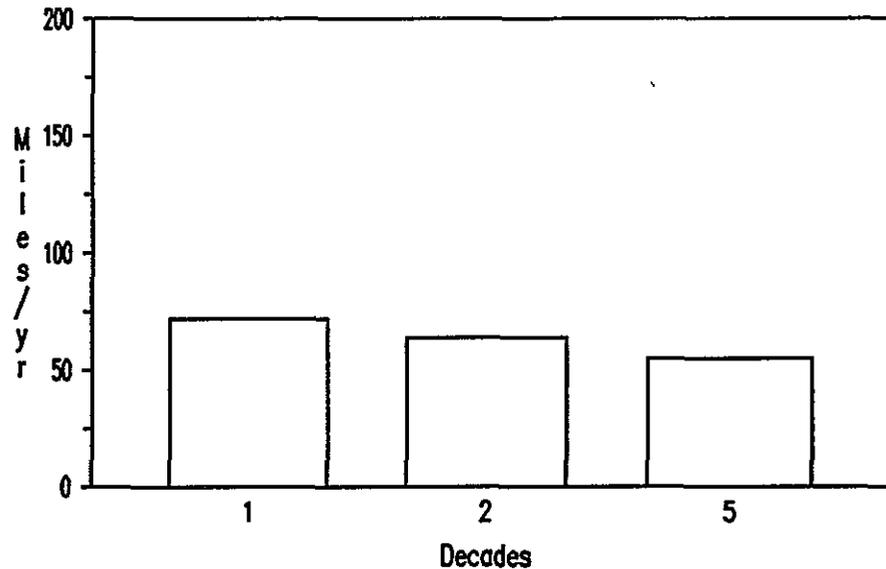


FIGURE B-44  
LOCAL ROAD CONSTRUCTION/RECONSTRUCTION



**8. Maximum Anadromous Fish Benchmark**

- a. Description      This benchmark estimates the maximum anadromous fish production that could be attained on the Forest, subject to Management Requirements and continued management of other resources
- b. Purpose          The purpose of this benchmark is to estimate the maximum level of anadromous fish that the Forest could provide
- c. FORPLAN Objective Function      This benchmark is developed outside the FORPLAN model.
- d. Assumptions and Constraints      It is assumed the Izee Falls passage project on the South Fork of the John Day River will be completed by 1990. Therefore, there will be a total of 280 miles of anadromous fish habitat on the Forest.

In addition to the standard riparian area constraints on timber management, two trees per acre each 40 years (minimum 20 inches diameter at breast height) in riparian anadromous areas are dedicated to fisheries. These are to provide additional large organic debris for instream structure to improve pool/riffle ratios. They may be left to fall naturally into the stream or be physically placed there to meet fisheries management objectives.

Instream and streamside enhancement projects (including planting shrubs and/or trees as needed, bank stabilization, occasionally raising the water table, and instream structural habitat improvement work) would occur on an estimated 250 miles of stream. Cost estimates for this work range from \$10,000 to \$40,000 per mile, averaging \$25,000 per mile. After an average structural life of about 40 years, about 40 percent of these structures would need to be replaced. Improved riparian vegetative condition and channel morphology should offset the need for the other 60 percent of the structures. It is estimated to take two decades to complete the initial structural and vegetative improvement work. Maintenance costs are estimated at 2 percent of installation cost per year.

To fully accomplish the objective of this benchmark, it would also be necessary to relocate and/or extensively mitigate an estimated 20 miles of roads in riparian areas, at an estimated cost of \$20,000 per mile.

All constraints (unless otherwise specified) are applicable throughout the planning horizon (150 years).

e Timber

This benchmark run produced a long-term sustained yield capacity of 61.7 million cubic feet per year with a first decade harvest volume of 51.7 million cubic feet per year (284.8 million board feet per/year). This includes approximately 4.0 million cubic feet per year (11.9 million board feet per year) due to mortality salvage and nonchargeable timber volume. This total volume exceeds the volume production goals for the Malheur National Forest called for in the "Forestry Program for Oregon" in all five decades. See Table B-20 for volume of timber harvest by decade.

The species mix for the first three decades is approximately 55 percent ponderosa pine and 43 percent mixed conifer species. This gradually shifts to 70 percent mixed conifer species and 30 percent ponderosa pine in the fifth decade. See Figure B-45 for the harvest methods used to achieve these volumes by decade. In addition, there is an average forest residue potential of 32.1 million cubic feet per year produced over the planning period. (See Figure B-46 )

FIGURE B-45  
HARVEST METHODS

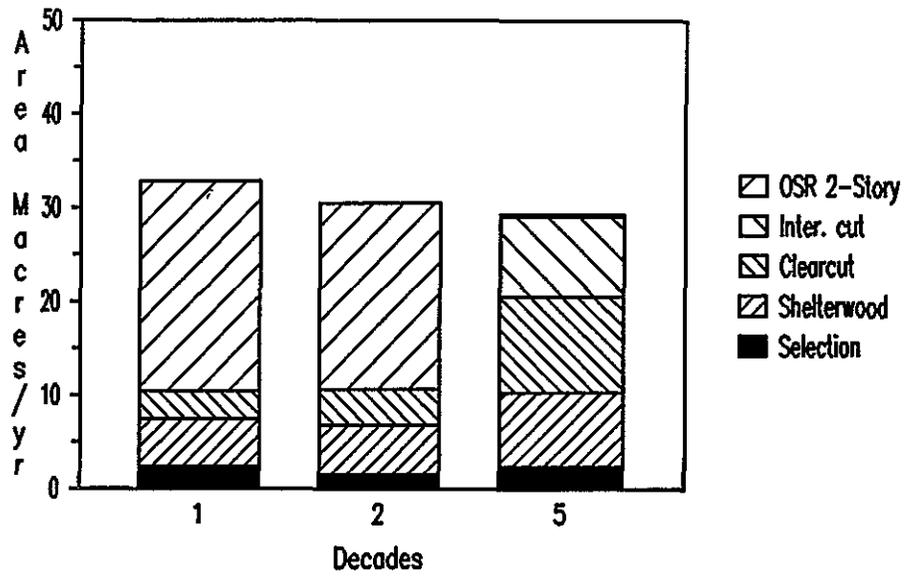
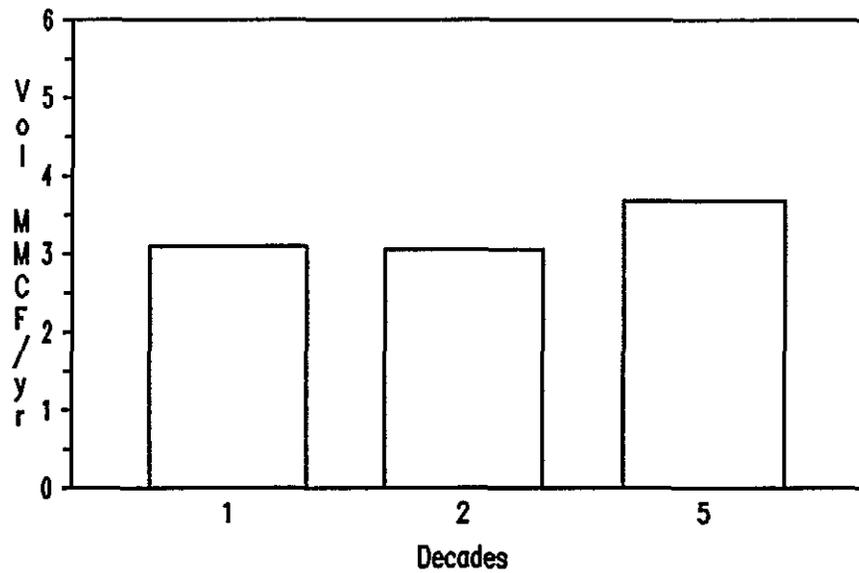


FIGURE B-46  
OTHER WOOD FIBER AND PERSONAL USE FIREWOOD



To achieve the projected harvest volumes, there will be an increase in precommercial thinning and planting acres over the 50-year period. General trends indicate high levels of precommercial thinning in the first three decades with decreasing levels in the last two decades. Reforestation (planting) occurs only in the later decades of the planning period. See Figures B-47 and B-48 for precommercial thinning and planting acres.

**FIGURE B-47**  
**PRECOMMERCIAL THINNING**

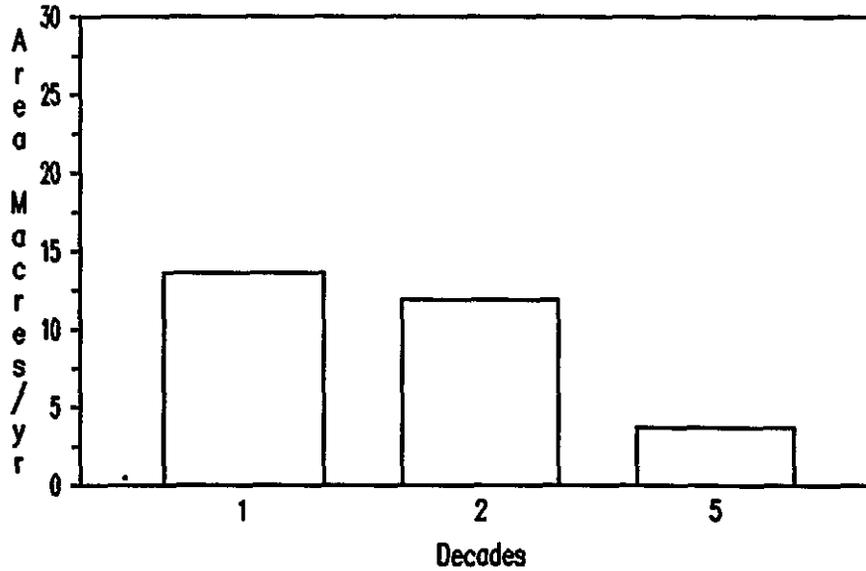
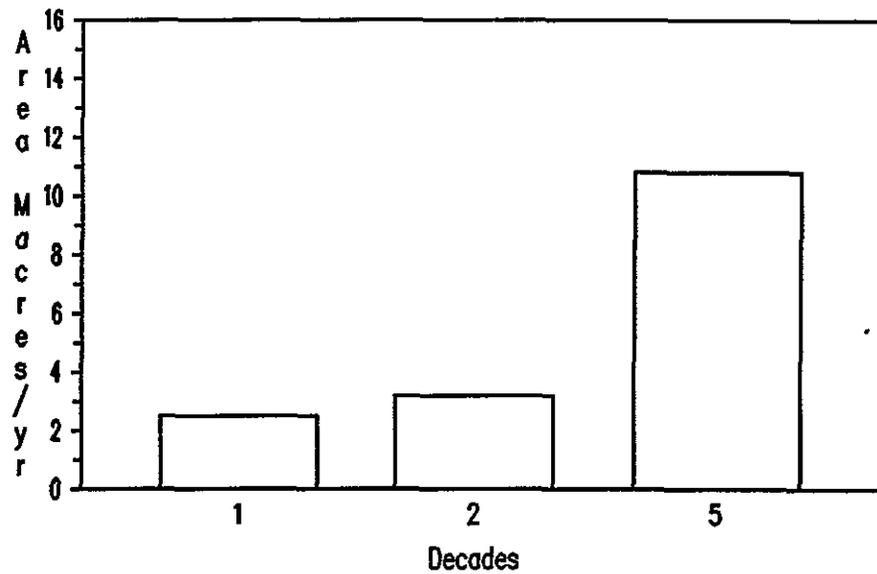


FIGURE B-48  
REFORESTATION (PLANTING)

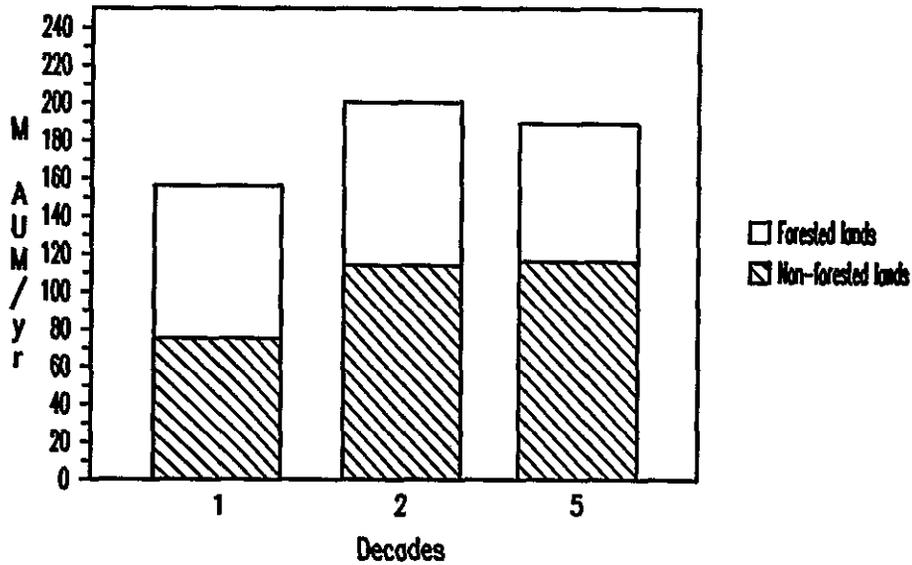


f. Range Management

Livestock would be removed from most riparian anadromous areas for one decade. In about 50 percent of the areas, this would continue for a second decade. After stream banks are stabilized and woody riparian vegetation well established, livestock use may be resumed under Riparian Management Area No. 3. Periodic short-term livestock exclusion may also be needed in the future.

Fencing for livestock control and developing water sources outside the riparian area, and/or providing water gaps for livestock, is estimated to cost \$2.2 million. This will occur on an estimated 300 miles of stream. Maintenance costs are estimated at \$220,000 per year. This will maintain current animal unit months by redistributing the animals outside the riparian areas. (See Figure B-49)

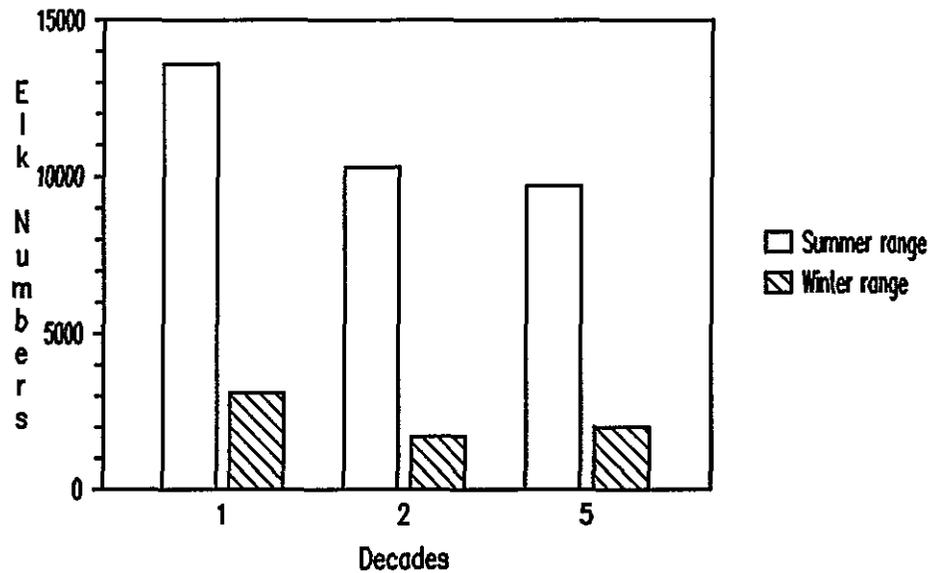
FIGURE B-49  
LIVESTOCK



Habitat diversity shows a slight increase in the first decade. Diversity decreases through the third decade and then increases again through the fifth decade.

Estimated elk numbers (per forage capability) on both winter and summer ranges decrease in the second decade then remain approximately constant. See Figure B-50. Elk numbers were estimated based on forage availability and a discount for less than optimum cover conditions only. No other factors such as hunting, predation, roading, weather, or Habitat Effectiveness Indices, were used to estimate the hypothetical population capacity of this benchmark.

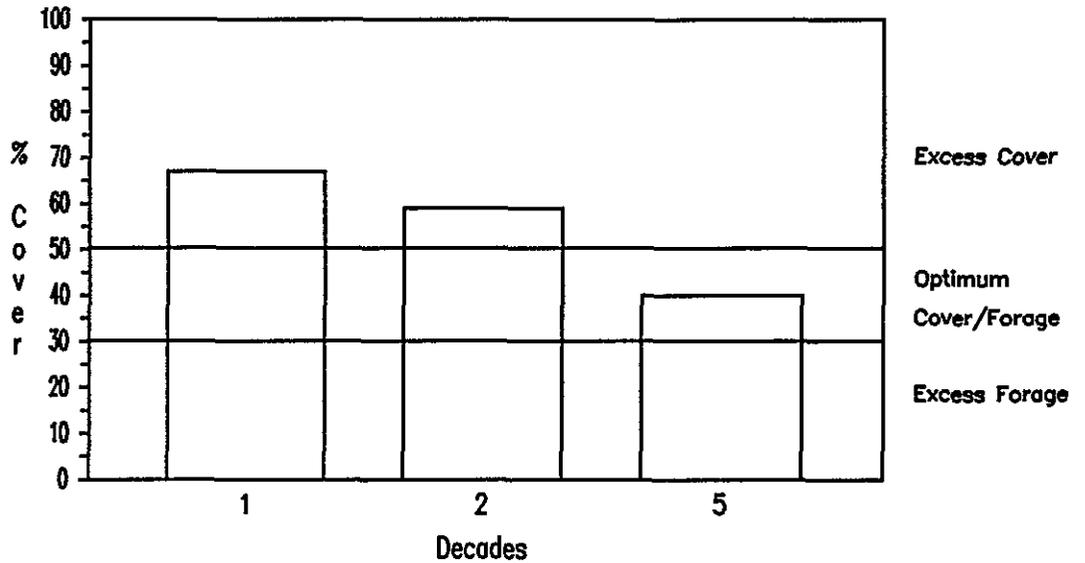
FIGURE B-50  
ESTIMATED ELK NUMBERS (per forage availability)



g. Wildlife

Big-game habitat shows a steady increase toward optimum cover/forage ratios through the fifth decade (Figure B-51)

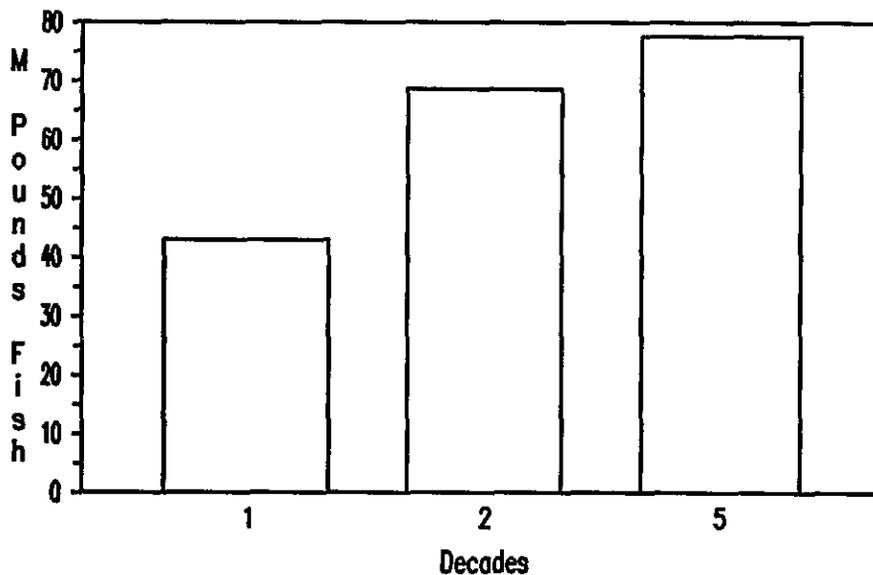
FIGURE B-51  
BIG-GAME HABITAT CAPABILITY



Cover in the above figure refers to an undefined combination of satisfactory and marginal cover categories

- h. Old Growth            Old growth will be maintained at the Management Requirement level of 44,860 acres
- i. Fisheries            Anadromous fish production would more than double in the first two decades then continue to increase at a slower rate through the fifth decade. This would result in an increase of about 33,600 wildlife and fish user days and 45,500 pounds of commercial harvest to the downstream fisheries. This is about 90 percent of the 1980 Resource Planning Act target.
- j. Water                See summary analysis, Section VI.C.10.d.
- k. Recreation           Developed Recreation: Developed recreation opportunities would be provided through the maintenance of existing facilities. Demand for developed recreation would be met through the fifth decade  
  
Dispersed Recreation. Unroaded dispersed recreation opportunities outside wilderness would be eliminated by the first decade. This benchmark would provide only roaded modified and wilderness semiprimitive nonmotorized opportunities.  
  
Visual Resource: No provisions for visual resource management would be made. By the end of the first decade, the only natural-appearing landscapes remaining would be those in wilderness.  
  
Cultural Resources. Cultural resources will be inventoried prior to the implementation of potentially impacting management activities. The number of acres managed for cultural resource values equals the acres of timber to be harvested annually. New acres will accumulate until all lands suitable for timber production have been surveyed and cultural resources located. Thereafter, new cultural resource management acres will continue to accrue as other Forest acres are examined, but at a slower rate and not as a significant correspondence with any specific resource output

FIGURE B-52  
ANADROMOUS FISH PRODUCTION POTENTIAL



l Transportation

Arterial and collector road construction and reconstruction will remain constant over time. The reason for this is the dispersion of harvest and recreational activities across the Forest. This assumption of a constant program also applies to maintenance levels 1, 3, 4, and 5 of the road maintenance program. Since local roads are usually used by only high-clearance vehicles they fall into the maintenance level 2 which will change over time.

The effect of this benchmark is to require movement of local roads away from streambanks and out of creek bottoms, probably at a more rapid rate and with a greater monitoring effort to ensure that it occurs. This would increase costs because of relocation requirements. Approximately 20 miles of road would need to be relocated or mitigated at a cost of \$20,000 per mile. (See Figure B-53)

m Protection

The cost of protection (dollars per million acres protected) will not vary by benchmark or alternative. Eighteen protection alternatives were run through the Fire Management Analysis process and the most cost-efficient alternative was selected. Differences in benchmarks or alternatives will probably have no measurable effect on the Fire Management Effectiveness level selected.

Method of Measurement Fire Management Effectiveness is measured by adding appropriated Forest Fire Protection dollars to Emergency Firefighting costs and resource loss values. Program Effectiveness is computed by averaging the annual cost over a decade.

FIGURE B-53  
LOCAL ROAD CONSTRUCTION/RECONSTRUCTION

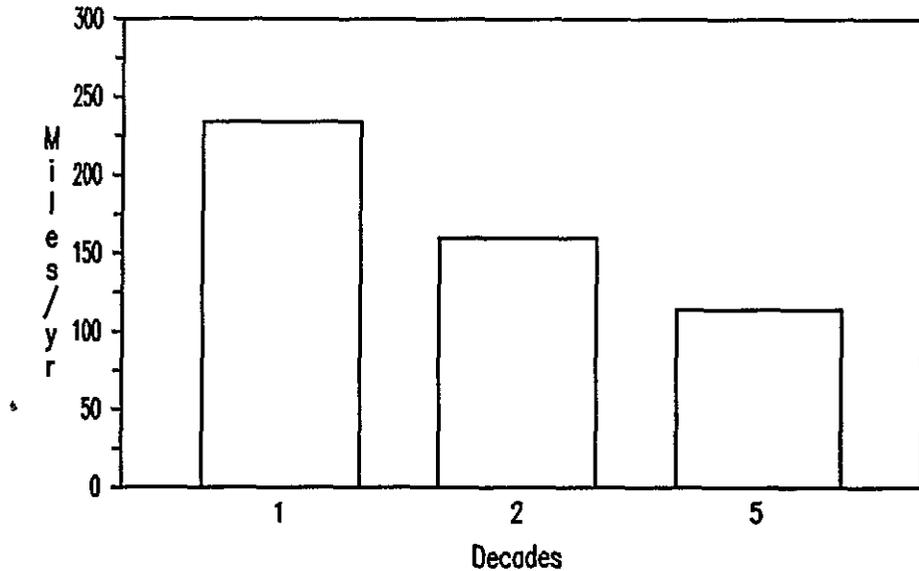


TABLE B-20

**BENCHMARK MAX FISH WITH MANAGEMENT REQUIREMENTS**

Output/Effect	Unit of Measure/yr	1st Decade	2nd Decade	5th Decade
<b>RECREATION</b>				
Developed Use	M RVDS	132 1	138.0	138 0
Dispersed Use				
Semi-Primitive				
Non-Motorized	M RVDS	0	0	0
Semi-Primitive				
Motorized	M RVDS	0	0	0
Roaded Natural	M RVDS	1,949	976.1	163.1
Roaded Modified	M RVDS	1,542	2,633	3,294 4
Wilderness	M RVDS	61.8	61.8	61.8
<b>WILDLIFE AND FISH</b>				
Elk (Summer)	Numbers	13,600	10,300	9,700
Anadromous Fish	M Pounds	43.0	68.6	77.6
Big-Game Use <sup>1/</sup>	M WFUDs	105.6	70 4	109.2
Fish Use <sup>1/</sup>	M WFUDs	31 8	50.6	57 3
<b>RANGE</b>				
Livestock Use	M AUMs	156.0	199.9	188.9
<b>TIMBER</b>				
LTSYC	MM Cu Ft	----- 61.7 in Decade 15 -----		
Programmed Sale	MM Bd Ft	284 8	N/A	N/A
Offered <sup>2/</sup>	MM Cu Ft	51.7	52.0	52.3
Other wood fiber and				
Personal firewood	MM Cu Ft	3.10	3.06	3 68
Volume by species				
Ponderosa Pine	MM Cu Ft	26.1	23.2	14.5
Mixed Conifer	MM Cu Ft	20.7	23.7	33.1
Lodgepole Pine	MM Cu Ft	0.8	0.9	0.1
Harvest Method				
Overstory Removal/				
Two-story stand	M Acres	22.3	19.8	0.2
Intermediate cut	M Acres	0	0	8 5
Clearcut	M Acres	3.0	3.8	10.3
Shelterwood cut	M Acres	5.1	5 3	7 9
Selective cut	M Acres	2.4	1.6	2.4
Precommercial thin	M Acres	13.6	11.9	3.7
Reforestation (Plant)	M Acres	2.5	3.2	10.8
<b>WATER QUALITY</b>				
Sediment	Index	1,333	1,168	1,446
Water Yield	M Acre Feet	620	620	620
<b>FIRE</b>				
Fire Effective Index	\$/M Acres	1,344	1,344	1,344
Fuel Treatment	M Acres	26 6	24 9	25.5
<b>FACILITIES</b>				
Passenger Car	Miles	1,472	1,472	1,472
High Clearance Vehicle	Miles	6,103	6,735	7,196
Construction and				
Reconstruction	Miles	234	160	114

<sup>1/</sup>Included in recreation visitor days in recreation.

<sup>2/</sup> Including 4.0 million cubic feet per/year salvage