RANGELAND

Affected Environment

The Oconee National Forest currently has 1,120 acres of the 46.2 million acres of National Forest System lands considered to be suitable for grazing. These acres are still maintained as early-successional habitat, and a special permit is issued for temporary grazing of cattle. The largest allotment is 282 acres; the smallest is 1 acre. The allotments are mostly improved pastures with a very small percentage of woodland grazing available. The allotments' water resources vary from watering troughs and well pumps to perennial streams and lakesides. The permittees acquire use of the allotments through a competitive bid system and are required to maintain (fertilizing, liming, and fence repair) the allotment after acquisition.

Grazing is a land management tool and a practice that helps meet people's needs for wool, leather, meat, and other products. Livestock production is an important part of local economics. In addition, fees to the Federal government from livestock grazing are shared with the local counties for roads and schools, returned to the U.S. Treasury, or used for range-betterment projects.

There are two types of grazing: open range and improved pasture. The Oconee National Forest implements the range program involving improved pastures. Since 1959, the Oconee National Forest has issued permits to the public to graze livestock within improved pastures. Currently, 1,120 acres are considered as range allotments with continuous grazing permits being issued. The Forest issues 15 permits annually. All permittees must comply with the Allotment Management Plan (AMP), which is used to determine animal units (AUs) and state the requirements of the permit. All AMPs follow NEPA requirements and Best Management Practices. The Range Allotments are located on the Oconee Ranger District within the Piedmont of Georgia. Cattle and horses are the types of livestock that graze our allotments

Grazing only occurs on the Oconee NF, since the Chattahoochee NF's mountainous terrain offers little potential for livestock production. The Oconee NF is the location of 19 grazing allotments, of which 15 are currently established as improved pastures and are useable. These are highly managed, fenced, and fertilized pastures. The majority of these allotments (13) are being leased for cattle grazing; the others are leased for horse use. Three of the 19 allotments (Swords, Murder Creek 1, and Murder Creek 2) were vacant for the 1995 grazing season and were subsequently deleted from the permit process in 1997. The Hillsboro allotment has been vacant for the past 5 years and no one is willing to bid on it due to the limited amount of grazing acres. This allotment is not suitable for grazing due to the encroachment of trees, kudzu, and other invasive weeds. For the past few years, budgets and litigations have significantly reduced implementation of silvicultural improvements to the allotments.

The current Forest Plan identified approximately 103,800 acres of the Oconee NF as secondary range. These lands are presently timbered, but after regeneration could provide limited woodland grazing with certain precautions and protective measures.

Such land would provide forage for 8–10 years if planted to a wide pine spacing. Forage production would be high during the first 3 years (i.e., 1,200–1,400 pounds per acre) dropping to less than 200 pounds per acre by the tenth year. The current Forest Plan also identifies 3,000–4,000 acres of land considered unsuitable for grazing due to unstable soils or other resource conflicts.

Fifteen grazing permits were issued during the 1995 grazing season. Four decades ago, 45 or more permittees grazed on the Oconee NF, but demand has dropped, except in the northern part of the district where dairy operations dominate the area. Beef cattle operations dominate the southern portion, making demand for Government pastures low.

There is demand for additional grazing in the Greene County area of the Oconee NF from dairy farmers. There is little demand in the Monticello area. Maximum range capacity is based on grazing suitable range that exists currently in present ownership. Most acres would be grazed as transitory range resulting from timber management regeneration, burning, or other management. The RPA grazing goals were met by grazing existing fenced pastures. Secondary range acres could be put in production through the removal of timber and planting suitable forage grasses. Any land purchases made in the future could increase the Forest's grazing capacity. The tables on the next page show grazing statistics for the Oconee NF.

The Hatcher allotment is located within a floodplain, and is not suitable for grazing, as limited forage is available. The primary purpose of the Hatcher allotment has been as a holding area for livestock. The area is located along Big Cedar Creek within Jones County. Future recommendations are to eliminate the Hatcher allotment from the grazing program due to the impact on the riparian area. The Swords Allotment has not been active for 10 years and is currently underwater at Lake Oconee. The water levels increased over this period of time, covering the land in water and making it unsuitable for grazing. Murder Creek allotments 1 and 2 also have been vacant for 10 years. Both of these were issued as free use due to the location and the size not being large enough for other interested livestock owners. These free use permits were issued to keep the area in an early-successional habitat and provide economic assistance to the community. The adjoining landowner families had been livestock farmers for several years since the Oconee Forest was established in 1959.

Currently the Oconee NF has 8 permits issued under the "Grandfather Clause," which means they have the right to graze the areas for 10 years. After that they can renew or 'expire' the right to graze. These permits were issued to local farmers who have been with the range program since 1959 and have been renewed year after year to the same permittee. However, these permittees are becoming unable to keep the family business going and younger family members do not want to maintain the business. Row crop farming is not as profitable, but dairy farming is still in demand. However, beef cattle are presently at the lowest demand levels seen in this area in twenty years. The Oconee NF has suffered drought conditions for the past 5 years (1997-2002) which has minimized forage and water availability on the allocations.

The Hay Index price ($3.47 - 2002 price) and bid prices fluctuate. (Prices increase above the Hay Index value by adding the bid which may range from $.01-$2 + HI.) The cost of the allotment permit is the Hay Index cost times the animal unit times a fraction of the year (365/30.44667). The number of livestock to be placed on the allotment is determined by the AMP, which has been developed for each allotment. The number is calculated by a formula determined by the number of acres of soil types and vegetation.

Table 3- 257. Grazing Statistics on the Oconee NF, Animal Units/AUMs per Allotment

Allotment	County	Animal Units	AUM's
Ashley Tract 1	Green	75	900
Ashley Tract 2	Green	25	300
Carey Station	Green	15	180
Cold Springs 1	Green	30	360
Cold Springs 2	Green	10	120
Greenbrier Creek	Green	52	624
Penfield	Green	75	900
Redlands (McCall)	Green	15	180
Sellers Pasture	Green	45	540
Town Creek	Green	30	360
Dyar Pasture	Green	40	480
Falling Creek	Jasper	20	240
Gladesville	Jasper	12	144
Smith	Jones	20	240
Uncle Remus	Jones	6	96
Work Center (Hadaway)	Jones	6	96
TOTAL		476	5712

Source: Range allotment files, Oconee RD, 2002

Table 3- 258. Grazing Statistics on the Oconee NF, Woodland and Pasture Acres per Allotment

Allotment	County	Woodland	Pasture	Total Acres
Ashley Tract 1	Green	22	35.1	57.1
Ashley Tract 2	Green	3.1	23.7	26.8
Carey Station	Green	0.7	20	20.7
Cold Springs 1	Green	77.8	42.6	120.4
Cold Springs 2	Green	8	20.1	28.1
Greenbrier Creek	Green	69.9	118.7	188.6
Penfield	Green	33	111.1	144.1
Redlands (McCall)	Green	8.3	20.6	28.9
Sellers Pasture	Green	15.6	26.5	42.1
Town Creek	Green	9.6	30.0	39.6
Dyar Pasture	Green	18.8	67.05	85.8
Falling Creek	Jasper	11.7	26.4	21.1
Gladesville	Jasper	3.6	19.7	23.3
Hatcher	Jones	9	0	9
Hillsboro	Jones	30	29	59
Smith	Jones	57	37.1	94.1
Uncle Remus	Jones	10.1	13.4	23.5
Work Center Hadaway)	Jones	9.1	5.3	14.4
Swords	Morgan	0	1	1
Murder Creek	Putnam	5.2	8.4	13.6
TOTAL		**402.4**		**1058.15**

Environmental Consequences

Alternative A
Of the existing 19 allotments on the Oconee, only 15 are to be permitted. Access for motorized vehicles continues to be allowed within the allotments. Allotments continue to be upgraded by installing cow excluder devices along stream/riparian corridors. Invasive noxious weeds/plants (mostly Russian Thistle) continue to be eradicated.

All alternatives (except E) have a similar level of recreation use and type (hunting, fishing, bird watching, etc.) inside range allotments. Recreation use does result in fences being left open or fences being damaged at times.

All alternatives propose the same level of law enforcement within the allotments.

Alternative B
Alternative B has the same environmental consequences as A.

Alternative D
Alternative D is similar to A, but allotments are expanded into suitable adjacent woodland stands. This is over a period of time as early-successional habitats (grasses and other woody forage plants) are created by forest/wildlife management activities such as prescribed burning, thinning, forest health, and seed tree or shelterwood harvesting of timber.

Alternative E
Due to a higher recreational emphasis, all allotments are phased out as permits expire.

Alternative F
Alternative F has similar environmental consequences as A.

Alternative G
Alternative G has similar environmental consequences as A.

Alternative I
Alternative I is similar to Alternative A, except that when an allotment becomes vacant for 1 year, it reverts to the surrounding MRx and is utilized as a wildlife opening/early-successional forest habitat area. It will not be re-permitted for grazing. Allotment improvements will be removed. Forest health management activities occur within the old allotments.

LANDS

The Lands program on the Forest consists of determining suitability of available lands for National Forest purposes. Acquiring, exchanging, divesting, and conveying are the methods of accomplishing this. Exchanging, acquiring, or abandoning rights-of-way, resolving land claims and trespasses, and locating and maintaining property boundaries are also a vital part of the lands program.

The Chattahoochee National Forest was established in 1936 from parts of the Cherokee and Nantahala National Forests and contains approximately 750,000 acres across 18 counties. Approximately 47 percent of the 1,585,185 acres within the proclamation or purchase unit boundary are in National Forest ownership.

The Oconee NF was proclaimed in 1959 from 96,000 acres of Federal land in an interagency transfer from the Soil Conservation Agency in 1954. Total acreage on the Oconee National Forest has grown to approximately 115,000 acres. Approximately 41 percent of the land within the proclamation or purchase unit boundary is under Federal ownership, with the other 59 percent of the 280,884 acres being accounted for by scattered private and state lands.

Legal and Administrative Framework

Several laws authorize the acquisition and exchange of National Forest land, including:

Transfer Act of 1905: transferred Forest Reserves to the Department of Agriculture

Weeks Law of 1911: authorizes the Secretary of Agriculture to acquire and exchange lands for watershed protection and timber production

General Exchange Act of 1922: authorizes land adjustments within Forest boundaries

Land and Water Conservation Fund Act of 1965: Provides funds for and authorizes Federal assistance to the States in planning, acquisition and development of needed land and water areas and facilities

Sisk Act of 1967: authorizes the Secretary of Agriculture to exchange to a county, state, municipal government, or public school authority for payment of the value of the land

Alaska National Interest Lands Conservation Act of 1980 (ANILCA): provides for access to non-Federally owned land within the boundaries of the NF System to secure to the owner the reasonable use and enjoyment thereof

Small Tracts Act of 1985: provides for the sale, exchange, or interchange of certain parcels of minimal acreage or value

Educational Land Grant Act of 2000: authorizes the Secretary of Agriculture to convey up to 80 acres per application to elementary and secondary schools for educational purposes.

Affected Environment

Land Ownership

Acreages under administration of the Chattahoochee-Oconee National Forests are shown in Table 3- 259. These figures are from the Land Status Database, and are slightly different from the GIS acreage figures used throughout the analysis, although the differences are within one-half of one percent.

Table 3- 259. Land Ownership within Proclamation Boundaries

Land Ownership	Acres
National Forest Service lands within Proclamation Boundary Chattahoochee National Forest	749,689
National Forest Service lands within Proclamation Boundary Oconee National Forest	115,353
Other lands within the Proclamation Boundaries (includes both Forests)	1,001,027

Source: Region 8 Land Status Database

Land Ownership Adjustments

From 1993 to the present, land adjustments have been completed as shown in Table 3- 260 and Table 3- 261.

Table 3- 260. Land Adjustments on the Chattahoochee NF, 1993-2002

	Acres Acquired in Exchange	Acres Divested in Exchange	Acres Purchased	Acres Donated	Asset Forfeiture Acres	Divested - Claims, Small Tracts	Acres Divested - Reversion
1993	36	37	128			1	
1994	89	153	12				4,377
1995			60				
1996	615	470	49		36	0.1	
1997	513	478	92				
1998			53	1			
1999	342	274	60	3			
2000	39	36	242		5		
2001	242	191					
2002				52		45	
2003	486	538	784	251			

Table 3- 261. Land Adjustments on the Oconee NF, 1993-2002

	Acres Acquired in Exchange	Acres Divested in Exchange	Acres Purchased	Acres Donated	Forfeiture Acres	Acres Divested - Claims, Small Tracts	Acquired - Reversion or Claims
1993	385		1,187				
1994	69		66		296		
1995			341				199
1996			8				
1997							
1998							
1999	834	1,370				10	
2000	255	85				8	2
2001							
2002				5			
2003							

Source: Lands staff records, Forest supervisor's office, Gainesville, GA, 2003

Land activities on the Forest are varied and include acquisitions, exchanges, transfers, donations, asset forfeitures, encroachments, and resolution of claims. The mixed ownership pattern within the Forest results in requests to utilize National Forest land for a variety of purposes, some of which are outside the scope of Forest Service mission, policy, and regulation. Net national forest lands within the proclamation and/or purchase unit boundary comprise 46 percent of gross acres. Intermingled ownership creates occasional conflicts concerning property boundaries, title claims, encroachments, and access. It also limits fulfilling the desired management potential of certain resources. The disposal of federal lands through exchange could cause some adverse effects, but new lands being acquired could offset these. The public, in particular county governments have concerns about land being removed from the tax land base. However, this usually occurs in those counties with a large percentage (over 50 percent) of national forest ownership. Acquisitions have been so limited over the last 10 years that the concern has diminished somewhat. This may change if the Forest begins receiving substantial Land and Water Conservation Fund (LWCF) dollars. Private landowners will sometimes purchase private inholdings in some areas as speculation for future Forest Service purchases or exchanges. Mostly they are purchased as second home sites to be adjacent to national forest land. The acquisition of private land benefits use and management of the Forest. Acquisition of such land would be largely through exchanges or willing-seller purchases and is primarily contingent on LWCF funding. Exchanges are generally very time consuming, taking up five years, and can be very controversial.

Environmental Consequences By Alternative

Land Adjustment and Rights-of-Way

In all alternatives, the mixed ownership pattern on the Forest would continue to provide opportunities for land adjustment through exchange, purchase, donation, and acquiring of rights-of-way. Obviously, congressional appropriations and LWCF funding affect this activity. There are slight differences in the alternatives that would tier to the priorities established for acquiring land and rights-of-way. Alternative A would emphasize acquiring lands for timber production, coldwater fisheries, developed and dispersed recreational opportunities, protection and restoration of watersheds, and environmentally sensitive lands. In Alternative B, lands needed to protect riparian ecosystems, environmentally sensitive lands such as old growth, and provide a variety of recreational opportunities would be a priority. Alternative D would emphasize acquiring lands within Congressionally-designated areas and along with proposed designated wilderness study areas. In addition, lands for increased recreational opportunities, old growth on identified suitable lands, and lands with high site indices would be purchased. In Alternative E, lands would be acquired primarily for developed and dispersed recreation; protection of environmentally sensitive areas, riparian ecosystems, and coldwater fisheries; additions to Congressionally-designated areas such as Wild and Scenic River Corridors; and acreage that produces large diameter and high quality sawtimber. Alternative F, the No Action Alternative, would emphasize those lands needed to protect threatened and endangered species habitats, lands within existing Congressionally-designated areas, and watershed protection. In Alternative G, lands needed for reintroduction of threatened and endangered species; watershed restoration; habitat for sensitive species, particularly late successional ones; dispersed recreational opportunities; viewsheds for the Appalachian Trail; recommended wilderness study areas; and quality sawtimber production would be purchased. In Alternative I, those lands needed for protection of Congressionally-designated areas, roadless areas, protection of riparian ecosystems and coldwater fisheries, additional dispersed recreational opportunities, viewsheds from the Appalachian Trail, environmentally sensitive lands, and administrative sites would receive priority for acquisition. In addition, lands available for purchase and needed for threatened and endangered species or for protection of significant historical and cultural resources would also be purchased.

Having legal access to the national forest land is a critical aspect of implementing the strategies of any of the alternatives. The primary reasons and emphasis stated for land acquisition in the alternatives would also be relevant for acquisition of rights-of-way.

Cumulative Effects

In almost all cases, acquiring National Forest land would be a positive cumulative effect. This would allow the Forests to consolidate their ownership and, in some cases, expand it. The effects of this would be protection of federally-listed threatened and endangered species, Congressionally-designated areas, riparian ecosystems,

environmentally-sensitive areas, administrative sites, significant historical and cultural resources, and viewsheds from the Appalachian Trail. Additional positive effects from acquisition would be increased opportunities for recreational pursuits and areas with high quality sawtimber. The only negative effects from land acquisition might possibly be social or political. There are limited concerns from some individuals and government officials that acquisition of additional Forest Service land will reduce the acres available for the property tax base and limit development potential for private enterprise mainly primary and secondary home construction. Additionally, as more development occurs in the mountains, land prices will assuredly increase. In some areas, this may be partially due to the presence of National Forest land.

Maintenance of property lines on a reasonable rotation will increase the Forests' ability to effectively manage the land for the Forest users. Encroachments and title claims will have negative effects, as those visitors to the Forest may be unsure of ownership. In addition, time and critical lands dollars will be expended in resolving such claims, taking these critical resources away from the Lands program.

Acquisition of needed rights-of-way will also have a positive affect on management in any of the alternatives. Access is critical to being able to implement any desired future condition on the Forest, both from a resource management standpoint and for the visiting public. Acquiring access to all lands on the Chattahoochee-Oconee National Forest will have a positive effect.

Land purchases are contingent on two factors. The first factor is the amount of money appropriated for administering the land exchange program and acquisition (LWCF). Secondly, escalating land prices may soon prohibit the purchase of any significant acreage on either Forest, but particularly the Chattahoochee.

SPECIAL-USES

Occupancy and use of National Forest System lands by Federal, State, and local agencies, as well as private industry and individuals, are authorized with special-use permits, leases and easements. Several different public laws regulate activities under special-use authorizations. The Organic Act of 1897 and the Federal Land Policy and Management Act (FLPMA) of 1976 authorize the majority of the uses.

Special use applications are increasing as more people make use of National Forest lands. Table 3- 262 lists the number of authorizations by type and acres involved as of October, 2002.

Table 3- 262. Number of Special Use Authorizations by Types and Acres

Special - Uses	Number of Authorizations	Acres
Power Lines	32	795
Private Roads/Easements	101	66
Public Roads/Easements	142	673
DOT Easements	121	2,078
Communication Uses	42	16
Dams and Reservoirs	8	184
Recreation Residences	34	13
Service Buildings	6	29
Oil and Gas Pipelines	6	51
Solid Waste Disposal	1	16
Power Lines	34	795
Telephone Lines	19	248
Water Lines	10	17
Well or Spring	158	58

Special - Uses	Number of Authorizations	Acres
Outfitter/Guides	22	110
Other Recreation Uses	21	15
Military Training Area	1	282
Other Uses	60	211
Totals	**818**	**5,657**

Source: SUDS (Special Uses Database System)

Key Indicators

The number and types of special-use authorizations issued are key indicators for special use monitoring.

Direct and Indirect Effects

Recreation Residences

There is one recreation residence tract with a total of 34 recreation residences located on the Forest. Permits for the recreation residences are issued for a period of 20 years. The current National policy is not to issue any additional permits. Management of recreation residences under all EIS alternatives will not change as a result of the plan revision process.

Utility Corridors

The areas designated as utility corridors do not change by alternative. Corridor management would comply with adjacent management objectives. Expansion and other activities and actions that would not meet these requirements would not be approved. The corridors are set in width as identified by the special-use permit issued. Corridors are only designated for transmission lines over 69 KV and for pipelines over 10 inches in diameter. Local distribution lines and smaller pipelines have not been identified as corridors. Table 3- 263 describes the existing uses of each utility corridor and the number of miles. (See the glossary for a definition of utility corridors.)

Table 3- 263. Utility Corridor Uses - Miles

Utility	Corridor Use	Total
Oglethorpe Power	115 KV Overhead Power Lines	1.65 Miles
Oglethorpe Power	115 KV Overhead Power Lines	6.06 Miles
Oglethorpe Power	115 KV Overhead Power Lines	0.9 Mile
Atlanta Gas Light Co.	12" Gas Lines	0.7 Mile
Colonial Pipeline Co.	16" Gas Lines	8.05 Miles

Source: Special Use Case Files

Communication Sites

There are 10 communication sites located on the Forest that have been identified and designated as communication sites in accordance with land management planning policy, environmental policy and special use policy. Any future sites considered for commercial and/or Forest use would require long-term management decisions to consider future needs of the Forest Service and public and management direction for associated lands. The designation of additional sites would require a Forest Plan amendment as all communication sites are allocated in the Forest Plan. The number of communication sites does not change by alternative. Designated communication sites are identified in Table 3- 264.

Table 3- 264. Communication Sites

Site*	Other Users	Used by Forest Service
Black Mtn.	Yes	Yes
Brasstown Bald	Yes	Yes
Brawley Mtn.	Yes	Yes
Cedar Cliff Knob	Yes	No
Currahee Mtn.	Yes	No
Dug Gap Mtn.	Yes	No
Glassy Mtn.	Yes	Yes
High House Mtn.	Yes	No
Mack White Gap	Yes	No
Rocky Top	Yes	No

Source: Official File for Communication Site Plans
Forest Supervisor's Office, Gainesville, GA

FIRE MANAGEMENT

Before Native Americans arrived, fire occurred mainly in the spring and summer thunderstorm season, ignited by lightning. Most fires were probably limited in extent, as normally humid and still nighttime conditions in the summer tend to extinguish fires in light fuels. Some fires, however, were undoubtedly far ranging because they were associated with dry weather fronts. (Stanturf et. al. 2002) Multi-year drought cycles affected the probability of ignition and the general fire behavior much the way it does currently. Prior to the advent of active fire suppression and human-created fuel breaks, during drought cycles it would be expected that fire size was much larger and included those areas on the higher end of fire return intervals (35-200 years). Steep slopes in the mountains also add an additional parameter that influences fire spread.

"The role of fire was dramatically increased with arrival of aboriginal man in America about 14,000 years ago. Beginning about 6,000 years ago (Middle Holocene) warmer climates translated into increased food resources and rapid population growth. Hunting and gathering characterized their progressively more sophisticated cultures until the advent of settled societies after 3,000 years ago in the Eastern Woodlands. After this rapid population growth, more or less permanent settlements appeared, primarily in river valleys and rich bottomland soils from the coastal plain to the mountains. Fire became an important part of the culture. Cereal grasses were fired annually, basket grasses and nut trees every 3 years, and grassy savanna hunting areas annually. Brush and undergrowth in forests were burned for visibility and game every 7-10 years. Even in areas of the Southern Appalachian Mountains that were sparsely settled and not prime hunting ground, major trails that followed rives were kept open by burning, and escaped campfires probably caused large areas to burn". (Stanturf et. al. 2002).

Prescribe fire has played an important role during the historic period. By the early 1800s, the Piedmont of Georgia was largely claimed and settlers moved into the mountains for land. The better land along the major streams was settled first. The settlement of Mulky Creek in the mountains of northern Georgia was where the first hay crop was harvested beneath the open timber of a south slope. Broom sedge grew shoulder high on the drier sites, and wild legumes were abundant. The role of fire must have played a role in maintaining open mountain ecosystems, even before grazing of livestock became a supporting factor. Frequent burning by settlers stimulated the production of forage for livestock and retarded the advance of woody undergrowth. As cotton farming increased in the Piedmont, the use of woods fires increased to control the vole weevil. This burning was generally an annual event, even though these fires did little to halt the spread of the weevil". (Van Lear and Waldrop 1989)

Although there is still controversy surrounding many of the specifics of humans using fire in the area, it is agreed by most research that humans have used fire in amounts and durations, which have affected the landscape and the species composition. The shift to more aggressive fire suppression in the 1930's was economically based to

protect timber values. The further impact of lack of fire to the ecosystem as a whole was not thoroughly considered. As the understanding of the value of fire in the environment grows, the shift is being made to use fire and fire effects in more ways to achieve multiple resource goals. This area of Forest Land Management policy and accepted procedure is also evolving. Fires are no longer viewed as all bad, and a wider scope of issues guides the management strategy of the fires. Adjacent resource values, as well as the value of the fire's effects are combined with predictability and risk factors to make informed decisions rather, than the one size fits all decision of immediate suppression.

In their 1998 policy document entitled *Interim Air Quality Policy on Wildland and Prescribed Fires*, the EPA stated that, while future air quality concerns from prescribed fire may arise, fire should function, as nearly as possible, in its natural role in maintaining healthy wildland ecosystems and to protect human health and welfare by mitigating the impacts of air pollutant emissions on air quality and visibility. Prescribed fire can have short-term negative effects on air quality. Many effects may be mitigated by burning at certain times of the year, at certain moisture thresholds, etc.; parameters that are outlined in the prescribed burn plan.

The management direction applicable to wildland fire is primarily governed by the amount of preplanning that has been accomplished and formally approved for the affected land. Although the following flow chart includes the reference "regardless of ignition source," the illegal nature of arson requires that all unplanned human caused fires be extinguished regardless of other circumstances. Prescribed fires that exceed their planned parameters and/or objectives are declared to be wildfires. The following flow chart illustrates the management direction stemming from the level of prior approved planning. (*Wildland and Prescribed Fire Management Policy: Implementation Procedures Reference Guide*, August 1998)

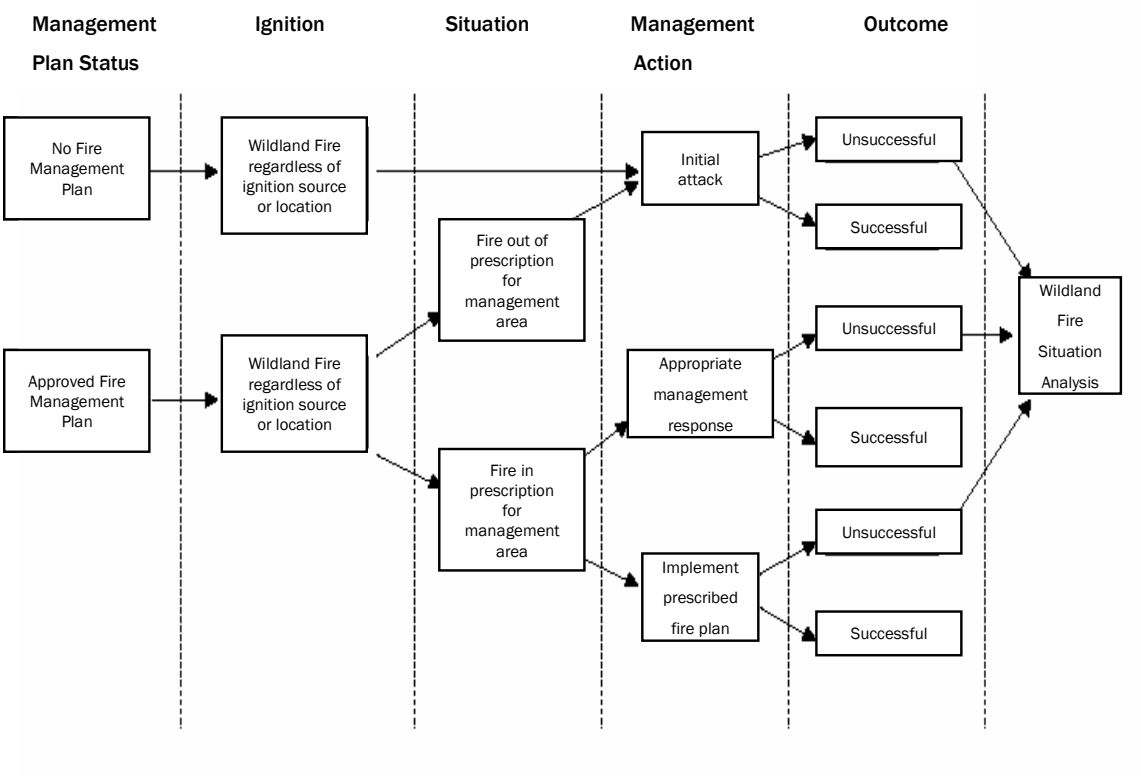

Figure 3 - 34. Wildland and Prescribed Fire Management Flowchart

Ignitions sources are divided into two categories: wildfires or prescribed fires. A wildfire is a fire resulting from an unplanned ignition; a prescribed fire is any fire ignited by management actions to meet specific objectives.

Wildland Fire Suppression

Upon the completion of an updated Fire Management Plan (FMP), and its complement of supporting documents, a full range of suppression strategies may be utilized. Direct attack is most often the costliest and is used whenever safety is a concern or to minimize acreage burned and resource values lost. Indirect attack often allows the fire to become larger by allowing it to spread out to pre-existing barriers in exchange for lesser costs. The option of simply monitoring the fire, both its behavior and effects may be the most cost efficient strategy in those areas where the effects of the fire are desirable and the risk to safety or resource values is manageable. Until an FMP is completed and approved the only option available is safe, and aggressive suppression. Firefighter and public safety is always the primary consideration for all suppression actions. Strategies and tactics for the fire should secondarily be commensurate with resource values at risk.

The Wildland Fire Situation Analysis (WFSA) is an addendum to the FMP and is the document that provides guidance in the comparison of alternative management

strategies against selected safety, environmental, social economic, political, and resource management objectives. Within the WFSA, preplanning includes the specifics of acceptable effects, strategies and tactics for specific areas. This document is completed using an interdisciplinary approach and allows for all resource issues to be included in the design of the overall management strategy of suppressing individual fires. In general natural barriers such as rockslides, riparian areas, roads, etc. are used whenever possible to limit ground disturbing fire line construction. Constraints on the use of equipment are outlined for particular areas. While safety is the overall guiding factor, more attention and emphasis is given to the impacts of suppression techniques versus the impact of the fire occurrence. Minimum Impact Suppression Techniques (MIST) is used wherever practical for fire suppression operations. Strategies that allow the fire to burn to natural barriers are favored, and if a fire control line must be constructed, it is designed to be of a minimum width and depth required to check fire spread. Limbing, bucking, and felling of trees or snags is minimized unless they are a safety hazard or threaten security of the fire line.

An area of evolving policy is the determination of value. Although often represented by a dollar amount, there is a growing understanding of intangible values. High value areas on the forest to be protected that are key in the fuel/fire situation are urban interface areas, unique habitats or features, municipal watersheds, high value timber, and scenic corridors as a few examples.

Until the required preplanning is accomplished and approved, wildfires may not be managed to meet resource objectives: suppression is the only acceptable alternative. Once a Wildland Fire Implementation Plan (WFIP) is written for a fire occurring within the parameters outlined in the FMP, then that fire may be designated a Wildland Fire Use fire and may be managed to meet resource objectives

Using the fire occurrence database as recorded in KCFAST for the years between 1970 and 1999, the following summaries illustrate the wildland fire occurrence for the National Forest lands covered in this plan.

There were 3,249 fire records on file. Less than 1 percent (0.4 percent) of the fires were greater than 300 acres.

Based on the reported statistical cause: 2,484 (76 percent) were human caused, 97 (3 percent) were either equipment or railroad related, 142 (4 percent) were lightning caused and 526 (16 percent) were classified as miscellaneous. The loss of 1 percent is due to rounding the number to the nearest percentage.

Arson is the leading cause (58 percent) of wildland fire starts within the Forests' boundaries. A Forestwide risk assessment is a portion of the FMP and may be used to prioritize programs in the attempt to reduce human caused fires through active fire prevention, education, and law enforcement.

The largest fire in the database, 2,570 acres was an arson fire in November 1980, which occurred on the Cohutta Ranger District.

The largest lightning caused fire within the same 30-year database, occurred on the Tallulah District in July of 1993. That fire reached 1,050 acres and was considered an out-of-season fire.

The average number of fires per year during the time period of 1970-1990 was 135; from 1991-1999 it was 121.

Table 3- 265. Fire History 1970 – 1999 for the Chattahoochee and Oconee NF

Calendar Year	1970-1990		1992	1993	1994		1996	1997	1998	1999	Total
Statistical Cause											
Lightning	115	1	1	9	0	3	3	3	3	4	142
Smoking	93	4	2	0	2	2	1	1	2	0	104
Campfire	101	8	3	8	3	3	4	0	5	3	134
Debris Burning	234	0	5	15	15	17	14	7	5	14	334
Children	18	18	0	2	1	0	1	0	1	0	23
Equipment	46	1	1	1	0	0	0	1	4	1	55
Railroad	34	4	1	0	0	2	1	0	0	0	42
Arson	1,662	65	46	18	24	13	17	9	13	22	1,889
Miscellaneous	400	20	19	22	9	11	7	5	22	11	526
Total No. Fires	2,703	104	78	75	54	51	48	26	55	55	3,249
Total Acres	29,020	912	1,129	1,584	1,442	453	541	338	510	6,917	42,845

Source: KCFast database, 2002

As stated this data is from in-service records of fire reports, although individual components of the report may not be 100 percent accurate, it is assumed to accurately reflect trends in the data.

The firefighting organization continues to evolve, as interagency and intra-agency cooperation multiplies available resources, communication improves, and aircraft is utilized. Cooperation with the Georgia State Forestry Commission (GFC) and Volunteer Fire Departments (VFDs) has become invaluable. Their rapid response has kept most roadside fires to minimal acres and has no doubt, prevented many wildfires from involving homes and structures.

The Chattahoochee and Oconee National Forests recently underwent a full analysis using the National Fire Management Analysis System (NFMAS) initial attack modeling for the planning and developing of the forest fire suppression and prevention program. The results of this latest analysis have illustrated the cost efficiencies related to a particular staffing level analyzed to be the Most Efficient Level (MEL) as well as the projected costs and net resource value lost of lesser staffing alternatives. While the Forest Management team supports the adoption of the MEL staffing guidelines, funding is obligated at the National and Regional levels and governs the ability of the Forests to achieve the staffing level outlined.

Fuels Management

Prescribed fire and mechanical fuels treatments are designed to reduce the risk of catastrophic wildfires by changing either or both the amount and the arrangement of available fuel that the fire is able to consume and thus carry the fire. Both prescribed fire and mechanical treatments may be used together or individually to reduce fuel loading, and to break-up fuel continuity, both vertically and horizontally, to reduce rates of spread and therefore fire size, intensity, and severity. Both methods may be used separately or in conjunction to restore condition class and/or fire regimes elements within or near an historical range. One or more of the following activities may have caused this departure: fire exclusion, timber harvesting, grazing, introduction and establishment of exotic plant species, insects and disease (introduced or native), or other past management activities. Fire Condition Class is a measure of general wildland fire risk and ecosystem condition defined as follows:

Condition Class 1:
Fire regimes are within or near an historical range.
The risk of losing key ecosystem components is low.
Fire frequencies have departed from historical frequencies by no more than one return interval.
Vegetation attributes (species composition and structure) are intact and functioning within an historical range.

Condition Class 2:
Fire regimes have been moderately altered from their historical range.
The risk of losing key ecosystem components has increased to moderate.
Fire frequencies have departed (either increased or decreased) from historical frequencies by more than one return interval. This results in moderate changes to one or more of the following: fire size, frequency, intensity, severity, or landscape patterns.
Vegetation attributes have been moderately altered from their historical range.

Condition Class 3:
Fire regimes have been significantly altered from their historical range.
The risk of losing key ecosystem components is high.
Fire frequencies have departed from historical frequencies by multiple return intervals. This results in dramatic changes to one or more of the following: fire size, frequency, intensity, severity, or landscape patterns.
Vegetation attributes have been significantly altered from their historical range.

There is sufficient evidence to show that wildfires occurring in areas that have been manipulated towards a Condition Class 1, typically exhibit less fire intensity and severity, and result in environments requiring less outside management efforts to sustain or restore forest health. Prescribed fire, despite concerns about its use, remains an important, ecologically appropriate fuels management tool. Both natural

fuels and artificially produced management-activity fuels must be managed over time to meet long-term resource management objectives. Artificially produced fuels have been of little concern in the more recent past, because of the small volume generated, but may require management in the future. Fuels management considers both the dead and live fuel components within the fuels complex that varies widely across the forest. Examples of fuel components include snags, dead pine needles and leaf litter, dead trees on the forest floor, and shrubs. The live components of the fuel complex includes any living vegetation that has a low enough fuel moisture content to be consumed in the flaming front of a fire. From a fuels management standpoint the areas of concern include the diploxylon pines (pitch and table mountain), mountain laurel, the *Ericaceous* species, huckleberry and the wilted hardwoods i.e. when the hardwoods are stressed right before leaf fall or during drought conditions. During extended drought periods this list lengthens considerably. Prescribed fire is a valuable tool for managing rare communities that require periodic fire to maintain plant viability; for diploxylon pine species; as a site preparation tool; to increase forage; and, as a tool to regenerate oak stands on highly productive sites (Brose and Van Lear 1999). Fire may be used to efficiently and effectively reduce more invasive or undesirable species or to limit the encroachment of shade tolerant species that would over time change the light characteristics of the site and in turn the stand species composition.

Snags are an important habitat site for many birds and mammal species. Number of birds and species richness of birds is typically found to increase with snag retention. Snags create more unusual safety problems for forest visitors and firefighters. Besides providing firebrand receptors and sources, snags may fall with little or no warning. As the time since mortality of snags increases, so does the possibility of the snag falling. Snags are less predictable and much more dangerous when attempting directional felling, due to decay and breakout of branches. Periodic outbreaks of southern pine beetle have created snag patches of various sizes throughout the Chattahoochee NF. Typically located on xeric, low site index soils, and in combination with public sentiment against logging, these stands have little potential for salvage. During years of heavy infestation, the richer sites experience heavy losses of pine types. With fire exclusion, poor regeneration of these stands is resulting in diminished pine communities. The southern pine beetle attacks result in greater mortality with decadent, older stands. These stands are often associated with pyrophitic *Ericaceous* species. The resulting fire behavior under dry conditions can be extreme. Fallen snags slow line-building rates for fire control. In an active prescribed fire program a balance is sought by identifying and protecting those snag patches, which have signs of use and also by their location make them less of a human safety issue. In prescribed burns, snags are typically felled near control lines prior to ignition (or raked around to prevent ignition), usually limited to within one chain of those lines, depending on the circumstances. The Forestwide standard of two snags per acre is a minimum and site-specific guidelines may be applied to increase that number. With snag recruitment from the prescribed burn (mortality), the number of snags within these burn areas can increase over the short run.

Snag density can be measured (Bull and others, 1990) to determine adequacy of the snag component. Besides numbers, snag characteristics: diameter (dbh), height and

surrounding vegetation are important to wildlife species. Fragmentation and decay rates of snags are important to both fuels and wildlife managers. Those rates may differ with the mode of recruitment. In California, Morrison and Raphael (1993) found that snags created by fire fell quicker than snags in unburned areas and Labosky and others (1990), found that girdled control trees decayed more rapidly than gypsy moth-killed trees. Hardwood snag fragmentation in a pine-oak forest in southeastern Arkansas was studied for that coastal plain location (Cain, 1996). He found that within three years of injection with herbicide, 57 percent of snag boles had broken below crown height. The number of cavities increased with time since injection, and at six years since injection, 44 percent of residual snags had evidence of wildlife cavities. Less than 50 percent of hardwood snags less than 25 cm dbh were still standing five years after injection. As expected, the rate for fragmentation was greatest for the smaller diameter snags and lowest for the larger snags. His data suggested that snag recruitment would be needed at intervals of ten years on that site. In the southern Appalachian Mountains, Harmon (1982) examined the decomposition of snags killed by fire for ten species. His study indicates that there are considerable differences between species within a single climatic zone. Standing dead trees 5 to 15 cm dbh were sampled at intervals up to 12 years after the fire.

From these findings, chestnut oak and blackgum had relatively higher rates of decay compared to Virginia pine and eastern hemlock, which had slower rates of decay. In general, the conifers had slower rates of decay than the hardwoods, though dogwood and sourwood also appeared to decay very slowly.

Pierce and Bivens (unpublished data, 1985) developed guidelines for determining the time of mortality for standing dead oak trees. They state that “trees dead one year or less will only have some leaves missing. The many fine twigs remain for about a year and then start to trickle off. Bark is still tight. A tree dead two years will have less numerous, blunter twigs as the very fine ones are gone by this time. Bark starts to loosen. Sapwood just inside the cambium will soften and start to deteriorate. A tree dead three years will have stubbly limbs as the next smaller twigs or limbs trickle off. Bark is loose, and sapwood becomes mushy. A tree dead four years or more may have stubs instead of limbs. The bark may be gone or patchy and the sap will be sloughing off. “Whole crown should be studied since some trees die a portion at a time over more than one year. The last limbs to die would be used to determine mortality age. Oak on dry sites deteriorates more slowly than oaks on moist sites. Hickory sap deteriorates faster than oak. Hickory twigs cling longer than oak. Softer woods such as yellow-poplar and buckeye deteriorate much faster than oak.”

The stage of snag decay will influence its ability to be both a source of firebrands and a receptor of brands. This can vary within species of the same genus with those species exhibiting a punky or semi rotted exterior being likely receptors of spotting, and those trees with a slick or “case hardened” exterior less likely receptors. Loose hanging bark will also provide likely locations for ignitions. Upper limbs may be punky, while the remaining stem is sound.

The dramatic reduction in fire occurrence, since organized suppression began, has resulted in diminished yellow pine communities, notably shortleaf pine, pitch pine

and Table Mountain pine. These species require open, exposed sites for germination, are drought tolerant, shade intolerant, and have thick, insulating bark. Table Mountain pinecones exhibit cone serotiny, requiring moderate heat for seed dispersal, and pitch pine can exhibit degrees of serotiny in part of its range. Lack of regeneration and the inability to compete with established hardwoods has led to measurably smaller associated communities (Gibson and Hamrick, 1991; Williams, 1991; Groeschl et al, 1992; Sutherland et al, 1993; Waterman et al, 1995; Turrill, 1998; Williams, 1998; Waldrop et al, 2000). Priority fire application should involve yellow pine and oak communities. An effective fire frequency of less than 10 years for oak pine communities and 15-20 years for oak communities is suggested to maintain integrity. But where white pines or other shade tolerant species have become a dominant under story component, a burn rotation of 2-3 years may be necessary to control these species. Mesic locations, included within those burn perimeters; will not be affected at the same level of intensity as the drier sites. This will result in a mosaic of effects, with a longer, effective fire frequency for those mesic sites.

As pine lose vigor and become susceptible to periodic southern pine beetle attacks or some other malady, their range grows smaller. When burned, the declining pine stands, often associated in a fuel complex with mountain laurel, can result in a fire intensity that provides the necessary conditions for regeneration of those stands. These pine stands are typically on poorer sites of timber productivity; steep, thin soils, and drier sites. The timber itself is poor quality, with minimum marketing potential. Maintaining the diversity that these communities contribute to ecosystem flexibility and health should be a primary goal.

White pines historically occurred in mid to upper elevations in the drains. This species is a shape tolerant species that now occurs on many of the south, east and west slopes of the Chattahoochee, especially in oak and oak/pine communities. Over the years, this species has remained somewhat suppressed, but as the forest grows older, and more light is reaching the forest floor, white pines are slowly becoming a dominate understory species. At this time, much of the white pine regeneration can be controlled by fire, but as time passes, dormant season, low intensity burns will not provide the desired conditions. Mechanical measures will be needed to control the white pine encroachment. As time progresses and with the lack of fire, this species will become the dominant species in the overstory, replacing the now dominant oak communities. This scenario will lower hard mast capability for the forest and reduce habitat capability of the many species of wildlife that depend on oak mast for winter foods. During this time, oak regeneration will be prohibitive due to the sunlight requirements for establishment.

Mountain laurel at certain lower fuel moistures is a highly flammable evergreen shrub that typically survives fire by sprouting from the root crown or rhizomes after aboveground portions are killed (Niering, 1981; Romancier, 1971). A light to moderate severity fire typically top-kills mountain laurel while severe fires may completely kill the shrub (Niering, 1981; Thackston et al, 1982).

Rhododendron has expanded its range and currently occupies more mid-slope positions, where prior to fire suppression the shrub was more restricted to areas immediately adjacent to stream channels. These impenetrable thickets now dominate mid-stories and under-stories of hardwood forests and prevent desirable hardwood regeneration from becoming established. (Van Lear 1991) It may serve as a highly used but low value browse species for white-tailed deer during years of low mast yields. Low fuel moistures in this species during drought years can produce very volatile conditions during fire suppression or prescribe burning activities.

Both the hillside blueberry and the low sweet blueberry are important wildlife shrubs, various birds and mammals eat the berries, flower buds and stems at various times of the year (Carlile et al, 1978; Martin et al, 1951; Van Dersal, 1938; Vander Kloet and Austin-Smith, 1986; and Vander Kloet, 1988). Both species are adept at recolonizing disturbed sites and are well adapted to fire (Brayton and Woodwell, 1966; Bourgeron et al, 1988; Stocks and Alexander, 1980). It readily regenerates from rhizomes, root crowns, or surviving portions of aerial stems. Fire intensity and severity, season of burn, community type, and soil are important factors influencing post-fire response. In general, low sweet blueberry is most reduced by summer fires (Eaton and White, 1960). Burning too frequently may be detrimental to blueberry yield (Black, 1963).

Black huckleberry provides food, shelter, and cover for various wildlife species ranging from game birds and songbirds to black bear and white-tailed deer. Black huckleberry is fire tolerant and while fires destroy its aboveground parts, dormant rhizome buds usually survive and sprout (Matlack et al, 1993; Reiners, 1965). Low-severity fire encourages prolific vegetative reproduction of black huckleberry; however, severe fire that burns the humus layer where many of the rhizomes are, can reduce or eliminate it from a site (Martin, 1956; Matlack et al, 1993). Too frequent fire in black huckleberry usually results in a reduction in its coverage probably because of inadequate time between fires to replenish root resources (Buell and Cantlon, 1953).

The decision to use management ignited prescribed fires in wilderness may be made at the Regional level only under a few exceptions: when the objective is the protection or enhancement of threatened and endangered species, to reduce hazardous buildup of fuels which may pose a threat to the basic wilderness values for which that wilderness was formed to protect, or an unacceptable level of risk for the fire to escape the wilderness. For any other reasons the analysis is forwarded to the Washington office for decision. In either case the following conditions must be met:

(a) The use of prescribed fire or other fuel treatment measures outside of wilderness is not sufficient to achieve fire management objectives within wilderness.
(b) An interdisciplinary team of resource specialists has evaluated and recommended the proposed use of prescribed fire.
(c) The interested public has been involved appropriately in the decision.

(d) Lightning caused fires cannot be allowed to burn because they will pose serious threats to life and/or property within wilderness or to life, property, or natural resources outside of wilderness.

Wildland Fire Use allows for the use of lightning ignitions, to achieve resource benefits. With the proper preplanning this may be used both in and outside of designated wilderness areas. Utilizing various parameters such as weather, fuel conditions and expected fire behavior, management strategies are determined based on the fire being and remaining within prescription parameters.

Controversy surrounds the use of prescribed burning to maintain pastureland and the ridge top balds. Critics contend that prescribed burning is maintaining an artificial ecosystem, while proponents recognize that the environment, though artificial, has been maintained long enough to effect species populations and distribution. Special plant communities, for example, those including threatened and endangered species or mountaintop balds, may have other fire frequency requirements. Monitoring community trends will remain important to determine direction. The benefits as well as the consequences are analyzed on a site-specific level, through an inter-disciplinary approach whenever and wherever burns units are planned.

Prescribed fire on the Chattahoochee NF has been used for a variety of resource needs: site preparation and activities fuel disposal, wildlife enhancement projects, safety and hazardous fuel removal. As the understanding grows as to the multi-faceted effects of fire, many areas of need are becoming more obvious. In sampling the stand density and composition across the Forest in conjunction with knowledge of the fire use and suppression of the past 10-15 years, the conclusion may be made that the majority of the land within the Chattahoochee's boundaries is in at best a Condition Class 2 and more probably within the definitions of Condition Class 3.

For the Oconee NF much of the current burning program is considered maintenance burning: burning to maintain a particular condition class rather than to restore a condition class. Due to the vegetative composition and growth rates of the forest types common in the Southeast the loss of a particular level of condition class occurs much more rapidly than elsewhere in the US, and maintenance burning at the current frequency is imperative to maintaining the restorative values which have been gained so far.

Wildland Urban Interface

Both the Chattahoochee and the Oconee NFs are highly interspersed with privately owned lands. There is increasing pressure as additional growth occurs in these areas. More people desire to live in wooded surroundings and typically work at maintaining a natural vegetative state, which blends their property into the adjacent forested environment. While this is aesthetically pleasing, the same vegetative bridge can quickly become hazardous fuel in the event of a wildfire. The same principles of fuel availability and arrangement apply regardless of jurisdiction or ownership. Also inherent to the existence of a vegetative bridge is the issue of fires originating on private land moving onto Forest land.

Nationally, the direction is to increase hazardous fuels treatment in the wildland urban interface areas. Those areas pose the greatest threat to public and firefighter safety as well as being the most complex and expensive areas to suppress wildland fires. The currently accepted NFMAS program does not allow for the analysis of dollars saved due to suppression efforts/costs involved with protection of private property. If for example $20,000 is spent to ensure that a wildfire doesn't burn private investments, and as a result none are burned, then the analysis program doesn't recognize a net loss to counter the cost of that fire. From the program's analysis those types of suppression efforts are not efficient. From a common sense standpoint Forest management accepts that though there is not a one-to-one correlation between acres treated and suppression dollars saved, or fewer acres burned, there is sufficient evidence to show that areas that have been treated typically exhibit lower rates of spread, less intensity, less severity, and a smaller overall cost to the government. At the national level, the road management program has been declining over the past several years and while any new roads that provide access to the public might increase the possibility of human caused ignitions they also provide firefighting resources with access as well. Conversely, due to the large number of arson fires, which do occur close to roads, there may be a decrease in arson-afflicted areas based on limiting accessibility. There is no one alternative that provides Fire Management a discernable advantage in the area of road management.

Cumulative Effects

In all Alternatives there is an increase in the use of fire as a tool in comparison to the current level of use. Fuel loadings will continue to increase under all alternatives; however, the alternatives that have a higher prescribe burning program and include the option of fuel removal should result in increases, which are more easily managed from a fire/fuels management perspective. Prescribed fire may be used as a management tool to create early-successional forest types as well as reduce the fire hazard within late successional types. The use of prescribed fire and prescribed natural fire to maintain and manage for native plant communities will result in fire being used in old growth areas, especially the yellow pine and oak community types. Where used, this could help perpetuate existing dominant tree species. The National level emphasis on Condition Class recovery will increase the use of fire in all Alternatives. Returning stands to a Condition Class 1, as outlined previously should produce more stands, regardless of the successional stage, that are fire tolerant and contain more of the definable qualities associated with a healthy forest environment. In many cases the fuel arrangement may need to be mitigated mechanically prior to the reintroduction of fire. Often the necessary vertical and horizontal arrangement may be created through stand density reduction projects. Just as often the result of mechanically creating the spacing needed to successfully reintroduce fire also results in the creation of excess fuel loading. Fire occurrence in areas of excess dead, downed woody fuels most often results in extreme fire behavior and unacceptable soil impacts. Due to the interdependence of the multiple use forest and the extreme amount of private landownership, fire may never again function in its' perceived natural role. Using fire as a tool as much as possible could retain many of the effects of natural fires.

The risk of ignition from lightning fires will remain constant, while the risk of human caused fires may increase in relation to the level of recreational use and private development.

Increased development in the urban interface adjacent to the forest boundary will require an increased emphasis be placed on reducing hazardous fuels in those areas.

INFRASTRUCTURE (ROADS AND ACCESS)

Access to the Chattahoochee-Oconee National Forests is provided by an interconnected transportation system of roads managed by the Forest Service, county and state agencies, and private individuals. Travel, an integral part of virtually every activity that occurs on the Forests, is necessary for outdoor recreation; fighting wildfires; management of livestock, wildlife, and commodity resources; access to private in-holdings; maintenance of communication sites and utilities; and monitoring. Vehicles using the forest transportation system include commercial trucks, automobiles, high clearance vehicles, four wheel drive vehicles, all-terrain vehicles, motorcycles, mountain bikes, and wheelchairs. Other means of forest travel include horseback riding, hiking, boating, and ballooning.

Travel management includes planning and providing for facilities to move people and products into and across National Forest System lands. A travel management plan provides clear, specific direction on the appropriate levels of access to the land, water, and air. While traditional commercial use of the Forest continues to demand transportation access, access demands by recreation and non-motorized travel are increasing. Consideration must be given to protection of wildlife habitat, species diversity, watershed condition, vegetation, and soils. If natural resources and ecosystems are to be protected while trying to accommodate the access demands of expanding uses, development of a road and trail system is essential.

Affected Environment

The official forest transportation inventory for the Chattahoochee-Oconee National Forest system roads and trails consists of two parts. Part one is the spatial data contained in the forest's geographic information system, which records the location of individual roads and trails. The spatial data may be used to produce maps at various scales. Part two of the inventory is a computer database containing descriptive details, such as structural information, jurisdiction, and maintenance activities. Records include all National Forest System roads, Forest Highways, forest system trails, and bridges. Information for the forest transportation inventory is updated as survey information becomes available. Updates to the records will occur when changes are made in the field, management changes occur, and technological improvements are made. Fifty percent of maintenance level 3, 4, and 5 should be surveyed each year.

National Forest System Roads

The forest transportation system currently contains approximately 660 miles having a passenger car as the design vehicle. The remaining miles are designed for high clearance vehicles or are closed to motorized vehicular traffic. These roads provide access to and across National Forest System lands. The transportation network is complimented by roads under county and state jurisdiction that provide access to the Forest's roads. In addition to providing public access, the road system provides access to administer, to protect, and to utilize National Forest System lands. Travel

management planning provides public access opportunities tempered by restrictions necessary to achieve land management and resource protection objectives.

Between 1986 and 1997, the Forests completed 98.98 miles of new road construction and 301.75 miles of road reconstruction. Years 1986 and 1987 had the most new road constructed with 21.2 miles and 23.38 respectively. The fewest miles or new road construction occurred in 1996 with 0 miles of new road constructed and 1997 with 0.8 miles of new road constructed.

Reductions in road construction and reconstruction were the result of a reduced timber sale program and reduced appropriations for capital investment. As a result of reduced funding and timber sale program, the condition of many of the Forests' primary access roads fell below the standard to safely and efficiently support the current traffic volumes. Trends indicate traffic volumes will increase, especially from recreation-oriented forest users.

Management objectives are established for all roads and provide construction standards and maintenance levels. Vehicle types, expected traffic volumes, user types, environmental constraints, and economics are considered when determining the appropriate standards to be applied.

Road Function Class

The National Forest System roads provide access in a branching system of arterial, collector, and local roads. Arterials provide access to large land areas, typically linking county roads, state highways, or communities. The roads are divided into three functional classes, arterials, collectors, and local roads. Arterials, because of the larger volumes of traffic they carry, have the highest standards for construction and maintenance. Collector roads disperse traffic from arterials onto large forest areas. Local roads, used to access specific project areas or sites, are usually less than two miles long and of lower standard construction. Table 3- 266 displays the total miles of National Forest System roads currently on the Chattahoochee-Oconee National Forests by functional class.

Table 3- 266. National Forest System Roads By Functional Class On The Chattahoochee-Oconee National Forests

	Functional Class Miles		
	Chattahoochee Miles	Oconee Miles	Total Miles
Arterial	75.95	8.47	87.42
Collector	257.21	77.86	335.07
Local	1,019.22	197.14	1,216.36
Total	1,352.38	283.47	1,635.85

Source: Transportation Information System database, 2002

Traffic Service Level

Roads are further characterized by traffic service levels (TSL). Traffic service levels describe a road's significant traffic characteristics and operating conditions. Transportation planning activities identify the required TSL. Table 3- 267 displays traffic service levels for all Forest Service roads. Traffic service levels represent the

significant traffic characteristics and operating conditions for a road: Level A (most efficient and free flowing) through Level D (single-purpose, low volume).

Table 3- 267. Miles Of Travel Ways By Traffic Service Level

Traffic Service		
Level	**Chattahoochee Miles**	**Oconee Miles**
A	15.76	7.46
B	41.09	31.59
C	657.81	171.81
D	637.72	72.60

Source: Transportation Information System database, 2002

Roads Maintenance Level

Roads in the national forests are maintained to assure that planned service levels and user safety are preserved and to assure that impacts to soil and water resources are minimized. Utilizing the annual road maintenance and prescription process, road maintenance needs are identified and cost estimates are prepared. Through the road maintenance planning process, priorities are determined and negotiated based upon available funding levels. Each road is assigned a maintenance level (1–5) based on road use objectives. These objective maintenance levels prescribe the upkeep and restoration work necessary to retain a desired traffic service level. Road maintenance levels (ML) are:

- ML 1 roads are closed to vehicular traffic and receive custodial maintenance only, primarily for resource protection.
- ML 2 roads are maintained to provide for passage of high clearance vehicles. Roads receive minimum maintenance.
- ML 3 roads are maintained for travel by the prudent driver in standard passenger vehicle. The comfort and convenience of the user is a low priority.
- ML 4 roads provide a moderate degree of driver comfort and convenience.
- ML 5 roads are maintained for a high degree of driver comfort and convenience. Road surfacing is usually asphalt.

The transportation system on the Chattahoochee-Oconee National Forests is maintained primarily through service/construction contracts with local contractors.

Any future changes to the existing system would only occur through the issuance of a subsequent decision document.

Table 3- 268. Miles Of Travel Ways By Road Objective Maintenance Levels

Objective Maintenance Level		
Level	**Chattahoochee Miles**	**Oconee Miles**
1	151.76	5.60
2	687.35	78.08
3	328.77	166.88
4	161.21	8.35
5	23.28	24.56

Source: Transportation Information System database, 2002

A number of variables affect Road maintenance capabilities. Budget allocations vary from year to year and from forest to forest, making it difficult to predict final budget allocations. No direct linkage exists between forest plan budget requirements and Congressional allocations; therefore, forests have no assurance that final budget levels will equal those stated in their forest plans.

Road maintenance budgets have fluctuated during the past 10 years, while traffic volumes on the Forest road system have increased. Timber sales and commercial user contributions to road maintenance have also declined. The declining commercial use of the transportation system is expected to continue. The reductions in contributed maintenance funds and fluctuating budgets have resulted in roads not being maintained to the level prescribed in management objectives.

County governments continue to provide maintenance on some Forest roads, but also at reduced levels. Local population growth has increased the burden on county road systems, while budgetary constraints have concentrated maintenance priorities on roads closer to urban areas.

Even though commercial use of the Forest road system has declined, the recreational traffic has increased substantially. The arterials and major collectors that connect the Forests to urban areas have experienced increased day-use traffic, particularly on weekends. This traffic increases the maintenance work necessary to keep the roads in a safe and structurally sound condition.

Continued growth in recreation use, without increases in the road system mileage, may cause lower visitor satisfaction and increased conflicts among competing recreational activities. New road construction for recreational purposes is expected to be very low to none, and would not vary by alternative.

Road decommissioning terminates motor vehicle use of roads no longer needed and restores ecological processes interrupted or impacted by the unneeded road. Decommissioning occurs when a road is no longer needed for resource management. Roads are also candidates for decommissioning when maintenance requirements and resource impacts outweigh access needs. Decommissioning includes various technologies to stabilize and rehabilitate unneeded roads such as:

- blocking the road intersection,
- revegetation,
- water barring,
- removing fills and culverts,
- re-establishing water drainages,
- removing unstable road shoulders,
- full obliteration by recontouring and restoring natural slopes.

Decisions regarding all road construction, reconstruction or decommissioning will be informed by a roads analysis. Currently, new road construction is 0 miles per year, reconstruction ranges from 20 to 40 miles, while decommissioning ranges from 0 to 10 miles on the Forests.

The rate of increase in motorized travel on the forest has outpaced the forest's ability to maintain the transportation system. Reports developed in response to inquiries regarding backlog and deferred road maintenance indicate that the Forest has been maintaining less than 20 percent of the road system to standard. New standards and guidelines designated to protect water quality, fish and wildlife habitats, and primitive recreation opportunities, also affect the degree to which motorized access will be provided.

The annual accomplishment reporting for Fiscal Year of 2002 indicated approximately 16 percent of the roads under the Forest's jurisdiction were maintained to their objective maintenance level. Forty-four percent of the Forest's system roads had some degree of maintenance. As a result of the Forest's reduced ability to provide adequate maintenance and restoration work, the Forest has increased road closures to motor vehicles (level 1 maintenance) and road decommissioning.

Potential Public Forest Service Roads

Under consideration is the ability for the Forest Service to designate certain Forest System Roads as public roads. By definition, a public Forest Service road (PFSR) is a National Forest System road that is designated "open to public travel" in accordance with *23USCs101(a).* The roads must serve a compelling public need. By definition, the roads would remain open and be subject to Federal Highway Safety Act requirements. Exceptions would be for scheduled seasonal closures or emergency closure needs. To date, and per agreement with the Federal Highway Administration, maintenance levels 3 to 5 roads have been subject to the Highway Safety Act requirements, but without the public road designation. The Forest Service has identified potential roads for public forest service road classification, along with construction work, which would be required to bring these roads up to the standards necessary for a public road. The Forest Service Region 8 Regional Office has prioritized the projects to be accomplished as money becomes available. PFSR designation is still preliminary and is subject to change, modification, and approval. Further analysis through travel management, road analysis, public involvement, and decision documentation is also required.

Trails

Trails can be an effective means of managing public travel and access in the backcountry. An increasing demand for a more primitive type of experience by all user groups has placed greater emphasis on trail system planning. As a result, the inventory of forest trails has grown. There are 798 miles of forest development trails, including the following nationally-recognized footpaths:

- The Appalachian Trail,
- The William Bartram Trail
- The Anna Ruby Falls Trail
- The Arkaquah Trail
- The Duncan Ridge Trail
- The Jacks Knob Trail
- The Benton MacKaye Trail
- The AT approach trail from Amicalola Falls State Park to Springer Mountain .

Trail uses include, hiking, mountain bikes, off-highway vehicle use, and horseback riding.

Unclassified Roads and Trails

Non-system roads and trails are referred to unclassified roads and trails. Unclassified roads or trails are roads or trails on National Forest System lands that are not managed as part of the transportation system. This class of travelway includes unplanned roads, abandoned travelways, off-road vehicle tracks that have not been designated for use. Unclassified roads include roads once under permit or other authorizations that were not decommissioned upon the termination of the authorization. Many of these routes have been created by recreation use. Some of these routes are older timber and range roads that no longer serve the purpose for which they were intended and were not properly closed.

Decisions will be made in project or watershed level decision documents to designate these routes or eliminate them. In most cases, the objective will be to eliminate the routes by obliteration, along with all subsequent routes created there after. Any new route, road, or trail that needs to be created will have to have a compelling need and go through the proper analysis process before construction.

Bridges and Major Culverts

There are 53 inventoried road bridges and 67 major culverts (open-end area equal to or greater than 35 square feet) on the forest. Of the structures under Forest Service jurisdiction, 61 are open to public travel and have a span length greater than 20 feet. These structures are subject to National Bridge Inspection Standards (NBIS) and currently are being inspected every two years. Of the NBIS structures inspected to date, nearly $500,000 in repair and/or replacement costs have been identified as necessary to bring the structures up to state legal load requirements. There are also 112 trail bridges on the forest. When inspections are performed, they are intermittent and occur only when specifically requested by field personnel. Local knowledge indicates that maintenance has been lacking on most trail bridges and some are in need of full replacement.

Future Trends

The past 10 to 15 years have brought a shift in the volume and mix of travel modes on the forest. All forms of recreation travel have increased in volume.

Variation in volumes can be attributed to a number of reasons. Factors include technology advances, economic conditions, changing demands for recreational experiences, population increases, and other social influences. Along with the multitude of diverse uses of National Forest System Lands has come an increasing demand for segregating those uses. The following are common conflicts in uses of the National Forest system lands: hikers and horseback riders vs. mountain bikers; all-terrain vehicle users vs. full-sized motor vehicle users; and all terrain vehicle users vs. hikers, horseback riders, and mountain bikers. Other conflicts also need to be addressed. The travel management plan will attempt to deal with many of these conflicts.

Direct And Indirect Effects

The transportation system on the Forest provides motorized travel opportunities. This system includes federal and state highways, county roads, and Forest service roads - those roads under the jurisdiction of the Forest Service. Travel on the Forest occurs on paved roads, gravel roads, and unimproved roads. The transportation system allows access to major portions of the Forest for administrative use, timber harvest, hunting, fishing, sightseeing, recreation, and numerous other activities. Management of resources and programs affects the existing transportation system and determines the need for further development (construction and reconstruction), maintenance, and use of roads. Certain areas of the Forest may have travel restrictions and prohibitions to protect soil and water resources, to reduce wildlife disturbance during certain seasons, and to resolve user conflicts.

Effects On Travel Management From Aquatic And Soil Management

One emphasis area of the Forest is to maintain quality of water and riparian areas, and to ensure soil stability. Improperly engineered and maintained roads can contribute to the degradation of water, riparian area and soil stability. There are techniques that can reduce and mitigate the road's impacts on these resources. The Forest Service is developing techniques and investing in ways to improve watersheds. The Forest will continue to use the applicable instructions in the Georgia Best Management Practices for Forestry, the fifth edition of the Manual for Erosion and Sediment Control in Georgia, Transportation Analysis Units (TAU or common name, Transportation Plans), and the latest science. Alternatives that have fewer roads and thus have fewer impacts due to roads would be Alternatives B, F, G, and I.

Effects On Travel Management From Wildlife Habitat Management

Habitat improvement projects for most species will include both permanent and seasonal road closures. Road density may also be limited. Generally, motorized and mechanized access is reduced as wildlife habitat is emphasized. Forest Plan alternatives that place greater emphasis on wildlife resources reduce the transportation system miles. Because of their wildlife emphasis, Alternatives B, F, G, and I would require fewer miles of road.

Effects On Travel Management From Recreation Management

Increasingly, National Forest System lands and other public lands have become the destinations of choice for people looking for high-quality outdoor recreation experiences. As recreation use increases, travel management may need to respond with more access for various recreation opportunities and develop additional mitigation techniques for addressing impacts.

Recreation traffic is the main source of traffic on the forest road system, therefore it has the biggest impact on road and trail conditions. With arterials and collectors handling traffic ranging from 100 to more than 1,000 vehicles per day, the road maintenance program has not been able to keep pace. New road construction for recreation purposes is expected to be low. If the growth in recreation use continues, without increases in the road system, there may be lower visitor satisfaction and more conflict between users.

Recreation opportunity spectrum (ROS) classifications affect travel management strategies in that they specify motorized and non-motorized experiences. Recreation managers use ROS to designate areas where people can anticipate a particular type of recreation experience. Part of that experience is to know whether motorized or non-motorized activities should be expected in that area.

The diversity in expectations of recreation users adds complexity to travel management. Managing the multitude of user demands and providing quality recreation experiences will require more intensive efforts in planning, public education, signing, and facility maintenance. Trends indicate increasing demand for semi-primitive and primitive uses such as hiking, Off-highway vehicle use, and horseback riding which may lead to a more extensive trail system. Motorized users have the ability to travel much farther distances in a given span of time; they desire to have more looping or through routes.

Recreation use on the Forest creates demand for roads for accommodating public travel. Different types of recreation use cause different effects to the road system. Recreation traffic creates a demand for generally higher standard roads such as, double-lane or wider single-lane, accommodation of higher travel speeds, smoother roadway surfaces, or greater visibility. Driving for pleasure creates the highest recreation demand for roads open to public travel. This causes safety concerns and results in a need for higher-standard, well-maintained roads. Developed recreation also creates demand for higher-standard roads, both to and within developed recreation sites.

The most road and trail damage occurs when traffic volume peaks and wet weather conditions that saturate the road surface and the subgrade, coincide. One of the highest traffic volume peaks on the Forest is during hunting season. It occurs during one of the wettest times of year. Traffic during wet conditions could cause rutting of the roadbed, therefore increasing road structure maintenance costs. Public demand for a quality hunting experience could require that some roads be closed to motor vehicle travel during the hunting season.

Recreation on the Forest is projected to increase over time. Where demand for recreation increases and opportunity decreases, crowding and reduction in recreation experience quality could occur. As dispersed recreation increases, the potential for user conflicts and resource damage may become greater as well. Cumulatively, recreation needs - especially developed recreation - could require a certain number of roads to be constructed or reconstructed and maintained to a higher standard over time. Alternatives A, E, G, and I should accomplish this.

Effects On Travel Management From Vegetative Management

Vegetative management includes managing the timber stands for commodity production. Road access is necessary to produce timber commodities. The Forest's arterial and collector system is in place; however, new roads may be necessary to get to identified sales and cutting units. Because of economic or resource concerns that warrant restrictions, any new road construction will be either low standard and usually closed to public motorized use following harvest activities, or temporary and

completely rehabilitated after harvest activities are completed. Alternatives B, F, E, G, and I would likely have less new road construction, while Alternatives A and D would have more new road construction due to timber management.

Timber sales also contribute to annual road maintenance accomplishment. Timber sale contracts require the purchaser to perform maintenance commensurate with the commercial use of the road system. This requirement could allow for more road maintenance to be accomplished in Alternatives A, D, F, and I; and less could occur in Alternatives B, E, and G. Since maintenance on the haul road is taken care of by the purchaser, Forest road maintenance crews and maintenance funds may be used elsewhere. On the other hand, adding large logging trucks to roads used by recreational traffic increases public safety risks on roads. These risks may be minimized through proper signing, road management, and contract administration. Additional traffic from timber sales results in increased frequency of reconstruction needs for traffic-related items such as surface rock replacement.

Effects on trails from timber harvest activities will be minimal. During project planning, trail locations are identified and mitigation measures applied when appropriate. Beneficial effects may be derived through removal of potentially hazardous trees adjacent to trails, improving access to trailheads, and maintaining vistas.

Cumulative Effects

A transportation system developed from the late 1800's to the present, to access mines, timber, private lands, and popular recreation sites. As are result of Federal acquisition of lands, a more extensive transportation network was developed to accommodate continuing land management and public needs.

Presently there is a greater demand to access Public Lands for a variety of recreation uses in both motorized and non-motorized settings. The current Forest transportation system consists of a combination of roads and trails that have varying degrees of user comfort and uses. The current system allows land managers continued access to areas for resource management. Restricting travel to designated routes will decrease resource damage to the land. This will also however increase the need on the Forest for a network of roads and trails to accommodate additional recreation use such as 4-wheel driving, OHV, motorcycling, and mountain biking.

As travel to and through the forest increases, there will be an increase in impacts on surrounding public roads. County roads will be affected the most. Congestion may increase on state roads especially during peak recreation periods. All types of recreation use will significantly increase in volume on the forest. The level of commercial forest product traffic using heavy trucks is not expected to increase significantly.

As populations grow and urban development expands closer to and adjacent to the Chattahoochee-Oconee National Forests, the continuous use of forest roads and trails will increase. The forest arterials and major collectors that connect the forest will experience the most increased day-use traffic, particularly on weekends. This

traffic adds to the maintenance work necessary to keep the roads in a safe and structurally sound condition. Lands administered by the Forest Service immediately adjacent to population centers are affected the most by user-created trails that access the forest from residential properties. Under all alternatives, continual coordination and collaboration with national, state, and county officials in the management of transportation facilities to and across the forest would be continued to ensure that access is maintained, standards are consistent, safety issues are addressed, and efficiency is considered at all times.

The Forest Service is required by law to provide reasonable access to private in-holdings. The type of access for an in-holding may be determined by the location, type of access needed, and number of access points in one location. As ownership changes, the access required may also change.

Overall, the transportation system for the Chattahoochee-Oconee National Forests will strive to be efficient and safe, provide access to areas of interest, and provide for the variety of modes of transportation used by all.

Effects On Travel Management From OHV

The objective is to minimize resource damage caused by random off-road use, by keeping the use on established, maintained, officially-designated routes. The Forest's obligation stems from Executive Order No. 11644, *Use of Off-Road Vehicles on Public Lands* with support from *36 CFR 219, and 295*. The order states "It is the purpose of this order that the use of off-road vehicles on public lands will be controlled and directed so as to protect the resources of those lands, to promote the safety of all users of those lands, and to minimize conflicts among the various users of those lands." It further states areas and trails shall be located to "minimize damage to soil, watershed, vegetation or other resources of the public lands" and to "minimize harassment of wildlife or disruption of wildlife habitats." The Executive Order establishes off-road policy and authority by stating "each respective agency head is authorized to adopt the policy that portion of the public lands within his jurisdiction shall be closed to use by off-road vehicles except those areas or trails which are suitable and specifically designated as open to such use."

The Chattahoochee-Oconee National Forests have experienced an increase in off-highway vehicle (OHV) use and mountain biking. It is anticipated that, due to a high rate of growth, popularity, and tourism in the area, these uses will increase further. Other public lands are also feeling the pressure of increased recreation use.

OHV

Restricting OHVs to designated trails and roads across the entire Forest will reduce some options for OHV travel. From a management standpoint, restricting OHVs to designated routes allows the resource managers to decide the best locations to allow OHV use.

Mechanized
Mountain biking has dramatically increased in the last decade and will continue to do so. In order to reduce ground disturbance due to mountain bike travel, such as rutting, erosion, and loss of vegetation, travel ought to be limited to a maintained trail system.

Disability Access
There may be concerns that the direction concerning OHV is limiting access to persons with disabilities. Wheelchairs are not limited to designated routes.

Engineering
Limiting travel to designated routes allows for proper construction and maintenance of travel routes.

In conclusion, limiting motorized and mechanized travel to designated routes still provides the opportunity for OHV and mountain bike use, while limiting the impacts those uses have on the land.

SOCIAL AND ECONOMIC ENVIRONMENT

AFFECTED ENVIRONMENT

Demographic Changes

The Chattahoochee portion of the Chattahoochee-Oconee National Forests (Chatt-Oconee) is located within the Southern Appalachian Mountains, which includes parts of the Appalachian Mountains, the Shenandoah Valley and extends southward from the Potomac River to northern Georgia and the northeastern corner of Alabama. The Southern Appalachian Mountain area includes portions of 135 counties in seven states and covers approximately 37 million acres. The Oconee portion is in the Southern Appalachian Piedmont

Past population growth and various racial and ethnic components of the population within the counties which comprise a National Forest are characteristics of an area used to determine how dynamic and subject to change it may be in the future. A static area generally implies fewer possible issues and conflicts for land managers to consider. Conversely, a dynamic growing population or changes in population characteristics may produce many conflicting issues for consideration. Certain areas of the National Forest System and surrounding lands may be very attractive for second homes or retirement home residences. This attraction to urban dwellers in the surrounding communities may produce issues that conflict with traditional residents of the area.

Demographic changes for the Analysis area (Chattahoochee-Oconee National Forest boundary counties) and the Southern Appalachian Region Assessment (SAA) are presented first in the analysis. Then a contrast is made between the SAA region, the Forest and the State in which the Forest resides. Many of the time frames used in the Assessment were not available for the Forest, and 1990 data is the most current available for the Assessment. Therefore, direct comparisons between the two are not always possible. Some limited 2000 Census data is available from the SF 1 count (mostly population, households and housing data from the “short form”). To the extent available these data are used in the analysis.

The Chattahoochee-Oconee NF analysis area covers the 26 Georgia counties that contained any National Forest system lands within their boundaries in 1990. The 26 counties are listed in Appendix B. In 1995 a small acreage of National Forest System lands was acquired in Monroe County but this county was not included in the analysis area for the study. Reference to the Forest or the Forest area in this report relates to the 25-county study area unless specifically stated otherwise.

Population in the Southern Appalachian region increased 7.3 percent between 1980 and 1990. This compares with 14.2 percent for the Chattahoochee-Oconee NF, and 17.3 percent for the State of Georgia. More currently, the change from 1990 to 2000 was 27.3 percent for the Forest area and 26.4 percent for the State. Appendix B

shows population characteristics and their rates of change for each individual county within the Forest area, while the table below illustrates significant population variable changes from 1980 to 1990 and from 1990 to 2000 for all counties within the NF boundary.

Table 3- 269. Minority Representation and Percent Population Change

	1990 % Minority	Population % change '80-'90	2000 % Minority	Population %change '90-'00
Forest Counties	10.2	14.2	13.9	27.3
Georgia	28.9	17.3	34.9	26.4
SAA (1996)	8.1	7.3	n/a*	n/a*

** No SAA number for 2000*
Source U.S. Census Bureau

Minorities made up approximately 10 percent of the population within the Forest area and almost 30 percent of the population at the State level in 1980. The State minority population continued to be represented by about 30 percent of total population in 1990 and increased to 35 percent in 2000. The minority population in the Forest area remained about 10 percent in 1990, but increased to 13.9 percent in year 2000. The potential for Forest visits by minorities have been substantive at the State level for some time and have increased since 1990 at the Forest level. The minority population in the SAA was lower than for the Forest Counties or State of Georgia, with 8.1 percent in 1990. The Forest continues to have a lower representation of minorities than the State, but has a much higher representation of minorities than the larger SAA.

Table 3- 270. Population Density

	1980 Population Density Persons/Sq. Mile	1990 Population Density Persons/Sq. Mile	2000 Population Density Persons/Sq. Mile
Forest Counties	72	82	104
Georgia	95	112	141
SAA (1996)	94	102	n/a*

** No SAA number for 2000*
Source: U.S. Census Bureau

Population density in the SAA and State of Georgia was 102 and 112 persons per square mile, respectively, in 1990. The Forest area population density was substantially less with an average of 82 persons per square mile. A decade earlier the same general relationship existed with densities of 94, 95 and 72 for the SAA, State and Forest, respectively. In 2000 the State and Forest density levels had increased about 27 percent to 141 and 104 leaving the Forest population density substantially below the State level. The Forest as a whole falls behind the State and SAA with regards to population density due to less exposure of the entire Forest to large metropolitan areas. However, this situation is not uniform and localized areas of the Forest are within metropolitan areas. The southwestern end of the Oconee is

within the Macon metro area. The north end of the Oconee is in the Athens metro area. And the northwestern corner of the Chattahoochee is in the Chattanooga, TN metro area. This divergence can be expected to continue in the future although the difference the Forest counties and the SAA or State may narrow.

The Forest area with the ten counties reflecting 100 percent rural population have population density levels well below the Forest average density of 83.6 in 1990. (Appendix B).

The low population density for the Forest area is consistent with the rural representation of the population in the Forest county boundaries relative to the State and SAA. The percentage of persons living in rural areas in Forest counties averaged 70 percent in 1980 and increased to 72 percent in 1990. This is in contrast to the lower percentage of approximately 37 percent for the State in both 1980 and 1990. The SAA had a rural character with 53.0 percent classified as rural in 1990, which was greater than Georgia, but much less than the Forest area. There were two Forest counties, Floyd and Walker that were below fifty percent rural in 1990. All the others had over 50 percent rural with a strong rural component in both 1980 and 1990 (see Appendix B). Ten counties, 40 percent, were shown to have 100 percent rural population in 1990.

Table 3- 271. Rural Representation

	1980 % Rural	1990 % Rural
Forest Counties	70.1	72.0
Georgia	37.6	36.8
SAA	n/a*	53.0

* No SAA numbers for 1980
Source: U.S. Census Bureau

Per capita income is a relative measure of the wealth of an area. It constitutes the personal income from all sources divided by the population of the area. In the Forest Analysis area, 1990 per capita income averaged $11,202 compared to $13,631 in the State of Georgia and $10,950 in the SAA.

Income for both the Forest area and Georgia grew faster on a real basis (inflation-adjusted) than the SAA during the 1980's. The Chattahoochee-Oconee NF grew at a 2.6 percent annual rate, compared to a slightly faster rate of 3.0 percent for the State and a much slower rate, 0.8 percent, in the SAA. All individual counties in the Forest area had positive per capita growth rates ranging from 1.5 to 4.6 percent (see Appendix B).

Table 3- 272. Per Capita Income

	1980 Per Capita Income	1990 Per Capita Income	Real Avg. Annual % Change '80-'90 Per Capita Income
Georgia	$6,380	$13,631	3.0
Forest Counties - Avg.	$5,449	$11,202	2.6
SAA	$6,377	$10,950	0.8

Source: U.S. Census Bureau

A different measure of income data for the Forest and State based on Bureau of Economic Analysis (BEA) measurements is presented in Appendix B. This data is per capita personal income, but not directly comparable with the Bureau of Census per capita income shown in Appendix B. The two data sets differ because Census data is obtained directly from households; whereas the BEA income series is estimated largely on data from administrative records of business and governmental sources. The definitions of income are also different. Caution must also be used in comparing these two because one is based on real or inflation adjusted dollars while is based on nominal dollars (unadjusted for inflation). In general, the two data sources give the same picture. That is, the State per capita personal income is higher in 1990. The rate of change is higher for the Forest area than the State in the period 1990-97.

The Chattahoochee-Oconee NF can be characterized as a relatively poorer area than the State of Georgia, but slightly above average when compared to the SAA in 1990. The growth rates during the 1980s lead to a widening of the income gap between the State and Forest area, but resulted in the Forest area passing the SAA in this period. The information in Appendix B indicates that the Forest area is at least keeping pace and, may be gaining on the State during the 1990s.

The percent of the workforce out of work is another indicator of relative economic prosperity. Unemployment rates change dramatically over time, depending in large part on the national and regional economy. Some areas, however, have protracted unemployment problems because of educational attainment and lack of skills.

The unemployment rate for the Forest in 1997 was 4.5 percent, equal to the State rate. More resolution in unemployment rates for the Forest by county can be found in Appendix B for 1997.

Table 3- 273. Unemployment Rate - 1997

	1997 Unemployment Rate (%)
Forest Counties	4.5
Georgia	4.5

Source: U.S. Census Bureau

The percent of people living in poverty is another population characteristic that provides an indicator of relative economic prosperity of an area. A substantial number of persons in the Forest area are classified as living in poverty. This statistic was 14.1 percent in 1989 and 1995. These data for Georgia were only slightly

higher, 14.7 in 1989 and 15.6 percent in 1995. Data for the SAA in only available for 1989, but reflects a lower rate of 11.0 percent. Information for individual Forest area counties is presented in Appendix B and presents a wide range between counties from 8 to 23 percent in 1995. Counties on the high end of the range in 1995 were also on the high end of the range in 1989, indicating that this is a persistent characteristic of individual areas within the Forest area.

Table 3- 274. Poverty Rate

	Percent of People of All Ages in Poverty 1989	Percent of People of All Ages in Poverty 1995
Forest Counties	14.1	14.1
Georgia	14.7	15.6
SAA	11.0	*

** No SAA number for 1995*
Source: U.S. Census Bureau

The percent of households headed by a female member can be a factor that contributes to the relative poverty and relates to social disunity for an area. The greater this percentage is, the higher the number of households that may be on some form of government assistance. The level of female-headed households in the SAA was 10.5 percent for 1990, the latest year in the analysis. The Forest level was stable between 1980 and 1990, at about 5.0 percent, only half the SAA level. The State had a female-headed household level of 7.8 in 1990 and was relatively unchanged from 1980.

Table 3- 275. Percent of Female Head of Households

	1980 Female Head of Households	1990 Female Head of Households
Forest Counties	5.0	5.3
Georgia	7.5	7.8
SAA	*	10.5

** No SAA number for 1980*
Source: U.S. Census Bureau

The number of persons per household in the decade of the 1980's and in the 1990's was very similar between the Forest area and the State. There was not much change over this period in household density with a modest decline from 2.8 to 2.7 persons per household in 1990, and then remaining at 2.7 in year 2000. This modest change has been experienced at both the Forest area and State level and is consistent with the 1990 data for the SAA.

Table 3- 276. Household Density

	1980 Persons per Household	1990 Persons per Household	2000 Persons per Household
Forest Counties	2.8	2.7	2.7
Georgia	2.8	2.7	2.7
SAA	*	2.6	*

** No SAA numbers for 1980 and 2000* *Source: U.S. Census Bureau*

The decade of the 1970s reflected substantial growth in housing units at both the Forest and State levels. This trend continued at a slower pace in the 1980s and then picked up again slightly in the 1990s but at a pace that was about two-thirds the 1970s growth pattern. The three statistics--population growth, housing density and housing units--are directly related. In the 1990s, Forest population increased 27 percent (presented above) and persons per household remained at 2.7. This could imply that the number of housing units should increase at about the same rate of 27 percent. As shown below, the rate of change in the 1990's for the Forest area was 27.5 percent. The rate of growth in housing units for three decades, 1970s, 1980s and 1900s, has been essentially the same at the Forest area and State level.

Table 3- 277. Housing Units

	Housing Units Percent Change 1970-80	Housing Units Percent Change 1980-90	Housing Units Percent Change 1990-00
Forest Counties	36.3	22.4	27.5
Georgia	36.7	26.4	27.0
SAA	41.5	23.5	23.1

Source: U.S. Census Bureau

Dawson and Gilmer County, which were both 100 percent rural in 1990 and had a population substantially below the county average in the Forest area in the 1980-2000 period, have experienced an explosion in population and housing units. Population and housing units have increased approximately three times the Forest area county average.

Median housing values for the three areas are contrasted below. Housing values in the Chattahoochee-Oconee are substantially below the values for the SAA and the State of Georgia. Housing values are determined principally by the extent of demand. The greater the demand, the higher prices are bid up. Population and job increases play a factor in the demand for housing. Another factor is land and building costs. Land cost in the more rural Forest setting would generally be less than in a more urban area. The median value of housing in the Forest area was $29,644 in 1980 and increased to $57,556 in 1990. The comparable values for Georgia were $36,900 and $71,300. The values for the SAA were substantially below the State level and only slightly above the Forest area at $59,700 in 1990.

Table 3- 278. Housing Value

	Housing Units Median Value 1980	Housing Units Median Value 1990
Forest Counties	$29,644	$57,556
Georgia	$36,900	$71,300
SAA	*	$59,700

** No SAA number for 1980*
Source: U.S. Census Bureau

Economic Trends

Analyzing the major sectors of an economy allows insight into how diverse the economy is and what industries may be driving its growth. Appendix B shows the entire economy broken out by major Standard Industrial Code (SIC) industries and by important industry sub-sectors for wood products and for an estimate of the contribution of certain industries to tourism.

Manufacturing is a dominant sector in the Forest economy. This sector declined in importance between 1985 and 1996 with respect to value of industrial output but increased in importance with respect to total employment. This sector represented 44 percent of industrial output and Forest areas employment in 1990.

As the manufacturing sector declines (increases) other sectors increase (decrease) leaving the economy more (less) diverse. The Forest appears to have increased in diversity when we look at industrial output between 1985 and 1996. In the case of total employment, the opposite has happened and the economy has become more concentrated in the manufacturing sector suggesting the economy is less diverse.

The larger SAA economy had 42 percent of industrial output associated with manufacturing in 1991. This reflects a slightly more diverse economy than existed in the Forest area. Both the SAA and the Forest have a concentration in manufacturing much higher than the 20 percent level of the U. S. economy as a whole.

Table 3- 279. Economic Diversity

Sector	Industry Output		Employment	
	% of Total 1985	% of Total 1996	% of Total 1985	% of Total 1996
Manufacturing	56.4	44.1	36.8	44.1
Lumber & Wood Prods.	0.9	1.1	1.2	1.1
Wood Furn. & Fixtures	1.3	2.2	1.9	2.2
Paper & Pulp Products	4.4	3.5	2.0	3.5
Total Tourism	1.2	1.2	2.0	1.2
Total Economy*	$14,562.1	$21,924.2	204,538	287,987

** Dollars in millions and numbers of employees*
Source: U.S. Census Bureau

Within the manufacturing sector, wood and wood-related products (Lumber, Furniture & Fixtures and Pulp & Paper) represented 6.8 percent of the local economy's total output in 1985 and 1996. Employment in the wood and wood-related products sub-sectors accounted for 5.1 percent of total Forest area employment in 1985 and increased to 6.8 percent in 1996.

Tourism is defined as any non business-related travel of 100 miles or more from home. Recreation would be a subset of the tourism estimate; therefore, its share of the economy would be something less than the tourism numbers. Recreation in a local area is a major part of the tourism estimate and presents the best estimate of

the importance of recreation available. Estimates of tourism for both industrial output and employment are very similar for 1996 and 1985. These data suggest about 1.2 percent of the Forest area economy is related to tourism. Employment in this sector was 2.0 percent in 1985 but dropped to 1.2 in 1996.

Forests within one hour of a population of one million people or more are qualified as Category 1 Urban National Forests. The Chattahoochee-Oconee NF is such a forest with several large cities including Atlanta, Chattanooga and Macon within an hour distance. Counties in the urban fringe around these cities border the Forest area in some cases. The State of Georgia had a population of over 8 million people in the year 2000 and most of these residents are within 1 hour of the Forest. Recreation and related activities to support this population and other tourists to the Forest area is important, but much of the economic activity related to this use takes place outside the Forest Analysis area.

Further comparison of all nine sectors of the Chattahoochee-Oconee analysis area economy is presented in Appendix B. Besides the manufacturing changes discussed above, other changes in industrial output include construction with an increase from 4.6 percent in 1985 to 7.4 percent in 1996; transportation and utilities, non tourism related, with an increased from 4.7 percent to 5.8 percent; finance, insurance and real estate increased from 3.9 percent to 7.3 percent; and services sector, non tourism related, increased from 8.2 to 15.2 percent. Agriculture, mining, wholesale and retail, non-tourism related, and government sectors all reflected minor declines from 1985 to 1996. With these changes the local economy appears to be moving in the direction of greater diversity. Employment data is less supportive of this conclusion and the Forest area economy remains very dependent on the manufacturing sector.

For the purpose of economic analysis, in the Southern Appalachian Assessment, the years of contrast were 1977 and 1991 from the IMPLAN input-output model. In the Forest analysis more current data were used, which contrasts a 1985 regional economy with the one found in 1996. Because these years are dissimilar, many of the percentage changes are not directly comparable. Determining an average annual rate of change for both data sets does allow for a relative comparison measure. The following chart compares the rate of change between the economy of the SAA and that of the Chattahoochee-Oconee NF analysis area.

Table 3- 280. Economy Dynamics

	Industrial Output Avg. Annual % Change	Employment Avg. Annual % Change
Forest Counties*	4.6	3.7
SAA**	2.6	1.9

** Change from 1985 to 1996*
*** Change from 1977 to 1991*
Source: IMPLAN 1985 and 1996 Data

The average annual growth in industrial output of 4.6 percent in the Forest area is approaching twice the growth rate of 2.1 realized in the SAA. The 3.7 percent average annual growth in employment in the Chattahoochee-Oconee NF area is slower than growth in industrial output (4.6) but faster than annual employment growth in the SAA (1.9). The faster growth rate for output compared to employment in the Forest area and SAA suggests that both areas have invested in capital equipment that provides productivity gains which result in higher levels of output growth relative to employment growth.

A principal way an economy grows is by exporting goods and services. Most typically, manufacturing activity is thought of as providing most of this export-related activity. However, services and retail trade can be considered "export" industries if significant visitors come in from outside the Analysis area and participate in travel-related activities to bring in new dollars. In this context tourism can be classified as an export-driven activity. A manufacturing industry can be a net importer if it imports more of a commodity than it exports.

The level of net exports for sectors in the IMPLAN analysis is presented in Appendix B. In this table the tourism detail is presented. The table below compares a summary of tourism and other selected sectors in the Chattahoochee-Oconee NF analysis.

The table shows that this economy was a net importing economy in 1985 by 1,864.1 million, and became more dependent on imports in 1996 (net $3,796.2 million). The change that has taken place in the "Wood and Wood-related Products" category is reflected above. "Lumber and Wood Products" was the only wood and wood-related products sub-sector that was a net exporter in 1985 and 1996. This sub-sector declined in net exports from $141.2 million in 1985 to $101.1 million (a decrease of 28 percent) in 1996. In the same period, there was a decline of 36 percent in the C-O NF timber output. (See 'Forest Products' topic of this EIS.) This would indicate that substitution of timber harvest to private lands as national forest harvest declines is not a completely effective option.

Table 3- 281. Exporting Industries

Commodity	Net Exports*		Net Exporting Industries as a Percent of Total (Positive Exporting Industries)	
SELECTED MFG.				
Lumber & Wood Prod.	$141.2	$101.1	5.2	2.6
Wood Furn. & Fixtures	-$2.2	-$35.9	0.0	0.0
Pulp & Paper Products	$119.1	- $173.4	0.0	0.0
Total Manufacturing	$1,803.3	$3,130.6	66.3	81.2
Tourism Trade-Estimate	-$27.3	-$71.9	0.0	0.0
EXPORTS				
Total Net Trade	-$,1864.1	-$3,796.2		
Total Positive Trade Ind.	$2,718.4	$3,857.6		

** Millions of Dollars* *Source: IMPLAN 1985 and 1996 data*

The other two sub-sectors, "Wood Furniture and Fixtures" and "Paper and Paper Products," were net importers in 1985, and became larger net importers in 1996. Total manufacturing was a net exporter in 1985 and increased its net exports in 1996. Tourism was a net importer in both time periods increasing from -$27.3 million in 1985 to -$71.9 million in 1995.

The sum of all sectors or sub-sectors, when sub-sector detail is provided, with a positive net export value ("EXPORTS-Total Positive Trade Ind." in Appendix B) provides the basis for determining a commodity's share of total net exports. This computation is only valid for sectors or sub-sectors that are net exporters (positive values). Manufacturing in 1985 had net exports of $1803.3 million and this was 66.3 percent of the $2718.4 million for all net exporting industries in the Forest area. The only other major sector that reflected positive net exports was the "Government" sector. "Finance, Insurance and Real Estate" and "Services-Non-Tourism" were the two largest net importing sectors with a drain of over a million dollars form each sector.

The Tourism sub-sector estimate suggests that spending in the Forest analysis area by travelers coming from outside the Forest area was less than expenditures of residents traveling outside the area. Further, net imports in this sub-sector actually increased between 1985 and 1996.

The Chattahoochee-Oconee NF Analysis area can be contrasted with the SAA, which was a net exporter in 1991 of goods and services of $25.5 billion. Manufacturing was the largest net exporting sector, representing 24.6 billion. Thus, manufacturing represented 96.5 percent of the net exports in the SAA. Construction (-$6.7 billion) and Services (-$4.3 billion) were the largest net importers and contributed to a drain of money from the SAA economy.

The total Chattahoochee-Oconee economy was a net importer in 1985 and increased in net imports in 1996 to a negative $3796.2 million. Manufacturing dominated the positive trade industries. "Lumber & Wood Products" was an important sub-sector of manufacturing with regards to the positive trade.

Another way to indicate diversity of an economy is with the Shannon-Weaver Entropy Indices of diversity. This process allows a relative measure of how diverse an area is with a single numerical index. The entropy method measures diversity of a region against a uniform distribution of employment where the norm is equi-proportional employment in all industries. All indices range between 0 (no diversity) and 1.0 (perfect diversity). These two extremes would occur when there is only one industry in the economy (no diversity) and when all industries contribute equally to the region's employment (perfect diversity). Another factor affecting the magnitude of the index is the number of industries in the local economy - the more industries, the larger the index.

Table 3- 282. Shannon-Weaver Entropy Indices

Forest Area Counties	1977 Four Digit SIC	1993 Four Digit SIC
Lumpkin	0.33670	0.57985
Chattooga	0.34921	0.51019
Banks	0.32330	0.57985
Greene	0.51083	0.57291
Hall	0.60665	0.67032
Forest area (all counties) (Weighted average)	0.47251	0.57781
Georgia	0.62443	0.71644
United States	0.66483	0.71644

Source: USDA Forest Service, IMI

In 1993, Chattooga was the least diversified county in the Forest area and Hall County was the more diversified. Chattooga was 40.4 percent less diversified than the State of Georgia [.71644/.51019-1]. Hall County was only 6.9 percent less diversified than the State in 1996.

Between 1977 and 1993 all Forest counties became much more diversified. Banks County was the least diversified in 1977 but moved to second least diversified in 1996. Lumpkin County increased its diversity 72.2 percent between 1977 and 1993, the greatest increase of the Forest area Counties. Hall County, which was the most diverse of all Forest area Counties increased its diversity index by only 10.5 percent between 1977 and 1993 and showed the least improvement.

In summary, the Forest area is less diversified than the State, but all counties have increased their diversity, from 10.5 to 72.2 percent in the 1977-93 period (see Appendix B). On an average aggregate employment basis, the Chattahoochee-Oconee NF was about 32.6 percent less diversified than the State of Georgia economy in 1977, and 24.0 percent less diversified in 1993. Thus the Forest area is gaining on the State which increased its diversity index value by 14.7 percent in the 1977-93 period.

Twenty-five percent of the monies received from natural resource consumption (25% funds), such as timber harvesting, mining and recreation, on National Forest lands are paid to the counties with these lands. If these payments by the Forest Service do not amount to at least $1.75 per acre, then Payments in Lieu of Taxes (PILT) are used to address the shortfall. The Bureau of Land Management administers the PILT payment.

The level of these payments and trends over time are important to the individual counties involved. Trends in 25 % Funds and PILT are important because declines or even slow growth can put additional pressure on the area's tax base. Appendix B provides information on revenues for each of the twenty-five Forest area counties. Aggregate amounts and change from 1990-97 is presented in the table below.

Table 3- 283. 25% Funds and PILT Funds

Forest County Area	1990	1997	% Change 1990-1997
25% Funds	$907,816	$689,906	- 23.0
PILT Funds	$396,132	$442,401	11.7
TOTAL	$1,303,948	$1,132,307	-13.2

Source: U.S. Dept of Interior

County revenues from 25 % funds vary annually depending on timber harvest, mining and recreation use for that year. The trend over time has been down, however, because of a reduction in timber harvesting. PILT payments have not made up for the shortfall and there has been a decline in the total payment of 13.2 percent from 1990 to 1997. One reason is that PILT comes from Federal Government monies specific to the program and appropriated prior to the availability of information on whether a shortfall will exist and if so its magnitude. Sometimes the appropriated money is inadequate to cover the shortfall. It would appear that this has resulted in some decline in payments to the Chattahoochee-Oconee NF Counties.

Recent legislation, Secure Rural Schools and Community Self-Determination Act of 2000 (PL 106-393), provided counties with options. They could continue to receive payments under the 25 percent fund payment process currently in effect or elect to receive their share of the average of the three highest 25 percent payments during the period of 1986 through 1999. Some Forest area Counties selected the second option, which is called the full payment option. The high three-year payments average for the 1986-97 periods at the Forest area level is about $1.2 million compared to the 1997 payment of $0.7 million. The 25 percent fund monies have continued to decline for the Forest area since 1997.

Land use and its change over time is an indicator of the dynamism of an area. Areas converting from rural uses to urban uses have implications of change that affect residents. The table below shows percent share land use for the Chattahoochee-Oconee NF Analysis area. The land use category is “Forest” and “Farm,” which is a rural use; for “Urban” and “residual” by individual Forest area Counties, see Appendix B.

Table 3- 284. Land Use

Percent Share							
Forest		Farm		Urban		Residual	
1982	1992	1982	1992	1982	1992	1982	1992
Forest Counties – Weighted Average							
18.0	17.2	55.3	53.9	3.8	5.4	22.8	23.6

Source: USDA Natural Resource Conservation Service

This data set from the Natural Resource Conservation Service includes federal land within the residual category. Residual also includes highways and power lines access right of ways. Thus, changes in the “Forest” category reflect changes in private forestland and not National Forest lands. The urban and residual categories have both increased in their share about 1 to 1.5 percentage points over the 10-year period (1982 to 1992). The forest and farm categories have each given up about 1 to

1.5 percentage points over this period. These are small changes within any category but suggest a slow shift from rural to non-rural uses.

In the SAA it was found that little forestland was lost between 1970 and 1990 in the Analysis area. However, urban uses, such as, roads and housing developments caused by increased population in the area decreased farmland, pasture, and open space. Retirees and commuters from nearby urban centers were responsible for part of that demand for development.

Summary of Demographic and Economic Changes

Population and economic dynamics are changing at a moderate rate within the Chattahoochee-Oconee NF Analysis area. Population growth was a healthy 14 percent in the 1980's and grew to twice this rate (27 percent) in the 1990's. The Forest area population grew slightly slower than the State of Georgia in the 1980s and slightly faster in the 1990s.

The minority population in the Forest area was considerably below the State level. It was 9.7 percent in 1990 compared to 28.9 percent for the State, and 13.5 percent in 2000 compared to 34.9 percent for the State. Further, the data suggests a net minority migration to both the Forest area and State during the 1990s. National minority representation was 13 percent of total population, the same representation found for the Forest area in 1990. The increasing trend for the Forest and the high representation of minorities in the State of Georgia suggests a relatively high opportunity for minority participation in local recreational endeavors.

A major difference exists between the Forest area and the State with regards to its rural population character. The Forest area is much more rural, 100 percent rural in ten of the twenty-five counties in 1990, and over 70 percent rural Forest-wide. Further, the Forest actually increased its rural representation in the 1990's. The State as a whole realized a slight decline during this period.

The Forest area's economic health, as measured by per capita income, grew at a robust real rate during the 1980s (2.6 percent per year), but this rate was less than the rate experienced by the State of 3.0 percent. Average per capita income in the Forest was $5,449 that was almost a $1,000 less than the State in 1980. The gap widened during the 1980's and the Forest area was $2400 behind in 1990. Unemployment decreased between 1990 and 1997 and mirrored the State level of 4.5 percent in 1997.

With a steady income growth rate and a downward trend in unemployment, the area economy appears strong and stable. People with increasing incomes and adequate employment are likely to have the time and resources to pursue recreational activities. The National Forest can be a prime outlet for some types of recreational activities.

The Forest poverty rate remained constant between 1989 and 1995 at 14.1 percent. It was slightly below the State level in 1989 and 1995, but substantially above the SAA rate in 1989. Households with female heads changed little between 1980 and

1990, but the rate was less than the State level in 1990 of 7.5 percent. Household density was at 2.7 persons per household in 2000, and that was comparable to the State and SAA. These Forest area characteristics are comparable to data for the larger State and SAA areas and should not detract from economic growth in the area.

The Chattahoochee-Oconee analysis area's economy was very dependent on manufacturing in 1985 and become more dependent in 1996, with 81.2 percent of net exports coming from the manufacturing sector. As measured by total output or employment in 1996, manufacturing was about 44 percent of the economy. Four sectors, "Construction", "Transport & Utilities", "Finance, Insurance, Real Estate" and "Services" have gained in shares of the economic activity, as measured by industrial output, during this period. "Lumber and Wood products" was the only wood-related sub-sector that gained in importance, from 0 .9 to 1.1 percent. "Wood Furniture & Fixtures" and "Paper & Pulp Products" both declined. These three sectors make up the wood products manufacturing components of the economy and their share of the total Forest area economy was about 6.8 percent in 1996. "Tourism" maintained a 1.2 percent share of the economy in 1985 and 1996. Employment data suggests the same general character of the Forest area economy but reflect slightly different sector shares and trends between 1985 and 1996.

In general, economies that export more than they import are able to grow faster than those that are net importers. The Forest was a net importer ($1864.1 million) in 1985 and this level of net imports increased to $3795.2 million in 1996. Wood Products and Tourism are two sectors examined in more detail with regards to net exports. Tourism was a net importer in both 1985 and 1996. "Lumber and Wood Products" was a net exporter in 1985 and 1996, but the level of exports decreased to $101.1 million in 1996. "Wood Furniture & Fixtures" and "Paper & Pulp Products" were both net importers in 1985 and 1996.

A different indicator of economic diversity is the Shannon-Weaver Entropy indices. The index value ranges from 0.0 to 1.0 with 1.0 reflecting complete diversity. The Forest area had a Shannon-Weaver Entropy index value of 0.57781 in 1993. The State value for this period was 0.71644.

Land use changed very little between 1982 and 1992. The Forest area in the private sector lost about one percentage point in the share of land in this category during this period. Forested public land including National Forest lands has changed very little over this period.

Thus, the Forest area economy and demography reflect a strong rural base. The economy appears healthy, but very dependent on manufacturing and not positioned for rapid growth. Population, housing, employment and income continue to increase which can generate some additional pressure for leisure time activities. The demand for such activities would be further supported by the urban setting that exists outside the Forest Analysis area but within 100 miles of the Forest.

Effect of Demographic Changes on Natural Resource Management

The Southern Appalachian Assessment found that since 1970, little forestland has been lost in the region. Urban, roads, and housing development growth, caused by increased population, have taken farmland, pastures, and available open space. Retirees and commuters from nearby urban centers are partly responsible for the demand for development.

Newcomers to the region feel differently than long-time residents about natural resource preservation. Often, the latter's livelihood depended upon manufacturing from natural resources. Managers of natural resources have had to respond to new sets of values and preferences, particularly increased demand from land and water resources for scenery, recreation and tourism.

Population in the region is projected to grow by 12.3 percent by 2010, slightly less than the growth rate expected for the nation (13.1 percent). Most of the growth is expected to be in northern Georgia, western North Carolina, and portions of eastern Tennessee and northwestern Virginia.

The increase in population density across all counties in the southern Appalachian region has impacted farms, forests, and pastures and has removed or impacted habitat for most species of wildlife and fish. More people entering the area has resulted in greater amounts of land conversion and impacts to water quantities, quality, and use. At higher elevations, development has impacted visual qualities.

As certain areas of the southern Appalachians have been developed, more urban pressures have impacted the land. Private lands have become posted as "off limits", causing public lands to become more coveted. This private land restriction put more pressures on public land to accommodate increased demand for tourism and recreation.

The following analysis details the Chattahoochee and Oconee NF's (C-O NF's) market area and presents estimates of the percentages of persons 16 or older that fit various personal and household profiles and who live in the forest impact area. The results were taken from the "Public Survey Report for Southern Appalachian National Forests; Chattahoochee & Oconee," Southern Region Forest Service, Southern Research Station, and the University of Tennessee, July, 2002. p.11 (see Table 3-285, below). The Forests' market area includes all counties within a 75-mile radius of the boundary of the forests. A sub region market area includes all the counties within the combined 75-mile radii of the forests covered by this report. Little difference in characteristics was found between other forests in the region and the C-O NF's market areas.

Most people, age 16 and over in the market area, live year round (98 percent to 97 percent), leaving only 2 to 3 percent being seasonal residents. Almost half, (48 percent) of the sample respondents were from Georgia with about 52 percent living in nearby southern Appalachian states.

Table 3- 285. Percentage Of Local Residents 16 Or Older By Personal Or Household Characteristic By Forest, Sub-Region, And Region-Wide In The Southern Appalachians, 2002.

Personal and Household Characteristics	Forest Market Areas	Combined Forests Sub region	Southern Appalachian Region Area
	Chattahoochee & Oconee (N=2597)		
Year-round resident	97.1	97.3	97.2
Part-time resident	2.9	2.7	2.8
Percentage of residents in market area by state	AL 13.3 TN 19.3 GA 47.9	TN 17.4 GA 43.4 NC 13.9	GA 24.2 AL 21.4 TN 14.3
Lived in SA entire life	35.2	35.3	38.1
Lived in SA 20+ years	46.7	46.8	51.7
Lived in SA 10-19 years	20.6	20.5	19.0
Lived in SA <10 years	32.8	32.7	29.3
Remain in the SA for job	6.5	6.4	7.4
Remain in the SA for family	56.0	56.5	54.8
Remain for the SA area	15.2	14.4	14.6
Remain for other reasons	22.4	22.7	23.2
Own 5+ acres of rural land	12.0	11.7	13.1
Age under 30	28.6	28.8	27.2
Age over 55	25.4	25.3	27.3
White, non-Hispanic	72.4	72.7	74.5
Black, non-Hispanic	21.0	20.8	19.7
Hispanic	4.5	4.3	3.6
Foreign born	1.6	1.8	1.8
Education - 8th grade or less	6.7	6.4	7.3
Education - Bachelor's degree/more	22.6	22.3	21.0
Work a job	60.8	61.4	59.9
Retired	37.4	37.0	39.5

Source: National Survey on Recreation and the Environment, Version 12, 11/2001 to 4/2002.

Almost 35 percent of residents surveyed have lived in the southern Appalachian region their entire lives. While about 47 percent of the residents have lived there for 20 years or more (Percentages include those who have lived there all their lives). Just under one third have lived in the region less than 10 years indicating a fairly mobile population and a large contingent of recent immigrants. For people living in the Georgia market areas, a majority, over 55 percent, remains in the sub-region because of family ties. Very few, around 7 percent, remain for their job and 15 percent remain because of attachment to the area itself.

Around 12 percent of responding residents are owners of 5 or more acres of rural land. Plus, about 28 percent are under age 30, and about 25 percent are over age 55. Most of those surveyed are between the ages of 30 and 55. About three fourths are non-Hispanic White, 21 percent are Black, and around 4 percent are Hispanic. Roughly 2 percent are foreign born. Around 7 percent have less than a high school education and around 23 percent have a college degree. About 60 percent work a job while 40 percent are retired. Typically, areas surrounding the Chattahoochee-Oconee National Forests are viewed as attractive because of the natural and scenic amenities that are available. These are popular retirement locations.

Management of Natural Resources' Impact on Economic and Social Status of Local Communities

The Southern Appalachian Assessment found that residents of communities near public land are sensitive to land management choices. Further, it found the region's communities are still in a lower economic status than surrounding state populations. Likewise, their economy is more heavily dependent on natural resources than those of the states that comprise the southern Appalachians. Of particular concern to residents of the area, is the need to balance local interests to those interests of retirees, logging, and tourism.

For the Chattahoochee-Oconee market area, its local economy is dependent on manufacturing, goods and services, and somewhat on tourism.

Findings of the Public Survey Report include the value to market area residents to protect sources of clean water; maintain the national forests in good condition for future generations; provide protection for wildlife and habitat; protection of trees to emphasize healthy forests; leave forest area natural in appearance, and to protect rare or endangered species.

Those values most often emphasized in the management of national forests, i.e., outdoor recreation and timber are the second or lower half of the list of values evaluated by survey respondents. Clean water, future generations, wildlife, and forest health are the highest priorities by the tax paying, stake-holding public (Table 3- 286).

Table 3- 286. Percentage Of Local And Regional Residents 16 Or Older Indicating the Stated Forest Value Is *Important/Extremely Important*.

Forest Value	Forest Market Areas	Combined Sub region Market Area	Southern Appalachian Region Market Area	National
	Chattahoochee & Oconee			
Protect sources of clean water	94.3/86.7	93/84.6	94/86.3	94.1/82.7
Maintain in good condition for future generations	92.1/83.9	91.8/81.9	92.7/83.7	92.5/80.4
Provide protection for wildlife	88.4/73.1	87.4/70	88.8/72.4	88/69.4
Emphasize healthy forests	88.0/70.7	86.7/69.3	87.7/70.5	N/a
Leave them natural in appearance	87.0/69.7	83.7/66.2	85.9/68.6	85.6/64.3
Protect rare or endangered species	83.2/70.8	81.7/68.1	83.1/69.7	84.7/67.1
Provide information and educational services	79.8/54.3	79.6/55.1	80.1/55.9	79.1/52.5
Provide natural places for personal renewal	75.5/53.9	75.5/53.4	75.8/54.2	73.9/49.1
Provide outdoor recreation	73.0/45.7	73.9/47.3	74.1/47.8	73.4/44.8
Provide abundant timber supply	70.3/51.9	73.8/56.6	72.3/54.8	77.7/57.6
Help local tourism businesses	53.3/31.8	60.1/38.4	57.3/36	56/31.1
Permit grazing of livestock	41.9/24.2	46.3/28.4	45.2/26.5	49.8/28
Provide raw materials and products for local industries	35.7/20.7	40.1/23	38.7/22.3	45.1/24.9

Source: National Survey on Recreation and the Environment, Version 12, November 2001 to April 2002.
National percentages are from NSRE Version 6 and 7, September 2000 to March 2001.

Values and Attitudes of Southern Appalachia Residents Toward Natural Resources and Ecosystem Management

Natural resource management attitudes and values that residents of the SAA hold are extremely important for land managers to realize. Research done during the SAA analysis showed that most people felt that environmental protection and economic growth could be compatible.

However, when people had to choose between the two, their first choice was the environment. Most people felt that environmental protection has not gone far enough. But, the SAA residents were not asked how to protect the environment, especially since (C-O data) 92.1 percent wanted to maintain forests for future

generations, 88.4 percent want to provide protection for wildlife, and 88.0 percent wanted to emphasize healthy forests (Table 3- 286). There could be a perception that these values would just 'happen' if left to nature or it is assumed that prudent forest management of all types is going to 'occur' to maintain those values. SAA residents also indicated a willingness to put more personal funds toward collective environmental protection but how they would do this was not elaborated upon in the survey.

Furthermore, the SAA found that as retirees, urban transfers, and other new residents move into the SAA region, concerns for the health and aesthetic appearance of the region's ecosystems were likely to strengthen.

In the Journal of Forestry article "*Changing Demographics, Values, and Attitudes*", H. Ken Cordell and Michael Tarrant, October/November 2002, pp. 31-32, it was found that the magnitude of upward trends in population, changes in demographic makeup, and rising demand for recreation suggest there likely are other significant social changes in the South. Among such possible changes are the values and attitudes people hold toward the natural environment in general and forests in particular. In rapidly urbanizing areas of the South, there have been dramatic decreases in the amount of and access to forested or other natural lands. A changing population and decreasing forest resources have led to changes in the values and attitudes Southerners hold toward forests. Below is a discussion of values, attitudes, and demographics found in the Southern Forest Resource Assessment (SFRA) conducted by the Forest Service and published in 2002.

Values

Published literature and survey results from the SFRA both indicate that private forest owners and the public as well rank "conservation" higher now than in past decades. Recently there has seemed to be growing concern in the public's view that environmental quality is more important than commodity benefits from forests and other natural lands. In the survey designed specifically for the SFRA, Southerners confirmed that environmental benefits from forests are valued higher than commodity benefits. Wood as a production commodity was rated as least important of four listed values (wood products, clean air, scenic beauty, and heritage) associated with forests (Tarrant et al. in press). Clean air was listed as most important. When survey respondents were asked about values of public forests as distinct from private forests, some differences were noted. Producing wood products was valued higher if it were to come from private forests while clean air was valued higher if coming from public forests. These results indicate that Southerners hold measurably stronger environmental values and more restrictive commodity values about public forests than they hold for private forests.

Respondents to the SFRA survey were asked if they or their spouse owned any rural land of 10 acres or more. When a comparison was made between those reporting owning land and those who did not, little to no significant differences regarding forest values were evident. The single exception was that landowners rated wood products as a more important use for private forests than did non-landowners. Furthermore, there were no significant differences between the two groups in attitudes toward the

environment. Overall, results suggest that land ownership has relatively little bearing on southern residents' values of forests or attitudes toward the environment.

Attitudes

While values indicate the relative good or worth of forests, attitudes represent levels of agreement with particular forest conditions or environmental issues, such as regulatory laws or policies. Based on results from the survey done for the SFRA, a majority of Southerners felt that "too little" was being spent on protecting the environment (62.5 percent). Only 9.2 percent reported they felt "too much" was being spent. Similarly regarding environmental laws, 45.5 percent indicated environmental laws had "not gone far enough," while only 13.1 percent thought environmental laws had gone "too far." But, as in the Chattahoochee-Oconee survey, 'environmental laws' were not elaborated upon or resource selective, so blanket coverage of environmental laws could be interpreted to mean anything from limiting toxic waste dumps to toughening endangered species laws on private lands. It could also mean that everyone wants clean air and water. No reference or distinction was made whether or not the enforcement of existing laws would achieve the desired results of the stated 'environmental protection' or regulation.

An overall mean score of 23.8 on the modified New Ecological Paradigm used in the SFRA survey (midpoint of 30 with a range of 10, highly favorable, to 50, highly unfavorable) suggests a moderately strong pro-environmental attitude among people of the South.

Demographic Differences in Values and Attitudes

A number of comparisons of values were made between different social groups in the South. They included urban-rural, age, length of residency, and gender. These comparisons revealed that where people live in the South (urban or rural) is not related to their values or attitudes toward forests and the environment. However, age did influence public values toward forests and environmental attitudes. For private forests, younger people placed significantly less importance on wood products and significantly more on heritage than did the older generation. For public forests, the younger generation valued scenic beauty significantly higher than did the older generation. Younger people were significantly more likely than older people to believe we are spending too little to protect the environment, and that environmental laws have not gone far enough. Generally, younger people tend to have more bio-centric values of forests than older people. There were no significant correlations between length of residency in the South and values of public or private forests or environmental attitudes. Females exhibited significantly stronger pro-environmental attitudes than males, and were more likely than males to believe that we have spent too little on the environment and that environmental laws and regulations have not gone far enough.

Priorities for Management of Private Land by Non-industrial Owners

The Assessment found that approximately 75 percent of the 37 million acres of the SAA region are privately owned. Of these 37 million acres approximately 19 million are forested acres. Three-fourths of the forestland in the region is privately owned.

Agriculture and timber harvesting are the overwhelming primary commodity uses of private undeveloped land. Recreation is the dominant non-commodity use. Raising livestock, recreation, enjoyment of a rural lifestyle, and having green space are most often listed as important reasons for owning land in the Southern Appalachians.

In the Journal of Forestry article "*Changing Demographics, Values, and Attitudes*", H. Ken Cordell and Michael Tarrant, October/November 2002, pp. 28-33, found that privately owned land dominates in the South. Corporate private owners typically provide recreation access by leasing land to clubs, counties, or others. Individual owners usually have little to none of their land open, either through lease or other means (Teasley et al. 1999). Persistently, the number of southern owners allowing the public to recreate on their land has been decreasing (Cordell et al. 1999). Among individual owners approximately 59 percent indicate that an emphasis in managing their land is maintaining and improving the land's natural components. For 37 percent of owners, improving the natural components is the primary thing they emphasize with their land. Accordingly, only about 14 percent of owners in the South permit the outside public to use their lands, even though the greatest growth in demand is for nature appreciation and photography. It appears that even less land may be open to public recreation in the future.

Unless conditions become more favorable for landowners, the percentage of them permitting public access is likely to continue to decrease, as it has been for several years. Increasingly, individuals and families are purchasing land for their own personal recreational pursuits and these owners are even less likely to permit others use of their land.

Potential Conflicts

A highly significant and growing issue nationally and in the South is that of conflict. Conflicts limit supply and increase the costs of management. Conflicts addressed in the SFRA included those between similar uses because of crowding; conflicts between non-similar uses because of incompatible norms, values and goals; and conflicts between users and providers.

Perhaps the most worrisome type of recreation conflict is that between users and owners of private tracts. These conflicts can and often do lead to posting and other ways of denying access, which act to limit supply. Because most of the forestland in the South is privately owned, conflicts between recreational users and private forestland owners are especially significant. Results from the 1995 National Private Landowner Survey, NPLOS 95 (Teasley et al. 1999), suggest a number of possibilities for owner-user conflict. For example, about 59 percent of individual southern landowners indicate that improving wildlife, water, aesthetics and other natural components of their land is an important emphasis in their land management. Because landowners sometimes encounter use problems they may perceive to be incompatible with their conservation goals, land closure can result. The more prominent of such problems include dumping garbage, littering, illegal hunting and fishing, damage to fences and gates, damage to roads, disturbance of wildlife, and careless shooting.

Private landowners in Georgia do not want outside intervention in how to take care of their land unless they request assistance, but they are also willing to abide by existing land ethics (laws/regulations).

Not all, maybe not even most, of these problems are the result of recreation use, although owners perceive them to be. As of 1995, about 41 percent of owners in the South posted their land. Among owners who already post some or all of their land, 16 percent anticipate posting more in the future. Very few anticipate posting less. Increasing demands for off-road vehicle use, hunting, fishing, and other of the more consumptive recreational activities, are likely to bring about more recreation participant-land owner conflicts. In part as a response, many of the higher-income residents of the South are purchasing their own land for personal recreational pursuits. Very often these purchased lands end up being posted.

Environmental Consequences

Economic Impacts

In terms of jobs supported, alternatives are not very variable except as a result of one program – timber. The range among alternatives for variation in the recreation program is only 27 percent indicating that it is relatively insensitive to the allocations and activities of alternatives. However, the largest decrease (in Alternative F) is associated with the highest timber production activity. Similarly, wildlife and fish related employment varies only 21 percent. The numbers of jobs that payments to states and counties can support is highly variable if based on the old 25 percent returns, but with the 'full payment option' this effect no longer occurs. In sharp contrast, employment related to wood industry varies enormously among alternatives. The number of jobs associated with timber of 600 in Alternative I is 15 percent of the average employment figure of 4,012 found in the timber supply and demand analysis for all primary wood industry within the historic Forest Service market area. This number matches reasonably well with the Forest Service historic proportion of timber volume supplied to mills.

All alternatives but D have a projected job decrease compared to current management. However, in interpreting this situation two things need to be borne in mind. The C-O NF timber program has been all but at a standstill for about seven years, forcing our historic markets to adapt such that projected job loss will not be as severe as indicated. In addition, actual harvest under current management – as contrasted with the effects of a projected harvest as shown here for Alternative F – has been about 50 percent of the projected. That is, the Forest has been managed in actuality as if it were much more like Alternative I. Therefore, effects on jobs can be generally expected to fall in the order of Alternative D having about a 3 percent increase, Alternative B about a 2 percent decrease, Alternative A about a 5 percent decrease, and Alternative I supporting 200 less jobs in wood industry for about a 4 percent decrease. Alternative E decreases jobs about 23 percent and Alternative G decreases about 33 percent. All of this assumes no economies of scale such that job loss is proportionate to volume reduction; that is, no companies are forced out of business by an imbalance of supply to the fixed expenses necessary to process it.

Table 3- 287. Employment by Program by Alternative (Average Annual, Decade 1)

	Total Number of Jobs Contributed						
Resource	Alt. F (Current)	Alt. A	Alt. B	Alt. D	Alt. E		Alt. I
Recreation	906	1,238	1,060	1,058	1,238	1,047	1,046
Wildlife and Fish	108	93	115	111	91	108	108
Grazing	0	0	0	0	0	0	0
Timber	805	396	606	727	51	10	600
Minerals	0	0	0	0	0	0	0
Payments to States/Counties	55	27	42	49	4	1	30
Forest Service Expenditures	269	269	269	269	269	269	269
Total Forest Management	2,143	2,023	2,091	2,214	1,653	1,436	2,143
Percent Change from Current	0.0%	-5.6%	-2.4%	3.3%	-22.9%	-33.0%	-4.2%

Source: IMPLAN analysis

Labor income stemming from the jobs supported logically follows the same pattern across the alternatives as does jobs. Alternative D can expect a small increase. Alternative B has about a 5 percent decrease. Alternative A and Alternative I are approximately equal at about 11 percent decrease. Alternative E has a 30 percent reduction and Alternative G has almost a 40 percent reduction. Both increases and decreases are primarily caused by the variation in the timber program. Neither the recreation nor the wildlife and fish programs have enough variation among alternatives to compensate for timber income losses.

Table 3- 288. Labor Income by Program by Alternative (Average Annual, Decade 1)

	Millions of dollars						
Resource	Alt. F (Current)	Alt. A	Alt. B	Alt. D	Alt. E	Alt. G	Alt. I
Recreation	$19.3	$26.5	$22.7	$22.6	$26.5	$22.4	$22.4
Wildlife and Fish	$2.5	$2.1	$2.7	$2.6	$2.1	$2.5	$2.5
Grazing	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Timber	$23.3	$11.4	$17.5	$20.8	$1.5	$0.3	$14.6
Minerals	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Payments to States/Counties	$1.8	$0.9	$1.3	$1.6	$0.1	$0.0	$1.0
Forest Service Expenditures	$8.3	$8.3	$8.3	$8.3	$8.3	$8.3	$8.3
Total Forest Management	$55.2	$49.3	$52.5	$55.9	$38.5	$33.6	$48.7
Percent Change from Current	0.0%	-10.7%	-4.8%	1.4%	-30.2%	-39.1%	-11.6%

Source: IMPLAN analysis

Employment by major industry reflects the power of the 'economic engine' provided by each alternative compared to no change from current (that is, planned). The table below provides a 'picture' of how money generated from Forest Service output of goods or services is estimated to result in an increased number of jobs in the economy if the economy expands or a decreased number of jobs if the economy is contracting. Key to this is the 'manufacturing' industry that would include wood industry processing national forest timber and 'services' to meet the needs of recreation visitors. The pattern is the same as already shown in the previous 'Employment by Program' table.

Table 3- 289. Employment by Major Industry by Alternative (Average Annual, Decade 1)

	Total Number of Jobs Contributed						
Industry	Alt. F (Current)	Alt. A	Alt. B	Alt. D	Alt. E	Alt. G	Alt. I
Agriculture	20	24	22	23	22	19	22
Mining	6	8	7	7	8	6	7
Construction	48	35	42	47	20	16	47
Manufacturing	527	306	420	491	104	70	419
Transportation, Communication, & Utilities	60	51	56	61	37	32	56
Wholesale trade	76	71	74	79	56	48	74
Retail trade	539	626	583	592	589	513	564
Finance, Insurance, & Real Estate	58	52	55	59	40	35	52
Services	553	601	577	595	543	471	562
Government (Federal, State, & Local)	247	241	246	250	227	221	241
Miscellaneous	9	8	9	10	7	6	8
Total Forest Management	2,143	2,023	2,091	2,214	1,653	1,436	2,052
Percent Change from Current	0.0%	-5.6%	-2.4%	3.3%	-22.9%	-33.0%	-4.2%

Source: IMPLAN analysis

Labor income by industry shows its strongest variation in the manufacturing industry with a more than seven-fold increase from lowest to highest. Once again, this is income associated with wood processing.

Table 3- 290. Labor Income by Major Industry by Alternative (Average Annual, Decade 1

	Millions of dollars						
Industry	Alt. F (Current)	Alt. A	Alt. B	Alt. D	Alt. E	Alt. G	Alt. I
Agriculture	$0.5	$0.6	$0.5	$0.6	$0.6	$0.5	$0.5
Mining	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Construction	$1.6	$1.2	$1.4	$1.6	$0.7	$0.5	$1.6
Manufacturing	$15.6	$9.3	$12.5	$14.4	$3.4	$2.4	$9.6
Transportation, Communication, & Utilities	$2.5	$2.2	$2.4	$2.6	$1.6	$1.4	$2.4
Wholesale trade	$3.0	$2.8	$2.9	$3.1	$2.2	$1.9	$2.9
Retail trade	$9.6	$11.1	$10.4	$10.6	$10.4	$9.1	$10.1
Finance, Insurance, & Real Estate	$1.8	$1.6	$1.7	$1.9	$1.2	$1.1	$1.6
Services	$12.2	$12.4	$12.3	$12.8	$10.8	$9.4	$11.9
Government (Federal, State, & Local)	$8.2	$8.0	$8.1	$8.3	$7.4	$7.2	$7.9
Miscellaneous	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1
Total Forest Management	$55.2	$49.3	$52.5	$55.9	$38.5	$33.6	$48.7
Percent Change from Current	0.0%	-10.7%	-4.8%	-1.4%	-30.2%	-39.1%	-11.6%

Source: IMPLAN analysis

In the table below, returns to counties are presented as if all counties were receiving 25 percent of gross receipts. Since 2002, this formula no longer applies to those counties who have chosen the 'full payment option'. Rather the information shown should be viewed more as how the alternatives are likely to behave in comparison to the highest three year average under the current plan (Alternative F) used to set the full payment level. Even this, however, would still leave actual payments to counties unchanged since they were 'decoupled' from Forest Service receipts. County governments likely opted for the full payment choice because of the stability afforded by it and the very low likelihood that future harvest would rise above that of the years used to set the option amount.

Table 3- 291. Forest Service Revenues and Payments to Counties (Annual Avg, Decade 1)

	Millions of Dollars						
Forest Service Program	(Current)	Alt. A	Alt. B	Alt. D	Alt. E		Alt. I
Recreation	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Wildlife and Fish	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Grazing	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Timber	$9.9	$4.9	$7.4	$8.8	$0.6	$0.1	$5.3
Minerals	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Soil, Water & Air	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Protection	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1
Total Revenues	$10.0	$5.0	$7.6	$8.9	$0.8	$0.3	$5.4
Payment to States/Counties	$2.5	$1.2	$1.9	$2.2	$0.2	$0.1	$1.3

Source: IMPLAN analysis

Table 3- 292. Current Role of Forest Service-Related Contributions to the Area Economy

	Employment (Jobs)		Labor Income ($ million)	
Industry	Area Totals	FS-Related		FS-Related
Agriculture	14,025	20	$306.3	$0.5
Mining	995	6	$33.3	$0.0
Construction	28,823	48	$830.0	$1.6
Manufacturing	117,625	527	$3,805.1	$15.6
Transportation, Communication, & Utilities	13,303	60	$521.4	$2.5
Wholesale trade	15,755	76	$549.7	$3.0
Retail trade	63,277	539	$1,066.7	$9.6
Finance, Insurance, & Real Estate	18,643	58	$520.9	$1.8
Services	87,661	553	$2,226.0	$12.2
Government (Federal, State, & Local)	48,561	247	$1,426.6	$8.2
Miscellaneous	3,393	9	$27.9	$0.1
Total	412,061	2,143	$11,313.9	$55.2
Percent of Total	100.0%	0.5%	100.0%	0.5%

Source: IMPLAN analysis

Cumulative Effects

Cumulative effects analysis is designed to reveal the context of alternative impacts within the planning area. This is done by comparing total changes in the planning area *with* each alternative to total changes *with* no action. Such a comparison is done by estimating employment and income at the expected end of the forest planning horizon (15 years) and calculating a share of the total economy that each alternative represents of the entire economy. Estimates for employment and income growth were derived by calculating the average annual increase in employment and the real average annual income growth for counties in the analysis area from 1969 to 2000. The analysis is made with employment and income estimates for each alternative remaining at 2000 levels.

The assumption made in our analysis is that the same rate of growth will continue over the 15 years of the forest plan. The source of the data for these estimates is the U.S. Bureau of Economic Analysis.

Table 3- 293 shows employment and labor income for the planning area. The first two columns present the 2000 base year and that portion of the base year attributable to use and management of the national forest. The next column shows

state and local government projections for 2015. Forest alternative outputs are assumed to be constant over the planning horizon. Included in the projections are employment and income effects attributed to the current direction (Alternative F, or no action alternative). The remaining columns show the separate effects of each alternative at the end 2015.

What in 2000 accounted for 0.6 percent of all employment will in 2015 account for about 0.4 percent for the no action alternative. For the proposed alternatives in the EIS, expected shares of the economy show small variation; from 0.3 percent to 0.4 percent. In essence this says that national forest is incapable, within the constraints it must meet, to be a great economic power at the scale of the entire economy of counties with national forest.

Employment changes have already been discussed. They are not greatly different except for Alternatives E and G; that is, the very low intensity management alternatives.

What in 2000 accounted for 0.6 percent of all income will in 2015 account for about 0.4 percent for the no action alternative; the same pattern as for employment. For the proposed alternatives in the EIS, expected shares of the economy will range from 0.2 percent to 0.4 percent. Alternatives are significantly different among them but are diluted to insignificance at the scale of the entire economy. This is reasonable since so much economic activity is unrelated to national forest.

The cumulative effects analysis shows that, over time, employment and income proportionate share of the economy will decline for all alternatives but D, the timber emphasis alternative. Alternative D is even a greater contributor than the no-action alternative (current direction or Alternative F).

Table 3- 293. Cumulative Economic Impacts in 2015

	2000		2015							
	Area Totals	Forest	Area	Forest Portion						
				Alt. F	Alt. A	Alt. B	Alt. D		Alt. G	Alt. I
Employment										
Total (jobs)	361,803	2,143	532,497	2,143	2,023	2,091	2,214	1,653	1,436	2,052
% of Area Totals	100%	0.6%	100%	0.4%	0.4%	0.4%	0.4%	0.3%	0.3%	0.4%
% Change from No Action	---	---	---	0.0%	-5.6%	-2.4%	3.3%	-22.9%	-33.0%	-4.2%
Labor Income										
Total ($ million)	$9,219.0	$55.2	$15,720.0	$55.2	$49.3	$52.5	$55.9	$38.5	$33.6	$48.7
% of Base	100%	0.6%	100%	0.4%	0.3%	0.3%	0.4%	0.2%	0.2%	0.3%
% Change from No Action	---	---	---	0.0%	-10.7%	-4.8%	1.4%	-30.2%	-39.1%	-11.6%

Source: IMPLAN analysis

Social Impacts

During the forest planning process, numerous public meetings were held to allow attending interested people an opportunity to express their wants, needs and demands for access to and use of national forest resources. Many of these views were incorporated into our range of alternatives. These public meetings, however, typically represent only a portion of the public's interests and seldom represent the so-called “silent majority” who do not or cannot attend these meetings. Region 8

commissioned the Southern Research Station to undertake a telephone survey to randomly survey the public within a 75-mile radius of our national forests, which are under forest plan revision. Such a survey provides input from this broader public concerning what they would like to see emphasized in national forest management. For more information on how this survey was conducted, see the "Public Survey Report, Southern Appalachian National Forests, and Chattahoochee-Oconee National Forests." Effects from our proposed land management alternatives on the public's preferences in land management follow below.

One of the ways people relate to the Chattahoochee-Oconee National Forests is their recreational use of National Forest lands. Among the 20 activities included in the survey of residents, the most popular are driving for pleasure at 74 percent; viewing and photographing wildlife, fish, or scenery in which 60 percent participate; picnicking at 56 percent; visiting a wilderness or other primitive area was 40 percent; and day hiking is 39 percent. For more information on the types of recreational activities people participate while on the National Forest, and how this may change by alternative, see the EIS section, on *Dispersed and Developed Recreation.*

The public survey provided some information on the values residents have relating to natural resource management and to the resources themselves. Of the sample in the Chattahoochee-Oconee National Forests' market area, 94.3 percent thought protection of clean water was an important management goal for national forests. Next highest values were maintaining the forests in good condition for future generations at 92.1 percent, providing protection for wildlife and habitat at 88.4 percent, emphasize healthy forest conditions at 88.0 percent, natural appearing forests at 87.0 percent, and protection of rare or endangered species with a value percentage of 83.2 percent.

Table 3- 294. Percentage Of Local Residents 16 Or Older Who Participate In Each Outdoor Recreation Activity.

Recreation Activity Participated in Past 12 months	Chattahoochee & Oconee (N=2597)
Driving for pleasure	73.5
View/photograph wildlife, fish, or scenery	59.6
Picnicking	56.0
Visit a wilderness or undeveloped roadless area	40.4
Day hiking	39.4
Swimming in streams/ lakes/ponds	37.7
Fishing	33.4
Gather mushrooms or other natural product	26.5
Motorboating/waterskiing	26.7
Camp at a developed site	24.9
Drive off-road	23.7
Camp at a primitive site	18.1
Rafting/tubing/floating on rivers or flowing water	18.3
Bicycling/mountain biking on trails or backcountry	16.9
Hunting	12.1
Hunting big game	9.6
Canoeing/kayaking	10.7
Horseback riding on trails	9.9
Backpacking on trails/ cross-country	10.1
Hunting small game or waterfowl	7.9

Source: National Survey on Recreation and the Environment, Version 12, November 2001 to April 2002.

Table 3- 295. Percentage Of Local Residents, 16 Or Older, Indicating The Stated Management Activity Is *Important/Extremely Important* To Emphasize In Management Of The National Forest In The Southern Appalachians, 2002.

Forest Management Activity	Important/ Extremely Impt.		Forest Management Activity	Important/
Protect streams, lakes, and watershed areas	91.9/ 79.2		Allow management activities near streams	60.9/ 35.5
Protect wildlife habitats	89.9/ 72.7		Allow recreation fees that go back to management	58.6/ 32.9
Protect old growth forests	85.3/ 66.2		Limit people who visit wilderness	48.0/ 26.2
Habitat for wildlife and bird viewing	84.0/ 61.4		Limit people on a river at one time	47.2/ 28.8
Use controlled fires	74.5/ 53.2		Increase wildlife for hunting	46.6/ 27.8
Open areas for wildlife	73.9/ 48.4		Trade public for private lands to eliminate in-holdings or acquire natural areas	44.8/ 22.9
Allow cultural uses of forests	72.5/ 51.3		Expand commercial recreation services	36.3/ 20.2
Trail systems for non-motorized recreation	68.7/ 39.5		Allow harvesting and mining to support communities	36.2/ 20.1
Increase law enforcement	67.8/ 48.2		New paved roads for cars	34.5/ 20.0
Designate more areas as wilderness	67.1/ 41.4		Allow recreational gold prospecting and dredging	24.2/ 11.7
Increase acres in the National Forest	65.2/ 44.1		Expand access for motorized off-highway vehicles	22.8/ 13.1
Allow diversity of uses such as grazing, recreation, and wildlife habitat	65.0/ 36.6		Allow commercial leasing of oil and gas rights	19.7/ 11.6
Restrict mineral removals	64.1/ 48.6			
Make management decisions at the local level	63.8/ 37.1			

People who reside in the areas near the National Forests put wildlife, ecosystems and naturalness above non-renewable objectives.

Respondents were asked for their reactions to possible management activities of the forest. The following analysis provides a comparison of the most favored management activities versus the range of alternatives available to forest decision makers

The continuum in the forest planning alternatives from more management activities and provision of multiple-use, to that of fewer management activities is as follows:

More Management Activities **Fewer Management Activities**

D F A I B E G

Approximately 94 percent of local residents favored management activities that would protect streams, lakes and watershed areas.

Alternative D calls for water quality and riparian areas to be protected through BMPs and the Riparian Corridor MRx that is embedded within all other MRxs, no matter what the alternative.

Alternative A restores degraded watersheds and emphasizes improvement of aquatic habitats and water quality. Alternative I emphasizes watershed restoration and riparian areas that are maintained and/or restored. Alternative B is more biologically driven and calls for riparian ecosystems to be managed to maintain water quality. Degraded conditions are restored. Alternative E is more recreation-based and provides for riparian ecosystems and streamside management zones to be designated and to provide water-quality protection and improvement. Alternative G provides for riparian area protection and restoration through emphasis on watershed assessments and establishment of riparian conservation areas and reference watersheds.

The next most favored management issues had to deal with naturalness. About 90 percent of respondents wanted the forest to be managed for wildlife by protecting their habitats; approximately 85 percent wanted management direction to protect old growth forests; approximately 84 percent want to see forests managed to provide habitat for wildlife and birds for people to see and photograph. Those that wanted more wilderness designated were approximately 67 percent, while 65.2 percent wanted to increase the acres (size) of the National Forests.

Alternative D has the least emphasis of all alternatives on naturalness. The forest appears highly variable in tree sizes, ages, and openings, and many more roadways from which to see and access the forest. It provides Old Growth on unsuitable lands within the many designated wilderness areas. Alternative A provides high quality scenery in both a natural and managed settings. Highways and roads in the forest have forest stands with few, if any, broken views to support enhancements to tourism. Roadless areas adjacent or in close proximity to wilderness areas are recommended for wilderness designation.

Alternative I provides for a healthy forest by managing ecosystems through restoration or maintenance to provide for diverse ecosystems that are sustainable. A variety of old growth patches are managed through restoration, protection, or maintenance to meet biological and social needs. Alternative B emphasizes restoring natural resources and processes in a natural landscape pattern. Wildlife and aquatic

habitats are emphasized. Restoration activities produce both large and small openings; scenic qualities are enhanced over time. Roadless areas are recommended for wilderness if needed for wildlife habitats.

Alternative E supports visual quality and most areas maintain a forested canopy. A substantial amount of the forest is allocated to providing old growth and in a roadless condition that provides remote backcountry experiences. Many insect and disease impacts are tolerated as part of a functioning natural ecosystem. Long-term timber objectives are to grow large diameter high quality sawtimber by tree species capable of reaching that objective. Most wild and scenic rivers are recommended for adding to the National Wild and Scenic Rivers System.

Alternative G provides for most roadless areas to be recommended for wilderness with other roadless areas maintained in unfragmented habitat blocks. Emphasis is on establishing a naturally resilient forest that avoids large outbreaks of forest pests. Fire is utilized to restore natural processes. Road miles will be reduced.

Some of the remaining objectives include management that limits people who visit wilderness areas, about 48 percent approved of this method; 36.3 percent approve expanding commercial recreation services; 36.2 percent agree to timber harvesting and mining to support local communities; providing new paved roads for cars at 34.5 percent; about 24 percent agree to allow recreational gold prospecting and dredging; and about 23 percent agree to expand access for motorized off-highway vehicles.

Alternative D emphasizes balanced age classes across the forests. All lands considered suitable for sustained-yield timber management is available for sustained-yield management. Each major forest ecosystem has specific rotation ages. Access increases but recreation is only provided for at existing or higher levels if demand warranted. Only roadless areas previously withdrawn from the suitable timber base are recommended for wilderness.

Alternative A provides sustained yield of wood products with an emphasis on high quality sawtimber. Goods and services to the local economies are enhanced. Alternative I allows forest management activities where needed and appropriate to achieve the desired composition, structure, and function of forest ecosystems. A result of such activities is to provide a sustainable supply of wood products. Nature based recreational opportunities emphasized, while the road system is reduced, but the remaining travel ways are enhanced.

Alternative B emphasizes restoring natural resources. Wood products are managed in concert with restoration and creating wildlife habitats. Timber sales are a by-product of restoration management. Recreational opportunities exist if compatible with the restoration objectives.

Alternative E provides for the overall long-term timber product objective of large-diameter and high quality sawtimber species. Off highway vehicle use could be increased, and popular travel ways are improved (paved). Alternative G emphasizes large undisturbed areas. High quality timber is produced in long rotations in areas

outside sensitive species habitat. The road network is reduced, so the remaining network is improved to accept higher traffic volumes. There is some potential for commercial recreational services with an increase in non-motorized areas.

Recreation use as a forest management direction was judged important by about two thirds of our respondents. The management objective to allow a diversity of uses such as grazing, recreation and wildlife habitat had 65 percent positive response. Allowing recreation fees that go back to the forest were favored by only 58.6 percent of the respondents.

Alternative D provides for developed and dispersed recreation opportunities in both natural and managed settings. Potential for roaded natural experiences increase as access roads for timber harvests are built or improved. Semi-primitive experiences are designated for unsuited lands.

Alternative A emphasizes developed and dispersed recreation opportunities achieved by commercial recreation and increased public access. Public access is increased in high-use areas in order to provide more recreation opportunities. Alternative I provides a spectrum of high quality, nature-based recreation settings and opportunities that are not widely available on non-federal lands. Hiking, biking, equestrian trail systems are emphasized in non-motorized settings with high quality landscapes. OHV routes are designated in proper settings. Hunting, fishing, and non-consumptive wildlife opportunities are also emphasized. Backcountry recreation experiences are provided.

Alternative B provides a variety of recreating settings in areas where they are compatible with restoration activities. A wide variety of recreation activities are provided. Alternative E emphasizes settings that attract a variety of recreation users. Active resource management is concentrated in certain locations that support recreation use and visual quality. Dispersed and developed recreation areas and opportunities are increased. A variety of recreation experiences including concentrated use of off-highway vehicle use, are provided. Alternative G emphasizes backcountry and nature-oriented non-motorized recreation opportunities; semi primitive, wildlife, and nature-oriented recreation opportunities that are provided. Developed facilities occur where they do not detract from ecosystem function and landscape connectivity.

Present Net Value of the Alternatives

Table 3- 296 estimates benefits, costs, net benefits, and cumulative present net value (PNV) by alternative. All figures are in year 2000 dollars. The benefits in Table 3- 296 include market values and non-market estimated values. Market values include those values where the Forest Service receives money such as for timber, minerals, special uses, etc. Non-market values are assigned values for amenities such as wildlife, range, and recreation.

Present value analysis answers the question, ‘How would the money spent (costs) and the benefits obtained over the next fifty years compare today?’ In this way, alternative courses of action can be directly compared today for their estimated

results in the future when both costs and benefits are occurring throughout the time period being considered. The present net value (PNV) presented is a cumulative look across time (50 years) and also across the various major program areas of National Forest management.

Table 3- 296. Present Value of Costs and Benefits, and Present Net Value by Alternative (000 $s)

	Alt A	Alt. B	Alt. D	Alt. E	Alt. F	Alt. G	Alt. I
Cumulative Total Present Net Value	2,780,197	2,342,121	2,356,610	2,575,068	794,771	2,306,596	2,296,450
Present Value Benefits by Program:							
Range:	431	431	431	431	431	431	431
Timber:	239,375	280,070	324,677	104,792	300,639	75,448	196,239
Minerals:	0	0	0	0	0	0	0
Recreation	946,904	810,195	824,729	906,816	348,711	899,596	859,864
Wildlife:	1,977,071	1,688,344	1,688,344	1,810,760	673,826	1,567,692	1,574,890
PV of Benefits	3,163,782	2,779,041	2,838,181	2,822,800	1,323,608	2,543,167	2,631,424
Present Value Costs by Program:							
Range:	109	109	109	109	109	109	109
Timber:	197,019	250,400	295,085	61,096	342,364	49,925	151,950
Roads/Engineering	28,151	28,105	28,072	28,222	28,058	28,231	24,609
Minerals:	109	109	109	109	109	109	109
Recreation	46,477	46,477	46,477	46,477	46,477	46,477	46,477
Wildlife:	17,198	17,198	17,198	17,198	17,198	17,198	17,198
Soil, Water, Air.	16,153	16,153	16,153	16,153	16,153	16,153	16,153
Protection/Forest Health	44,758	44,758	44,758	44,758	44,758	44,758	44,758
Lands	10,776	10,776	10,776	10,776	10,776	10,776	10,776
Planning, Inventory and Monitoring	22,836	22,836	22,836	22,836	22,836	22,836	22,836
PV of Costs	383,585	436,920	481,572	247,732	528,837	236,571	334,974

Source: FEAST spreadsheet analysis, Oct. 2003.

The summary table below shows in brief how alternatives compare to each other in each of costs and benefits, and then in the overall PNV. The ranking scale is not one of 'best' or 'worst' but simply one of highest to lowest in order to maintain comparability between benefits and costs. In general, a "1" is 'best' for benefits and a '7' is 'best' (least) for costs.

Table 3- 297. Present Net Value Rankings By Alternative

Rankings: 1 = highest, 7 = lowest							
PNV Components	Alt. A	Alt. B	Alt. D	Alt. E	Alt. F	Alt. G	Alt. I
Benefits	1	4	2	3	7	6	5
Costs	4	3	2	6	1	7	5
PNV	1	4	3	2	7	5	6

Source: Table 3- 296

The PNV derives from the balance between the value of the benefits and the expense of producing them, since it is benefits minus expenses. But it also reflects how much value of benefits is produced. The better the PNV rank, the more benefits are being produced and the greater the difference between the value of the benefits and the costs of producing them. The relationship is complex because on the costs side, only timber and roads vary and other program costs are held the same. Timber costs vary widely with the highest costs being 5.6 times the lowest cost. Road program costs vary little among alternatives A through G. The difference is less than one percent of the highest cost with the single exception of Alternative I, which varies significantly. In terms of costs, this makes the variability largely dependent on the timber program. Also, several of the programs with costs do not have an associated benefit. Their effect is to depress the overall PNV. But on the benefits side, both recreation and wildlife vary widely among alternatives. And of these two, wildlife is by far the strongest at returning benefits; that is, the benefits shown are from about two to five times more than timber or recreation benefits. Both wildlife and recreation also produce total values far above timber revenues such that timber production is not really a determinant of PNV rank.

Overall PNV does not vary very widely between Alternatives A, B, D, E, G, and I. For these six, the range between the highest (Alt. A) and the lowest (Alt. I) is 17.4 percent of the Alternative A PNV value. Within individual program areas however, variation is many times this amount. Timber benefits vary very widely, with the highest value being approximately four times the lowest. Recreation benefits vary widely as well, with the highest value being approximately three times the lowest. The highest value of wildlife benefits is very nearly three times the lowest. The highest timber cost is approximately seven times the lowest. Engineering costs do not vary very widely with the lowest costs being only about 13 percent less than the highest cost.

Each alternative is discussed in the following paragraphs individually. The overall PNV rank is presented along with a comparison of benefits and costs of programs. But the most powerful comparison is how alternatives rank in terms of the net contribution (program benefits minus program costs) of each program.

Alternative A has the highest PNV because it has the highest benefits but only moderate costs. Both timber revenues and costs are in fourth rank but the timber program ranks third among alternatives for its net contribution to overall PNV. But both recreation and wildlife programs rank first among alternatives for their net contribution to overall PNV. Other program costs without an associated benefit do not counteract the strong net positive of the recreation, wildlife, and timber programs.

Alternative B ranks fourth of the seven alternatives overall in PNV. Both timber revenues and costs rank third but the net contribution of the timber program is in fourth rank among alternatives. The recreation program contribution ranks sixth, and the wildlife program contribution ranks third. Roads costs are fourth. The net effect is for Alternative B to rank near the middle among alternatives.

Alternative D with a timber emphasis is a moderately strong PNV alternative in third place and ranks overall alongside Alt. B. Timber revenues are the highest but timber costs are next to the highest with the net timber program contribution being relatively poor and ranking fifth among alternatives. The recreation program also ranks fifth. The wildlife program ranks third and is strong enough to pull the overall PNV to third as well.

Alt. E ranks second overall in PNV. Both timber revenues and costs rank sixth but the net contribution of the timber program ranks it second among alternatives. Alternative E has only 44 percent of the timber revenues of Alternative A. Alternative E is very consistent throughout programs with the contribution of the recreation and wildlife programs also each ranking second.

Alternative F (current management) has the combination of lowest benefits but highest costs and ranks last in overall PNV. Timber revenues are next to the highest but timber costs are the highest such that the net timber program contribution is negative, the only alternative with this situation. It is next to the highest in road costs as well. The contribution of the recreation program is poorest of all alternatives at seventh and the wildlife program contribution is next to last at sixth rank. The costs of other programs without an associated benefit further reduce the PNV.

Alt. G ranks fifth overall. Both timber revenues and costs are lowest; that is, seventh rank, but the net timber program contribution ranks it sixth. Recreation ranks third, and wildlife ranks sixth.

Alternative I is sixth of seven, or next to last, in PNV overall. Timber revenues and costs are fifth but the net contribution of the timber program ranks first among alternatives. In addition, road costs are significantly lower, being 87 percent of the highest road costs. This reduction most likely comes from two sources; (a) allocations to unsuitable prescriptions of those lands not roaded, and (b) not modeling cable slopes in prescriptions otherwise suitable. (*See the 'Forest Products' topic of this EIS*.) Both the recreation and wildlife programs rank fourth in their contribution.

UNAVOIDABLE ADVERSE EFFECTS

Implementation of any alternative would result in some adverse environmental effects that cannot be avoided. The application of the management prescriptions, standards, best management practices (BMPs), and monitoring and evaluation are intended to limit the extent, severity, and duration of these effects. Although the formulation of the alternatives included avoidance of potential adverse environmental effects, some adverse impacts to the environment that cannot be completely mitigated are expected to occur.

Some adverse effects are of a transitory type. For example, air quality could be diminished on a recurring, though temporary, basis due to the use of prescribed fire used to restore plant communities or enhance wildlife habitat. Even though standards require prescribed burning to be scheduled for times when weather conditions would provide for smoke dispersion, the presence of smoke and haze over or adjacent to the Forest would detract from people's expectation of clean air. Recreation traffic, timber hauling, and the operation of other internal combustion engines, could have localized and temporary adverse effects on air quality where these activities occur.

The natural landscape would appear altered by management activities, particularly where activity is highly visible from travel routes. Prescribed burning in forest communities and their blackened appearance would also be apparent. These temporary adverse effects would eventually be reduced by re-growth of vegetation and weathering. Other impacts on the natural appearance of the landscape include roads and certain recreational structures that are highly visible despite efforts to blend them with landforms and mitigate the effect by landscaping.

In inventoried roadless areas, management activities that would maintain roadless character, such as wildlife habitat manipulations and some associated temporary road construction or construction of recreational trails could have an adverse effect on the potential future management of these areas as designated wilderness, as research natural areas, or for other purposes requiring natural characteristics.

Disturbance, displacement, or loss of fish and wildlife may occur as a consequence of habitat loss and increased human recreational activity in areas. Roads and their associated use can impact fish and wildlife due to human activities associated with new access. Improved access into areas that previously had low-standard roads would have similar effects. Other wildlife use could increase by increased management.

Both the amount and distribution of mature stands would be changed through implementation of any alternative. The rate and severity of adverse impacts varies by alternative. Since some wildlife species rely on habitat conditions provided by late successional habitats, a reduction or shift in the populations (range) of some wildlife species can be expected.

Although standards, BMPS, and monitoring plans are designed to prevent significant impacts to soil and water, the potential for impacts does exist. Sediment production could exceed natural rates in certain locations where roads are being built or maintained, or where management activities include harvesting and removal of timber. Dispersed and developed recreation along riparian corridors, and restoration of forest communities/habitats could also result in temporarily increased sedimentation. Sediment would result from surface erosion, channel erosion, and mass movement.

Fire hazard and resistance to control would increase as a result of designating more areas to wilderness or other allocations that would not be favorable to management activities. Such designations would result in increased accumulation of forest residues. The potential for these adverse impacts increases relative to the lack of emphasis on management activities in the alternatives being considered. Wildfire risk would also increase where access results in more people being drawn into an area. Some risk would be mitigated by early detection, suppression, and prevention methods. Where permitted, long-term increases in fuel hazard would be mitigated through fuels management activities that are responsive to forest health management objectives.

RELATIONSHIP OF SHORT-TERM USE AND LONG-TERM PRODUCTIVITY

NEPA requires consideration of the "relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity" *(40 CFR 1502.16).* As declared by Congress, this includes using all practicable means and measures, including the financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans *(NEPA Section 101).*

The relationship between the short-term uses of man's environment and the maintenance and enhancement of long-term productivity is complex. Short-term uses are generally those that occur irregularly on parts of the Forest, such as prescribed burning. Long-term refers to a period greater than ten years.

Productivity is the physical capability of the land to provide vegetation-based market and amenity outputs and values for future generations. Soil and water are the primary factors of biological productivity and represent the relationship between short-term uses and long-term productivity. The quality of life for future generations would be determined by the capability of the land to maintain its productivity. By law, the Forest Service must ensure that land allocations and permitted activities do not significantly impair the long-term productivity of the land.

The alternatives considered in detail, including the selected alternative, incorporate the concept of sustained yield of resource outputs while maintaining the productivity

of all resources. The specific direction and mitigation measures included in the Forestwide management standards ensure that long-term productivity would not be impaired by the application of short-term management practices.

Each alternative was analyzed using the Spectrum linear programming model (See Appendix B – Description of the Analysis Process and the Forest Products topic), to ensure that certain minimum standards to safeguard long-term productivity could be met. The alternative was changed if some aspect did not meet these minimum standards. Long-term productivity of the Forest's ecosystems is assured for all alternatives through this analysis.

In decreasing order of vegetation management, alternatives are; F, D, B, A, I, E, and G as measured by the planned total acres of vegetation treatment per year or per decade. Short-term consequences of management such as human-caused visual impact, forest composition and structure changes, and potential for increased sedimentation follow the same pattern. All alternatives to Current Management (Alt. F) have less planned vegetation management activity overall than does current management. The Current Management alternative was also determined in 1985 to not cause decreases in long-term productivity. It is reasonable to conclude that, with the mitigation measures required in place, no alternative would be detrimental to the long-range productivity of the Chattahoochee-Oconee National Forest.

The management prescriptions and the effects of implementing the revised Forest Plan will be monitored. Evaluation of the data collected will determine if standards for long-term productivity are being met, or if management practices need to be adjusted. Monitoring requirements and standards apply to all alternatives, and are included in Chapter 5 of the revised Forest Plan.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Irreversible commitment of resources results from a decision to use or modify resources when they are renewable only over a long period of time, such as soil productivity; or are nonrenewable resources, such as cultural resources or minerals. The revised Forest Plan and the alternatives examined were all based on the principles of multiple use and long-term productivity for all resources. Measures to protect natural resources that could be irreversibly affected by management activities were incorporated into Forestwide standards.

Archeological resources are part of an absolutely nonrenewable and irreplaceable resource base. Once disturbed, for whatever reason, the impacted portion of a property cannot be replaced or repaired, even though controlled data recording techniques may recover part of the information contained in the damaged site.

Archeological surveys and evaluations routinely use small shovel tests or larger excavations to address research designs or potential. These excavations represent the controlled destruction of a portion of an archeological site. The results of such

excavations are an irreversible effect. This is balanced by using conventional, accepted archeological techniques and methods with a commitment to high standards.

Any other resource management action or result, whether planned or inadvertent, that diminishes the character or integrity of a heritage property, has irreversibly committed a portion of that site's value.

Irretrievable commitment of resources is the loss of the production or human use of renewable resources due to allocation decisions. The loss applies only as long as the allocation decision stands and can be changed in the future by re-allocation; that is, it is shorter term than an irreversible commitment. Examples include allocation decisions that establish Wilderness areas, Scenic Areas and Wild and Scenic Rivers; or decisions to maintain roadless character; or decisions to construct recreation sites or new roads. The total number of acres committed to these uses remains essentially the same for all alternatives, although the types of allocated uses vary. By contrast, non-wilderness allocation of inventoried roadless areas that would result in their no longer meeting roadless criteria is considered an irretrievable – not irreversible - loss of increased wilderness opportunities. Tradeoffs between wilderness, roadless, and other uses are discussed previously in this chapter.

Under a given alternative, differences between output levels and the higher levels that otherwise could be produced also represent irretrievable commitment of resources. For example, a low level of forage use for livestock grazing or a low level of timber yield could be increased in the future, based on different management prescriptions, but the outputs between now and then would be "lost " or not available for use. The production thus lost would be irretrievable, but the action is not irreversible.

EFFECT ON WETLANDS AND FLOODPLAINS

No significant adverse impacts on wetlands or floodplains are anticipated. Wetlands values and functions would be protected in all alternatives through the implementation of the Riparian Corridor Management Prescription (MRx 11) and following Georgia's Best Management Practices for Forestry. Under the requirements of Executive Order 11990 and Clean Water Act, Section 404, wetland protection would be provided by ensuring that new construction of roads and other facilities would not have an adverse effect on sensitive aquatic habitat or wetland functions. In addition, wetland evaluation would be required before land exchanges or issuance of special-use permits in areas where conflicts with wetland ecosystems may occur.

Mitigation measures have been designed to conserve riparian areas and protect floodplains through the Riparian Corridor Management Prescription. The direction of this prescription is embedded in all management prescriptions. Executive Order 11988 also requires site-specific analysis of floodplain values and functions for any project occurring within the 100-year floodplain zone, and prior to any land exchange involving these areas.

Protective measures for riparian areas include the delineation of riparian corridors on perennial and intermittent streams. Riparian corridors are designated as unsuitable for timber production in all Alternatives. Management activities within the riparian corridor must comply with the previously mentioned State BMPs and other State water quality regulations. Any vegetation manipulation in these areas would be for the enhancement of riparian-associated resources. Floodplains would be managed by locating critical facilities outside of floodplains or by using structural mitigation measures. Further protections are provided in Forestwide standards for management of ephemeral stream zones.

UNAVAILABLE OR INCOMPLETE INFORMATION

The Council on Environmental Quality, in its implementing regulations for the National Environmental Policy Act, addressed incomplete or unavailable information at *40 CFR 1502.22 (a) and (b)*. That direction has been considered. There are two tests to be applied; (1) does the incomplete or unavailable information involve '*reasonably foreseeable significant adverse effects…'* and (2) is the information about these effects '*essential to a reasoned choice among alternatives…'.*

There are reasonably foreseeable significant adverse effects. For example, gypsy moth – once it becomes established in Georgia – can be expected to kill many of the oaks and we cannot be certain of the date it will become established. Hemlock wooly adelgid is likely to virtually eliminate hemlock. However, information about the timing and amount of these effects is not essential to a reasoned choice among the alternatives. In addition, no decision being made at the strategic plan level within the Regional Forester's authority cannot be changed based on new information.

Where information is unavailable or incomplete, the allocation of management prescriptions and Forestwide goals, objectives, and standards have been designed to implement a conservative approach. This conservative approach hedges against the probability that a lack of information would result in a poor choice of alternative. Monitoring is directed in part towards collecting the necessary information to assure that decisions remain sound and any assumptions made in reaching those decisions continue to hold true. In addition, research needs have been identified as the foundation for studies directed at answering any remaining questions.

ENVIRONMENTAL JUSTICE

The concerns of environmental justice encompass specific considerations of equity and fairness in resource decision-making. As required by Executive Order 12898, all Federal actions must consider potentially disproportionate effects on minority or low-income communities. The principles for considering environmental justice outlined in *Environmental Justice Guidance under the National Environmental Policy Act* (Council on Environmental Quality, 1997) were considered in this analysis. This chapter of the EIS discloses the environmental effects of the alternatives. The

Economic and Social Environment section of the chapter identifies the demographics of minorities and low-income populations.

There are no disproportionate environmental or health effects to minority or low-income populations resulting from the proposed Land and Resource Management Plan for the Chattahoochee-Oconee National Forest. Public involvement during plan revision was inclusive and provided ample opportunity for issues of environmental justice to be raised (refer to Appendix A - Summary of Public Involvement).

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