

Chapter 2

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CHAPTER 2. SUMMARY OF THE ANALYSIS OF THE MANAGEMENT SITUATION

Introduction

Chapter 2 summarizes the resource conditions and the Forest ability to supply market and nonmarket goods and services in response to public demands. A discussion of resource supply conditions and projected demands can be found in the Analysis of the Management Situation (July 1985), and is updated in both the DEIS and FEIS (Chapters III and II).

The chapter is divided into two major sections. The first discusses existing conditions on the Forest, supply and demand conditions for the Resources Planning Act (RPA) periods, and production levels under current management direction (Alternative A in the FEIS) or the existing situation. The second section lists information, inventory, and research needs identified in the planning process-information that would be desirable to have for improving the present Forest Plan or aiding in preparation of the next Plan.

RESOURCE CONDITIONS AND SUPPLY ESTIMATES

The major issues and concerns, which guided the development of the Forest Plan, revolved around the management of the recreation, roadless, wildlife, big game, fish, riparian, water, minerals, and timber resources. The ability of the Forest to provide goods and services in response to the issues is dependent on the current conditions and capability of forest resources. The ability to supply these resource outputs was generally estimated through 'benchmark' analysis (additional discussion about benchmarks can be found in the AMS, or FEIS Appendix 6). The benchmarks were designed to explore the maximum supply potentials for each issue related resource that the Forest produces, while satisfying all of the legal requirements for forest planning. Benchmarks help define the resource and economic potentials of the Forest and the range of outputs from which alternatives could be formulated in order to address the identified planning issues.

Table 2-1 shows the existing supply situations. Table 2-2 displays the potential output levels for each of the resource maximization benchmarks, and the maximum economic levels. Table 2-2 gives an idea of the magnitude of complementary and competitive relationships existing between the production of the key resources.

RESOURCE DEMAND PROJECTIONS

The term 'demand' is used by the lay person to identify a certain level of consumption, and by the analyst or economist, to identify a schedule of consumption levels which vary depending on price. In the following discussions, 'demand' is used as a lay person would use the term. As such, demand estimates reflect an intersection at a particular point in time between a demand schedule (a list of willingness-to-pay values for various levels of offerings) and a supply schedule (a list of volumes the seller is willing to offer at various prices). Demand estimates reflect future outputs/effects levels anticipated by several public agencies, including the Forest Service. These projections are generally historical use patterns and/or regional and national trends applied to the local situation. The assumption is that at maximum supply levels, each of the resources produced by the Forest would be demanded (i.e., utilized).

Table 2-2 displays the intersection points over time for several Forest outputs for which estimates are meaningful. As such, they assume a continuation into the future of the relationships which would provide viability for the respective enterprises. In the case of livestock grazing, for instance, the figures assume continued population growth in the United States, a certain level of red meat consumption per capita, certain levels of imports and exports,

certain cost levels for the goods and services used in the production of red meat, and so on. The projections, like any projections, are therefore expected to be less accurate in the distant future than in the near future.

EXISTING SUPPLY SITUATION

TABLE 2-1. SUMMARY OF EXISTING SITUATION ON THE UMATILLA NATIONAL FOREST

TOTAL NATIONAL FOREST AREA		1,511.1	(1 000 Acres)
OTHER OWNERSHIPS		108.6	(1000 Acres)
WILDERNESSES (Three Statutory Wildernesses)		304.4	(1000 Acres)
NON-FOREST, ROADS, FACILITIES, WATER, ETC		200.9	(1000 Acres)
LANDS SUITABLE FOR TIMBER PRODUCTION			
1963 Timber Plan as amended		897.2	(1000 Acres)
<hr/>			
RECREATION	Primitive & Semi-Primitive (Supplied)	503.9	(1000 Acres)
	Retention/Partial Retention	485.9	(1000 Acres)
ROADLESS AREAS	Area Remaining Unroaded	281.1	(1000 Acres)
	Areas Remaining Unroaded	22	(Number)
WILDLIFE	Old Growth (Total Including Wilderness)	190.7	(1000 Acres)
BIG GAME	Estimated Elk Population (1983)	21,135	(Number of Elk)
	State Management Objectives (Index)	21,056	(Number of Elk)
FISH	Smolt Habitat Capability Index (1980 Base)	1,480	(1000 Smolts)
RANGE	Permitted Grazing	54.5	(1000 AUM's/Yr.)
	Total Program Sale Quantity (Sell) (1979-88 Average)	164.5	(MMBF/Yr.)
TIMBER	Total Sawtimber (Sold) (1979-88)	108.5	(MMBF/Yr.)
	Other (Cull, Small Material, Salvage, and Fuelwood) (1979-88 Average)	56.0	(MMBF/Yr.)
	Actual Total Harvest (1979-88 Average)	148.5	(MMBF/Yr.)
	Allowable Sale Quantity (Green) as Per 1963 TM Plan as Amended	147.8	(MMBF/Yr.)
SOCIO-ECONOMIC	Present Net Value	922	(Million \$)
	Total Returns to U.S. Treasury*	6.2	(Million \$/Yr.)
	Payment to Counties*	2.6	(Million \$/Yr.)
	Jobs (directly related to UNF operations)	3,564	Total Jobs
	Income (directly related to UNF operations)	48.5	(Million \$/Yr.)

* 1980-88 Average

Output/Effects	Units	DECADE 1		DECADE 2		DECADE 5	
		Potential Supply	Potential Demand	Potential Supply	Potential Demand	Potential Supply	Potential Demand
RECREATION Dispersed Recreation Dispersed Recreation, Primitive/Semi-primitive Developed Recreation	M RVD's/Yr. M Acres M RVD's/Yr.	3,830 585 640	1,127 331 264	3,880 585 700	1,190 363 320	4,030 585 840	1,345 464 547
WILDLIFE Potential Elk Population Big Game Hunting Opportunity Old Growth (including wilderness)	Index M WUD's/Yr. M Acres	22,600 580 191	20,500 524	21,900 559 264	20,600 525	23,500 602 925	20,800 531
FISH Anadromous Anadromous Fish Use (Sport Fishing)	M Smolts/Yr. M RVD's/Yr.	2,900 28.3	2,960 28.3	3,900 39.8	3,900 36.8	7,600 74.4	7,600 53.8
RANGE Permitted Grazing Use	M AUM's/Yr.	103	74	105	77	105	77
TIMBER Allowable Sale Quantity Firewood	MMBF/Yr. MMBF/Yr.	207 23	262 ¹ 140 ² 17	207 23	276 ¹ 154 ² 23	207 23	260 ¹ 138 ² 23
WATER Total Flow	M Acre Feet/Yr.	2,460	Unknown ³	2,460	Unknown ³	2,460	Unknown ³
MINERALS/ENERGY Acres of Land Open to Development	M Acres	1,048	1,048	1,048	1,048	1,048	1,048

1 Projected high demand for Forest timber

2 Projected average demand for Forest timber.

3 Unknown—Demand substantially higher than supply.

ECONOMIC AND SOCIAL ENVIRONMENT

THE ECONOMY

The Forest most directly influences 10 counties: Asotin, Columbia, Garfield, and Walla Walla in Washington; and Grant, Morrow, Umatilla, Union, Wallowa, and Wheeler in Oregon. These counties utilize most of the Forest resources. The Forest is also indirectly linked with more distant neighbors via recreational opportunities, economics, and forest products.

Economic Base and Population Dynamics

In other than the relatively small service and trade centers in the area, most local economies and lifestyles evolve around agriculture, ranching, government, and the timber industry. People living in the Washington counties follow a predominantly agricultural lifestyle; they produce mainly wheat and cattle. In Oregon, the newly industrialized portions of Umatilla and Morrow counties along the Columbia River are growing rapidly while other portions of these counties are agricultural and growing slowly. Mechanized, irrigated agriculture has been a major source of this growth. Although Union and Wallowa county residents live in predominantly agricultural communities, their economy is more timber-oriented than the other agricultural counties. Wheeler and Grant counties are ranching areas; they are too dry for dryland wheat farming and too far from water sources for cost-effective irrigation. However, Grant County is predominately timber-oriented and is relatively stable, but it suffered economically from the recent downtrend in the wood products market.

In the Umatilla National Forest area of influence, traditional economies have grown slowly. Forest products have been part of the core of the area's economy, but have not been the major stimulus for growth. Therefore, for the area of influence as a whole, economic growth is expected to be slow, steady, and stable. Areas that are growing or declining will continue the trends; urban areas are expected to expand in the service and trade sectors; and agriculture will continue to be a stabilizing influence on county economics.

A specific area may fluctuate, but variation is usually offset by change in the opposite direction in another area. An example is the region along the Columbia River which has grown rapidly as new industries and irrigated agriculture have brought newcomers, and has had its growth offset by declines in agricultural employment caused by increased mechanization. Changes in the lumber industry have also reduced employment and affected the ties of local populations and economies to the Forest industry.

Ties to the Umatilla National Forest

The economic and social ties to the Forest are numerous and complex. The Forest provides a variety of resources, land uses, and values to the communities and people within the area of influence. Some people and communities are more dependent on the Forest than others.

Generally, county governments receive around 10 percent of their operating revenues from national forest receipts. Percentages (ranging from 0.1 percent in Walla Walla County to 14.4 percent in Umatilla County) depend on receipts from activities and related market values. In 1988, the Umatilla National Forest contributed about 22 percent of the county payment funds from national forest receipts to counties in the State of Washington, and approximately 78 percent of Oregon county funds.

THE SOCIETY

Social linkages with the Forest are characterized in three broad areas as follows:

- People or communities with direct economic relationships with the Forest.

- People or communities with aesthetic and recreation-related ties to the Forest.
- Confederated Tribes of the Umatilla Indian Reservation and other Indian people.

The timber resource is important to towns with logging and milling industries. Towns like Elgin in Union County, Pilot Rock in Umatilla County, Heppner in Morrow County, and John Day in Grant County are oriented toward wood products. Many jobs are directly related to, and businesses dependent on, the timber supply from both private forest land and national forests, and on market demand.

Direct ties are also seen in agricultural communities which are linked to the Forest by their need for water, and ranching communities highly dependent on the Forest for forage for livestock grazing. Forest grazing policy has major impacts on survival and growth of individual ranching operations and on ranching communities. Recreation-related industries and services tied to the Forest also provide employment and economic contributions throughout the area.

People in communities throughout the area of influence have recreation and aesthetic ties to the Forest. Residents in communities both in and outside the area of influence utilize recreational opportunities year-round. Many are concerned about wilderness, wildlife, hunting, fishing, other recreation, roadless areas, and environmental values.

Ties between the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) and the Forest are close and longstanding. For many members of the CTUIR, the Forest is more than simply a resource; it is a special place for traditional activities and holds religious and spiritual significance. The Forest is a site for traditional berry picking and root gathering; issues of site protection and privacy are sensitive and complex. The Forest also provides fish and game for subsistence fishing and hunting.

Predictions of social change are difficult to make, but some trends are evident. Communities are likely to become more aware of their dependence on government and federal funding as related government jobs are cut (Cockle 1981). Economic decline and reduced production in traditional industries during the early 1980's may have encouraged communities to diversify and recruit new businesses.

Part of the social character of a community is its values; which and what kinds of people, places, objects, feelings, and ways of living are important to community members. The local area encompasses people with a diversity of values, reflective of the nation as a whole. Many residents in these counties feel their pioneer heritage is important; they value hard work, rugged self-reliance, individualism, use of resources, and independence. For many local residents, family ties are important; relatives and neighbors are often major actors in day-to-day life. Others have more of a social, urban, or environmental orientation and are concerned about amenities, protection, or preservation of the Forest.

RECREATION

The Forest provides a variety of recreation opportunities from highly developed downhill skiing facilities to remote wilderness. According to the 1984 Recreation Complexity Rating System, the Forest ranked 8th out of 19 in the Pacific Northwest Region (Region 6) and 52nd of all the 159 national forests.

The recreation resources on the Forest are described and managed in terms of recreation opportunities, using the Recreation Opportunity Spectrum (ROS). The ROS inventory identified five physical/social settings on the Forest. The settings are Primitive, Semi-primitive Nonmotorized, Semi-primitive Motorized, Roaded Natural, and Roaded Modified. Within the ROS settings, the Forest provides two principal types of recreation: recreation sites, in which the

activities are dependent on constructed facilities, i.e., RV camping, downhill skiing, recreation residences, etc.; and dispersed, in which the activities are not dependent on constructed facilities (hunting, fishing, off-highway vehicle use, etc.).

Recreation Sites

The Forest has a variety of recreation facilities which provide numerous opportunities for the public. There are 20 developed campgrounds, 5 of which are administered as fee sites by the Forest. The five fee sites are: Jubilee Lake, Target Meadows, and Woodward on the Walla Walla Ranger District; Bull Prairie Lake on the Heppner Ranger District, and Tollbridge on the North Fork John Day Ranger District. In addition to the campgrounds, there are 2 downhill ski areas (Ski Bluewood and Spout Springs), 101 recreation residences, 7 picnic sites, 4 boating sites, and 1 organizational camp.

The developed sites on the Forest can accommodate 6,949 persons-at-one-time (PAOT). The practical capacity for the sites is 568,576 recreation-visitor-days (RVD's) annually. Currently, the annual use is approximately 220,000 RVDs. All of the developed sites occur within the Roaded Natural ROS class.

Demand vs. Capacity

According to the 1988 Oregon State-wide Comprehensive Outdoor Recreation Plan (SCORP), the demand for camping and picnic facilities will more than double by the year 2000. Comparable information for northeastern Oregon indicates a 17 to 38 percent increase. The 1985 edition of the Washington SCORP predicts a small rate of increase for camping in the six southeastern counties. However, a severe supply shortage exists to meet current demands for that part of the state. The demand for other developed facilities, such as alpine skiing, also continues to grow.

Currently, the total practical capacity for campgrounds, picnic, and boating sites is 296,117 RVD's. The current use for these sites is 160,000 RVD's. Expanding the current use by the projected increases for northeastern Oregon would require a practical capacity of 330,000 RVD by the year 2000. Based on this evaluation, it appears that existing campground and picnic facilities will accommodate expected use during this planning period.

However, because sites constructed near water or with visually appealing settings are currently the most popular and are used near capacity, the demand for more developed recreation facilities is site-specific and is not a Forest-wide problem. In order to be responsive to public demand, a need exists to consider increasing the capacity at existing heavy-use sites. The following candidate sites by ranger district for increased capacity are:

Heppner	Pomeroy
Bull Prairie Lake Campground	Tucannon River area
Penland Lake Picnic/Campground	Teal Spring Campground
North Fork John Day	Walla Walla
Olive Lake Campground	Jubilee Lake Campground
Sites along the North Fork John Day	Umatilla Forks Campground
River	

Although there is a demand for additional alpine skiing facilities statewide, there does not appear to be a need for additional sites on the Forest. Presently, the area is served by Ski Bluewood and Spout Springs ski areas on the Umatilla National Forest (both have room for expansion), and by Anthony Lakes on the Wallowa-Whitman National Forest. Currently and for the near future, the demand for alpine skiing is being met. Increased demand can be met through expansion of existing sites.

Dispersed Recreation

The Umatilla National Forest is known mostly for its dispersed recreation opportunities. In analyzing the existing opportunities, the Forest grouped use into the 12 activities identified in 1979 by the Pacific Northwest River Basins Commission (PNRBC). These were further aggregated by ROS class.

The 1982 ROS inventory classified the Forest into a spectrum of physical and social settings. Currently, 36 percent of the Forest is in an undeveloped condition (Primitive and Semi-primitive); 36 percent is Roaded Natural; and 28 percent is Roaded Modified. Of the total recreation use on the Forest (1986), 21 percent occurs in the Primitive and Semi-primitive settings; 44 percent in Roaded Natural; and 35 percent in Roaded Modified.

Hunting, primarily for Rocky Mountain elk and mule deer, is the most popular activity on the Forest. In 1986, hunting generated about 520,000 RVD's of use or 48 percent of the dispersed use on the Forest. Hunting use has stabilized in the last couple of years. Other high use activities are sightseeing (18 percent), snow activities (10 percent), and dispersed camping (9 percent).

There are 735 miles of managed trails on the Forest, 355 miles of which are within wildernesses. Off-highway vehicle (OHV) use (primarily trail bike and snowmobile use) is very popular on the Forest OHV users and clubs are looking for areas and opportunities to enjoy their pursuits. Currently, the Forest maintains over 361 miles of trails open to motorcycles and has 168 miles of groomed snowmobile trails. Nordic skiing has grown in popularity in the late 1970s and early 1980s. There are six Sno-Park areas, all on the north end of the Forest.

Demand vs Capacity

Dispersed recreation use on the Forest is not limited by quotas or allowable numbers of visitors. Permits are issued for limiting the number of users only in the Mill Creek Watershed In light of the unrestricted access, current use should equate to current demand. Based on recreation participation projections found in the 1979 PNRBC report and adjusted based on factors found in the 1988 Oregon SCORP, recreation use on the Umatilla National Forest is expected to increase gradually as shown in Table 2-3. Total demand is estimated to increase from approximately 1.1 million RVD's to 1.3 million five decades from now. Current demand is distributed between unroaded (primitive and semi-primitive) and roaded areas in a 20:30 proportion. About one-fourth of the unroaded use is related to motorized transportation.

TABLE 2-3. RECREATION ACTIVITY TRENDS (MRVD)

Umatilla National Forest

Activity	Decade					% Increase
	1	2	3	4	5	(Decades 1-5)
1. Camping	86	92	99	106	113	31%
2. Picnicking	11	12	13	14	14	35%
3. Swimming	7	7	8	8	9	34%
4. Sightseeing	186	210	224	240	256	38%
5. Fishing	80	85	91	98	104	31%
6. Boating	11	13	14	15	16	43%
7. Walking	32	33	35	38	40	25%
8. Hunting	524	525	527	529	531	1%
9. Bicycle	1	1	1	1	1	34%

Activity	Decade					% Increase
	1	2	3	4	5	(Decades 1-5)
10. Horseback	28	29	31	33	36	27%
11. Snow Activity	94	109	117	125	134	42%
12. Other	67	74	80	85	91	35%
Total MRVD's	1,127	1,190	1,240	1,292	1,345	19%

As seen in Table 2-3, participation in recreation activities is predicted to increase by approximately 20 percent over the next 50 years. All activities, except big game hunting (also see Wildlife section), will increase significantly (274%). All future activity use levels, with the possible exception of elk hunting, can be readily accommodated on the Forest. The problem will be accommodating activities in the desired physical and social opportunity setting.

Table 2-4 displays the existing situation and current direction. Table 2-5 displays estimates of the acres needed in each ROS class, at current use densities, in order to meet future demand.

TABLE 2-4. ACRES BY ROS CLASS

Umatilla National Forest

ROS Class	Existing Situation	Current Direction
Primitive	36,000	36,000
Semi-primitive Nonmotorized	321,200	269,000
Semi-primitive Motorized	146,700	6,000
Roaded Natural	507,600	119,000
Roaded Modified	<u>390,500</u>	<u>972,000</u>
	1,402,000	1,402,000

TABLE 2-5. ACRES NEEDED FOR RVD DEMAND BY DECADE

DECADE	PRIMITIVE	SPNM	SPM	TOTAL PRIM/ SEMI-PRIM	RN	RM
1	77	158	96	331	140	169
2	88	171	104	363	149	173
3	98	183	113	394	156	174
4	111	196	122	429	164	175
5	123	210	131	464	171	176

As seen in Tables 2-4 and 2-5, given current direction, demand for roaded opportunities could be met. However, the Forest would have difficulty meeting future demand for primitive and semi-primitive opportunities. Under current direction, the Forest falls short in acres needed to meet first decade demand; by the fifth decade the situation will be worse. The Forest does have the capability to meet future (fifth decade) demand, depending on the disposition of the roadless areas. Maximum potential primitive and semi-primitive area, including wilderness, amounts to about 585,000 acres; fifth decade needs are estimated at 464,000 acres.

Frequency of contacts between individuals or groups is an important factor in determining the recreation setting. Except during the elk hunting season, Umatilla National Forest visitors are generally accustomed to a very low user density. However, as demand and use increases in the

future, user density and encounters with others will increase. A key assumption is that people seeking primitive and semi-primitive opportunities will experience and accept increased encounters with other parties in the future and continue to have satisfying experiences. Current demand results in an average of 0.66 RVD/acre/year. Future demand in 2030 will increase user density to 0.93 RVD/acre/year, a 41 percent increase.

WILDLIFE

The Forest provides a broad diversity of forest and range ecosystems which support a wide range of game and nongame wildlife species. There are 324 species of vertebrate animals on the Forest, including 7 amphibians, 14 reptiles, 29 fish, 73 mammals, and 201 birds. A complete list of species is on file for the FEIS. More detailed descriptions of species and their habitat are found in Wildlife Habitats in Managed Forests: The Blue Mountains of Oregon and Washington (Thomas and others 1979).

The distribution, as well as abundance, of wildlife populations is largely determined by habitat type and conditions. Several habitats or habitat components, including riparian areas, meadows, dead/down trees and mature tree/old growth, are very important on the Forest. For elk and other big game, the amount and distribution of cover, forage, and human disturbance are important habitat considerations.

Active cooperation between the Forest, the Oregon Department of Fish and Wildlife (ODNV), and the Washington Department of Wildlife (WDW) is important to fish and wildlife programs on the Forest. While the Forest is responsible for providing and improving habitat, the states are responsible for managing wildlife populations.

Wildlife and its management hold strong public interest. However, the primary output for which supply and demand estimates are meaningful is big game hunting opportunity. There are indications that the amount of hunting is approximating the capacity of the existing resource. Hunting demand is expected to increase slightly through time. The Forest has some capacity to increase hunting opportunities (i.e., produce more big game).

Indicator Species

Seven fish and wildlife indicator species were selected to represent animals associated with the major habitat types on the Forest. The habitat requirements of the selected indicator species are presumed to represent those of a larger group of wildlife species. Habitat conditions for management indicator species, as well as for all other wildlife species on the Forest, will be managed to maintain viable populations (36 CFR 219.19).

A list of the selected Forest management indicator species is shown in Table 2-6.

TABLE 2-6. MANAGEMENT INDICATOR SPECIES AND THEIR ASSOCIATED HABITATS

Umatilla National Forest

Species	Habitat Types
Steelhead (anadromous fish)	Streams/riparian habitats
Rainbow trout (resident)	Streams/riparian habitats
Rocky Mountain elk	General forest habitat and winter ranges
Pileated woodpecker	Dead/down tree habitat (mixed conifer) in mature and old growth stands
Northern three-toed woodpecker	Dead/down tree habitat (lodgepole pine) in mature and old growth stands
Pine marten	Mature and old growth stands at high elevations
Primary cavity excavators	Dead/down tree (snag) habitat

Nongame Species

The Forest provides habitat for many nongame species of wildlife including furbearers, songbirds, predators, and reptiles. The interest in nonconsumptive uses of wildlife (wildlife photography, birdwatching, etc) is increasing and creating an interest and concern in the management of nongame species. The nongame species most likely to be affected by Forest management activities and practices include those wildlife species requiring stands of mature or old growth timber and large diameter dead or down tree habitat.

In the Blue Mountains, nearly 100 different wildlife species of birds and mammals utilize dead and down tree habitats for nesting, feeding, and perching (Thomas and others 1979). Nearly 60 species depend on suitable trees and associated cavities for their survival. Primary excavators, such as the pileated woodpecker, three-toed woodpecker, and downy woodpecker, create holes in dead or decaying trees that may be used later by secondary cavity users such as owls, bluebirds, wrens, and flying squirrels.

Timber harvest and fuelwood cutting in the past 10 years have reduced the amount of available dead tree habitat for wildlife species. Early indications are that tree mortality from insect and disease attacks, triggered by drought conditions of the last several years, will probably provide sufficient quantities of suitable habitat in snag deficient areas. Nevertheless, given present trends, the estimated or potential populations of wildlife species dependent on these habitats are anticipated to decline.

Old Growth Tree Habitat

A variety of wildlife species on the Forest (25 bird and 13 mammal) appears to demonstrate a high level of use or dependence on mature and old growth tree habitat. Past timber harvest activities have removed much of the suitable old growth tree habitat once found on the Forest. The remaining acres are not uniformly or well distributed. Presently there are about 190,700 acres of inventoried old growth tree habitat on the Forest, including about 10,200 acres of mature and old growth lodgepole pines. Approximately 68,850 acres of old growth tree habitat type have been identified in existing wilderness

The abundance and distribution of available old growth and mature tree habitat has become an issue with many segments of the public. This habitat component is important to the timber industry as a source of high value (and needed) timber volume, and to others as essential for wildlife species, for diversity, and for aesthetic values. Continued current timber harvest activities will further diminish and fragment the forest inventory of old growth/mature tree habitat.

The Forest supports one of the largest Rocky Mountain elk herds in the country, and portions of the Forest provide some of the most productive elk habitat in Washington and Oregon. The combined two-state summer population management objective for the Forest is 21,056 Rocky Mountain elk and 22,760 mule deer. Present populations of elk are at or slightly below state management objectives, while deer numbers have been declining for several years and are substantially below the management objectives. Of great concern is the more recent reduction in calves and fawns production and survival, resulting in a range of about 18-36 per 100 adults. In addition, state wildlife agency tracking data indicates that more elk are staying yearlong on private lands.

Other game species found on the Forest include white-tailed deer, black bear, Rocky Mountain and California bighorn sheep, mountain lion, turkey, quail, grouse, and several species of waterfowl. Other important wildlife species include beaver, bobcat, and coyote. Although bighorn sheep are indigenous to the Forest, they were extirpated from the area during the early 1920's. California bighorn sheep were introduced to the area in the early 1960's and Rocky Mountain bighorn sheep in 1982. State wildlife agencies regulate the harvest of wildlife species on the Forest.

BIG GAME

Management Activities and Big Game Habitat

Timber, roads, and range management practices can alter big game and other wildlife habitat faster and more profoundly than other Forest management activities. Past timber harvest activities improved the ratio of forage to cover on summer ranges, which resulted in increased capacities for elk and deer and contributed to the high numbers of animals on the Forest through the early 1980s. In many areas, however, the level and patterns of timber harvest and road construction may have reached, or even exceeded, the level at which elk habitat is improved, and may be adversely affecting it. Road use and management (closures) are another critical practice affecting big game security.

Winter Ranges

Twenty-one winter ranges, totaling 277,677 acres, have been identified on the Forest in cooperation with state wildlife agencies. An extensive survey of open grasslands and scabrock flats (half of these winter ranges) in 1981-82 indicated that 71 percent of the surveyed area is in fair to good condition while 29 percent remains in poor to very poor condition. The survey did not consider the condition of the timbered areas. Much of the poor condition can be attributed to heavy grazing by livestock, 40 to 80 years ago. There are still some localized problems in areas presently grazed by both big game and livestock, but the trend is generally stable or upward. Habitat improvement plans have also been developed to improve the areas. Habitat conditions of forest big game winter ranges are of particular concern because management activities that disturb wintering big game animals, or poor habitat conditions, may force animals onto adjacent private lands where they will likely cause agricultural damage.

Hunting Demand and supply

The harvest of big game animals, as well as the total number of hunters on the Forest, reached a peak in about 1977, with subsequent reductions of about 10 to 20 percent. In 1986, an estimated total of 49,900 hunters (572,800 Wildlife/Fish User Days or WFUDs) harvested about 4,265 elk and 3,250 mule deer. Forest recreation projections estimate that the demand for big game hunting will remain high and increase slightly through the next decades (see Table 23).

The Forest has an opportunity to manage habitat to increase potential elk populations. As estimated in the AMS, maximum potential big game populations can be expanded by as much as 28 percent through habitat management in the first decade. The Forest model and data have since been updated for the FEIS. A maximum increase of 10 to 15 percent may be a more reasonable figure for the short term.

Since big game hunting is the most popular recreational activity on the Forest, it has an important impact on the social and economic structure of the area influenced by the Forest. The large number of hunters who arrive in the months of October and November is equal or close to the capacity of the Forest for that time period. To some people, the capacity has already been exceeded and they have moved to less popular areas or quit big game hunting. More capacity can be created by developing more access and skewing opportunities toward the Roaded Modified end of the ROS, but this would not meet the growing demand for recreation opportunities on the Primitive and Semi-primitive end of the spectrum.

THREATENED, ENDANGERED AND SENSITIVE SPECIES

The Endangered Species Act of 1973 requires the Forest to protect and manage threatened and endangered species and their habitats. The American peregrine falcon is classified as endangered under the Federal Endangered Species Conservation Act of 1969. Although only one recent sighting of migrating peregrine has been reported, the Forest makes up part of the

Blue Mountain peregrine breeding management area which calls for establishment of four pairs of peregrines. The Forest will cooperate with the U S Fish and Wildlife Service by providing and managing suitable habitat needed to meet recovery objectives.

The bald eagle, federally classified as a threatened species in Oregon, occurs as a late fall and winter migrant in small numbers (40 to 50 birds scattered throughout and adjacent to the Forest). Eagles use the North Fork John Day River and Camas Creek, and the Grande Ronde and Umatilla rivers, although most of the use occurs off-Forest. Large snags along these rivers are left as roost or perching sites for these scattered migrants. The Forest will cooperate with the U.S. Fish and Wildlife Service by providing or managing habitat needed to meet the recovery objectives of two breeding pairs in the Grande Ronde drainage.

Eleven additional species are considered 'sensitive' in the Blue Mountain portion of the region and include the following (1) ferruginous hawk, (2) long-billed curlew, (3) Preble's shrew, (4) Townsend's big-eared bat, (5) California wolverine, (6) grey wolf, (7) North American lynx, (8) California bighorn sheep, (9) Blue Mountain cryptochian, (10) bull trout, and (11) redband trout. Sensitive species are those that could become endangered within the foreseeable future if no management action protects their habitats.

RIPARIAN/FISH

The Forest fish populations and associated riparian habitat are significant resources. Based on the 1975-79 spawning escapement levels, the Forest produces an estimated 4 percent of the spring Chinook salmon and 7 percent of the steelhead trout runs returning to the Columbia River system. The importance of riparian vegetation to water quality and fish habitat is well known.

The riparian area on the Forest totals 70,743 acres of which 23,548 acres are adjacent to anadromous fish streams, 18,435 acres are designated resident trout areas, 24,162 acres are designated as non-fish-bearing intermittent areas, 157 acres provide domestic water supply, and 4,441 acres are in wet areas. Four stream classes (Class I through Class IV) are recognized on the Forest, and are defined by the extent of the perennial or fish-bearing portion of the stream. A stream is typically sectioned into several classes. The stream class definitions are found in the Glossary.

Riparian areas on the north half of the Forest are typically in good condition. Less favorable riparian condition is generally found on the south half of the Forest. In addition to maintaining fish habitat, water quality, and riparian vegetation in their present condition through the Forest compliance with the Clean Water Act, restoration and enhancement programs are improving current conditions.

Species

There are 6 reservoirs and lakes, and 900 miles of fish-bearing streams and rivers on the Forest that support a variety of cold-water fish species, including rainbow trout, eastern brook trout, and bull trout, as well as Kokanee and mountain whitefish. Two species of anadromous fish, Chinook salmon and steelhead trout are found in 489 miles of Forest streams. Currently, there are no fish species in the Forest streams that have been identified as threatened or endangered. Redband and bull trout are identified as sensitive species.

Only a small percentage of the Forest is occupied by standing waters; however, the heaviest angler use and the highest future demand for resident fishing opportunities occur on the Forest lakes and reservoirs. These are Bull Prairie, Penland, and Jubilee lakes (constructed reservoirs); Olive Lake (a natural lake enlarged by dams); and Jumpoff Joe and Lost lakes (natural lakes).

Key trout fishing streams are the North Fork John Day, South Fork and main stem Umatilla, Grande Ronde, Tucannon, and North Fork Touchet rivers. Resident trout angling on the Forest provides 75,000 WFUDs annually.

Supply

Chinook salmon are presently found in the larger tributaries of the John Day and Snake river systems. An estimated 4,300 spawning, spring Chinook salmon produce approximately 700,000 smolts annually in 158 miles of Forest streams. Approximately 8,600 adult steelhead produce 1 million smolts annually in 489 miles of the resident rainbow habitat.

Off-Forest activities such as hydroelectric generation, irrigation, and commercial fisheries harvest have depressed adult anadromous fish spawning populations to record low levels. On-Forest activities such as road building, gold mining, and livestock grazing have also contributed to low anadromous fish numbers.

Two state operated anadromous fish hatcheries (Oregon's Lookingglass Creek Salmon Hatchery and Washington's Tucannon River Steelhead Hatchery) rely on streams draining Forest lands for sources of cold, high quality water.

Chinook salmon historically occupied streams on Forest lands in the Umatilla and Walla Walla River basins and contributed toward the Native American harvest; however, the basins no longer contain natural salmon runs because of off-Forest conditions. The Confederated Tribes of the Umatilla Indian Reservation, Oregon Department of Fish and Wildlife, Bureau of Reclamation, Bonneville Power Administration, and the Forest are currently working to restore Chinook salmon runs in the Umatilla basin. The first adult salmon returned to Forest streams in 1986.

Habitat Restoration And Improvement

The Forest has an opportunity to increase its share of anadromous and resident fish through riparian area recovery. Both riparian area improvement and instream habitat restoration are part of the Forest total restoration program. Increases in fish production are primarily attributable to riparian management and habitat improvements; some of the potential increases are due to 'correcting' downstream off-Forest problems. Under current direction, in the next decade, fish habitat restoration and enhancement are expected to increase present habitat capability for anadromous fish by an estimated 58 percent and resident trout by an estimated 37 percent. The emphasis has been, and is expected to continue to be, on restoration of spring Chinook salmon and summer steelhead trout habitat particularly in the North Fork John Day sub-basin. Maximum potential increases are over 400 percent by the year 2030.

Examples of recent and ongoing fisheries enhancement projects include: (1) Clear Creek-Granite Creek Anadromous Fish Rehabilitation Project (North Fork John Day District); (2) log weir and deflector construction in Thomas Creek (Walla Walla District) to prevent summer losses of rearing steelhead; (3) log weir construction in Charley Creek (Pomeroy District) to improve rearing habitat condition; and (4) rock weir construction in Wilson Creek (Heppner District) to increase survival of summer steelhead.

Demand

Except for a limited harvest by Native Americans, most of the harvest of Forest-produced anadromous fish occurs downstream from the Forest or in the ocean. Demand for salmon products has been high for some time, with prices rising steadily, and at times dramatically, resulting in an almost fourfold increase between 1967 and 1976. Demand for anadromous fish will continue to exceed availability; all harvestable fish produced over escapement needs could be utilized by commercial, Native American, and sport fishermen. Strong pressure to expand

salmon stocks is expected to continue into the foreseeable future. The goal of the Northwest Power Planning Council is to double the fish runs by the year 2000.

Based primarily on license sales and participation rates, total demand for sport fishing in the Pacific Northwest Region for both resident and anadromous fish is expected to increase by about one-third between 1980 and 2000. By 2030, demand for sport fishing is expected to increase by at least 90 percent. The demand for resident trout sport fishing opportunities is expected to be met on the Forest. The projected increases in anadromous fish production will play a key role in meeting the demand for increased salmon production in the Columbia River Basin.

RANGE

Grazing has been an important use of the area since before the Forest was officially established. Grazing use of the Forest is only a fraction of what it was 80 years ago. Causes for the reduction are adjustments made by the Forest to recognize the carrying capacity of the range, loss of forage areas, and aggressive fire prevention and suppression practices. Such practices helped convert open grazing areas to forested sites. Forage areas have been created by regeneration timber harvest over the past 20 years and have helped to re-create the forage supply for both livestock and game animals.

The Forest forage supply still plays an important role in the area's ranching economy. There are 51 Forest range areas allotted to 74 permittees. Currently, grazing allotments cover approximately 1,075,000 acres which include most of the Umatilla's forest land. Approximately 10,000 cattle and 8,000 sheep use Forest land for 3 to 4.5 months each summer. The amount of use is equivalent to 54,400 AUM's. Individual grazing permits specify the numbers of animals, seasons of use, and grazing allotment where use is authorized.

The grazing allotments on the Forest are presently classified as follows: 23 are rated as having Quality Intensive (QI) management; 10 are rated Quality Extensive (QE); 4 are vacant (PA); 12 are underdeveloped (PB); and 2 are classified (PD) with some resource allocation problems. All allotments have long-range Allotment Management Plans (AMP's) except for some on/off and transitory sheep allotments. About 10 AMP's need revision and/or updating to be fully viable. (See update schedule under Range in Appendix A; the same table displays the grazing system in use on each allotment.)

Forage Supply

On the average, an estimated 525 million pounds of forage are produced annually on the Forest. Transitory range accounts for at least 60 percent of the forage production. Production per acre generally triples once timber harvest opens up the forest canopy. The increased production occurs within the first few years after tree removal and will gradually remain available for about 20 years. Production rapidly decreases over the next few years as the forest canopy closes in, and returns to original levels again by about 30 years following harvest. If the harvest area is reseeded to enhance forage production, the production per acre will usually be tripled above the natural-seeding levels. About 10 percent of the transitory range production stems from domestic species seeded as a result of some management activity. The major portion of forage production is provided by the native grass and forb species. Of the total palatable forage, about 36 percent (189 million pounds) can safely be removed by browsing or grazing animals on an average of all slope classes, but only 31 percent of the forage producing area is suitable for allocation to domestic livestock because of steepness of slope or other factors. Currently, about 44 million pounds of the available, palatable forage on suitable range are allocated to domestic livestock.

The Forest has the potential to increase current livestock use by more than 60 percent based on the available forage supply. The maximum potential forage production levels could support over 103,000 AUMs per year; an 87 percent increase over current permitted grazing levels. Increased forage production has been realized through utilization of transitory range created by timber harvest activities and seeding of forage species. Investments have been made in range improvements to prevent overuse, to distribute grazing to lightly used areas, or increase utilization of transitory range. Increased use has been made by big game as well as by livestock.

Range Condition

Range condition is defined as the degree of departure of the present vegetation from the potential natural community (the cause of the departure is not considered). 'Excellent' range condition implies that the current situation is 81-100 percent of that found in an undisturbed or unused condition. 'Good' condition is 61-80 percent of potential, 'fair' is 41-60 percent, 'poor' is 21-40 percent, and 'very poor' is 1-20 percent.

About 49 percent of the total acres in Forest grazing allotments contain usable forage. Of the usable acreage, less than 1 percent is in 'excellent' condition, 8 percent is 'good', 64 percent is 'fair,' 27 percent is 'poor,' and less than 1 percent is "very poor". These range condition acreage totals are based on analyses conducted in the late 1950's and early 1960's. However, many of the established, long-term transect readings show that range condition across the Forest has increased by nearly one condition class (i.e , "fair" acres have moved up to "good") since original data collection.

Demand

Nationally, the livestock industry is in a long-term decline as demand for red meat decreases. However, the local livestock industry production has increased, the trend has continued despite decline in livestock market prices. Locally, demand for grazing land for livestock is in excess of the current permitted use. In the judgment of Forest range managers, the local industry would utilize about 75 percent of the maximum forage production, given the opportunity.

Demand for grazing land has also increased as an indirect result of the rapid development of irrigated cropland in the Columbia River Basin. The residues from dryland wheat and pea crops provide a cheap supply of winter feed for livestock. The availability of cheap feed increases the potential for more animals which is constrained by the lack of available summer pastureland. A number of requests for grazing permits, primarily for cattle, are received each year even though permits are rarely available.

TIMBER

The Forest is an important producer and supplier of sawtimber and other wood products. Trees cut by local companies are processed into lumber, plywood, wood chips, and furniture. The timber resource has a strong influence on economic well-being and lifestyles of communities and their residents; some communities are highly dependent on timber. The resource has important economic effects on employment, income, county budgets, and returns to the National Treasury.

Conifer forests cover about 75 percent of the Forest, but only about 58 percent (807,233 acres) is classified as tentatively suitable for timber production. Commercial conifer species dominate 17 of the 44 identified plant community types. The dominant species are Douglas-fir, Engelmann spruce, grand fir, lodgepole pine, ponderosa pine, subalpine fir, western larch, and white fir. There are no commercially important hardwood stands.

Ponderosa pine has been, and still is, the most desirable commercial species, followed by white fir, Douglas-fir, western larch, Engelmann spruce, and others in descending order. From 1979 through 1988, ponderosa pine constituted about 27 percent of the sawlog volume sold, averaging 29 MMBF/year. Timber sales not containing substantial amounts of ponderosa pine are more difficult to sell. Of the timber offered for sale during the 1979-1988 period, about 10 percent of the offered volume did not sell. In addition, recent inventories have shown a decline in available ponderosa pine volume on the Forest.

Current Timber Harvest Levels

Timber harvest levels are currently based on the Timber Management Plan developed for the Forest in 1963. The plan has been amended and updated to reflect major changes in policy direction, and to reflect a land base changed by the designation of wildernesses and significant land exchanges.

Levels of timber harvest have fluctuated widely over the past decade (1979-1988) leaving no clear trend (see Table 2-7). The average total volume of timber actually harvested over the past 10 years is about 148.5 million board feet. The average includes volume of green sawlogs, chips, cull, and other materials.

TABLE 2-7. RECORD OF TIMBER HARVEST

Umatilla National Forest (Cumulative Total)¹

Year	Harvest Volume MMBF	Total ¹ Harvest MMBF	Year	Harvest Volume MMBF	Total ¹ Harvest MMBF	Year	Harvest Volume MMBF	Total ¹ Harvest MMBF
1922	1.3	1.3	1945	24.9	239.4	1968	179.8	1871.1
1923	1.9	3.2	1946	16.4	255.8	1969	165.9	2037.0
1924	1.6	4.8	1947	21.3	277.1	1970	151.6	2188.6
1925	4.8	9.6	1948	33.2	310.3	1971	122.5	2311.1
1926	14.0	23.6	1949	30.5	340.8	1972	126.5	2437.6
1927	16.5	40.0	1950	33.7	374.5	1973	222.5	2660.1
1928	1.8	41.9	1951	22.7	397.2	1974	161.0	2821.1
1929	0.9	42.8	1952	29.0	426.2	1975	198.4	3019.5
1930	3.2	46.0	1953	16.7	442.9	1976	202.1	3221.6
1931	0.9	46.9	1954	37.1	480.0	CQ ²	93.5	3315.1
1932	2.6	49.5	1955	32.0	512.0	1977	205.0	3520.1
1933	1.1	50.6	1956	43.6	555.6	1978	152.7	3672.8
1934	6.2	569.87	1957	55.2	610.8	1979	120.9	3793.7
1935	13.1	69.9	1958	61.9	672.7	1980	105.5	3899.2
1936	17.8	87.7	1959	89.0	761.7	1981	146.8	4046.0
1937	18.1	105.8	1960	104.7	866.4	1982	93.4	4139.4
1938	2.8	108.6	1961	85.9	952.3	1983	135.6	4278.0
1939	9.3	117.9	1962	109.4	1061.7	1984	181.9	4456.9
1940	17.9	135.8	1963	134.2	1195.9	1985	144.4	4601.3
1941	8.9	144.7	1964	127.0	1322.9	1986	165.1	4766.4
1942	11.0	155.7	1965	116.9	1439.8	1987	215.5	4981.9
1943	29.0	184.7	1966	132.5	1572.3	1988	175.8	5157.7
1944	29.8	214.5	1967	119.0	1691.3			

² Conversion Quarter (6/1-9/30P6)

Figures for 1922 through 1962 are on a calendar year basis. Figures for 1963 through 1988 we on a fiscal year basis.

Information for 1962 and 1963 was taken from the Timber Sale Action Plan and from the Annual Progress of Timber Management Report for 1950 through 1961. All other Information was taken from the Umatilla National Forest Quarterly Timber Cut and Sold Report.

Forest Supply Potential

According to the AMS, the Forest has a potential to increase timber supplies. Based on the use of intensive silvicultural practices and genetically improved stock, the maximum harvest potential (TSPQ) for the Umatilla National Forest in the first decade is about 266 million board feet per year (adjusted in the FEIS) considering legal requirements and a policy of nondeclining flow. The estimate includes all volume such as fuelwood, chips, and green sawlogs. The biological potential amounts to 207 MMBF per year. The long-term sustained-yield level of the fully regulated forest is estimated at 257 million board feet per year (Benchmark 1A), a substantial increase over the existing situation.

Regional Supply

Regional and national timber supply and demand will influence local timber supply and demand. A discussion of each follows. According to the RPA Assessment and 1985 update, total projected softwood roundwood harvests would rise 24 percent from 9.6 billion cubic feet in 1980 to 11.9 billion cubic feet in 2030. Though the outlook is for increased softwood harvests nationally, there are important differences among the major softwood timber producing regions.

In the Douglas-fir subregion, projected annual harvest from 1980 to 1990 was about 2.3 billion cubic feet. It then declines slightly to about 2 billion cubic feet per year. The level is roughly maintained through the rest of the 50-year projected period (RPA 1984, 1985). Currently, part of the timber formerly supplied by the Pacific Northwest is now being supplied by the South and Canada. However, the supply situation from other sources can be expected to change within 15 years. The projected change indicates a drop in supply capability of 30 to 50 percent from the current relatively high levels. At about the same time this drop in supply capability begins to occur for the other sources, the growth of wood fiber on private lands in the Pacific Northwest would again be reaching its capability. The private lands in the Pacific Northwest could then become a major source of supply for softwoods to meet national and international demand. During the period before the private lands in the region regain their full supply potential, the public forests would be looked upon as a major source for a relatively stable supply of wood fiber (Schallau 1985, 1986).

Regional Demand

Over the next 10 years, timber demand from the Pacific Northwest geographic region will grow slowly. Although there is a backlog of unfulfilled housing demand, the future will depend primarily on the continuing strength in personal income and the availability of affordable housing and financing.

The long-term outlook for the solid wood products industries contains a number of challenges. Evaluation of recent data and information indicates that the demand for timber is increasing at a moderate rate in contrast to the slowdown that occurred in the early 1980's. The dominating factor is that supplies from private lands will be declining over the next 20 years, thereby increasing the demand for (and prices for) national forest timber supplies. At the same time, however, the timber industry must make its own accommodations to a changing marketplace irrespective of national forest timber supply. Canadian and southern region dominance in wood products markets will continue to offer a severe economic challenge to the Pacific Northwest Region (Schallau 1985, 1986). The long-term trend in housing demand, the growing popularity of construction methods that use less wood, availability of wood substitutes, and a shift in business management strategies and methods, all contribute to a potential shift in future demand, not just to price and supply changes (Adams and Haynes 1985).

UMATILLA NF TIMBER SUPPLY AND DEMAND

All of the Forest area is located within the 10-county area of influence and most of the timber harvested on the Forest is processed by mills in these counties. However, no readily available compilation of data exists that isolates the Forest contribution to the local timber supply and demand. Available study information utilizes county boundaries which do not coincide with Forest boundaries or its area of influence. Also, it is well known that timber purchasers go back and forth from one forest and/or county to others to procure logs. Therefore, in order to study the supply and demand situation for the area, it was necessary to use the Oregon State system of regional analysis and the four southeast counties of Washington to define a 12-county study area. The process is described in Chapter III of the FEIS and in the process records.

In this area, there are slightly more than 4 million acres of commercial forest land and about 35 billion board feet of sawtimber growing stock. About three-quarters of the land and about 84 percent of the growing stock are found on the national forests. About one-quarter of the land and about 30 percent of the growing stock are found on the Forest (Norbury 1982).

The average annual harvest for the national forests in the 10-county area during the last 5 years (1984-88) has been nearly 650 million board feet. National forests contribute about 75 percent of the annual harvest in the area. To place the Forest supply potential in context of its relationship to northeast Oregon and southeast Washington, the supply potential of the area needs to be considered. Table 2-8 displays the supply sources in the area other than the Umatilla National Forest.

TABLE 2-8. PROJECTED DEMAND FOR UMATILLA NATIONAL FOREST TIMBER
(MMBF ASQ PER DECADE)

	DECADE				
	1990-99	2000-09	2010-19	2020-29	2030-39
Estimated Total Demand					
Low	6,112	6,112	6,112	6,112	6,112
Average	7,334	7,334	7,334	7,334	7,334
High	8,555	8,555	8,555	8,555	8,555
Non-Umatilla Forest Supply ²	5,936	5,792	5,599	5,727	5,958
Demand for Umatilla Timber ³					
Low	176	320	513	385	154
Average	1,398	1,542	1,735	1,607	1,376
High	2,619	2,763	2,956	2,828	2,597
Umatilla Percent of Total Demand					
Low	2.9	5.2	8.4	6.3	2.5
Average	19.1	21.0	23.7	21.9	18.8
High	30.6	32.3	34.6	33.1	30.4

1 Includes slate lands, industrial forests, other private lands, national forests, and other public lands
Sources. State of Washington Timber Harvest Reports 1979.1988
State of Oregon Timber Harvest Report 1979.1988

2 Includes all land ownership classes except the Umatilla National Forest
Sources. Forestry In Oregon' 1980 Oregon Timber Supply Assessment

³ Demand for Umatilla National Forest timber is calculated by subtracting the non-Umatilla timber supply from estimated total demand

Milling capacity in the area has not changed substantially in recent years. Some closures have occurred, such as Kinzua, Hudspeth, and Harris Pine; and some new mills have been constructed, including Malheur Pine. Sawmill capacity will probably not be completely utilized, but all major mills in the area will be active.

Table 2-8 shows projected demand for Umatilla National Forest timber in millions of board feet per decade. Total demand is derived as a function of past harvest activity. Total demand is first estimated using harvest reports from all landownerships, including national forests, in the 12-county area. The high demand estimate is the actual harvest recorded in the 12-county area in the 5 highest years of the past decade, and is considered to be the maximum demand probable. The low demand estimate is the actual harvest recorded in the 12-county area in 1979-1983 (recession years) and is considered the lowest demand probable. The average demand estimate is simply the average actual harvest recorded in the 12-county area over the past decade (1979-1988). Demand increased steadily between 1981 and 1986. It leveled off in 1987, and declined in 1988, the last year for which data is available.

As seen in Table 2-8, the Forest has the potential of exceeding the projected average demand for all decades. The potential of each alternative to meet estimated demand is discussed in the Timber Supply section in Chapter II of the FEIS.

Fuelwood Supply and Demand

Prior to 1974, fuelwood was an incidental program on the Forest. Demand was primarily limited to local residents who had traditionally burned wood for home heating. The 1974 oil crisis caused many people to view wood as a more economical and reliable method of home heating. Coupled with the rising demand for fuelwood in the early 1970s was the growing supply of readily available dead lodgepole pine created as the result of the mountain pine beetle outbreak.

In 1983, a charge firewood program was initiated. The number of permits rose, peaking in 1985, and has decreased since then. The average volume for 1983 through 1988 is 22 MMBF/year; the most recent year is about half the average. Demand is expected to remain at a level near the 1986-88 average, or 16.7 MMBF/year.

Other Products

During the economic recession in the lumber market, starting in 1980, and as a result of the associated increase in the value of wood chips, a commercial market formed for dead lodgepole pine and cull material. For the 4-year period from 1980 to 1983, an average of 30 million board feet of dead lodgepole pine was sold annually. Because of the established markets in the area, the future demand for chippable material should remain constant but the availability of dead lodgepole pine will be reduced.

Harvest Management Practices

Timber harvest activity on the Forest has generally been in response to the demand for wood and wood products. Current timber harvest activities are based on resource objectives set forth in unit land management plans and the 1963 Timber Management Plan. Management is of moderate to high intensity for all coniferous timber species and landtypes on the Forest. The historic trend has been to manage those landtypes and timber species where the lowest logging cost would be incurred and/or the mix of high valued species is the highest.

Even-aged silvicultural practices are the most commonly used methods of managing forested timber types. Silvicultural practices include planting and natural regeneration precommercial thinning, commercial thinning, removal cuts, salvage harvest, and regeneration harvest by clearcut, seed tree, or shelterwood. Although not currently practiced, uneven-aged silvicultural management will become more common. Practices will be similar to those for even-aged management, with the exception being that single tree selection or group selection will be used as the regeneration method.

Tractor skidding was and is the least-cost logging system followed by cable and aerial (helicopter) logging methods in ascending order. Timber sale design may include one or more of the following logging methods. Horse, feller-buncher, whole tree chipping, crawler tractor, rubber-tired skidder, hi-lead, skyline, multi-span skyline, and helicopter. Prescribed logging systems vary according to landtype, resource management objectives, and economics of operation.

Several of reforestation practices are employed in establishing a new forest including site preparation, planting or natural regeneration, release, and protection. Currently, about 4,000 acres are planted annually, and another 2,000 acres regenerated naturally. The Forest has established a genetics program with the goal of increasing tree growth and yield, disease resistance, and other desirable characteristics.

Timber stand improvement (release thinning, and weeding and cleaning) is used to increase growth and yield, improve species composition, and control insects and diseases. Timber stand improvement work is accomplished on approximately 2,000 acres of the Forest annually. Protection of young trees from a variety of potentially damaging agents is also practiced.

WATER

The 900+ miles of fish-bearing rivers and streams on the Forest are valuable resources in northeastern Oregon. The streams and rivers originate in, and flow through, productive forests whose wood products are vital to the local economy. They also provide excellent quality water for anadromous fish spawning and rearing areas, and habitat for resident trout and other native fish species both on and off the Forest. The streams and rivers provide high quality water that is used off the Forest by municipalities for domestic and industrial use, and by agriculture for irrigation of croplands and orchards. Several other uses such as riparian and wildlife habitat, range management, and outdoor recreation are dependent upon, or influenced by, the quality or quantity of water issuing from Forest watersheds.

Water Production

The rivers and streams on the Forest are located in the upper reaches of four large drainage basins: The Umatilla, John Day, Walla Walla, and Grande Ronde river basins. The major rivers are the North Fork John Day, the north and south forks of the Umatilla and Walla Walla, and the Touchet, Grande Ronde, Wenaha, and Tucannon rivers. The headwaters of all but the Grande Ronde originate on the Forest. Across the Forest, 52 principal watersheds produce an average of 2,460,000 acre-feet of water per year. The amount of water produced on the Forest is a function of precipitation, and is governed by the physical characteristics of the watershed.

Although water is plentiful in Blue Mountain streams, the seasonal distribution of flow presents problems for many water users. The Forest is in a snow dominated region where most of the annual precipitation comes in that form. Snow accumulates in the higher elevations throughout the winter, and most of the total water yield from Forest watersheds occurs during the spring snowmelt season of May and June. In contrast, rainfall is generally very sparse during the latter part of the summer growing season from July through September. During this period, streamflow is dependent upon replenishment from water stored in the soil mantle and upland

aquifers. These contributions are limited due to the low water retention characteristics of Forest watersheds. As a result, summer base flows in the stream are very low relative to the winter/spring snowmelt period.

Timing of the snowmelt runoff is dependent primarily on elevation, aspect, and yearly weather characteristics. Snowmelt rates at the higher elevations are very important to local irrigators since runoff which occurs before the growing season has limited usefulness for them due to a general lack of upland storage facilities. Rain-on-snow events and brief periods of unusually warm weather (chinooks) during the winter months generate the highest peak flows. Summer thunderstorms can create locally heavy runoff for short periods.

Water Quality

The Forest has conducted an extensive program of water quality monitoring in streams in the Blue Mountains. Monitoring has included both ambient condition and impacts of specific projects on water quality and has focused on potential non-point sources of pollution typically associated with land management activities, including sediment, turbidity, and temperature. The overall indication given by monitoring is that water quality is excellent and exceeds applicable state water quality standards.

Stream temperatures above those desired for high quality fish habitat commonly are reached during the late summer months in many reaches on the south half of the Forest. Sediment levels in Forest streams vary significantly with flow, and are highest during periods of spring snowmelt. However, the sediment loading from Forest land is significantly lower than from downstream agricultural lands. Geologically, the watersheds on the Forest are generally in very stable condition.

Water Use

Water produced on the Forest is used for a variety of purposes off the Forest. Agricultural irrigation accounts for 88 percent of the total consumed; domestic use by municipalities, 11 percent; and industrial use, 1 percent. Nonconsumptive uses of water on the Forest are for maintenance of riparian areas and stream channels, fish and wildlife habitat, wetlands, floodplains, and lake levels, and for sluice mining. Consumptive use of water on the Forest is mainly for administrative purposes such as fire suppression, dust abatement and construction of roads, wildlife and livestock watering, administrative sites use, special use summer residences, and developed recreation sites.

Water Demand

Demand for water has increased from that necessary to sustain native populations of fish, wildlife, and people in the mid-1800's to the present high demand for a wide variety of uses. In many basins surrounding the Forest, demand for surface waters (and in some instances, ground water as well) exceeds supply during critical late summer low flow periods. An overall increase in water demand is projected for the region (Pacific Northwest River Basins Commission 1979).

Competition for off-Forest use of surface runoff during low flow periods is expected to intensify, particularly in the Umatilla, Walla Walla and John Day basins. Three notable factors contribute to this situation. First, ground water tables continue to decline in certain areas of the Umatilla Basin due primarily to irrigation withdrawals. A second factor is the major effort being undertaken on a regional basis to restore and improve the runs of anadromous fish in the Columbia River Basin. These efforts include not only the improvement of stream habitat and the removal of barriers to fish passage, but also the provision of sufficient instream flows to allow for fish migration, spawning, and rearing. A third factor contributing to surface water

demands in the John Day Basin is the provision of instream flows needed to meet the requirements of the state designated Scenic Waterways reaches.

These factors, and other water use concerns, have increased local public interest in the prerogatives available to Forest managers to maintain or improve annual water yield, and to increase late season flows. In reality, the Forest has only limited capacity to significantly influence these parameters through land management practices within the context of multiple-use objectives.

Potential Water Developments

Few feasible dam sites have been identified which fit into regional water development strategies and objectives, and no specific dam proposals for Forest lands have been submitted for consideration. Out-service proposals for water resource development projects on national forest lands are evaluated on a case-by-case basis using procedures mandated by the National Environmental Policy Act. Anticipated water developments for Forest management purposes are primarily related to livestock and wildlife water developments.

Water Rights

Currently, the Forest has applied to the States of Oregon and Washington for water rights for about 1,400 water developments used for recreation, livestock, and wildlife. The water developments consist of stockpounds and developed wells and springs. The Forest is committed to protecting minimum instream flows needed for these purposes. Quantifications of minimum instream flows needed to protect 'reserved rights' and other instream flow needs are conducted on a case-by-case basis in response to out-service proposals which have the potential to adversely impact these water needs.

MINERALS AND ENERGY

LOCATABLE MINERALS

Locatable mineral deposits on public domain lands may be prospected for and extracted under the 1872 mining law, as amended and supplemented. Although administration of the general mining laws is the responsibility of the Bureau of Land Management (BLM), a 1957 Memorandum of Understanding between BLM and the Forest Service provides for joint administration of the mining laws on National Forest System lands. Regulations covering surface use of the national forests under the mining laws were promulgated in 1974 to provide for orderly development of locatable mineral resources and for subsequent reclamation of the land. The Forest Service minerals program objectives are to manage National Forest System lands to accommodate and facilitate the exploration, development, and production of mineral resources, while integrating these activities with the use and conservation of other resources to the fullest extent possible.

The mining history of the Forest is long (since 1862) and colorful. The southeastern portion of the Forest is in the heart of the most productive gold and silver region in the State of Oregon. Other metals including copper, lead, and chrome also have been produced in the Forest vicinity. Table 2-9 lists metals and minerals found on the Forest and indicates their potential for development.

TABLE 2-9. MINERALS AND METALS FOUND ON THE UMATILIA NATIONAL FOREST

Mineral Metal*	Status on Forest
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Chromium	Known occurrences, small potential
Platinum Group	Minor placer by-product
Mercury	Known occurrences, small potential
Zinc	Production by-product from precious metals mining
Tungsten	Known occurrences, small potential
Gold	Over 3.5 million ounces produced in NE Oregon, much from Umatilla
Silver	Over 5 million ounces produced in NE Oregon, much from Umatilla NF,
Antimony	Known occurrences, small potential
Vanadium	Minor occurrence in gold-quartz vein, insignificant
Copper	Nearly 10,000 tons produced in NE Oregon, little from potential
Lead	Production by-product from precious metals mining
Molybdenum	Several occurrences, significant future potential

*All are listed as strategic and critical minerals by the US Bureau of Mines (Regional Forester 1920/2800 Memo to Forest Supervisor, January 25, 1983).

Production and Trends

Metals produced from both lode and placer mines in northeastern Oregon and the general area of the Umatilla National Forest have been substantial. Current average annual production projected for the next decade is estimated at \$900,000.

Production is currently at a moderate level. Although, in the past, the Granite and Greenhorn areas at the far southeastern end of the Forest produced nearly 0.5 million ounces of gold and 1.4 million ounces of silver. With the increase in gold and silver prices, the area has reemerged as a focus of mining interests. Recent advances in previous mining technology are trending toward processing large tonnages of low value ore. However, the forest area lends itself more to low tonnage and high quality processing.

There are currently thousands of lode and placer claims in the mineral belt of northeast Oregon. Approximately 1,100 unpatented mining claims exist on the Forest. Most of this mineral activity is in the Granite-Greenhorn area, with other minor claim staking scattered elsewhere. Mining activities on the Forest, from prospecting through production, are expected to continue. Demand for minerals is variable. The minerals in highest demand are gold and silver. The remaining mineral commodities are in low demand.

Withdrawals

All national forest lands are open to mining except those areas specifically withdrawn from mineral entry. The Forest has a responsibility to identify areas with resource values that could be affected by mining activities and recommend that the BLM remove the area from mineral entry. The Forest currently has 38 withdrawals covering 142 sites. There are four other-agency withdrawals within the boundaries of the Forest. The mineral withdrawals on the Forest have been reviewed and recommendations completed, the BLM will be reviewing the recommendations.

There are now 353,273 acres of the Forest withdrawn for wildernesses, Wild and Scenic Rivers, municipal watersheds, Research Natural Areas (RNA's), and administration and recreation sites. Mining claims which predate withdrawal, including those within wilderness, may continue to be worked under the mining laws if they contain a valid discovery of a valuable mineral.

LEASABLE MINERALS

The Forest Service has no statutory responsibility to issue leases or permits on lands reserved from the public domain. In some cases on national forest land, the Secretary of Agriculture has consent authority for leasable minerals. For leasable minerals, the Forest Service provides advice on how to protect surface resource values and gives recommendations or consent to leasing. Where the Forest Service is permitted to sell certain mineral materials, the permit includes requirements for adequate protection of other resource values.

Oil and Gas

Although current interest in leasing has waned, the Forest is considered to have significant potential for oil and gas development. According to regional leasable mineral assessment (Tennyson and Parrish 1987), between 20 and 25 percent of the Region's oil and gas leases are expected to occur on the Forest. Currently, only 20 oil and gas leases involve Forest land covering about 109,025 acres either on or contiguous to the Forest. To date, no drilling has occurred.

Coal

A new coal field containing the most extensive lignite deposit in the State of Oregon has been found in northern Wallowa County, and extends into the State of Washington (Ferns 1985). Based on the currently available information, a resource of nearly 2 billion tons of lignite is estimated. Industry currently values only the upper, cleaner coal seam where it is under less than 150 feet of overburden. Under these restrictions, the estimated reserves are 240 million tons. Only a small portion of this tonnage is within the Forest Boundary.

In the past, coal was mined at Coalmine Hill, southwest of Heppner, Oregon. Four coal patents were issued between 1881 and 1904 and prospect pits are still in evidence along Willow Creek in the Coalmine Hill vicinity. Although lenses and thin beds of good bituminous coal are present, they are too thin, too intimately mixed with carbonaceous shale, and too structurally deformed to be of commercial interest.

Mineral Materials

Sand, gravel, crushed rock, building stone, and some limestone occur within the Forest Boundary. These are all low value materials which must be near transportation routes, and usually the point of consumption, to be utilized. A continuing need for some quantities of these materials can be anticipated, with increased demand during periods of growth. The Forest Service may dispose of obviously common varieties of mineral materials, such as cinders, building stone, and rock or sand.

ENERGY

During the late 1970's and early 1980's, interest in small hydroelectric developments was strong in the northwest. However, the Forest has limited potential for this type of development. Currently, the Forest has no Federal Energy Regulatory Commission (FERC) applications or permits.

Geothermal

A few hot springs are known to occur in and near the Forest, and there is some potential for direct use of the geothermal resource. Currently, there are no geothermal leases or lease applications on the Forest. The U.S. Geological Survey considers some lands in the vicinity prospectively valuable for geothermal resources, some of which partially overlap the Forest Boundary.

Cogeneration

Wood fiber is becoming more important as an alternate energy source as the costs for conventional energy sources (i.e., natural gas, oil, electricity) rise. Periodic interest has been shown for the use of wood and wood residue as a fuel for wood-fired electrical generation plants. One such electrical generation plant associated with sawmill operation has been constructed and is operational at Heppner, Oregon. As electrical rates increase, more demand will be made for wood and wood residue as hog fuel for electrical generation.

INFORMATION, INVENTORY, AND RESEARCH NEEDS

This section identifies Forest needs for information and research to add to current knowledge. The list is not exclusive and may change as needed.

RECREATION

- Appropriate recreation densities for calculating 'practical maximum capacity' for Umatilla NF Recreation Opportunity Spectrum (ROS) classes.
- An effective and economical recreation survey technique for measuring the amount of visitor use (including encounter levels) and user satisfaction for each ROS class
- Representative models of the estimated demand for various classes of recreation opportunities.
- The maximum amount of hunting which the Umatilla National Forest can sustain while maintaining hunter satisfaction. The type of hunting experience (setting, experience opportunities) desired by the hunting public.
- Complete inventory of capacities and conditions for the Forest's identified dispersed use sites.

WILDERNESS

- Appropriate standards for selected indicators of Limits of Acceptable Change (LAC) in various recreation opportunity classes, especially in wildernesses.
- The effectiveness of the LAC planning and management concept as an indicator in monitoring ecosystem change and trends in wilderness use, and user satisfaction
- How small wildernesses, such as the North Fork Umatilla or Tower Unit of the North Fork John Day, can best provide 'opportunities for solitude or a primitive and unconfined type of recreation.'
- Baseline data levels of air quality related values and LAC for each of the wildernesses.
- Existing campsite conditions within the wildernesses and roadless areas so that appropriate indicators of visitor use can be selected and a baseline established to measure changes.
- Determination of 'natural' versus 'unnatural' buildups of fuels for planned ignition fire prescriptions.

RESEARCH NATURAL AREAS

- Complete the inventory to identify the areas which represent the Forest contributions to the RNA system for the Ochoco, Blue, and Wallowa Mountains Province.

WILDLIFE

- The value, importance, or need of old growth habitat for wildlife species indigenous to northeastern Oregon.
- Effective techniques for managing old growth stands and retaining desired characteristics for long periods of time.
- Need to establish indicator species for ponderosa pine old growth, and other Forest wildlife habitats. Validation of appropriateness of pileated woodpeckers as indicator species for old growth habitat on the Forest.
- Inventory of dead and down tree habitat, and a determination of the relationship between timber management and firewood cutting and future dead and down tree habitat.
- Evaluation of amount and type of habitat needed by cavity nesters, particularly wildlife tree clump requirements for cavity dependent species. Validation of the number of dead trees per potential population levels of cavity dependent species outlined in Wildlife Habitats in Managed Forests (USDA Forest Service Publication #553).
- Validity or soundness of management requirements (MR's) used in the plan for providing for wildlife species viability.
- Inventories to identify potential or existing bald eagle roost sites and territories and potential peregrine falcon nest sites and territories done in accordance with respective recover plans and in cooperation with state wildlife agencies.
- Inventories of all threatened, endangered, and sensitive wildlife species to identify location and distribution of existing and potential habitats.

BIG GAME

- The correlation of elk hunter numbers with elk population fluctuation. (Is the amount of hunting directly proportional to the number of elk?)
- The recreational value of big game and fishing RVD's for northeastern Oregon using more recent data and methods. Assigned RPA values appear low; most recent Oregon studies are out of date.
- Effects of human disturbances (e.g., logging activities, vehicular traffic on roads, and trail use) on big game habitat effectiveness.
- Responses of big game species, particularly elk, to improved grazing systems (i.e., deferred and rest/rotational grazing). The effect of fall or late summer livestock grazing on big game winter ranges in terms of available winter forage.
- Correlation between habitat capability (effectiveness) and actual populations,
- The effect of low male to female ratios on the reproductive performance of elk herds.
- Effects of Forest prescribed burning program on wildlife habitat (forage, cover) and species, especially big game and ground dwelling species.
- Effects of uneven-aged management on big game habitat (cover), and big game response (use) of these forest conditions.

FISH

- Complete inventory of anadromous and resident fish stream conditions in conjunction with stream rehabilitation work.

- Effectiveness of riparian conditions and fish habitat improvement projects on production of resident and anadromous fish.
- Bull trout population density and fish distribution study. Redband trout population distribution study.
- Inventory of riparian vegetative types and existing condition and baseline inventory of riparian ecological potential. Complete limiting factors assessment of the Forest fish habitat with attention on sediment, water temperatures, low flows, rearing habitat, and large wood. Determine methods for estimating in-channel future potential large woody debris.
- Effectiveness of Best Management Practices in protecting fish habitat
- Verification of Forest stream classes, especially for Class III streams.
- Level of instream flows needed to sustain aquatic organisms, proper functioning of stream channel, or existing beneficial uses of the stream. Relationship of sediment loading and transport to fish habitat parameters and ultimately to fish production.

RANGE

- Comparison figures for range forage consumption for cattle, sheep, elk, and deer for both summer and winter periods.
- Evaluation of existing conditions on riparian areas in good condition, compared to the grazing management system in effect in the area, and possible changes for riparian areas in less than good condition. Also, comparisons to existing riparian area studies to determine why the existing areas are in good condition.
- An evaluation of productions, timing, and location of transitory range forage for the Forest.
- Evaluation of continually evolving information on grazing systems and grazing practices for use on the Forest.

BOTANICAL

- Completion of the Forest inventory of threatened, endangered, and sensitive plants.

TIMBER

- Response of plant communities to management activities and various prescriptions including harvest, slash disposal, and reforestation.
- Growth and yield studies for managed stands to verify and build data base for future Forest and project plans, assist in monitoring yields, and for site-specific information for project level planning
- The effects on growth and yield of stand management for wildlife, visual, etc., objectives, rather than stand management for timber objectives.
- Prospects for fertilization on the Forest for increasing tree and stand growth.
- Use of pruning to increase quality and value of ponderosa pine and other species.
- The prospects for using uneven-aged management to meet nontimber resource objectives.
- Methods for achieving desirable natural regeneration and reducing lag time for regeneration.
- Determine the most cost-effective method(s) for stocking level control in naturally regenerated lodgepole stands.

- The most cost-effective logging method(s) for meeting timber and other resource needs.

WATER AND SOIL

- The magnitude and duration of soil and site productivity changes resulting from Forest management activities. Determine strategies that minimize soil disturbance and compaction during management activities.
- Effects of Forest management activities on the magnitude and duration of water yield, sediment production, peak flows, and stream stability.
- Improved models of sediment generation and transport from managed forested watersheds.
- System of rating watershed sensitivity to management activities to refine critical threshold levels.
- Evaluation and modeling of the concept 'watershed condition' as related to activities.
- Validity or soundness of management requirements (MR's) used in the Forest Plan in providing for water and soil protection.

MINERALS/ENERGY

- Identification of valid claims (validity examinations) in the North Fork John Day Wilderness.
- An updated mineral resource inventory and evaluation for locatable minerals.

TRANSPORTATION

- Effects of low standard roads on overall logging costs.

PROTECTION

Pest Management

- Confirmation of the effects of insects and disease on growth and yield assumptions in development of Forest yield tables.
- Further research into integrated forest pest management strategies to reduce or prevent losses caused by insects and disease.
- Consequences of uneven-aged management practices on the occurrence and severity of insect and disease problems in mixed conifer and white fir habitat types.

SOCIO-ECONOMIC

- Timber sale preparation costs in wildlife areas vs. nonwildlife areas.
- Effects of timber sale variables on bidding.
- Effects of timber sale variables and resource constraints on logging costs.
- Determine the economic efficiency, including long-term effects, on Forest growth and yield of genetics program.
- Update role and effect of the three Forests (Umatilla, Malheur, and Wallowa-Whitman) on the economy, lifestyles, and social organizations of northeast Oregon and southeast Washington.
- Determine or quantify economic values for local nonmarket (or nonpriced) resources, including recreation and wildlife.

GENERAL

- Develop a Forest Plan model (process) that includes efficient resource considerations in the optimization process and interacts with a mapping system.
- Effective use of integrated, remote sensing and GIS technology to utilize resource information and inventory data.
- Develop detailed integrated Forest inventories for responding to Forest management planning problems and project questions.