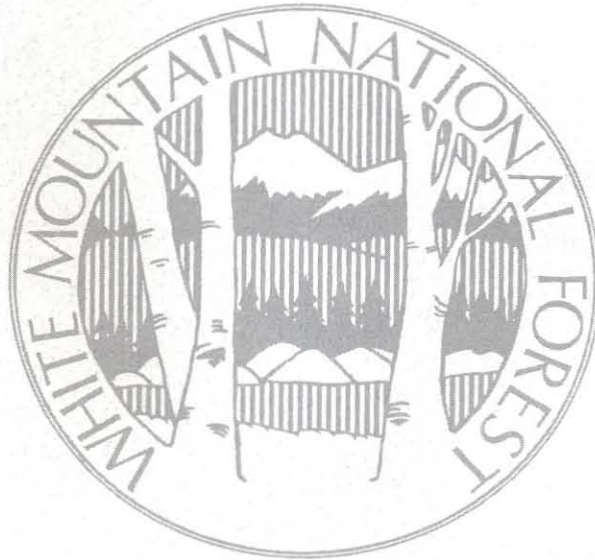




United States  
Department of  
Agriculture  
Forest Service

# White Mountain National Forest



*1996 Annual Report*  
***Ten Year Monitoring Summary***

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# **IMPLEMENTING THE WHITE MOUNTAIN NATIONAL FOREST PLAN: A TEN YEAR MONITORING SUMMARY**

## **INTRODUCTION**

This year's annual monitoring report summarizes the results of Forest Plan monitoring and findings of Forest Service managers over the past 10 years of experience implementing the Forest Plan. Our approach to evaluating the Plan was to ask three questions: what worked; what didn't work and why; and what did you wish the Plan included? We have also included an update on wildlife population monitoring efforts, summarizing the last 5 years of the Committee of Scientist's project.

The report is organized in 7 sections. In section 1.0, we start with the major management issues that formed the basis of the Forest Plan. We look at how the Plan described these issues, review the proposed solutions and how effective they have been.

In section 2.0, we compare program accomplishments, and benefits produced during the first decade with Plan estimates, including, an assessment of how budgets and revised costs affected programs. Section 3.0 describes our progress toward meeting desired conditions within selected management areas, while section 4.0 gives our view of how well the standards and guidelines have worked. Section 5.0 describes general topics the interdisciplinary team thinks should be included in the dialogue about revising the Plan and section 6.0 is the wildlife monitoring update. Section 7.0 is the interdisciplinary team conclusions, and recommended improvements to be achieved in the revision.

## **SECTION 1.0 RESOLUTION OF MAJOR MANAGEMENT ISSUES**

The Forest Plan for the White Mountain National Forest was approved in 1986. It set management direction for the next 10 to 15 years and altered past management directions to address demands for various resources and resolve public issues that surfaced through a public involvement process that began in 1980.

From this process, we learned that New Englanders were particularly concerned about scenic values and recreation opportunities in the White Mountain National Forest (Forest Plan, p. II-3). New Englanders also recognized the value of economic benefits from the forest which included: timber, minerals, developed recreation and the potential for alternative energy. The solution, outlined in the Forest Plan, attempted to achieve a balance of uses over time, and across the National Forest, to meet peoples' needs and minimize changes in the Forest's unique character.

The questions and comments that resulted from public meetings and letters were combined into major issue topics:

- Minerals Management
- Wilderness
- Nonmotorized Dispersed Recreation
- Motorized Dispersed Recreation
- Developed Recreation
- Downhill Ski Areas
- Timber
- Transportation (Roads)
- Visual
- Wildlife and Fish
- Watershed Management
- Alternative Energy Sources
- Economic Efficiency

The Plan sought to resolve these issues in a combination of ways: (1) prescribing management practices which could occur on the Forest, (2) establishing levels of services and benefits to be produced, (3) allocating land to different uses, and (4) specifying standards and guidelines to mitigate impacts or achieve certain conditions.

**In this section we review management issues identified in the Plan, and report our findings about how well the Plan resolved them.**

**1.1 Minerals Management.** Issues of minerals management centered around public concerns about the effects of mineral exploration and development on backcountry, wilderness and other resources. National Forests are, by law, open to applications for prospecting and mineral leasing. Some people indicated a desire to see the Forest provide more opportunities for hobby mineral collection (Record of Decision (ROD) p. 9).

Under Federal mining law(s), the issuance of prospecting and mineral development permits falls under the jurisdiction of the Bureau of Land Management, U.S. Department of Interior. However, permitting mineral activity on National Forests requires the consent and site specific approval of the Forest Service. This approval process must follow the procedural guidelines in the National Environmental Policy Act.

The Forest is not a likely source for oil, gas or coal. At the time the Plan was being developed there were over 40 applications pending from interested parties wishing to prospect for "hardrock" minerals (e.g., gold, copper, and zinc).

Solution: No decisions were made in the Forest Plan regarding mineral development, except in wilderness; it dealt primarily with exploration. It incorporated the Forest Service's mineral permit approval role into Forest-wide standards and guidelines.

Plan direction prohibited mineral extraction or surface disturbance in designated wilderness and specified that mineral activity could not adversely affect the character of research natural or scenic areas. Hobbyist and noncommercial mineral collection was also restricted to that which can be done with hand tools in a limited area. No permit was required for noncommercial use.

Effectiveness: There has been little opportunity to evaluate how well Plan guidelines for mineral permitting worked. After approval of the Plan in 1986, about one half of the pending applications were withdrawn. In 1989, following completion of environmental analysis and documentation, the Regional Forester approved the remaining 25 applications. This decision was later appealed and the appeal has not been resolved. Since 1989, we have received 3 more applications but have not acted upon them pending resolution of the appeal.

Currently, there are no active commercial mineral permits or mining operations on the Forest. Current mineral activity on the Forest consists of sand and gravel excavation (by permits issued to local governments for road repairs), and moderate to high levels of hobbyist collection. Sand and gravel removal has been effectively managed under Plan guidelines and site specific permitting. Although the Plan contains adequate direction to regulate hobbyist activity, some hobbyists say that the guidelines are too restrictive. Forest managers have found that this activity is difficult to monitor without permitting; and in some cases results in resource damage.

**1.2 Roadless Areas and Wilderness.** The 1970s were a period of national debate over wilderness: e.g., how much should there be and where should it be located. At the start of the forest planning process, there were 26,000 acres of Congressionally designated Wilderness on the Forest, within the Great Gulf and the Presidential Range-Dry River areas.

To address concerns about wilderness the Forest participated in the 1979 Roadless Area Review and Evaluation (RARE II), a national study, designed to inventory and evaluate wilderness potential on federal lands; and make recommendations for inclusion of additional backcountry areas into the Wilderness Preservation System. Evaluation and recommendations for 13 "roadless" areas, encompassing approximately 265,000 acres on the White Mountain National Forest, were included along with analyses for other national forests in a broad scale Environmental Impact Statement (EIS). When this EIS for RARE II was found to be inadequate by the 9th Circuit Court of Appeals, it set the stage for a re-evaluation of roadless areas during the forest planning process.

The Forest, along with other national forests, began re-evaluating roadless areas. But the 1984 New Hampshire Wilderness Act was passed before this analysis was completed. The law stated that the study done for RARE II was adequate basis to designate Wilderness and manage lands with future wilderness potential in New Hampshire. It made important decisions about the disposition of inventoried RARE

II areas and other roadless areas. (1) The Act established the Sandwich Range (25,000 acres) and Pemigewasset Wildernesses (45,000 acres) and added to the existing Presidential Range-Dry River area (7000 acres). This brought the total area of designated Wilderness on the Forest to 103,000 acres. (2) The Act "released" the remaining RARE II areas and some additional roadless areas identified in Unit Plans for multiple uses other than wilderness. This decision would remain in effect until the completion of revised forest plans, scheduled 10 to 15 years later. Recognizing that signs of past logging, railroads and other evidence of human settlement, do not necessarily preclude wilderness designation, the Act gave the Forest Service the discretion to implement management in roadless areas which might temporarily alter wilderness attributes. (3) The legislation further directed the Forest to fully evaluate management of the Kilkenny area for all uses including wilderness, during development of the Forest Plan.

While the New Hampshire Wilderness Act effectively addressed new Wilderness area designation, it did not completely resolve public concerns about management of roadless areas. Some groups and individuals felt that the primary consideration for managing these lands should be protection of future wilderness options, which are scarce in the eastern United States. They were particularly concerned that future wilderness designation would be precluded if timber harvesting and road construction occurred, particularly in areas like Wild River, Mount Wolf -Gordon Pond, and other controversial areas. Others argued that the Forest had enough wilderness and former roadless areas should be available for multiple use. Since the law did not apply to Maine, it did not address the management of the Caribou-Speckled Roadless Area, which was not evaluated in RARE II.

After the court ruling on RARE II, and the subsequent Wilderness legislation, the following issues regarding approximately 245,000 acres of roadless lands were left for resolution in the Forest Plan:

- Management of 14 roadless areas released for other uses through the NH Wilderness Act (approximately 202,00 acres).
- Management options for the Kilkenny area (27,000 acres) including deciding whether or not to recommend wilderness designation.
- Management options for the Caribou-Speckled Roadless Area (16,000), including potential recommendation for wilderness.

Plan Solution: The Forest Plan dealt with roadless area issues including Kilkenny, primarily through allocation of land to management areas. The Plan recommended that 12,000 acres of the Caribou-Speckled Roadless Area be considered for wilderness designation; and as such assigned these lands to MA 9.1, where emphasis is on protection of wilderness values.

Effectiveness: Wilderness values for the Caribou-Speckled Roadless Area were maintained; and this area was designated Wilderness in 1990. With this designation,



the total amount of Congressionally designated Wilderness on the Forest has grown from 26,000 acres prior to RARE II, to the current 115,000 acres.

The Forest Plan assigned the bulk of released roadless areas to MAs 6.1-6.3, where emphasis was on maintenance of solitude, primitive recreation and natural ecological conditions. Several organizations, who continued to believe that snowmobiling, timber harvesting and road construction should only occur in currently roaded areas, filed an administrative appeal in 1986, after the Plan was approved. As shown in the data table, the settlement of this appeal resulted in the reassignment of additional lands, within or adjacent to roadless areas of special interest, out of management areas 2.1, 3.1, and 6.1, where timber harvesting or snowmobiling would be anticipated. (Refer to the table on the next page). A 1987 Forest Plan Amendment shifted the management direction for some of these areas into two newly designated Management Areas, ( 9.4 and 2.1a) and into MA 6.2, which precluded timber harvesting, road construction, and snowmobiling.

The Plan's initial land allocation, combined with adjustments made through the appeal settlement, resulted in an emphasis on preserving wilderness options within roadless areas, and a de-emphasis on management for a broader range of resource uses, including timber harvesting. About 18 percent of roadless areas were assigned to management areas where timber harvesting and road construction were among management options.

As a first step toward developing information for Plan revision, we recently determined from our records that timber harvesting and road construction had been implemented on about 7710 acres, or about 18 percent of roadless areas in MAs 2.1 and 3.1, where these uses could have occurred. About 3 percent of total identified roadless areas were affected. Most of the harvesting was done by uneven-aged methods. About 8.1 miles of new road were constructed. We further noted, that all of the roadless areas identified in the Forest Plan continue to meet the original inventory criteria used to identify areas with future wilderness potential. Planning regulations require that revised plans include a re-evaluation of roadless areas.

Disposition of Roadless Areas, through Wilderness Legislation, Forest Plan Land Allocation and Appeals Settlement										
	Designated Wilderness (MA 5.1)	Management Area Allocation								
		6.1/3	6.2	2.1/3.1	8.1	9.4	2.1A	9.1	9.2	
-----Acres-----										
Existing in 1975	26,000									
NH Wild. Act (1984)	77,000									
Land Allocation per F. Plan Released Roadless Area		39,598	104,644	52,747	5,547	0	0	0	150	
Kilkenny		22,000		5,000						
Caribou Speckled			850	3,150					12,000	0
<b>Subtotal</b>		<b>61,598</b>	<b>105,494</b>	<b>60,624</b>	<b>5,547</b>				<b>12,000</b>	<b>150</b>
Adjustment per Appeal (1987)		-5,798	+10,999	-17,212	0	+10,193	+1,100	0		
Caribou Speckled Designation (1990)	12,000								-12,000	0
<b>Total</b>	<b>115,000</b>	<b>55,800</b>	<b>116,493</b>	<b>43,412</b>	<b>5,547</b>	<b>10,193</b>	<b>1,100</b>	<b>0</b>	<b>0</b>	<b>150</b>

**1.3 Nonmotorized Dispersed Recreation.** In 1986, many people felt that the greatest value of the White Mountain National Forest was to provide abundant high quality opportunities for nonmotorized dispersed recreation; and people wanted to ensure that these types of opportunities would not decrease over time. There was also concern that roads, timber harvesting, and developed recreation facilities would reduce the quality of the experience (ROD, page 12).

Solution: The Forest Plan strategy to address the nonmotorized recreation issue was to manage natural resource settings to provide these recreation opportunities. The Plan did this through land allocation, providing standards and guidelines, and by planning investments in trails and backcountry facilities.

Although nonmotorized opportunities exist in all parts of the Forest, the quality of experience is greatest in areas where nonmotorized use is either exclusively provided (as in Management Areas 5.1, 6.2, 8.1, and 9.1) or in MA 6.1 where it is emphasized. (ROD page 12). The Plan allocated 385,000 acres to these Management Areas (MAs). The Plan also envisioned that some nonmotorized use would occur within MAs allowing timber harvesting (MA 2.1/3.1) and where emphasis is on motorized use but only on designated trails (MA 6.3).

To meet demand for nonmotorized recreation, the Plan proposed investments in new trails, trails maintenance, trail parking facilities and tent sites (Forest Plan Implementation Schedule, Appendix A). The Plan recognized that the quality of recreation experiences and resource impacts are affected by the number of visitors, as well as the maintenance and design of facilities. As a result, standards and guidelines addressing use restrictions in sensitive areas. Guidelines for trail and facility design including maintenance were established.

Effectiveness: The Plan resulted in emphasis on nonmotorized dispersed recreation experiences. Over 40 percent of the Forest excludes motorized use and timber harvesting. The 1993 Forest Monitoring Report notes that land allocation in the Plan has been effective in reducing conflicts between motorized and nonmotorized recreation activities, and that the Forest continues to provide the bulk of backcountry and solitude-based experiences on public land in New England.

As noted in the 1995 Forest Monitoring Report, page 13, we do not have the level of monitoring information we need to adequately assess how well Plan standards and guides have worked to mitigate the effects of overuse in backcountry settings. Budget constraints have limited our ability to hire seasonal staff and pursue backcountry monitoring projects. Our best information indicates that visitor use of trails and backcountry areas, especially the Presidential and Franconia Ranges, and Wilderness, has increased beyond Plan expectations. For heavily used areas some resource damage and diminished quality of experience have been reported (Annual Wilderness Reports, and 1993 Monitoring Report, p.9). As of 1994, trail use was spread evenly between heavy, moderate, and low use trails, with about 30 percent being heavily or very heavily traveled (12 or more users per day).

We have not had the necessary funding to monitor dispersed recreation use within MAs 2.1 and 3.1, where timber harvesting and road construction occur. We know from observation that semi-primitive nonmotorized use does occur within these areas. While recreation opportunities become more limited during active timber harvesting and road construction, the quality of recreation experiences and opportunities may be enhanced by closed woods roads left after projects are completed. For example, logging roads are being used for mountain biking.

Though we have made progress on construction and maintenance of backcountry facilities, we have not been funded at the levels needed (Figure 10). (Refer to the discussion of dispersed recreation and budgets in Section 2.0). We reported in the past, that about 46 percent of WMNF trails are still in fair or poor maintenance condition (1993 Monitoring Report, p. 6). Preliminary public participation for Forest Plan Revision in early 1997 indicates that nonmotorized dispersed recreation remains important to people.

**1.4 Motorized Dispersed Recreation.** The public was divided in their support for off-road vehicle (ORV) use. Many felt that summer ORV use (four wheel drive dirt motorcycles and ATVs) was incompatible with the recreation setting on the Forest. They were concerned that noise from ORVs would conflict with other recreation uses. The Forest Plan noted that terrain was generally unsuitable for summer off-road vehicle use, reflecting a combination of steep slopes, and incompatible soil and water conflicts. Demand for summer ORV use was low when the Plan was written, but all terrain vehicles were gaining popularity. Some people expressed concerns about the possibility of resource damage and user conflicts in the future.

Public demand and support for snowmobiling as an activity was higher than summer ORV use, mostly because the Forest's terrain and ecology is more suitable for winter snow travel. People noted that the quality of snowmobiling opportunities could be improved by expanding the snowmobile trail system and establishing better connections for existing trails. Some people were concerned that this might be incompatible with other winter recreation experiences. There was significant concern about the snowmobile route through Wild River.

Solution: The Forest Plan addressed this issue primarily through establishment of standards and guidelines for recreational use of vehicles on the Forest (including snowmobiles), and limiting use of motorized recreation through Management Area assignments.

In general, the Forest was closed to private motor vehicles unless specifically designated as open. Forest Plan guidelines, for situations where motor vehicle use is allowed, distinguish between use of vehicles on forest development roads, and both on and off trails. No cross country, off-trail, use was allowed. Vehicle use was allowed only on designated trails. The Plan also allowed identification of opportunities for summer off road use on a case by case basis; but no trails were to be specifically developed for four wheel drive vehicles.

Snowmobile use management direction emphasizes family oriented experiences. MAs 6.1 and 6.3 were established, in part, so that traditional use of snowmobile routes through backcountry areas could continue. The Plan provided for a temporary snowmobile route through Wild River, until a permanent route could be found. The Plan recommended 20 miles of snowmobile trails be built to link existing trails. A study of a permanent north-south snowmobile trail was also planned.

Effectiveness: Most of the growth in motorized recreation use on the Forest has occurred in driving for pleasure and sight seeing, not in ORV use. The 1993 Monitoring Report, page 11, states that unauthorized summer ORV use was localized and not serious. No summer off-road use designations have been identified, although recently the Forest has been contacted by a number of persons interested in exploring opportunities for summer motorized recreation.

Snowmobile use has occurred on designated routes as planned. The Plan estimate for the number of miles of new trail have been completed, along with numerous improvements to bridges and improved grooming through the efforts of local snowmobile clubs.

The study of a permanent north-south snowmobile trail through Wild River was conducted but never finalized. Currently, use of the temporary trail has been discontinued. During implementation of the Plan, we have identified the need for the Plan to better the Forest's role in relation to the long term needs of the state snowmobile system.

Recent public participation for Forest Plan Revision indicates that there is significant interest in expanding opportunities for motorized recreation particularly from four wheel drive users.

**1.5 Developed Recreation.** The White Mountain National Forest represents a small proportion of the total developed campground opportunities in New England. However, the experience of camping in the Forest was considered unique because of the rustic attractions of the National Forest. Demand for developed recreation was projected to grow faster than other types of recreation, and opportunities to increase the supply of developed sites were identified in the Forest Plan. Providing access to developed sites for people with disabilities was raised as a management concern.

Public reaction to proposed increase in developed recreation facilities was mixed. Some were concerned that more campgrounds and picnic areas would increase use of the Forest, de-emphasize dispersed recreation and compete with the private sector. There was also concern that more campers would mean more effects on local community lifestyles and more law enforcement. See ROD, page 11, and Final EIS, Appendix K-62-65.

Solution: The Forest Plan called for increasing the capacity of rustic, forest-oriented developed sites to resolve overuse problems during high visitation periods and to meet some of the overall regional demand. First decade projects included improving universal access to developed sites for people with disabilities. Most of the new demand was to be met in the 2nd to 5th decades of the plan. The role of the Forest was considered to be limited to meeting 50 percent of projected increases in demand, allowing the private sector to plan for expansion to meet future needs (ROD, p.12).

Effectiveness: In general, the Forest Plan was successful in addressing the issue of providing rustic, developed recreation facilities, but not at the capacity anticipated. No net increases in number of sites has occurred since the Plan was developed. Most of the investments were made in improving existing campgrounds and restroom facilities and providing universal access. Occupancy rates at the campgrounds continue to be high during peak summer weekends but total use was less than projected. A variety of opportunities are now more available for people with disabilities at many campgrounds.

The Forest continues to feature developed rustic recreation experiences, and there have not been conflicts with the private sector suppliers. However, new improvements at some National Forest campgrounds have been at development levels which exceed the rustic standards established in the Forest Plan. This was in response to campground users who expressed preferences for more conveniences (flush toilets and showers). The Forest needs to better define the range of experience levels and amenities it should provide at developed campsites (1993 Monitoring Report, p. 10).

**1.6 Downhill Ski Areas.** At the time the Plan was developed, downhill skiing opportunities on the Forest included six areas under special use permit. The Forest Plan projected that demand for alpine skiing would continue to grow (at a slower rate than in the past) in response to active marketing by the industry. National Forest lands contain the bulk of terrain most suitable for skiing in northern New England, and are considered important for meeting future demand.

There was a range of public reaction. Some opposed expansion on National Forest, because they felt that current downhill facilities were adequate and expansion should only occur on private land. Supporters noted that downhill skiing uses relatively little land base, has positive economic benefits and returns money to the treasury (ROD, p.11).

Solution: The Record of Decision (ROD, p. 11), stated that expansion of existing ski areas is consistent with the recreation objectives of the White Mountain National Forest. The Plan set aside 1400 acres for future expansion adjacent to four existing ski areas (Loon Mountain, Waterville Valley, Attitash and Cannon/Mittersell) within Management Area 9.2. It stated that specific expansion projects would be assessed through the National Environmental Policy Act. The Plan ruled out developing new ski areas.

Effectiveness: Skiing demand grew beyond the level anticipated in the Forest Plan Final Environmental Impact Statement. Only one ski area expansion was proposed during the past decade, at Loon Mountain. The expansion was approved following a lengthy and complex analysis process. The decision was later appealed administratively and subsequently litigated on specific points. Many felt that the process would have been less burdensome if the analysis done in the Forest Plan better addressed the broader effects of ski area expansion on communities and natural resources.

**1.7 Timber Harvesting.** The issue of timber harvesting had many facets: its value as a tool for improving vegetative diversity, the importance of the Forest as a source of raw material for local mills, effects of timber harvesting on other resources, and the cost/revenue ratio of timber sales.

In the 1974 Forest Plan, 344,000 acres of the Forest were classified as suitable for timber production. Land that was considered unsuitable because of its slope, soil depth, access or development costs was excluded. The average annual yield from 1976-1986 (pre-Plan approval) was about 38 million board feet (MMBF). Most timber harvesting was by clearcut.

Forest planners determined that if management of the Forest focused on intensive timber management, a maximum of 492,000 acres could produce up to 93 million board feet (MMBF) per year over the long term. However, considering the need to meet other management objectives, the Draft Environmental Impact Statement

analyzed alternative amounts of land which would be suitable for timber harvesting and the corresponding volume of timber which could be sustained.

The preferred alternative in the Draft EIS (390,000 acres sustaining 78 MMBF of annual production by the fourth decade) drew diverse public reaction. This led to a revised draft. Some felt that the harvest should be increased to provide jobs, economic benefits and wildlife habitat. Others felt that increasing the harvest would be harmful to recreation, scenic values and sensitive wildlife species. Many preferred uneven-aged over even-aged management and clearcutting.

Solution: The alternative ultimately selected as the Forest Plan, provided for timber harvest on 345,000 acres (44 percent of the Forest), with a long term sustainable yield of 69 MMBF. The first decade annual maximum harvest from these acres would be 35 MMBF, growing to 48 MMBF by the fifth decade. On a decadal basis (1987-1996), the Plan called for harvest of 52,000 acres (less than 7 percent of the Forest). Most marginal lands were excluded from the suitable base. Suitable lands were allocated to MAs 2.1 and 3.1. This land allocation was thought to best balance the Forest's need to provide wilderness and recreation experiences with the needs of local wood-dependent communities, and wildlife habitat diversity.

Standards and guidelines were established both Forest-wide and by Management Area to address concerns about the effects of harvesting on backcountry recreation, visual quality, soil and water, and wildlife. Quality hardwood sawlog production was the main emphasis. More uneven-aged management would be used than before the Plan. The goal would be 50 percent uneven-aged management in management area 2.1 and 10-20 percent uneven-aged management in management area 3.1.

Although harvests returned less money to the treasury than costs incurred, the FEIS showed that when all factors were considered the timber program provided positive net benefits. For example, timber harvests were considered critical to meeting the objectives for wildlife habitat. The ROD, page 20, states that timber sales would be the most economically viable means of producing vegetative diversity.

Effectiveness: The Plan solution was partially effective. Standards and guidelines were generally effective in mitigating adverse effects of harvesting on other resources (section 4.0). Timber harvesting proved, as predicted, to be the most effective method of providing vegetative diversity, and is closely tied with achieving wildlife habitat composition objectives.

Land allocation appears to have been effective in ensuring that adequate land was available for recreation, and wilderness benefits. Based on the first decade alone, it is not really possible to determine whether land allocation in MAs 2.1 and 3.1 is adequate to meet the Forest's full contribution to societal needs for forest products or wildlife habitat. We have also noted from experience with project implementation that some marginal land included within the base may not be suitable for harvest

within standards and guidelines (1994 Monitoring Report, p. 29). These areas were excluded from harvest.

The quantity of timber sold and acres harvested may not have met expected levels, but the Forest supplied an estimated 80 million board feet of valuable sawtimber and over 2.5 million cubic feet of pulpwood to wood producing industries. The 1993 Monitoring Report, page 44, states that rising bid prices for timber indicate demand remains high. It appears that the prediction made in the FEIS, that there would be high demand for all the timber the Forest offered for sale, is valid.

The intended differences in emphasis on visual quality, intensity of timber harvesting, and type of wildlife habitat produced between lands allocated to MA 2.1 versus MA 3.1 have not occurred in implementation (Section 3.0). We found that the public was as concerned about visual quality for lands within MAs 3.1 as with 2.1, and that in many cases the position on the landscape in MA 3.1 was more visually sensitive.

Timber sales continue to cost more dollars than they return to the treasury. This is discussed in more detail in the 1994 Monitoring Report, pages 27 and 28 and later in this report (Section II under "Budgets and Costs). But annual TSPIRS reports continue to show that the overall benefits of the program, including market and non-market values exceed costs.

**1.8 Transportation (Roads).** The issues regarding roads centered around concern that road construction standards and the number of roads built were higher than necessary. Roads potentially cause resource damage; and roads open to vehicle use may adversely affect the quality of nonmotorized recreation experiences. The National Forest had 346 miles of roads when the Forest Plan was initiated, mostly constructed for timber harvesting. Of these, 150 miles were open to public vehicular access.

Solution: The Plan addressed roads issues by establishing limits on the number of miles of road to be built by construction standard. The Plan said that roads would be built to the minimum standard needed, and required managers to include an analysis of design alternatives through the NEPA process. New road construction in the first 10 years would be limited to 70 miles, and they would generally be closed to the public. Only 6 miles of high standard roads would be built, plus a few access roads to developed recreation sites.

The Forest Plan established standards and guidelines to mitigate effects of road construction, on soils, water, and fish. It also set guidelines for road management which would be consistent with recreation settings. Roads would be closed to public vehicles after project use, but District Rangers had the discretion to temporarily open selected roads for hunting, fishing and fuelwood gathering.

Effectiveness: The Plan effectively addressed all aspects of the road issues. In fact



the high level of pre-plan concern about road issues did not appear to continue during implementation. Road issues were not as prominent a feature of our January 1997 public participation workshops as they were in the 1980s. As of 1995, less than half of the total new roads proposed in the Plan have been built (Section 2.0, Figure 5). Of those roads constructed, more than one half are low standard winter roads and only 3 miles (of the estimated 6) high standard roads were built. Overall, road costs were substantially lower than expected.

Section 2.0 of this report and page 36 of the 1993 Monitoring Report discuss reasons why there appear to be more roads on the Forest despite the decreased levels of new construction.

Road management standards were effective in addressing concerns for impacts on recreation. As predicted, closed roads enhanced opportunities for cross country skiing, hiking, hunting and fishing (ROD, p. 16). Timber sales and associated road construction were effectively designed to increase recreation opportunities, as planned. Managers were able to open roads for seasonal public use.

**1.9 Visual Quality.** Outstanding scenery was identified as the major attraction for millions of visitors, and important to New Hampshire's tourist industry. The Forest's accessibility to urban areas was assumed to guarantee future increases in tourism and visitation. People felt it was important to protect the visual resource, and recognize places with outstanding scenery. Some expressed concern about the location and size of clearcuts, and roads, and favored low intensity silviculture and use of uneven-aged management.

Solution: Standards and guidelines to mitigate impacts on visual quality were included in the Forest Plan, including size limits on clearcuts. Uneven-aged management was included as an important timber management option. Guidelines specified that at least 50 percent of MA 2.1, and 20 percent of MA.3.1 would be managed under the uneven-age system. A main emphasis for management area 2.1, (which included land along major roads and trails below timber line), was to protect the visual resource. Several outstanding scenic resources had already received special designation. The Mt. Chocorua Scenic Area was later added. The Plan also recognized a need to maintain vistas along major travel corridors to provide opportunities for people to obtain views of the spectacular White Mountain scenery.

Effectiveness: Outstanding scenery continues to attract millions of visitors to the White Mountain National Forest. As shown in the 1994 Monitoring Report, page 24, the Forest today retains the natural appearance it had when the Plan was approved. Some of this is attributable to the reduced pace of implementing timber harvesting and the trends toward reduced clearcutting over the last decade. Uneven-aged management has been used to a greater extent than envisioned in the Plan. Road construction has not occurred to the levels planned.

But the maintenance of the scenic quality of the Forest is primarily attributable to the effectiveness of standards and guides in mitigating the effects of management on visual resources. Plan monitoring guidelines state that achievement of visual standards will be assessed through sampling of finished projects, like timber harvests, recreation construction, ski area and road developments, and by monitoring adverse public response. The 1993 Monitoring Report, page 53, describes how computer modeling and simulation techniques have proven successful in achieving stated visual quality objectives for projects.

Recent public participation in Forest Plan Revision workshops indicates there remain some concerns about clearcutting, and the cumulative effects of new clearcuts done in areas where past cuts are still visible. Research has shown that the Plan may need more effective guidelines to mitigate the effects of multiple harvesting over time within critical viewsheds. There are also concerns from those wishing to see better maintenance of roadside vistas, to ensure that spectacular views of the Forest are not obscured.

**1.10 Wildlife, Fish and Rare Plants.** Issues related to wildlife and fish focused on the need to provide habitat for the diversity of species occurring on the Forest, some of which are threatened and endangered. People were particularly concerned about species requiring old growth habitat. Regulations developed to implement the National Forest Management Act specified that Forest Plans would provide for habitat to maintain viable populations of existing native vertebrates, and maintain diverse habitat for plants and animals on national forest land. This was intended to be achieved to the extent possible within the overall balance with other uses of the Forest. Many respondents to the Draft Environmental Impact Statement said that the role of the National Forest in providing habitat should be considered in the context of the larger private land base. They felt that private lands should provide most of the early successional habitat. There was much discussion about how to monitor species viability, and which species would be the best indicators of how well management was working.

Solution: The Plan provided for habitat diversity through a strategy which set integrated goals for various forest types and age classes within vegetative community types. These goals were based on estimates of ecological capability to reproduce desired species. Goals established for the overall proportion of forest cover types were designed to be achieved over long periods, up to 200 years. Because of the large imbalance toward older forest conditions, young growth forest objectives were intended to be achieved as soon as possible.

To optimize habitat (food, shelter) and its proper distribution across the forest, the Forest Plan divided the Forest into Habitat Management Units (HMUs) of about 4000 acres. Each HMU has its own desired mix of forest cover (based on dominant tree species) and size/age classes (arrangement and layering of trees and shrubs).

Standards and guidelines to achieve vegetative composition goals were applicable only within parts of the Forest where timber harvesting was practiced, e.g., MA 2.1 and 3.1 (Forest Plan, p.III-13). Management Areas without timber harvests were intended to function as habitat for species which required larger expanses of undisturbed forest. The mix of managed and unmanaged lands was considered critical to make the strategy work.

Even-aged final harvest would provide for young growth. Ninety percent of native wildlife species, depend on 0-40 year old forest conditions. The needs for young forest conditions would be constantly shifting. As regenerating stands grew older, the needs of wildlife dependent on regeneration would be met by newly harvested areas. For bird species in particular, uneven-aged management would provide forest conditions similar to mature even-aged forests. Most wildlife species use conditions created by both even and uneven-aged management during parts of their life cycle.

The theory was that if these desired mixes of habitat could be achieved, it would increase vegetative diversity and ensure that habitats were well distributed across the forest. Standards and guides were also established for wildlife openings, special habitat features like wildlife trees, threatened and endangered species, and non-native species.

The ROD, page 23, notes that the Plan recognized that to balance wildlife habitat needs with other forest values, the Forest Plan could not produce all young growth habitat possible. There would be some parts of the forest which would not contain all ecological niches for wildlife. This heightened the importance of achieving early successional goals established by the Plan. Overall, the Plan recognized that the Forest would inevitably provide more habitat for species that needed mature and overmature aged conditions. It also acknowledged that there should always be sufficient early successional habitat for species.

For each forest condition, a species or group of indicator species was selected. By monitoring populations of these species, biologists could evaluate changes caused by management. Species selected were believed to be representative of particular habitat, easy to monitor, and that knowledge of its habitat preferences was known.

Fisheries standards and guidelines were not included in the Forest Plan. In 1989, standards and guides designed to protect resident and anadromous fish habitat were added by amendment.

Effectiveness: The Habitat Management Unit (HMU) strategy was somewhat effective in moving the forest toward the desired mix of habitat conditions, but it was not implemented at the rate envisioned in the Plan. As of 1994, we had achieved the regeneration goals (0-10 year old) for the predominant forest type, northern hardwood. The number of acres in 0-40 year old stands (51,000) had

decreased from 1984 levels (60,000). As predicted in the FEIS and the ROD, the mix of habitats on the Forest still strongly favors species who prefer older aged forest habitat. Comparisons between current and desired conditions for each forest type are provided in section 2.0 of this summary.

Past Monitoring Reports in 1994 and 1995 address the factors affecting progress in achieving HMU goals. We know, for example, that achievements in wildlife habitat are closely tied with acres harvested through timber sales. Young growth was not produced at the rate envisioned because we did less clearcutting. Budgets limited our ability to establish the number of permanent openings that we planned. For some species like paper birch and aspen there is current concern that habitat goals may not be consistent with ecological land type capability on parts of the Forest.

Forest types were used to classify habitat partly because the only vegetative data available for the Forest was developed to support the timber management program. There is concern that this vegetative classification system may not adequately describe wildlife habitat within an ecological context (1995 Monitoring Report, p. 8). The 1994 Monitoring Report reflects a growing national concern that tracking populations of management indicator species may not be the most effective way to assess the effects of management for some species (page 6).

When the Plan was developed, there was potential habitat identified for four endangered animal species and one plant on the Federal List. Of the five, only the Peregrine falcon and the endangered plant, Robbins' cinquefoil, actually occur on the Forest. The US Fish and Wildlife Service did not require consultation for the Gray Wolf, the Eastern Cougar and the Bald Eagle. There have been no confirmed sightings of Gray Wolf and Eastern Cougar nor breeding Bald Eagle. Recovery efforts and management guidelines have been very successful in reintroducing peregrines and protecting the Robbins' cinquefoil. Since the Plan, the Small-whorled pogonia has been discovered on the Forest and recovery plans are being implemented.

Of the ten sensitive species whose viability was of immediate concern in 1984 only the viability of the Canada Lynx appeared to be at risk under any of the alternatives, so standards and guides were developed specifically to protect lynx from the effects of backcountry recreation. Directed searches have not identified any lynx on the Forest. Research does not indicate there are any vertebrates in New England with sole dependence on old growth. There may be some non-vertebrates or lichens with such a dependency.

In 1986, several parties appealed the decisions made in the Record of Decision partially with regard to the wildlife strategy. Part of the Appeal Settlement in October 1987, was that the Forest would evaluate the wildlife strategy by

convening a group of recognized wildlife authorities and appellants. This would include evaluation of wildlife monitoring data (Appeal Settlement Agreement, Between USDA Forest Service and Conservation Law Foundation of New England, Inc., ET AL., October 6, 1987).

The Committee of Scientists (COS) was formed and has directed one of the most comprehensive wildlife monitoring programs ever conducted on National Forest land. The 1993 Monitoring Report, pages 63-104, is a sample of the range of data collected and summarized annually by the COS up to that date. Data collected from 1992 to the present does not indicate that management under Forest Plan direction has had an adverse effect on the viability of any species. Section 6.0 of this report, contains an updated summary of the 5 year COS monitoring project.

When the Forest Plan was being developed, conservation biology was evolving as a discipline. Ecosystem management had not been introduced, though the Plan in many ways was ecosystem based. By regulation, Forest Plans had to provide for species viability on National Forest land. Concepts like species viability and management of indicator species were relatively new. Much more is known about the concepts of conservation biology today. Currently, there is a national dialogue among conservation biologists, ecologists and wildlife managers about how to better define and measure viability, and incorporate the principles of ecosystem management into managing for wildlife habitat on National Forests.

Fish habitat standards and guides have been effective in maintaining habitat quality. Forest wide standards for water and soil, riparian zones, and road construction function to protect fish habitat during project implementation. Inventories have indicated that overall, streams have stable banks, cool water temperatures and good hiding cover, but pool habitat is lacking. Each stream is ideally comprised of 15 percent hiding pools, but only one in ten streams on the Forest meets that standard.

**1.11 Watershed Management.** Municipal watersheds for 14 communities are contained within the White Mountain National Forest. Water supply needs were projected to increase along with population growth. The effects of timber management, ski area expansion and recreation use on water quality were of primary concern. There were those who favored selection logging as better protection for the watershed over clearcutting. Concerned citizens wanted the Forest to avoid wetlands, and employ strict anti-erosion measures during road construction and skidding of logs.

Some commenters to the Draft Plan felt that municipal watersheds should not be managed for multiple use. They suggested that land allocation decisions should exclude municipal watersheds from Management Areas where timber harvesting or road construction would occur. Others were concerned about

the effects of management on water quantity, which might cause reductions in stream flows affecting fish or damaging floods.

Solution: This issue was resolved by specification of standards and guidelines. Forest-wide standards and guidelines were developed to assure that water quality meets municipal or domestic use standards. There were specific standards applicable to road construction, and stream crossings. Wetlands would be avoided, and protected by other laws and regulations. There was no research at the time the Plan was developed to indicate that water quality was better protected using selection cutting, versus clearcutting if all guidelines are followed.

The presence of a municipal watershed was not a criteria for land allocation to a particular management area. The rationale was that regardless of management area, water quality and domestic water supplies can be protected through adherence to standards and guides ( FEIS, p.IX-K-102).

Water quantity guidelines were established for water withdrawal projects such as snowmaking at alpine ski areas. Based on research findings, flood flows were not expected to result from timber harvesting. The Plan did restrict the area within 1000 acre or smaller watersheds which could be clearcut within a 10 year period, as a precaution against possible adverse effects of tree cover removal.

Effectiveness: The 1993 Monitoring Report, pages 20-25, reviewed the effectiveness of standards and guides for protection of water quality at municipal watersheds, ski areas, and timber sales. The report also evaluated the effectiveness of guidelines for snowmaking.

Municipal watershed monitoring results from 1986-1993 sampling, were in areas where timber harvesting, road construction and recreation had occurred during the period. The findings on page 22 of the 1993 report indicated that there were no trends toward declines in water quality. Monitoring does not indicate that multiple use of municipal watersheds degrades water quality. There continues to be a segment of the public concerned about recreation use within municipal watersheds.

Standards and guides have been effective in preventing erosion and siltation in road construction, timber harvesting and at ski areas. Turbidity monitoring done at ski areas indicated that implementation of standards and guides contained within erosion control plans are adequate to protect water quality at ski areas. In 1995, an on site review of the effects of timber harvesting and road construction on each of the districts was conducted. Standards and guides for erosion prevention were found to be effective in keeping the effects of management activities within the range of those shown in the FEIS. There were no differences in protection for soil and water resources noted between uneven-aged harvests and clearcutting with use of proper standards and guides.

The Plan established site specific flow requirements and monitoring for snowmaking. The purpose is to ensure that all perennial streams will have minimum flows necessary for fish spawning and incubation. These requirements are made part of individual special use permits. Flow studies have been done for each of the four ski areas on the Forest and gages have been installed to monitor compliance. These measures have been effective in providing for minimum flow.

The 1995 Monitoring Report, page 10, indicated that there may be some concern for impacts of high levels of dispersed recreation use on riparian areas. In 1995, the Forest conducted a watershed scale assessment for Eastman Brook. Preliminary findings are that camping in the riparian zone had affected vegetation and soils. Although the Forest Plan addressed riparian areas in standards and guides for other resources such as road construction and water quality, it did not contain direction that addressed the unique characteristics of riparian zones as integrated linkages between terrestrial and aquatic ecosystems.

Recent public involvement indicates that people are still concerned about water quality and municipal watersheds.

**1.12 Alternative Energy Sources.** Northern New England was working toward energy self-sufficiency during the development of the Forest Plan. The Forest was recognized as a potential supply of wood for alternative energy, along with wind, water, solar and geothermal sources.

Solution: The Forest Plan determined that the timber management program would emphasize high quality sawtimber, with some allowances for biomass production and incidental uses of fuelwood from the timber sale program. Proposals for wind, water, solar or geothermal projects would be assessed following the NEPA process.

Effectiveness: Several wood-to-energy plants were constructed near the National Forest, but the amount of wood from the National Forest used by these plants was not estimated. High demand for other forest-based alternative energy activities has not yet materialized.

**1.13 Economic Efficiency.** People expressed a variety of concerns about the costs of managing the National Forest, ranging from the view that Forest activities should be funded entirely by receipts collected, to concerns about the costs and benefits of timber management and roads.

Solution: Alternatives considered in the preparation of the Forest Plan were evaluated for economic efficiency (net present value). The Forest Plan was selected to provide a mix of outputs that best meets net public benefits.

Effectiveness: There remain concerns about the cost of managing the National Forest. Some are particularly concerned about below cost timber sales. There continues to be a significant imbalance between the costs of providing recreation opportunities and revenues collected. See section 2.2 of this summary.

**1.14 Other Issues.** Cultural resources, environmental awareness, land ownership adjustments, fire and air quality were issues of moderate importance to the public. The Forest Plan integrated resolution of these issues in the Forest-wide standards and guidelines or management area direction.

The issue of acid precipitation did not influence development of the Forest Plan, but the Plan stated that acid precipitation should be closely monitored, and that the Plan would be adjusted if conclusive evidence suggested the need to alter management practices. No conclusive evidence has been developed which would support the need to alter management practices, but the Forest has been closely tracking research related to the combined effects of acid precipitation and tree harvesting.



## SECTION 2.0 HOW THE PLAN HAS WORKED

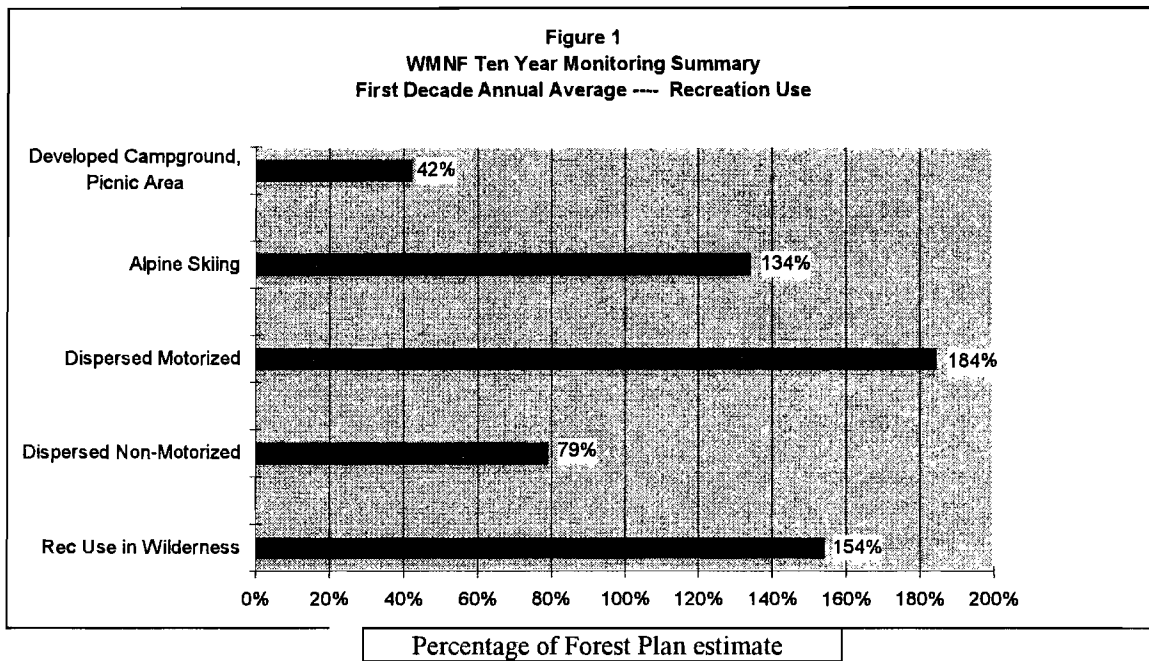
**2.1 Program Achievements, Products and Service Levels.** One of the ways the Forest Plan addressed issues was to establish levels of goods and services to be produced from the Forest, sustainable over time. According to the National Forest Management Act (NFMA), resource production and use levels must maximize long term public benefits to the extent possible within the guidelines for environmental protection. This is an important part of what a Forest Plan means both to people who value forest amenities or those who have an economic or social dependence on a National Forest.

To determine how much of each benefit should be produced from the White Mountain National Forest, planners first estimated the maximum physical and biological capability of the forest to supply resources; such as timber, wildlife habitat and recreation. Land capability was compared with estimates of demand and the environmental effects of meeting demand at various levels. The estimates of outputs to be achieved during the first decade of the Forest Plan represent the production levels believed to best address land capability and projected demand and resource protection. Longer range projections are made beyond the second decade, to reflect the achievement of a desired future condition.

As part of our Plan monitoring, we have tracked how well we have done in producing outputs from the Forest. We do this to tell how much of the Plan has been accomplished, what factors have affected our ability to provide benefits and to test the assumptions used in making Plan estimates. The goal is to see if we need to change our expectations when revising the Plan. Achievement of production and service levels varied by program area during the first decade of the Plan.

**2.1-1 Recreation Program Accomplishments.** Recreation use of the Forest has increased over the last 10 years, partially in response to the State of New Hampshire's travel and tourism marketing program. New Hampshire Office of Travel and Tourism statistics indicate that about 60 percent of the 10 million visitors to the state spend time in the National Forest each year. In fact, one need only visit the Forest on popular holidays and weekends year round to obtain the sense that the White Mountain National Forest represents some of the most heavily used public lands in the Eastern U.S.

Monitoring information from Forest Recreation Use Summaries in Figure 1, shows how recreation use in the past decade compares with estimates made in the Forest Plan.



	Campground Picnic	Ski Area	Dispersed Motorized	Dispersed Non Motorized	Recreation Use Wilderness	Total
Avg. Annual Use (MRVD)	363	461	1145	1056	123	3148
Forest Plan Estimate (MRVD)	859	344	620	1339	80	3242

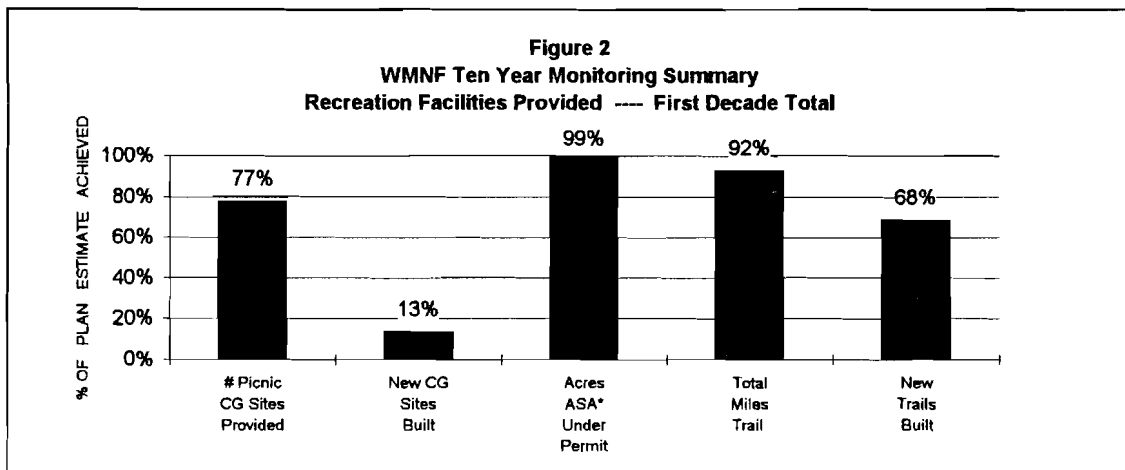
Footnotes: MRVD = Thousands of recreation visitor days. A visitor day is on person for 12 hours or 12 people for one hour or any combination.

Dispersed Motorized Use = Driving for pleasure, snowmobiling, viewing scenery

Dispersed Nonmotorized = Hiking, x/c skiing, canoeing, backpacking, bicycling, dispersed camping, AMC Hut use

Source: *Recreation Use Summaries - 1990 thru 1996*

**2.1-1a Recreation at Developed Sites.** Campground demand continues to exceed supply at peak periods. Occupancy rates are near 100 percent during July and August. Yet, due to the deteriorating infrastructure and decreased funding for maintenance and operations, the capacity of existing sites to provide a safe, quality, experience for the numbers of users we anticipated appears to have diminished. Also, as shown in Figure 2, we have not constructed the number of new campground facilities and provided for increased capacities as predicted in the Plan.



**\*Alpine Ski Areas**

	# of Campground and Picnic Sites	# of New Campground and Picnic Sites	Acres of Ski Areas	Total Miles of Trails	Miles of New Trails
First Decade Total	997	39	3351	1504	74
Plan Estimate	1290	281	3400	1638	109

Source: Annual Management Attainment Reports

The Forest Plan predicted that demand for alpine skiing would grow steadily in response to industry marketing, and that the increased demand would be met through expansions of about 1400 acres at existing areas. Expansions, when added to the 2000 acres estimated to be under permit when the Plan was developed, were expected to increase the total to 3400 acres of permitted alpine skiing on the Forest by year 10 ( Figure 2). There were actually around 2700 acres under permit in 1986, so the Plan underestimated the extent to which expansions would increase the area of alpine ski areas under permit.

Skier use has increased beyond plan estimates and ski area expansions have not kept up to pace. Only one expansion of about 600 acres has been approved at Loon Mountain and that decision has been overturned. We now believe that there are more effective indicators of ski area capacity than permitted acres alone. Lift capacity, area in trails, and parking capacity can add to total capacity without increasing the permit area.

**2.1-1b Dispersed Recreation and Wilderness.** Our records indicate that non-motorized dispersed recreation, such as hiking, cross country skiing, mountain biking and backpacking have increased in popularity on the Forest but not at the predicted rate. However, estimating recreation participation in dispersed activities is a challenge. Monitoring for the Recreation Fee Pilot will help on this. We do not believe that our past techniques to estimate recreation use of trails, Wilderness and backcountry settings have been adequate or effective. We are currently developing monitoring plans to provide more reliable estimates of dispersed recreation use. This is particularly important when we consider thresholds of visitor use related to impacts

on the carrying capacity of natural systems.

Our monitoring data probably understates the increase in motorized recreation. Reports from our visitor information centers and the New Hampshire Tourism industry, indicate the greatest increases in recreation use are in driving for pleasure and sightseeing combined with day use at mountain attractions.

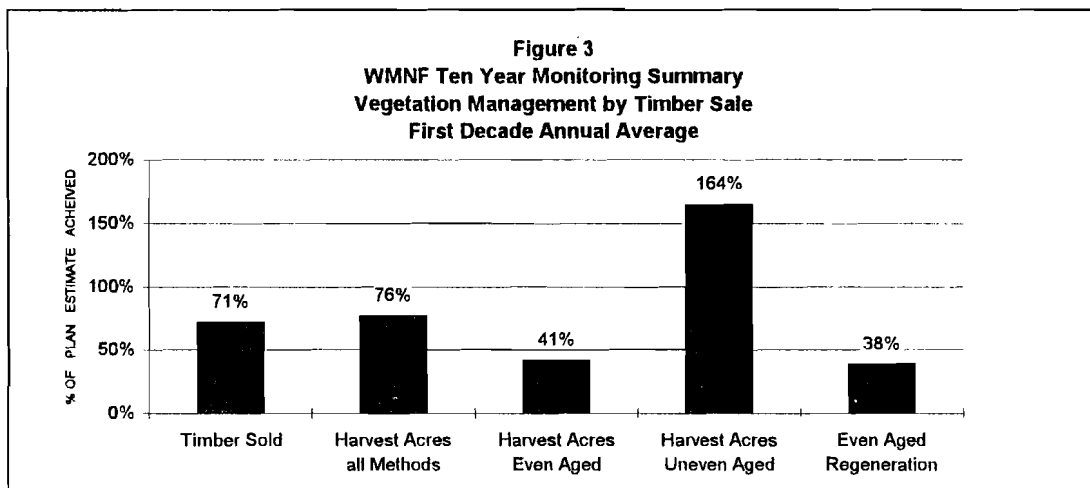
Off-highway motorized use increases are associated with snowmobiling and not four wheel drive vehicles. Snowmobiling has increased from when the Forest Plan was developed up until about 1992, but has leveled off in the past four years. Since snowmobiling depends heavily on snow cover, it is difficult to predict use from year to year.

The Plan estimated 89 miles of hiking trails and about 20 miles of snowmobile trails would be constructed. Although we did not construct as many new hiking trails as expected, we did accomplish the planned additions to the snowmobile system and completed 175 miles of reconstruction and relocation of badly deteriorating hiking trails in the first decade. No summer motorized ORV trails were designated or constructed.

The amount of recreation use as a measure of human impact is one indicator of how well Wilderness as a resource is being maintained. The Forest Plan did not foresee any increase in use of Wilderness in the first decade. However, visitor use in Congressionally designated Wilderness areas has increased as shown in figure 1. This may be partially attributed to the addition of the Caribou-Speckled Wilderness, which increased the total Wilderness on the Forest by about 12 percent to approximately 115,000 acres. Concentrated use of popular camp sites, high encounter rates on trails and civilian and military overflights continue to affect wilderness character. Visitor management efforts such as the enforcement of group size limits and leave no trace education programs have been understaffed. The Forest is developing social and biophysical monitoring indicators which will allow us to better determine how much human use and influence is compatible with each Wilderness.

**2.1-2 Vegetation Management Program Accomplishments.** Management of vegetation on the Forest is aimed at providing wildlife habitat and producing quality timber products while protecting soils, watershed, and visual resources. This is done through commercial timber sales, and noncommercial treatments such as thinnings, prescribed fire, mowing, planting and seeding, and other cultural practices.

**2.1-2a Timber Sales.** The commercial timber sale program is the primary tool for managing vegetation for wildlife habitat on the Forest, and is important economically to local communities. Figure 3 shows that we have not sold the amount of timber nor harvested the number of acres predicted in the Plan.



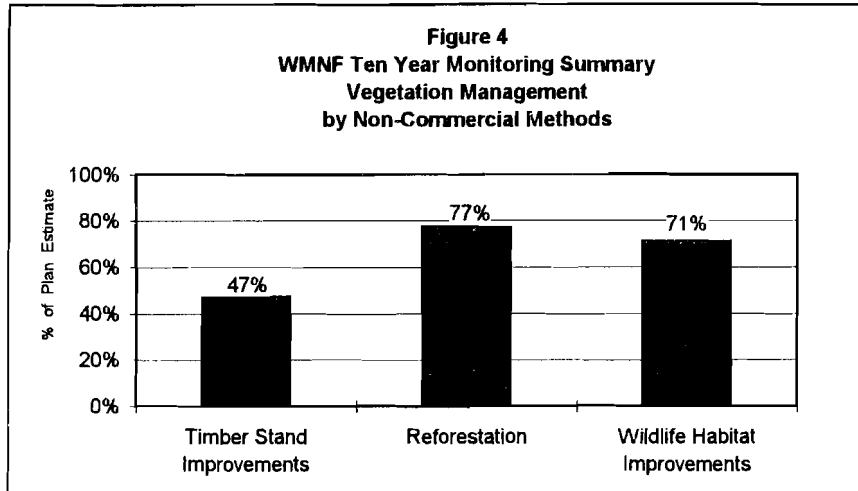
	Timber Sold (MMBF)	Acres Harvested All Methods	Acres Harvested Even-Aged	Acres Harvested Uneven-Aged	Acres Harvested Even-Aged Regeneration
Avg Annual Achieved	25	3985	1518	2467	730
Forest Plan Estimate	35	5200	3700	3700	1900

Source: Program Sales Statements 1987-1996  
 Annual Cut and Sold Reports 1987-1996

In our 1994 Monitoring Report, we described some possible reasons why the annual average timber harvest has fallen short of the plan estimate. First, the Forest has not been funded to support preparation and administration of the full allowable sale quantity. Since about 1992, costs to prepare sales have increased significantly and budgets have not increased commensurately (See section 2.2 on Budgets and Costs). Second, we found that as Forest Plan guidelines were applied to site specific timber harvest projects, there were more limits on where and how much we should cut than the Plan predicted. Third, we are using less clearcutting than predicted. Fourth, the silvicultural guidelines that we follow to manage northern hardwoods have changed, which may head to a short term decrease in the number of stands needing harvest. Finally, we have found that our ability to reproduce certain forest types is more limited by ecological land capability than we thought on some parts of the forest (Figure 7). This is explained in the 1995, WMNF Monitoring Report. The net result of the above factors is fewer trees and less timber cut on an average acre harvested than predicted-- less than 6,000 board feet harvested per acre, versus over 8,000 board feet predicted.

**2.1-2b Noncommercial Vegetation Management.** Figure 4 shows decadal accomplishments for the three main types of vegetation done by noncommercial activities. Timber stand improvement (TSI) refers to investments made in thinnings and "weeding" to improve growth and composition of young stands. After reviewing the benefits and costs, the Forest cut back on the TSI program beginning in 1994. Reforestation includes removal of competing vegetation and preparing sites for natural reseeding and some planting. Wildlife practices include creation and

maintenance of permanent openings, thinning and release of vegetation valuable for wildlife, seeding, planting and culture of forage.



	Timber Stand	Reforestation	Wildlife Habitat
Acres Accomplished/Yr	467	1462	400
Forest Plan Yearly Estimate	1000	1900	560

Source: Management Attainment Reports

**2.1-3 Visual Resource Management.** The potential for management activities to adversely affect the landscape character of the Forest was one of the primary management concerns addressed in the Forest Plan. One of the overarching Forest Management Goals identified in the Plan is that all management activities be conducted with full recognition of the importance of the White Mountains as a natural landscape distinct in the urban environments of the Eastern U.S.

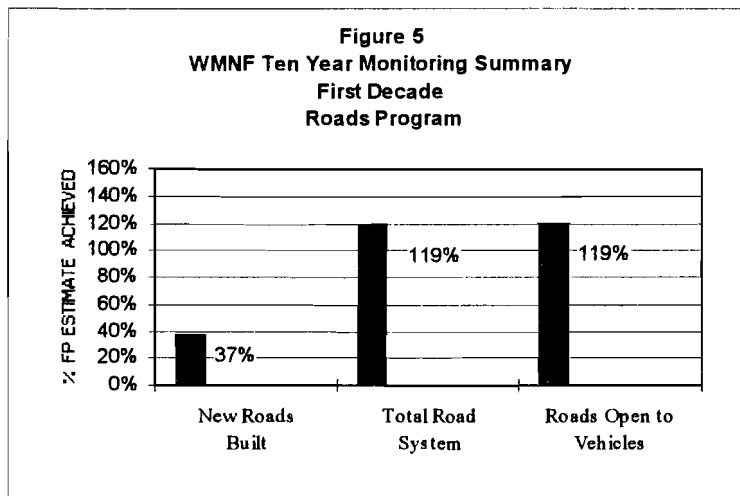
The Forest Plan estimated that about 6 percent of the landscape would be affected by human activity as a result of Plan implementation, over the long term. Land uses which affect the degree of naturalness of the landscape are timber harvesting which creates temporary visible openings in the tree canopy, and other clearings such as ski area trails, power lines, roads and mineral developments. In our 1994 Monitoring Report we indicated that about 5 percent of the landscape currently shows visual evidence of land use. This is the same as when the Plan was written.

Indications are that the scenic qualities of the Forest are being maintained. Sightseeing as a recreation activity has increased during the last decade. In fact, many long term visitors have noticed that there is less dramatic scenery visible as the road side vegetation grows taller and budgets for vista management decrease. Clearings from even-aged management are less prevalent than the Plan estimated since we have implemented less than half of the planned clearcuttings and shelterwood removals. However, a recent research project on public perceptions of

timber harvesting conducted with cooperation of the North Central Forest Experiment Station, and the State University College of Forestry at Syracuse NY, indicates that there may be cause for some concern about the cumulative visual effects of clearcutting in some parts of the Forest.

**2.1-4 Roads.** The Forest contains miles of woods roads. Some are new roads built after lands were acquired as public land, but many predate the National Forest. Roads are either maintained by the Forest Service to meet the long term management of the National Forest or under the jurisdiction of States and Towns, within the Forest boundary. When the Plan was written, an estimated 346 miles of roads were included in the Forest Transportation System; 150 were opened to public vehicle use.

Figure 5 shows the accomplishments and service levels for the road program. The Plan envisioned the road system would increase in the first decade by 70 miles due to new road construction, and the portion open to public vehicles would remain about the same. Only 26 new miles were built, due to trends in timber management toward reconstruction or restoration of existing roads rather than building new ones. However as we continued to inventory lands, we discovered 124 additional miles of potentially useable woods roads which we added to the System, accounting for the net increase of 150 miles. More roads are now open to public use than the Plan estimated. Some of these allow greater public access for seasonal use firewood gathering, hunting, and snowmobiling.



	New Roads Built	Total Roads	Roads Open
First Decade (Total Miles)	26	496	180
FP Estimate (Total Miles)	70	416	151

Source: Annual Monitoring Summaries

**2.1-5 Heritage Resource Program Accomplishments.** The Forest Plan EIS

indicated the intent to survey and map all locations of historic human habitation on the Forest by the year 2000 (about 53,000 acres per year). Forest Plan general direction is to mitigate potential project related impacts to areas of cultural resources, and to inventory all cultural resource sites. The Plan does not specify the schedule for completion. In our 1993 and 1994 annual monitoring reports we describe how the Forest has prioritized use of limited appropriated funding to perform surveys in support of site specific project implementation. To date we have completed surveys of 64,000 acres, 9 percent of the Forest. Through partnerships, we have accomplished a number of prehistoric site evaluations, some structure rehabilitation and interpretive plans for historic cabins and fire towers.

#### **2.1-6 Land Acquisition and Boundary Management Program**

**Accomplishments.** Forest ownership is approximately 773,805 acres as of October 1996, approximately 7000 acres more than projected for the first decade. This represents roughly 85 percent of the gross acres within the Proclamation Boundary established by Congress when the Forest was created. We have acquired 23,000 acres since the Plan was approved. The 1995 Monitoring Report erroneously showed this figure to be 59,000 acres.

Land is acquired either in fee title (through purchase, donation or exchange, whereby all rights are acquired), or in the form of conservation easements that secure partial interest in lands for the purpose of protecting social or natural resource values. Other aspects of the lands program include acquisition of rights-of-way, and maintenance of property boundaries. About 300 miles of boundary lines have been refurbished or relocated in the past 10 years.

**2.1-7 Wildlife and Fish Program Accomplishments.** Wildlife and Fish programs support the achievement of the Forest management goal of managing habitats for indigenous species. The National Forest Management Act requires that the Forest maintain viable populations of native vertebrate species; and provide for diversity of plant and animal communities. These requirements are to be achieved insofar as they are consistent with overall multiple use objectives on the National Forest.

These programs are aimed at compliance with Forest-wide and Management Area goals and standards and guidelines. Main categories of program achievement include: (1) habitat inventory and population monitoring; (2) development of the desired amount and structure of terrestrial and aquatic communities; (3) habitat restoration and enhancement; and (4) providing for human use of wildlife and fish resources. The Forest Plan provides for improvement of quality, and diversity of terrestrial and riparian habitats through timber sales and noncommercial vegetation management. Examples of structural improvements include building nest boxes, girdling trees for future snags or placing brush piles. Terrestrial vegetative inventory is done in conjunction with the timber management program.

Fisheries habitat improvement practices include fish stocking and building habitat



pond surveys are done for anadromous and inland fish. The Forest Plan was amended in 1989 to include direction for fisheries and aquatic resource management, so most of the accomplishments for the program occurred after that date.

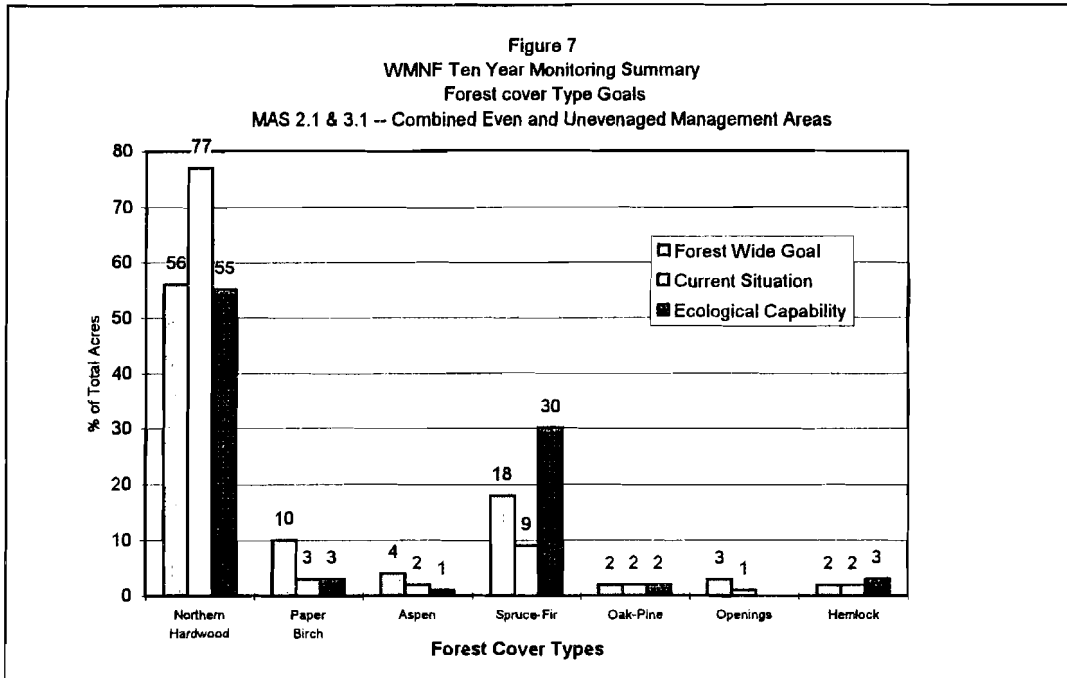
Figure 6 shows the accomplishments in inventory, enhancement and restoration for Wildlife and Fish Programs. With the exception of wildlife habitat enhancements (560 acres per year), the Forest Plan did not establish specific first decade expectations for these activities.

**Figure 6**  
**WMNF Ten Year Monitoring Summary**  
**1986-1996**  
**Wildlife and Fish Habitat**  
**Inventory, Enhancement and Restoration Accomplishments**

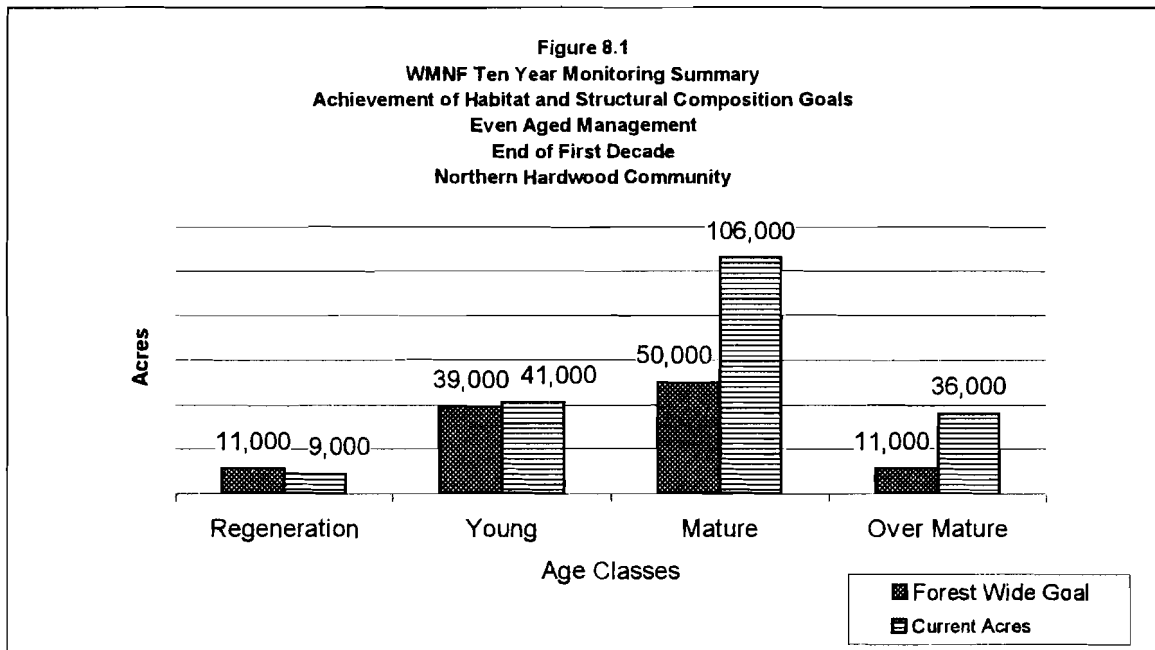
<u>Activity/Measure</u>	<u>First Decade Accomplishments</u>		
	<u>Wildlife</u> <sup>1</sup>	<u>Fish</u>	
		<u>Atlantic Salmon</u>	<u>Inland</u>
Habitat Enhancement (acres)	4,000 <sup>2</sup>	1400 acres <sup>4</sup>	
Structures (# built)	90	5 <sup>5</sup>	0
Habitat Inventory	210.718 ac <sup>3</sup>	608 miles <sup>6</sup>	300 acres <sup>7</sup>

<sup>1</sup> Source: Management Attainment Reports  
<sup>2</sup> Primarily wildlife opening restoration  
<sup>3</sup> Done in conjunction with timber stand inventory  
<sup>4</sup> Atlantic Salmon Restoration  
<sup>5</sup> Instream Habitat Improvement  
<sup>6</sup> Stream Inventories  
<sup>7</sup> Pond Inventories

Figure 7 contrasts the achievement of overall goals for Forest cover Type distribution along with the ecological capability of the Forest to achieve them within areas where vegetation management is practiced. Figures 8.1-8.5 show how age class goals within each type have been reached for all HMUs. These charts are for parts of HMUs where we use even-aged management. In both the 1994 and 1995 monitoring reports, we described the main reasons why we have not made faster the progress toward these goals for some Forest Types.

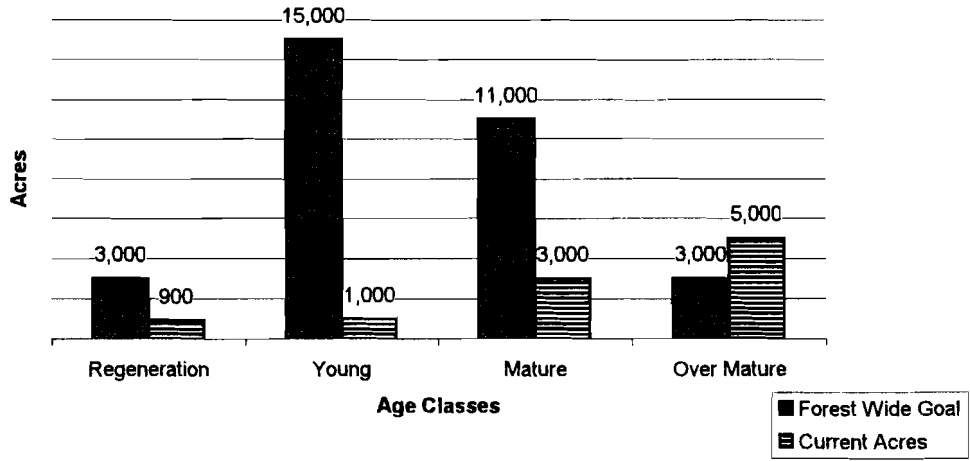


Sources: WMNF Vegetation Management Data Base  
 1995 Monitoring Report, p. 6.



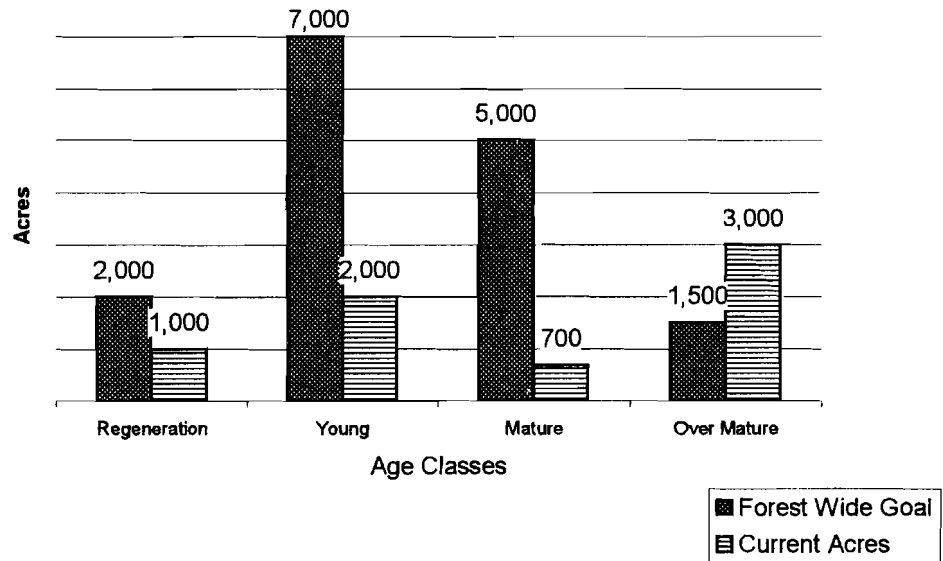
Source: WMNF Vegetation Management Data Base  
 1995 Monitoring Report

**Figure 8.2**  
**WMNF Ten Year Monitoring Summary**  
**Achievement of Habitat and**  
**Structural Composition Goals**  
**Even Aged Management**  
**End of First Decade**  
**Paper Birch Community**

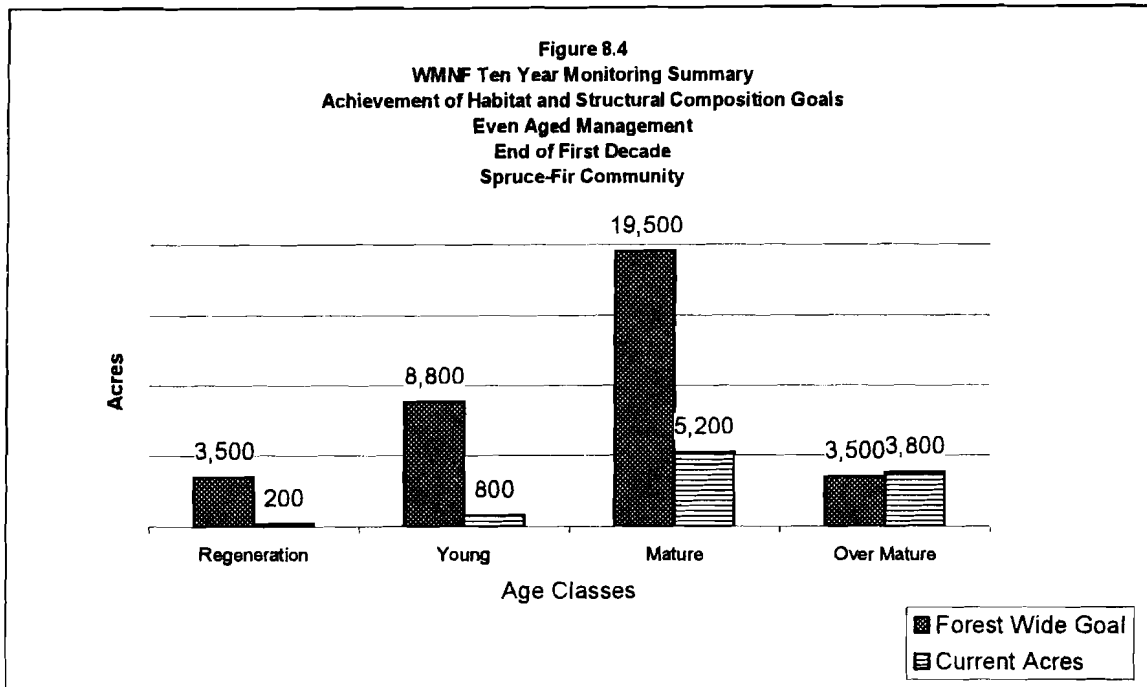


Source: WMNF Vegetation Management Data Base  
 1995 Monitoring Report

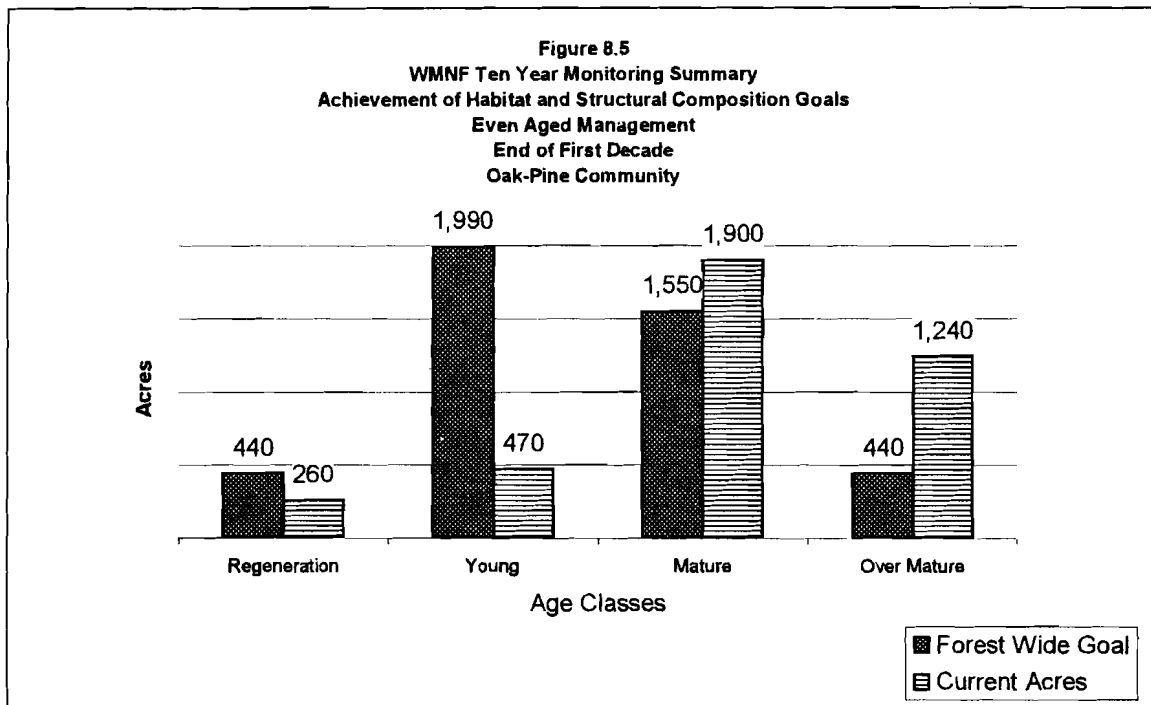
**Figure 8.3**  
**WMNF Ten Year Monitoring Summary**  
**Achievement of Habitat and Structural Composition Goals**  
**Even Aged Management**  
**End of First Decade**  
**Aspen Community**



Source: WMNF Vegetation Management Data Base  
 1995 Monitoring Report



Source: WMNF Vegetation Management Data Base  
 1995 Monitoring Report



Source: WMNF Vegetation Management Data Base  
 1995 Monitoring Report

Wildlife and Fish monitoring are major components of these program areas. Terrestrial wildlife species monitoring is aimed at assessing: (1) habitat requirements and availability, and (2) the status of selected species using

population trends or other measures to determine response to habitat conditions and changes. Most of the wildlife population surveys are conducted with the cooperation of the Committee of Scientists, a partnership composed of representatives from various universities, state agencies, and nonprofit private organizations and researchers (See section 6.0 of this report for the summary of findings from the Committee).

Fisheries and aquatic habitat monitoring accomplishments in the first decade include:

- Mapping and Inventory of Wetlands
- Inventory of 60 percent of fish bearing streams on the Forest
- Annual Fish Population Monitoring at 10 sites on streams and ponds
- Annual Atlantic Salmon Parr abundance monitoring at 15 index sites.
- Fish structure project monitoring at four sites.

**2.1-8 Soil, Water and Air Program Accomplishments.** The first Forest Management Goal is to protect water and soil resources. The main categories of accomplishment in these programs are: (1) monitoring, (2) watershed improvements, and (3) ecological land type inventories. National Forests were established to "secure favorable conditions of water flows" and watershed protection (Organic Administration Act of June 4, 1897 [30 Stat.35]).

The objective of water quality monitoring is to detect any significant changes in water quality, instream values or uses. Emphasis has been on sampling at four of the 14 municipal watersheds, turbidity and low flow gage measurements at snow-making sites on the four alpine ski areas, and at the Wildcat Brook (in accordance with the Wild and Scenic River Designation).

Municipal watershed data has been collected for the last 10 years at the towns of Littleton, Twin Mountain, and Lancaster, NH. Ski area monitoring has taken place for 8 years. Each ski area has low flow requirements to be maintained during the snow-making season, which are part of the terms of their special use permits.

Air quality monitoring includes review of applications for air pollution emission permits (PSDs), and tracking effects of air pollutants on air quality related values (AQRVs) including: visibility, acid deposition, vegetation, and water quality. In the first decade of the plan we have reviewed 13 PSDs, conducted visibility studies over the Great Gulf and Presidential Dry River Wildernesses each year, and have provided funding for ozone monitoring near these Wilderness locations since 1988. We have coordinated closely with research conducted on acid deposition at Hubbard Brook Experimental Forest, and through the Forest Health monitoring program of State and Private Forestry.

available funding. The Plan was intended to be used as the basis for annual budget requests.

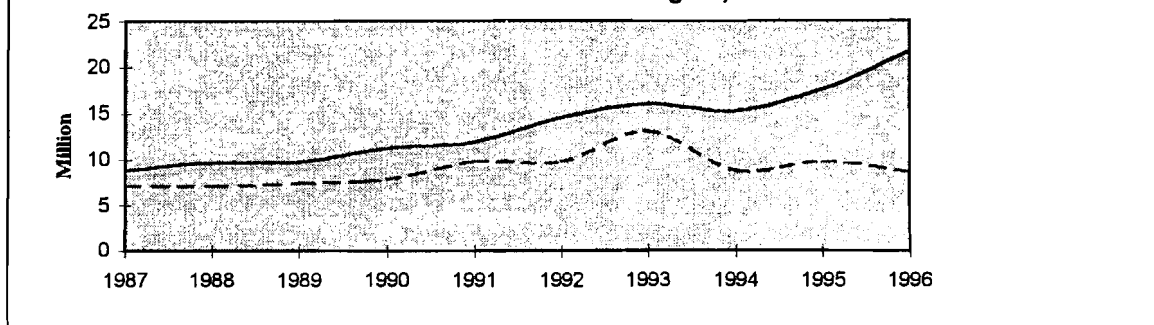
When the National Forest Management Act was passed there was general optimism that Congress would fully support implementation of Forest Plans; but there was no provision of the law to require that. One of the findings from a national critique of Forest Planning completed in 1990 ("Synthesis of the Critique of Land Management Planning," USDA Forest Service, Policy Analysis Report FS-452, Washington DC, 1990, Volume 11, p.30-31.), was that the basic assumption of a close link between Forest Plans and the national budget and appropriations process never materialized.

The Forest Service budget process for any given Fiscal Year begins 3 years in advance. The Forest Service prepared a number of alternative budgets to be submitted first to regional and then national levels. One of these alternatives represents the budget needed to fully implement the Forest Plan. These alternative budgets are combined with those of other National Forests to reflect alternative operating costs for the entire National Forest System and submitted through the Department of Agriculture to the President. The President reviews the alternatives and submits a budget request to Congress, which must approve the spending.

Once the appropriation act is passed for that fiscal year, the money is allocated to each Forest. Through the budget process congress adjusts program emphasis. Budgets are separated into categories of funds. Funds can only be used for the program areas for which they are appropriated. These funds are appropriated for yearly management and operation of Forest programs and those which address special needs like Recreation Construction, Land Acquisition, and Fire. Funding varies from year to year based on Congressional emphasis.

For program operation and management appropriations, the average budget received has been about 68 percent of the amount needed to fully fund the Forest Plan. When other variable funds are added, the total budget, as shown in Figure 9; is about 72 percent of needed.

**Figure 9**  
**WMNF Ten Year Monitoring Summary**  
**First Decade Total Forest Budgets; 1995 Dollars**



LEGEND =   
 \_\_\_\_\_ Needed   
 - - - - - Received

Fiscal Year	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Budget Needed (million \$)	8.8	9.7	9.8	11.2	11.9	14.6	16	15.3	17.6	21.7
Budget Received (million \$)	7.3	7.1	7.5	7.9	9.8	9.8	13.1	8.8	9.8	8.6

Source: USFS Region 9, Forest Level Budget Reports

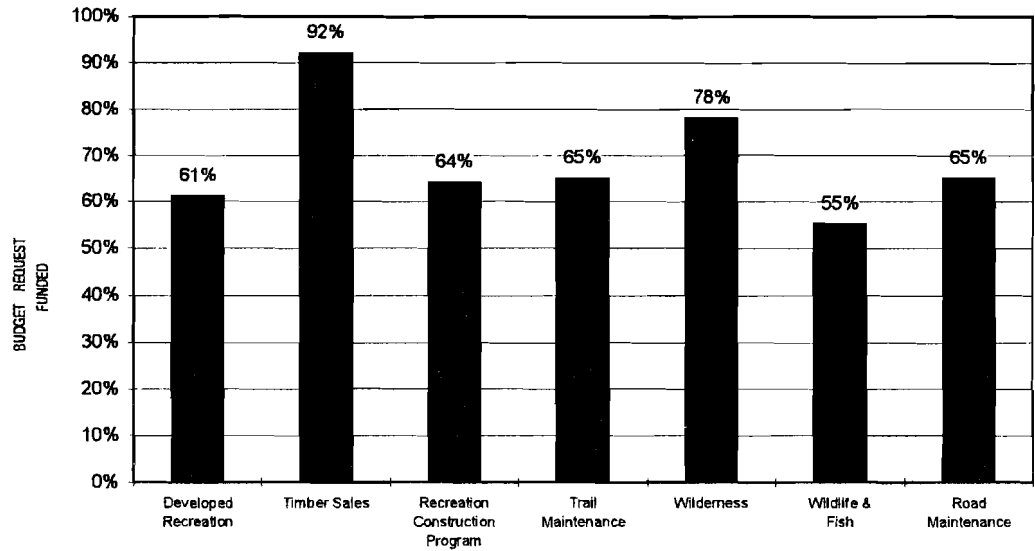
NOTES: Figures are adjusted using deflation factors from Budget Process Advice  
 No land acquisition funds are included.

We prepare our alternative budget requests by program--timber, wildlife, recreation etc. The requests are based on the estimated costs of the numerous activities which comprise the programs, at different quantitative and qualitative levels, including the Forest Plan level. The initial estimate to fully implement the alternative mix of costs and outputs chosen for the Forest Plan in the first decade, was 3.9 million in 1978 dollars (factored for inflation about 8.5 million in 1995 dollars).

As we gained experience with implementing the Plan, we realized that initial cost estimates apart from inflation were too low to fully implement the Plan. Beginning around 1990, our budget requests began to reflect increased funding needs due to greater public expectations for services, increased visitor use, changes in practices due to new policies and public issues. Our total Forest Plan level budget need for 1995 was 17.6 million dollars, about double the initial estimate in the Forest Plan.

Figure 10 shows the average annual budget received as a percentage of budget requested for our major program areas.

**Figure 10**  
**WMNF Ten Year Monitoring Summary**  
**First Decade**  
**Annual Average**  
**Funding Received vs. Funding Requested**  
**for Selected Programs**



	Developed Recreation	Timber Sales	Recreation Site Construction	Trail Maint.	Wilderness	Wildlife/Fish	Roads Maint.
Avg. Budget Request (Million \$ in 1995)	2.8	1.3	0.82	0.63	0.26	1.1	0.54
Avg. Budget Received (Million \$ in 1995)	1.7	1.2	0.53	0.41	0.20	0.60	0.35

Source: USFS R9, Forest Level Budget Reports

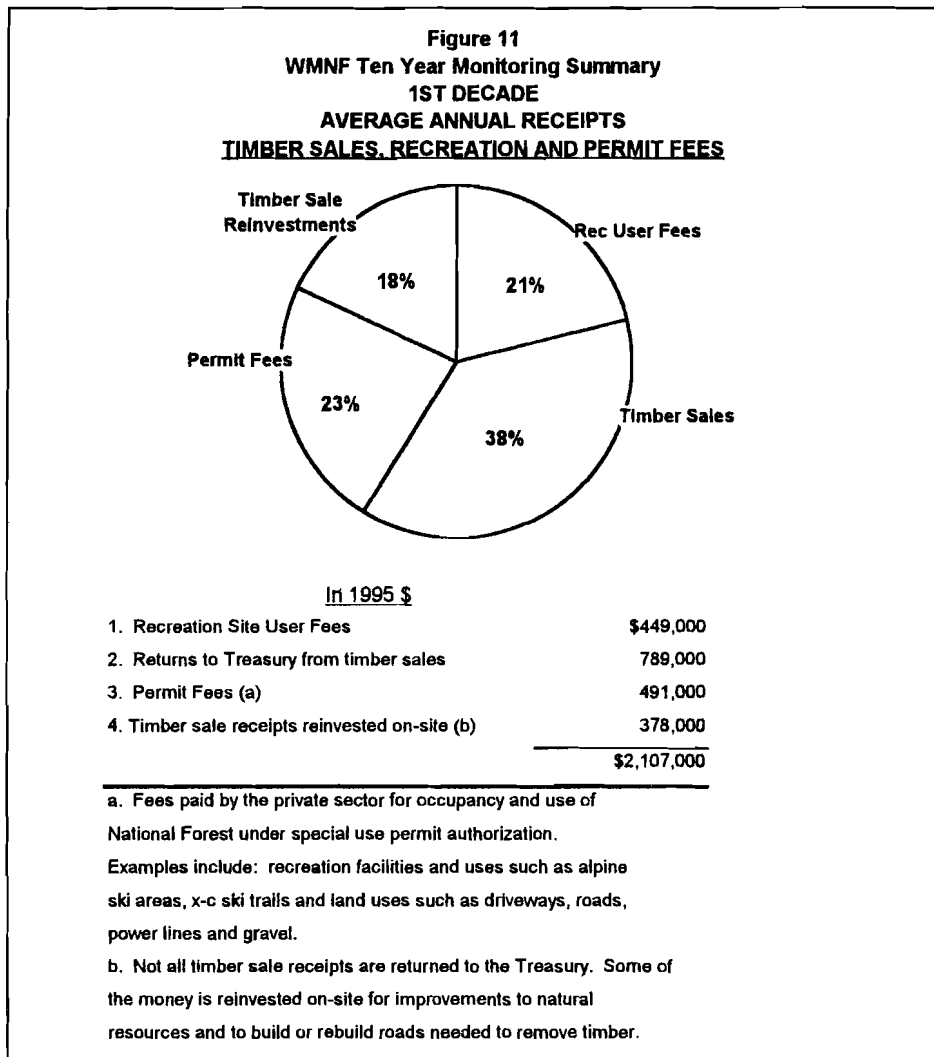
Recreation operation and maintenance costs have increased with more visitors and deteriorating campground and trails infrastructure. Even though we have made substantial gains in facility reconstruction, our capital investment needs continue to grow. Wilderness budget needs remained relatively close to allocations up until about 1992. The increased costs associated with the addition of the newly designated Caribou Speckled Wilderness coincided with an increased agency emphasis on Wilderness management and implementation of Wilderness Plans. In 1993 the Forest did an overall assessment of wilderness management costs and found that our budget was not adequate to meet our wilderness stewardship responsibilities.

Unit costs of offering timber for sale are increasing beyond expectations, due in part to more use of uneven-aged management. Uneven-aged harvesting produces lower quantities of timber per acre than clearcutting, and requires more time for planning and marking trees to be cut. There are other reasons. Environmental analysis for timber sales has become increasingly complex, as we respond to public desires for more information about the effects of timber harvesting. The number of



administrative appeals of timber sale project decisions rose sharply beginning about 1991. Note that the annual average budget request, shown in Figure 10, was not sufficient to fully meet the Allowable Sale Quantity of 35 MMBF.

**2.3 Measuring net benefits from the National Forest.** By law, the Forest must be managed to maximize net public benefits, which includes both cash and noncash benefits. Cash flow to the Treasury and taxpayers is the difference between dollar costs to operate the Forest (the budget) and the income the Forest receives from sale of timber, fees paid at recreation sites, and by private sector permittees, such as ski area operators (Figure 11.)



In addition to returning income to the Treasury, the White Mountain National Forest contributes significantly to the economic health and vitality of local communities and to New England as a region. Note that a portion of the income (about 25 percent) is returned from the Treasury to towns in Maine and New Hampshire, within the Forest boundary, for use in schools and for road maintenance. The percent return is based on population. In combination with the "25 percent fund," the Federal Government

on population. In combination with the "25 percent fund," the Federal Government makes another type of direct payment called PILT, Payment In Lieu of Taxes, based on the amount of National Forest land within each town which is funded by Congress.

Many Forest-derived benefits including: quality of life, recreation, scenic values, and wildlife diversity are difficult to measure by market criteria. For this reason there is no legal requirement that National Forests have positive cash returns to the Treasury.

Figure 12 shows the net annual cash flow including both cash and noncash amenity value estimates.

**Figure 12**  
**Net Public Benefits**  
**WMNF Ten Year Monitoring Summary**  
**Millions of 1995 \$**

	<b>Initial Forest Plan Estimate</b>	<b>Actual Ten Year Average/a</b>
<b>Annual Budget</b>	8.5	9.0
<b>Annual Receipts</b>	1.6	2.1
<b>Subtotal: Net Cash Flow</b>	- 6.9	- 6.9
<b>\$Value of Nonmarket Amenities/b</b>	+ 43.0	not measured

*(Source: Reports To Congress, 1987-1995, Annual Receipts).*

- a. This reflects the average annual budget received during the first decade and does not reflect the cost of full Forest Plan implementation.
- b. To compare alternatives which include market and nonmarket benefits, planners estimate dollar values of amenities based on social science indicators, such as public willingness to expend dollars to travel to the Forest.

**Examples of Indirect Economic Benefits To Communities**  
**Estimated Average Annual Figures (1995 dollars)**

Jobs created by timber sale program	438
Permanent jobs created at Ski Areas	212
Indirect value of income generated on NF land	\$23,560,000
PILT plus 25% fund:	\$800,000
NH timber severance taxes generated on NF land	\$92,000

*(Source: WMNF issues, "Briefing paper for Congressional delegation, March 1995)*

There are a two factors that contribute to negative cash flows. The first is an accounting phenomena. As mentioned above, the cost of producing intangible benefits is reflected in the annual budget, but intangible benefits do not contribute dollar returns to the Treasury. The second factor is operating costs. As demonstrated in the Environmental Impact Statement for the Forest Plan, there is a significant imbalance between the costs of managing wilderness operating campgrounds, picnic areas, and maintaining trails, contrasted with recreation user fees paid. Although efforts have been, and will continue to be, made to reduce operating costs, it appears that this level of imbalance will continue, unless the National Forest begins charging broader based fees for the range of recreation use it provides. Currently, the Forest is part of a pilot program to evaluate a broader based fee structure.

## **SECTION 3.0 COMPLIANCE WITH MANAGEMENT AREA DIRECTION**

The Plan sets out to achieve broad management goals by zoning the entire Forest into different management areas, each with a different management emphasis and desired future condition. Following are some general findings about the success of the management area concept, and more detailed information about selected Management Areas.

### **3.1 General Findings About Management Areas.**

- Allocating land to different management areas worked well as a tool to separate incompatible activities and provide for balanced uses of the National Forest. The management areas generally provided managers with a clear blueprint of what activities could take place in different areas of the National Forest.
- Descriptions of the desired condition of the land helped the public and managers picture what the land would look like. Some of the descriptions included measurable elements that proved very useful for evaluating progress toward achieving the desired condition of the land. In management areas where the description lacked measurable elements, it was much more difficult to assess progress in achieving the desired conditions.
- The distinction between Management Areas 6.1 through 6.3, and between 2.1 and 3.1 appear to be less clear and less useful in practice than intended. Despite the stated emphasis on nonmotorized recreation in 6.1, snowmobiling is allowed as in 6.3. MA 6.1 was intended to allow some incidental timber harvesting and road construction within semi-primitive settings. In practice, little incidental timber harvesting has occurred in MA 6.1. So, one management area emphasizing semi-primitive motorized recreation may have sufficed.
- The distinction between MAs 2.1 and 3.1 has not proven to be as valuable for addressing visual quality and early successional habitat through different mixes of silvicultural systems. In practice, the concerns for visual quality were addressed in much the same way and the achievement of habitat diversity occurred at the same pace in both.
- The Forest Plan deliberately avoided creating linear management areas. Instead, special provisions for the management of features like riparian areas, the alpine zone and the Appalachian Trail, were integrated into standards and guidelines for other management area. From an ecosystem management perspective, it may have been more efficient and relevant to have wholistic direction for the management of these features identified in one place.

- Some MA designations and direction seemed unnecessary. There seems to be no reason why the direction contained in MA 9.2, providing guidance for ski area expansion could not have been included in MA 7.1. In practice, there appears to be no necessity for specifying individual management direction for each Scenic Area within MA 8.1.
- The Plan did not articulate a process for analyzing management area assignments for newly acquired lands. Amendments to assign management areas to new acquisitions were approved in 1988 and 1989, but no amendments have been written for lands acquired since then. An outline of accepted criteria for analyzing land acquisition decisions would have been useful to planners. Managers wished the Plan had provided more detail about interim management of new land acquisitions prior to being assigned to a management area.

### **3.2 Specific Findings About Management Areas.**

#### **3.2-1 Management Area 2.1 -- Emphasizes on visual quality, 50/50 mix of even-aged and uneven-aged silviculture, long harvest rotations, maintain wildlife habitat diversity, Roaded-Rural recreation settings.**

When the Plan was approved most of the Forest in MAs 2.1 and 3.1 was in single-aged stands from 70 to 90 years old. The first step in implementing the Plan was to decide which stands in management area 2.1 would be managed under even and uneven-aged management. These designations were based on an analysis of ecological land type, forest community, stand age, visual quality concerns, and special management considerations.

The result of applying these guidelines was a mix of areas where even and uneven-aged management would be used was close to the 50/50 spread envisioned in the Forest Plan. However, during implementation, we used about 75 percent uneven-aged to 25 percent even-aged harvest methods (Figure 13).

Uneven-aged management was used to protect visual quality, but some concerns about the use of group selection were identified. From certain observer positions, group shape, pattern, and arrangement did not mimic natural landscape patterns in all cases. The amount of timber harvested in MA 2.1 was below the level the Plan projected for this decade (Figure 14). The high cost of pre-commercial thinnings led managers to conduct fewer of these operations than the Plan proposed.

Northern hardwood comprises more of the Forest cover type mix than desired. paper birch, aspen, spruce-fir and forest openings comprise less of the mix than desired (Figure 15). Progress toward the mix of habitats for wildlife species was limited. Less than one half of the even-aged regeneration and young age class goals were met (Figure 16).

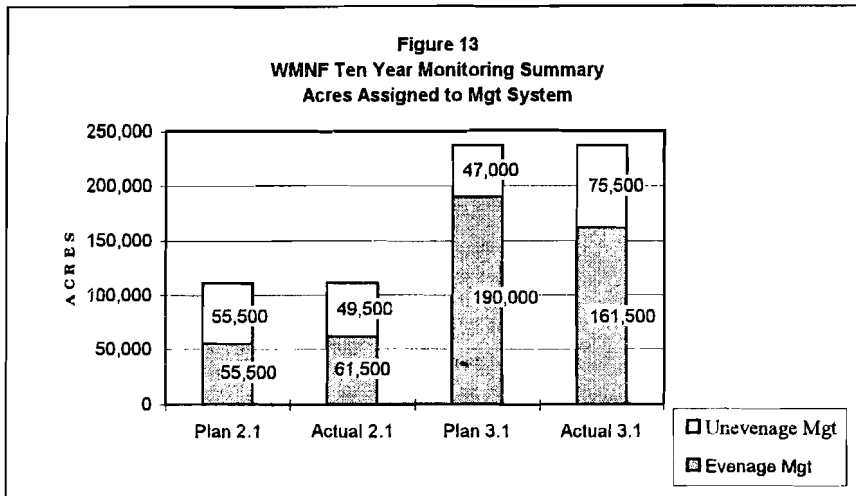
Roaded-natural recreation opportunities were enhanced through a number of activities, including developing an interpretive plan for the Kancamagus Scenic Byway and reconstructing trailhead and recreation site parking lots. Improvements were made to major campgrounds, but not to the full extent anticipated in the Plan. The desired condition includes a description of visual quality along major road corridors. Vegetation management was used in some places to create the conditions described, but fewer openings to provide views from the road were created than envisioned in the Plan.

**3.2-2 Management Area 3.1 -- Emphasizes large volumes of high quality sawtimber and early successional wildlife habitat, using an 80/20 of even- to uneven-aged silviculture; short rotation harvests of small diameter trees for fiber production; and maintenance of semi-primitive recreation opportunities.**

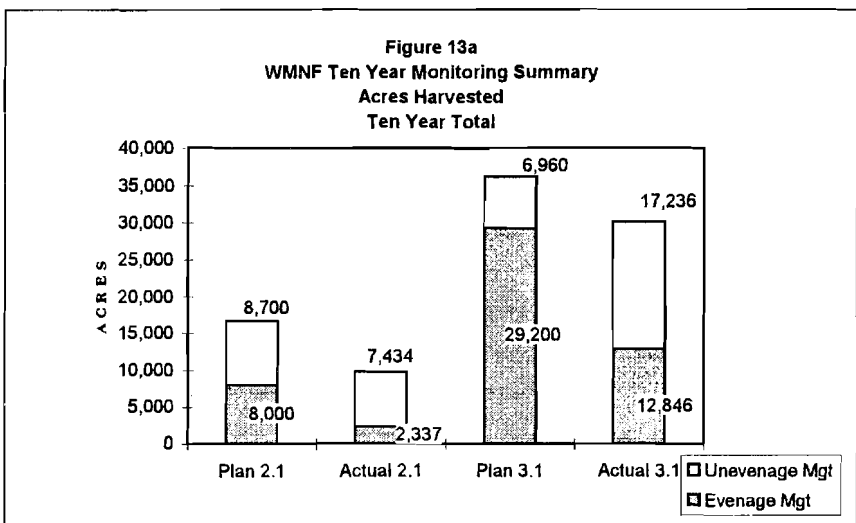
Progress toward the goals of this management area were limited since much less even-aged management occurred than the Plan anticipated. Stands were assigned to even-aged or uneven-aged management using the same process as in Management Area 2.1. The result of applying the guidelines was a mix of about 68/32 percent even to uneven-aged management assignments. About two and one half times more uneven-aged harvest acres and less than one half of the even-aged harvests were implemented over the decade than envisioned in the Forest Plan. (Figure 13 ). About 75 percent of the total volume predicted for MA 3.1 was produced (Figure 14). Since the wood energy market did not materialize, and there were concerns for the effects of whole tree utilization on soil productivity; no stands were designated for short rotation fiber production.

The planned emphasis on providing early successional wildlife habitat was not achieved to the extent anticipated. As with MA 2.1, even-aged regeneration and young forest structure is about half of that desired, and conversions of northern hardwood to paper birch, aspen and softwoods is not occurring as planned (Figures 15, 16).

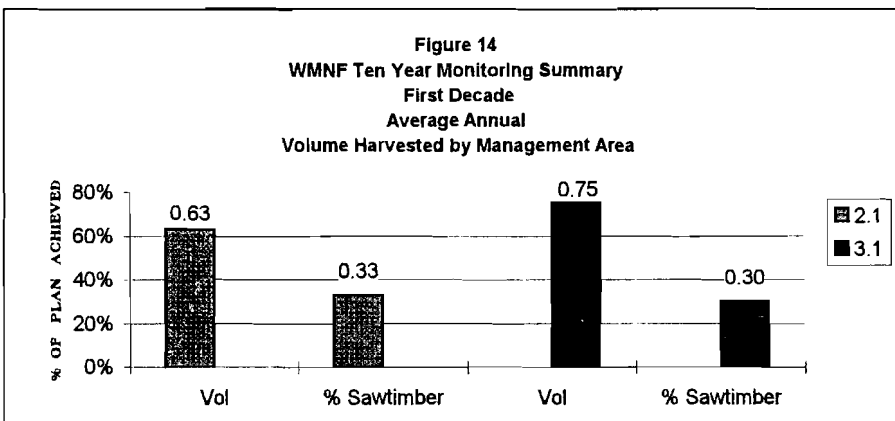
Semiprimitive motorized recreation was successfully integrated with other management activities. For example, forest roads were used by mountain bikers and snowmobilers between, and sometimes during, timber harvest activities.



Source: Vegetative Management Information Database



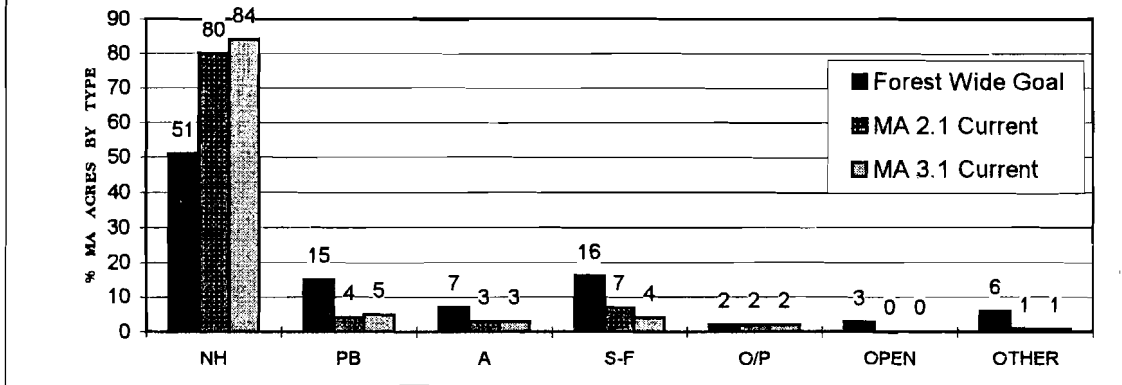
Source: Vegetative Management Information Database



	MA 2.1	MA 3.1
Planned Avg Volume Sole (MMBF)	8.7	26
Actual Volume Sold (MMBF)	5.5	19.7 (75%)

Source: Annual Cut/Sold Reports

**Figure 15**  
**WMNF Ten Year Monitoring Summary**  
**First Decade**  
**Even Aged Cover Type Dist by MA**

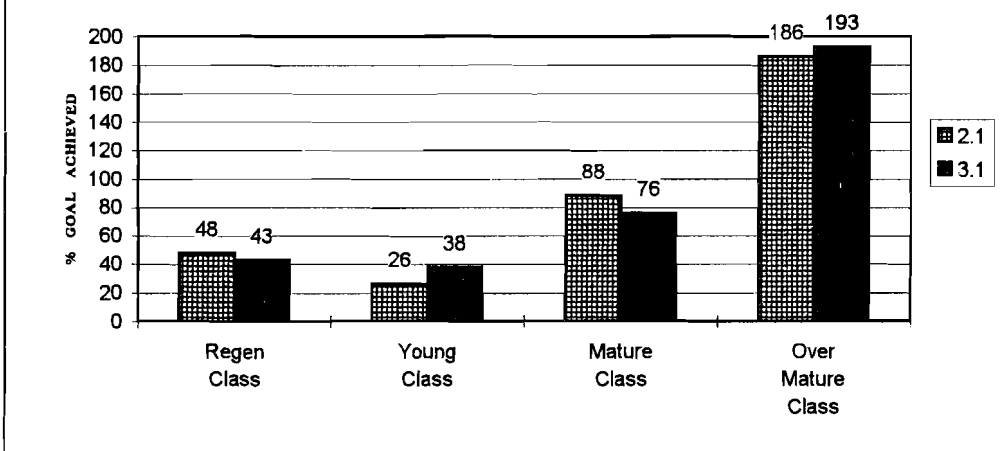


Source: Vegetative Management Information Database

NH = Northern Hardwood  
 PB = Paper Birch  
 A = Aspen  
 Other = Wetlands, Rock, open water

SF = Spruce Fir  
 O/P = Oak Pine  
 Open = Permanent Openings

**Figure 16**  
**WMNF Ten Year Monitoring Summary**  
**First Decade Achievement of Age Class Distribution Goals Average of All**  
**Cover Types by Management Area**



Source: Vegetative Management Information Database

### 3.2-3 Management Areas 6.1-3

The differences between management areas 6.1, 6.2 and 6.3 are subtle. The planning record shows that 6.1, 6.3 Management Areas evolved from the concept of one management area devised to emphasize semi-primitive, nonmotorized recreation. MA 6.1, was developed to respond to the need to access some backcountry areas



for incidental mineral prospecting, timber harvests, and wildlife management, and allow traditional snowmobile use. MA 6.3 was devised to provide for limited snowmobile use of high country areas to perpetuate traditional routes. Figure 17 shows how the three MA 6 areas differ.

**Figure 17**  
**WMNF Ten Year Monitoring Summary**

MA	Acres	Harvest	Winter ORV Use	Summer ORV Use	Road construction
6.1	88,000	salvage	some trails	none	single project
6.2	167,000	none	none	none	none
6.3	14,000	none	some trails	not excluded	none

[Note: that the original intent of MA 6.3 was not to allow summer ORV use, though guidelines as written do not specifically exclude it.]

**Management Area 6.1 -- Emphasize nonmotorized semi-primitive recreation; motorized use on designated trails; provide wildlife habitat, incidental timber salvage allowed.**

The essential purpose and Desired Future Condition for this management area appear to have been achieved. There were few trails or single project roads constructed and very frequent need for timber salvage activities to control insect or disease outbreaks. There was also little direct wildlife opening maintenance.

**Management Area 6.2 -- Emphasize nonmotorized semi-primitive recreation; no motorized use only; no timber harvest or road construction; provide undisturbed wildlife habitat; recognize alpine and subalpine ecosystems.**

Progress was made toward accomplishing the goals for this management area. Existing semiprimitive nonmotorized recreation opportunities were maintained, and the popularity of some activities, such as winter backcountry skiing and snowshoeing, increased significantly. Achievement of the goal of recognizing alpine and subalpine ecosystems was difficult to measure. No standards and guidelines were developed to address the special needs of alpine and subalpine ecosystems for activities such as overnight camping and trail reconstruction. Forest Supervisor's orders were used to control camping in the alpine zone and projects were initiated to rehabilitate vegetation along high-use trails.

The desired condition in the Plan is an accurate description of the condition today. However, there is no mention of the Kancamagus Scenic Byway, a prominent landscape feature that bisects an otherwise contiguous portion of management area 6.2. The desired condition does not provide any guidance about how activities along this major road corridor should contribute to the

how activities along this major road corridor should contribute to the management area goals.

**Management Area 6.3 -- Emphasize semi-primitive recreation with motorized use; no timber harvest or road construction; provide undisturbed wildlife habitat; recognize alpine and subalpine ecosystems.**

The goals for the 14,000 acres of land in this management area were mostly achieved. A broad range of semiprimitive motorized and nonmotorized recreation opportunities was provided. The goal of recognizing alpine and subalpine ecosystems would have been enhanced, as described above, if standards and guidelines tailored to the special needs of alpine and subalpine ecosystems.

## **SECTION 4.0. EFFECTIVENESS OF STANDARDS AND GUIDELINES**

**4.1 General Findings about Standards and Guidelines.** In July 1995, we convened a field review for managers and resource team leaders to evaluate the effectiveness of standards and guidelines as employed at a number of project sites. In September 1996, we followed up with a workshop to evaluate each standard and guideline. The information in this section reflects the findings of the field review and workshop.

- The Forest Plan does not distinguish between use of the terms standards and guidelines. It defines them together, in the glossary, as the bounds within which management practices are carried out. These terms were applied interchangeably, as prescriptive requirements. Managers think it would be useful to distinguish standards which are technically prescriptive from guidelines which are flexible. Standards would be defined as limitations placed on management activities to ensure consistency with the Plan. Guidelines would be a preferred method of implementation, with flexibility for application of judgment based on the situation.

Note: Some of the resource headings in the Forest-wide Standards and Guidelines only contain General Direction. The information under General Direction varies in content, and the Plan does not clearly state how the General Direction for resources with no standards or guidelines should be used.

- Managers found it easier to implement standards and guidelines that were clearly written. Most standards and guidelines achieved an obvious purpose, either mitigating an effect or contributing toward a desired condition of the land. Some standards and guidelines were not clearly written and could be interpreted several ways. In some cases the specific purpose was not clear.

Several of the standards and guidelines may need to be updated to reflect new information. Some examples include: new information about minimum standards for in stream flow; recognition of vernal pools as important amphibian habitat; new information about soil nutrient depletion; and a new system of classifying natural communities catalogued by State Natural Heritage Programs.

- A number of the standards and guidelines refer to published references such as a Silvicultural Guide, a Forest Handbook, or other documents. Some of the documents referenced in the Plan have since been replaced with revised editions that contain different information.

Note: New information and published guidance was routinely incorporated in project level analysis.

- Chapter III of the Plan starts with a section on Forest-wide Standards and Guidelines organized under resource headings such as timber, recreation, wildlife, water/soil and visual quality. Additional standards and guidelines are included using the same resource headings in the section on each Management Area. Some standards and guidelines are duplicated in several Management Area sections. The relationship between Forest-wide and MA specific standards and guidelines is not clearly explained. In addition, many timber activities depend on standards and guidelines listed under visual quality and water/soil to mitigate effects, while standards and guidelines for wildlife and visual quality are implemented through activities associated with timber harvesting.
- Forest Planners avoided creating linear management areas. But as the Plan was implemented, managers found that the standards and guidelines for linear features like riparian corridors and the Appalachian Trail were scattered in multiple locations. Riparian corridors are complicated since many different kinds of activities take place, from wildlife use, to overnight camping, to road crossings. The management needs of riparian areas, such as recruitment of large woody debris to restore stream structure, differ significantly from upland areas.

## **4.2 Findings about Resource-Specific Standards and Guidelines**

**4.2-1 Recreation Standards and Guidelines.** Managers found the organization of standards and guidelines for recreation in need of improvement. Some apply to all types of recreation, some are limited to one particular recreation use, and others apply to groups of recreation uses. For example, trails are addressed as a heading, and again in facility maintenance. Standards and guidelines were used effectively. Managers suggested inclusion of additional details about: overnight camping, relationship between Forest Supervisor's orders and Plan standards and guidelines, and universal access to recreation facilities.

Each management area was designed to provide recreationists with different opportunities and experiences, described as Recreation Opportunity Spectrum (ROS) Classes. The standards and guidelines for the management area are intended to help managers provide the desired ROS class. However, managers need more guidance on how to measure if visitors are experiencing what the ROS class prescribes. This could be better achieved by mapping existing recreation settings to determine what kinds of experiences recreationist are most likely to have in different parts of the Forest. Effects of changes in physical or social characteristics in an area on recreation opportunities could then be measured more effectively.

**4.2-2 Heritage Resources Standards and Guidelines.** The Plan provided standards and guidelines for cultural resources. These were technical in nature and

managers had few concerns about implementing them. However, they did note that the standards and guidelines were not tied directly to Forest Plans goals or elements of the desired condition of the land. Better articulated goals would translate into more meaningful standards and guidelines.

**4.2-3 Wildlife Standards and Guides.** The Forest Plan, Section III-F-4, pages III-11-15 contains the direction for wildlife management. As written, this direction is applicable only to management areas 2.1 and 3.1, where vegetation management occurs. Two main aspects of Forest Wide General Direction for wildlife are: (1) manage habitat to maintain viable populations of all native plants, fish and wildlife and (2) establishment of vegetative age class and cover type composition objectives, for each Habitat Management Unit (HMU).

Standards and Guides included in Section III-4, a and b, provide two main areas of guidance--the need to locate some aspen management within specific ecological habitats; and the specification that vegetative management will be designed to move toward an Ideal Habitat Management Unit, containing the mix of age and vegetative communities, shown on page III-13, of the Forest Plan.

Standards and guides pertaining to wildlife are also located throughout Chapter III under other resource sections. Although not specifically referenced in Chapter III, a significant part of the Plan Appendix, (B, pages, VII-1-28) is devoted to the wildlife program and contains what is apparently intended to be direction. Part of the appended material restates standards and guides from Chapter III. Other sections of Appendix B contain information on implementation of the Habitat Management Unit concept, population monitoring, and threatened and endangered species.

Managers felt that the Plan direction including the appended material, generally addressed issues and responded to National Forest Management Act regulation. The HMU strategy was generally viewed as an effective management concept for identifying and tracking progress toward habitat diversity goals. We did identify two basic areas for improvement: (1) Forest Plan Wildlife program direction is based on an inherently complex strategy. The clarity, level of detail, and overall user friendliness of the direction as written needs to be improved; (2) Based on monitoring there may be a need to evaluate the content of standards and guides. Most of these clarifications have been addressed during implementation and documented in monitoring reports or informal guidance.

There are a number of ways that direction might be clarified and made easier to use:

- As identified for other resource areas prescriptive direction should be distinguished from flexible guidelines.
- Prescriptive and General Direction, should be consolidated within one section of Chapter III or cross referenced. The Appendix page VIIB-18-22 actually contains a section entitled Standards and Guidelines, which duplicates direction scattered

throughout Chapter III. The close connection between Appendix B and Forest Wide Direction should be addressed. Some information in the Appendix is an integral part of Plan direction. Where appended material directly relates to implementation or clarification of prescriptive standards it should at minimum be cross referenced if not moved to Chapter III.

- As written, it appears that vegetation management should be conducted to achieve the conditions on page III-13. Yet it is apparent that the intent is to achieve objectives developed for individual HMUs, each with its unique mix of age and community type, and that the idealized HMU is more of a yardstick for comparison. The use of the Idealized HMU and its connection with standards established for vegetation management objectives should be more clearly specified.
- In general more detailed guidance is needed. For example, there is little procedural guidance for establishing individual HMU objectives, including methods for incorporating ecological land type suitability and factoring in the role of lands in Management Areas not allocated to vegetation management. Application of ecosystem management principles would suggest that the role of adjacent private land should be considered.
- Timeframes for achievement of objectives need to be further clarified. As written, objectives are to be met in two or less rotations, there is no distinction between short and long term timeframes. Yet it appears from the information in the appendix that there may be a greater urgency for achieving early successional age class habitat.
- The general direction statement on species viability, should not include language to reflect that species viability would be achieved within the context of other multiple use objectives. The HMU composition objectives were based on this assumption, as indicated in analysis documented in the FEIS.
- As written, there are no standards and guidelines listed in section III-4 which are associated with the general direction statement on viability. It would be advisable to either cross reference or move information from Appendix B to Section III, which addresses the fact that viability was assumed to be achievable through the implementation of the HMU concept, and other relevant elements of the Wildlife Strategy.

With regard to potential adjustments to the content of the General Direction and Standards and Guides the following areas should be considered:

- As discussed in the 1994 and 1995 Forest Monitoring Reports, there is evidence that current HMU composition objectives for providing Paper Birch and Aspen vegetative communities exceed the number of acres of ecological land types suitable for efficiently regenerating these species within the range of harvest intensity assumed by the Plan. Pages 4-8 of the 1995 Monitoring Report discuss this concern. Indications are that the Paper-Birch and Aspen objectives could be shifted to produce more softwood since there is more than enough land with ecological land type suitable to support softwood.
- Based on the reduced levels of clearcutting which have occurred over the past

ten years, there is a need to reevaluate the levels of regeneration age class forest specified in the Idealized HMU model.

- There is evidence that some management indicator species may not be efficient for monitoring habitat conditions.
- Managers felt that standards for wildlife openings, Forest Plan, p. III-14, should be revised to address guidance on identifying specific objectives for wildlife openings, including desired distribution, size, and featured vegetative species. There was also general agreement that the objective for achieving 3 percent permanent openings should be reevaluated in view of current and expected budgets.
- Standards and Guides for snags and wildlife trees should address OSHA regulations.

Wildlife issues continue to be important to our stakeholders and interested public, and a key program area on the Forest. Wildlife Management direction is a main part of the Forest Plan, and will likely be a major topic of interest during revision of the Plan.

**4.2-4 Fish Habitat Standards and Guidelines.** As with wildlife species, a goal of the Forest Plan was to feature management for indigenous aquatic species. In addition, the Plan provided direction to assist with the restoration of Atlantic salmon to headwater streams on the Forest, and to cooperate with state fishery agencies of New Hampshire and Maine to maintain a sustainable trout fishery on the Forest. The Fisheries Amendment (1989) to the Forest Plan emphasizes maintenance of salmon and resident fish habitat and riparian habitat by adhering to standards and guidelines which optimize growth and survival of these species. No Desired Future Condition for fish populations or fish habitat were identified in the Plan nor in the Amendment. As a result, the standards and guidelines have served as the DFC for fish and their habitat. Some of these standards, especially those for riparian habitat management, have been difficult for field personnel to interpret during project implementation. Clearer direction for implementing standards for fish habitat integrated into management area goals and desired conditions are needed.

**4.2-5 Endangered, Threatened and Sensitive Species Standards and Guidelines.** The 1989 Forest Plan amendment also contained standards and guidelines for Endangered, Threatened and Sensitive Species. Managers noted that rare plants and natural communities are not included in the amendment, and that there is no provision for updating the species lists (Federal, State and Regional Foresters).

**4.2-6 Roads Standards and Guidelines.** The Forest-wide Standards and Guidelines have two resource headings related to roads: Road Use and Transportation. The latter addresses activities related to road construction, management and maintenance. Managers found overlap between the standards and guidelines listed under the two headings. For example, a stream crossing

constructed for a timber harvest might later be used for a snowmobile trail, or after a road is reconstructed for timber harvest, it could be used to provide occasional access for wildlife openings maintenance. The standards for road location, design, construction, and management were found to be clear and effective in accomplishing their intended purpose.

The Forest Plan uses a system of road classification (Type I, II and III) that is unique to the White Mountain National Forest and differs from national standards for road classification. As road inventories and databases become computerized it is more important that the White Mountain system be compatible.

**4.2-7 Timber Management Standards and Guidelines.** Managers found that most of the standards and guidelines for timber management accomplished the intended purpose of mitigating effects or contributing to the desired future condition. However, a handful of the timber standards and guidelines, especially those dealing with the spatial patterns and cumulative effects of harvesting activities, were not clearly stated, and were subject to various interpretations.

Many of the standards and guidelines for timber in management areas 2.1 and 3.1 are the same. Managers recognize that these standards and guidelines are not applied forest-wide, but felt the Plan would have been easier to use without the duplication in both management area sections.

**4.2-8 Water and Soil Standards and Guidelines.** Water and soil are addressed together, and managers found the standards and guidelines effective at mitigating soil erosion and maintaining water quality.

**4.2-9 Visual Quality Standards and Guidelines.** Standards and guidelines for visual quality focus on mitigation of timber activities. Managers found these to be effective, but wished for more detail about how to address cumulative effects of timber harvesting on visual quality. In some instances, managers found that focusing on the number of acres treated, instead of concentrating on the size, shape, and configuration of the harvest area, did not sufficiently mitigate effects on visual quality. Managers wished for better guidelines for design of structures and facilities.

**4.2-10 Special Uses Standards and Guidelines.** Standards and guidelines were entirely lacking for a range of special uses such as communication sites, hydroelectric dams, personal driveways, and outfitter/guiding of organized groups. The Forest Service Handbook provided a great deal of direction about these special uses, and planners did not wish to duplicate this information. However, the Forest Plan did not address which special uses were compatible with each management area, and how much of the special uses could or should occur.



## **SECTION 5.0 TOPICS TO CONSIDER IN FOREST PLAN REVISION**

Revision of the Forest Plan provides an opportunity to improve the existing Plan by including new scientific information and rethinking parts of the Plan that were unclear and hard to implement. Revision also gives us a chance to think about the current and future role of the White Mountain National Forest.

To apply ecological principles, we need to understand the capabilities or limits of the resources we manage. We must stay within these capabilities in order to sustain the resources for future generations. Once we understand the sideboards we must operate under, we can evaluate different ways of meeting societies' needs and desires. These often conflicting needs are at the heart of issues. Most, if not all of the issues are interrelated in some way. Satisfying one person's concern will almost always impact someone else.

After a review of the monitoring information, the Forest Planning Interdisciplinary Team believes the topics listed below should be considered during Forest Plan revision. In making this list, the team considered how well the current Plan is working, and focused on the parts of the Plan they think can be improved.

**5.1 Forest Plan Monitoring.** Monitoring and evaluation provide essential information about how well the Forest Plan is working. Chapter 4 could use many improvements, including monitoring questions that are more tightly focused, protocols for data collection to answer each question, a process for analyzing the data, monitoring cost estimates, and monitoring priorities.

**5.2 Riparian Area Management.** The Forest Plan addresses riparian areas through standards and guidelines for individual resource areas, such as water quality road construction, and fisheries habitat. From an ecosystem management perspective riparian areas may be better managed if considered more as intact systems. Since people are drawn to these areas, riparian areas are often more heavily impacted and by a wider variety of users than other areas.

**5.3 Diverse Wildlife Habitat.** The Forest Plan sets desired composition objectives for forest vegetation to provide diverse habitat for wildlife. These objectives were determined by considering the potential of the National Forest to provide habitat for native species. The objectives assume the use of intensive harvest practices, which are often controversial. As we develop a better understanding of habitat dynamics, we recognize that it is also important to consider the habitat currently provided on lands adjacent to the National Forest. There is also some concern about ecological land type suitability to produce certain forest types. We may need to adjust the objectives we set on National Forest lands based on this information.

**5.4 Old Growth Forests.** By the early 20th century nearly every acre of forest in

the White Mountain region (except the summits and high ridges) was cut at least once. Stands in management areas with no timber harvesting (MA 5.1, 6.1, 6.2 and 6.3) will become old growth forests in the future. The current Forest Plan does not provide adequate detail for managing old growth within areas for vegetation management.

**5.5 Forest Practices.** Management areas in the Forest Plan now specify the approximate balance of even- and uneven-aged management practices necessary to meet the desired composition objectives. Managers found they used uneven-aged practices on more acres than the Plan anticipated. Visual quality is one of the main reasons for increased emphasis on uneven-aged management. The balance of even- and uneven-aged management may need to be reviewed.

**5.6 Timber Harvest Quantity.** There are widely divergent opinions concerning the role the White Mountain National Forest should take in providing wood fiber for society. One feature of a Forest Plan is the ceiling it sets on the amount of timber that can be harvested. This ceiling is referred to as the allowable sale quantity or ASQ. Through the management area allocations, the Plan provides guidance about where and how wood fiber can be harvested. If society decides the role of the Forest should change, this could require a change in the ASQ and the management area allocations. Regulations require a reevaluation of ASQ at Plan revision.

**5.7 Recreation Use.** While the Forest Plan anticipated growing recreation use, use has exceeded Plan expectations for some activities. People are drawn to Wilderness areas, making solitude hard to find and summits often crowded. In revising the Plan, we have an opportunity to think about how to accommodate increasing visitation without sustaining damage to the land; and, a chance to rethink the range of experiences provided to visitors and the differences between recreation on the National Forest and on surrounding lands.

**5.8 Alpine Environments.** Several management areas have the goal of recognizing subalpine and alpine environments. But the Plan provides few guidelines about how these fragile ecosystems should be managed, and what uses and levels of use are appropriate. New information about plant species occurring in alpine environments and the ecological processes that maintain these systems will improve our ability to meet this Forest Plan goal.

**5.9 Land Allocations.** The Forest Plan clearly states that lands in management area 9.4 are considered as "holding" areas and should be evaluated "for a full range of future uses" in plan revision. The National Forest Management Act also requires us to review all roadless areas for "recommendation as potential wilderness areas..." We may also want to look at the value of other management area designations. For example, the Forest has been managed at a higher level of visual sensitivity than envisioned. If this is to continue, it may not be worthwhile having

both 2.1 and 3.1 management areas.

**5.10 Ski Area Expansion.** Lands in management area 9.2 are adjacent to downhill ski areas and were set aside for possible ski area expansion. The National Forest lands in northern New England comprise the bulk of alpine skiing opportunities. People are still concerned about the positive and negative effects of ski areas.

**5.11 Special Uses.** Examples of special uses of National Forest lands include siting communication and electronic equipment sites, leading guided trips of paying clients, holding bike races, or other large events. The Forest Plan is largely silent on special uses, but managers would like guidance to help them determine if a special use should be permitted in a given management area.

## **SECTION 6.0 WILDLIFE POPULATION MONITORING UPDATE**

### **6.1 Forest Plan Monitoring FY 1996 Summary of Findings**

**6.1-1 Fish Habitat.** Monitoring of fish habitat conditions over the past decade has shown that the amount of pool habitat in the White Mountain National Forest streams is below what is considered optimum for montane aquatic ecosystems. Current literature indicates that pool spacing in streams is relatively uniform and a pool generally occurs every 3 to 7 channel widths (Keller and Melhorn, 1978; Grant et al, 1990; Richmond and Fausch, 1995). Analysis of the data collected to date on the Forest indicates a number of factors influence pool frequency on the Forest. These include the amount of instream large woody debris, stream width, and channel gradient (Fudge, 1997, unpublished manuscript). Of these factors, only amount of large woody debris is one which can be addressed through land management activities. Riparian management which favors growth of large diameter conifers along the streambank and retention of a continuous supply of recruitable wood for the stream channel should continue to be a consideration where timber management is occurring.

**6.1-2 Fish Populations.** Fish population monitoring at established index sites showed a decline in Eastern brook trout densities compared to 1995. Other fish species such as longnose dace and slimy sculpin also suffered declines over the previous year. This decline may be due to a year class failure in response to the extreme flooding which occurred on the Forest after fall spawning season. Flooding causes bedload transport, debris torrents, and subsequent disturbance to streambeds where incubating eggs are deposited. Juvenile trout would also suffer high mortality during floods, or at the very least, displacement to points downstream in the watershed. This decline is expected to be temporary and should be considered within the natural variability of brook trout population fluctuations.

**6.1-3 Atlantic Salmon Parr Abundance.** Monitoring of Atlantic salmon parr in the fall of 1996 indicated similar concerns as those for Eastern brook trout populations. All age classes of parr (0+, 1+, and 2+ years old) showed declines over 1995 numbers. Again, extreme flooding in juvenile rearing areas may be the cause of these declines. Flows equaled or exceeded 100 year flood events. This may result in a low return of adult salmon to the Merrimack and Connecticut River watersheds from 1998 through 2002.

**6.2 Committee of Scientists Monitoring.** The following are summaries of findings from the Committee of Scientists, after 3-5 years of monitoring. The Committee was formed in 1988 in accordance with the settlement agreement to resolve an appeal of the Forest Plan regarding the wildlife management strategy. The objectives of the Committee were to recommend a protocol for monitoring and evaluating the impacts of the strategy and the vegetative management program and to identify any changes in management needed to prevent negative impacts on populations or habitats. The

Committee was divided into three subcommittees which focused on monitoring for small mammals, large mammals, and birds. Monitoring protocols were replicated on survey transects within sections of forest where vegetative management takes place, unmanaged forest adjacent to managed forest, and forest remote from vegetative management areas. In general, the subcommittees do not have sufficient population trend data to fully evaluate the wildlife strategy. However, as the large mammal subcommittee pointed out, the HMU concept is basically sound; and there is no evidence that its' implementation is causing adverse effects on wildlife populations.

**6.2-1 Large Mammals.** Large mammal populations were monitored from 1993 through 1996 by collecting snow tracking data on transects located in vegetatively managed lands, unmanaged lands adjacent to managed lands, and remote areas. Hibernating species (skunks, raccoons, bears) were not monitored using this protocol. This data was analyzed by the Committee of Scientists which developed the monitoring protocol and oversaw the delivery of the monitoring program for all vertebrate species monitored on the Forest.

Analysis of monitoring data collected from 1993 through 1996 indicated that all species of large mammals expected to be detected were found. In addition, the patterns of occurrence of these species fit expected patterns of abundance. Deer and moose populations appear to be stable. The number of occurrences of moose and deer did not differ by management category, which was unexpected. Literature indicates these species tend to utilize managed habitat more often than remote or unmanaged habitats. However, due to the seasonal nature of this monitoring effort, and the fact that deer and moose do not "roam" as much in winter as in nonsnowy parts of the year, these results should not be used to evaluate habitat preference of these species.

Snowshoe hare populations remained stable during the monitoring period. Snowshoe hare were more prevalent in the managed and adjacent unmanaged sites than in remote sites, as was expected.

Fox, coyote and fisher also showed no change in population trends, and did not differ by management category.

Bobcat, pine marten, Canada lynx, timber wolf, and eastern cougar, in order of expected occurrence from highest to lowest, are considered the rarest large mammals on the Forest. Bobcat and pine marten were documented in all years and in all management categories. Lynx, timber wolf and cougar tracks were not found. In the case of lynx, nonoccurrence of tracks may be due to the fact that snow tracking transects were not located in high elevation habitats. Timber wolf and cougar are not currently expected to inhabit the Forest. Track survey results for pine marten, fisher, and bobcat were compared to snow track survey results obtained from Maine Department of Inland Fisheries and Wildlife in western Maine. Proportional occurrence of fisher and bobcat was similar to

the White Mountain National Forest data. Marten tracks were observed more often in the State of Maine sampling than in the White Mountain National Forest. This is likely due to a more concentrated effort at re-establishing this species in Maine.

**6.2-2 Small Mammals.** Small mammal populations have been monitored over the past 5 years. We began with a general monitoring effort to evaluate which species were present, and then utilized directed searches for northern bog lemmings. General small mammal sampling was partially implemented in 1992 and fully implemented across the entire forest in 1993. Two sampling procedures were utilized: a Y-shaped array of pitfall traps with drift fencing and a grid of variously sized snap traps. As with the large mammal transects, small mammal traps were set in vegetatively managed lands, unmanaged lands adjacent to managed lands, and remote areas of the Forest.

Analysis of the trapping data by the Committee of Scientists indicated 18 small mammal species were present using both snap and pitfall trap protocols. Woodland jumping mouse, southern red-backed vole, white-footed mouse, deer mouse, masked shrew, and short-tailed shrew comprised 90-95 percent of all captures. Smoky shrew, pygmy shrew, eastern chipmunk, meadow vole, rock vole, southern bog-lemming, meadow jumping mouse, long-tailed shrew, pine vole, water shrew, hairy-tailed mole, and star-nosed mole made up the remaining 5-10 percent of captures.

The order of abundance of the most common species varied annually, but the six most common species remained the same for all sampling years.

At the onset of monitoring, the Committee of Scientists expected several species to be less common than others, especially long-tailed shrew, rock vole, southern bog lemming and northern bog lemming. General small mammal trapping indicated 3 of these species (long-tailed shrew, rock vole, and southern bog lemming) were present across the Forest in the three management regimes. The fourth species, the northern bog lemming, was not detected. Therefore, in 1995, general monitoring for all species ceased, and directive searches for northern bog lemming was initiated. The directive search protocol for northern bog lemming retained both the snap trap and pitfall trap methods previously used. While the monitoring focus was to locate northern bog lemmings, it was recognized the more common small mammal species would also be caught, thereby allowing monitoring for small mammals as a whole.

Results from both the general and directive search monitoring gave similar results for the most common species. Directive searches confirmed the presence of northern bog lemmings on the Forest, although they are rare. All small mammal species expected to occur in the White Mountain National Forest have been confirmed to exist within the Forest boundaries. One house mouse was trapped on the Forest near an urban area, but no Norway rat was trapped during

this monitoring. This indicates neither of these two exotics have invaded forest habitat to the extent of affecting native species.

Analysis among the three management categories (managed, adjacent to managed and remote) indicated more species inhabited managed and adjacent to managed lands than remote areas. However, a higher number of individuals were trapped in the nonmanaged areas (adjacent and remote). Eleven species (masked shrew, smoky shrew, long-tailed shrew, pygmy shrew, water shrew, short-tailed shrew, white-footed mouse, deer mouse, southern red-backed vole, southern bog lemming and woodland jumping mouse) were trapped across all management areas. The rock vole, meadow vole, pine vole and meadow jumping mouse were trapped from managed and adjacent areas only. Eastern chipmunk was physically trapped only in lands adjacent to managed lands and remote areas. The hairy-tailed mole was trapped in managed and remote areas, but not on adjacent to managed areas. The star-nosed mole was the only species trapped exclusively in the remote area.

Monitoring has not been conducted long enough to determine trends for any small mammal. Statistical indications infer 10-15 years of monitoring data would be required before any trend in the more common species could be detected. More years of data would be needed to determine trends in the less common species.

The two monitoring protocols used were not effective in trapping all small mammals. Squirrels, (grey, red, northern flying, and southern flying) along with eastern chipmunks are known to be more abundant on the forest than indicated in this monitoring project. Moles were not trapped to the extent expected. Other trapping techniques are recommended to collect information on these species' distributions on the Forest.

No research was conducted in 1996 on bats inhabiting or utilizing the Forest. Other small mammals whose range incorporates the White Mountain National Forest, but did not get sampled in this monitoring project are Virginia opossum, eastern cottontail, New England cottontail, woodchuck, beaver, and porcupine. Some of these species were detected in the large mammal monitoring conducted and others are tracked via hunting or trapping records collected by New Hampshire Fish and Game and Maine Department of Inland Fisheries and Wildlife.

**6.2-3 Birds.** A comprehensive bird monitoring program has been in place since 1992. As with other wildlife monitoring efforts, we have not been able to detect statistically significant changes in bird population trends, especially for the less common species. However, given the extensive amount of data collected to date, much can be said about the status of the populations during the monitoring period. It appears that the total number of individual birds observed and the number of species has decreased since 1992. A similar downward trend has been documented for many of the same species in the NH

Breeding Bird Survey, which monitors birds in areas off the White Mountain National Forest. This suggests that if a decline is actually occurring, it is occurring region-wide and not just on the Forest. Although both data sets are preliminary in nature, there is concern among ornithologists that some bird species populations may be declining in New England (John Kanter, personal communication).

Of the 81 species observed during the monitoring, 24 species show significant differences in abundance among management categories: 19 species are most abundant in managed forest, one most abundant in adjacent to managed forest, and 5 most abundant in remote areas.

The Committee of Scientists has recommended that bird monitoring continue for the next 5 years in order to detect any changes in population trends, especially for neotropical migratory species.



## **SECTION 7.0 CONCLUSIONS AND RECOMMENDATIONS**

The findings in this report range from small details about the Forest Plan to major concepts used throughout the Plan. This section addresses major concepts that are likely to play a central role in the Plan revision.

**7.1 The Best of the Plan.** The management area concept successfully resolved some of the original management issues by allocating land to different uses. For example, allocating approximately half of the National Forest land area to Wilderness and backcountry recreation uses, and the other half to active management and motorized recreation uses, effectively resolved some of the conflicting public demands. In addition, Forest Service managers benefited from knowing what activities could take place in different parts of the forest. This made the implementation job easier.

Goals set in the Forest Plan worked moderately well to guide management activities. The Forest-wide goals were general in nature and set the tone for management. They provided a "barometer" for managers to gauge whether certain activities were appropriate. If a proposed project would contribute to achieving one of the Forest goals, it was likely implemented. Goals for the management areas provided even more specific direction for managers, since all projects had to pass the test of contributing to management area goals.

Standards and guidelines helped ensure that implementation was consistent across the Forest. Most of the standards and guidelines achieved their stated purpose of mitigating an effect or achieving a desired condition. Managers found the consistency and guidance helped them work more efficiently.

**7.2 Recommendations.** From the standpoint of Forest Service managers charged with implementing the Forest Plan, we see some parts of the Forest Plan that could be improved. Following are five areas for improvement based on our experience.

We would like to see consideration given to establishing a management area for riparian zones. Information that is needed for activities in riparian areas is currently scattered throughout the Plan. Goals might include protecting riparian habitat, soil and water, restoring aquatic habitat, and providing for or some cases excluding recreation uses and road crossings. The standards and guidelines would address practices that need to be conducted differently in riparian and upland areas, and would be presented in an integrated fashion.

Management areas whose implementation is similar should be evaluated for the potential to combine them. This applies particularly to management areas 2.1 and 3.1, where the limited use of even-aged practices such as clearcutting has diminished the differences between the management areas. Any proposal to combine these two management areas would need to consider the goal of providing habitat for

wildlife that use early successional stages of vegetation and the use of clearcutting to achieve the goal.

Habitat Management Units are an integral part of the Forest Plan. The concept provided a new way of thinking about the management of forest landscapes that far surpassed previous efforts to integrate timber harvesting and wildlife management. We would like to see the Plan revision consider how to implement the wildlife strategy and Habitat Management Unit concept more effectively given actual forest conditions, land capability and available technology. We have new tools, like Geographic Information Systems (GIS), and much more detailed information on topics such as natural communities, historical trends in forest cover, natural disturbance regimes, and more. We would like to build on what we already have by using our experience over the last ten years, new information, and modern methods of landscape analysis, to update the Habitat Management Unit concept.

Many of the activities occurring on the National Forest fall under the heading of special uses. The AMC hut system, communications sites, utility corridors and hydroelectric dams are all considered to be special uses. We would like the Plan revision to explore integrating special uses into existing management areas by considering which special uses are appropriate and in what amounts they might be allowed. The revision might also lead to standards and guidelines where they are necessary to guide implementation.

Lastly, the organization of the Plan could be adjusted to meet the needs of people who implement the Plan on a daily basis. For example, the revised plan might distinguish between standards and guidelines; provide better cross-referencing of forest-wide and management area-specific standards and guidelines; and modify the resource headings to be organized around activities that effect many resources. We have moved from the era of the typewriter to the computer, and these kinds of organizational changes can now be considered.