGT. ST. STANDARDS	M AC FT	611.0	611.0	611.0	611.0	611.0		
INCR. OVER NAT.	M AC FT	.296	.222	.167	.125	.094		
PROTECTION								
FUEL BKS. & TRT.	ACRES	100	0	0	0	0		
MINERALS								
LEASES & PERMITS	CASES	200	200	180	180	160		
HC&D								
HUMAN RES. PROG.	ENRY'S	13	11	11	11	11		

LANDS PUR. & ACQ.	ACRES	110	110	0	0	0
SOILS S. & WAT. RES. IMP.	AC	76	151	151	151	151
FACILITIES						
TRAIL CONST. /RECONST.	MILES	2.0	2.2	2.6	3.0	3.4
ROAD CONST. /RECONST. (ART. & COLLECT)	MILES	0	0	0.1	0.1	0.1
RD. BETTERMENT	MILES	13.0	13.0	13.0	13.0	13.0
LOCAL RD. CONST	MILES	0	0.1	0.2	0.2	0.1
LOCAL RD. RCONST.	MILES	0.3	0.2	0.1	0.1	0.2
TM PURCH. RD. CONST.	MILES	26.1	21.4	15.1	23.7	3.1
TM PURCH. RD. RCONST.	MILES	0	0	0	0	6.9

AVERAGE ANNUAL BENEFITS

RECREATION						
DEVELOPED	M \$	2303.1	2820.2	3361.9	3897.3	4408.1
DISPERSED	M \$	4396.6	5326.5	6356.1	7203.3	8061.5
RANGE	M \$	1546.6	1463.2	1415.9	1419.2	1413.1
TIMBER	M \$	4772.9	3642.7	2786.7	2205.7	1699.7
WILDLIFE (WFUDS)	M \$	4708.6	5030.8	5124.4	5210.0	5295.7
WATER YIELD INCREASE	M \$	17.3	13.0	9.75	7.3	5.5
MINERALS	M \$	9292.7	9292.7	9292.7	9780.0	9780.0

AVERAGE ANNUAL COSTS

TOTAL FOREST BUDGET	2/	M \$/YR	4832.0	4803.1	4839.7	4816.4	4828.0
FIXED COSTS							
PROTECTION		M \$/YR	576.0	576.0	576.0	576.0	576.0
GEN ADMIN		M \$/YR	407.0	407.0	407.0	407.0	407.0
VARIABLE COSTS							
INVESTMENTS	3/	M \$	955.3	888.9	849.8	770.4	780.1
TOT RDS.		M \$	644.8	538.8	471.1	885.5	256.5
APP FUND RDS.		M \$	65.8	79.8	95.1	109.5	123.5
PURCH. CREDIT. RDS.	4/	M \$	579.0	459.0	376.0	776.0	133.0
OPERATIONAL		M \$	2214.9	2280.4	2340.8	2382.5	2468.4
GENERAL ADMIN		M \$	423.0	423.0	423.0	423.0	423.0
NON-F S COSTS		M \$	2981.0	2278.0	1823.0	1918.0	1039.0
RETURNS TO TRES.		M \$	9877.7	9819.6	9778.1	10241.2	10225.3

- 1/ BOARD FOOT/CUBIC FOOT RATIOS SAWTIMBER 5 TO 1, FUELWOOD 4 TO 1
 2/ DOES NOT INCLUDE NON-F S PURCHASER CREDIT ROADS NOR HUMAN RESOURCE PROGRAMS
 3/ DOES NOT INCLUDE ROAD COSTS
 4/ INCLUDES F. S. ENGINEERING COSTS

TABLE II - 9
TIMBER DEPARTURE ANALYSIS

LTSVC
SOFTWOOD 8 89 MMBF
HARDWOOD 1 38 MMBF
TOTAL 10 27 MMBF

AVERAGE ANNUAL OUTPUT OR ACTIVITY		1	2	3	DECADE 4	5	10	15
RECREATION								
DEV. REC. USE								
RURAL	MRVD	274 1	310. 6	376 3	427. 2	473. 4		
RD. NAT.	MRVD	182 7	207. 1	251 0	284 7	315. 7		
DISP. REC. USE								
RURAL	MRVD	54. 9	71. 8	74. 0	74 0	74 0		
RD NAT	MRVD	481. 5	630. 5	650 0	650 0	650 0		
S P MOT	MRVD	154 6	202 5	208 8	208. 8	208 8		
S P N MOT	MRVD	11 9	15 6	16 1	16. 1	16. 1		
WILDLIFE								
STRUCT. HAB. IMP.	STRUC	503	503	503	503	503		
NSTRUCT HAB. IMP	M AC.	. 291	. 390	. 418	. 390	. 418		
WLD & FISH USE	MWFUD	187. 4	197. 3	197 5	197. 6	197 7		
RANGE								
GRAZING USE	M AUM	133 5	131. 4	130. 6	131. 5	131. 0		
TIMBER AVAILABLE SALE QUANTITY	MMBF 1/	3 0	17 0	10 3	10 3	6. 3	9 7	7 9
SAW T SOFTWOOD	MMCF	54	3. 35	2. 01	2 00	1. 20	1. 87	1 52
SAW T HARDWOOD	MMCF	. 06	. 06	. 06	. 06	. 06	. 06	. 06
ROUNDWOOD PRODUCTS	MCF	0	0	0	0	0	0	0
FUELWOOD	MCF	2410	3200	3200	3200	3200	3397	3595
REFORESTATION	M AC	136	865	372	. 226	118	. 258	095
TSI	M AC	0	286	115	530	302	534	. 219
WATER								
MGT ST STANDARDS	M AC FT	611 0	611. 0	611 0	611. 0	611 0		
INCR OVER NAT	M AC FT	. 057	. 349	. 209	. 209	. 125		
PROTECTION								
FUEL BKS & TRT	ACRES	0	0	0	0	0		
MINERALS								
LEASES & PERMITS	CASES	200	200	180	180	160		
HC&D								
HUMAN RES PROG	ENRY'S	13	11	11	11	11		

LANDS							
PUR & ACQ.	ACRES	110	110	0	0	0	
SOILS							
S & WAT RES. IMP	AC	300	414	414	414	414	
FACILITIES							
TRAIL CONST /RECONST	MILES	2 2	2 2	2 5	2 9	3 2	
ROAD CONST./RECONST. (ART. & COLLECT)	MILES	0	0	0 1	0 1	0 1	
RD. BETTERMENT	MILES	13 0	13 0	13 0	13 0	13 0	
LOCAL RD CONST	MILES	0	0 1	0 2	0 2	0 1	
LOCAL RD RCONST	MILES	0 3	0 2	0.1	0 1	0 2	
TM PURCH RD CONST.	MILES	7 1	39 0	19 5	38 3	1 6	
TM PURCH RD. RCONST	MILES	0	0	0	0	15.2	

AVERAGE ANNUAL BENEFITS

RECREATION							
DEVELOPED	M \$	1904 9	2158 8	2615. 8	2968 6	3290 5	
DISPERSED	M \$	2931 1	3838 1	3956 9	3956 9	3956 9	
RANGE	M \$	1586 0	1561. 0	1551 5	1562 2	1556 3	
TIMBER	M \$	1001 7	5611. 6	3416. 6	3558. 6	2185. 6	
WILDLIFE (WFUDS)	M \$	4737 1	5057 0	5139 6	5235 0	5318 7	
WATER YIELD INCREASE	M \$	3 3	20. 4	12 2	12 2	7 3	
MINERALS	M \$	9292 7	9292 7	9292 7	9780 0	9780 0	

AVERAGE ANNUAL COSTS

TOTAL FOREST BUDGET	2/	M \$/YR	4766 6	6067 4	5913 8	5913 8	5161 8
FIXED COSTS							
PROTECTION		M \$/YR	576 0	576 0	576 0	576 0	576 0
GEN ADMIN		M \$/YR	407 0	407 0	407 0	407. 0	407 0
VARIABLE COSTS							
INVESTMENTS	3/	M \$	856 5	1565. 6	1480 4	1480 4	1286 4
TOT RDS		M \$	195 6	848 7	512 7	1343 7	224 7
APP FUND RDS		M \$	58 1	84. 7	84 7	84 7	84. 7
PURCH CREDIT RDS.	4/	M \$	137 5	764 0	428 0	1259 0	140 0
OPERATIONAL		M \$	2352 4	2821 1	1794 7	2794 7	2334 7
GENERAL ADMIN		M \$	424 6	423 0	423 0	423 0	423 0
NON-F S COSTS		M \$	4766 6	3538 0	2245 0	3134 0	1342 0
RETURNS TO TRES		M \$	9630 1	9924 2	4802 6	10299 9	10308 7

- 1/ BOARD FOOT/CUBIC FOOT RATIOS SAWTIMBER 5 TO 1, FUELWOOD 4 TO 1
- 2/ DOES NOT INCLUDE NON-F S PURCHASER CREDIT ROADS NOR HUMAN RESOURCE PROGRAMS
- 3/ DOES NOT INCLUDE ROAD COSTS
- 4/ INCLUDES F. S ENGINEERING COSTS

FIGURE II - I

Benchmark Decision Space
For Developed Recreation

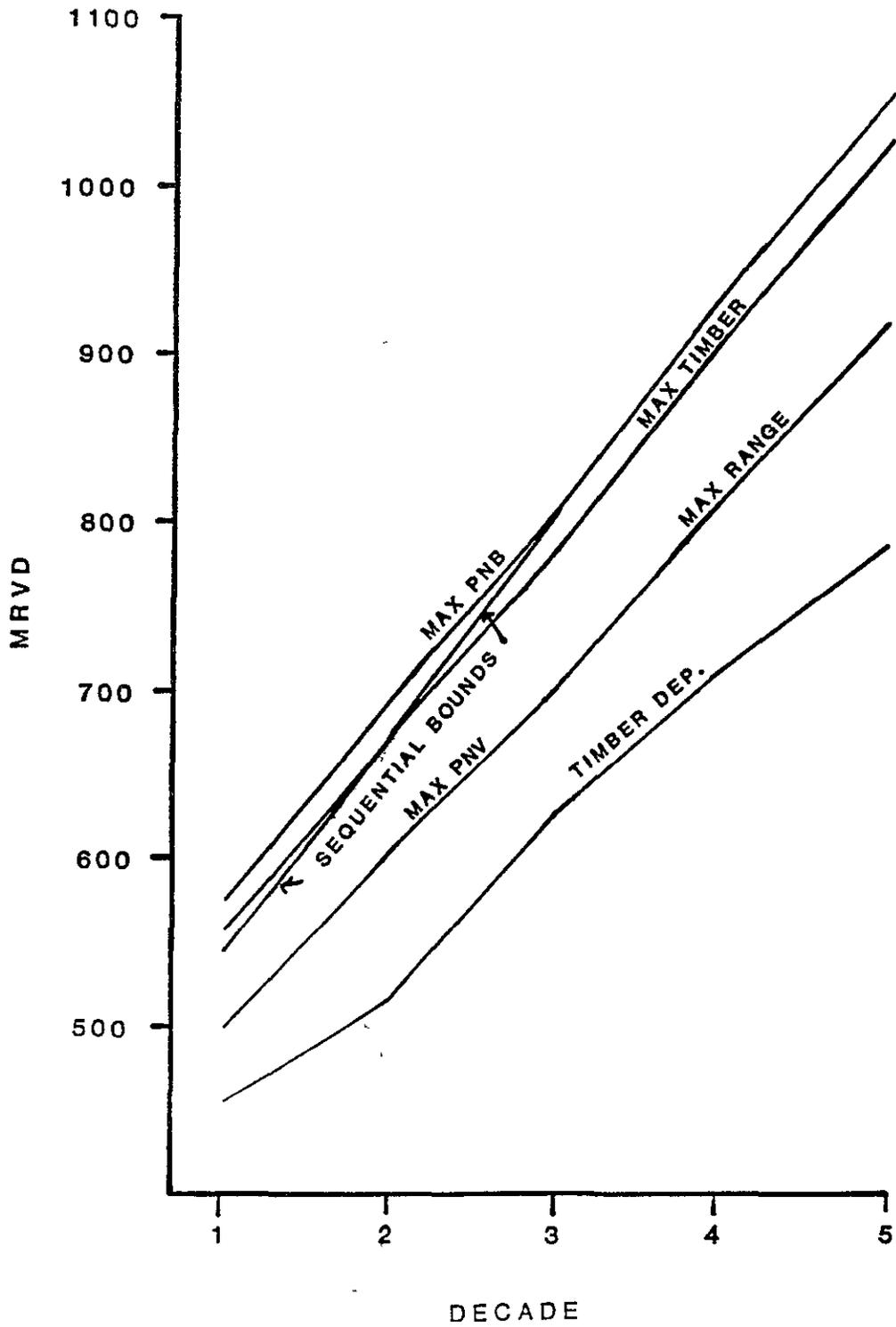


FIGURE II - 2

Benchmark Decision Space
For Dispersed Recreation

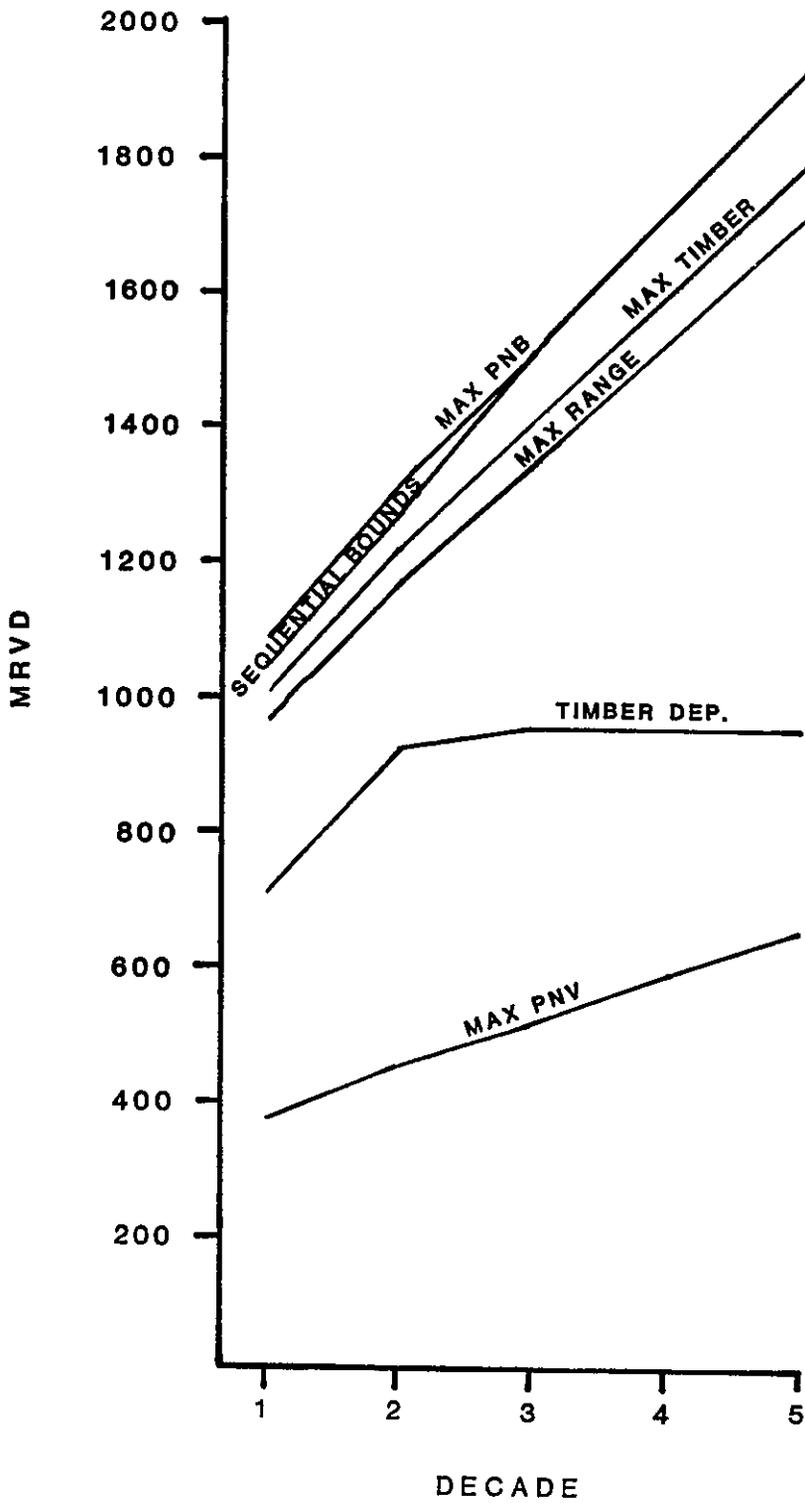


FIGURE II - 3

Benchmark Decision Space
For Range Outputs

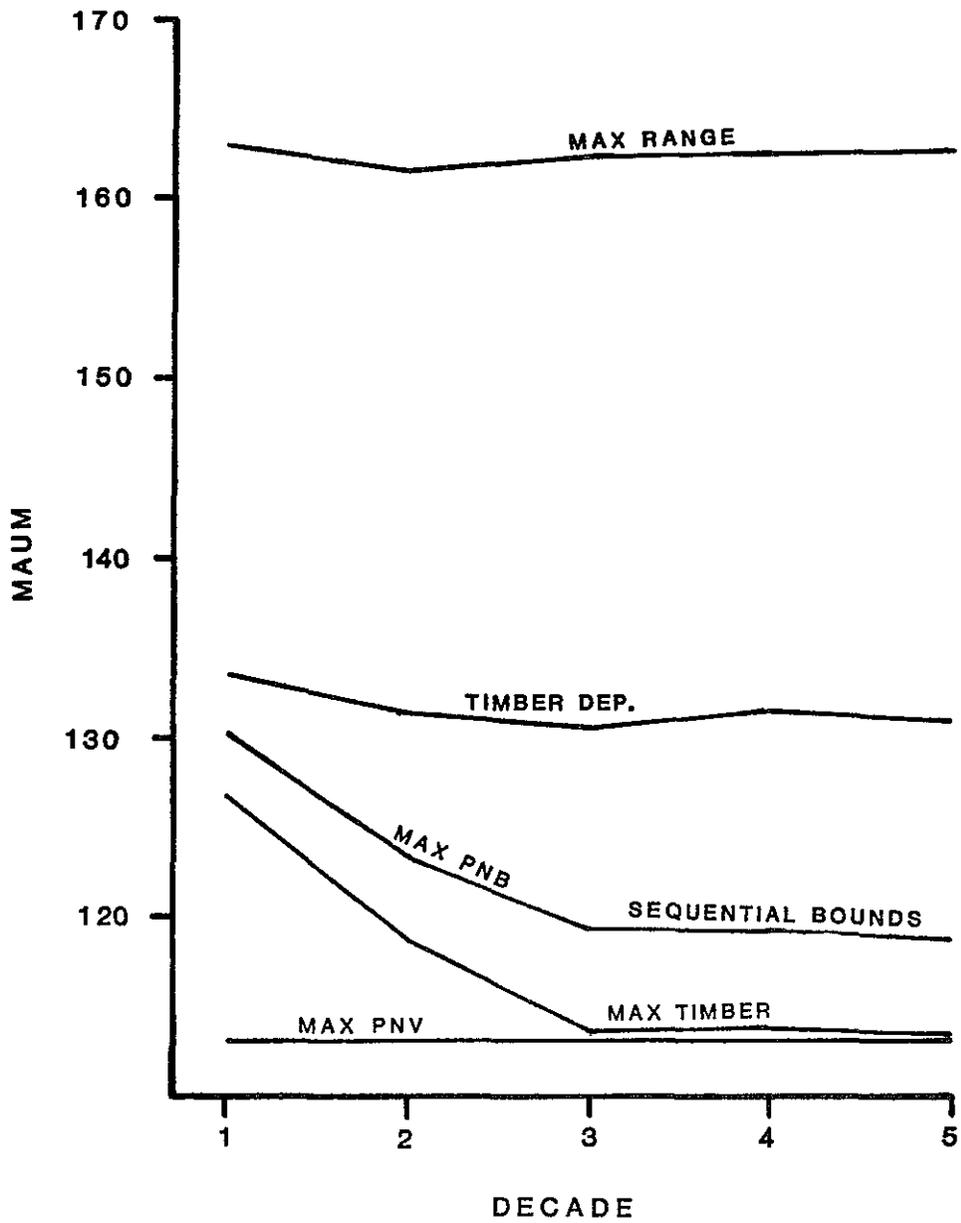
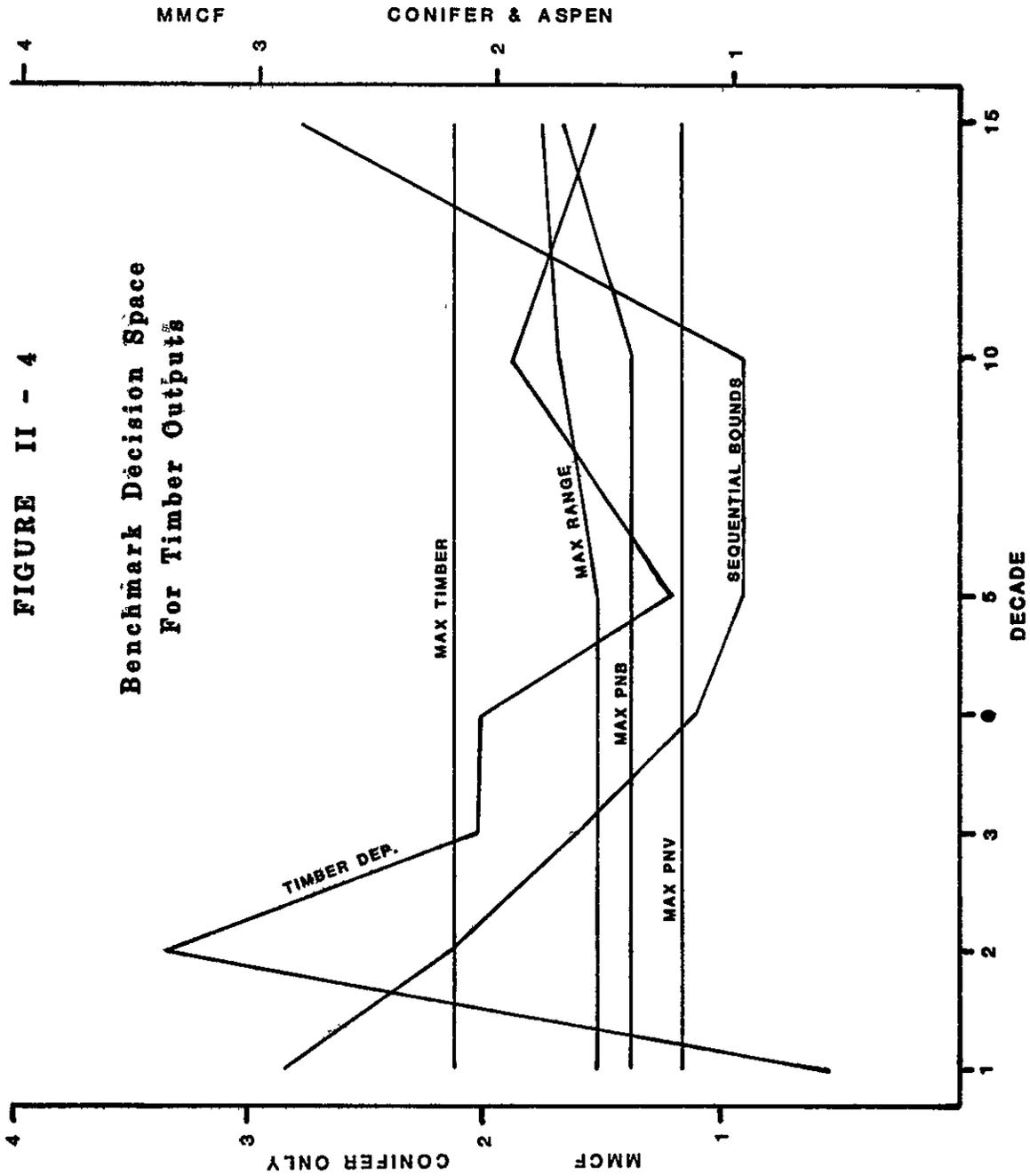


FIGURE II - 4
Benchmark Decision Space
For Timber Outputs



D. BENCHMARK DISPOSITION

Following is the evaluation and disposition of identified benchmarks. Rationale is included for those eliminated from further study.

The Minimum Level Benchmark (#1) is not considered in detail because it ignores discretionary outputs such as timber, range, or developed recreation. The Multiple Use and Sustained Yield Act of 1960, and other legislation, mandates production of these and other outputs from National Forests; the minimum management level is in violation of these acts. Additionally, this level has a devastating effect on local economies. It will not be considered further.

Single resource levels (Benchmarks #5 - #8) are eliminated from detailed analysis because they cannot provide an integrated mix of resource outputs responsive to planning problems, and because other resources are adversely affected. Achievement of biological potentials for single resources would violate management standards and guidelines in NFMA regulations (36 CFR 219.27). NFMA also requires that the Forest Plan provide for multiple use and sustained yield of products and services that flow from the Forest, in accordance with the Multiple Use-Sustained Yield Act of 1960. Maximization of single resource outputs does not satisfy this requirement. In addition, alternatives that generate maximum outputs of single resources at the expense of others also produce wide fluctuations and reduce dependability in total resource outputs

Examples of effects of several benchmarks that eliminated them from further study are:

Maximum people at one time (PAOT) capacity far exceeds projected demand.

Maximization of timber harvest requires timber sales in the Fish Lake Recreation Complex.

These discarded benchmark levels also created some adverse conditions which could not be avoided within the constraints of the problems, or could only be reduced with excessive cost. Maximum timber and range benchmarks produce negative values for measured net public benefits, indicating that costs of production greatly exceed market benefits. Environmental consequences of achieving some of the maximum resource outputs are also unacceptable.

Maximum Present Net Value Benchmark #3 is used in comparing economic efficiency of alternatives considered in detail, as far as the quantified benefits and costs are concerned. It is used to obtain economic bases for measuring opportunity costs for meeting: 1) boundaries that go beyond all requirements of laws and regulations, 2) budget limitations, 3) different mixes of outputs based on public issues and management concerns, and 4) specific policy objectives not contained in laws or regulations. Detailed analyses for this comparison are contained in Appendix B.

E. ALTERNATIVES EVALUATED BUT ELIMINATED FROM DETAILED STUDY

A departure analysis for the base sale schedule of Alternative 11 (preferred alternative) was conducted in accordance with FSM 1922.31d. The analysis was made using the FORPLAN model run with the same prescriptions and constraints as the Preferred Alternative with the following exceptions:

1. For timber harvest flow constraint, both the lower and upper bounds were set at 25%.
2. Long Term Sustained Yield Capacity link was removed.
3. A scheduled output constraint was applied, setting the harvest of period 15 (final period) equal to the value of the Long Term Sustained Yield Capacity determined for the Base Sales Schedule.

No increase in cut will occur in the first decade. Although periodic harvest will be increased in later decades, the increase is not needed to meet current or projected demand or Forest objectives. An increase in current production is achievable without a departure because the full allowable sale quantity is not scheduled in the preferred alternative. The departure is not needed for community stability and may result in serious consequences.

Further details of the departure analysis are shown in Appendix B. Alternatives containing wilderness proposals were not considered in detail because of the recent enactment of the Utah Wilderness Act of 1984 (PL 98-428). Congress has determined for this planning period that adequate consideration of roadless and undeveloped lands within the Forest has been made as to suitability for inclusion in the National Wilderness Preservation System. No other alternatives were eliminated from detailed consideration.

F. ALTERNATIVES CONSIDERED IN DETAIL

Alternatives presented in this planning effort reflect different combinations of management prescriptions applied to different areas of the Fishlake National Forest for the purpose of addressing public issues and management concerns (Planning problems). They represent reasonable multiple-use resource management strategies that supply outputs within minimum and maximum supply levels for each resource designated in Planning Action 4 (the AMS). They are an integrated mix of resource uses. In addition, planning problems, resource demand projections, Regional Guides, and the 1980 RPA also guided their formulations. In general, the alternatives considered in detail are designed to increase net public

benefits within the guidelines used to formulate them. Alternative Number 11 (Spatially Modified Revised Mix) is recommended by the Forest Supervisor as the preferred alternative.

All alternatives considered in detail were checked for spatial feasibility, conflicting adjacent management emphasis, resource scheduling, adherence to the requirements of 36 CFR 219.14 through 219.27, and the Forest-wide direction Standards and Guidelines (contained in the Forest Plan). Their social and economic effects on local populations were also considered. Cost efficient and effective management procedures were applied to achieve their goals and objectives.

All alternatives meet requirements of NFMA regulations. All include mitigation measures--outlined in the Forest-wide direction Standards and Guidelines and in management area prescriptions--in the prescriptions shown in Chapter IV of the Forest Plan. Habitat recovery for threatened and endangered species is provided for in all alternatives. Outputs and effects of alternatives are estimated with mitigation measures applied.

Major areas of needed management direction change, as determined in Planning Action 4 (the AMS), are emphasized in each alternative to varying degrees. They are: 1) to bring grazing use by livestock into line with indicated capacity of suitable range; 2) to establish specific wildlife objectives; 3) to meet future demands in developed recreation use due to projected population increase from energy development in central Utah; 4) to establish an aspen market; 5) to develop an adequate transportation system to serve the timber resource; 6) to reduce damage to soil and watershed resources from the Forest's transportation system; and 7) to respond to current and projected demands from the minerals industry with timely and thorough analysis.

The alternatives to be described represent different land base assignments of 30 prescriptions--management prescriptions developed in Planning Action 1 (Identification of Purpose and Need). These land based assignments, made in response to goals and objectives of individual alternatives, appear on maps in the packet accompanying this Final Environmental Impact Statement. Management area prescriptions emphasize individual types of resource management that will predominate; however, each prescription is a multiple-use strategy. For instance, acres proposed for vegetative manipulation to improve livestock range will also benefit big game animal habitat.

All alternatives are described in equal detail below. More specific considerations, including boundaries and limitations constraining alternatives, are detailed in Appendix B. Comparisons among alternatives are presented in Section G, following these detailed descriptions.

Alternative 1 (Fiscal Year 1982 Budget and Current Direction)

The goal of Alternative 1 is to maximize PNV and increase NPB by providing the most likely amount of goods and services if the Fiscal Year 1982 budget (non-inflating dollars) level was continued into the future. Current management direction is the existing direction in approved management plans, Policies, Standards, and Guidelines.

Specific objectives of Alternative 1 include: 1) maintaining a balanced program with moderate levels of outputs; 2) emphasizing range management on acres suitable for livestock grazing, while working towards favorable forage production; 3) continuing a combination of full and reduced service management in developed recreation sites, with some sites closed if they fail to meet health standards; 4) harvesting sawtimber from suitable land but allowing the removal of wood products (poles, firewood, Christmas trees) from both suitable and unsuitable land; 5) continuing current output trends in other resources; and 6) assigning a nondevelopment type of prescription to the RARE II proposed wilderness areas.

TABLE II - 10
ALT. 1

AVERAGE ANNUAL OUTPUT OR ACTIVITY		1	2	3	DECADE 4	5	10	15
RECREATION								
DEV REC USE								
RURAL	MRVD	228 6	213 7	213 7	213 7	213 7		
RD NAT	MRVD	152 4	142 5	142 5	142 5	142 5		
DISP REC USE								
RURAL	MRVD	51 6	43 4	43 4	43 4	43 4		
PD NAT	MRVD	452 9	381 6	381 6	381 6	381 6		
S P MOT	MRVD	145 4	122 6	122 6	122 6	122 6		
S P N. MOT	MRVD	11 6	10 0	10.1	10 2	10.3		
WILDLIFE								
STRUCT HAB IMP	STRUC	29	29	29	29	29		
NSTRUCT. HAB IMP	M. AC	0	0	0	0	0		
WLD & FISH USE	MWFUD	176 3	176 3	175.2	175 2	175 2		
RANGE								
GRAZING USE	M AUM	130 8	124 9	121 8	121 9	120 8		
TIMBER AVAILABLE SALE QUANTITY								
SAW T SOFTWOOD	M MCF	54	54	54	54	54	54	54
SAW T HARDWOOD	M MCF	06	06	06	06	06	06	06
ROUNDWOOD PRODUCTS	MCF	0	0	0	0	0	0	0
FUELWOOD	MCF	1970	1970	1970	1970	1970	1970	1970
REFORESTATION								
	M AC	182	182	182	182	182	182	182
TSI								
	M AC	005	005	005	005	005	005	005
WATER								
MGT ST. STANDARDS	M AC FT	611 0	611 0	611 0	611.0	611 0		
INCR OVER NAT	M AC FT	053	169	169	169	169		
PROTECTION								
FUEL BKS & TRT	ACRES	100	100	100	100	100		
MINERALS								
LEASES & PERMITS	CASES	200	200	180	180	160		
HC&D								
HUMAN RES PROG	ENRY'S	13	11	11	11	11		

LANDS						
PUR & ACQ	ACRES	0	0	0	0	0
SOILS						
S & WAT RES IMP	AC	180	180	180	180	180
FACILITIES						
TRAIL CONST /RECONST	MILES	0 5	0 5	0 5	0 5	0.5
ROAD CONST./RECONST. (ART & COLLECT)	MILES	0	0	0	0	0
RD BETTERMENT	MILES	0	0	0	0	0
LOCAL RD CONST.	MILES	0	0	0	0	0
LOCAL RD RCONST	MILES	0 1	0 1	0 1	0 1	0.1
TM PURCH RD CONST	MILES	5 0	8 0	9 0	6 0	3.0
TM PURCH RD. RCONST.	MILES	0	0	0	0	5 0

AVERAGE ANNUAL BENEFITS

RECREATION						
DEVELOPED	M \$	1588 8	1485 4	1485 4	1485 4	1485 4
DISPERSED	M \$	2761 6	2328 7	2329 5	2330 4	2331 6
RANGE	M \$	1553 9	1483 8	1446 9	1448 2	1435 1
TIMBER	M \$	993 3	981 3	1000 3	1008 3	1008.3
WILDLIFE (WFUDS)	M \$	4303 2	4266 0	4251 0	4251 0	4252 8
WATER YIELD INCREASE	M \$	3 1	9 9	9 9	9 9	9 9
MINERALS	M \$	9292 7	9292 7	9292 7	9780 0	9780 0

AVERAGE ANNUAL COSTS

TOTAL FOREST BUDGET	2/	M \$/YR	3199 3	3199 3	3199 3	3199 3	3199 3
FIXED COSTS							
PROTECTION		M \$/YR	576 0	576 0	576 0	576 0	576 0
GEN ADMIN		M \$/YR	407 0	407 0	407 0	407 0	407.0
VARIABLE COSTS							
INVESTMENTS	3/	M \$	342 3	342 3	342 3	342 3	342 3
TOT RDS		M \$	158 8	196 8	219 8	231 8	146 8
APP FUND RDS.		M \$	42 3	42 3	42 3	42 3	42 3
PURCH CREDIT RDS	4/	M \$	116 5	154 500	177.5	189 5	104 5
OPERATIONAL		M \$	1463 9	1463 9	1463 9	1463 9	1463 9
GENERAL ADMIN		M \$	322 0	322 0	322 0	322 0	322 0
NON-F S COSTS		M \$	573 0	593.0	614 0	747 0	610 0
RETURNS TO TRES		M \$	9613 9	9605 0	9601 9	10089 3	10088.2

- 1/ BOARD FOOT/CUBIC FOOT RATIOS SAWTIMBER 5 TO 1, FUELWOOD 4 TO 1.
- 2/ DOES NOT INCLUDE NON-F S PURCHASER CREDIT ROADS NOR HUMAN RESOURCE PROGRAMS
- 3/ DOES NOT INCLUDE ROAD COSTS
- 4/ INCLUDES F S. ENGINEERING COSTS

Alternative 2 (Market Opportunities)

The goal of Alternative 2 is to maximize PNV and increase NPB by emphasizing opportunities to increase timber, range, minerals, and other outputs that have the potential to produce an income to the government. Management direction toward this goal is accomplished incrementally through the first decade, regulated by the budget limitation of a 10 percent per year increase above the fiscal 1982 level. Management for other resources would be at levels economically and environmentally feasible, consistent with emphasis on market-oriented outputs.

Specific objectives of Alternative 2 include: 1) meeting demand projections for market-oriented outputs, and maintaining current output levels of other resources; 2) emphasizing range management on areas suitable for grazing, and constructing necessary range improvements to permit a slight increase in obligated numbers and to achieve favorable forage production; 3) full service management for most developed recreation sites, increased maintenance at existing sites, and construction of new sites at places such as Johnson Valley Reservoir, Gooseberry Reservoir, Oak Creek, Little Reservoir, and Manning Meadow to meet anticipated demands; 4) continuing to provide roaded natural and semi-primitive motorized opportunities while increasing semi-primitive non-motorized opportunities; 5) fully developing the road and trail system to meet the needs of resource management; 6) harvesting sawtimber from suitable land but allowing the removal of wood products (poles, firewood, Christmas trees) from both suitable and unsuitable lands; and 7) assigning a nondevelopment type of prescription to about 321,000 acres.

TABLE II - 11
ALT 2

AVERAGE ANNUAL OUTPUT OR ACTIVITY		1	2	3	DECADE		10	15
					4	5		
RECREATION								
DEV REC USE								
RURAL	MRVD	364 0	386 4	408 8	431 2	453 6		
PD NAT	MPVD	242.7	257 6	272 6	287 5	302 4		
DISP REC USE								
RURAL	MRVD	46 2	47 1	48 0	48 9	49 8		
RD NAT	MPVD	405 4	413 5	421 5	429 6	437 6		
S P MDT	MRVD	130 2	132 8	135 4	138 0	140 6		
S P N MDT	MRVD	16 5	17 7	19 0	20 4	22 1		
WILDLIFE								
STRUCT HAB IMP.	STRUC	29	72	72	72	72		
NSTRUCT HAB IMP	M AC	0	45	45	45	45		
WLD & FISH USE	MWFUD	177 2	177 9	178 2	178 5	178 3		
RANGE								
GRAZING USE	M AUM	137 6	136 4	135 6	136 7	135 8		
TIMBER AVAILABLE SALE QUANTITY								
SAW T SOFTWOOD	M MCF	80	1 52	1 52	1 52	1 52	7 9	7 9
SAW T HARDWOOD	M MCF	.40	06	06	06	06	06	06
ROUNDWOOD PRODUCTS	MCF	0	0	0	0	0	0	0
FUELWOOD	MCF	3350	3850	3850	3850	3850	3975	4100
REFORESTATION								
	M AC	240	422	290	276	450	244	81
TSI								
	M AC	124	178	232	230	503	515	243
WATER								
MGT ST STANDARDS	M AC FT	611 0	611.0	611 0	611 0	611 0		
INCR OVER NAT	M AC FT	159	159	.159	.159	159		
PROTECTION								
FUEL BKS & TRT	ACRES	100	100	100	100	100		
MINERALS								
LEASES & PERMITS	CASES	200	200	180	180	160		
HC&D								
HUMAN RES PROG	ENRY'S	13	11	11	11	11		

LANDS							
PUR & ACQ	ACRES	110	110	0	0	0	
SOILS							
S & WAT RES IMP	AC	0	90	90	90	90	
FACILITIES							
TRAIL CONST /RECONST	MILES	0 5	0 5	0 5	0 5	0 5	
ROAD CONST /RECONST (ART & COLLECT)	MILES	0	0	0	0	0	
RD BETTERMENT	MILES	13 0	13 0	13 0	13 0	13 0	
LOCAL RD CONST	MILES	0	0	0	0	0	
LOCAL RD RCONST	MILES	0 1	0 1	0 1	0 1	0 1	
TM PURCH RD. CONST	MILES	10 0	10 0	24 4	13 4	12 7	
TM PURCH RD RCONST	MILES	0	0	0	10 0	10 1	
AVERAGE ANNUAL BENEFITS							

RECREATION							
DEVELOPED	M \$	2529 9	2685 5	2641 4	2997 0	3152 5	
DISPERSED	M \$	2539 4	2599 2	2660 3	2723 3	2788 7	
RANGE	M \$	1634 7	1620 4	1610 9	1624 0	1613 3	
TIMBER	M \$	1454 5	2666 7	2679 7	2770 7	2769 7	
WILDLIFE (WFUDS)	M \$	4287 3	4312 5	4332 5	4336 9	4339 8	
WATER YIELD INCREASE	M \$	9 3	9 3	9 3	9 3	9 3	
MINERALS	M \$	9292 7	9292 7	9292 7	9780 0	9780 0	
AVERAGE ANNUAL COSTS							

TOTAL FOREST BUDGET	2/ M \$/YR	4717 5	5431 3	5431 3	5431 3	5431 3	
FIXED COSTS							
PROTECTION	M \$/YR	576 0	576 0	576 0	576 0	576 0	
GEN ADMIN	M \$/YR	407 0	407 0	407 0	407 0	407 0	
VARIABLE COSTS							
INVESTMENTS	3/ M \$	804 7	1058 1	1058 1	1058 1	1058 1	
TOT RDS	M \$	296 7	622 4	937 4	669 4	526 4	
APP FUND RDS	M \$	68 0	84 6	84 6	84 6	84 6	
PURCH CREDIT RDS	4/ M \$	228 7	537 8	852 8	584 8	441 8	
OPERATIONAL	M \$	2356 9	2703 5	2703 5	2703 5	2703 5	
GENERAL ADMIN	M \$	423 0	454 3	454 3	454 3	454 3	
NON-F S COSTS	M \$	839 0	2060 0	2619 0	2324 0	1786 0	
RETURNS TO TRES	M \$	9721 6	9767 9	9771 6	10,264 4	10,268 0	

- 1/ BOARD FOOT/CUBIC FOOT RATIOS SAWTIMBER 5 TO 1, FUELWOOD 4 TO 1
 2/ DOES NOT INCLUDE NON-F S PURCHASER CREDIT ROADS NOR HUMAN RESOURCE PROGRAMS
 3/ DOES NOT INCLUDE ROAD COSTS
 4/ INCLUDES F S ENGINEERING COSTS

Alternative 3 (Ten Percent Reduced Budget)

The goal of Alternative 3 is to maximize PNV and increase NPB by emphasizing opportunities for timber, range, minerals, and other outputs that have the potential to produce an income to the government, at an overall budget level that is reduced ten percent below the fiscal year 1982 level. Because of the emphasis on income producing outputs, budgets for these components equal or exceed current levels while budgets for other components are reduced so that the total Forest budget is ten percent below FY 1982 levels.

Specific objectives of Alternative 3 include: 1) limiting livestock grazing to range carrying capacity and achieving favorable forage production; 2) maintaining current levels of timber outputs; 3) reducing expenditures and outputs in nonmarket resources; 4) reducing the number of developed sites to those that can be operated and maintained to meet health standards, continuing to provide motorized recreation opportunities while increasing non-motorized opportunities; 5) complying with threatened and endangered species regulations; and 6) assigning a nondevelopment type of prescription to about 168,000 acres.

TABLE II - 12
ALT. 3

AVERAGE ANNUAL OUTPUT OR ACTIVITY		1	2	3	DECADE 4	5	10	15
RECREATION								
DEV REC USE								
RURAL	MRVD	211.5	184.3	157.0	157.0	157.0		
RD NAT	MRVD	141.0	122.8	104.7	104.7	104.7		
DISP REC USE								
RURAL	MRVD	51.6	41.1	30.7	30.7	30.7		
RD NAT	MRVD	452.9	361.3	269.7	269.7	269.7		
S P MOT	MRVD	145.4	116.0	86.6	86.6	86.6		
S P N. MOT	MRVD	14.2	12.4	10.7	11.3	12.3		
WILDLIFE								
STRUCT HAB IMP.	STRUC	0	0	0	0	0		
NSTRUCT. HAB IMP	M AC.	0	0	0	0	0		
WLD & FISH USE	MWFUD	176.6	176.3	176.0	176.0	176.0		
RANGE								
GRAZING USE	M AUM	134.8	131.9	130.6	130.8	130.3		
TIMBER AVAILABLE SALE QUANTITY								
SAW T. SOFTWOOD	MMBF 1/	3.0	3.0	3.0	3.0	3.0	3.0	3.0
SAW T. HARDWOOD	MMCF	.54	.54	.54	.54	.54	.54	.54
ROUNDWOOD PRODUCTS	MMCF	.06	.06	.06	.06	.06	.06	.06
FUELWOOD	MCF	0	0	0	0	0	0	0
	MCF	2000	2000	2000	2000	2000	2000	2000
REFORESTATION								
	M AC	.184	.184	.184	.184	.184	.184	.184
TSI								
	M AC	-	-	-	-	-	0	0
WATER								
MGT ST. STANDARDS	M AC FT	611.0	611.0	611.0	611.0	611.0		
INCR OVER NAT	M AC FT	.053	.099	.099	.099	.099		
PROTECTION								
FUEL BKS. & TRT	ACRES	0	0	0	0	0		
MINERALS								
LEASES & PERMITS	CASES	200	200	180	180	160		
HC&D								
HUMAN RES PROG	ENRY'S	13	11	11	11	11		

LANDS						
PUR & ACQ	ACRES	0	0	0	0	0
SOILS						
S & WAT. RES. IMP.	AC	0	0	0	0	0
FACILITIES						
TRAIL CONST./RECONST	MILES	0 3	0 3	0.3	0 3	0.3
ROAD CONST/RECONST (ART & COLLECT)	MILES	0	0	0	0	0
RD BETTERMENT	MILES	0	0	0	0	0
LOCAL RD CONST.	MILES	0	0	0	0	0
LOCAL RD. RCONST.	MILES	0 1	0.1	0.1	0.1	0.1
TM PURCH. RD. CONST.	MILES	4 2	5 3	7 0	5 0	4 0
TM PURCH RD RCONST.	MILES	0	0	0	0	1 0
AVERAGE ANNUAL BENEFITS						

RECREATION						
DEVELOPED	M \$	1469 9	1280.6	1091 3	1091.3	1091.3
DISPERSED	M \$	2790.2	2237 6	1682.8	1692 4	1700.1
RANGE	M \$	1601 4	1567 0	1551.5	1553 9	1548.0
TIMBER	M \$	980.9	952 9	972.9	1001.9	1001.9
WILDLIFE (WFUDS)	M \$	4305.5	4245.9	4186 5	4187 3	4190 2
WATER YIELD INCREASE	M \$	3.1	5 8	5.8	5.8	5 8
MINERALS	M \$	9292.7	9292 7	9292 7	9780 0	9780 0
AVERAGE ANNUAL COSTS						

TOTAL FOREST BUDGET	2/ M \$/YR	2866 3	2866 0	2866 0	2866 0	2866 0
FIXED COSTS						
PROTECTION	M \$/YR	576 0	576 0	576 0	576 0	576 0
GEN. ADMIN	M \$/YR	407 0	407 0	407 0	407 0	407.0
VARIABLE COSTS						
INVESTMENTS	3/ M \$	396 1	396 7	396.7	396 7	396 7
TOT RDS	M \$	136.8	141 8	170 8	181.8	135.8
APP. FUND RDS	M \$	26 3	263 0	26 3	26 3	26 3
PURCH CREDIT RDS	4/ M \$	110 5	115 5	144 5	155 5	109.5
OPERATIONAL	M \$	1158.4	1158 5	1158.5	1158.5	1158.5
GENERAL ADMIN	M \$	257 0	257 0	257.0	257.0	257 0
NON-F S COSTS	M \$	572 0	564 0	590.0	790 0	594 0
RETURNS TO TREES	M \$	9614 8	9606 5	9599 7	10,087.2	10,086 7

1/ BOARD FOOT/CUBIC FOOT RATIOS SAWTIMBER 5 TO 1, FUELWOOD 4 TO 1

2/ DOES NOT INCLUDE NON-F S PURCHASER CREDIT ROADS NOR HUMAN RESOURCE PROGRAMS

3/ DOES NOT INCLUDE ROAD COSTS.

4/ INCLUDES F S ENGINEERING COSTS

Alternative 4 (Nonmarket Opportunities)

The goal of Alternative 4 is to maximize PNV and increase NPB by emphasizing opportunities to improve water quality, fish and wildlife, dispersed recreation, and other amenity values. Management direction toward this goal is accomplished incrementally through the first decade by a 10 percent per year increase above the fiscal 1982 levels. Management of other resources would be at economically and environmentally feasible levels consistent with the emphasis on nonmarket values.

Specific objectives of Alternative 4 include: 1) closing and obliterating selected roads, increasing non-motorized recreation opportunities and increasing the trail system; 2) emphasizing improved wildlife habitat diversity and other management activities to benefit big game; 3) maintaining existing developed recreation sites and providing additional sites which support non-motorized opportunities while maintaining motorized opportunities; 4) continuing timber harvest at current levels; 5) reducing grazing levels by withdrawing livestock from suitable range at poor to very poor conditions; 6) providing fuelwood from range improvement projects, commercial timber sales, and timber stand improvement projects; 7) enhancing fisheries and water quality by improving watershed conditions and lessening impacts on riparian areas; and 8) assigning a nondevelopment type of prescription to about 527,000 acres.

TABLE II - 13
ALT 4

AVERAGE ANNUAL OUTPUT OR ACTIVITY		1	2	3	DECADE		10	15
					4	5		
RECREATION								
DEV REC USE								
RURAL	MRVD	228 6	282 3	335 9	426 8	517 7		
RD NAT	MRVD	152 4	188 2	223 9	284 6	345 2		
DISP REC USE								
RURAL	MRVD	39 1	61 9	84 6	107 4	130 1		
RD NAT.	MRVD	343 0	542 8	742 7	942 5	1142 3		
S P MDT.	MRVD	110 2	174 4	238 6	302 7	366 9		
S P N MDT	MRVD	20 4	27 1	34 1	41 5	49 1		
WILDLIFE								
STRUCT HAB IMP	STRUC	517	553	553	553	553		
NSTRUCT HAB. IMP.	M AC	.414	.414	.414	.414	.414		
WLD & FISH USE	MWFUD	188 2	197 8	198 2	198 3	195 2		
RANGE								
GRAZING USE	M AUM	134 8	132 1	130 0	131 0	130 4		
TIMBER AVAILABLE SALE QUANTITY								
SAW T SOFTWOOD	MMBF 1/	3 0	6 5	6 5	6 5	6 5	6 5	6 5
SAW T HARDWOOD	MMCF	30	1 00	1 00	1 00	1 00	1 00	1 00
ROUNDWOOD PRODUCTS	MCF	0	0	0	0	0	0	0
FUELWOOD	MCF	4040	4040	4040	4040	4040	4040	4040
REFORESTATION								
	M AC	073	280	.152	097	.207	163	096
TSI								
	M AC	.050	072	.285	052	.105	052	289
WATER								
MGT ST. STANDARDS	M AC FT	611 0	611 0	611 0	611 0	611 0		
INCR OVER NAT	M AC FT	032	103	103	.103	103		
PROTECTION								
FUEL BKS. & TRT	ACRES	100	0	0	0	0		
MINERALS								
LEASES & PERMITS	CASES	200	200	180	180	160		
HC&D								
HUMAN RES PROG	ENRY'S	13	11	11	11	11		

LANDS							
PUR & ACQ	ACRES	110	110	0	0	0	
SOILS							
S & WAT RES IMP	AC	543	730	730	730	730	
FACILITIES							
TRAIL CONST /RECONST	MILES	0	3 5	3 5	3 5	3 5	
ROAD CONST /RECONST (ART. & COLLECT)	MILES	0	0	0	0	0	
PD BETTERMENT	MILES	13 0	13 0	13 0	13 0	13 0	
LOCAL RD CONST	MILES	0	0 2	0 4	0 2	0 1	
LOCAL RD RCONST	MILES	0 1	0 3	0 1	0 3	0 4	
TM PURCH. RD CONST	MILES	3 3	11 7	16 4	6 7	7 9	
TM PURCH RD RCONST.	MILES	0	0	0	0	1 2	
AVERAGE ANNUAL BENEFITS							

RECREATION							
DEVELOPED	M \$	1588 8	1962 0	2334 4	2966 5	3598. 3	
DISPERSED	M \$	2220 6	3457 2	4696 3	5939 2	7185 2	
PANGE	M \$	1601 4	1569. 3	1544 4	1556 3	1549 2	
TIMBER	M \$	697 3	1784 3	1854 3	1874 3	1874. 3	
WILDLIFE (WFUDS)	M \$	4510 6	4901 0	5025 3	5167 0	5283 0	
WATER YIELD INCREASE	M \$	1 9	6 0	6 0	6 0	6 0	
MINERALS	M \$	9292 7	9292 7	9292 7	9780 0	9780 0	
AVERAGE ANNUAL COSTS							

TOTAL FOREST BUDGET	2/	M \$/YR	4716 8	6226 5	6226 5	6226 5	6226 5
FIXED COSTS							
PROTECTION		M \$/YR	576 0	576 0	576 0	576 0	576 0
GEN ADMIN		M \$/YR	407 0	407 0	407 0	407 0	407 0
VARIABLE COSTS							
INVESTMENTS	3/	M \$	1076. 4	1486 1	1486. 1	1486 1	1486 1
TOT RDS		M \$	126 1	389 6	426 6	375 6	306 6
APP FUND RDS		M \$	31 6	114 9	114 9	114 9	114 9
PURCH CREDIT RDS	4/	M \$	94 5	244 7	311 7	260 7	191 7
OPERATIONAL		M \$	2155 3	3117 5	3117 5	3117 5	3117. 5
GENERAL ADMIN		M \$	425 0	454 3	454 3	454 3	454 3
NON-F S COSTS		M \$	4716 8	1037 0	1099 0	1431 0	1065 0
RETURNS TO TRES		M \$	9638 6	9716 7	9725 3	10,231 8	10,249 3

- 1/ BOARD FOOT/CUBIC FOOT RATIOS SAWTIMBER 5 TO 1, FUELWOOD 4 TO 1
2/ DOES NOT INCLUDE NON-F S PURCHASER CREDIT ROADS NOR HUMAN RESOURCE PROGRAMS
3/ DOES NOT INCLUDE ROAD COSTS
4/ INCLUDES F S ENGINEERING COSTS

Alternative 5 (1980 RPA Program)

The goal of Alternative 5 is to maximize PNV and increase NPB by meeting RPA objectives within budget limits--as assigned to the Fishlake National Forest through the Regional Guide--and in the most cost efficient manner. This alternative is highly responsive to all 1980 assigned targets except range. Although permitted livestock grazing would exceed current levels because of increased expenditures on non-structural and structural improvements, AUM's fall short of the 1980 RPA target.

Specific objectives are that: 1) timber, minerals, and range are high emphasis outputs, however, range will limit grazing to carrying capacity that achieves fair to good conditions; 2) harvesting sawtimber from suitable lands but allowing the removal of wood products (poles, firewood, Christmas trees) from suitable and unsuitable lands; 3) developed recreation sites needing major repair will be reconstructed, and new sites in areas of high demand will be constructed; 4) continuation of the present mix of recreation opportunities; and 5) The RARE II proposed wilderness was assigned a nondevelopment type of prescription.

TABLE II - 14
ALT 5

AVERAGE ANNUAL OUTPUT OR ACTIVITY		1	2	3	DECADE 4	5	10	15
PECREATION								
DEV REC USE								
RURAL	MRVD	312.7	413.8	487.3	560.8	534.3		
RD NAT	MRVD	208.4	275.8	324.8	373.8	422.8		
DISP REC USE								
RURAL	MRVD	57.2	72.3	87.5	102.6	102.6		
RD NAT	MRVD	502.0	635.0	768.0	901.0	901.0		
S P MOT.	MRVD	161.2	203.9	246.7	389.4	289.4		
S P N. MOT	MRVD	12.8	16.2	19.6	23.0	23.1		
WILDLIFE								
STRUCT HAB IMP	STRUC	407	407	407	407	407		
NSTRUCT HAB IMP	M AC	418	418	418	418	418	418	
WLD & FISH USE	MWFUD	190.5	204.8	208.1	208.3	208.5		
PANGE								
GRAZING USE	M AUM	155.1	157.6	159.6	161.6	162.6		
TIMBER AVAILABLE SALE QUANTITY								
SAW T SOFTWOOD	MMCF	98	1.82	1.82	1.82	1.82	1.82	2.02
SAW T HARDWOOD	MMCF	50	10	10	10	10	10	10
ROUNDWOOD PRODUCTS	MCF	0	0	0	0	0	0	0
FUELWOOD	MCF	2060	2910	2910	2910	2910	3035	3135
PEFORESTATION								
	M AC	255	339	303	293	247	314	211
TSI								
	M AC	060	579	533	513	550	0	634
WATER								
MGT ST STANDARDS	M AC FT	611.0	611.0	611.0	611.0	611.0		
INCR OVER NAT	M AC FT	190	190	190	190	190		
PROTECTION								
FUEL BKS & TRT	ACRES	100	0	0	0	0		
MINERALS								
LEASES & PERMITS	CASES	200	200	180	180	160		
HC&D								
HUMAN RES PROG	ENRY'S	13	11	11	11	11		

LANDS							
PUR & ACQ	ACRES	110	110	0	0	0	
SOILS							
S & WAT RES IMP	AC	260	403	403	403	403	
FACILITIES							
TRAIL CONST /RECONST	MILES	2 5	2 3	2 3	2 3	2 3	
ROAD CONST /RECONST.	MILES	0	0 1	0 1	0 1	0 1	
(ART & COLLECT)							
RD BETTERMENT	MILES	13 0	13 0	13 0	13 0	13 0	
LOCAL RD CONST	MILES	0.2	0 1	0.2	0 1	0.1	
LOCAL RD PCONST	MILES	0 1	0 2	0.1	0.2	0 2	
TM PURCH PD CONST.	MILES	9 0	31 4	31 7	39 2	4 0	
TM PURCH PD RCONST	MILES	0	0	0	1 0	27 3	
<u>AVERAGE ANNUAL BENEFITS</u>							
RECREATION							
DEVELOPED	M \$	2173 0	2875 6	3386 5	3897 3	4408 1	
DISPERSED	M \$	3060 6	3870.7	4681.8	5492 1	5494 6	
RANGE	M \$	1842 6	1872 3	1896 0	1919 8	1931.7	
TIMBER	M \$	1693 6	3195 3	3202 3	3245 3	3232 3	
WILDLIFE (WFUDS)	M \$	4734 3	5059 1	5218.1	5302 3	5300 5	
WATER YIELD INCREASE	M \$	11 1	11 1	11 1	11.1	11 1	
MINERALS	M \$	9292 7	9292 7	9292 7	9780.0	9780.0	
<u>AVERAGE ANNUAL COSTS</u>							
TOTAL FOREST BUDGET	2/ M \$/YR	5395 3	7034.0	7034 0	7034 0	7034 0	
FIXED COSTS							
PROTECTION	M \$/YR	576 0	576 0	576.0	576 0	576 0	
GEN ADMIN	M \$/YR	407 0	407 0	407 0	407.0	407 0	
VARIABLE COSTS							
INVESTMENTS	3/ M \$	1262 9	1824 5	1824 5	1824 5	1824 5	
TOT RDS.	M \$	295 0	715 7	722 7	1389 7	452 4	
APP FUND RDS	M \$	78 6	111 5	111.5	111 5	111 5	
PURCH CREDIT RDS	4/ M \$	226 4	604.2	611.2	1278 2	337 2	
OPERATIONAL	M \$	2564 8	3499.5	3499 5	3499 5	3499 5	
GENERAL ADMIN	M \$	424.6	454 3	454 3	454.3	454 3	
NON-F S COSTS	M \$	5395 3	2009 0	2080 0	3040 6	2063 0	
RETURNS TO TRES	M \$	9743 9	9819 2	9835 9	10339 9	10355 5	

1/ BOARD FOOT/CUBIC FOOT RATIOS SAWTIMBER 5 TO 1, FUELWOOD 4 TO 1.

2/ DOES NOT INCLUDE NON-F S PURCHASER CREDIT ROADS NOR HUMAN RESOURCE PROGRAMS

3/ DOES NOT INCLUDE ROAD COSTS

4/ INCLUDES F S ENGINEERING COSTS

Alternative 6 (Emphasis on Local Issues and Concerns)

The goal of Alternative 6 is to maximize PNV and increase NPB by emphasizing a mixture of market and nonmarket outputs in response to local issues. The social and economic condition of the Sevier Social Resource Unit has shown a slight shift away from an agricultural base toward a service and industrial base over the past decade. This has brought new demands for amenity outputs, while the demand for market outputs has remained strong. This alternative strives to meet these demands within the Forest's capability. Management direction toward this goal is accomplished incrementally through the first decade, regulated by the budget constraint of 10 percent per year increase above the fiscal 1982 level.

Specific objectives for Alternative 6 include: 1) maintaining timber harvest at current level during first decade then increasing it to the potential of the suitable land for the alternative; 2) maintaining range outputs at near current levels, while constructing range improvements to restore favorable forage production; 3) constructing developed recreation sites near local communities, and managing existing developed recreation sites at full service, increasing maintenance so they can remain open; 4) continuing a similar mix of recreation opportunities as presently supplied; 5) eliminating the soil and watershed improvement backlog by the year 2030; 6) rehabilitating orphan mines; 7) increasing road and trail maintenance to prevent sediment production from these sources, and closing unneeded roads causing accelerated erosion; 8) increasing wildlife habitat, particularly in winter range areas; 9) sawtimber would be harvested from suitable land, but wood products (poles, firewood, and Christmas trees) would be allowed to come from both suitable and unsuitable land; and 10) no nondevelopment type of prescriptions were required of the model.

TABLE II - 15
ALT 6

AVERAGE ANNUAL OUTPUT OR ACTIVITY		1	2	3	DECADE		10	15
					4	5		
RECREATION								
DEV REC. USE								
PURAL	MRVD	266 0	320 5	401.8	483 1	483.1		
RD NAT.	MRVD	177 3	213 6	267.9	322 1	322 1		
DISP REC USE								
RURAL	MRVD	52 0	59 7	67 4	67 4	67 4		
RD NAT	MRVD	456 3	524 2	592 0	592 0	592.0		
S P MDT	MRVD	146 5	168 4	190 2	190 2	190 2		
S P N. MDT	MRVD	11 3	13 0	14 7	14 7	14 7		
WILDLIFE								
STRUCT. HAB IMP.	STRUC	252	574	574	574	574		
NSTRUCT HAB IMP	M AC	412	418	.418	418	418		
WLD & FISH USE	MWFUD	181 8	192 7	198 9	199 1	199 0		
RANGE								
GRAZING USE	M AUM	136 1	132.7	131.0	131 8	130 7		
TIMBER AVAILABLE SALE QUANTITY								
SAW T SOFTWOOD	M MCF	54	1.86	1 86	1 86	1 86	1 86	2 10
SAW T HARDWOOD	M MCF	06	06	06	06	06	06	06
ROUNDWOOD PRODUCTS	MCF	0	0	0	0	0	0	0
FUELWOOD	MCF	3030	2910	2910	2910	2910	3035	3135
REFORESTATION								
	M AC	181	.462	.273	195	342	274	202
TSI								
	M AC	058	336	553	.361	.289	365	607
WATER								
MGT ST STANDARDS	M AC FT	611 0	611 0	611 0	611 0	611 0		
INCR OVER NAT	M AC FT	.194	194	194	.194	194		
PROTECTION								
FUEL BKS & TRT	ACRES	100	0	0	0	0		
MINERALS								
LEASES & PERMITS	CASES	200	200	180	180	160		
HC&D								
HUMAN RES PROG	ENRY'S	13	11	11	11	11		

LANDS							
PUR & ACQ	ACRES	110	110	0	0	0	
SOILS							
S & WAT RES IMP	AC	463	597	597	597	597	
FACILITIES							
TRAIL CONST /RECONST	MILES	2 3	2 5	2 5	2 5	2 5	
ROAD CONST /RECONST (ART & COLLECT)	MILES	0	0 1	0 1	0 1	0 1	
RD BETTERMENT	MILES	13 0	13 0	13 0	13 0	13 0	
LOCAL RD CONST.	MILES	0 1	0 1	0 1	0 1	0 1	
LOCAL RD RCONST	MILES	0 1	0 2	0 2	0 2	0 2	
TM PURCH RD CONST	MILES	5 3	27 4	30 3	24 7	10 6	
TM PURCH. RD RCONST	MILES	0	0	0	1 5	14 3	
AVERAGE ANNUAL BENEFITS							

PECREATION							
DEVELOPED	M \$	1848 6	2227 2	2792 6	3357 7	3357 7	
DISPERSED	M \$	2777 6	3191 3	3604 1	3604 1	3604 1	
RANGE	M \$	1616 9	1576 5	1556 3	1565 8	1552 7	
TIMBER	M \$	1011 5	3203 5	3277 5	3314 5	3300 5	
WILDLIFE (WFUDS)	M \$	4426 6	4747 4	4947 0	4950 2	4947 0	
WATER YIELD INCREASE	M \$	11 3	11 3	11 3	11 3	11 3	
MINERALS	M \$	9292 7	9292 7	9292 7	9780 0	9780 0	
AVERAGE ANNUAL COSTS							

TOTAL FOREST BUDGET	2/ M \$/YR	4719 0	6284 9	6284 9	6284 9	6284 9	
FIXED COSTS							
PROTECTION	M \$/YR	576 0	576 0	576 0	576 0	576 0	
GEN ADMIN	M \$/YR	407 0	407 0	407 0	407 0	407 0	
VARIABLE COSTS							
INVESTMENTS	3/ M \$	986 1	1654 6	1654 6	1654 6	1654 6	
TOT RDS	M \$	152 5	634 2	671 2	921 2	455 2	
APP FUND RDS	M \$	57 0	85 0	85 0	85 0	85 0	
PURCH CREDIT RDS	4/ M \$	95 5	549 2	586 2	836 2	370 2	
OPERATIONAL	M \$	2204 4	2946 8	2946 8	2946 8	2946 8	
GENERAL ADMIN.	M \$	443 0	454 3	454 3	454 3	454 3	
NON-F S COSTS	M \$	4719 0	2026 0	2106 0	2623 0	2105 0	
RETURNS TO TRES	M \$	9637 3	9775 6	9790 2	10294 5	10293 4	

- 1/ BOARD FOOT/CUBIC FOOT RATIOS SAWTIMBER 5 TO 1, FUELWOOD 4 TO 1
 2/ DOES NOT INCLUDE NON-F S PURCHASER CREDIT ROADS NOR HUMAN RESOURCE PROGRAMS
 3/ DOES NOT INCLUDE ROAD COSTS
 4/ INCLUDES F S ENGINEERING COSTS

Alternative 7 (Twenty-five Percent Reduced Budget)

The goal of Alternative 7 is to maximize PNV and increase NPB by emphasizing opportunities for timber, range, minerals, and other outputs that have the potential to produce income to the government, at a budget level reduced 25 percent below the Fiscal Year 1982 level.

Specific objectives for Alternative 7 include: 1) timber outputs of half a million board feet, sawtimber would be harvested from suitable land, but wood products (poles, firewood, and Christmas trees) would be allowed to come from both suitable and unsuitable land; 2) using only range betterment funds for range improvement projects; 3) adjusting the number of recreation sites and Forest recreation use to the level that can be adequately managed while providing a mix of opportunities similar to the present; 4) reducing expenditures and outputs in nonmarket output resources; and 5) assigning a nondevelopment type of prescription to about 735,000 acres.

TABLE II - 16
ALT 7

AVERAGE ANNUAL OUTPUT OR ACTIVITY		1	2	3	DECADE 4	5	10	15
RECREATION								
DEV REC. USE								
RURAL	MRVD	136 5	175 3	175 3	175 3	175 3		
RD NAT	MRVD	91 0	116 8	116 8	116 8	116 8		
DISP. REC USE								
RURAL	MRVD	2.2	2 2	2 2	2.2	2 2		
RD NAT	MRVD	19 3	19 3	19 3	19 3	19 3		
S P MOT	MRVD	6 2	6 2	6 2	6 2	6 2		
S P. N. MOT	MRVD	17 0	19 5	22 4	25 6	29.4		
WILDLIFE								
STRUCT. HAB IMP.	STRUC	0	0	0	0	0		
NSTRUCT HAB IMP.	M AC	0	0	0	0	0		
WLD & FISH USE	MWFUD	176 2	172 1	174.7	174 6	174 6		
RANGE								
GRAZING USE	M AUM	130 9	124.7	120 6	120 8	120 7		
TIMBER AVAILABLE SALE QUANTITY								
SAW T SOFTWOOD	MMBF 1/	0 5	0 5	0.5	0 5	0 5	.5	5
SAW T HARDWOOD	MMCF	10	.10	10	.10	.10	10	.10
ROUNDWOOD PRODUCTS	MMCF	0	0	0	0	0	0	0
FUELWOOD	MCF	0	0	0	0	0	0	0
		2410	2410	2410	2410	2410	2410	2410
REFORESTATION								
	M AC	022	022	134	117	126	138	099
TSI								
	M AC	050	.050	050	154	099	050	050
WATER								
MGT. ST STANDARDS	M AC FT	611 0	611 0	611.0	611.0	611 0		
INCR OVER NAT.	M AC FT	012	071	071	.071	071		
PROTECTION								
FUEL BKS & TRT	ACRES	0	0	0	0	0		
MINERALS								
LEASES & PERMITS	CASES	200	200	180	180	160		
HC&D								
HUMAN RES PROG	ENRY'S	13	11	11	11	11		

LANDS							
PUR & ACQ	ACRES	0	0	0	0	0	0
SOILS							
S & WAT RES. IMP	AC	0	0	0	0	0	0
FACILITIES							
TRAIL CONST /RECONST	MILES	0 1	0 1	0 1	0 1	0 1	0 1
ROAD CONST /RECONST	MILES	0	0	0	0	0	0
(ART. & COLLECT)							
RD BETTERMENT	MILES	0	0	0	0	0	0
LOCAL RD. CONST.	MILES	0	0	0	0	0	0
LOCAL RD RCONST.	MILES	0 1	0 1	0.1	0 1	0.1	0.1
TM PURCH RD CONST.	MILES	1 6	1.6	1.6	1 6	1.6	1.6
TM PURCH RD. RCONST.	MILES	0	0	0	0	0	5 2

AVERAGE ANNUAL BENEFITS

RECREATION							
DEVELOPED	M \$	948 7	1218 1	1218 1	1218 1	1218 1	1218 1
DISPERSED	M \$	301 1	328 9	361 1	396 7	439 0	439 0
RANGE	M \$	1551 5	1481 4	1432 7	1335 1	1439 9	1439 9
TIMBER	M \$	271 5	266 5	267 5	271 5	271 5	271 5
WILDLIFE (WFUDS)	M \$	4054 9	4047 7	4045 2	4048 9	4052 5	4052 5
WATER YIELD INCREASE	M \$	0 7	4 1	4 1	4 1	4 1	4 1
MINERALS	M \$	9292 7	9292 7	9292 7	9780 0	9780 0	9780 0

AVERAGE ANNUAL COSTS

TOTAL FOREST BUDGET	2/	M \$/YR	2416 7	2419 0	2419 0	2419 0	2419 0
FIXED COSTS							
PROTECTION		M \$/YR	576 0	576 0	576 0	576 0	576 0
GEN. ADMIN		M \$/YR	407 0	407 0	407 0	407 0	407 0
VARIABLE COSTS							
INVESTMENTS	3/	M \$	222 9	230 3	230 3	230 3	230 3
TOT RDS		M \$	60 0	74 2	75 2	80 2	64 2
APP FUND RDS		M \$	25 4	32 6	32 6	32 6	32 6
PURCH CREDIT. RDS.	4/	M \$	34 6	41 6	42 6	47 6	31 6
OPERATIONAL		M \$	934 8	903 2	903 2	903 2	903 2
GENERAL ADMIN.		M \$	230 0	250 0	250 0	250 0	250 0
NON-F S COSTS		M \$	2416 7	105 0	109 0	163 0	106 0
RETURNS TO TRES		M \$	9550 0	9551 6	9547 5	10035 0	10034 9

- 1/ BOARD FOOT/CUBIC FOOT RATIOS SAWTIMBER 5 TO 1, FUELWOOD 4 TO 1.
- 2/ DOES NOT INCLUDE NON-F S PURCHASER CREDIT ROADS NOR HUMAN RESOURCE PROGRAMS
- 3/ DOES NOT INCLUDE ROAD COSTS
- 4/ INCLUDES F. S. ENGINEERING COSTS

Alternative 8 (Current Program-No Action)

The goal of Alternative 8 is to maximize PNV and increase NPB by providing the current level of goods and services and the most likely amount of goods and services forecast if current management direction continues. Management action toward this goal is accomplished incrementally through the first decade, regulated by the budget limitation of slightly less than a 10 percent per year increase above fiscal 1982 level.

Specific objectives of Alternative 8 include: 1) maintaining a balanced program with existing levels of outputs; 2) emphasizing range management, achieving fair to good conditions with a stable to upward trend; 3) a significant increase during the first decade in operation and maintenance of recreation sites and managing use with a current mix of recreation opportunities; 4) meeting demands for timber outputs by harvesting sawtimber from suitable lands, but wood products (poles, firewood, and Christmas trees) would be allowed to be removed from both suitable and unsuitable lands; 5) increasing trail maintenance and constructing new trailheads; 6) continuing current output trends in other resource areas; and 7) assigning a nondevelopment type of prescription to the RARE II proposed wilderness.

TABLE II - 17
ALT. 8

AVERAGE ANNUAL OUTPUT OR ACTIVITY		1	2	3	DECADE		10	15
					4	5		
RECREATION								
DEV REC USE								
RURAL	MRVD	287 4	363 3	398 9	398 9	398 9		
RD NAT	MRVD	191 6	242 2	265 9	265 9	265 9		
DISP REC USE								
RURAL	MRVD	59 4	57 7	57 7	57 7	57 7		
RD NAT.	MRVD	521.3	507.1	507 1	507 1	507.1		
S P MOT.	MRVD	167 4	162 9	162 9	162 9	162 9		
S P N MOT	MRVD	13 3	13 1	13 2	13 3	13 4		
WILDLIFE								
STRUCT HAB IMP	STRUC	10	7	7	7	7		
NSTRUCT. HAB IMP	M AC	0	0	0	0	0		
WLD. & FISH USE	MWFUD	176 6	177 3	177.4	177 0	177 4		
RANGE								
GRAZING USE	M AUM	136 6	136 4	136 4	137 1	136 4		
TIMBER AVAILABLE SALE QUANTITY								
SAW. T SOFTWOOD	MMBF 1/	3 0	3 0	3 0	3 0	3 0	3 0	3 0
SAW. T HARDWOOD	MMCF	54	54	54	54	54	54	54
ROUNDWOOD PRODUCTS	MCF	06	06	06	06	06	06	06
FUELWOOD	MCF	0	0	0	0	0	0	0
		1970	1970	1970	1970	1970	1970	1970
REFORESTATION								
	M AC	182	182	182	182	182	182	182
TSI								
	M AC	.005	.005	.005	.005	.005	.005	.005
WATER								
MGT. ST STANDARDS	M AC FT	611 0	611.0	611 0	611 0	611 0		
INCR OVER NAT	M AC FT	173	173	173	173	173		
PROTECTION								
FUEL BKS & TRT	ACRES	100	0	0	0	0		
MINERALS								
LEASES & PERMITS	CASES	200	200	180	180	160		
HC&D								
HUMAN RES PROG	ENRY'S	13	11	11	11	11		

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LANDS PUR & ACG	ACRES	0	110	110	0	0
SOILS S & WAT RES IMP	AC	260	523	523	523	523
FACILITIES						
TRAIL CONST /RECONST	MILES	3 8	0 1	0 1	0 1	0 1
ROAD CONST /RECONST. (ART & COLLECT)	MILES	0	0	0	0	0
RD BETTERMENT	MILES	13 0	13 0	13 0	13 0	13 0
LOCAL RD CONST	MILES	0	0 1	0 1	0	0
LOCAL RD RCONST	MILES	0 1	0 2	0 2	0 3	0 3
TM PURCH RD CONST	MILES	5 1	8 1	9 0	7 2	2 2
TM PURCH RD. RCONST	MILES	0	0	0	0 8	5 8
<u>AVERAGE ANNUAL BENEFITS</u>						
RECREATION						
DEVELOPED	M \$	1997 4	2524 9	2772 2	2772 2	2772 2
DISPERSED	M \$	3178 1	3092 7	3093 5	3094 4	3095 6
RANGE	M \$	1662 8	1620 4	1620 4	1628 7	1620 4
TIMBER	M \$	967 3	980 3	999 3	1007 3	1006 3
WILDLIFE (WFUDS)	M \$	4339 2	4346 4	4348 9	4336 5	4348 9
WATER YIELD INCREASE	M \$	10 1	10 1	10 1	10 1	10 1
MINERALS	M \$	9292 7	9292 7	9292 7	9780 0	9780 0
<u>AVERAGE ANNUAL COSTS</u>						
TOTAL FOREST BUDGET	2/ M \$/YR	4583 1	5093 7	5093 7	5093 7	5093 7
FIXED COSTS						
PROTECTION	M \$/YR	576 0	576 0	576 0	576 0	576 0
GEN ADMIN	M \$/YR	407 0	407 0	407 0	407 0	407 0
VARIABLE COSTS						
INVESTMENTS	3/ M \$	852 4	963 3	963 3	963 3	963 3
TOT RDS	M \$	150 8	226 4	245 4	316 4	175 4
APP FUND RDS	M \$	32 0	70 9	70 9	70 9	70 9
PURCH CREDIT RDS	4/ M \$	118 5	155 5	174 5	245 5	104 5
OPERATIONAL	M \$	2252 1	2576 4	2576 4	2476 4	2476 4
GENERAL ADMIN.	M \$	424 6	454 6	454 6	454 6	454 6
NON-F S CDSTS	M \$	4583 1	592 0	613 0	778 0	616 0
RETURNS TO TRES	M \$	9631 5	9646 5	9653 6	10141 6	10140 9

- 1/ BOARD FOOT/CUBIC FOOT RATIOS SAWTIMBER 5 TO 1, FUELWOOD 4 TO 1
 2/ DOES NOT INCLUDE NON-F S PURCHASER CREDIT ROADS NOR HUMAN RESOURCE PROGRAMS
 3/ DOES NOT INCLUDE ROAD COSTS
 4/ INCLUDES F S ENGINEERING COSTS

Alternative 9 (Revised Mix)

The goal of alternative 9 is to maximize PNW and increase NPB by emphasizing a mixture of market and nonmarket opportunities in response to issues, concerns, demand, and the Forest's capabilities. The more favorable aspects of alternatives 4, 6, and 8 are incorporated in this alternative.

Specific objectives of alternative 9 include: 1) maintaining timber harvest at a level meeting projected demand, harvesting sawtimber from suitable lands, but allowing the removal of wood products (poles, firewood, Christmas trees) from suitable and unsuitable lands; 2) constructing range improvements to better livestock management, and to increase carrying capacity above present levels, but below currently permitted livestock numbers; 3) constructing developed recreation sites near local communities, and increasing maintenance of existing sites while providing for increased use that emphasizes motorized recreation opportunities, but also for non-motorized opportunities; 4) eliminating the soil and watershed improvement backlog by 2020; 5) rehabilitating orphan mines; 6) increasing road and trail maintenance to prevent sediment production from these sources, and closing unneeded roads causing accelerated erosion; 7) shifting the emphasis of the wildlife program from projects that benefit big game to those that benefit fisheries; and 8) assigning a nondevelopment type of prescription to the RARE II proposed wilderness.

TABLE II - 18
ALT 9

AVERAGE ANNUAL OUTPUT OR ACTIVITY		1	2	3	DECADE		10	15
					4	5		
RECREATION								
DEV REC USE								
RURAL	MRVD	269 2	326 9	405 0	483 1	483 1		
RD NAT	MRVD	179 5	218 0	270 1	322 1	322 1		
DISP. REC USE								
RURAL	MRVD	47 3	67 4	67 4	67 4	67 4		
RD NAT.	MRVD	415 1	592 0	592 0	592 0	592 0		
S P MOT	MRVD	133 3	190 2	190 2	190 2	190 2		
S P N MOT	MRVD	11 3	15 8	16 0	16 2	16 4		
WILDLIFE								
STRUCT HAB IMP	STRUC	567	573	573	573	573		
NSTRUCT HAB IMP	M AC	418	418	418	418	418		
WLD. & FISH USE	MWFUD	188 0	199 0	199 0	199 2	199 1		
RANGE								
GRAZING USE	M AUM	134 5	132 1	130. 9	131 9	131 2		
TIMBER AVAILABLE SALE QUANTITY								
SAW T SOFTWOOD	MMCF	54	1 7	1 7	1 7	1 7	1 7	1 88
SAW T HARDWOOD	MMCF	06	06	.06	06	06	06	06
ROUNDWOOD PRODUCTS	MCF	0	0	0	0	0	0	0
FUELWOOD	MCF	2410	2910	2910	2910	2910	3035	3135
REFORESTATION								
	M AC	165	361	.297	273	295	276	180
TSI								
	M AC	077	.384	364	364	355	.368	570
WATER								
MGT ST STANDARDS	M AC FT	611 0	611 0	611 0	611 0	611 0		
INCR OVER NAT	M AC FT	177	177	177	177	177		
PROTECTION								
FUEL BKS & TRT	ACRES	0	0	0	0	0		
MINERALS								
LEASES & PERMITS	CASES	200	200	180	180	160		
HC&D								
HUMAN RES PROG	ENRY'S	13	11	11	11	11		

LANDS							
PUR & ACQ		ACRES	110	110	0	0	0
SOILS							
S & WAT RES. IMP		AC	300	414	414	414	414
FACILITIES							
TRAIL CONST /RECONST		MILES	1 1	2 5	2 5	2 5	2 5
ROAD CONST /RECONST (ART & COLLECT)		MILES	0	0 1	0.1	0.1	0 1
RD BETTERMENT		MILES	13 0	13 0	13 0	13 0	13 0
LOCAL RD CONST		MILES	0 1	0 2	0 2	0 1	0 1
LOCAL RD RCONST		MILES	0 1	0 1	0 1	0 2	0 2
TM PURCH RD CONST		MILES	5 0	25 4	28 8	26 4	8 8
TM PURCH RD RCONST		MILES	0	0	0	1 5	16 7
<u>AVERAGE ANNUAL BENEFITS</u>							
<u>RECREATION</u>							
DEVELOPED		M \$	1871 1	2272 2	2815 2	3357 7	3357 7
DISPERSED		M \$	2531 8	3609 7	3610 5	3611 4	3612 6
RANGE		M \$	1597 5	1569 3	1555 1	1566 9	1558 7
TIMBER		M \$	985 7	2940 5	2997 5	3024 5	3020 5
WILDLIFE (WFUDS)		M \$	4562 3	4945. 3	4949 5	4950 2	4953 1
WATER YIELD INCREASE		M \$	10 3	10 3	10. 3	10 3	10 3
MINERALS		M \$	9292 7	9292 7	9292 7	9780 0	9780 0
<u>AVERAGE ANNUAL COSTS</u>							
TOTAL FOREST BUDGET	2/	M \$/YR	4716 0	5864 4	5864. 4	5864 4	5864 4
<u>FIXED COSTS</u>							
PROTECTION		M \$/YR	576 0	576 0	576 0	576 0	576 0
GEN ADMIN		M \$/YR	407 0	407 0	407 0	407 0	407. 0
<u>VARIABLE COSTS</u>							
INVESTMENTS	3/	M \$	852 4	1420 8	1420 8	1420 8	1420 8
TOT RDS		M \$	179 6	587 5	642 3	955 5	425 5
APP FUND RDS		M \$	58 1	84 7	84. 7	84 7	84 7
PURCH CREDIT RDS	4/	M \$	121. 5	502 8	557 6	870 8	340 8
OPERATIONAL		M \$	2352 4	2773 8	2773 8	2773 8	2773 8
GENERAL ADMIN		M \$	424. 6	454. 3	454 3	454 3	454 3
NON-F.S COSTS		M \$	4716 0	1633 0	1919. 0	2489 0	1923 0
RETURNS TO TRES.		M \$	9630 1	9760 3	9774 7	10278 6	10277 9

- 1/ BOARD FOOT/CUBIC FOOT RATIO SAWTIMBER 5 TO 1, FUELWOOD 4 TO 1
- 2/ DOES NOT INCLUDE NON-F S PURCHASER CREDIT ROADS NOR HUMAN RESOURCE PROGRAMS
- 3/ DOES NOT INCLUDE ROAD COSTS
- 4/ INCLUDES F.S ENGINEERING COSTS

Alternative 10 (High Productivity from RPA 85 Update)

The goal of Alternative 10 is to maximize PNV and to increase NPB by meeting, in the most cost efficient manner, the Fishlake National Forest's share of the High Production Alternative that appeared in the 1985 draft RPA program.

Specific objectives are: 1) to emphasize timber, range, recreation sites, and minerals management, and to manage nonmarket outputs such as wildlife and recreation use at economically efficient levels subordinate to the high market resource emphasis; 2) to relax visual quality and other amenity standards to produce lower cost market outputs; 3) to protect threatened and endangered species, but not improve habitat for recovery populations; and 4) to assign no nondevelopment type of prescriptions as a constraint on the model.

TABLE II - 19
ALT 10

AVERAGE ANNUAL OUTPUT OR ACTIVITY		1	2	3	DECADE 4	5	10	15
PECPEATION								
DEV REC USE								
RURAL	MRVD	266 0	320 5	401 8	483 1	483 1		
PD NAT	MRVD	177 3	213 6	267. 9	322 1	322 1		
DISP REC USE								
RURAL	MRVD	52 0	59 7	67 4	67 4	67 4		
RD NAT	MRVD	456 3	524. 2	592 0	592 0	592 0		
S P MOT	MRVD	146 5	168 4	190 2	190 2	190 2		
S P N MOT	MRVD	11 3	13 0	14 7	14 7	14 7		
WILDLIFE								
STRUCT HAB IMP	STRUC	255	574	574	574	574		
NSTRUCT HAB IMP	M AC	412	418	418	418	418		
WLD & FISH USE	MWFUD	182 1	193 9	200 4	200 3	200 6		
RANGE								
GRAZING USE	M AUM	137 6	140 6	140 6	140 9	143. 6		
TIMBER AVAILABLE SALE QUANTITY								
SAW T SOFTWOOD	MMBF 1/	9 6	9 6	10 4	12 0	13 5	13 5	13 5
SAW T HARDWOOD	MMCF	1 86	1 86	2. 02	2 34	2 64	2 64	2 64
ROUNDWOOD PRODUCTS	MCF	06	06	06	06	06	06	06
FUELWOOD	MCF	0	0	0	0	0	0	0
		2410	2410	2410	2410	2410	2410	2410
REFORESTATION								
	M AC	992	. 336	. 395	417	. 644	360	192
TSI								
	M AC	050	433	575	494	. 848	869	574
WATER								
MGT ST STANDARDS	M AC FT	611 0	611 0	611 0	611 0	611 0		
INCR. OVER NAT	M AC FT	195	. 195	. 216	249	281		
PROTECTION								
FUEL BKS & TRT	ACRES	260	260	260	260	260		
MINERALS								
LEASES & PERMITS	CASES	200	200	180	180	160		
HC&D								
HUMAN RES PRQG	ENRY'S	13	11	11	11	11		

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LANDS							
PUR & ACQ	ACRES	110	110	0	0	0	
SOILS							
S & WAT RES IMP	AC	546	694	694	694	694	
FACILITIES							
TRAIL CONST /RECONST	MILES	2 8	3 5	3 5	3 5	3 5	
ROAD CONST /RECONST (ART & COLLECT)	MILES	0	0	0	0	0	
RD BETTERMENT	MILES	13 0	13 0	13 0	13 0	13 0	
LOCAL RD CONST	MILES	0 1	0 3	0 2	0 2	0 2	
LOCAL RD RCONST.	MILES	0 1	0 1	0 2	0 2	0 2	
TM PURCH RD CONST	MILES	5 0	29 0	35 4	43 9	17 6	
TM PURCH RD RCONST	MILES	0	0	0	0	21 9	
AVERAGAE ANNUAL BENEFITS							

RECREATION							
DEVELOPED	M \$	1848 6	2227 2	2792 6	3357 7	3357 7	
DISPERSED	M \$	2777 6	3191 3	3604 1	3604 1	3604 1	
RANGE	M \$	1634 7	1670 3	1670 3	1673 9	1709 5	
TIMBER	M \$	3124 7	3223 7	3602 7	4193 7	4720 7	
WILDLIFE (WFUDS)	M \$	4430 5	4759 7	4960 7	4958 2	4961 1	
WATER YIELD	M \$	11 4	11 4	12 6	14 5	16 4	
MINERALS	M \$	9292 7	9292 7	9292 7	9780 0	9780 0	
AVERAGAE ANNUAL COSTS							

TOTAL FOREST BUDGET	2/ M \$/YR	6232 9	7405 4	7405 4	7405 4	7405 4	
FIXED COSTS							
PROTECTION	M \$/YR	576 0	576 0	576 0	576 0	576 0	
GEN ADMIN	M \$/YR	407 0	407 0	407 0	407 0	407 0	
VARIABLE COSTS							
INVESTMENTS	3/ M \$	1526 1	2002 6	2002 6	2002 6	2002 6	
TOT RDS	M \$	472 6	732 6	825 4	1505 4	591 4	
APP FUND RDS	M \$	58 4	85 2	85 2	85 2	85 2	
PURCH CREDIT RDS	4/ M \$	414 2	647 4	740 2	1420 2	506 2	
OPERATIONAL	M \$	2933 1	3589 9	3589 1	3589 9	3589 9	
GENERAL ADMIN	M \$	570 5	583 5	583 5	583 5	583 5	
NON-F S COSTS	M \$	6232 9	2556 0	2534 0	4203 0	3048 0	
RETURNS TO TRES	M \$	9764 6	9778 5	9810 8	10346 6	10379 3	

- 1/ BOARD FOOT/CUBIC FOOT RATIOS SAWTIMBER 5 TO 1, FUELWOOD 4 TO 1
 2/ DOES NOT INCLUDE NON-F S PURCHASER CREDIT ROADS NOR HUMAN RESOURCE PROGRAMS
 3/ DOES NOT INCLUDE ROAD COSTS
 4/ INCLUDES F S ENGINEERING COSTS

Alternative 11 (Spatially Modified Revised Mix)

This has been selected as the preferred alternative. The goal of this alternative is to increase NPB by emphasizing a mixture of market and non-market opportunities in response to issues, concerns, local demand, and the Forest's capabilities. The first decade budget for this alternative is the same as alternative 9 except some money was added to the timber program. Prescription assignments are the same as alternative 9 except where local line officers made changes to resolve local issues.

Specific objectives of alternative 11 include: 1) maintaining timber harvest at a level meeting projected demand, harvesting sawtimber from suitable lands, but allowing the removal of wood products (poles, firewood, Christmas trees) from suitable and unsuitable lands; 2) constructing range improvements to better livestock management, and to increase carrying capacity above present levels, but below currently permitted livestock numbers; 3) constructing developed recreation sites near local communities, and increasing maintenance of existing sites while providing for increased use that emphasizes motorized recreation opportunities along with non-motorized opportunities; 4) eliminating the soil and watershed improvement backlog by 2020; 5) rehabilitating orphan mines; 6) conducting road and trail maintenance to prevent sediment production from these sources, and closing unneeded roads causing accelerated erosion; 7) balancing the wildlife program to include projects that benefit big game, fish, and other wildlife species; and 8) not constraining the model with regard to nondevelopment type of prescriptions.

All alternatives were formulated and evaluated prior to selection of the preferred alternative. The interdisciplinary team evaluated the significant physical, biological, economic, and social effects of each alternative that was considered in detail.

TABLE II - 20
ALT 11

AVERAGE ANNUAL OUTPUT OR ACTIVITY		1	2	3	DECADE		10	15
					4	5		
RECREATION								
DEV REC USE								
RURAL	MRVD	269.2	326.9	384.0	435.9	483.1		
RD NAT.	MRVD	179.5	218.0	256.1	290.5	322.1		
DISP REC USE								
RURAL	MRVD	53.9	74.0	74.0	74.0	74.0		
RD NAT	MRVD	473.0	650.0	650.0	650.0	650.0		
S P MOT	MRVD	151.9	208.8	208.8	208.8	208.8		
S P N MOT	MRVD	11.7	16.1	16.1	16.1	16.1		
WILDLIFE								
STRUCT HAB. IMP	STRUC	567	573	573	573	573		
NSTRUCT HAB IMP	M AC	418	418	418	418	418	418	
WLD & FISH USE	MWFUD	187.9	198.9	199.0	199.1	199.0		
PANGE								
GRAZING USE	M AUM	133.5	131.4	130.6	131.5	131.0		
TIMBER AVAILABLE SALE QUANTITY								
SAW T. SOFTWOOD	MBCF	54	1.60	1.60	1.60	1.60	1.60	1.70
SAW T HARDWOOD	MBCF	06	.06	.06	.06	.06	.06	.06
ROUNDWOOD PRODUCTS	MCF	0	0	0	0	0	0	0
FUELWOOD	MCF	2410	3200	3200	3200	3200	3397	3595
REFORESTATION								
	M AC	174	439	284	204	249	203	193
TSI								
	M AC	.50	199	251	528	.167	532	356
WATER								
MGT ST. STANDARDS	M AC FT	611.0	611.0	611.0	611.0	611.0		
INCR OVER NAT.	M AC FT	177	177	.177	177	177		
PROTECTION								
FUEL BKS & TRT	ACRES	0	0	0	0	0		
MINERALS								
LEASES & PERMITS	CASES	200	200	180	180	160		
HC&D								
HUMAN RES PROG	ENRY'S	13	11	11	11	11		

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LANDS							
PUR & ACG	ACRES	110	110	0	0	0	
SOILS							
S & WAT RES IMP	AC	300	414	414	414	414	
FACILITIES							
TRAIL CONST /RECONST	MILES	1 1	2 5	2 5	2 5	2 5	
ROAD CONST /RECONST (ART & COLLECT)	MILES	0	0.1	0 1	0 1	0 1	
RD BETTERMENT	MILES	13 0	13 0	13 0	13 0	13 0	
LOCAL RD CONST	MILES	0 1	0 2	0 3	0 1	0 1	
LOCAL RD RCONST	MILES	0 1	0.1	0	0 2	0 2	
TM PURCH RD. CONST.	MILES	6 2	18 9	21 0	37 1	7.9	
TM PURCH RD RCONST	MILES	0	0	0	0	8.2	
<u>AVERAGE ANNUAL BENEFITS</u>							
<u>RECREATION</u>							
DEVELOPED	M \$	1871 1	2272 2	2669. 2	3024. 9	3357 7	
DISPERSED	M \$	2879 4	3539 9	3539 9	3535 9	3535 9	
RANGE	M \$	1586 0	1561 0	1551 5	1562 2	1556 3	
TIMBER	M \$	1001 7	2749 6	2782 6	2866 6	2866 6	
WILDLIFE (WFUDS)	M \$	4594 1	4980 7	4984 8	4986 3	4985. 6	
WATER YIELD INCREASE	M \$	10 3	10 3	10 3	10 3	10. 3	
MINERALS	M \$	9292 7	9292. 7	9292 7	9780 0	9780. 0	
<u>AVERAGE ANNUAL COSTS</u>							
TOTAL FOREST BUDGET	2/ M \$/YR	4766 6	5863 7	5863 7	5863 7	5863. 7	
<u>FIXED COSTS</u>							
PROTECTION	M \$/YR	576 0	576 0	576. 0	576 0	576 0	
GEN ADMIN	M \$/YR	407 0	407 0	407 0	407 0	407 0	
<u>VARIABLE COSTS</u>							
INVESTMENTS	3/ M \$	856 5	1412. 0	1412 0	1412 0	1412 0	
TOT RDS.	M \$	195 6	514. 5	553 5	1316 5	386 5	
APP FUND RDS	M \$	58. 1	84. 7	84 7	84 7	84 7	
PURCH CREDIT RDS	4/ M \$	137 5	429. 8	468 8	1231 8	301 8	
OPERATIONAL	M \$	2352 4	2771. 9	2771 9	2771 9	2771 9	
GENERAL ADMIN	M \$	424. 6	454. 3	454 3	454 3	454 3	
NON-F S COSTS	M \$	4766 6	1671. 0	1730. 0	2627 0	1792 0	
RETURNS TO TRES.	M \$	9629 1	9752. 5	9763 1	10261 5	10270 6	

- 1/ BOARD FOOT/CUBIC FOOT RATIOS SAWTIMBER 5 TO 1, FUELWOOD 4 TO 1
- 2/ DOES NOT INCLUDE NON-F S PURCHASER CREDIT ROADS NOR HUMAN RESOURCE PROGRAMS
- 3/ DOES NOT INCLUDE ROAD COSTS
- 4/ INCLUDES F S ENGINEERING COSTS.

G. COMPARISON OF ALTERNATIVES

This section compares ten of the alternatives with the Current Program ("No Action") Alternative. Table II-21 displays acres assigned to each prescription by alternative. The numbers used for comparison and shown in Table II-22A & B represent the differences in outputs, activities, benefits and costs from the current program.

The purpose of Forest Planning is to identify and select for implementation the alternative that most nearly maximizes net public benefits. Net public benefits are defined as the "overall long term value to the Nation of all outputs and positive effects (benefits) less all associated inputs and negative effects (costs) whether they can be quantitatively valued or not, consistent with the principles of multiple use and sustained yield."

There is no mathematical formula available to define the desired alternative. Indeed, there are differences of opinion about whether particular effects of alternatives are positive or negative. Therefore it is necessary to separately define all the major effects of each alternative as the basis for review, judgment, and eventual selection.

This section compares outputs, activities, costs, benefits, responses to issues, concerns, and opportunities, and selected environmental consequences for each alternative. Chapter IV, Environmental Consequences, describes in greater detail the expected effects of implementing each alternative. Consequences are briefly summarized in this section.

The following tables present in tabular and narrative form the comparison of the significant differences between the alternatives:

Table II-21 is a display of management prescription assignments by alternative.

Table II-22A & B display changes in outputs by alternative or benchmark, and decade, from the first decade of alternative 8, the No Action alternative.

Table II-23 describes how each alternative addresses each planning problem.

Table II-24 displays timber land classification by alternative.

Table II-25 displays benefit prices of outputs included in the present net value (PNV) analysis.

Table II-26 displays the effects priced outputs have on PNV.

Table II-27 displays the effects nonpriced outputs have on PNV.

Table II-28 discusses the qualitative effects of the alternatives on PNV.

H. ECONOMIC EFFICIENCY

Present net value (PNV) is the measure of economic efficiency used in Forest planning. It is defined as the difference between the discounted value of all expenditures for management and investment (the process of discounting expresses all values at a common date). PNV is one important component or effect that is included in net public benefits. Any differences in PNV among alternatives may be related to the production of public benefits to which prices have not been assigned. Such benefits include certain outputs, such as endangered animals; physical conditions, such as the maintenance of areas with particularly pleasing visual qualities; and desirable distributive effects, as when especially high levels of commodities are produced to help support dependent communities. Also included are reductions in risk, such as those due to intensifications of insect and disease surveys, and improvements in quality, such as those due to increasing recreation site management standards. Similarly, differences in PNV may be related to the production of public benefits to which prices have been assigned. Further, differences in PNV may be directly related to the budget restrictions associated with the alternatives.

An important purpose of this section is to define the differences in the production of public benefits among alternatives that lead to the differences in PNV.

Tables II-26,27, and 28 summarize the economic information used in defining PNV for each alternative. This information includes total discounted benefits and the contributions to those benefits of individual priced outputs. It also includes total discounted costs of managing the Forest and the rough assignment, to facilitate the later discussion, of those costs to major accounting or budgeting categories of expenditures. Some combination of cost categories is necessary to support production of any particular priced output on a Forest-wide basis under a system of multiple use of integrated Forest management. Therefore, it would not be correct to assume that there is a one-to-one relationship between the dollar benefits listed under contribution of timber, or other priced output, to total discounted benefits and the costs listed under contribution of timber, or other cost category, to total discounted costs.

Each alternative represents the most cost-efficient combination of management prescriptions to accomplish the objectives established for a particular alternative. The most cost efficient set of management prescriptions for each alternative was attained by maximizing the Present Net Value (PNV). FORPLAN, a linear programming model, produced a tentative assignment and scheduling of resource outputs over time. Since all outputs from the Forest could not be quantified with FORPLAN, the tentative assignment was analyzed by the ID team and a final determination made.

Resources valued or priced in the model and included in the PNV analysis include timber, recreation, wildlife, range, increased water yield, and minerals. Land assignments vary between alternatives because each alternative represents a specific objective and these objectives influence the management of land.

Non-priced outputs are displayed in Table II-27 in terms of physical measures such as numbers, acres, and pounds. These values are not included in the PNV analysis but are displayed to show total benefits from the Forest.

The social effects of each alternative are found in Chapter IV.

TABLE II - 22A
 * CHANGES IN RESOURCE OUTPUTS, ACTIVITIES, COSTS, AND BENEFITS FROM CURRENT DIRECTION

OUTPUT/ACTIVITY	CURRENT UNITS DIRECTION	ALTERNATIVE											
		1	2	3	4	5	6	7	8 NO ACTION	9	10	11 PREFERRED	
RECREATION													
DEV REC USE													
RURAL	MRVD												
DECADE 1		287 4	-58 8	76.6	-75 9	-58 8	25 3	-21 4	-150 9	0	-18 2	-21 4	-18 2
2			-73.7	99 0	-103 1	-5 1	126 4	33 1	-112.1	75.9	39 5	33 1	39 5
3			-73.7	121 4	-130 4	-48 5	199 9	114 1	-112 1	111 5	117 6	114 4	96 6
4			-73.7	143 8	-130 4	139 4	273 4	195.7	-112 1	111 5	195 7	195 7	148 5
5			-73.7	166 2	-130 4	230 3	346 9	195 7	-112 1	111 5	195 7	195 7	195 7
RD NAT	MRVD												
DECADE 1		191 6	-39 2	51 1	-50 6	-39 2	16 8	-14 3	-100 6	0	-12 1	-14 3	-12 1
2			-49 1	66 0	-68 8	-3 4	84 2	22.0	-74 8	50 6	26 4	22 0	26 4
3			-49 1	81 0	-86 9	32.3	133 2	76 3	-74 8	74 3	78 5	76 3	64 5
4			-49.1	95 9	-86 9	93 0	182 2	130 5	-74 8	74 3	130 5	130.5	98 9
5			-49.1	110.8	-86.9	-86.9	231 2	130 5	-74 8	74.3	130 5	130 5	130 5
DISP REC USE													
RURAL	MRVD												
DECADE 1		59 4	-7.8	-13 2	-7 8	-20 3	-2 2	-7 4	-57 2	0	-12.1	-7 4	-5 5
2			-16 0	-12.3	-18 3	2 5	12.9	0 3	-57 2	-1 7	8 0	0 3	14 6
3			-16 0	-11.4	-28 7	25.2	28 1	8 0	-57 2	-1.7	8 0	8 0	14 6
4			-16 0	-10.5	-28 7	48.0	43 2	8 0	-57 2	-1.7	8 0	8 0	14 6
5			-16.0	-9.6	-28 7	70 7	43 2	8 0	-57 2	-1 7	8 0	8 0	14 6
RD NAT	MRVD												
DECADE 1		521 3	-68 4	-115 9	-68 4	-178.3	-19.3	-65 0	-502 0	0	-106 2	-65 0	-48 3
2			-139 7	-107 8	-160 0	21 5	113 7	2 9	-502 0	-14 2	70 7	2 9	128 7
3			-139 7	-99 8	-251 6	221 4	246 7	70 7	-502 0	-14 2	70 7	70 7	128 7
4			-139 7	-91.7	-251 6	421.2	379 7	70 7	-502.0	-14 2	70 7	70 7	128 7
5			-139.7	-87.3	-251.6	621 0	379 7	70 7	-502 0	-14 2	70 7	70 7	128 7
S P MDT	MRVD												
DECADE 1		167 4	-22 0	-37 2	-22 0	-57.2	-6 2	-20 9	-161 2	0	-34 1	-20 9	-15 5
2			-44 8	-34.6	-51.4	7.0	36 5	1 0	-161 2	-4 5	22 8	1 0	41 4
3			-44.8	-32 0	-80 8	71 2	79.3	22 8	-161 2	-4 5	22 8	22 8	41 4
4			-44 8	-29 4	-80 8	135 3	222 0	22 8	-161 2	-4 5	22 8	22 8	41 4
5			-44 8	-26 8	-80 8	199 5	122 0	22 8	-161 2	-4 5	22 8	22 8	41 4
S P N MDT	MRVD												
DECADE 1		13 3	-1 7	3 2	0 9	7 1	-0 5	-2 0	3 7	0	-2 0	-2 0	-1 6
2			-3 3	4 4	-0.9	13 8	2 9	-0 3	6 2	-0 2	2 5	-0 3	2 8
3			-3 2	5 7	-2 6	20 8	6 3	1 4	9 1	-0 1	2 7	1 4	2 8
4			-3 1	7 1	-2 0	28 2	9 7	1 4	12 3	0 0	2 9	1 4	2 8
5			-3 0	8 8	-1 0	35 8	9 8	1 4	16 1	0 1	3 1	1 4	2 8

● CHANGES MEASURED AS A DIFFERENCE FROM FIRST DECADE OF ALTERNATIVE 8

TABLE II - 22A CONTINUED
 CHANGES IN RESOURCE OUTPUTS, ACTIVITIES, COSTS, AND BENEFITS FROM CURRENT DIRECTION

WILDLIFE															
STRUCT	HAB	IMP	STRUCT												
DECADE	1			10 0	19 0	19 0	-10 0	507 0	397 0	242.0	-10 0	0	557 0	245 0	557 0
	2				19 0	62 0	-10 0	543 0	397.0	564 0	-10 0	-3 0	563 0	564 0	563 0
	3				19 0	62 0	-10 0	543 0	397.0	564 0	-10 0	-3 0	563 0	564 0	563 0
	4				19.0	62 0	-10 0	543 0	397 0	564 0	-10 0	-3 0	563 0	564 0	563 0
	5				19 0	62 0	-10 0	543 0	397 0	564 0	-10 0	-3 0	563 0	564 0	563 0
NSTRUCT HAB IMP M AC															
DECADE	1			0	0	0	0	0 414	0 418	0 418	0 412	0	0	0 418	0 412
	2				0	0 45	0	0 414	0 418	0 418	0 418	0	0	0 418	0 418
	3				0	0 45	0	0 414	0 418	0 418	0 418	0	0	0 418	0 418
	4				0	0 45	0	0 414	0 418	0 418	0 418	0	0	0 418	0 418
	5				0	0 45	0	0 414	0 418	0 418	0 418	0	0	0 418	0 418
WLD & FISH USE MWFUD															
DECADE	1			176.6	-0 3	0 6	0	11 6	13 9	5 2	-0 4	0	11 4	5 5	11 3
	2				-0 3	1 3	-0 3	21.2	28 2	16 1	-4.5	0 7	22 4	17 3	22 3
	3				-1 4	1 6	-0 6	21 6	31.5	22 3	-1 9	0 8	22 4	23 8	22 4
	4				-1 4	1 9	-0 6	21 7	31.7	22 5	-2 0	0 4	22 6	23 7	22 5
	5				-1 4	1.7	-0 6	18 6	31 9	22 4	-2.0	0 8	22 5	24 0	22 4
RANGE															
GRAZING USE M AUM															
DECADE	1			136 6	-5 8	1.0	-1 8	-1 8	18 5	-0 5	-5.7	0	-2 1	1 0	-3 1
	2				-11 7	-0 2	-4 7	-4 5	21 0	-3 9	-11 9	-0 2	-4 5	4 0	-5 2
	3				-14 8	-1.0	-6 0	-6 6	23 0	-5 6	-16 0	-0 2	-5 7	4 0	-6 0
	4				-14 7	0.1	-5.8	-5 6	25 0	-4 8	-15 8	0 5	-4 7	4 3	-5 1
	5				-15 8	-0 8	-6.3	-6.2	26 0	-5 9	-15 9	-0 2	-5.4	7 0	-5 6
TIMBER SALES OFFERED MMBF															
DECADE	1			3.0	0	3 0	0	0	4 4	0	-2.5	0	0	6 6	0
	2				0	4 9	0	3 5	6 6	6 6	-2 5	0	5 8	6 6	5 3
	3				0	4 9	0	3 5	6 6	6 6	-2 5	0	5 8	7 4	5 3
	4				0	4.9	0	3 5	6 6	6.6	-2 5	0	5 8	9 0	5 3
	5				0	4.9	0	3 5	6 6	6.6	-2 5	0	5 8	10 5	5 3
	10				0	4.9	0	3 5	6 6	6 6	-2 5	0	5 8	10 5	5 3
	15				0	4 9	0	3 5	7.6	7 8	-2 5	0	6 7	10 5	5 8
SAW T SOFTWOOD MMBF															
DECADE	1			0 54	0	0.26	0	-0 24	0 44	0	-0.44	0	0	1 32	0
	2				0	0 98	0	0.46	1 28	1 32	-0 44	0	1.16	1 32	1 06
	3				0	0 98	0	0 46	1 28	1 32	-0 44	0	1 16	1 48	1 06
	4				0	0.98	0	0.46	1 28	1.32	-0.44	0	1 16	1 80	1 06
	5				0	0.98	0	0.46	1 28	1.32	-0.44	0	1 16	2 10	1 06
	10				0	0 98	0	0.46	1.28	1.32	-0.44	0	1 16	2 10	1 06
	15				0	0 98	0	0 46	1.48	1.56	-0 44	0	1 34	2 10	1 16

TABLE II - 22A CONTINUED
 CHANGES IN RESOURCE OUTPUTS, ACTIVITIES, COSTS, AND BENEFITS FROM CURRENT DIRECTION

SAW T. HARDWOOD		MCF												
DECADE	1		0 06	0	0.34	0	0.24	0.44	0	0.06	0	0	0	0
	2			0	0	0	0.24	0.04	0	0.06	0	0	0	0
	3			0	0	0	0.24	0.04	0	0.06	0	0	0	0
	4			0	0	0	0.24	0.04	0	0.06	0	0	0	0
	5			0	0	0	0.24	0.04	0	0.06	0	0	0	0
	10			0	0	0	0.24	0.04	0	0.06	0	0	0	0
	15			0	0	0	0.24	0.04	0	0.06	0	0	0	0
ROUNDWOOD PRODUCTS		MCF												
DECADE	1		0	0	0	0	0	0	0	0	0	0	0	0
	2			0	0	0	0	0	0	0	0	0	0	0
	3			0	0	0	0	0	0	0	0	0	0	0
	4			0	0	0	0	0	0	0	0	0	0	0
	5			0	0	0	0	0	0	0	0	0	0	0
	10			0	0	0	0	0	0	0	0	0	0	0
	15			0	0	0	0	0	0	0	0	0	0	0
FUELWOOD		MCF												
DECADE	1	1970	0	1380	30	2070	90	1060	440	0	440	440	440	440
	2		0	1880	30	2070	940	940	440	0	440	440	1230	1230
	3		0	1880	30	2070	940	940	440	0	440	440	1230	1230
	4		0	1880	30	2070	940	940	440	0	440	440	1230	1230
	5		0	1880	30	2070	940	940	440	0	440	440	1230	1230
	10		0	2005	30	2070	1065	1065	440	0	440	440	1927	1927
	15		0	2130	30	2070	1165	1165	440	0	440	440	1625	1625
REFORESTATION		M AC												
DECADE	1		0 182	0	0 058	0 002	-0 109	0 073	-0 001	-0 160	0	-0 0 7	0.810	-0 008
	2			0	0.240	0 002	0 098	0 157	0 280	-0 160	0	0 179	0 154	0 257
	3			0	0.108	0 002	-0 030	0 121	0 091	-0 048	0	0 115	0 213	0 102
	4			0	0 094	0.002	-0 085	0 111	0 091	-0 065	0	0 091	0 235	0 022
	5			0	0.268	0 002	0 025	0 065	0 160	-0 056	0	0.113	0 462	0 067
	10			0	243 818	0.002	-0 019	0 132	0 092	-0 044	0	0 094	359 818	0 021
	15			0	80 818	0.002	-0 086	0 029	0 020	-0.083	0	-0 002	191 818	0 011
TSI		M AC												
DECADE	1		0 005	0	0 119	-	0 045	0 055	0 053	0 017	0	0.072	0 045	0 495
	2			0	0 173	-	0 067	0 574	0 331	0 017	0	0 379	0 428	0 194
	3			0	0 227	-	0 280	0 528	0 548	0 129	0	0 359	0 570	0 246
	4			0	0 225	-	0 047	0 508	0 354	0 112	0	0 359	0 489	0 523
	5			0	0 498	-	0 100	0 545	0 284	0 121	0	0 350	0 843	0 162
	10			0	0 510	-0 005	0 047	-0 005	0 360	0 133	0	0 363	0 864	0 527
	15			0	0 238	-0 005	0 284	0 629	0 602	0 094	0	0 565	0 569	0 351

TABLE II - 22A CONTINUED
 CHANGES IN RESOURCE OUTPUTS, ACTIVITIES, COSTS, AND BENEFITS FROM CURRENT DIRECTION

WATER														
MGT	ST	STANDARDS	M	AC	FT									
	DECADE	1	611.0	0	0	0	0	0	0	0	0	0	0	0
		2		0	0	0	0	0	0	0	0	0	0	0
		3		0	0	0	0	0	0	0	0	0	0	0
		4		0	0	0	0	0	0	0	0	0	0	0
		5		0	0	0	0	0	0	0	0	0	0	0
	INCR	OVER	NAT	M	AC	FT								
	DECADE	1	0 173	-0 120	-0 014	-0 120	-0 141	-0 083	0 021	-0 161	0	0 004	0 022	0 004
		2		-0 004	-0 014	0 074	-0 070	-0 083	0 021	-0 102	0	0 004	0 022	0 004
		3		-0 004	-0 014	-0 074	-0 070	-0 083	0 021	-0 102	0	0 004	0 043	0 004
		4		-0 004	-0 014	-0 074	-0 070	-0 083	0 021	-0 102	0	0 004	0 076	0 004
		5		-0 004	-0 014	-0 074	-0 070	-0 083	0 021	-0 102	0	0 004	0 108	0 004
PROTECTION														
	FUEL	BKS.	&	TRT.	ACRES									
	DECADE	1	100	0	0	-100	0	0	-100	0	-100	160	-100	
		2		0	0	-100	-100	-100	-100	-100	-100	160	-100	
		3		0	0	-100	-100	-100	-100	-100	-100	160	-100	
		4		0	0	-100	-100	-100	-100	-100	-100	160	-100	
		5		0	0	-100	-100	-100	-100	-100	-100	160	-100	
MINERALS														
	LEASES	&	PERMITS	CASES										
	DECADE	1	200	0	0	0	0	0	0	0	0	0	0	
		2		0	0	0	0	0	0	0	0	0	0	
		3		-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	
		4		-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	
		5		-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	
HC&D														
	HUMAN	RES	PROG	ENRY'S										
	DECADE	1	13	0	0	0	0	0	0	0	0	0	0	
		2		-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	
		3		-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	
		4		-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	
		5		-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	
LANDS														
	PUR	&	ACQ	ACRES										
	DECADE	1	0	0	110	0	110	110	110	0	0	110	110	110
		2		0	110	0	110	110	110	0	110	110	110	110
		3		0	0	0	0	0	0	0	110	0	0	0
		4		0	0	0	0	0	0	0	0	0	0	0
		5		0	0	0	0	0	0	0	0	0	0	0

TABLE II - 22A CONTINUED
 CHANGES IN RESOURCE OUTPUTS, ACTIVITIES, COSTS, AND BENEFITS FROM CURRENT DIRECTION

SOILS														
S & WAT RES IMP AC														
DECADE 1	260	-80	-260	-260	283	0	203	-260	0	284	284	40		
2		-80	-170	-260	470	143	337	-260	263	434	434	154		
3		-80	-170	-260	470	143	337	-260	263	434	434	154		
4		-80	-170	-260	470	143	337	-260	263	434	434	154		
5		-80	-170	-260	470	143	337	-260	263	434	434	154		
FACILITIES														
TRAIL CONST /RECON MILES														
DECADE 1	3 8	-3 3	-3 3	-3 5	-3 8	-1 3	-1 5	-3 7	0	-2.7	-1 0	-2 7		
2		-3 3	-3 3	-3 5	-0 3	-1 5	-1 3	-3 7	-3 7	-1 3	-0 3	-1 3		
3		-3 3	-3 3	-3 5	-0 3	-1 5	-1 3	-3 7	-3 7	-1 3	-0 3	-1 3		
4		-3 3	-3 3	-3 5	-0 3	-1 5	-1 3	-3 7	-3 7	-1 3	-0 3	-1 3		
5		-3 3	-3 3	-3 5	-0.3	-1.5	-1 3	-3 7	-3 7	-1 3	-0 3	-1 3		
ROAD CONST /RECON MILES (ART & COLLECT)														
DECADE 1	0	0	0	0	0	0	0	0	0	0	0	0		
2		0	0	0	0	0.1	0.1	0	0	0.1	0	0.1		
3		0	0	0	0	0.1	0.1	0	0	0.1	0	0.1		
4		0	0	0	0	0.1	0.1	0	0	0.1	0	0.1		
5		0	0	0	0	0.1	0.1	0	0	0.1	0	0.1		
RD BETTERMENT MILES														
DECADE 1	13 0	-13 0	0	-13 0	0	0	0	13 0	0	0	0	0		
2		-13 0	0	-13 0	0	0	0	13.0	0	0	0	0		
3		-13.0	0	-13.0	0	0	0	13.0	0	0	0	0		
4		-13 0	0	-13 0	0	0	0	13 0	0	0	0	0		
5		-13 0	0	-13 0	0	0	0	13.0	0	0	0	0		
LOCAL RD CONST MILES														
DECADE 1	0	0	0	0	0	0.2	0.1	0	0	0.1	0.1	0.1		
2		0	0	0	0.2	0.1	0.1	0	0.1	0.2	0.3	0.2		
3		0	0	0	0.4	0.2	0.1	0	0.1	0.2	0.2	0.3		
4		0	0	0	0.2	0.1	0.1	0	0	0.1	0.2	0.1		
5		0	0	0	0.1	0.1	0.1	0	0	0.1	0.2	0.1		
LOCAL RD RECONST MILES														
DECADE 1	0 1	0	0	0	0	0	0	0	0	0	0	0		
2		0	0	0	0.2	0.2	0.1	0	0.1	0	0	0		
3		0	0	0	0	0	0.1	0	0.1	0	0.1	-0.1		
4		0	0	0	0.2	0.2	0.1	0	0.2	0.2	0.1	0.1		
5		0	0	0	0.3	0.3	0.1	0	0.2	0.2	0.1	0.1		
TM PURCH RD CONST MILES														
DECADE 1	15 1	-10 4	4 1	-10.9	-11 8	1 8	3 2	-13 5	0	1 0	1 9	-8 9		
2		8 3	3 9	-6 8	-3 4	16 3	12 3	-5 5	9 0	10 3	13 9	3 9		
3		13 4	9 3	-3 1	1 3	16 6	15 2	-4 9	13 1	13 7	20 3	5 9		
4		1 8	-1 7	-6 8	-8.4	24 1	9 6	-8 3	7 6	11.3	28 8	22 0		
5		-7 2	-2.4	-7 4	-7 2	-11 1	-4 5	-11 8	-6 9	-6 3	2 5	-7 2		

TABLE II - 22A CONTINUED
 CHANGES IN RESOURCE OUTPUTS, ACTIVITIES, COSTS, AND BENEFITS FROM CURRENT DIRECTION

TM PURCH	RD	RECON	MILES												
DECADE	1			0	0	0	0	0	0	0	0	0	0	0	0
	2			0	0	0	0	0	0	0	0	0	0	0	0
	3			0	0	0	0	0	0	0	0	0	0	0	0
	4			0 3	10 0	0	0	1 0	1.5	0	0 8	1 5	0	0	0
	5			15 8	10 1	1.0	1 2	27.3	14.3	5 2	15 7	16 7	21 9	8 2	
BENEFITS M \$															

RECREATION DEVELOPED M \$															
DECADE	1	1997 4	-408 6	532 5	-527 5	-408 6	175 6	-148 8	-1048 7	0	-126 3	-148 8	-126 3		
	2		-512 0	688 1	-716 8	-35 4	878 2	229 8	-779 3	527 5	274 8	229 8	274 8		
	3		-512 0	844 0	-906 1	337 0	1389 1	795 2	-779 3	774 8	817 8	795 2	671 8		
	4		-512 0	999 6	-906 1	969 1	1899 9	1360 3	-779 3	774 8	1360 3	1360 3	1027 5		
	5		-512.0	1155 1	-906 1	1600 9	2410 7	1360 3	-779 3	774 8	1360 3	1360 3	1360 3		
DISPERSED M \$															
DECADE	1	3178 1	-416 5	-638 7	-387 9	-957 5	-117 5	-400 5	-2877 0	0	-646 3	-400 5	-298 7		
	2		-849 4	-578 9	-940 5	279 1	692 6	13 2	-2849 2	-85 4	431 6	13 2	361 8		
	3		-848 6	-517 8	-1495 3	1518 2	1503 7	426 0	-2817 0	-84 6	432 4	426 0	361 8		
	4		-847 7	-454 8	-1485 7	2761.1	2314 0	426.0	-2781 4	-83 7	433 3	426 0	357 8		
	5		-846 5	-389 4	-1478 0	4007 1	2316 5	426 0	-2739 1	-82 5	434 5	426 0	357 8		
RANGE M \$															
DECADE	1	1662 8	-108 9	-28 1	-61 4	-61 4	179 8	-45 9	-111 3	0	-65 3	-28 1	-76 8		
	2		-179 0	-42 4	-95.8	-93 5	209 5	-86 3	-181 4	-42 4	-93 5	7 5	-101 8		
	3		-215 9	-51 9	-111 3	-118 4	233 2	-106 5	-230 1	-42 4	-107 7	7.5	-111 3		
	4		-214 6	-38 8	-108.9	-106 5	257 0	-97.0	-227 7	-34 1	-95 9	11 1	-100 6		
	5		-227 7	-49 5	-114 8	-113 6	268 9	-110 1	-222 9	-42 4	-104 1	46 7	-100 5		
TIMBER M \$															
DECADE	1	967 3	26 0	498 8	13.6	-270 0	740 9	44 2	-694 6	0	18 4	2157 4	34 4		
	2		14 0	1717 7	-14 4	817 0	2230 9	2236 2	-699 6	13 0	1973 2	2256 4	1782 3		
	3		33 0	1712 4	5 6	887 0	2230 9	2310 2	-698 6	32 0	2030 2	2635 4	1815 3		
	4		41 0	1803 4	34 6	907 0	2280 9	2347 2	-694 6	40 0	2057 2	3226 4	1899 3		
	5		41 0	1802 4	34 6	907 0	2267 9	2333.2	-694 6	39 0	2053 2	3753 4	1899 3		
WILDLIFE (WFUDS) M \$															
DECADE	1	4339 2	-36 0	-51.9	-33 7	171 4	395 1	87 4	-284 3	0	223 1	91 3	254 9		
	2		-73 2	-26 7	-93 3	561 8	719 9	408 2	-291 5	7 2	606 1	420 5	641 5		
	3		-88 2	-6.7	-152 7	686 1	878 9	607 8	-294 0	9 7	610 3	621 5	645 6		
	4		-88 2	-2 3	-151 9	827 8	963 1	611 0	-290.3	-2 7	611 0	619 0	645 4		
	5		-86 4	0 6	-149 0	943.8	963 1	607 8	-186 7	9 7	613 9	621.9	646 4		
WATER YIELD INCREASE M \$															
DECADE	1	3 7	-2 6	-0 3	-2.6	-3 0	0 3	0 4	-3 5	0	0 1	0 4	0 1		
	2		-0 1	-0 3	-1 6	-1 5	0 3	0 4	-2 2	0	0 1	0 4	0 1		
	3		-0.1	-0 3	-1 6	-1 5	0 3	0 4	-2 2	0	0 1	0 9	0 1		
	4		-0 1	-0 3	-1 6	-1.5	0 3	0 4	-2 2	0	0 1	1 6	0 1		
	5		-0.1	-0 3	-1 6	-1 5	0 3	0 4	-2 2	0	0 1	2 3	0 1		

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TABLE II - 22A CONTINUED
 CHANGES IN RESOURCE OUTPUTS, ACTIVITIES, COSTS, AND BENEFITS FROM CURRENT DIRECTION

MINERALS													
	M \$												
DECADE 1	9292.7	0	0	0	0	0	0	0	0	0	0	0	0
2		0	0	0	0	0	0	0	0	0	0	0	0
3		0	0	0	0	0	0	0	0	0	0	0	0
4		487.3	487.3	487.3	487.3	487.3	487.3	487.3	487.3	487.3	487.3	487.3	487.3
5		487.3	487.3	487.3	487.3	487.3	487.3	487.3	487.3	487.3	487.3	487.3	487.3
COST M \$													

TOTAL FOREST BUDGET M \$/YR													
DECADE 1	4583	1-1383.8	134.4	-1716.8	133.7	812.2	135.9	-2166.4	0	132.9	1649.8	183.5	
2		-1383.8	848.2	-1717.1	1643.4	2450.9	1701.8	-2164.1	510.6	1281.3	2822.3	1280.6	
3		-1383.8	848.2	-1717.1	1643.4	2450.9	1701.8	-2164.1	510.6	1281.3	2822.3	1280.6	
4		-1383.8	848.2	-1717.1	1643.4	2450.9	1701.8	-2164.1	510.6	1281.3	2822.3	1280.6	
5		-1383.8	848.2	-1717.1	1643.4	2450.9	1701.8	-2164.1	510.6	1281.3	2822.3	1280.6	
FIXED COSTS													
PROTECTION M \$/YR													
DECADE 1	576.0	0	0	0	0	0	0	0	0	0	0	0	0
2		0	0	0	0	0	0	0	0	0	0	0	0
3		0	0	0	0	0	0	0	0	0	0	0	0
4		0	0	0	0	0	0	0	0	0	0	0	0
5		0	0	0	0	0	0	0	0	0	0	0	0
GEN ADMIN. M \$/YR													
DECADE 1	407.0	0	0	0	0	0	0	0	0	0	0	0	0
2		0	0	0	0	0	0	0	0	0	0	0	0
3		0	0	0	0	0	0	0	0	0	0	0	0
4		0	0	0	0	0	0	0	0	0	0	0	0
5		0	0	0	0	0	0	0	0	0	0	0	0
VARIABLE COSTS													
INVESTMENTS M \$													
DECADE 1	852.4	-510.1	-47.7	-456.3	224.0	410.5	133.7	-629.5	0	0	673.7	4.1	
2		-510.1	205.7	-455.7	633.7	972.1	802.2	-622.1	110.9	568.4	1150.2	559.6	
3		-510.1	205.7	-455.7	633.7	972.1	802.2	-622.1	110.9	568.4	1150.2	559.6	
4		-510.1	205.7	-455.7	633.7	972.1	802.2	-622.1	110.9	568.4	1150.2	559.6	
5		-510.1	205.7	-455.7	633.7	972.1	802.2	-622.1	110.9	568.4	1150.2	559.6	
TOTAL RDS M \$													
DECADE 1	150.8	8.0	145.9	-14.0	-24.7	144.2	1.7	-90.8	0	28.8	321.8	44.8	
2		46.0	471.6	-9.0	238.8	564.9	483.4	-76.6	75.6	436.7	581.8	363.7	
3		69.0	786.6	20.0	275.8	571.9	520.4	-75.6	94.6	491.5	674.6	402.7	
4		81.0	518.6	31.0	224.8	1238.9	770.4	-70.6	165.6	804.7	1354.6	1165.7	
5		-4.0	375.6	-15.0	155.8	301.6	304.4	-86.6	24.6	274.7	440.6	235.7	
APP FUND RDS. M \$													
DECADE 1	32.0	10.3	36.0	-5.7	-0.4	46.6	25.0	-6.6	0	26.1	26.4	19.0	
2		10.3	52.6	231.0	82.9	79.5	53.0	0.6	37.0	52.7	53.2	311.3	
3		10.3	52.6	-5.7	82.9	79.5	53.0	0.6	56.0	52.7	53.2	350.3	
4		10.3	52.6	-5.7	82.9	79.5	53.0	0.6	127.0	52.7	53.2	1113.3	
5		10.3	52.6	-5.7	82.9	79.5	53.0	0.6	-14.0	52.7	53.2	183.3	

TABLE II - 22B
 CHANGES IN RESOURCE OUTPUTS, ACTIVITIES, COSTS, AND BENEFITS FROM CURRENT DIRECTION

OUTPUT/ACTIVITY		BENCHMARK							
		CUR : DIR :	MIN LVL	PNB : ALL VALUES	PNV MARKET VALUES	TIMBER FOR I B M	RANGE	SEQUENTIAL LOWER AND UPPER BOUNDS	TIMBER DEPARTURE ANALYSIS
RECREATION									
DEV REC USE									
RURAL		MRVD							
DECADE	1	287 4	-287 4	57 8	12 9	47 4	12 9	44 0	-13 3
	2		-287 4	131 0	76 6	118 4	76 6	118 4	23 2
	3		-287 4	196 3	133 4	181 8	133 4	196 3	88 9
	4		-287 4	273 4	200 5	256 6	200 5	273 4	139 8
	5		-287 4	346. 9	264. 4	327 9	264 4	346 9	186 0
RD NAT		MRVD							
DECADE	1	191 6	-191 6	38 5	8. 6	31 6	8 6	29 3	-8 9
	2		-191 6	87 3	51. 0	78 9	51 0	78 9	15 5
	3		-191 6	130 9	89 0	121 2	89 0	130 9	59 4
	4		-191 6	182. 2	133 6	171 0	133 6	182 2	93 1
	5		-191 6	231 2	176 2	218 8	176 2	231 2	124 1
DISP REC USE									
RURAL		MRVD							
DECADE	1	59 4	-59 3	24 8	-31 6	18 9	15 5	22 3	-4 5
	2		-59 3	42 7	-25 7	35 6	31. 5	39 6	12 4
	3		-59 3	58 6	-20 5	50 3	45 6	58. 6	14 6
	4		-59 3	74 5	-15 2	65 1	59 8	74 5	14 6
	5		-59 3	90 5	-9 9	80 0	74 0	90 5	14 6
RD NAT		MRVD							
DECADE	1	521 3	-511 1	0	-277 3	166 2	136 7	195 8	-39 8
	2		-511. 1	0	-225. 6	312 0	276 1	347 8	109 2
	3		-511 1	0	-179 5	442 0	400 6	514 5	128. 7
	4		-511 1	654 3	-133 4	572 0	525 0	654 3	128 7
	5		-511 1	794 1	-87 2	702 0	649 4	794 1	128 7
S P MOT		MRVD							
DECADE	1	167 4	-146. 7	69 9	-89 1	53 3	43 8	62 8	-12 8
	2		-146 7	120 3	-72 5	100 2	88 7	111. 7	35 1
	3		-146 7	155. 1	-57 7	141 8	128 5	165 1	41 4
	4		-146 7	210 0	-42. 9	183 6	168 5	210 0	41. 4
	5		-146 7	254 9	-28 0	225 3	207 6	254 9	41 4
S P N MOT		MRVD							
DECADE	1	13 3	-9. 3	7. 9	3 7	4 1	4 4	7 3	-1 4
	2		-9 3	12 3	6. 6	7 7	8 1	11 4	2 3
	3		-9 3	19 6	9 6	11 0	11 4	16 0	2 8
	4		-9 3	20. 2	13 0	14 3	14 8	20 1	2 8
	5		-9. 3	24. 2	16 5	17 5	18 1	24 1	2 8

TABLE II - 22B CONTINUED
 CHANGES IN RESOURCE OUTPUTS, ACTIVITIES, COSTS, AND BENEFITS FROM CURRENT DIRECTION

WILDLIFE										
STRUCT. HAB. IMP. STRUCT										
DECADE	1	10.0	-10.0	384.0	20.0	347.0	330.0	395.0	493.0	
	2		-10.0	384.0	45.0	347.0	330.0	395.0	493.0	
	3		-10.0	384.0	45.0	347.0	330.0	395.0	493.0	
	4		-10.0	384.0	45.0	347.0	330.0	395.0	493.0	
	5		-10.0	384.0	45.0	347.0	330.0	395.0	493.0	
NSTRUCT. HAB IMP M AC										
DECADE	1	0	0	0.026	0.013	0.025	2.11	0.026	0.291	
	2		0	0	0	0	0.58	0	0.390	
	3		0	0	0	0	1.97	0	0.418	
	4		0	0	0	0	0.58	0	0.390	
	5		0	0	0	0	1.97	0	0.418	
WLD & FISH USE										
DECADE	1	176.6	-162.1	17.1	1.0	7.9	2.4	8.8	10.8	
	2		-162.1	27.9	-0.7	15.6	9.9	17.9	20.7	
	3		-162.1	28.4	-1.6	14.8	9.5	17.5	20.9	
	4		-162.1	28.8	-1.5	14.8	8.3	17.7	21.0	
	5		-162.1	28.9	-1.6	14.7	8.1	17.7	21.1	
RANGE GRAZING USE										
DECADE	1	136.6	-136.6	-6.4	-23.5	-9.7	26.4	-6.4	-3.1	
	2		-136.6	-13.4	-23.5	-17.8	25.1	-13.4	-5.2	
	3		-136.6	-17.4	-23.5	-23.0	25.7	-17.4	-6.0	
	4		-136.6	-17.1	-23.5	-22.8	26.9	-17.1	-5.1	
	5		-136.6	-17.7	-23.5	-23.2	27.0	-17.7	-5.6	
TIMBER SALES OFFERED										
DECADE	1	3.0	-3.0	4.1	3.1	7.9	4.8	11.5	0	
	2		-3.0	4.1	3.1	7.9	4.8	8.0	14.0	
	3		-3.0	4.1	3.1	7.9	4.8	5.3	7.3	
	4		-3.0	4.1	3.1	7.9	4.8	3.3	7.3	
	5		-3.0	4.1	3.1	7.9	4.8	1.8	3.3	
	10		-3.0	4.1	3.1	7.9	5.6	1.8	6.7	
	15		-3.0	5.6	3.1	7.9	6.1	11.1	4.9	
SAW T SOFTWOOD										
DECADE	1	0.54	-0.54	0.83	0.62	1.574	0.97	2.30	0	
	2		-0.54	0.83	0.62	1.574	0.97	1.59	2.81	
	3		-0.54	0.83	0.62	1.574	0.97	1.06	1.47	
	4		-0.54	0.83	0.62	1.574	0.97	0.66	1.46	
	5		-0.54	0.83	0.62	1.574	0.97	0.36	1.46	
	10		-0.54	0.83	0.62	1.574	1.13	0.36	1.33	
	15		-0.54	1.12	0.62	1.574	1.21	2.22	0.98	

TABLE II - 22B CONTINUED
 CHANGES IN RESOURCE OUTPUTS, ACTIVITIES, COSTS, AND BENEFITS FROM CURRENT DIRECTION

SAW T HARDWOOD		MCF							
DECADE	1	0 06	-0.06	0	0	0	0	0	0
	2		-0.06	0	0	0	0	0	0
	3		-0.06	0	0	0	0	0	0
	4		-0.06	0	0	0	0	0	0
	5		-0.06	0	0	0	0	0	0
	10		-0.06	0	0	0	0	0	0
	15		-0.06	0	0	0	0	0	0
ROUNDWOOD PRODUCTS		MCF							
DECADE	1	0	0	0	0	0	0	0	0
	2		0	0	0	0	0	0	0
	3		0	0	0	0	0	0	0
	4		0	0	0	0	0	0	0
	5		0	0	0	0	0	0	0
	10		0	0	0	0	0	0	0
	15		0	0	0	0	0	0	0
FUELWOOD		MCF							
DECADE	1	1970	342	0	1380	1380	1380	1380	1380
	2		342	0	1880	1880	1880	1880	1880
	3		342	0	1880	1880	1880	1880	1880
	4		342	0	1880	1880	1880	1880	1880
	5		342	0	1880	1880	1880	1880	1880
	10		342	0	2005	2005	2005	2005	2005
	15		342	0	2130	2130	2130	2130	2130
REFORESTATION		M AC							
DECADE	1	0 182	-0.182	0 424	0 269	0.664	0 335	0 699	-0 046
	2		-0.182	0 135	0.251	0 626	0 094	0 518	0 683
	3		-0.182	0 096	-0 006	0.236	0 129	0 107	0 190
	4		-0.182	-0 027	-0 011	0 209	0 034	0 003	0 044
	5		-0.182	0 094	0 054	0 274	0 054	-0 059	-0 064
	10		-0.182	0 080	-0 015	0.081	0.092	-0 77	0 076
	15		-0.182	-0 055	-0 124	0.040	-0 034	-0 132	-0 087
TSI		M AC							
DECADE	1	0 005	-0 005	-0 005	0 010	0 242	-0 005	-0 005	-0 005
	2		-0.005	0 435	-0 005	0 635	0 328	0.126	0 281
	3		-0 005	0 179	0 127	0 279	0 328	0 108	0 110
	4		-0 005	0 322	0.055	0 393	0 552	0 305	0 525
	5		-0.005	0 635	-0 005	0 371	0.350	0.146	0 297
	10		-0 005	0 325	0 055	0 357	0 556	0 309	0 529
	15		-0 005	0 215	0.055	0 284	0 439	0 145	0 214

TABLE II - 22B CONTINUED
 CHANGES IN RESOURCE OUTPUTS BY ACTIVITIES, COSTS, AND BENEFITS FROM CURRENT DIRECTION

WATER										
MGT.	ST.	STANDARDS	M	AC	FT					
DECADE	1		611	0	0	0	0	0	0	0
	2			0	0	0	0	0	0	0
	3			0	0	0	0	0	0	0
	4			0	0	0	0	0	0	0
	5			0	0	0	0	0	0	0
INCR	OVER	NAT	M	AC	FT					
DECADE	1		0.173	-0.173	-0.030	-0.052	0.047	-0.016	0.123	-0.116
	2			-0.173	-0.030	-0.052	0.047	-0.016	0.049	0.176
	3			-0.173	-0.030	-0.052	0.047	-0.016	-0.006	0.036
	4			-0.173	-0.030	-0.052	0.047	-0.016	-0.048	0.036
	5			-0.173	-0.030	-0.052	0.047	-0.016	-0.079	-0.048
PROTECTION										
FUEL	BKS	& TRT.	ACRES							
DECADE	1		100	-100	0	160	160	0	0	-100
	2			-100	-100	160	160	0	-100	-100
	3			-100	-100	160	160	0	-100	-100
	4			-100	-100	160	160	0	-100	-100
	5			-100	-100	160	160	0	-100	-100
MINERALS										
LEASES	& PERMITS	CASES								
DECADE	1		200	0	0	0	0	0	0	0
	2			0	0	0	0	0	0	0
	3			0	-20	-20	-20	-20	-20	-20
	4			0	-20	-20	-20	-20	-20	-20
	5			0	-40	-40	-40	-40	-40	-40
HC&D										
HUMAN	RES	PRDG.	ENRY'S							
DECADE	1		13	-13	0	0	0	0	0	0
	2			-13	-2	-2	-2	-2	-2	-2
	3			-13	-2	-2	-2	-2	-2	-2
	4			-13	-2	-2	-2	-2	-2	-2
	5			-13	-2	-2	-2	-2	-2	-2
LANDS										
PUR	& ACQ	ACRES								
DECADE	1		0	0	110	110	110	110	110	110
	2			0	110	110	110	110	110	110
	3			0	0	0	0	0	0	0
	4			0	0	0	0	0	0	0
	5			0	0	0	0	0	0	0

TABLE II - 22B CONTINUED
 CHANGES IN RESOURCE OUTPUTS, ACTIVITIES, COSTS, AND BENEFITS FROM CURRENT DIRECTION

SOILS										
S & WAT. RES		IMP	AC							
DECADE	1		260	-260	-199	-260	-141	-101	-184	40
	2			-260	-123	-260	-21	58	-109	154
	3			-260	-123	-260	-21	58	-109	154
	4			-260	-123	-260	-21	58	-109	154
	5			-260	-123	-260	-21	58	-109	154
FACILITIES										
TRAIL CONST /RECON		MILES								
DECADE	1		3.8	-3.8	-1.6	-3.1	-1.8	-1.9	-1.8	-1.6
	2			-3.8	-1.3	-3.0	-1.6	-1.7	-1.6	-1.6
	3			-3.8	-1.0	-2.9	-1.4	-1.5	-1.2	-1.3
	4			-3.8	-0.6	-2.8	-1.1	-1.3	-0.8	-0.9
	5			-3.8	-0.3	-2.6	-1.0	-1.1	-0.4	-0.6
ROAD CONST /RECON		MILES								
(ART & COLLECT)										
DECADE	1		0	0	0	0	0.1	0	0	0
	2			0	0	0	0.1	0	0	0
	3			0	0.1	0	0.1	0.1	0.1	0.1
	4			0	0.1	0.1	0.1	0.1	0.1	0.1
	5			0	0.1	0.1	0.1	0.1	0.1	0.1
RD. BETTERMENT		MILES								
DECADE	1		13.0	-13.0	0	0	0	0	0	0
	2			-13.0	0	0	0	0	0	0
	3			-13.0	0	0	0	0	0	0
	4			-13.0	0	0	0	0	0	0
	5			-13.0	0	0	0	0	0	0
LOCAL RD. CONST.		MILES								
DECADE	1		0	0	0	0	0	0	0	0
	2			0	0.1	0.1	0.1	0.1	0.1	0.1
	3			0	0.2	0.1	0.2	0.2	0.2	0.2
	4			0	0.2	0.2	0.2	0.2	0.2	0.2
	5			0	0.1	0.2	0.1	0.1	0.1	0.1
LOCAL RD. RECONST.		MILES								
DECADE	1		0.1	-0.1	0.2	0.1	0.1	0.1	0.2	0.2
	2			-0.1	0.1	0	0	0	0.1	0.1
	3			-0.1	0	0.1	0	0	0	0
	4			-0.1	0	0	0	0	0	0
	5			-0.1	0.1	0	0.1	0.1	0.1	0.1
TM PURCH. RD		CONST	MILES							
DECADE	1		15.1	-15.1	-1.1	-3.1	14.7	-1.2	11.0	-8.0
	2			-15.1	-1.1	-3.2	4.6	8.6	6.3	23.9
	3			-15.1	-2.1	-4.3	20.1	7.9	0	4.4
	4			-15.1	-6.1	-7.4	1.5	23.4	8.6	23.2
	5			-15.1	-6.1	-6.3	4.2	-10.1	-12.0	-13.5

TABLE II - 22B CONTINUED
 CHANGES IN RESOURCE OUTPUTS, ACTIVITIES, COSTS, AND BENEFITS FROM CURRENT DIRECTION

TM PURCH	RD.	RECON.	MILES								
DECADE	1			0	0	0	0	0	0	0	0
	2			0	0	0	0	0	0	0	0
	3			0	0	0	0	0	0	0	0
	4			0	2.0	0.8	13.5	0	0	0	0
	5			0	2.0	0	4.1	18.3	6.9	15.2	
BENEFITS M \$											
RECREATION DEVELOPED											
DECADE	1	M \$	1997 4-1997 4	401.6	89.7	329.5	89.7	305.7	-92.5		
	2		-1997 4	910.3	532.1	822.8	532.1	822.8	161.4		
	3		-1997.4	1364.4	927.4	1263.5	927.4	1364.5	618.4		
	4		-1997 4	1899.9	1393.5	1783.1	1393.2	1899.9	971.2		
	5		-1997.4	2410.7	1837.3	2278.5	1837.3	2410.7	1293.1		
DISPERSED											
DECADE	1	M \$	3178.1 3134.3	1353.6	-1570.9	1010.8	842.4	1218.5	-247.0		
	2		3134.3	2312.9	-1238.2	1898.9	1694.4	2148.4	660.0		
	3		3134.3	3168.6	-936.5	2690.5	2454.2	3178.0	778.8		
	4		3134.3	4026.0	-630.9	3482.8	3215.2	4025.2	778.8		
	5		3134.3	4884.3	-323.2	4274.8	3975.4	4883.4	778.8		
RANGE											
DECADE	1	M \$	1662.8-1662.8	-1662.8	-1662.8	-1662.8	-1662.8	-1662.8	-1662.8	-1662.8	-1662.8
	2		-1662.8	-1662.8	-1662.8	-1662.8	-1662.8	-1662.8	-1662.8	-1662.8	-1662.8
	3		-1662.8	-1662.8	-1662.8	-1662.8	-1662.8	-1662.8	-1662.8	-1662.8	-1662.8
	4		-1662.8	-1662.8	-1662.8	-1662.8	-1662.8	-1662.8	-1662.8	-1662.8	-1662.8
	5		-1662.8	-1662.8	-1662.8	-1662.8	-1662.8	-1662.8	-1662.8	-1662.8	-1662.8
TIMBER											
DECADE	1	M \$	967.3 -870.9	1397.6	1073.6	2679.5	1627.6	3805.6	34.4		
	2		-956.5	1419.4	1067.4	2630.4	1711.4	2675.4	4644.3		
	3		-956.5	1461.4	1106.4	2691.4	1717.4	1819.4	2449.3		
	4		-956.5	1539.4	1177.4	2814.4	1777.4	1238.4	2591.3		
	5		-956.5	1539.4	1177.4	2810.4	1777.4	732.4	1218.3		
WILDLIFE (WFUDS)											
DECADE	1	M \$	4339.2-3900.5	464.4	-106.1	331.0	203.0	369.4	397.9		
	2		-3900.5	839.0	-113.2	615.1	454.5	691.6	717.8		
	3		-3900.5	943.3	-104.3	677.4	520.8	785.2	800.4		
	4		-3900.5	1036.1	-75.8	756.5	567.5	870.8	895.8		
	5		-3900.5	1124.2	-50.1	835.3	636.6	956.5	979.5		
WATER YIELD											
DECADE	1	M \$	3.7 -3.7	-0.7	-1.1	1.0	-0.4	2.6	-2.5		
	2		-3.7	-0.7	-1.1	1.0	-0.4	1.0	3.7		
	3		-3.7	-0.7	-1.1	1.0	-0.4	-0.2	0.7		
	4		-3.7	-0.7	-1.1	1.0	-0.4	-1.0	0.7		
	5		-3.7	-0.7	-1.1	1.0	-0.4	-1.7	-1.0		

TABLE II - 22B CONTINUED
 CHANGES IN RESOURCE OUTPUTS, ACTIVITIES, COSTS, AND BENEFITS FROM CURRENT DIRECTION

MINERALS									
	M \$								
DECADE 1	9292 7	0	0	0	0	0	0	0	0
2		0	0	0	0	0	0	0	0
3		0	0	0	0	0	0	0	0
4		0	487 3	487 3	487 3	487 3	487 3	487 3	487 3
5		0	487 3	487 3	487 3	487 3	487 3	487 3	487 3
COST M \$									

TOTAL FOREST BUDGET M \$/YR									
DECADE 1	4583 1	-3600.1	-295.7	-823 9	-86.0	1759.2	248.9	183.5	
2		-3600.1	-226 1	-746 2	114 0	669 7	220 0	1484.3	
3		-3600.1	-116.8	-665.9	211 2	1336 7	256 6	1330 7	
4		-3600 1	109 9	-584 8	320 8	1342 7	233 3	1330 7	
5		-3600.1	108 5	-521.0	426 5	1110 5	244 9	578 7	
FIXED COSTS									
PROTECTION M \$/YR									
DECADE 1	576 0	0	0	0	0	0	0	0	
2		0	0	0	0	0	0	0	
3		0	0	0	0	0	0	0	
4		0	0	0	0	0	0	0	
5		0	0	0	0	0	0	0	
GEN ADMIN M \$/YR									
DECADE 1	407.0	0	0	0	0	0	0	0	
2		0	0	0	0	0	0	0	
3		0	0	0	0	0	0	0	
4		0	0	0	0	0	0	0	
5		0	0	0	0	0	0	0	
VARIABLE COSTS									
INVESTMENTS M \$									
DECADE 1	852 4	-852 4	-140 1	-430.5	-65 1	1647.6	102 9	4.1	
2		-852 4	-215 6	-440.7	39 2	477 9	36 5	713 2	
3		-852 4	-189.2	-427 1	57.5	1072 3	-2 6	628 0	
4		-852 4	-655 6	-395.9	78 2	997 2	-82 0	628 0	
5		-852.4	-146.9	-404 7	98 2	687 4	-72 3	434.0	
TOTAL RDS M \$									
DECADE 1	150 8	-150.8	258.8	201.7	481.2	262 6	494.0	44 8	
2		-150 8	268 5	305 8	1074 2	422 9	388 0	697 9	
3		-150.8	252 3	196 8	640.2	441.5	320 3	361 9	
4		-150 8	257.7	256 0	572 9	1205 1	734 7	1192.9	
5		-150 8	328 7	185.5	675 4	257 4	105 7	73.9	
APP. FUND RDS. M \$									
DECADE 1	32 0	-32 0	40 6	15 5	33 0	27 5	33 8	26.1	
2		-32 0	50 3	25 6	46.7	39 7	47 8	52 7	
3		-32.0	63 1	34 6	59 0	51 3	63 1	52 7	
4		-32 0	77 5	40 8	72 9	63 9	77 5	52.7	
5		-32 0	91 5	50 3	86 2	76.2	91 5	52.7	

TABLE II - 22B CONTINUED
 CHANGES IN RESOURCE OUTPUTS, ACTIVITIES, COSTS, AND BENEFITS FROM CURRENT DIRECTION

PURCH CREDIT. RDS		M \$							
DECADE	1	118 5	-118.5	218 5	186.5	448.5	235.5	460 5	19 0
	2		-118 5	218.5	280.5	1028 5	383 5	340 5	645 5
	3		-118 5	189 5	162 5	581 5	390.5	257 5	309 5
	4		-118 5	252 5	215 5	500.5	1141.5	657 5	1140 5
	5		-118 5	237 5	135.5	-10.5	181 5	14 5	21 5
OPERATIONAL		M \$							
DECADE	1	2252 1	-2252.1	-262 6	-495 3	-245 3	-23.3	-37 2	100 3
	2		-2252 1	-147 2	-417.5	-121.3	44 7	28 3	569 0
	3		-2252.1	-77 1	-359 8	-54 7	105 7	88 7	-457 4
	4		-2252 1	1001 6	-316 1	20.3	174 2	130 4	542 6
	5		-2252 1	77 5	-250 0	92 7	239 5	216.3	82 6
GENERAL ADMIN		M \$							
DECADE	1	424 6	-424.6	-1.6	-1.6	-1.6	-1.6	-1 6	-1 6
	2		-424 6	-1 6	-1 6	-1 6	-1 6	-1.6	-1.6
	3		-424.6	-1.6	-1 6	-1 6	-1 6	-1 6	-1 6
	4		-424 6	-1.6	-1.6	-1.6	-1 6	-1.6	-1.6
	5		-424 6	-1 6	-1.6	-1 6	-1 6	-1 6	-1.6
NON-F. S COSTS		M \$							
DECADE	1	4583 1	-4583 1	-3145 1	-3364 1	-2311 1	-3002 1	-1602 1	183.5
	2		-4583 1	-3151.1	-3374.1	-1968 1	-2996.1	-2305.1	-1045.1
	3		-4583 1	-3102 1	-3332 1	-1224 1	-2873 1	-2760 1	-2338 1
	4		-4583.1	-2495.1	-2922 1	-1239.1	-1952 1	-2665 1	-1449.1
	5		-4583.1	-3121.1	-3329.1	-2119 1	-2918.1	-3544.1	-3241.1
RETURNS TO TREAS.		M \$							
DECADE	1	9631 5	-315 7	101.9	54.9	171.0	139 8	246 2	-1.4
	2		-312.8	114.6	72.6	182 1	156 2	188 1	292 7
	3		-312 8	123 6	84 0	189.5	168 2	146.6	-4828 9
	4		174.5	626.7	584 7	682 0	670 1	609 7	668 4
	5		174 5	640 8	597.5	705 8	683 0	593.8	677.2

TABLE II-23
SUMMARY OF PLANNING PROBLEM RESOLUTION BY ALTERNATIVE

Planning Problem	Output Effects to be Measured	<u>ALTERNATIVES</u>										
		1	2	3	4	5	6	7	8	9	10	11
1. Development of additional facilities & rehabilitation of existing sites to meet demand.	M-RVD	No new site development, inadequate funds to rehab. existing sites.	Provides for additional sites and rehab of existing but does not meet demand in 4th & 5th decades.	Would reduce existing approx-imately 25%.	Does not meet demand for sites New facilities would support nonmotorized oppor-tunities existing sites would be rehabil-itated, some sites added in 4th & 5th decades.	Resolves problem after 1st decade, most responsive of alternatives to meeting demand.	Is slow to respond to demand in 1st decade, levels off so as to only meet 75% of demand in 5th decade for developed sites.	Least responsive of alterna-tives would reduce existing sites about 35%.	Ranks third in first part of planning period for meet-ing site & facil-ity needs then falls to 8th by end of planning period.	Provides for rehab. and new sites but only meets 75% of site de-mand by year 2000, no new construc-tion after 4th decade.	Almost same as alt. 9	Provides for rehab. and steady growth of new sites meeting 75% of projected demand throughout the planning period.
2. Increasing recreation use, resulting impacts & other resources activity conflicts.	M-RVD	A low budget alternative only provid-ing for 32% of demand after a de-cline in 1st decade.	Over-emphasis on developed sites to provide returns to the treas-ury makes on unbalanced program which only provides for about 40% of demand outside of developed sites.	Next to lowest in out-puts after 1st decade provid-ing about 25% of demand.	Provides for the most visi-tor days of use in the last part of planning periods but emphasizes nonmotoriz-ed oppor-tunities and only meets 50% of demand in 1st decade.	Although it ranks 1st in providing desired opportuni-ties and managing use, it only meets 70% of de-mand.	Provides for in-creasing use, meeting about 60% of demand till 3rd decade but then only meets about 50% as no in-crease is provided for in 4th and 5th decades	Is the low-est output alternative, does not address this plan-ning prob-lem.	The best increase in funds to pro-vide and manage oppor-tunities in first decade but then decreases so as to only pro-vide 43% of demand.	Emphasis is on pro-viding for in-crease in use during 1st decade & meets approxi-mately 65% of demand then does not pro-vide for increases and only meets 50% of demand in last 2 decades.	Very similar to al-terna-tive 6.	Emphasis on managing in-creasing use in 1st decade meeting 73% of demand, but does not provide for increase in use after 2nd decade & only provides for 55% of demand

TABLE II-23
SUMMARY OF PLANNING PROBLEM RESOLUTION BY ALTERNATIVE

Planning Problem	Output Effects to be Measured	<u>ALTERNATIVES</u>										
		1	2	3	4	5	6	7	8	9	10	11
3. Minerals & energy development will increase social impacts & conflicts with other resource uses. Existing laws identify the Forest Service role in mineral activities & provide for protection of the public interest, other resource uses, & the environment.	Percent or Acres Available for mineral Activities (Used as a relative measure of the number of operating plan which would be received)	Under all alternatives the Forest will respond to proposals by 1) providing for mineral exploration and development in accordance with existing laws and regulations; 2) prohibiting unnecessary disturbance of the surface; and 3) providing for reasonable rehabilitation of the surface.										
		<u>Locatable & Salable Minerals</u> - The following shows the percent of total Forest acres which are available for minerals activities under the various alternatives:										
		98.6	77.4	88.2	63.1	98.3	99.9	48.5	98.6	98.6	99.9	99.7
		<u>Leasable Minerals:</u>										
		<u>Oil and Gas</u> - The following shows the percent of Forest acres identified as having a medium potential for oil and gas (909,500 A.), which are available for further consideration for oil and gas leasing under the various alternatives:										
		97.8	72.1	84.4	61.5	97.8	99.9	43.7	97.8	97.8	99.9	99.9
		<u>Coal</u> - The following shows the percent of Forest acres identified as having a high to moderate potential for coal development (81,534 A.), which are available for further consideration for coal leasing under the various alternatives:										
		100.0	100.0	100.0	86.6	100.0	100.0	67.2	100.0	100.0	100.0	100.0
		<u>Geothermal</u> - The following shows the percent of Forest acres identified as having potential for utilization of geothermal resources (183,560 A.), which are available for geothermal resource activities under the various alternatives:										
		100.0	99.1	100.0	56.9	100.0	100.0	56.9	100.0	100.0	100.0	100.0
	<u>Summarization of Above Commodities</u> - The greatest potential for social impacts and conflicts with other uses would be provided for in alternatives 1, 3, 5, 6, 8, 9, 10, and 11 because more acreage would be available for minerals and energy resources activities. Alternatives 2, 4, and 7 would provide for substantially less because activities would be disallowed on a greater area.											

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TABLE II-23
SUMMARY OF PLANNING PROBLEM RESOLUTION BY ALTERNATIVE

Planning Problem	Output Effects to be Measured	ALTERNATIVES												
		1	2	3	4	5	6	7	8	9	10	11		
4. The Forest is over obligated for livestock, given present forage production requiring increased range maintenance and restoration allowances or decreased grazing obligations; appropriate levels of forage, treatment & grazing numbers must be determined	AUMS	Livestock grazing emphasized. On spring range, 90% of the available capacity for livestock use. Remaining capacity available for big game. This rule also applies to increased capacity resulting from vegetative manipulation on spring range. Decrease in AUM's.	Livestock grazing emphasized. Increased spending in structural & non-structural improvements to provide increased capacity. On spring range, 90% of available capacity for livestock use, & the remaining capacity for big game This also applies to areas being treated on spring range.	Livestock grazing emphasized. On spring range, 90% of the available capacity for big game. This also applies to areas being treated on spring range. Decrease in AUM's	Wildlife needs emphasized. On spring range, 70% & on summer range, 90% of the available capacity for livestock use. The remainder available for big game. This rule also applies to areas of increased forage due to non-structural improvements. Overall livestock capacity decreases due to increased usage by wildlife & forage reserved for watershed needs.	Livestock grazing emphasized. 90% of available forage on spring range for livestock. The remainder for big game use. This rule also applicable to areas of vegetative manipulation on spring range. Overall capacity increases due to increased spending for structural and nonstructural improvements.	Emphasizes different outputs in each HRU of the Forest. This is in response to the issues & concerns. Available capacity use level treated on each HRU: On the Beaver, Fillmore & Delta HRU's, 80% of the capacity for livestock on the Plute & Fremont HRU's, 90%, & on the Richfield HRU, 70% of the capacity for livestock. Remainder available for wildlife. Some decrease in AUM'S.	Livestock grazing emphasized. On spring range, 90% of the available forage for livestock use. The remainder available for big game. This also applies to areas being treated on spring range. This alternative has lower overall capacity due to less vegetative manipulation.	Livestock grazing emphasized. On spring range, 90% of the available forage for livestock use. The remainder available for big game. This rule also applies to areas being treated on spring range. This alternative has a large investment in structural improvements. This is to help protect fisheries and riparian values. Some decrease in AUM's.	Livestock grazing emphasized. On spring range, 90% of the available forage for livestock use. The remainder available for big game. This rule also applies to areas being treated on spring range. This alternative has a large investment in structural improvements. This is to help protect fisheries and riparian values. Some decrease in AUM's.	Livestock grazing emphasized. On spring range, 90% of the available forage for livestock use. The remainder available for big game. This rule also applies to areas being treated on spring range. This alternative has a large investment in structural improvements. This is to help protect fisheries and riparian values. Some decrease in AUM's.	Livestock grazing emphasized. On spring range, 90% of the available forage for livestock use. The remainder available for big game. This rule also applies to areas being treated on spring range. This alternative has a large investment in structural improvements. This is to help protect fisheries and riparian values. Some decrease in AUM's.	Livestock grazing emphasized. On spring range, 90% of the available forage for livestock use. The remainder available for big game. This rule also applies to areas being treated on spring range. This alternative has a large investment in structural improvements. This is to help protect fisheries and riparian values. Some decrease in AUM's.	Livestock grazing emphasized. On spring range, 90% of the available forage for livestock use. The remainder available for big game. This rule also applies to areas being treated on spring range. This alternative has a large investment in structural improvements. This is to help protect fisheries and riparian values. Some decrease in AUM's.

TABLE II-23
SUMMARY OF PLANNING PROBLEM RESOLUTION BY ALTERNATIVE

Planning Problem	Output Effects to be Measured	ALTERNATIVES										
		1	2	3	4	5	6	7	8	9	10	11
5. To what extent will we manage the wildlife and fish habitat for game & nongame species.	Terrestrial wildlife habitat capability.	All alternatives will provide sufficient habitat to allow for the big game numbers established as the 1990 DWR and Forest RPA goals, which will increase big game hunting opportunities.										
		All alternatives will continue to provide for the Forest's established goal or responsibility in the pending recovery plan for the endangered Utah prairie dog and the rydberg milkvetch.										
		No alternative will significantly deteriorate any known bald eagle or peregrine falcon habitat. All alternatives will provide for or exceed habitat to provide for minimum viable populations of all MIS.										
		No significant change in habitat for game & nongame species.	Increased benefits to big game & other species	Significant change in habitat for game & nongame species.	Substantial increase in benefits to game & nongame species.	Increased benefits for big game & other game species.	Substantial increase in benefits to game species & nongame species.	No significant change in habitat for game & nongame species.	No significant change in habitat for game & nongame species.	Increased benefits for game & nongame species.	Increased benefits for all species except old growth dependent species.	Same as #9.
		Although all alternatives will provide for increased big game hunting opportunities with increased chances for a successful harvest in both deer and elk, the demand will still far exceed the supply.										
	Aquatic Wildlife habitat capability.	Increasing improvement in Bonneville cutthroat habitat condition.	Slight improvement in Bonneville cutthroat habitat condition.	No significant change in Bonneville cutthroat habitat condition.	Substantial improvement in Bonneville cutthroat habitat condition.	Substantial improvement in Bonneville cutthroat habitat condition.	Substantial improvement in Bonneville cutthroat habitat condition.	No significant change in Bonneville cutthroat habitat condition.	Increasing improvement in Bonneville cutthroat habitat condition.	Substantial improvement in Bonneville cutthroat habitat condition.	Substantial improvement in Bonneville cutthroat habitat condition.	Substantial improvement in Bonneville cutthroat habitat condition.

TABLE II-23
SUMMARY OF PLANNING PROBLEM RESOLUTION BY ALTERNATIVE

Planning Problem	Output Effects to be Measured	ALTERNATIVES										
		1	2	3	4	5	6	7	8	9	10	11
		Slight improvement in riparian habitat condition. No significant change in macroinvertebrate habitat condition.	Slight decline in macroinvertebrate habitat condition. No significant change in riparian habitat condition.	No significant change in riparian habitat condition. Slight decline in macroinvertebrate habitat condition.	Substantial improvement in riparian habitat condition. Slight improvement in macroinvertebrate habitat condition.	Initial decline in riparian & macroinvertebrate habitat condition.	Slight improvement in riparian habitat condition. Decline in macroinvertebrate habitat condition.	Slight improvement in riparian habitat condition. No significant change in macroinvertebrate habitat condition.	No significant change in riparian habitat condition. Slight improvement in riparian and macroinvertebrate habitat condition.	Initial decline in riparian and macroinvertebrate habitat condition.	Slight improvement in riparian & macroinvertebrate habitat condition.	
		No significant change in fishing opportunities.	No significant change in fishing opportunities.	No significant change in fishing opportunities.	Substantial increase in fishing opportunities.	Substantial increase in fishing opportunities.	Gradual increase in fishing opportunities.	No significant change in fishing opportunities.	No significant change in fishing opportunities.	Substantial increase in fishing opportunities.	Substantial increase in fishing opportunities.	Substantial increase in fishing opportunities.

No alternative will meet projected demand for fishing opportunities over the planning period.

6. How extensive should the transportation system be?

Each alternative considers the need to meet prescriptions and land allocation with a suitable transportation network of arterial, collector and local roads plus trails and special use facilities and corridors. For each alternative the transportation system should provide for:

1. Access at a standard commensurate with resource use, public needs and desires, and management objectives.
2. Flexibility to respond to future direction and uses for National Forest Lands.
3. Conservation and efficient use of natural resources with no unmitigated, transportation-caused side effects incompatible with land allocation and planning.
4. Efficient maintenance levels.

Most prospective changes over the present system would occur on local roads and reflect changes in road standard and maintenance level. Road management, including closures, is considered in resource management and protection needs. Each alternative would provide a broad range of travel opportunities open to motorized and nonmotorized transportation and travelways restricted to some uses for management and protection.

Transportation differences between alternatives were not significant enough to qualify as factors in deciding the preferred alternative.

TABLE II-23
SUMMARY OF PLANNING PROBLEM RESOLUTION BY ALTERNATIVE

Planning Problem	Output Effects to be Measured	ALTERNATIVES																				
		1	2	3	4	5	6	7	8	9	10	11										
7. How should the Fish-lake manage its tree re-source?	Volume of timber products (MBF) Volume of firewood products (Cords.)	Does not meet expected future timber demand beyond 1st decade. Does not meet firewood demand.	Responsive to demand for wood products (timber and firewood) 1st decade of timber above current. Very high firewood output.	Does not meet expected timber demand beyond first decade. Does not meet firewood demand.	Responsive to timber demand; however decade one conifer output reduced to provide 50% aspen output. Highest output for fuelwood with emphasis on utilization of aspen.	Highly responsive to demand for timber. Meets demand for fuelwood except for decade one.	Responsive to demand for wood products (timber & firewood). First decade of timber at current level.	Lowest timber output. Does not meet present or expected future timber demand. Slightly exceeds projected fuelwood demand.	Does not meet expected timber demand beyond first decade. Does not meet fuelwood demand.	Responsive to demand for wood products (timber & firewood) 1st decade of timber at current level.	Highest timber output. Highly responsive to demand for timber. Slightly exceeds demand for fuelwood in all decades.	Responsive to demand for wood products (timber and firewood). 1st decade of timber at current level. High firewood output.										
8. Some Fishlake watersheds need to be stabilized: Forest resource uses must be managed to prevent watershed degradation and improve watershed condition and water production if feasible.	Water yield in acre ft. Water quality	Provides for moderate increase in yield.	Provides for slight increase in yield.	Provides for slight increase in yield.	Same as 8, 9, 10 and 11.	Provides for increase in yield.	Provides for greatest potential for increased water yield through timber harvest.	Water yield in acre ft.	No change in water quality.	Slight decrease in water quality from increased sediment from soil & bank disturbances.	Same as #2.	Most improvement to water quality by sediment reduction resulting from range S&W, and wildlife improvement projects.	Initial decrease in water quality from increased sediment. Eventual increase in water quality from improvement projects.	Same as #5.	Same as #1.	Same as #1.	Same as #1.	Same as #1.	No change in water quality initially. Eventual increase in water quality due to reduced sediment from improvement projects.	Same as #5.	Same as #9.	
	Watershed condition acres improved	Slight improvement in watershed condition.	Moderate improvement in watershed condition.	Same as #1.	Most improvement in watershed condition.	Same as #4.	Same as #4.	Same as #1.	Same as #2.	Same as #4.	Same as #4.	Same as #4.	Same as #4.	Same as #4.	Same as #2.	Same as #4.	Same as #4.	Same as #4.	Same as #4.	Same as #4.	Same as #4.	Same as #4.

TABLE II-23
SUMMARY OF PLANNING PROBLEM RESOLUTION BY ALTERNATIVE

Planning Problem	Output Effects to be Measured	ALTERNATIVES										
		1	2	3	4	5	6	7	8	9	10	11
9. Resolves problems of land ownership rights-of way, boundaries and encroachment.	J11 Land Exchange (acres) J18 R.O.W. Acquired (cases) J06 Property boundaries posted (miles) J10 Encroachment (cases)	Inadequate program. Problems would continue with land ownership, rights-of-way, boundaries & encroachments not being worked on regularly.	Similar to Alt. 1. Program increases over planning period to greater than double the activity. The program is inadequate to meet problems.	No exchange, rights-of-way, or encroachment program. Inadequate boundaries resolution.	Similar to Alt. 1 during first decade, then ranks second in meeting program needs in all activities.	Ranks 2nd in providing a program which would be devoted to resolving all problems.	Same as Alt. 4.	Same as Alt. 3.	Ranks 3rd in resolution. Program may be inadequate during later part of planning period.	Same resolution as Alt. 5.	Provides best program. All necessary & desirable activities funded managed.	Same resolution as Alt. 5.

10 The Forest needs to determine how many acres should be recommended to Congress for Wilderness Designation.

Public Law 98-428, The Utah Wilderness Act of 1984 resolved this planning problem for the Forests in Utah. No further evaluation will be conducted of released lands until the plan is revised in the next iteration, about 10 years after implementation. No wilderness areas were designated on the Fishlake by the Utah Wilderness Act.

TABLE II-24
TIMBER LAND CLASSIFICATION

CLASSIFICATION	ALTERNATIVES										
	1	2	3	4	5	6	7	8	9	10	11
1. Non-Forest land (inc. water)	646700	646700	646700	646700	646700	646700	646700	646700	646700	646700	646700
2. Forest land	777779	777779	777779	777779	777779	777779	777779	777779	777779	777779	777779
3. Forest land withdrawn from timber production	162	162	162	162	162	162	162	162	162	162	162
4. Forest land not capable of producing crops of industrial wood	371560 ^{1/}	371560	371560	371560	371560	371560	371560	371560	371560	371560	371560
5. Forest land physically unsuitable: Irreversible damage likely to occur	14448 ^{2/}	14448	14448	14448	14448	14448	14448	14448	14448	14448	14448
Not restockable within 5 years.	8143	8143	8143	8143	8143	8143	8143	8143	8143	8143	8143
6. Forest land - inadequate information 2/	14831	14831	14831	14831	14831	14831	14831	14831	14831	14831	14831
7. Tentatively suitable Forest land (Item 2 minus items 3, 4, 5, and 6)	386635	386635	386635	386635	386635	386635	386635	386635	386635	386635	386635
8. Forest land not appropriate for timber production 3/ (Acres by mgmt. emphasis)4/	289958	289188	319318	266789	257299	276393	339446	284120	282128	254957	288663
9. Unsuitable Forest land (Items 3, 4, 5, 6, and 8)	699102	698332	728462	675933	666443	685537	748590	693264	691272	664101	697807
10. Total suitable Forest land (Item 2 minus item 9): Softwood	66677	60647	37317	41846	83336	80242	29189	72515	74507	101678	67972
Hardwood	12000	18800	12000	60000	28000	12000	0	12000	12000	12000	12000
Total	78677	79447	49317	101846	111336	92242	29189	84515	86507	113678	79972
11. Total National Forest land (Items 1 and 2)	1424479	1424479	1424479	1424479	1424479	1424479	1424479	1424479	1424479	1424479	1424479

1/Pinyon-juniper not expected to be utilized for timber within the next ten years.

2/Lands for which current information is inadequate to project responses to timber management. Usually applies to low site lands.

3/Lands identified as not appropriate for timber production due to: (a) assignment to other resource uses to meet Forest Plan objectives; (b) management requirements; and (c) not being cost-efficient in meeting Forest Plan objectives over the planning horizon.

4/ Acres by Management emphasis (See Following Table)

	1	2	3	4	5	6	7	8	9	10	11
Existing and proposed developed recreation sites	44	403	34	107	460	27	46	423	100	190	120
Semi-primitive Non-motorized (No timber harvest allowed)	13841	52094	31640	87279	13841	0	213641	14701	13841	0	14783
Improved Watershed	11145	416	11232	9402	7202	10027	1605	10065	10165	9844	3779
Proposed Research Natural Areas Economically less suitable land not utilized to meet timber objectives of the alternative	---	---	---	---	1751	---	---	---	---	---	1751
	264928	236275	276412	170001	234045	266339	124154	258931	258022	244923	268230
TOTAL ACRES	289958	289188	319318	266789	257299	276393	339446	284120	282128	254957	288663

TABLE II-25

PRICES OF OUTPUTS INCLUDED IN PNV ANALYSIS
(1978 DOLLARS INFLATED TO 1/1/82)

SOURCE	RESOURCE	OUTPUT MEASURE	VALUE OR PRICE					
			DECADE 1 1985	DECADE 2 1995	DECADE 3 2005	DECADE 4 2015	DECADE 5 2025	
RPA	Developed Rec. and Visitor Infor. Serv.	RVD	4.17	4.17	4.17	4.17	4.17	
RPA	Dispersed Rec. Use	RVD	4.17	4.17	4.17	4.17	4.17	
Fishlake NF	Sawtimber (lumber selling price by diameter class)	8.0 - 10.9	MCF	1360	1360	1360	1360	1360
		11.0 - 13.9	MCF	1617	1617	1617	1617	1617
		14.0 - 16.9	MCF	1712	1712	1712	1712	1712
		17.0 - 19.9	MCF	1762	1762	1762	1762	1762
		20.0 - 22.9	MCF	1827	1827	1827	1827	1827
		23.0 and above	MCF	1865	1865	1865	1865	1865
Region 4	Increased Water Yield	Acre Feet	58.38	58.38	58.38	58.38	58.38	
GEE	Livestock Grazing	AUM	11.88	11.88	11.88	11.88	11.88	
RPA	Coal and Gas Leases	Short Ton \$	3.65	3.65	3.65	3.65	3.65	
			----- estimated lease payments -----					
RPA	Wildlife	WFUD						
		-Hunter User Day	User Day	32.10	32.10	32.10	32.10	32.10
		-Fishing User Day	User Day	24.80	24.80	24.80	24.80	24.80
		-Nonconsumptive Wildlife User Day	User Day	40.30	40.30	40.30	40.30	40.30

DEFINITIONS:

RPA: Resource Planning Act; 1980 Assessment.

Region 4: Developed by Intermountain Region, Forest Service, for use in Forest planning.

TIMBERVAL: Computer model used by Intermountain Region, Forest Service, to estimate 1981 stumpage values.

GEE: A study by Kerry Gee, Agricultural Economist of the Economic Research Service, USDA.

Note: A more detailed discussion of resource values (including projected values) appears in Appendix B.

TABLE II-26
PRESENT NET VALUE AND PRICED OUTPUTS DISCOUNTED AT 4 PERCENT
(Figures are in Thousands of Dollars and
Are Discounted Over the 50 Year Planning Period)

ALT	PNV	----- PVB BY RESOURCE -----							----- PVC BY MAJOR COST CATEGORY -----				
		PVC	PVB	TIMBER	REC.	WILDLIFE	RANGE	MIN.	TIMBER	ROADS	REC. & WILDLIFE	RANGE	OTHER
1	349741.4	87129.3	436870.7	24860.9	86217.4	91829.3	32136.3	201669.8	20337.4	4409.7	11980.6	9237.3	4164.2
2	335153.8	164872.9	500026.7	57027.5	108623.4	92618.9	34887.7	201669.8	55915.6	12967.6	21840.2	25389.6	48759.9
3	347364.1	79152.1	426516.2	24446.6	75244.5	91233.4	33819.5	201669.8	19757.6	3506.3	8522.0	15636.9	31729.3
4	353287.8	147786.2	501074.0	36654.9	124951.1	103888.6	33914.0	201669.8	30515.4	6532.1	29441.6	19760.5	61536.5
5	371209.2	196256.2	567465.4	68007.0	149413.0	107650.8	40287.1	201669.8	59192.5	15040.4	34284.6	24599.7	63139.0
6	347187.5	173112.9	520300.4	63306.5	120062.9	100965.8	34052.1	201669.8	55111.4	11748.0	24442.6	19661.9	61602.9
7	300341.7	55459.9	355800.9	6736.3	28303.4	87013.7	32016.6	201669.8	6266.8	1549.1	8197.6	9473.6	29972.1
8	349810.0	123840.2	473650.2	24633.7	118977.9	93301.3	34850.5	201669.8	20471.6	4729.6	17848.1	21114.1	59676.9
9	353688.5	164455.8	518144.3	58410.6	120805.1	10369.3	33867.5	201669.8	49852.9	11545.5	26721.2	19114.8	57221.3
10	317897.7	232113.0	550010.7	91184.4	120062.9	101159.7	35668.4	201669.8	84695.9	17986.1	25347.9	21504.0	82579.3
11	352852.2	163567.9	516420.1	55502.2	121432.0	103897.6	33696.5	201669.8	48023.9	12085.0	26721.2	19114.9	57622.8

TABLE II-27
EFFECTS OF NONPRICED OUTPUTS ON PVN
IN M\$ DISCOUNTED AT 4 PERCENT

Alter- native	Decades	DISCOUNTED at 4% (Figures are in thousands of dollars)			Elk Num- bers	Deer Num- bers	M-Lbs. of Fish	Water- shed Improve- ment Pro- ject Acres	Semi- Motorized M-Acres	Reten- tion Ac. VQ-M-AC	Partial Retention Acres VQ-M-AC
		PNV	PVC	PVB							
1	1ST	349,741.4	87,129.3	436,870.7	3940	46880	359.4	180	290.5	226.4	756.4
	2ND				3960	47260	362.9	180	290.5	225.3	752.6
	3RD				3960	47320	364.7	180	290.5	224.3	749.4
	4TH				3960	47340	364.7	180	290.5	223.3	746.1
	5TH				3960	47340	365.4	180	290.5	222.3	742.9
2	1ST	335,153.8	164,872.9	500,026.7	4020	49850	355.5	0	363.0	225.0	751.7
	2ND				4090	51175	356.9	90	363.0	222.5	743.4
	3RD				4160	51565	357.3	90	363.0	220.3	736.1
	4TH				4160	51760	356.9	90	363.0	218.1	728.8
	5TH				4160	51860	357.3	90	363.0	215.9	721.5
3	1ST	347,364.1	79,152.1	426,516.2	3910	46150	356.9	0	360.6	226.1	755.4
	2ND				3920	46470	358.7	0	360.6	224.7	750.7
	3RD				3920	46550	359.4	0	360.6	223.5	746.6
	4TH				3920	46555	359.1	0	360.6	222.2	742.5
	5TH				3920	46500	359.4	0	360.6	221.0	738.4
4	1ST	353,287.8	147,786.2	501,074.0	4410	58220	365.6	543	438.4	225.3	752.6
	2ND				4530	61030	375.2	730	438.4	223.0	745.2
	3RD				4540	61270	376.8	730	438.4	221.1	738.7
	4TH				4540	61135	376.4	730	438.4	219.2	732.2
	5TH				4540	61080	376.4	730	438.4	217.2	725.8
5	1ST	371,209.2	196,256.2	567,465.4	4110	50880	353.5	260	217.5	222.6	743.8
	2ND				4170	52220	363.2	403	217.5	217.8	727.6
	3RD				4170	52320	364.8	403	217.5	213.5	714.1
	4TH				4160	52095	363.8	403	217.5	209.3	700.6
	5TH				4160	51960	363.0	403	217.5	205.0	687.1
6	1ST	347187.5	173112.9	520300.4	4280	55140	360.2	483	230.7	225.3	752.6
	2ND				4390	57590	369.8	597	230.7	223.0	745.1
	3RD				4420	57590	369.8	597	230.7	221.1	738.6
	4TH				4420	58060	375.4	597	230.7	219.1	732.1
	5TH				4420	57940	376.1	597	230.7	217.2	725.6

TABLE II-27 (CONTINUED)
EFFECTS OF NONPRICED OUTPUTS ON PNV
IN M\$ DISCOUNTED AT 4 PERCENT

Alter- native	Decades	DISCOUNTED AT 4% (Figures are in Thousands of Dollars)			Elk Num- bers	Deer Num- bers	M-Lbs. of Fish	Water- shed Improv- ment Pro- ject Acres	Semi- Prim. Non- Motorized M-Acres	Reten- tion Ac. VO-M-AC	Partial Retention Acres VO-M-AC
		PNV	PVC	PVB							
7	1ST	300,341.7	55,459.2	355,800.9	3900	45720	359.8	0	588.1	226.7	757.6
	2ND				3900	45810	363.0	0	588.1	226.0	755.1
	3RD				3900	45750	365.4	0	588.1	225.3	752.9
	4TH				3890	45650	365.1	0	588.1	224.7	750.7
	5TH				3880	45600	365.1	0	588.1	224.0	748.5
8	1ST	349,810.0	123,840.2	473,65.2	3940	47120	356.0	260	268.2	225.1	752.1
	2ND				3930	47540	357.1	523	268.2	222.7	744.0
	3RD				3960	47590	357.1	523	268.2	220.6	737.0
	4TH				3970	47635	357.4	523	268.2	218.5	730.0
	5TH				3980	47740	357.1	523	268.2	216.4	723.1
9	1ST	353,688.5	164,455.8	518,144.3	3875	45330	366.4	300	252.4	225.2	752.3
	2ND				3905	45990	375.2	414	252.4	222.8	744.5
	3RD				3920	46265	376.1	414	252.4	220.8	737.7
	4TH				3920	46260	375.7	414	252.4	218.7	730.9
	5TH				3920	46250	376.1	414	252.4	216.7	724.1
10	1ST	317,897.7	232,113.0	550,010.7	4105	50880	360.2	546	182.4	225.7	754.1
	2ND				4170	52220	365.5	694	182.4	223.9	748.2
	3RD				4160	52320	370.4	694	182.4	222.4	743.0
	4TH				4160	52095	370.0	694	182.4	220.8	737.8
	5TH				4160	51960	367.9	694	182.4	219.3	732.7
11	1ST	352,852.2	163,567.9	516,420.1	3875	45330	366.7	300	192.5	225.2	752.5
	2ND				3905	45985	375.9	414	192.5	222.9	744.8
	3RD				3920	46450	376.4	414	192.5	220.9	738.2
	4TH				3920	46510	375.7	414	192.5	218.9	731.5
	5TH				3920	46250	376.1	414	192.5	216.9	724.9

TABLE II-28
 QUALITATIVE EFFECTS OF ALTERNATIVES
 ON PNV, M\$, DISCOUNTED AT 4 PERCENT

Alternative	PNV	PVC	PVB	NARRATIVE
1	349,741.4	87,129.3	436,870.7	The Budget remains at current levels. Timber outputs remain at current levels. Range outputs decrease over time. The limited budget prevents much investment in developed recreation and outputs decrease over time. The wildlife and watershed budgets prevent major investments.
2	335,153.8	164,872.9	500,026.7	The high market/high wilderness option has timber outputs to increase rapidly over time; there are large investments in range and developed recreation. Nondevelopment acreage totals 321 thousand acres. Investment in wildlife and watershed projects is low. The relatively high PVC reflects the restriction of market development activities to non-wilderness sites.
3	347,364.1	79,152.1	426,516.2	The low costs are due to a 10% reduction in allowed budgets from current levels. The mix in spending favors market values. Range investments are higher than in Alternative 1. Wildlife, watershed, and recreation operational costs decline.
4	353,287.8	147,786.2	501,074.0	Alternative 4 emphasis is on high non-market outputs. The nondevelopment acres are 526 thousand. Large investments in fishery habitat improvement and watershed treatments cause the PVC to be high but the PVB is enhanced by increased fishing user days. Timber outputs around investments are low. Range investments are moderate.
5	371,209.2	196,256.2	567,465.4	The 1980 RPA alternative has high timber, developed recreation, fish habitat improvement, range and watershed development. The result is a high output/high cost alternative.

TABLE II-28 (CONTINUED)
 QUALITATIVE EFFECTS OF ALTERNATIVES
 ON PNV, M\$, DISCOUNTED AT 4 PERCENT

Alternative	PNV	PVC	PVB	NARRATIVE
6	347,187.5	173,112.9	520,300.4	Alternative 6 has high developed recreation and range investments. There are substantial investments in wildlife and watershed improvements but not as much as alternatives 4, 5, 9 or 11.
7	300,341.7	55,459.2	355,800.9	The 25% reduced budget (from Alt. 1) prevents a substantial investment program and the resulting PVB figures reflect only mineral activity.
8	349,810.0	123,840.2	473,650.2	Alternative 8, the no action alternative tries to maintain current outputs. The results are substantial range investments and watershed investments. Developed recreation investments are high at first but decrease over time.
9	353,688.5	164,455.8	518,144.3	Alternative 9 has only moderate developed recreation development high wildlife investment (fishery) and a moderate watershed investment work. The pace of watershed investment is one half that of Alternative 4.
10	317,897.7	232,113.0	550,010.7	The 1985 RPA alternative is a very high investment alternative. Timber and range outputs are at their highest of any alternative. Watershed investment is moderate.
11	352,852.2	163,567.9	516,402.1	Alternative 11 is very similar in budget to Alternative 9, that is moderate developed recreation investment, watershed development, and range development. Wildlife investment (again fish habitat improvement) is high.

III. AFFECTED ENVIRONMENT

A. INTRODUCTION

This chapter describes the existing environment of the Fishlake National Forest, including the physical, biological, social, and economic features. Features described are limited to those that would be significantly affected if any of the alternatives were implemented. A more detailed description of Forest environments can be found in the Planning Action 4 document, Analysis of the Management Situation, which is available at the Fishlake National Forest Supervisor's Office in Richfield, Utah.

B. PHYSICAL AND BIOLOGICAL SETTING

Geology

The Fishlake National Forest is located in two major physiographic provinces. Its eastern half is in the Colorado Plateau Physiographic Province, and its western half is in the Basin and Range Province. While the eastern and western halves of the Forest are different physiographically, geological differences exist between the southern and northern halves. The southern half of the Forest is underlain by extrusive igneous rocks. The Tushar and Monroe Mountains are composed of Tertiary volcanics; the Tertiary and Quaternary lava flows cover the Forest north of Loa. The northern half of the Forest is underlain by sedimentary rocks; most of these are nearly flat-lying Tertiary shales, limestones, and sandstones. However, the western edge of the Pahvant Range and most of the Canyon Range are underlain by moderately to steeply dipping Paleozoic sedimentary rocks.

Basin and range type block faulting, present along the edges of several of the mountains, is responsible for much of the topography. Portions of the Forest are in the overthrust belt; Laramide thrusting occurred in the Pahvant Range. Alpine glaciation in the Tushars, plateau glaciation around Fish Lake, and landsliding have also helped form the present landscape.

Climate

The Fishlake Forest is affected by two major storm paths approaching from nearly opposite directions. During the winter and spring months, frontal storm systems from the Pacific Northwest predominate; during the late summer and early fall, thunderstorms move in from the south and southwest. The frontal storms from the north and northwest primarily affect the northern half of the Forest. The summer storms from the south to southwest occur in isolated areas and are of greater intensity than the Pacific storms. Summer storms have produced as much as 2.8 inches of moisture in two hours, and have the potential to produce devastating floods.

Precipitation varies greatly, from 8 to 10 inches at the Forest boundary to 40 inches at the highest elevations. Most of the precipitation received between October and April is in the form of snow; it accounts for about two-thirds of the yearly precipitation. The average growing season

Sunny skies prevail most of the year. During December, the Sevier Basin averages 50 percent sunshine. More sunshine prevails during summer and fall, when the average is about 78 percent.

Wind speeds are usually light to moderate, although strong winds do occur.

Flora and Fauna

A variety of ecosystems from high desert through transitional alpine are present on the Fishlake Forest. Riparian areas also span this range from desert springs and washes to alpine lakes and streams.

Major tree species on the Forest include aspen, juniper, pinyon, Engelmann spruce, alpine fir, white fir, ponderosa pine, Douglas-fir, and cottonwood. Growing sites range from those of relatively high productivity to barren.

The diversity of wildlife reflects the wide range of climatic and vegetative types on the Forest. Approximately 83 species of mammals inhabit the area, 160 species of birds, 30 species of reptiles and amphibians, and 16 species of fish. Aquatic resources are numerous, with 700 miles of streams and 4,500 acres of lakes and reservoirs.

C. ECONOMIC AND SOCIAL SETTING

Introduction

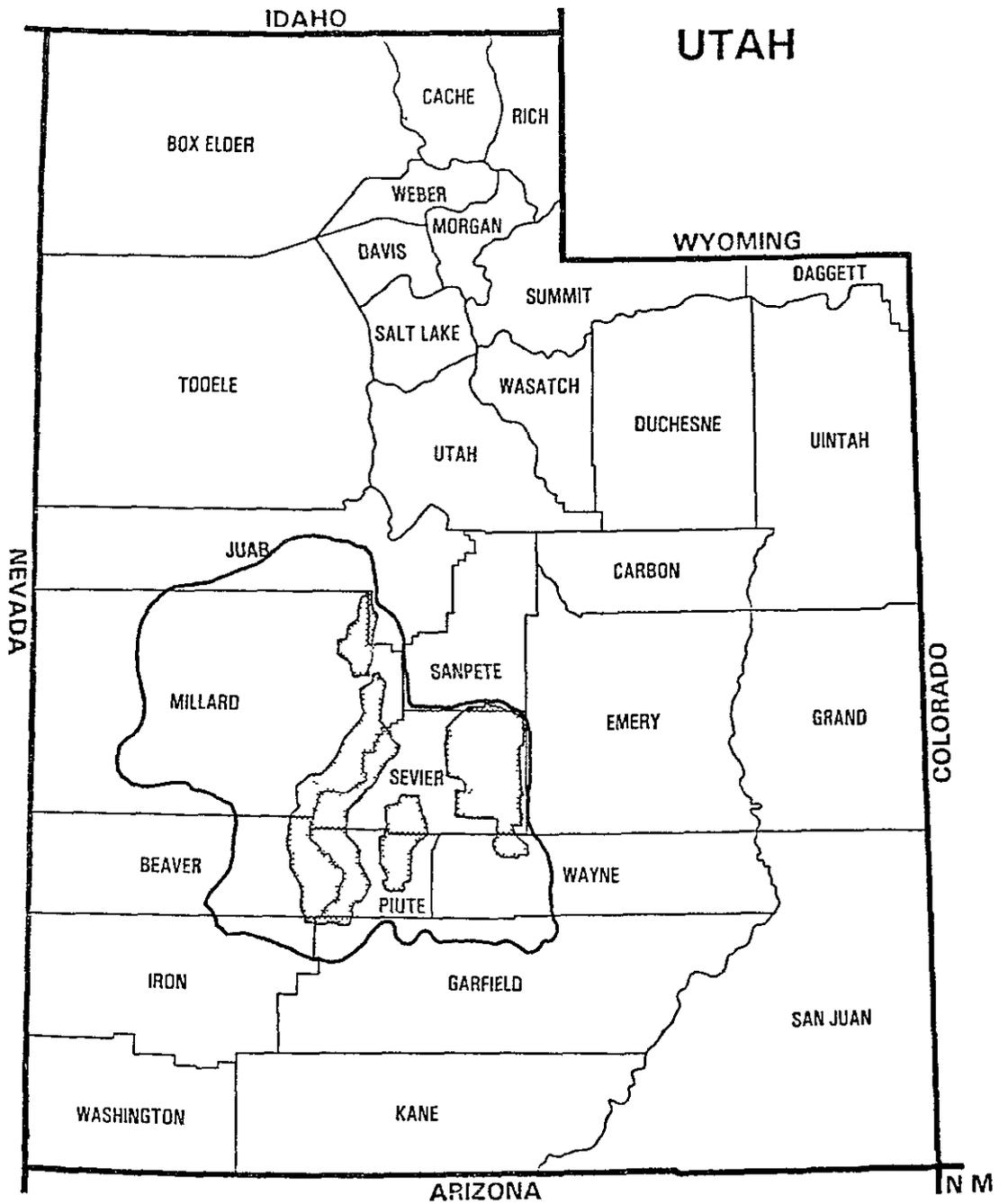
In describing current social and economic conditions in the Fishlake Forest's Zone of Influence (See Fig. III- 1) and assessing potential impacts, a system called Socially Responsive Management (SRM), proposed by the Foundation of Urban and Neighborhood Development of Denver, Colorado, was used. Key to this approach is the Social Analysis Unit, which is defined as a geographical area used to describe current and possible future social, economic, and institutional conditions at the local, regional, and national levels.

The two units used in this Forest Plan are the Human Resource Unit (HRU) and the Social Resource Unit (SRU). Human Resource Units are used to design, implement, and monitor management actions that respond to changing social conditions at local levels. Social Resource Units perform the same functions at regional levels, and thus contain one or more Human Resource Units, which are basic building blocks. The Human Resource Units are the units of social analysis called for in Estimating Social Effects: R-4 Social Analysis guidelines for project LMP. Procedures for characterizing and delineating Human Resource Units are described in FUND (1979).

In using the Socially Responsive Management approach to social impact analysis, seven cultural descriptors are used. These are: publics and their organizations, settlement patterns, work routines, communication networks, support services, recreational activities, and geographical boundaries. The geographical boundaries are shown on Figure III-2; the other descriptors will be discussed in more detail. Four economic indicators are also used: population change, employment mix, wage structure, and local labor supply. These also are discussed in more detail.

Data for the cultural descriptors and economic indicators were first collected for the six HRU's in the Forest's zone of influence, and then generalized to the Sevier Social Resource Unit, comprised of the Beaver, Delta, Fillmore, Fremont, Piute, and Richfield Human Resource Units (Figure III-2).

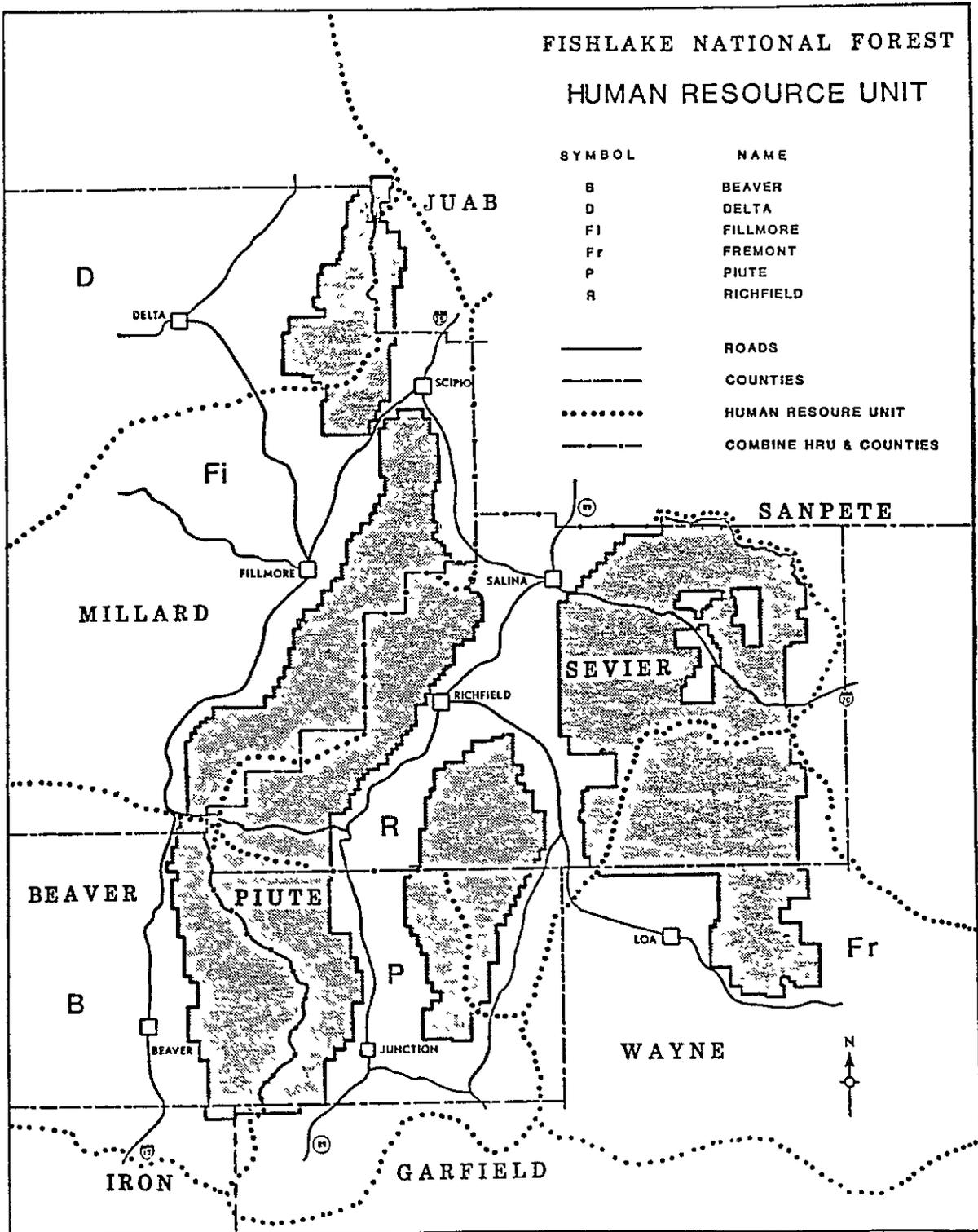
FIGURE III - 1



VICINITY MAP FISHLAKE NATIONAL FOREST

—— Sevier Social Resource Unit which is the zone of influence of the Fishlake National Forest.

FIGURE III - 2



Cultural Descriptors

Publics and Their Organizations

The Church of Jesus Christ of Latter Day Saints (Mormons), with its system of religious and social institutions, is the major organization within the Sevier Social Resource Unit. Most of the Human Resource Units are about 85 percent Mormon. An exception is the Piute HRU, which is 68 percent Mormon. While a diversity of economic interests is represented within the church, its emphasis on family unity, conservatism, and agricultural and small business employment are powerful influences in the area.

Livestock permittees, water users, recreationists, senior citizens, and local businessmen are the major publics in the area that have associations to promote their interests. Hunters, fishers, campers, and picnickers are also significant publics, although they have fewer formal organizations to advance their causes.

Other publics and their formal and informal organizations are present in only one or two of the Human Resource Units. These range from the small but tightly knit groups of Orientals and Piute Indians in the Fillmore HRU to the California immigrants in the Richfield and Piute HRU's. The California immigrants include both retired people looking for a safe, pleasant place to live and former residents returning home because of new employment opportunities. These various publics have distinct perceptions about Forest management.

Settlement Patterns

The Sevier Social Resource Unit was settled by Mormon pioneers between 1850 and 1880. Most of these people were recent European immigrants sent to colonize the area by the Mormon church. Following church policy, the societies they created were agricultural, with a tight, cohesive social structure that centered around their religion. Farmers and shopkeepers alike lived in the towns, the farmers commuting to their fields. This pattern led to the lack of rural farm houses typical of agricultural America. The towns thus had to be located near agricultural areas, which meant in valleys near water sources, usually lower mountain streams.

Between 1900 and the Second World War, the population of most of the SRU showed a gradual increase of about 40 percent. The one exception to this trend was the Piute Human Resource Unit, which experienced a hardrock mining boom around 1920.

Between the end of World War II and 1970, the SRU showed a population decline of about 20 percent, resulting from widespread population migration from rural to urban areas and lack of jobs in the region. The emigration occurred at different rates in different Human Resource Units. These population trends reversed themselves once again starting about 1970, so that the 1980 census showed a 33 percent growth over 1970 figures. Again, the rate of change was different for the various human resource units. The Richfield Unit had the highest growth rate, due mainly to creation of jobs in the non-agricultural sectors of government, service, and small business. In the future, industrial jobs related to coal mining near

Salina and electricity generation near Delta should bring a new wave of settlers into the Sevier SRU. These immigrations are tending to diversify the culture of the Sevier SRU.

Work Routines

The highest percentages of employment in the Sevier area are in the government, trade, agricultural, and services sectors. Because of this, there is only a minor seasonal change in numbers of jobs. Since most agriculture is livestock raising, it also produces little seasonal fluctuation. With expected increases in mining and manufacturing, the percentage of seasonal change should become even lower. However, a more industrialized economy could have multi-year fluctuations reflecting national trends.

Seasonal fluctuations tend to result from the summer tourist industry, where motels and other services get seasonal business from people traveling to areas like Fish Lake or nearby National Parks. In some areas, such as the Fremont HRU, ranchers tend to harvest alfalfa in the summer and then supplement their income from other sources such as timbering during other seasons.

Communication Networks

Formal communication networks, such as newspapers, radio, and television, are readily accessible to all residents of the Sevier SRU. Seven weekly newspapers are published within the SRU, and it has three local radio stations. Daily newspapers, television, and several radio stations from the Salt Lake area also cover the SRU. Because Salt Lake is the communications center for the Intermountain West, its media are attuned to events in outlying, rural areas. Satellite signal receiving dish-type antennae are bringing many additional television channels to an increasing number of homes in the area.

Support Services

Law enforcement is handled by police departments in larger towns such as Beaver, Fillmore, and Richfield, by County Sheriff Departments, and by the State Highway Patrol. The Forest has had cooperative agreements for law enforcement with sheriffs in Beaver, Millard, Sevier, and Wayne Counties. Volunteer Fire Departments in towns provide fire protection for private property. There is a fire protection offset agreement between the Forest and Utah Division of State Lands and Forestry for the portion of the Forest north of Interstate 70 and east of Salina. This offset agreement, in turn, provides for Forest Service protection of other state and private lands within the Forest boundary in Sevier County. Sevier County has three ambulances. Others are stationed at Beaver, Fillmore, and Loa. These are manned by volunteer Emergency Medical Technicians. Hospitals serving the area are located at Beaver, Fillmore, and Richfield, but more difficult cases are transferred to the Provo and Salt Lake area.

Government services are obtained in the county seats of Beaver, Fillmore, Junction, Loa, and Richfield. Some residents utilize government social services, and many utilize services provided by the Soil Conservation Service, Agricultural Stabilization and Conservation Service, Farmer's Home Administration, and county Agricultural Extension Service.

Elementary education is provided at small community schools scattered throughout the area. High school students must commute to schools at Bicknell, Salina, Richfield, Monroe, Junction, Beaver, Fillmore or Delta.

Informal support services are important in the area. The various programs and organizations of the Mormon church provide leading support services in the area.

Recreational Activities

Agriculture-related activities such as rodeos, brandings, 4-H Clubs, and county fairs provide recreation for SRU residents. Church activities and high school sporting events are popular and receive active support.

Local residents participate in many of the same recreational activities that attract non-residents to the area. Opening days of hunting seasons for deer and elk almost have the status of state holidays. Opening of fishing season is not far behind in popularity. Throughout the season, waters from high elevation Fish Lake to lower elevation Lake Powell are heavily used by residents and non-residents alike. Other recreational activities such as picnicking, camping, and fourwheel driving are also practiced. Many of the 116 summer homes at Fish Lake are owned by residents of the Richfield area; but increasingly they are being purchased by people from outside the Sevier SRU.

One recreational phenomenon popular in Utah is group camping. Church and other group outings, and especially family reunions that may attract over 50 people, are very popular in summer months.

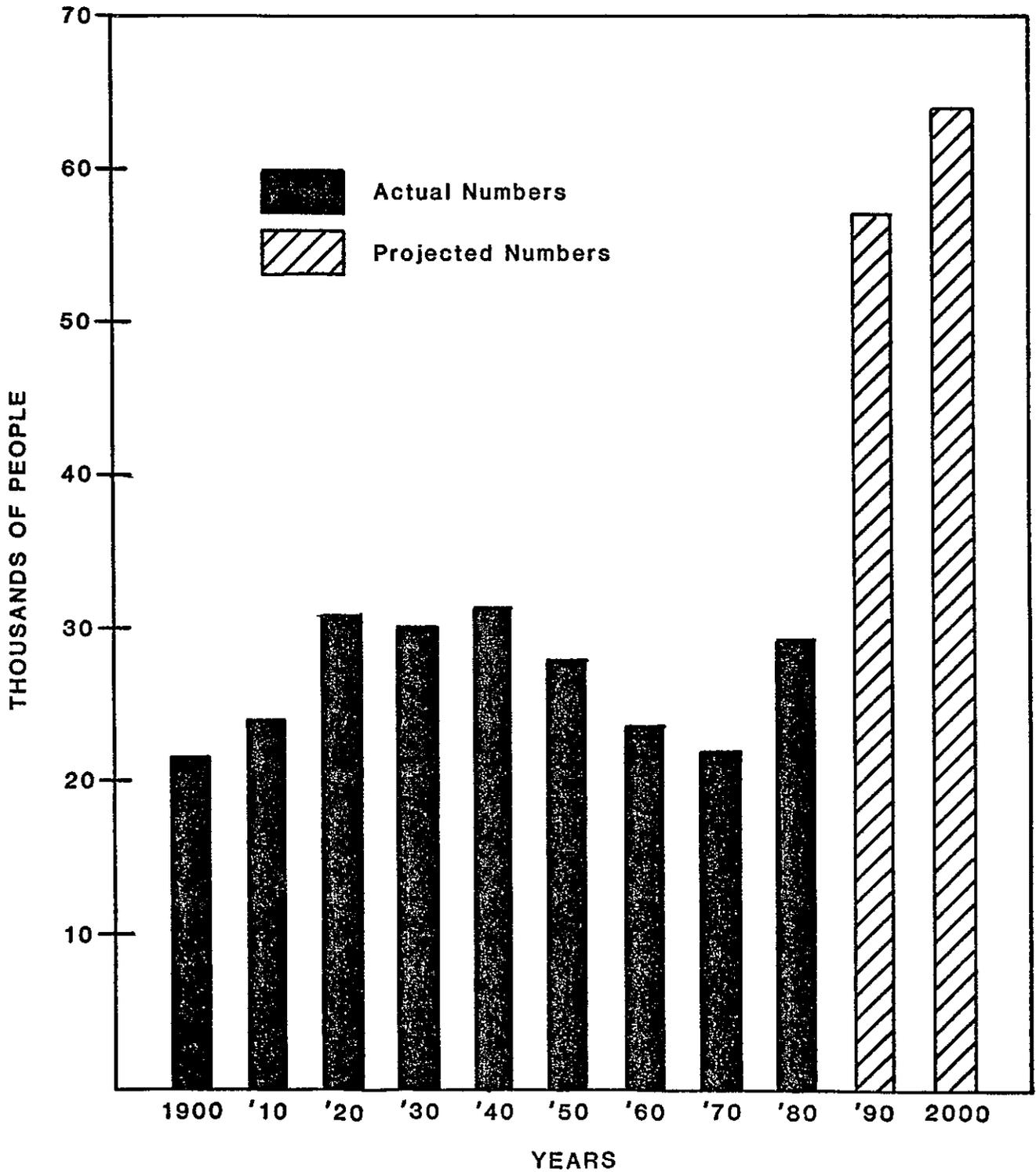
Economic Indicators

Population Change

The population of the Sevier Social Resource Unit (primarily the population of Beaver, Millard, Piute, Sevier and Wayne Counties in Utah) grew from approximately 22,000 in 1900 to 31,000 in 1940. The next two decades the population declined from 31,000 to 23,000 due to the shift in population from rural to urban settings. Since 1970 the population has grown back to 31,000.(Figure III-3, Population of Sevier Social Resource Unit.)

FIGURE III - 3

POPULATION OF THE SEVIER SOCIAL RESOURCE UNIT



A comparison of population growth in the State of Utah shows a sharp contrast with the Sevier Social Resource Unit.

TABLE III-1
POPULATION GROWTH COMPARISONS

<u>Years of Comparison</u>	<u>Utah</u>	<u>Sevier SRU</u>
1900 to 1980	+428%	+45%
1900 to 1940	+ 99%	+45%
1940 to 1970	+ 92%	-25%
1940 to 1980	+165%	0%
1970 to 1980	+ 38%	+33%

The State of Utah has grown steadily while the population of the Sevier SRU has fluctuated in a narrow band for the past 40 years.

The next two decades should see a large population increase in Sevier SRU. The population should reach 64,000 by the year 2000 if a minimum of planned development takes place. This 106 percent increase compares with the State of Utah's "high development scenario" population growth of 71 percent (Utah State Planning Coordinator, 1980).

The population in Sevier Social Resource Unit is approximately 98 percent white. Individual county percentages vary from 95.4 to 99.4 percent.

Employment Mix

The structure of Sevier Social Resource Unit varies by Human Resource Unit. Percentages of the total workforce by sector and HRU are shown in Table III-3. The Richfield HRU has a more diverse economy and is more industrialized than the other HRU's. Piute and Fremont are both heavily dependent upon agriculture and have less diverse economies than the Richfield HRU. Delta is currently heavily agricultural, but with the addition of the Intermountain Power Project that HRU's economy will become more industrial.

Figure III-4 displays the agricultural/non-agricultural ratios of the HRU's. An HRU with a ratio of less than one agricultural worker to three non-agricultural workers is considered an agricultural economy. A ratio of one agricultural worker to seven non-agricultural workers is considered a non-agricultural economy. The ratios in between denote transitional economies. For the Sevier SRU as a whole, the ratio is 4.5 non-agricultural to one agricultural, which makes it a transitional area.

FIGURE III - 4

MIX OF EMPLOYMENT

1980 data

Agricultural
1:1 - 1:3

Transitional
1:4 - 1:6

Non-Agricultural
1:7 +

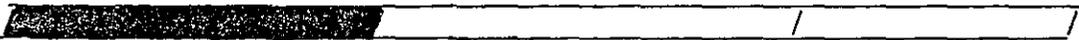
Richfield 1:6.8



Piute 1:1.9



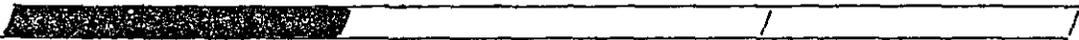
Delta 1:2.3



Fillmore 1:5.8



Fremont 1:2.5



Beaver 1:5.2



The structure of the local HRU's can and does change over time. The general tendency for the entire Sevier SRU is a shift from agricultural toward non-agricultural. For example, the agricultural/non-agricultural ratios for the Richfield HRU have shifted as shown in Table III-2.

TABLE III-2
RICHFIELD HRU STRUCTURE RATIOS

Richfield HRU		
<u>Year</u>	<u>Ratio</u>	<u>Characterization</u>
1950	1:1.2	Agricultural
1960	1:3.2	Agricultural
1970	1:4.5	Transitional
1980	1:6.8	Non-Agricultural

TABLE III-3
PERCENTAGE OF EMPLOYMENT BY SECTOR
(IN EACH HRU OF THE SEVIER SOCIAL RESOURCE UNIT)

	HRU 1/					
	Beaver	Delta	Fillmore	Fremont	Piute	Richfield
1. Employees on non-agricultural payroll..	68.4	58.1	71.1	47.7	56.3	74.0
Manufacturing..	6.2	9.3	7.0	4.1	7.5	7.9
Mining.....	4.7	3.0	3.4	4.7	2.7	1.3
Contract Construction.....	2.2	2.4	2.5	3.9	3.4	5.9
Transportation, Comm. & Public Utilities.....	3.4	8.2	3.1	.5	1.9	4.5
Trade.....	19.6	17.1	17.4	6.6	3.6	20.8
Finance, Insurance, & Real Estate.....	1.6	1.6	1.6	.6	.2	2.7
Services.....	8.4	4.1	4.6	3.1	.5	10.4
Government.....	22.1	12.4	31.5	24.3	36.4	20.6
2. "All other" 2/ non-agricultural employment.....	12.6	11.6	14.2	23.4	19.7	13.1
3. Agricultural Employment 3/..	19.00	30.3	14.7	28.9	34.0	12.9

1/ County data were disaggregated to the various HRU's. County data were supplied by Utah State Employment Security.

2/ "All Other" refers to self-employed, domestic workers, and unpaid workers in family businesses.

3/ Estimate of agricultural proprietors and agricultural laborers.

The Richfield HRU has experienced sharply expanded government, trade, and service sectors in the past 30 years. This tendency toward non-agricultural has not been the result of large increases in manufacturing or mining but is because Richfield is becoming a regional service center. It is clear that the change in structural characterization toward non-agricultural can occur without significant mining or industrial development. However, this change will be accelerated by significant mining and industrial development expected in some parts of the Sevier SRU.

The result of the shift is an economy that is more diverse, and that may be less dependent upon Forest Service production of forest and range commodity products.

The Piute, Delta, and Fremont HRU's in the Sevier Social Resource Unit are heavily agriculturally based. For example, the Fremont HRU economic data are shown in Table III-4.

TABLE III-4
FREMONT HRU STRUCTURE

<u>Year</u>	<u>Ratio</u>	<u>Characterization</u>
1950	1:0.5	Agricultural
1960	1:0.9	Agricultural
1970	1:1.8	Agricultural
1980	1:2.5	Agricultural

The characterization of Fremont HRU as an agricultural economy means that the economy is heavily dependent on the National Forest's production of forest and range commodity outputs. The economy is not diverse and actions taken by the Forest Service have a significant impact on this HRU.

There are many projects that could potentially have a significant impact on the structure of the HRU's. The projects are shown in Table III-5.

TABLE III-5
PROJECTS AFFECTING HRU STRUCTURES

<u>PROJECT</u>	<u>HRU</u>	<u>Note</u>
Intermountain Power Project	Delta	Used for population forecast
Coal Mining Development	Richfield	Used for population forecast
Oil and Gas Development	Potentially All	Not used for population forecast
Mineral and Uranium Development	Piute Beaver Milford	Not used for population forecast
Geothermal Development	Beaver	Not used for population forecast

Wage Structure

Two measures show that wages and incomes in the Sevier Social Resource Unit are below average. Measured by per capita income, the six HRU's of the Sevier SRU vary from 63 to 79 percent of the national average, because of larger families. Total family income was also compared to the national average. The six HRU's ranged from 61 to 80 percent of the national average by this measure.

TABLE III-6
PER CAPITA INCOME (1977)

<u>Area</u>	<u>Amount</u> <u>(1971 dollars)</u>	<u>Percent of</u> <u>National Average</u>
United States	\$5,751	100%
Utah	\$5,135	89%
Beaver HRU	\$4,431	77%
Delta HRU	\$3,761	65%
Fillmore HRU	\$3,761	65%
Fremont HRU	\$3,640	63%
Piute HRU	\$3,722	60%
Richfield HRU	\$4,523	79%

TABLE III-7
 MEDIAN INCOME FOR FAMILIES (1970)

<u>Area</u>	<u>Amount</u> <u>(1970 dollars)</u>	<u>Percent of</u> <u>National Average</u>
United States	\$9,590	100%
Utah	\$9,320	97%
Beaver HRU	\$7,289	76%
Delta HRU	\$6,819	71%
Fillmore HRU	\$6,819	71%
Fremont HRU	\$5,836	61%
Piute HRU	\$7,486	78%
Richfield HRU	\$7,668	80%

Wage scales of miners, power plant workers, carpenters and other workers who are primary beneficiaries of increased development suggest that incomes will increase dramatically in the next 20 years. The Bureau of Economic Analysis predicts that Utah's per capita income will grow at the second fastest rate in the nation.

Local Labor Supply

Table III-8 shows employment participation rates per 100 people over 15 years of age:

TABLE III-8
 EMPLOYMENT PARTICIPATION

<u>HRU</u>	<u>1980</u>	<u>1981</u>
State of Utah	59.49	57.95
Beaver	60.14	59.73
Delta	62.28	60.00
Fillmore	62.28	60.00
Fremont	53.73	53.33
Piute	54.35	54.26
Richfield	63.30	62.79

Only Fremont and Piute HRU's have the capacity to increase employment and participation rates to state averages. The rest of the HRU's participation rates are already greater than the state average. The base populations of the Fremont and Piute HRU's combined with high (compared to the State) employment participation rates leads to the conclusion that creation of large numbers of new jobs will require immigration of labor from outside the area.

Implications of Economic Analysis

The factors that influence the Sevier SRU are: 1) rapid population increase in an area that has not grown rapidly during the last 40 years; 2) transitions in several HRU's from agricultural toward non-agricultural economics; 3) prospective mining and industrial developments that will have major impacts on the area if initiated; and 4) change in per capita incomes due to the influx of workers developing the area.

Demands for resources from the Fishlake National Forest will vary according to impacts. In HRU's that switch to non-agricultural based economies the Forest will see increases in demands for recreation. In HRU's that remain agriculturally based, the Forest will continue to receive commodity demands for grazing and wood products.

Expected Future

The baseline population of the counties in the Sevier Social Resource Unit is anticipated to increase by 64 percent by the year 2000 (Utah State Planning Coordinator, 1980). This population growth is slightly more than the baseline population growth projected for the rest of the state.

The Bureau of Economic and Business Research (1981) estimated the population impact of the Intermountain Power Project (IPP) in West Millard County, Delta Human Resource Unit, to peak in 1986 at 4,027 and then decrease to 2,630 in the year 2000. Another factor in the growth of the population of the Sevier Social Resource Unit is coal development. Allen Fawcett in Population Impacts Resulting From Coal Mining in the Six-County Area (1979) estimated a range of coal production in the Sevier Social Resource Unit of between 9.2 and 10.0 million tons a year. If the total production were 5.0 million in the year 2000, the total population of the area can be expected to increase by 7,500. Oil and gas production is possible from the area. A total of 1,200,000 acres of Fishlake National Forest is currently under oil and gas leases. Additional government and private lands are being explored. A major find could boost the population of the Sevier SRU by adding workers for development of that resource. The timing and extent of development depend on both demand for oil and gas and locatable resources. Minerals such as uranium, molybdenum, alunite, gold and silver are found in the Sevier SRU. Development of a major mine to obtain any of these hard rock resources will have a significant local impact. The timing and size of locatable mineral development will depend on deposits and world and national economic conditions.

Fishlake National Forest lands will be influenced in a number of ways by expected development. The need to manage mineral resources will require more time and money. Demand for recreation will increase dramatically as population and per capita incomes increase. Conflicts between recreation and other resources will increase. There will be a need for more protection of resources from trespass and vandalism.

TABLE III-9
IN LIEU TAXES DISTRIBUTED TO COUNTIES UNDER PL94-565

ENTITLEMENT LAND ACREAGE (NOTE 1)

<u>COUNTY</u>	<u>FISHLAKE (ACRES)</u>	<u>TOTAL GOVERNMENT (ACRES)</u>	<u>FISHLAKE ACRES PERCENT OF TOTAL (Federal acres)</u>
BEAVER	137,906	1,287,605	10.7
GARFIELD	3,344	2,607,999	.1
IRON	2,297	1,220,803	.2
JUAB	20,788	1,538,094	1.4
MILLARD	306,956	3,342,691	9.2
PIUTE	188,787	350,860	53.8
SANPETE	1,941	530,743	.4
SEVIER	685,551	950,867	72.1
WAYNE	<u>76,909</u>	<u>1,274,138</u>	<u>6.0</u>
TOTAL	1,424,479	13,104,400	10.9

	PL94-565 PAYMENTS SECTIONS 1&3 FY 1979 - (NOTE 2)		(NOTE 3) ACTUAL FY 79 PAYMENT 87.676% PRORATED (DOLLARS)
	<u>TOTAL GROSS PAYMENT (DOLLARS)</u>	<u>FISHLAKE PROPORTION (DOLLARS)</u>	
BEAVER	199,496	21,346	18,715
GARFIELD	171,445	171	150
IRON	441,091	882	773
JUAB	245,471	3,437	3,013
MILLARD	328,000	30,176	26,457
PIUTE	57,755	31,014	27,192
SANPETE	387,968	1,552	1,361
SEVIER	393,265	283,544	248,600
WAYNE	<u>92,562</u>	<u>5,554</u>	<u>4,870</u>
TOTAL	2,317,053	377,676	331,131

NOTES

1. Total government acres are from an enclosure to a letter, 1920 Land and Resource Planning, Subject: Payment in Lieu of Taxes, date October 3, 1980. The Fishlake acreage is from internal documents.
2. Total gross payments are from the same letter referenced in the preceding note 1. The actual amount paid is subject to appropriation by Congress and previous years payments, etc. The payment, subject to a maximum based upon population, is computed by taking the higher of 75 cents an acre less certain adjustments, or 10 cents an acre.

3. The actual payment was 87.676% of the total gross payment. This column is the amount that is from Fishlake National Forest. The amount was estimated by taking the total payment and adjusting for the percentage of Fishlake National Forest lands in the county.

While growth in the local economy will create many problems, it will also offer opportunity for the Fishlake National Forest to respond to that growth. If expected changing demand is responded to in a timely manner, the land can be managed with a minimum of resource damage. Several HRU's in the Sevier SRU could experience boom type growth if rapid development takes place. The Forest Service has the opportunity to anticipate and respond to these changes.

Revenue Disbursement

In lieu taxes paid to the state for distribution to local counties, resulting from Public Law 95-565, are listed in Table III-9. The payment is based on a standard valuation of \$.10 an acre, or \$.75 an acre less certain adjustments. In either case, the maximum amount paid is based on county population. Finally, funds must be appropriated. For example, in Fiscal Year 1979 total funds appropriated equaled 87.676 percent of maximum funds payable.

A second source of funds to local counties is the 25 percent payment to counties under the Act of May 23, 1908. Table III-10 and III-11 show a breakdown of 25 percent fund payments by county.

TABLE III-10
25 PERCENT FUND PAYMENTS BY COUNTY

<u>COUNTY</u>	<u>FY 80 PAYMENT (DOLLARS)</u>	<u>FY 81 PAYMENT (DOLLARS)</u>
Beaver	9,210.15	8,728.89
Garfield	223.41	211.73
Iron	153.46	145.44
Juab	1,388.82	1,316.25
Millard	20,507.26	19,435.70
Piute	12,594.33	11,936.25
Sanpete	129.68	122.90
Sevier	45,801.48	43,407.41
Wayne	5,138.17	4,867.69

The source of the receipts and the corresponding payments by functions are as follows:

TABLE III-11
GROSS RECEIPTS AND 25% FUND PAYMENTS BY FUNCTION

<u>FUNCTION</u>	<u>FY 81 RECEIPTS (DOLLARS)</u>	<u>FY 81 PAYMENTS (DOLLARS)</u>
Knutsen-Vandenburg Sale Area		
Improvement Deposits	20,373	5,093
Timber	22,621	5,655
Land Uses	2,287	572
Recreation (Special Uses)	26,134	6,533
Power	4,018	1,005
Minerals	30,415	7,604
Recreation (Land & Water Cons. Fund)	23,744	5,936
Grazing	<u>231,106</u>	<u>57,776</u>
TOTALS	360,697	90,174

A far more significant source of funds to the state and the local counties comes from the Minerals Leasing Act of 1920. The state and local counties can share up to 50 percent of total receipts from lease sales, bonuses, royalties and rentals. Forty percent goes to the Bureau of Reclamation, and the remaining 10 percent of receipts goes to the U.S. Treasury.

Royalties and rentals are shown in Table III-12:

TABLE III-12
ROYALTIES AND RENTALS

	<u>FY 81 (DOLLARS)</u>
Coal	1,351,520/Year
Oil and gas	850,000
Geothermal	<u>23,435</u>
TOTAL	2,224,955/Year

Oil and gas rental will increase to approximately \$1,200,000, as all lands leased pay \$1.00/acre/year. If production occurs, royalty payments from oil and gas production could contribute large sums to the fund.

Coal rental and royalty payments should approach \$4,000,000 as the minimum royalty payment per ton increases to \$1.80, or 8 percent of the value of the coal.

The economic indicators for 1960 through 1995 for the 6 county area are shown in Table III-13.

TABLE III-13
ECONOMIC INDICATORS
(1978 dollars inflated to 1/1/1982 dollars)

	Past Trends				Baseline		
	1960	1970	1977	1981	1985	1990	1995
Population (M Persons)	23.9	21.8		36.45		57	60
Income (MM\$)						291	307
Employment (M Persons)				12.7		19.8	20.8
Agriculture				2.43		2.4	2.4
Logging and Sawmills				.2		.22	.23
Tourism and Retail Trade				2.27		3.55	3.7
(Other Sectors as Approp.)							
Payments under 25% Fund (in lieu of taxes) M\$				90		84	89

D. RESOURCE ELEMENTS

1. Recreation

Physical Setting

Mountains and elevated plateaus between intervening occupied valleys and a unique natural lake entice local and regional visitors to the Fishlake National Forest. Significant elevation change, providing climatic relief, coupled with 76 perennial streams and about 60 bodies of water, mostly reservoirs, create a pleasant setting for recreational opportunities. Various kinds of roads, ranging from two-tracks to paved highways, along with 900 miles of trails offer access and viewing possibilities to most of the 1.4 million acres of National Forest lands, as well as 100 thousand acres of State and private lands, within the National Forest boundary.

Fish Lake, a 2,500 surface acre natural lake and regional attraction, is about 185 highway miles from Salt Lake City. The rugged and scenic Tushar Mountains are located immediately east of Beaver. Beaver, along Interstate 15, is 220 miles from Las Vegas.

Visitors seeking recreational experiences on this Forest use motor vehicles to get to the locations of their preferred activities and may use them to participate in their activities. The classification of all lands within the Forest boundary into Recreation Opportunity Spectrum (ROS) classes results in 88 percent being either semi-primitive motorized or roaded natural, 11 percent being semi-primitive non-motorized, and one percent being rated rural.

Social Setting

Annual average use for the five year period 1978-1982 is 1,333,900 recreation visitor days (RVD). (One person visiting for 12 hours or 12 persons visiting for one hour or some combination equals one RVD.)

Data on fee envelopes from campgrounds at Fish Lake show the origins of visitors to be about 73 percent Utah, 15 percent California, 4 percent Nevada, 3 percent Arizona, and 5 percent other.

TABLE III-14
ORIGIN OF VISITORS BY MILEAGE ZONES AT CAMPGROUNDS AT FISH LAKE

<u>Sample Year</u>	<u>Distance Zones*</u>							
	<u>50</u>	<u>100</u>	<u>200</u>	<u>300</u>	<u>400</u>	<u>500</u>	<u>1000</u>	<u>1000+</u>
1980	12.40	5.64	53.02	4.13	3.02	16.61	3.25	1.90
1979	9.66	7.59	56.12	7.96	2.06	13.27	1.84	1.47
1972	5.90	3.87	62.52	4.96	2.30	15.75	2.90	1.80
1970**	1.13	5.51	53.88	14.34	3.14	9.29	9.32	3.32

* 50 represents 0-50 miles, 100 represents 51-100 miles and so on 1000+ represents distances greater than 1000 miles.

** Only Bowery Campground fee envelopes were used.

Developed sites on Tushar Mountain (Beaver Ranger District) have a different mix. Preliminary data analysis indicates visitor origin to be 40 percent California, 26 percent Utah, 22 percent Nevada, 6 percent Arizona, and 6 percent other.

Most common activities are driving/sightseeing, camping, fishing, hunting, picnicking. These activities, including those at developed sites, account for 85 percent of reported use on the Forest. A majority of the visitors seek motorized recreational opportunities and utilize motor vehicles to engage in other kinds of activities.

Most campgrounds rarely have unoccupied units during weekends, especially at Fish Lake, where facilities provide for overflow crowds. Fish Lake's campgrounds are usually 75 to 95 percent occupied from the third or fourth week of June through Labor Day, the heavy use season. Visitors are turned away from most sites during peak weekends, holidays, and opening weekends of fishing and hunting seasons.

Except for "favorite" areas (a few on each Ranger District), camping outside of developed sites can provide an opportunity for solitude. Hunting season, of course, is a big contrast, as "camps" seem to exist everywhere. However, considering the exceptions, opportunities for primitive-type camping are plentiful. It is this "solitude" that visitors from adjacent communities seek. Many of them do not want more developed sites and facilities.

Sites and Facilities

Public sector sites are developed by public funds, and include 19 campgrounds, 9 picnic sites, 1 boating site, and 1 visitor information site. These 30 sites accommodate about 3,700 people at one time (PAOT) and account for 250,000 RVD's of use. Many of these sites were constructed or reconstructed during Civilian Conservation Corps work of the 1930's. Another significant period for developed sites was the 1960's, when most sites were rehabilitated and almost all of the rest of the now existing sites were constructed.

Facilities within public sites have various service lengths, but eventually each table, fire circle, toilet, road and parking spur, and water system needs major repair or replacement. Annual funding has been limited and major maintenance or replacement has not been done as needed. Many of the facilities which were replaced or had major maintenance 15 to 20 years ago are approaching the end of their service period.

Water systems serving these sites are a special problem. They were installed as simple "running water" devices with only spring collection boxes, distribution lines, and hydrants. Safe drinking water standards have evolved since these systems were built. There is a need to design and construct facilities to meet those standards.

Private Sector sites are those on which facilities were usually constructed with private funds, but located on National Forest system land. Currently there are 126 permits involving 8 recreation residence sites, which range from one cabin at Widgeon Bay to nearly 50 residences at Lakeview. There are also three concession sites, commonly called resorts, under permit: Bowery Haven, Fish Lake Lodge, and Lakeside. Except for one site, Merchant Valley, east of Beaver, all sites are located adjacent to Fish Lake on the Loa Ranger District.

The capacity for the residences at Fish Lake is 695 people at one time (PAOT), and for the resorts is 776 PAOT. Residences at Fish Lake provided an estimated 68,200 RVD's, and the resorts 64,500 RVD's. The 11 residences at Merchant Valley have an estimated capacity of 68 PAOT, and use (1982) was 1,600 Recreation Visitor Days (RVD).

Trails

Administration and use of the Forest over a long period of time has changed from heavy reliance on trails to roads. Today most Forest land is within three miles of a road. Trail management plans currently provide for maintaining 897 miles of trails. Two trails are National Recreation Trails, Lakeshore, a 1.4 mile long paved route paralleling the shore of Fish Lake, and Skyline, 8.8 miles with scenic views along the top of the Tushar Mountains. Use of trails, except a few popular ones, is considered low to moderate.

Supply-Demand

It is difficult to compare total expected recreation visitor days with supply. Some activities now or will soon exceed supply. Others can increase considerably before exceeding supply. Demand for developed recreation in the public sector is projected to increase by 63 percent between 1980 and 1990 to 384,400 RVD's. Demand by the year 2030 should reach 684,000 RVD's. Maximum supply potential RVD's for developed recreation in the public sector in the 1980's is 575,300 and 1,057,100 for the 2020's.

Recreational opportunities are different from other resource supplies. With more people seeking the same opportunities in the same area, a point will eventually be reached where the experience is degraded. This is known as a shift in the social setting. It is believed fishing may have undergone this shift at some water bodies, and hunting has already been through one or more shifts, depending on the area visited.

Cultural Resources

The lands administered by the Fishlake National Forest, due to their general remoteness, have become a repository for much of the undisturbed evidence of the prehistoric and historic habitations in south central Utah. On the timbered ridges, and within the grass and sage-covered valleys of our Forest, the untold stories of ancient hunters, gatherers and farmers, as well as the tales of our own pioneering ancestors, are silently awaiting an expression. To this end, cultural resource specialists are currently inventorying the thousands of archeological properties within the boundaries of the Fishlake National Forest. As directed by Executive Order 11593, all inventoried cultural resources are evaluated for eligibility for nomination to the National Register of Historic Places. Through November of 1983, 1,230 archeological sites have been recorded on 75,000 to 90,000 acres of Fishlake National Forest system land. The occurrence of another 15,000 to 20,000 sites is projected for the remaining 1,335,000 to 1,350,000 acres of Forest.

Of the 1,230 archeological sites, one district and two sites have been nominated to the National Register. They are the Gooseberry Historic District, which contains over 175 individual properties, and the Aspen - Cloud Rockshelters. Many more sites have been evaluated as eligible for inclusion on the National Register. Many of these significant, eligible sites are found in:

1. Clear Creek Canyon,
2. Paradise Valley,
3. Bullion Canyon, and the
4. Upper and Lower Kimberly Districts.

According to the guidelines established by the USDA Forest Service (FSM 2361.02-2), 1990 has been established as the target date for the completion of the cultural resources survey and inventory of the Fishlake National Forest. This target will not be met, as the complete survey of the approximately 1,425,000 acres of Forest would take another 141 years based on a high annual survey average of 10,000 acres (see Table III-15).

TABLE III-15
CULTURAL RESOURCE SURVEY OUTPUT*

ACTIVITIES	No. of Surveys	Cleared Acres	Sites Located	% of Total Sites	Sites/Acres	No. of Surveys w/Sites
Lands	3.5	2,241	3	3%	1/747	2
Range	16	4,756	66.5	76%	1/71.5	5.5
Wildlife	1.5	20	0	0	0/20	0
Soil & Water	2.5	284	0.5	-1%	1/568	0.5
Timber	9.5	2,888	4	5%	1/722	3.5
Engineering	7	25	0.5	-1%	1/50	0.5
Recreation	2.5	26	0	0	0/26	0
Minerals	2	48	1.5	2%	1/32	1.5
Fires	1	165	0.5	1%	1/330	0.5
Special Uses	6.5	95	3.5	4%	1/27	2.5
CRM	6	45	8	9%	1/5.6	6
Total	58	10,593	88	N/A	N/A	22.5

* Table III-15: Baseline datum of cultural resource survey outputs by activity type under Alternative 8 (Current Program). The table has been constructed from an averaging of FY 82 and FY 83 data as presented on the Cultural Resources Management Accomplishment Report (Reference FSM 2360, Report FS-2300-M). Cultural resource surveys of range projects examined 45 percent of the cleared, year-end acres and recorded 76 percent of the sites.

For the future, cultural resource inventories will continue to be conducted prior to any decision relating to Federal undertakings which involve ground disturbing activities. As the rate of ground disturbing activities (i.e., range chainings, fences, pipelines, timber sales, etc.) increases or decreases, the rate of cultural resource survey and the recording and evaluation of new archeological properties will increase or decrease proportionately. Monitoring activities, which judge the effectiveness of site avoidance by project activity, have been done as other priorities permitted.

The enhancement and protection of the Fishlake National Forest's cultural resources, which is only minimally related to the degree of project work, will continue as in the past. The enhancement of the Forest's archeological properties, and indirectly their protection, has been pursued informally through the medium of public education. Cultural resource specialists, over the past five years, have taken an active role in the development of an awareness by the public of the fragile and irreplaceable nature of their archeological resources. This has been accomplished by the presentation of slide talks to civic groups, the development of conservation programs for use with public school children, the publishing (i.e., newspapers) of the on-going accounts of area excavations and the recent completion of a video movie dealing with both the preservation and recovery of archeological sites and artifacts in Clear Creek Canyon.

Page III-25, Paragraph 3: In February of 1985, the 46th Utah State Legislature passed the Fremont Indian Heritage Park bill (hb241) by a 79-8 margin. A sum of \$800,000 was appropriated for the facility with a commitment to provide an additional \$800,000 in January 1986. The managing state agency will be the Utah Division of State Parks and Recreation. The final architectural drawings by Edwards & Daniels of Salt Lake City were approved by the State Construction Board in November of 1985.

The Forest's law enforcement program, which is formally charged with the protection of the cultural resources, operates on the premise that every Fishlake National Forest employee has enforcement responsibilities. Ideally, the primary responsibility of the employee is to report any activity initiated by the public or the agency that is detrimental to cultural resources. In the past, cultural resource specialists have been informed of these activities.

At the notification of a cultural resource violation, the specialist then involves the appropriate Ranger District's law enforcement coordinator and the Forest's law enforcement officer. In the past, law enforcement efforts have been bolstered by both Regional Office surveillance equipment and manpower. Regional law enforcement officers have been generally responsive to the needs of the Forest and have participated in at least three investigations of cultural resource violations during the last 5 years.

Finally, the Forest has just recently introduced a new policy that would aid in the protection of significant cultural resources. When a property is nominated to and, subsequently, is accepted to the National Register of

Historic Places, a plan of protection will be formulated within a year of the listing. This plan of protection may contain measures such as fencing, periodic patrolling and compatible multiple-use management.

Visual Resource

An intensive level inventory of visual quality for the entire Forest has not been completed. Certain parts have been done since the visual resource management system was developed. Some visual quality determination was done as part of the previous unit planning process, also areas of intensive resource activity, particularly Fish Lake-Johnson Valley and Tushar Mountains were examined. Further a first approximation of visual quality was prepared for use in environmental assessments. Altogether 40 percent of the Forest has had an intensive level of examination for visual condition or had visual quality objectives established for unit plans. The remaining 60 percent has had an extensive level of inventory.

There is a variety of mountain landscapes within the Forest with a wide range of forms and numerous lines, colors and textures. Forms range from flat plateaus to rugged vertical cliffs with many different rounded or angled forms in between these extremes. The most noticeable lines are those related to the geology, such as layers of rock or change between colors of rock. Some lines are evident as change in vegetation, aspen to conifer or sage-grass to pinyon-juniper. Other than the white of winter, color contrast is greatest where the red or even white rocks meet or are interspersed with the green vegetation. Large areas of same color and texture are infrequent, usually due to either interspersed vegetation types or changes in land forms.

Most visitors see the Forest from vehicles and a "utilitarian" impression may dominate the mind. Roads, fences, vegetative manipulation, water developments (livestock), reservoirs, power lines, structures, mining scars, watershed treatment and timber harvest provide constant reminders of landscapes of utility.

Almost every acre can be seen either from the valleys outside the Forest or the roads and trails within the Forest. Conifer acreage is only 10 percent of the Forest. This fact combined with the many steep slopes presents an "openness". Thus many Forest landscapes have a low ability to absorb resource activities.

2. Wilderness

Public Law 98-428 designated no wilderness areas on the Fishlake National Forest. Prior to the Utah Wilderness Act of 1984, the Forest planning process had developed an inventory of lands meeting the minimum definition of wilderness, and qualified for wilderness evaluation per NFMA Regulation 219.17. The inventory contained 36 roadless areas, totalling 735,320 acres Forest wide. This inventory and description of each area is filed with the Forest's planning records.

The Utah Wilderness Act of 1984 designated 749,500 acres state-wide as wilderness. It is estimated that these areas, in addition to the area

that existed prior to the Act, will meet the anticipated demand for wilderness during the first planning period. At the end of this period, and during Forest Plan revision, the need for additional wilderness will be evaluated. The total acres on the Fishlake Forest that are estimated to be available at that time is approximately 720,000. See also Chapter IV.

Maximum supply potential for wilderness is calculated as 735,320 acres.

3. Fish and Wildlife

The Fishlake Forest has a wide range of habitats, with a corresponding large number and variety of wildlife species. Habitats are diverse because of physiographic variations, topographic features, elevation differences, precipitation variances, and management practices that alter vegetation communities. However, diversity is being lost due to long-term encroachment of pinyon-juniper and other conifers and to lack of aspen regeneration.

Major habitat types include: alpine; spruce-fir; quaking aspen; some areas of ponderosa pine mixed into the transition zone between conifer-aspen and mountain brush; pinyon-juniper; and a wide range of sagebrush-desert shrub types. Mixed throughout these types are riparian zones and meadows (both dry and wet). Aquatic habitats are represented by mountain streams, reservoirs and lakes, seeps and springs, potholes, and various ephemeral water sources.

Wildlife is cooperatively managed with the Utah Division of Wildlife Resources (DWR), and coordinated with the Bureau of Land Management and the National Park Service on adjoining administered lands and with the public at large. The U.S. Fish & Wildlife Service is consulted in matters concerning the Threatened and Endangered Species Act, Fish and Wildlife Coordination Act, Bald Eagle Protection Act, and animal damage control.

Most previous wildlife habitat management programs have been directed toward big game winter range improvement. During 1982 and 1983, approximately 4,243 acres of big game habitat have been rehabilitated through burning, cutting, and chaining. Other projects include: fencing approximately 1.5 miles of streams to protect Bonneville cutthroat trout habitat; installation of 88 instream fish habitat structures; 16 access ramps in water developments, and 50 nest boxes for song birds. Work has also been done to close roads, plant willows, and maintain existing developments.

Current management is attempting to expand the scope of the wildlife program and to place a greater emphasis on fisheries, other game, and nongame species habitat improvement, while maintaining the progress made in big game habitat management. Increased awareness and acknowledgement of existing and available big game forage will be the key to this change of emphasis.

Future management practices will continue to improve horizontal and vertical diversity of habitat for viable populations of the wide range of species found on the Forest. Population sizes of species other than

Threatened and Endangered (T&E) and big game are for the most part unknown or poorly understood.

Terrestrial Wildlife

Big game species found on the Forest include mule deer, elk, and pronghorn antelope. Demands for these species far exceed current supplies. Existing habitat capabilities of winter range exceed current populations of elk and deer. Moose are not considered to be a native big game animal. Antelope are found only on one small area of the Forest and to date have received limited attention as a viable Forest big game species.

Black bear and mountain lion are classed as game animals, but not as big game, and pressures for their removal as potential predators of livestock are intense. Hunting demand far exceeds supply. Other game animals which are harvested from the Forest include blue grouse, ruffed grouse, sage grouse, chuckar partridge, cottontail rabbits, snowshoe hares, and mourning doves. Other species of game animals which occupy Forest habitat, but for which information is limited, include turkey, quail, band-tailed pigeons, and waterfowl.

Nongame and furbearing animals which are of economic importance are the coyote, bobcat, muskrat, beaver, and jackrabbit. Songbirds, shorebirds, water birds and raptors are found over a wide range of habitats, especially riparian/aquatic zones. Information concerning the distribution, habitat use, and economic importance of most of these latter categories of wildlife is limited.

Wildlife of high sensitivity, which have economic value, and which have potential for being reestablished in Forest habitats, include bighorn sheep, otter, and possibly marten. Bighorn sheep are listed by DWR for relocation on the west side of the Forest, but specific plans for reintroduction have not yet been established. There has been no effort to reestablish marten or otter. Turkeys are being transplanted onto the Forest.

In the early 1970's deer numbers were reduced to below carrying capacity of winter ranges: they have not yet recovered Forest-wide. Elk were eliminated from the Forest in the late 1800s: they also have not yet recovered to carrying capacity of available habitat. Currently a total of 500 elk are found scattered throughout the western and southern mountain ranges (Tushar, Monroe and Pahvant) of the Forest, and approximately 1,500 are located on the eastern portion of the Forest (Salina Canyon and Fish Lake Mountain).

Winter range carrying capacity for deer at this time is calculated to be approximately 25,000 deer on the 29 percent of the total winter range provided by the Forest. Current carrying capacity for elk is approximately 3,700 elk on the 90-95 percent of the winter range provided by the Forest. Deer numbers appear to be trending upward at a pace which may bring them to carrying capacity of their critical range by 1990.

The elk population is trending upward at about 2-5 percent per year (Sawyer 1982). At the apparent current rate of natural increase of elk, DWR and Region 4 RPA 80 objectives will not be reached by 1990. A relocation or translocation program (trap and release) may be needed if the 1990 goal of 3,400 elk Forest-wide is to be reached. This program would relieve the current unequal distribution of elk, as well as provide for an equalization of hunting pressure to relieve heavy congestion of hunters on the east side of the Forest. Maximum habitat capability for deer and elk, with an 80 percent deer to 20 percent elk habitat ratio, is 136,436 deer and 12,350 elk.

Demand for big game hunting exceeds the supply, and the gap between the two continues to widen. In 1981, 31,701 rifle hunters (6,000 above the last 10 year average) harvested 9,746 deer, (114 less than the 10 year average). Elk hunting on the Fish Lake unit in 1981 fared somewhat better, where 1,919 hunters (124 less than 10 year average) spent over 8,000 hunter days to harvest 344 elk (126 more than 10 year average). In 1982, approximately 3,143 archers spent over 16,000 hunter days to harvest approximately 495 deer, while approximately 718 muzzle loaders spent almost 3,000 hunter days to harvest approximately 122 deer. Fishlake elk also attracted 174 archers who spent 1,149 hunter days with a harvest of approximately 10 elk. Current hunter days (one person for 12 hours or combination thereof, including nonconsumptive use) for the Forest are estimated at 103,000 annually.

Sensitive, Threatened and Endangered Species

No critical habitat has been formally classified for any threatened and endangered species on the Forest. The bald eagle (endangered) winters on the Forest near rivers, lakes, and major migration routes. The Forest also provides habitat for the Utah prairie dog. The Forest has cooperated for several years in a recovery program which consists of providing 10 transplant locations. This has led to the downlisting of the Utah prairie dog from endangered to threatened status. The Bonneville cutthroat trout is regionally listed as a sensitive species and is a candidate for Federally listed threatened status. It is found on the Forest on the west side of the Tushar Mountains and the south end of the Pahvant range. The peregrine falcon (endangered species) also has utilized the Forest in very limited numbers. However, only one nesting area has been identified (see Forest Threatened and Endangered Plan). Another raptor of high interest is the osprey, which inhabits the Fish Lake-Johnson Valley Reservoir area. Trends of these species have been up for the bald eagle, prairie dog, and cutthroat trout, and static for all others. Region 4 listed sensitive animal species are shown in Table III-16.

TABLE III-16
SPECIES CONSIDERED BUT NOT SELECTED FOR MIS

SPECIES	REASON FOR CONSIDERATION	VIABLE POPULATION	ESTIMATED POPULATION	APPARENT TREND
1. Bald Eagle	Endangered species	Yes	Migratory (unknown)	Up
2. Peregrine Falcon	Endangered species	Yes	Migratory (unknown)	Static
3. Utah Prairie Dog	Threatened species	Yes	Transplanting Stage	Up
4. Sage Grouse	Economically important, hunted	Yes	Unknown	Static
5. Northern Flying Squirrel	Sensitive	Yes	Unknown	Unknown
6. Mountain Bluebird	Sensitive	Yes	Unknown	Unknown
7. Turkey	Economically important, hunted	Unknown	Transplanting Stage	Unknown
8. Cottontail Rabbits	Economically important, hunted	Yes	Unknown	Up
9. Snowshoe Hare	Economically important, hunted	Yes	Unknown	Up
10. White-tailed Jack-rabbit	Ecological indicator, declining	Unknown	Unknown	Down
11. Forest Grouse (ruffed and blue)	Hunted	Yes	Unknown	Static to down
12. Merlin	Sensitive	Yes	Unknown	Unknown
13. Osprey	Locally rare, high interest	Unknown	1-2 pairs	Static
14. Western Bluebird	Sensitive	Unknown	Unknown	Unknown

There are eleven species of sensitive plants (Table III-17) and two threatened species (Astragalus perianus and Townsendia aprica) on the Forest. In addition several other sensitive species occur on lands adjacent to the Forest. Habitat for these species may occur within grazing allotments. When this happens, allotment management plans will recognize and provide for the protection of these species. Sites for the threatened species have been located and mapped.

TABLE III-17
SENSITIVE PLANT SPECIES FOUND ON THE FOREST

Astragalus consorbrinus
Castilleja parvula var. parvula
Draba ramulosa
Draba sobolifera
Epilobium nevadense
Eriogonum ostlundii
Hymenoxys helenioides
Machaeranthera kingii
Najas caespitosa
Penstemon parvus
Penstemon wardii

Aquatic Wildlife

The Fishlake National Forest supports a variety of fishery habitats ranging from small potholes and streams to large reservoirs and natural lakes. There are over 700 miles of perennial streams and 4,500 acres of lakes and reservoirs within the Fishlake Forest. Sixty-six streams, representing over 380 miles of habitat, are known to support fish populations. Forty-nine lakes and reservoirs provide more than 4,200 acres of fish habitat. Numerous small potholes and beaver dam ponds provide additional habitat.

There are 16 species of fish found on the Fishlake Forest. Coldwater game species include lake, rainbow, cutthroat, brown and brook trout; kokanee; and arctic grayling. The yellow perch was first found in Fish Lake in 1970 and is presently established in Fish Lake and Johnson Valley Reservoir in limited numbers. Nongame species found on the Forest include: mottled sculpin, speckled dace, redbelt shiner, Utah chub, leatherside chub, mountain sucker, flannelmouth sucker, and Utah sucker.

Cutthroat trout are the only native game fish found on the Forest. Originally, two subspecies of cutthroat trout are believed to have occurred on the Fish Lake. The Colorado River cutthroat trout, was found in the Colorado River drainage and is thought to have been common at one time in Fish Lake. The Bonneville cutthroat trout was once found throughout the Bonneville Basin, which includes the Beaver and Sevier River drainages. Both fish have been greatly reduced throughout their ranges through the loss of habitat and the widespread introduction of

nonnative trout. The Forest Service has identified both fish as sensitive subspecies. The U.S. Fish and Wildlife Service is currently reviewing the status of the Bonneville cutthroat trout to determine whether it should be proposed for listing as a threatened subspecies.

There are presently no known populations of Colorado River cutthroat trout remaining on the Forest. Several isolated pure strain populations of Bonneville cutthroat trout have been identified in Utah streams including two streams on the Forest. Pure strain Bonneville cutthroat trout have been transplanted into two additional streams on the Forest. A number of small headwater streams on the Forest could still contain remnant populations of Bonneville cutthroat trout.

Most cutthroat trout presently found on the Forest are introduced fish, primarily of the Yellowstone variety. The Utah Division of Wildlife Resources (DWR) is currently taking eggs from cutthroat trout found in Strawberry Reservoir, which originally came from Yellowstone stock, to use in their cutthroat trout stocking program throughout the state.

The DWR has rated many of the lakes, reservoirs and streams found on the Forest on the basis of esthetics, availability and productivity. A numerical rating system is used to assign each water to a class ranging from Class I, the highest valued waters, to Class VI, dewatered streams or lakes. Fish Lake, a 2500 acre natural lake, is one of four lakes in the state rated as a Class I fishery. This lake supports a variety of introduced trout species, the primary one being rainbow trout. In addition, a trophy lake trout fishery is maintained by natural reproduction and annual fingerling stocking.

Johnson Valley Reservoir is one of five Class II lakes and reservoirs in the state. Johnson Valley Reservoir has a continuing problem with large nongame fish populations competing with trout for food. The reservoir was chemically treated in 1979 and restocked with rainbow and cutthroat trout in 1980.

The remainder of the fishable lakes and reservoirs and most of the fishable streams are rated as Class III, typical coldwater trout habitat or Class IV, marginal coldwater trout habitat. A few sections of Forest streams are dewatered and rated as Class VI waters. The Fishlake Forest has conducted habitat surveys on 49 of its fishable streams. These surveys rated the streams by their percent of optimum habitat. Thirty-one streams (63 percent) were rated as being in overall poor condition. Sixteen streams (33 percent) were in fair condition. Only two streams (4 percent) were considered in good condition. The average stream rated on the Forest had a habitat condition of less than 50 percent of optimum. These low habitat ratings were based on a combination of poor pool quality, lack of streamside vegetation and high amounts of silt in the streams.

About half of the lakes on the Forest, representing 80 percent of the total lake surface area, are thought to be producing trout below their potential due to problems such as frequent winter kills, low water levels from periodic drawdowns, or competition from nongame fish. The average trout production of all lakes on the Forest is estimated to be

approximately 65 to 70 percent of potential production based on estimated impacts of known problems.

Fishing use on the Forest has increased an estimated 23 percent in the past ten years. An estimated 58,500 recreation visitor days (RVD's) were spent on cold water fishing on the Forest in 1980 at an estimated dollar value of \$1,044,225. Demands on the fishery resource are expected to increase substantially over the next 20 years due to population increases in the five county area in which the Forest is located. Overall dispersed recreation use on the Forest, which includes fishing, is expected to increase 30 percent from 1980 to 1990 and 130 percent from 1980 to 2030. If fishing demand increases at the same rate as overall dispersed recreation demand, an estimated 134,550 RVD's will be spent on fishing in 2030.

During this same time period, projected increases in mineral development, oil and gas exploration, road construction, as well as continued impacts from timber harvest and livestock production have the potential for adversely impacting fish habitat and further reducing fish production on the Forest.

Fish production in Forest streams and lakes could be increased by improving aquatic habitat. There is considerable opportunity for fishery habitat improvement on the Forest. This includes rebuilding or repairing small dams; obtaining conservation pools on existing reservoirs; and improving degraded stream habitat through bank stabilization, pool development, barrier removal, cover improvement, improvement of spawning habitat and maintenance of minimum instream flows.

Management Indicator Species (MIS)

National Forest Management Act Regulations direct the National Forests to identify Management Indicator Species (MIS). FSM 2621.1 states: "Wildlife, Fish, and Plant Species (or groups of species) shall be selected to assure the maintenance of viable populations of existing native and desired non-native plants and animals; to facilitate the attainment of RPA habitat capability goals; and to represent area specific issues, concerns, and opportunities." Some species were selected to represent specific habitats while others were selected to represent several habitat types.

Two categories of MIS have been established for this Forest Plan. One for ecological indicators and the other to represent species of high interest. Ecological indicator species were selected using the following criteria:

1. A strong (but not exclusive) affinity for the vegetation type.
2. A life cycle keyed to a vegetation type.
3. Sensitivity to habitat change.
4. Relative ease of monitoring, i.e., easily recognized and adequate numbers.
5. Somewhat representative of other species which use the same vegetation type.

Ecological indicator species and their obligate vegetation types or special habitat needs, are listed in Table III-18.

TABLE III-18
ECOLOGICAL INDICATOR MIS FOR THE FISHLAKE NATIONAL FOREST

<u>SPECIES</u>	<u>VEGETATION TYPE OR HABITAT NEED</u>	<u>ESTIMATED POPULATIONS</u>
1. Goshawk	Mature (old growth) conifer	Unknown
2. Cavity Nesters*	Snags (standing dead trees)	Unknown
3. Riparian Guild**	Riparian (communities)	Unknown
4. Sage Nesters***	Sagebrush (Communities)	Unknown
5. Macroinvertebrates	Streams (water quality)	
6. Resident trout****	Streams, lakes and reservoirs	Unknown

* Includes primary and secondary species (to be monitored on a case by case basis), i.e.: Williamson's sapsucker, Bluebirds, Hairy Woodpecker.

** Includes selected riparian dependant species from the wide array of communities or habitat types found in the riparian zone, ie: McGillivray's warbler from the shrub zone, Bullock's oriole for tall hardwood trees, water pipit for high elevation wet meadow areas, etc., dependent upon the proposed project or management activity.

- *** Includes sage dependent species, ie: sage thrasher, vesper sparrow, sage sparrow, etc. (on a case by case basis) dependent upon proposed project or management activity.
 - **** Includes brown, brook, cutthroat, rainbow and lake trout (to be monitored on a case by case basis).
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Species which are categorized as high interest MIS are listed in Table III-19. They were selected because of their threatened, endangered or sensitive status, social or economic importance, or high public interest.

TABLE III-19
HIGH INTEREST MIS FOR THE FISHLAKE NATIONAL FOREST

SPECIES	VEGETATION TYPE OR HABITAT NEEDED	ESTIMATED POPULATION
1. Elk	General & winter range	2,000*
2. Mule deer	General & winter range	25,000*
3. Bonneville Cutthroat Trout	Cool clear water with high oxygen content (streams)	5,500
4. Rydbergs milkvetch	Federal T&E species (threatened)	4,000

*Population based on the animals currently occupying the winter range found on the Forest (Bowden-1984)

Other species on the Forest which were considered as MIS, but which were not selected because planned management activities would not significantly impact them, are listed in Table III-16. Elk, deer, resident trout, and macroinvertebrates were selected because they are generalist, wide ranging species. The latter two will represent aquatic and semi-aquatic species and many riparian species as well, i.e., when trout habitat, be it lake or stream, is managed optimally, then many riparian habitats will be improved and waterside vegetation diversity will provide niches for species found there. Also, when water quality is managed for a high biotic condition index for macroinvertebrates, many other aquatic species will benefit.

Special habitat needs which cannot be met by the above concept have been provided for by the use of MIS for special habitats, such as cavity nesters, riparian guild, sage brush and old growth conifer dependent species.

Currently, with the exception of T&E Species, all known wildlife species existing on the Forest have viable populations. Several species—bighorn sheep, otter, grizzly bear, wolves, marten, mink, and lynx—may have existed on the Forest but do not at the present time. Existing population levels of management indicator species are below their habitat capabilities. Maximum potential levels of terrestrial indicator species can be obtained with management techniques which will change vegetative ecological succession; exceptions would be species dependent upon old growth sagebrush and timber. Curtailment of conifer and pinyon-juniper invasion, modification of existing timber and pinyon-juniper stands, increased and improved riparian zone vegetation, and rejuvenation of aspen and mountain brush will improve conditions for MIS. Trends of significant vegetative types as they relate to specific habitats associated with MIS are shown in Table III-20. Estimated population trends are also depicted in Table III-20. Aquatic MIS will not reach maximum potential populations, however, population levels are expected to increase.

TABLE III-20
 COMMUNITY TYPES AND THEIR CURRENT TRENDS*
 POPULATION TREND OF MANAGEMENT INDICATOR SPECIES**

MANAGEMENT INDICATOR SPECIES	ASPEN	CONIFER	MEADOW	SAGE-BRUSH	MOUNTAIN BRUSH	PINYON-JUNIPER	RIPARIAN	AQUATIC	POPULATION TREND	SELECTION*** CRITERIA
Mule Deer	-	+	-	X	X	+	-		+	2 & 4
Elk	-	+	-	X	X	+			+	2 & 4
Rydberg's Milkvetch	-	+					-		X	1 & 3
Bonneville Cutthroat Trout								X	+	1,2 & 3
Resident Trout								-	X	2,3,& 4
Macroinvertebrates								X	X	3 & 4
Sage Nesters				-					-	3 & 4 sage nester
Cavity Nesters	-	-			-	-	-		-	3 & 4 snags
Riparian Guild							-		-	3 & 4
Goshawk		-							X	3 & 4-old growth conifer

- § Habitat trends for species: - = Decreasing; x = Static; + = Increasing; "Blank" = Non-applicable.
 ** Population trends for species: - = Decreasing; X = Static; + = Increasing; "Blank" = Non-applicable.
 *** 1 - Species on State and Federal Lists classified as Threatened, Endangered.
 2 - Species commonly hunted, fished or trapped.
 3 - Species with special habitat needs.
 4 - Species whose population changes are believed to indicate effects of management of other species.

Habitat Type/MIS Relationships (Ecological Indicators)

Goshawk (Mature Old Growth Conifer)

The goshawk is a raptor that requires a habitat containing some old-growth timber. It constructs a nest of sticks in tall trees in dense coniferous forests. It has a nesting territory of 8 to 12 miles in diameter. Reproduction activity takes place in April, May and June in dense forested areas, with three to five whitish eggs in a clutch. It is migratory and has a minimum habitat requirement of 25,000-30,000 acres per pair (Thomas - 1979). Current distribution on the Forest is unknown.

Cavity Nesting Species (Standing Dead Trees)

This group of species all have similar needs for a certain type of specialized habitat component. That component is dead or dying trees above a certain DBH. No single species could be picked because of the wide range of species obligation. Therefore cavity nesters will be monitored on a case by case basis, determined by proposed projects which could affect existing or potential snags, i.e., an aspen clearcut would affect different cavity nesters than would a spruce-fir or ponderosa pine silvicultural treatment. Approximately 21 species of birds and 11 species of mammals utilize holes in trees in various stages of decay. Because a great many of these species depend on the 10 primary species (the ones which drill the holes) in different habitat types it was decided to use a group MIS rather than a single species. Inventory and monitoring will be done on a case by case basis. A proposed project in old growth timber will require use of species such as the northern three-toed woodpecker which is a primary species or cavity maker. A proposal to remove aspen or oak might call for mountain blue bird to be monitored.

Intense interest in saving energy by burning wood in stoves and fireplaces appears to be responsible for the decreasing numbers of standing dead trees on the Forest.

The northern three-toed woodpecker is a commonly found primary cavity nester in the conifers of the Fishlake National Forest. It excavates nest cavities each year in standing dead trees or in dead limbs or live trees with rotted heartwood (Jackman and Scott, 1975). It is important in combating forest insect pests, especially spruce beetles. It is a year long resident on the Forest. It reproduces during May and June, usually producing 4-5 young. Its territory is approximately 75 acres/pair (Thomas, 1979). Cavities left by this, and other primary nesters, are quickly occupied by secondary nesters such as chickadees, bluebirds, and flying squirrels.

MacGillivray's Warbler (Riparian Guild Representative For Riparian Shrub Community)

This summer breeder is restricted to low dense brush and moist thickets along riparian areas where it lays 3-5 white eggs with brown spots in a grassy cut nest close to the ground (rarely above 5 feet) in brush or tall weeds.

Sage Thrasher (Sage Nester Guild Representative For Old Growth Sage)

This species is somewhat dependent on old growth sagebrush where it nests in old (20 years) sagebrush stands. The bulky twig nest is on the ground or well hidden in brush and contains 4-5 glossy blue, boldly spotted eggs. Critical nesting areas require 5-10 acre patches.

Macroinvertebrates (Aquatic)

Macroinvertebrates are found in a wide variety of aquatic habitats on the Forest. Each macroinvertebrate community is directly related to its physical and chemical environment. Macroinvertebrate communities are excellent indicators of water quality and are sensitive to environmental changes in the aquatic habitat.

Resident Trout (Lakes, Reservoirs And Streams)

Because a variety of resident trout species are found in several aquatic habitats on the Forest, no one species was selected to represent all aquatic habitats. Brook, brown, cutthroat, lake and rainbow trout will be used as indicator species in habitats where they are presently found or where they may be introduced in the future. All trout species prefer habitats with cold, clean water, adequate food, and available spawning habitats. In riverine habitats, trout prefer streams with deep pools, clean gravel, undercut banks, overhanging streamside vegetation and sufficient riffle areas for food production. In lake and reservoir habitats, trout need either an inlet or outlet stream or a rubble or boulder lake bottom for spawning and adequate year-round dissolved oxygen levels.

High Interest Species

Mule Deer (General And Varied Habitat Types)

Approximately 50,000 mule deer are currently using the Fishlake Forest for the greater part of their life cycle. They occupy most vegetation types at some time during a given year. Nonwinter range generally occurs on the Forest above 6,500 feet elevation in conifer, aspen, and mountain brush communities. Winter range occurs in the pinyon-juniper, sagebrush, and low elevation mountain brush. Tree and tall brush types provide thermal and hiding cover areas. Shrub, forb and grassland types are used as forage areas. Optimum fawning habitat occurs where there is tree or brush overstory, succulent forage and gentle south aspect topography in close proximity. Winter range is believed to be the limiting factor for the carrying capacity of the Forest. Currently, about 25,000 deer are using winter range on the Forest. Population viability is not considered to be an issue for mule deer because no Forest actions or policies would be implemented which would bring deer populations to such a low number that they could become nonviable.

Elk (General And Varied Habitat Types)

This species also occupies most of the Forest vegetation types at some time during a given year. Summer range generally occurs in mesic conifer or aspen/grass/forb meadow complexes. Spring, fall and winter ranges are located at lower elevations, usually just above the wintering deer populations, in shrub/grass range types or hardwood shrub-grass complexes adjacent to conifer types. The preponderance of elk winter range occurs on the Forest. Optimum calving habitat generally occurs where forested stands occur interspersed with shrub, grassland, or meadow types and where there is gentle, south aspect topography, succulent forage, and adjacent cover. It is generally believed that winter range is the limiting factor for carrying capacity. Like deer, species viability is not an issue for elk. Current population is estimated at 2,000 animals Forest wide.

Bonneville Cutthroat Trout (Selected Streams)

The Bonneville cutthroat trout is listed as a sensitive species by the Regional Forester. It is currently undergoing status review by the U.S. Fish and Wildlife Service to determine whether it should be officially listed as threatened or endangered.

Populations of Bonneville cutthroat trout are presently known to occur in four small headwater streams on the Forest. Habitat requirements include high water quality, clean gravels for spawning, adequate pool/riffle ratios for resting and feeding habitat, and streamside vegetation and undercut banks for cover and water temperature control.

Rydberg Milkvetch (Selected Habitat Type)

This species is officially listed as threatened. It is endemic to the Fishlake and Dixie National Forests. The species is restricted to igneous intrusive and volcanic gravels between 8,000 to 11,500 feet. Habitat alteration or loss of habitat are potential threats to the Rydberg milkvetch. Population counts have not been made for this species but a rough estimate of 4,000 plants seems reasonable for the Fishlake National Forest populations. One habitat area of this species is included within a proposed RNA. Such a designation should provide management strategies for habitat protection.

MIS Minimum Viable Populations

The amount of habitat necessary to maintain viable populations of ecological indicators has not been well established. However, such a determination can be guided by some existing facts:

-All management practices on the Fishlake Forest will ensure that fish and wildlife habitats are managed to "maintain viable populations of all native and desired nonnative wildlife, fish and plant species in habitats distributed throughout their geographic range on NFS lands". (NFMA Regulations)

-Population "boundaries" for ecological indicators are not defined, but are undoubtedly larger than the Forest Standards and Guidelines will allow any one practice to be applied. If a given area of sagebrush is 1,000 acres in size, no treatment will be allowed which will convert more than 50 percent of that type.

-Conversely, population "boundaries" are probably limited to "isolated" units of habitat (e.g., a resident species that inhabits the Loa District has little opportunity to interbreed with one that inhabits the Fillmore District). However, gene flow between resident populations within a District is probable and desirable.

-A minimum viable population for animals has been suggested to range from 50 to 500 individuals (Franklin, 1980). While average bird territory sizes are quite variable due to differences in population density, habitat type, and aggressiveness (Schoener, 1968), a generalized nesting territory size of 20 acres can be assumed. This generalized territory is ample for some (MacGillivray warbler and sage thrasher) and minimal for others (northern three-toed woodpecker and goshawk). Therefore, we have assumed that a minimum unit of viable habitat must be maintained where each population is reproductively isolated and the species currently exists.

In instances where the specificity is lacking to determine individual populations or habitat isolation, then potential populations are calculated Forest-wide and minimum viable populations calculated at 40 percent of the potential. For minimum viable population numbers of Forest MIS, see Table III-21.

For instance, determining the number of isolated or individual populations (demes) of elk or deer with the available baseline data would not be appropriate. Therefore, for deer and elk, minimum viable populations were arrived at by determining 40 percent of the 1979 RPA figures of 3,400 elk and 82,600 deer Forest-wide. (See Table III-21)

A minimum viable habitat for a bird species unit is thus calculated:
250 nesting pairs X 20 acre/nesting pair = 5,000 acres of habitat for that species.

Since a viable population must be able to reproduce itself and have interaction with adjacent populations, a minimum unit of habitat must be available where the species currently exists and it must be close enough to allow interaction between populations.

Minimum viable population numbers for resident trout are based on 40 percent of potential or current population numbers, whichever is greater. (See Table III-21).

TABLE III-21
FISHLAKE FOREST MIS ESTIMATED POPULATION & HABITAT CAPABILITIES

PLANT AND ANIMAL SPECIES

SPECIES	INDICATOR HABITAT	ACRES OF INDICATOR HABITAT	ACRES OF POTENTIAL HABITAT	EXISTING POPULATION ESTIMATE	POTENTIAL POPULATION NUMBERS	MINIMUM VIABLE POPULATION NUMBERS	ACRES REQUIRED TO MAINTAIN MINIMUM VIABLE POPULATION NUMBERS
Macroinvertebrates	Streams	800	800		BCI=100	Unknown	800
Resident trout							
Lacustrine	Lakes & Reservoirs	4,200	4,500	260,000LBS			4,200
Lake <10,000'					100 lbs/acre	40 lbs/acre	
Reservoirs <10,000'					50 lbs/acre	20 lbs/acre	
Lakes & Reservoirs >10,000'					20 lbs/acre	8 lbs/acre	
Riverine	Streams	800	800	25,000LBS			800
Pahvant & Salina					160 lbs/acre	64 lbs/acre	1/
All other					120 lbs/acre	48 lbs/acre	1/
Bonneville cut-throat trout	Streams	10	800	4,500FISH			10
Wapiti (elk)	General		677,533		4,540	1,360	27,170
Mule deer	General		677,533		61,080	33,040	45,584
Sage nesters	Sagebrush	265,183	265,183		88,394 pairs	35,358 pairs	206,074
Riparian Guild	Riparian Communities	23,700	74,910		3,746 pairs	1,498 pairs	29,960
Goshawk	Conifer (old growth)	111,877	379,880		723 pairs	289 pairs	111,877
Cavity nesters	Conifer, Aspen (snags)	420,586	420,586			8,412 pairs	168,234
				<u>PLANT SPECIES</u>			
Rydberg milkvetch	3/		4,000			As prescribed in recovery plan	

1/ or 40% of current, whichever is greater

2/ Based on habitat carrying capacity of Forest share of winter range. DWR goals from 1979 R-4 data base include 3,400 elk & 82,600 deer for the total Forest.

3/ Criteria for this plant has not been fully established

4. Range

Fishlake National Forest lands provide important forage for grazing animals. In 1980, over 1.3 million Forest acres were included in grazing allotments. Currently, approximately 639,856 acres are suitable for livestock grazing. Suitable grazing acres vary, depending on the class of livestock being grazed.

The Forest manages 75 range allotments; 59 are under some form of intensive management. There are approximately 340 permittees. Approximate permitted animal unit months used on the Forest by cattle and sheep since 1943 are shown in Table III-22.

TABLE III-22
APPROXIMATE PERMITTED ANIMAL UNIT MONTHS*
Fishlake National Forest

<u>Year</u>	<u>Sheep</u>	<u>Cattle</u>	<u>Total</u>
1943	75,616	148,572	224,188
1944	74,142	145,687	219,839
1947	48,787	126,808	175,595
1948	46,353	120,699	167,052
1949	42,366	114,244	156,610
1950	41,096	113,756	154,852
1951	40,029	115,797	155,826
1952	40,877	116,407	157,284
1964	35,530	116,023	151,553
1965	34,682	115,458	150,140
1966	35,962	112,724	148,686
1968	35,420	116,415	151,835
1969	35,247	119,321	154,586
1970	32,917	111,764	144,681
1971	33,387	112,499	145,886
1972	32,640	113,154	145,794
1973	29,504	110,365	139,869
1977	24,089	127,604	151,693
1978	22,208	120,243	142,451
1979	19,248	118,052	137,300
1980	20,769	121,618	142,387
1981	19,440	121,064	140,504
1982	19,517	118,294	137,811
1983	18,792	120,597	139,389
1984	18,811	118,089	136,900

* Table Does Not Include Permitted Horses

Maximum production potential could increase significantly over the current level. Using the nonstructural and structural improvement strategies identified in Alternative 5, potential AUM's could increase to 157,600 in 1995 and to a high of 162,500 by 2025.

Potential increases would be obtained by improving forage production and improving livestock distributions. Forage production could be increased by decreasing competition between undesirable and desirable species, using chaining, burning, spraying, and other vegetation manipulation procedures. This projected production is based on retreatment of suitable aspen stands every 80 years. Large investments in structural improvements on cattle allotments would also be required. Maximum production would be limited only by the need to maintain a sustained yield of conifer production and viable numbers of wildlife species.

Current management does not attain maximum production potential due to the need to provide for multiple resource management for soil, water, wildlife, riparian habitats, recreation, timber, etc. The maximum level of production would require substantial funding to implement range improvement projects. Without such funding and with multiple resource considerations given for alternative 11, output for the year 2025 will instead be 131,000 AUM's. It seems unlikely that the Forest can attain production above the current level.

Demand for grazing exceeds available capacity. This trend will continue as more grazing land is converted to other uses and as long as the cost of grazing on the Forest is economical for the rancher.

Under current management direction, grazing use will remain fairly constant, or may decline slightly. Current management direction provides for attaining favorable forage production with stable or upward trends.

Continuation of current management will result in stabilization of, or even slight declines in, the numbers of permitted livestock. This is due to three significant factors.

First, some grazing areas have low productivity, high livestock numbers, poor conditions, or downward trends. In order to meet the Forest's goals of providing favorable forage production with stable or upward trends, these acres need to be evaluated and measures must be taken to stabilize trends and improve conditions.

Second, many revegetation projects need to be maintained or their benefits will be lost. Current grazing capacities were based on outputs during the most productive periods for those projects. They need adjustment to reflect current production levels. Structural improvements are also in need of maintenance or rebuilding. Many are currently non-functional.

Third, a trend of conversion from sheep to cattle operations has resulted in fewer suitable grazing acres and a need for more intensive management. With fewer suitable acres, the Forest's ability to produce AUM's decreases.

On some allotments timing of use is critical. Since there is a limited amount of big game winter range which often is used by livestock during the spring grazing period, the amount of time that livestock can spend on these areas is restricted. On some allotments, the entry date for livestock has been changed to insure that range readiness is achieved and big game winter range is protected.

Because riparian area management has become a major concern in recent years, management practices are being implemented which will correct many abuses. These include adjustment in livestock numbers and fencing springs and riparian areas. In addition, better salting procedures and proper placement of key structural improvements will enhance riparian areas which will improve water quality onsite and downstream.

The Forest cooperates with permittees and Animal Damage Control, Animal and Plant Health Inspection Service, USDA in controlling predators to reduce losses of livestock. The Forest Service makes recommendations to Animal Damage Control for each grazing allotment as to the need for control, methods to be used, and special precautions needed. The current program of control has consisted primarily of shooting coyotes from a helicopter in the winter. Some trapping is also practiced. Control efforts are directed toward offending animals where need is demonstrated. Losses of livestock to predators vary from year to year.

Wild and free roaming horses and burros do not occur on the Fishlake.

Noxious weed control is directed mostly at Scotch, Musk and Canadian thistle infestations. These occur on the Fillmore, Beaver and Richfield Districts. Whitetop and toadflax are also of concern, together with some poisonous plants that occur on all districts. Control efforts have helped prevent spread of all of these plants. Cooperation with county weed control agencies has been beneficial in past and current control efforts.

Grasshopper and cricket infestations make cyclic appearances on the Forest. There are black bug infestations on many introduced range grasses. These insects take a major toll on forage in areas of concentration. The total quantity of forage available for livestock and wildlife is greatly reduced, along with a reduction in quality. Leafy materials are stripped, leaving only the coarser stems.

The value of coordination on allotment management has been adequately demonstrated on the Oak Creek Cooperative Management Area. The area encompasses 316,500 acres about 15 miles north of Fillmore. It includes 117,200 acres managed by the Forest Service; 109,800 acres of private land; 59,800 acres administered by the BLM, and 29,750 acres of state land. Much work has been accomplished on a cooperative basis. Chaining and spraying contracts covered several land ownerships; several pipelines supply water to National Forest, BLM and private land from one spring source; and some fences were placed in more manageable locations, rather than following ownership boundaries.

Grazing management is shared between the Forest Service and the grazing permittees. The Forest issues grazing permits that specify the type and number of livestock and the season of use. Allotment Management Plans outline the use and development of each allotment on a long-term basis. Operating Plans outline annual direction. Allotments are inspected by the Forest Service for use, condition, and compliance with grazing permits, the Allotment Management Plan, and the annual Operating Plan. The permittee is responsible for herding, salting, and doctoring his livestock and for maintaining improvements on his allotment.

5. Timber

Land Suitability

Some 386,635 acres have been classified as tentatively suitable forest land on the Fishlake National Forest (Table II-24). This acreage was determined in accord with regulations in 36 CFR 219.14. Suitability criteria are described in Appendix B (page B-1) of the proposed Land and Resource Management Plan.

Existing Situation

Approximately 770 thousand acres of the Fishlake's 1.4 million acres, or 55 percent, are forested. Of these forested acres, about 28 percent are tentatively suitable for timber production. The Forest is selling between 2.5 and 3.0 MMBF annually. Due to the recent depressed lumber market annual harvest has dropped from just over 2 million to slightly under a million board feet.

Current harvesting is on average slopes under 40 percent. Tractor logging is the only skidding method in use, but recently purchasers have expressed interest in cable logging steeper slopes.

Cutting practices have changed considerably over the years. In the early seventies spruce sales with extensive clearcutting were sold. Since 1977, the use of clearcutting has been reduced, with large spruce clearcuts no longer prescribed. Group selection, shelterwood and small clearcuts are presently being prescribed in spruce.

Localized infestations of mountain pine beetle in ponderosa pine and Engelmann spruce beetle have inflicted light losses for several years. A moderate infestation of spruce budworm is present primarily in Douglas fir on the Beaver District. Dwarf mistletoe infects much of the Douglas fir and ponderosa pine. Rots are common in old growth spruce and aspen.

Present conditions in terms of growing stock inventory, annual net growth, age class distribution, and productivity are displayed in tables II-15 and II-16 of the Proposed Land and Resource Management Plan.

Supply and Opportunity

The maximum long term sustained yield capacity is 16.3 MMBF, which is primarily conifer. The Forest lacks a major market for aspen.

Approximately 236 thousand acres of aspen could be managed for timber with development of a market and specialized logging techniques .

Potential for intensive management opportunity includes:

- a) Utilization and management of the aspen resource.
- b) Use of genetically improved planting stock.

Average annual sale quantity and long term sustained yield capacity are displayed by alternative in table III-23.

TABLE III-23
AVERAGE ANNUAL ALLOWABLE SALE QUANTITY
AND
LONG TERM SUSTAINED YIELD CAPACITY
BY ALTERNATIVE

ALTERNATIVE	AVERAGE ANNUAL ALLOWABLE SALE QUANTITY (50 yr. planning period)		LONG TERM SUSTAINED YIELD CAPACITY	
	MMCF	MMBF	MMCF	MMBF
1	.60	3.0	2.07	10.35
2	1.50	7.5	2.29	11.44
3	.60	3.0	1.45	7.25
4	1.16	5.8	2.58	12.92
5	1.84	9.2	2.67	13.34
6	1.66	8.3	2.37	11.87
7	.10	.5	.82	4.09
8	.60	3.0	2.17	10.86
9	1.52	7.6	2.16	10.82
10	2.20	11.0	3.26	16.32
11	1.44	7.2	2.09	10.46

The Fishlake National Forest Firewood Management Action Plan estimates the firewood supply to be 1,076,680 cords Table III-24.

TABLE III-24
FIREWOOD SUPPLY

<u>Type</u>	<u>Total Cords</u>
Dead	968,060
Activity Fuels	43,730
Annual Mortality	53,590
Livewood Available	<u>6,300</u>
	1,076,680

The estimated maximum amount of firewood that can be supplied on a sustained basis, once the dead accumulation is gone, is 108,620 cords. Based on these estimates, it appears that a continuous supply of firewood will be available for both personal and commercial users. Firewood near existing roadways has become scarce in some areas, however. This trend will continue.

Christmas tree harvest over the last decade averages about 6,000 trees annually. In the last three years annual Christmas tree sales have been near 10,000 trees.

Opportunity exists in a number of areas (particularly isolated white fir stands) for management of Christmas trees. For the past three years, the Fishlake has been a leading Forest in the Intermountain Region in sale of Christmas trees and also in dollar value received from sale of Christmas trees.

Demand

Average annual production of timber over the last 29 years is 1.7 MMBF. Within this period there have been large fluctuations in annual harvest, ranging from a high of 6.6 MMBF in 1973 to a low of 120 MBF in 1967. Demand for timber is expected to slowly increase throughout the planning period (Fishlake AMS page 55).

As a result of the recent energy concern and high energy costs, fuelwood consumption increased substantially in 1978. Table III-25 shows a continual increase in personal use firewood from 1977 thru 1982. In 1983 use leveled off, partially due to easing of the energy situation and users becoming aware that gathering their own fuelwood was not as inexpensive and entertaining as they had thought.

TABLE III-25
FIREWOOD USE (FREE USE PERMITS FOR FIREWOOD)

<u>YEAR</u>	<u>VOLUME (MBF)</u>
1977	3,581
1978	3,579
1979	7,098
1980	5,476
1981	10,110
1982	11,140
1983	5,856*

* Charge firewood program in effect half the year produced 2,804 MBF, for a total firewood program for 1983 of 8660 MBF.

Based on this history, the demand for firewood is estimated at 8,500 MBF or 17,000 cords annually.

All of the 10,000 quality Christmas trees the Forest has offered for sale the past three years have been purchased. Therefore the demand for Christmas trees exceeds 10,000 trees. Total demand is unknown.

Growth

The Fishlake National Forest contains primarily mature and overmature stands. Currently, of the suitable forest acres, approximately 3 percent of these stands are age 70 or less. Mature and overmature stands are putting on little growth. Regenerated stands have not reached their maximum growth rates. Therefore, the Forest cannot meet the President's Revised Statement of Policy on Growth, 90 percent or better growth rate at long term sustained yield capacity (LTSYC 2030.) Under the preferred alternative, the Forest should be able to meet 90 percent of growth rate of C by 2070.

6. Water

Water Yield

Forest lands produce an average of 611,000 acre feet annually. Of this, about 80 percent is delivered to the Great Basin and 20 percent to the Colorado River Basin.

Demand for water in the Sevier River and Colorado River already exceeds supply. As the population increases and development continues, demand for water will increase. The potential of the Forest to increase water yield by feasible means is limited. Since the Fishlake has only scattered timber resources and much of its aspen type is on potentially unstable soil, the prospect of increasing water yield by vegetative manipulation (timber harvest) is very poor. In types below the conifer and aspen belt, vegetative manipulation lacks the potential to produce increased yield, as little moisture is available in excess of evapo-transpiration demand for that precipitation zone.

All of the mountains in Central Utah, including all of the Fishlake Forest, have been a target area for cloud seeding since implementation of a seeding program by the State of Utah in 1973-74. The results for the primary target in central and southern Utah indicate increases in the January-March precipitation ranging from 8 to 14 percent (Shaffer and Thompson, 1980). Seeding increases appear to be greater in the higher elevations of the target area. Any increase that would result from this activity would likely be dispersed proportionately to all watersheds. The amount of precipitation increase which will result in increased water yield is unknown.

Water Uses

Major uses of water produced on the Forest are irrigation, livestock watering, domestic use, timber production, suitable flows for fisheries, maintenance of riparian habitats, wildlife, recreation, and energy production. All water originating on the Forest is in high demand. It is used on the Forest, as well as downstream by non-Forest users. Eighteen local communities get all or part of their municipal water from within the Forest boundary. Four other communities have water sources adjacent to the Forest boundary. However, the water source for these communities is undoubtedly within the Forest boundary.

Domestic use of water in the communities amounts to about 8,500 acre feet annually. An additional 285 acre feet are used annually by livestock grazing on the Forest. Quantities of water for other uses on the Forest are unmeasured.

No waters on the Forest have been classified as "Outstanding Natural Resources."

Wetlands and Floodplains

There are about 34,600 acres of riparian areas on the Fishlake National Forest. Identification of these lands was done by interpretation of color and infrared aerial photography and transferred to 7 1/2 minute quadrangle maps. Riparian areas and wetlands are important components of the landscape, both because of their sensitive nature, which is recognized in Executive Order 11990, and because of the wide variety of uses occurring on them. The need to manage these areas wisely will increase as populations of surrounding valleys increase, accelerating demands for water, recreation, and wildlife.

Condition of riparian areas ranges from good to very poor. Location and use of individual areas determine their condition.

The following table shows the dissaggregation of the acreage of riparian areas:

TABLE III-26
RIPARIAN ACREAGES

<u>Riparian Areas</u>	<u>Acres</u>
1. Wetlands	6,500
2. Aquatic zones	4,400
3. Stream courses	
a. Conifer	7,300
b. Deciduous	11,600
c. Aspen	<u>4,800</u>
TOTAL	34,600

Executive Order 11988 defines floodplains as those areas inundated by 100-year floods. They occur along each drainage of the Forest, and include bottomlands and alluvial fans at the mouths of canyons. Most of the Forest's floodplains have not been mapped; but in general they would coincide with riparian areas, which have been mapped. Riparian areas will often be larger than floodplains, since the former extend 100 feet horizontally from either bank of a stream or body of water. In narrow canyons or along first order streams, 100-year floods will not extend this far.

Water Quality

The nature of National Forest management makes it more susceptible to non-point sources of water pollution than point sources. Grazing, timber harvest, and dispersed recreation all have the potential to contribute sediments and other pollutants to streams. Presently, the only known point-source on the Forest is the SUFCO coal mine in Convulsion Canyon. However, expected mineral development may increase the number of point-sources.

Water quality monitoring was initiated in 1971 on the Beaver River and Fremont River drainages. Streams on the Fillmore and Richfield Districts were added in succeeding years. A recently completed water quality monitoring plan has redirected the program away from established base level data toward monitoring activities and problems. All data collected from monitoring has been entered on STORET.

Monitoring has shown that water quality on the Forest is generally high. Water leaving the Forest meets state standards of quality for designated uses. Some water bodies within the Forest boundaries do not meet state standards for cold water fisheries, due to natural factors. Sediment is probably the most common pollutant on the Forest. There is no state standard for this parameter.

Water Rights

Until the Membres River Decision, the Forest claimed use of needed water through the reservation doctrine and very few water rights were established through the state procedure. Since that decision, national direction has been to obtain water rights through established state procedures. Currently the Forest is participating in State Water Adjudications on the Beaver and Colorado River drainages.

Approximately 2,500 water uses have been identified on the Forest. A Forest goal is to obtain valid rights to all water used. Statements of Water User's Claims to Diligence Rights are being prepared on all uses where this procedure is valid. These are being submitted to the State Engineer. Where Diligence Rights are not applicable, water rights will be acquired by purchase or appropriation.

Instream Flows

Manual direction is to determine and obtain instream minimum flows in accordance with the reservation doctrine, where applicable. Where reservation is not applicable, water rights will be obtained in accordance with state law. Where neither the reservation principle nor state law can be used to secure a legal right to maintain instream flows, quantification of needed flows will be made as a basis for management decisions in future proposals for water diversions.

Floods of 1983 and 1984

During the spring runoff periods of 1983 and 1984 the Forest sustained considerable flood and landslide damage. The water content of the snowpack in the spring of 1983 was about 500 percent of normal, that of 1984 was about 300 percent of normal. Further compounding the problem in 1983 was a cold spring season that delayed any gradual melting before hot weather arrived at the end of May. This resulted in floods on the main streams leaving the Forest which have an estimated 50 year recurrence interval. Not only the magnitude, but also the two to six week duration of these floods, caused considerable damage. Water levels in 1984 were not as high, but the removal of streamside vegetation during 1983 led to higher than expected erosion and damage during the 1984 floods also.

Not only did these two flood events differ in terms of their duration from the more common summer thunderstorm events, but they also differed in terms of increasing magnitude in the downstream direction. Since vast areas of a given watershed were contributing meltwater, as opposed to a few tributaries as in the case of a summer storm, the main streams leaving the Forest had higher magnitude events than did their tributaries. In many cases the valleys of these main streams also provide transportation routes onto the Forest. Road damage was in excess of four million dollars.

Rising groundwater tables and saturated soil conditions resulting from above average precipitation during 1983 and 1984 led to several hundred acres of landslides and debris flows. Studies (Godfrey in press) suggest that this amount of landslide activity has a 200 year recurrence interval. These landslides and debris flows not only damaged federally-owned facilities on the Forest, but also did several hundred thousand dollars worth of damage to Utah Power and Light power lines that cross the Forest.

The combined result of the flooding and landslides was considerable damage to roads, trails, recreation facilities, range facilities, watersheds and fisheries on the Forest. Over the two year period there was \$4,145,000 damage to Forest roads and \$200,000 damage to Forest trails that qualified for Emergency Relief to Federally Owned Roads from the Federal Highway Department. Damage to facilities and resources that was not covered by emergency funding is estimated as follows:

Recreation Facilities	\$223,000
Range Facilities	67,000
Roads	500,000
Watershed	211,000
Fisheries	1,473,000

7. Minerals

A. Past Trends and Present Production

Approximately 99 percent of the Forest is open to mineral exploration and development under the mining and leasing laws. The lands removed from appropriation under these laws and the lands which are encumbered or are

being managed in such a way as to constitute a defacto withdrawal from mineral development are listed below.

Lands withdrawn from operations of the mining law but not the leasing laws.

	<u>Acres</u>
Recreation Sites	6,634
Administrative Sites	3,406
Roadside Zones	1,447
Watershed Protection Areas	<u>880</u>
SUBTOTAL	12,367

Lands encumbered but not formally withdrawn from operations of the mining and leasing laws.

Partridge Mtn. Research Natural Area	1,200
Areas being studied for Research Natural Area Status (Bullion Canyon, Upper Fish Creek-Mt. Baldy, and Belnap Cirque)	3,100
Areas determined as unsuitable for stipulated methods of coal mining.	None
SUBTOTAL	4,300
Lands with reserved or outstanding rights.	<u>4,072</u>
TOTAL	20,739

No Forest lands are constrained or removed from mineral appropriation by special legislation.

The Forest includes parts of two physiographic provinces, the Basin and Range and the Colorado Plateau. As presently recognized, the Tushar Mountains, Pahvant Range, and Canyon Mountains are within the former province and the remainder of the Forest within the latter.

Principal mineral deposits in the Basin and Range Province are arranged in three zones or belts, one of which crosses the Forest and runs through the Tushars and southern part of the Sevier Plateau. This mineralized area is the eastward terminus of the mineral belt extending westward through Beaver County, Utah, and into the Pioche region of Nevada. The rock types and structures are favorable for metallic deposits because of igneous intrusive bodies. Five of the six mining districts within the Forest are in this belt. The sixth is at the north end of the Forest in the Canyon Mountains.

In contrast to the complex geologic structures and deposits present in the Basin and Range Province, the mineral resources of the Colorado Plateau Province are primarily those associated with sedimentary rocks.

Categories of minerals on the Forest:

1. Locatable Minerals

Significant amounts of gold, silver, copper, lead, zinc, mercury, alunite, uranium and sulfur have been produced mainly from the Tushar Mountains. During the period of 1868 through 1963, a total gross value of about ten

million dollars, based on December, 1965, prices, was produced by these commodities. Unknown amounts of lead, silver, limestone and dolomite have been produced from the north end of the Forest in the Canyon Mountains during the same period. Activities for hardrock minerals have increased from 59 cases in 1977 to 97 in 1981.

Presently, limestone, shale, and quartz are being mined by open pit methods in the north part of the Canyon Mountains near Leamington. Starting in 1980, approximately one million tons of raw materials per year have been mined and used to produce approximately 650,000 tons of portland cement. Operations are expected to continue to 2025. It is the largest cement producing operation in Utah and will provide cement for use throughout the West.

Gold, silver, copper, lead, and zinc are being produced in small amounts from the Bullion-Cottonwood and the Kimberly areas of the Tushar Mountains. Ore production during 1981 was between 7,000 and 8,400 tons. A total of 31 operating plans for prospecting and exploration for precious metals were processed during 1981. Prospecting and exploration for Uranium occurred at 34 places on the Forest during 1981.

An uncommon form of kaolin clay is mined from three sites within the Forest. Two of the sites are located in the Mill Creek drainage in the Tushars and the third is near Box Creek on the Sevier Plateau. Mining is by open pit method and has occurred during the past 12 years. Approximately 3,000 tons of material were removed from one of the Mill Creek pits during 1981.

Dendrite is being mined at the rate of 5 to 10 tons per year in the North Fork of North Creek drainage on the west side of the Tushars. Activity has been occurring for about 5 years.

Other mineral commodities, including alunite, fluorspar, molybdenum, sulfur, and gypsum, have generated prospecting and exploration activities in the Tushars and the Sevier Plateau areas. A total of 20 operating plans associated with these minerals were processed in 1981.

No revenues to the Federal Government, in the form of rental fees or royalties, are generated by the locatable minerals. The 1872 Mining Law provides that: "... all valuable mineral deposits in lands belonging to the United States... shall be free and open to exploration and purchase..."

2. Leasable Minerals

Coal is the only leasable mineral produced on the Fishlake. Coal resources within the Forest underlie the southeast edge of the Wasatch Plateau, and are included in the Salina Canyon, Wasatch Plateau and Emery coal fields. The reserves are approximately 1,693.6 million tons which underlie approximately 220,527 acres within the Forest. Forest lands identified as potentially minable but presently not leased for coal development are approximately 81,534 acres. These potentially minable lands contain an estimated reserve of 1,515.2 million tons, of which 606.1 million tons are estimated to be recoverable by underground mining

methods. Doelling (1972, p. 555) describes the coal quality as high volatile C bituminous with medium ash content and low Sulfur content.

There is one active coal mine on the Forest at the present time. It produces 2.2 million tons of coal per year, and is expected to continue until 2005. It has five Federal coal leases covering 6,773 acres. About 5,866 acres are administered by the Fishlake Forest, 683 acres by the Manti-LaSal National Forest, and 164 acres by the Richfield District of the Bureau of Land Management. Approximately 640 acres of fee land (coal and minerals privately owned) is connected with the operation.

Even though no other coal mines are active at this time, an additional 12,407 acres of the Forest are under lease to two energy companies. Core drilling operations are presently being conducted by these companies. The United States Geological Survey is conducting a continuing drilling program to define the coal resources of unleased lands. An average of 32 holes per year have been drilled from 1977 through 1981 on the Forest.

Coal activity planning, in preparation for additional lease sales was done in coordination with the Bureau of Land Management. Three lease tracts involving about 423 acres of the Forest have been evaluated in the Uinta-Southwestern Utah Coal Region Environmental Impact Statement.

Total receipts from coal lease conveyances, including bonus payments, royalties, and rentals, for fiscal year 1981 were \$1,351,520.

Much of the Forest has a moderate potential for oil and gas, particularly the hinge line area of the Basin and Range Province.

Over 1.2 million acres or 85 percent of the Forest was under lease for oil and gas development as of the end of 1981. The major blocks of land not under lease are the upper elevations of the Tushars, Thousand Lake Mountain, and the area east of Bicknell, Utah. During the five year period of October 1976 through September 1981, an average of 52 leases per year were issued for the Forest. The average for the previous five year period was 80.

Oil and gas exploration activities have mainly been by surface seismic methods or shot holes less than 100 feet deep. An average of 267 miles of seismic exploration per year has been permitted between 1977 through 1981, involving an average of 16 permits per year. Fifty-two percent of the seismic surveys are in the Pahvant Range and Canyon Mountains, 23 percent each on the Fishlake and Wasatch Plateaus, and 2 percent on the north end of the Tushars.

Since 1958 fifteen wells have been drilled on the Forest. None are producing wells. Funds generated from oil and gas lease rental fees and prospecting permits for fiscal year 1981 totaled \$880,415.

The potential for geothermal resources exists in an area of the Forest beginning in the Cove Fort-Sulphurdale area and extending eastward to the west edge of the Sevier Plateau near the town of Monroe. Sixteen leases containing 22,728 acres of Forest land occur in the Cove Fort-Sulphurdale area and one lease containing 707 acres of Forest land is present in the

Monroe area. These leases were issued in 1975 for a term of 10 years. Applications for adjoining lands are presently being evaluated.

A considerable amount of geophysical exploration, including deep wells, was conducted in the Cove Fort-Sulphurdale area between 1977 and 1979 for geothermal resources. In one well hot water was discovered and tested to have a high potential for low temperature non-electrical application. A second well hit hot water but was not tested for production. A third well presented drilling problems and was soon abandoned.

In late 1983 and early 1984, three wells were drilled near Sulphurdale. High pressure steam was hit at a depth of 1,170 feet. Plans are being formulated to generate electricity with the steam.

No geothermal activities other than casual exploration have occurred on the Forest near Monroe. Two deep wells drilled outside the Forest near Monroe in 1979-80 tested favorably for use in heating and other direct applications. However, no utilization of the resource has been made.

The money paid into the U.S. Treasury for geothermal lease rental fees for fiscal year 1981 totalled \$23,435.

In 1977 the Forest received several applications for prospecting permits for potassium. There has been no follow up on these applications.

3. Saleable Minerals

The Forest contains significant amounts of sand and gravel, building stone, and light-weight aggregate. The amount of sand and gravel removed in selected years and their estimated values follow:

1977	\$ 243	7,300 Tons
1978	\$ 89	2,670 Tons
1979	\$6,235	187,060 Tons
1981	\$ 78	2,350 Tons

Presently, there are six permits authorizing removal of up to a total of 65,000 cubic yards per year. Of these only one is a commercial permit where the material removed is for resale. The remainder of the material has been used by Federal or State agencies without charge.

Small amounts of building stone are sold each year from various sites around the Forest. No large-scale commercial operations exist.

Light-weight aggregate is abundant in the Clear Creek Canyon area. Half a dozen inquiries have been made since 1976 about mining possibilities, but no applications have been received. Vast quantities of this material are being used in the construction of the interstate highway through the canyon.

B. Future Demand

The U.S. Bureau of Mines estimates mineral demand will increase until the year 2,000. This is coupled with an increasing need for the demand to be met domestically.

Prediction of mineral activity is risky and easily can be inaccurate. Confidential company information, economics, changing concepts of mineral localization, new techniques of exploration, and other factors can bring exploration to new area or shift it from an existing one.

1) Energy Minerals

Coal activity is expected to increase gradually in the future. Additional leasing is expected in the northeast corner of the Forest as indicated from the expressions of interest received for that area in January, 1982. The existing, non-producing leases on the Forest are expected to be in production by 1990.

Considerable oil and gas activity is expected through 1997. On-the-ground activity has included the entire Forest, except for the Tushar Mountains. The most significant amount of seismic prospecting has been on the Pahvant and Canyon Ranges.

The Cove Fort-Sulphurdale and the Monroe-Joseph areas have been designated Known Geothermal Resource Areas (KGRA's). Activity in and adjoining these KGRA's is expected to increase as technology improves and the extent of the resource is defined.

Uranium occurs in the Tushar Mountains. Continued exploratory work is expected due to the recent U.S. Geological Survey report by Steven and Morris (1984) indicating the area has high potential for uranium. Demand is expected to remain low.

2) Non-Energy Minerals

High prices and increased demand for gold and silver have renewed the interest in these precious metals. The Tushar Mountains have both, found in association with lead, zinc, and copper. Continued small scale activity is expected.

Base metals, particularly if accompanied by precious metals, will continue to attract exploration interest. It is expected the Tushar Mountains will be impacted substantially by this trend until 1990.

Demand for molybdenum is predicted to be high, which might lead to activity in the Tushar Mountains. The demand for limestone, sand, gravel, crushed rock, kaolin clay, and lightweight aggregate is expected to continue at about present levels. Demand for gypsum from the Forest is not expected to materialize within the near future due to more accessible deposits of considerable size outside the Forest.

8. Human and Community Development

The population living in or near the planning area generally shares similar needs and interests. The area's cultural and economic survival and development are tied to some degree to National Forest System (NFS) land and resource management. Dependency and use of the Forest lands are important to the majority of the public in the planning area.

The value of human resources and the needs of the local communities and other publics are recognized in all phases of NFS land and resource management. Forest resource management is aimed at complementing local community and public needs to the extent allowed by personnel ceilings, federal funding, and regulations.

Several human resource programs have been established by the Federal Government to provide temporary employment. These programs support the Secretary of Agriculture's commitment to serve the unemployed, under-employed, minorities, economically disadvantaged, youth, and elderly through forestry oriented activities.

The Fishlake National Forest participates in the following human resource programs aimed at accomplishing resource related activities while providing employment, skills, education, and training to eligible individuals, both young and old. In the past years many persons have participated in several human resource programs administered by the Fishlake National Forest. The conservation work performed in these programs represents an integral part of the resource management and development program in the National Forest System and on lands of state and local cooperators.

Youth Conservation Corps (YCC)

This program was established to accomplish needed conservation work on public lands. Purpose of the program was to provide gainful employment for youth 15-18 years old, males and females, from all social, economic, ethnic, and racial classifications. From 1977 through 1981, the Fishlake National Forest successfully operated a residential Youth Conservation Corps camp for 48 youths on the Richfield Ranger District, at Gooseberry. In 1983 the Forest operated a non-residential program for 10 enrollees.

Young Adult Conservation Corps (YACC)

This program was established and designed primarily for local youths. The program was utilized to accomplish needed conservation work on public lands. Purpose of the program was to provide gainful employment for youths 16 to 23 years of age not intending to return to school. The Fishlake National Forest operated a non-residential YACC Program from 1977 through 1982, with up to 35 enrollees.

Senior Community Service Employment Program (SCSEP)

This program is utilized to foster and promote useful part-time work opportunities in community service by training unemployed, low income

persons who are 55 years of age or older and who have poor employment prospects. The SCSEP has provided substantial benefits to both elderly individuals and the Forest Service. Enrollees are given the opportunity to supplement their income while providing valuable support to the regular work force in accomplishing both field and office work loads. The Fishlake National Forest has employed an average of 12 people under this program annually since 1973.

Volunteers

Volunteers of all ages have contributed many valuable hours of work to the Forest Service annually. These include school groups and organizations, as well as interested nonaffiliated individuals. During 1982 the Fishlake National Forest reached an all time high in its volunteer program with participation the equivalent of 12 person years of work.

Work Incentive Program

This program is utilized to provide training for individuals with dependent children who receive aid through welfare funds. The Fishlake has periodically assisted in training individuals referred under this program.

Comprehensive Employment and Training Act (CETA)

This program is utilized to provide work experience and vocational training for economically disadvantaged youth and adults. The Fishlake National Forest within the last five years has trained several individuals under this program, and subsequently placed two participants in full time employment with the Forest Service.

Human Resource Programs have resulted in many person-years of work accomplishment, and have included activities such as clerical work, trail construction and maintenance, stream and fish habitat improvement, fence and recreation area facility construction, erosion prevention, tree planting, insect and disease control, fire control and mop-up, vehicle and structure maintenance, and wildlife habitat improvement. These are only a few of the many activities accomplished by the enrollees.

Unemployment in the planning area creates a demand for jobs, particularly during school recess periods. Recent budgetary and personnel ceiling cuts have affected the Forest Service's ability to hire summer or seasonal employees and to fill continuing positions. It is anticipated that unemployment will continue because of population trends in local population areas.

A Forest Service goal is to utilize human resource programs as funding and ceilings are available. Opportunities to provide employment and to develop employable skills for eligible individuals, both young and old, will be considered in the planning of all Forest resource related projects and activities. Some programs are being phased out as part of an effort to achieve budget savings, and because of a redirection of Federal Government funds. Other human resource programs will be utilized to every possible extent.

Complement and Assist Local Economy and Dependent Industries

In addition to specific human resource programs utilized, essentially all of the activities performed by the Fishlake National Forest contribute to local employment and income, and contribute in some measure to the support and economic health of Forest based communities. Purchase of supplies, equipment, fuel, and services is carried out with local suppliers whenever possible.

E. SUPPORT ELEMENTS

1. Land and Land Ownership

Special Land Use Administration

Special uses are non-Forest Service occupancies and uses of National Forest land such as summer homes, pastures, facilities, fences, transmission lines, electronic sites, recreation sites, water transmission lines, and other activities authorized by permits. Approximately 3,465 acres are occupied by 264 special uses within the planning area. The types and areas of uses are widely scattered throughout the Forest. Increasing populations and development will result in increased demand for uses on National Forest lands. Development of private lands within and adjacent to the Forest has increased the need for supporting facilities and uses that can only be provided by National Forest land. This trend of increased uses will continue.

Annual fees produced by land uses on the Forest totaled \$54,261 in 1982. This includes revenue from minerals activities but not from rights-of-way.

Withdrawals and Special Areas

Withdrawals from mineral entry include administrative sites, recreation sites, and rehabilitated watersheds. Each classification or withdrawal has specific conditions or restrictions, depending on the values being protected. Entry is regulated under general mining laws on these withdrawals. Approximately 12,367 acres are withdrawn from mineral entry on the Forest. These areas are reviewed periodically to determine their continued applicability and need.

Special areas include the Partridge Mountain Research Natural Area, and Fish Creek and Bullion Canyon candidate Research Natural Areas. The Research Natural Area (RNA) Partridge Mountain is a 1200 acre site located at the northern end of the Forest, east of Oak City, near the upper limit of the pinyon-juniper woodland zone. Management as an RNA necessitates closure of this area to all conflicting uses, including grazing and recreation. While these areas have not been withdrawn from mineral entry, there are some use restrictions imposed on them.

During the planning process the Nature Conservancy and several botanical organizations expressed an interest in having one or more of the subalpine and mountain areas of the Tushar Mountains designated as RNA's. These would form part of a transect of alpine areas between the Rocky Mountains

and the Sierra Nevada Mountains near the southern limit of the alpine in the Great Basin. The Fish Creek and Bullion Canyon candidate RNA's are being considered as possible RNA sites in the southern alpine area of the Great Basin.

Land Status

There is a total of 1,525,984 acres within the proclaimed boundary of the Fishlake National Forest. Of this total, 101,505 acres are state and private lands within the National Forest boundary. There are also three internal exclusions from the National Forest.

2. Soils

The history of soil conditions since valley settlement by the white man closely parallels the history of grazing use of adjacent mountain lands. The use of range lands by domestic livestock reached a peak during the period 1890 to about 1910. Mountain ranges were heavily overgrazed, resulting in devastating floods out of the canyons. With the establishment of Forest Reserves in the early 1900's, a control on grazing was started. Soils previously subjected to severe erosion by heavy grazing eventually began to respond and produce more forage. Since the early 1900's, soils and vegetation conditions have been improved over most of the Forest.

During the 1950's and 60's, some of the areas still not satisfactorily recovered were treated to hasten recovery. Treatments included seeding, contour furrowing and trenching, Dixie harrowing, and protection from livestock use.

Problem areas and conditions still exist, but soils and vegetation have improved remarkably from conditions present in the early 1900's. A Watershed Improvement Needs Inventory has been completed on the Forest and identifies approximately 26,000 acres that are in less than satisfactory watershed condition and are in need of rehabilitation.

3. Facilities

Facilities includes capital investments needed for resource management, administration, and public use. Dams, roads, bridges, trails, water systems, sanitation systems, buildings, and other improvements are part of this element. Many facilities throughout the Forest are owned and operated under Special Use Permits.

Buildings

There are Forest offices, warehouses, and other facilities in Fillmore, Loa, Reaver, and Richfield, plus 12 administrative sites (Guard Stations) in use on the Forest. Buildings range from new facilities under lease from private vendors to older Government owned buildings constructed in the 1920's or before. Conditions of these buildings are generally good. Several Guard Stations need work, though structurally all are serviceable. A total of 85 buildings has been inventoried for the Forest.

Transportation

Major Federal and State Highways form completed circuits around most of the Forest boundaries and give good access to the main Forest units. State, County, and Forest roads provide a network to reach most areas within the Forest.

TABLE III-27
DESIGNATED FOREST HIGHWAYS

U72-FH 10	Loa to Fremont Junction	34.8 miles
U153-FH 29	Beaver-Junction	41.6 miles
FH 42	Fish Lake-Fremont River	25.0 miles
FH 43	Seven Mile-Gooseberry	41.6 miles

Some Forest system roads are under State, County, or other jurisdictions and maintenance. Special use and mining roads account for another segment of existing roads on the Forest.

Updated data for Fillmore District revealed 364.5 miles of previously uninventoried primitive local roads on the Forest, in addition to the 267.6 miles of this type previously shown on the inventory, an increase of 136 percent in this category. Total inventoried mileage jumped at least 96 percent since the last complete inventory about 1967. Most of this change can be attributed to two factors: a change in definition as to what constitutes a road from the 1967 inventory, and concentrated off-road vehicular use establishing new roads and tracks. Figures now being generated for the remainder of the Forest are expected to show similar increases. An estimate based on 125 percent increase in primitive road mileage shows:

TABLE III-28
MILES OF FOREST SYSTEM ROADS

	<u>Primitive</u>	<u>Graded & Drained</u>	<u>Soil Aggregate</u>	<u>Bituminous</u>	<u>Total</u>
1967 Inventory	929	415	31	34	1,408
1983 Estimate	2,091	450	31	45	2,617

This represents a total increase of 1,200 miles since 1967, or roughly the equivalent of the round trip from Salt Lake City to Los Angeles.

There are 40 bridges and major culverts on the Forest. Several bridges have been replaced with new ones or large culverts in recent years and further replacements are planned. Bridges on the Forest are generally in good condition.

Roads are maintained to varying standards depending on management level, public need, safety, and budget. Many more miles of road exist than can be maintained under current conditions, so most effort is concentrated on those roads used most.

Revised estimates show 897 miles of trail under Forest management. For more detail see the discussion of trails under Recreation.

There is no scheduled air service to areas adjacent to the Forest. Small airports or air strips are located at Beaver, Fillmore, Wayne County, Richfield, Salina/Gunnison, Junction, Torrey and Delta. Commercial charters are available from several of these.

Prediction of transportation needs during the planning period depends heavily on assumptions of economic development of Forest resources, particularly coal and minerals, and growth of surrounding communities and recreational uses.

Utility Corridors - Refer to Appendix G of the Forest Plan.

Dams

There are 47 inventoried dams on the Forest and numerous small developments for stock water and wildlife. The major dams and reservoirs are under Special Use Permits with storage rights adjudicated by the Utah State Engineer. Conditions of these facilities vary from excellent to bad. In recent years, several dams have been breached and other reservoirs drained or operated at reduced storage levels until needed repairs are made.

Water & Sanitation

Water and sanitation facilities are provided at developed recreation and administrative sites. There are 26 inventoried culinary water systems and a substantial number of city and community culinary developments on the Forest. Most of the inventoried systems need work to meet current codes and standards for public noncommunity water systems. Regular sampling and testing is done on all systems used for culinary purposes.

There is one major sanitation system on the Forest and numerous small facilities using vaults or drainfields. Sewage at Fish Lake is collected and piped 6 miles through 6 lift stations to 3 lagoons located southwest of Fish Lake. Repairs and modifications to this system were made in 1982 to provide more evaporation area. Vault wastes from other sources, including some from the Dixie National Forest, are disposed of at Fish Lake or other suitable locations off the Forest.

Solid waste on the Forest is collected and hauled to Richfield City's sanitary landfill.

4. Protection

Fire and Fuels Management

The Fishlake National Forest has 1.36 million acres in its protection area. Dry climate conditions, seasonally high winds, topography, and vegetation create a potential for large wildfires. Lightning causes 75 percent of the Forest's fires. The ten year average (1974-1983) fire occurrence is 35 fires per year (26 lightning, 9 man-caused). The average annual acreage burned during that period was 3,134 acres per year (2,954 acres lightning, 180 acres man-caused).

The largest fire on the Fishlake since 1951 occurred July 24, 1981. The Clay Springs #2 Fire burned approximately 35,000 acres of sagebrush, grass, pinyon-juniper and oak brush; approximately 23,000 acres were National Forest lands. The next day, the Little Oak Creek Fire burned an additional 26,000 acres, 3,450 of which were National Forest lands. Prior to these fires, the largest fire was the Dog Valley Fire in 1963, which burned 2,095 acres.

In most situations, Forest personnel can suppress or manage these fires. On major fires, they are aided by local BLM pumper units, organized fire crews, and interagency or Forest Service overhead teams. Occasionally air attack bombers and helicopters are also used.

Air Quality

Air quality is managed on the Forest to ensure compliance with the Clean Air Act ammendment of 1977 (PL. 95-95). The Forest Service's responsibility in this regard is to protect air quality and related values.

Air quality on the Forest is generally excellent. At times during the dry summer months, vehicular traffic produces dust which temporarily reduces the air quality. Smoke impact from occasional grass, brush and/or conifer fires is slight, since most fires are small and burn a short time. During the period of March through October, stable atmospheric conditions build only during evening and night. Daytime surface heating normally causes the air to become unstable, dispersing pollutants through a thick layer of the atmosphere and consequently decreasing pollution concentrations to insignificant levels.

IPP (Intermountain Power Project) is presently being constructed 11 miles north of Delta, Utah. The impact of this large coal-fired electric power plant on the air quality of the Forest should be minimal. This is due primarily to the southwesterly flow of prevailing winds. Occasionally, however, wind patterns will shift to the northwest and north, which will carry pollutants over the Forest. However, the environmental impact statement for that project states that emissions will not exceed existing Class II Air Quality Standards.

Law Enforcement

Law enforcement problems include: vehicle use on closed areas, littering, vandalism, theft, resource trespass, pothunting, and illegal timber cutting. The Forest works cooperatively with state and local law enforcement agencies in situations of mutual concern. Forest Service employees have the authority to enforce Federal laws and regulations.

IV. ENVIRONMENTAL CONSEQUENCES

A. INTRODUCTION

This chapter presents the scientific and analytic basis for the comparison of alternatives described in Chapter II. Chapter II of this document, Affected Environment, described the situations and conditions in the planning area, and provided the basis for understanding the environmental consequences of implementing a given alternative.

Environmental consequences can be either beneficial or adverse. Consequences also can be of vital importance or negligible, and they vary in duration from the short term, 10 years or less, to the long term, over 10 years.

The alternatives considered in detail are made up of distinct combinations of management prescriptions, which in turn are combinations of compatible management practices. The environmental consequences of the alternatives can therefore be based on consequences of the management practices which make up the prescriptions used in the alternative. Management practices and management area prescriptions are contained in the Forest Plan direction. A summary table of the acres assigned to each management prescription alternative appears in Chapter II.

Specific Standards and Guidelines, which include requirements designed to protect Forest resources and mitigate adverse impacts, have been included in the management practices. This was done to assure that long-term productivity of the land will not be impaired, that federal and state regulatory standards are met, and that requirements of the NFMA regulations 36 CFR 219.13 through 219.27 are satisfied. Therefore, significant adverse environmental consequences of applying the management prescriptions, and subsequently the alternatives, have been mitigated.

This chapter describes beneficial and adverse consequences, both short and long term, of implementing the eleven alternatives considered in detail. Effects were identified using the criteria of context and intensity as set forth in 40 CFR 1508.27. It also displays output levels by alternative and describes the direct and indirect environmental consequences that would result from implementing the alternatives. Direct effects are defined as those occurring at the same time and place as the initial cause or action. Indirect effects are those that occur later in time or are separated spatially from the activity, but are nevertheless a result of the action. Priced and nonpriced benefits are described in detail in Appendix B.

Predicted outputs and effects for the alternatives were determined through the specific processes outlined and documented in Planning Action 2, Planning Criteria. These estimations are based on a quantification of the integrated relationships between the renewable resources of the Forest. Relative differences between alternatives, by decade, may be compared in tables II-10 to II-20 in Chapter II and in the remainder of this chapter. Additional detail on these estimated effects is included in the planning records on file at Forest headquarters in Richfield, Utah.

Maps of each of the alternatives, including the preferred alternative, are included in the map packet in the back of this document. These maps display the geographic distribution of management area direction and thus the differences in emphasis between alternatives.

The eleven alternatives considered in detail during the preparation of the Fishlake National Forest's Land and Resource Management Plan are listed below in the same order as they were described in Chapter II. All stress the need to increase net public benefits, while emphasizing different management strategies.

Alternative 1 - FY '82 Budget and Concern Direction

Alternative 2 - Market Opportunities

Alternative 3 - Ten Percent Reduced Budget

Alternative 4 - Nonmarket Opportunities

Alternative 5 - 1980 RPA Program

Alternative 6 - Emphasis on Local Issues and Concerns

Alternative 7 - Twenty-five Percent Reduced Budget

Alternative 8 - Current Program - No Action

Alternative 9 - Revised Mix

Alternative 10 - High Productivity from RPA 85 Update

Alternative 11 - Spatially Modified Revised Mix - Preferred Alternative

B. DIRECT AND INDIRECT ENVIRONMENTAL EFFECTS

The effects of implementing an alternative upon the quantity of the physical and biological resource outputs are stated and displayed in Chapter II and the following sections of this chapter. The effects of implementing an alternative upon the quality of the physical and biological resources are more subtle.

1. RECREATION

Use and Facilities

The land base of the Fishlake National Forest is physically capable of sustaining more recreation activity than provided by the alternatives. However, the ability to provide opportunities and manage use to acceptable standards is dependent upon funding. Therefore, only the amount of recreation visitor days (RVD's) that can be provided for and managed to a satisfactory standard are shown as outputs for each alternative.

A significant effect on the social facet of man's environment would occur because of the gap between recreation demand and the outputs provided for by most alternatives. Projected demand over the next five decades will only be met by alternative 5. Other alternatives will only meet a percentage of demand ranging from 20 percent for alternative 7 to 94 percent for alternative 11 by year 2000. Details are shown in table IV-1. The data displayed compare total recreation outputs with total demand. The results are different than comparing site and dispersed use outputs separately as discussed in Chapter II.

TABLE IV-1

PERCENT OF TOTAL DEMAND MET FOR ALL
THE ALTERNATIVES IN YEAR 2000 AND 2030

		ALTERNATIVES										
YEAR	1	2	3	4	5	6	7	8	9	10	11	
2000	57	78	52	79	100	82	20	85	89	82	94	
2030	39	60	28	100*	100	71	14	60	71	71	75	

* Alternative 4 produces more RVD's (8 percent) than the projected demand used to evaluate the alternatives for the year 2030. These additional outputs are still valued because the attraction of a major visitor center with an archeological theme would create additional demand.

In the process of formulating and evaluating alternatives a choice had to be made between two distinct approaches. In the first approach minimum standards are set and adhered to while the amount of recreation use that can meet those standards is shown for each alternative. In the second approach all alternatives meet anticipated recreation demand while the quality of the recreation experience is allowed to vary. While the second approach leads to qualitative descriptors of impacts on the environment, the first approach allows quantification of environmental impacts by stating the percentage of demand that is met. Because of this quantification the first approach was used even though we realize that there is no practical way of preventing dispersed recreation use of the Forest. Modeling did not address any problems that might result from relocating or shifting recreation demand to other lands outside of the Forest. These shifts would most likely occur in those alternatives which only meet part of the projected demand.

Some minor effects would occur in riparian areas where activities, especially camping, take place. Past mitigation measures have been to limit use to daytime activities, rotate use, and rest areas for a period of time. Utilization of these mitigation measures was included in the evaluation of effects of the alternatives.

Developed sites are currently located in several different settings including some within 100 year floodplains. Eleven of the 30 public sites (camp and picnic grounds) have been and may be subject to periodic flooding. In the past a few recreation facilities, mainly those in Chalk Creek, have been damaged by flooding to the extent that they require additional funds for repair of structures. Even greater funding has been required to stabilize streambanks in the campgrounds and for bridge and road replacement.

All developed sites on the Forest, both public and private, occupy less than 600 acres. Even though future construction of sites could double or triple this acreage, it is significantly less than half of one percent of the total Forest acreage. Construction and reconstruction will cause minor soil disturbance and some vegetation removal for roads, parking, water lines, and camping units. Use within a site also has a minor effect on soil compaction, vegetation loss and if present, stream bank deterioration. Most effects of human use can be mitigated by hardening the sites or adding facilities to protect the environment.

Grazing by livestock would be more restricted and in some cases excluded from present sites and from sites developed in the future. An increase in recreation use within the general forest environment would cause conflict with or even displacement of livestock. Again, the overall effect is judged to be relatively minor.

Recreation Opportunities

The Forest is almost exclusively used for its motorized opportunities. Rural, roaded natural and semi-primitive motorized recreation visitor days combined are 98.7 percent of the total. Only 1.3 percent of the total is non-motorized use.

A significant shift from the present demand for motorized opportunities is not expected to take place. However, land management decisions and resource activities that reduce the capacity of the land to provide motorized opportunities will have an effect on this demand. Alternative 7 would have the greatest effect and then alternative 4, due to the amount of land unavailable for motorized opportunities. Alternative 5 would have the least effect.

Perhaps the activity that has the most effect on and off roads is vehicle use. Current effects are damaged roads caused by use during wet periods and growth of two tracked roads usually caused by driving farther than the last vehicle. Cross-country, off-road vehicle use is occurring, but is mostly concentrated near communities. Areas open, restricted or closed to ORV's by alternative vary. These areas were determined on the basis of assignment of land to management prescriptions in FORPLAN. The development of a Travel Plan for a Forest Plan developed from any of the alternatives would probably change to acres of open, restricted, and closed. This is because several geographic factors such as wildlife resting areas are not included in the prescriptions.

TABLE IV-2

ACREAGE OPEN, RESTRICTED, OR CLOSED TO ORV
(Thousands of Acres)

ALTERNATIVE	OPEN	RESTRICTED	CLOSED
1	978.5	258.9	192.3
2	826.0	251.2	352.4
3	903.4	247.7	278.7
4	523.9	345.1	560.8
5	1,216.0	132.2	81.4
6	818.2	461.4	150.2
7	644.1	41.0	744.7
8	866.4	416.9	146.3
9	677.5	583.3	168.9
10	976.9	348.2	104.5
11	888.1	364.5	177.0

Alternatives 4 and 7 have the most acreage closed to ORV use.
 Alternatives 9 and 11 have the most acreage with restricted classification, such as seasonal closures.
 Alternatives 1 and 5 have the most acreage open to ORV use.

Recreation use projections, by alternative, are displayed in sections B and C of Chapter II.

Cultural Resources

Cultural resources, as the irreplaceable and nonrenewable fabric of our Nation's history and prehistory, are identified, protected, preserved and interpreted according to a body of legislated mandates enacted since 1906. With the conception of a project, a field survey is conducted to identify the existing cultural resources within the projected area of disturbance. If part or all of the identified cultural properties are evaluated as significant and eligible for inclusion on the National Register, as outlined in 36 CFR 60.4, then the effects of the proposed activity upon the significant resources must be determined.

Determinations of both significance and effect are made in consultation with the Utah State Historic Preservation Officer. Prior to any Forest undertaking which may affect a cultural resource property, the property is evaluated for significance. The categories of significance are:

1. Class I (significant)
2. Class II (unevaluated)
3. Class III (non-significant)

The categories of the effects of a Forest undertaking upon the cultural resource property are:

1. No Effect
2. No Adverse Effect
3. Adverse Effect
4. Beneficial Effect

Projects which cause "no adverse effect" and "adverse effect" to significant or unevaluated properties must be accompanied by a data recovery plan which will mitigate the effects of the undertaking upon the cultural resource. As with determinations of significance and effect, mitigation plans must be reviewed and concurred with by the Utah State Historic Preservation Officer.

Since 1980, over 99 percent of the projects conducted on the Fishlake National Forest have been determined as causing "no effect" on the significant cultural resources. The large number of "no effect" determinations is consistent with the present direction of management that steers disruptive project actions away from significant cultural properties. For example, significant sites within range chainings are simply flagged and avoided by chaining equipment. Most projects conducted on the Fishlake National Forest possess sufficiently flexible boundaries to allow the avoidance of significant cultural resources. A notable exception to this statement is the land exchange, which removes the protective umbrella of mandated legislation from the significant cultural resource property as it moves to private ownership.

In the opinion of the Forest, the enacting of any one of the eleven management alternatives will not significantly alter, change, accelerate or decrease the degree of direct project activity impacts to the cultural resources base. Under all alternatives, management direction will require the avoidance or mitigation of project effects upon significant or unevaluated cultural resources.

Indirect project activity impacts, in contrast, will significantly differ between alternatives. For example, alternatives that promote the construction of new roads into previously hard to access areas will indirectly contribute to increased vandalism. Improved access will also promote the presence of a greater number of vehicles in a given area. The presence of more vehicles can be damaging to certain types of cultural resource properties such as rock art panels that are susceptible to decay induced by carbon monoxide emissions.

Alternative 5, which emphasizes dispersed recreation, is potentially very disruptive to the cultural resource base. Dispersed recreationists, like other Forest users, impact cultural resources through intentional or unintentional vandalism. Intentional vandalism might include the use of petroglyphs for target practice or the collection of prehistoric artifacts from the surface of a site. An unintentional form of vandalism could witness the establishment of a modern camp within the boundaries of a cultural resource property. The degree of these impacts will increase or decrease according to the level of dispersed recreation. It should be stated that