CHAPTER 3
AFFECTED ENVIRONMENT

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3.1 INTRODUCTION

None of the alternatives examined in the environmental assessment will, on its own, change the physical environment of the affected national forests.

To provide the decision maker with a means of comparing the possible effects of the alternatives, the ID Team evaluated components of the environment that could be affected by the decision/proposed management direction.

3.2 PHYSICAL COMPONENTS

A brief description of the current condition of the physical components potentially affected by the decision to be made follows. A more complete description of the affected physical environment is included in the specific Land and Resource Management Plan (Forest Plan) for the six affected national forests.

3.2.1 Soil

Soil is a non-renewable resource. One inch of soil is developed from bedrock in several hundred to more than a thousand years. When soil is lost through erosion, soil productivity is reduced and essentially lost forever. Excessive removal of vegetation and ground cover from a site would expose the soil to erosion and loss of plant nutrients Long-term soil productivity is the capability of soil to sustain the inherent, natural growth potential of plants and plant communities over time. Ecosystem structures and functions ultimately depend on a productive soil resource. Maintenance of long-term soil productivity is widely recognized as a basic requirement of forest and rangeland ecosystem management. The extent to which long-term soil productivity is affected by management activities is variable, depending on the type of soil, the climatic conditions at the time of the activities and the intensity of the activity. Natural resource land management activities and uses on forest and rangelands have the potential to reduce natural productivity if certain operating guidelines are not followed. Soil productivity is reduced when erosion removes soil; management activities displace soil; soil porosity is Areduced; or when surface organic mater in the form of large and small organic debris (e.g., down logs) is removed in excess, from the forest floor (typically, after some form of vegetative manipulation).

Land area within the NFS boundaries in Utah is composed of rugged, glaciated mountains in the north and high plateaus in the southern part of the State. The tallest peaks in the mountains are more than 13,000 feet high. Many of the southern plateaus are more than 10,000 feet above sea level. With elevation changes ranging from 3,000 to 7,000 feet, the soil temperature and moisture gradients are highly variable. The land area is semiarid and most of the soil moisture comes as snow in the winter. Yearly precipitation ranges from 10 to 20 inches in the lower valleys to over 40 inches in the higher mountains. Moderately well developed soils with soil moisture regimes at the higher elevations are generally sufficient to support the growth of subalpine fir and spruce forest as well as lodgepole pine and aspen. In the southern plateau areas, soils may be somewhat weakly developed, with moisture regimes that support ponderosa pine, aspen, and some Douglas-fir. The lower woodland zone has only enough soil moisture and temperature regimes to support pinyon-juniper and mountain brush of oak and maple species. Many areas of low soil moisture support sagebrush, grasses and desert shrubs.

Because of the complexity of the geologic formations, steep slopes, and the parent materials, land stability in the form of landsliding and mass wasting occurs in many areas within Utah. The presence of these hazards and limitations within the soil mantle, coupled with high erosion hazards in some areas, influence

the management activities that can be applied to the landscapes. Materials from which the soils were derived have a great influence on the inherent soil characteristics. Sedimentary bedrock materials, such as those which make up the interbedded shales and siltstones in the North Horn and Wasatch geologic formations, weather into fine texture soil materials which are susceptible to mass movement.

Soil is a highly variable and complex layer of unconsolidated material. The combined influences of time, parent material, climate, living organisms, and the topography of a site interact to form soils with unique sets of physical and chemical properties that determine the productivity of each soil. Natural soil productivity varies widely across Utah due to soil properties (e.g., nutrient status, depth, coarse fragment content, texture) and site characteristics (e.g., elevation, aspect, slope gradient). The soil resource on the six Utah NFs varies considerably within and between watersheds, river basins and Forests. Historic use as public domain lands severely impacted the soil resource, with areas of extensive soil loss, compaction, and in some places changing the soil hydrologic function. Some soil ecosystems which support high elevation alpine vegetative communities and soils that once supported tall forb communities, are currently rated as "functioning at risk" when reviewed from a properly functioning condition concept.

Soil directly or indirectly supports all other resources. It serves as a growth medium for plants, filters biological and chemical substances and regulates water transmission. The long-term productivity of forest and rangeland resources is dependent upon the soil resource.

Direction for soils and watershed management is contained in many federal laws. The Organic Act of 1897 requires protection of natural resources including soils and water. The NFMA (16 USC §1604) requires the management of public lands in a manner that will not impair the long-term soil productivity of the land. A major goal for soil resource management is long-term maintenance and sustainability of soil productivity and watershed protection. This requires avoiding management actions that would irreversibly impair soil productivity. Maintaining soil productivity also requires restoring or improving soils in areas where they have been degraded.

3.2.2 Water

Water quality and ecosystem health are closely linked. Changes in any of the chemical, physical, and biological properties of water can directly affect people, fish, wildlife, and overall ecosystem functions and values. The State of Utah’s surface water resources include 16,457 miles of rivers and streams, nearly 3,000 lakes and reservoirs, including the Great Salt Lake, and approximately 510,039 acres of wetlands and 1,902 linear miles of wetlands (Utah Division of Water Quality 1998).

Waters flowing from forested areas administered by the Forest Service in Utah have a number of beneficial uses, including providing domestic, industrial, and agricultural water, recreation opportunities, fish and wildlife habitat, and power production. And, one unique aspect of the water resource in the project area is that a large percentage of water flows into the Great Salt Lake. Water quality plays an important role in ecosystem function on federal lands. Primary factors affecting water quality are erosion and subsequent sedimentation resulting from natural and management-induced disturbances such as vegetation manipulation, road construction, stream crossings, high intensity fires and increased temperatures resulting from removal of riparian vegetation that shades streams. NFS lands in Utah are extremely important to the maintenance of water quality in the state as they provide the cleanest source of water as well as the main source of all drinking water.

The headwaters of the major drainages are found on NFS lands which means that the quality of water flowing from NFS lands into the Great Salt Lake could also affect the Great Salt Lake ecosystem. Proper management and use of water resources, combined with care for the watershed lands from which they originate, are fundamental to managing all other resources on these national forests. The primary water resource issue on NFS lands is water quality. The goals are to maintain the soil mantle and to provide water for human, wildlife, fish, and vegetative needs. Water is used on the Utah NFs for livestock, dust abatement on roads during timber hauling, human consumption, maintenance of in-stream flows, and wildlife needs, including wetland habitat.

Since the scope of this analysis is limited to NFS lands within Utah and small portions of Colorado and Wyoming, most of the streams and rivers can be characterized as lower order streams, including their headwaters. The 1st, 2nd, and 3rd order streams tend to be high energy, fast-moving water courses that are often confined or partially confined within limited flood prone areas; and, they are often structurally controlled. The higher order streams (typically 4th and 5th order) can be expected to have moderate energy and slopes and they are usually weakly confined by their valleys.

Streamflows from the headwaters generally is snow-dominated. A significant snowpack accumulates from late fall through spring. Snow melt in spring and early summer results in a notable runoff surge that usually is sustained well into the summer. Water temperatures tend to be cool year-round. Generally, water quality is excellent in the headwaters. Rivers and streams are relatively steep in the headwaters, controlled by bedrock and glacially-derived formations. High mountain lakes are common in the headwaters.

The Clean Water Act directs federal agencies to comply with state water quality requirements to restore and maintain water quality necessary to protect beneficial uses such as public water supply, recreation in and on the water, and protection and propagation of fish, shellfish, and wildlife. Under the Clean Water Act, Utah adopted water quality standards. Water quality standards consist of designated beneficial uses for the waters of the state as delineated in Utah's administrative rules, and criteria to protect the beneficial uses. Criteria may be constituent concentrations (e.g., turbidity, temperature), levels, or narrative statements (e.g., no discharge of materials in concentrations harmful to human health or aquatic life) representing water quality that supports a particular use. The water quality standards also include an antidegradation policy protecting existing uses and waters of high quality. Best management practices (BMPs) are water quality protection measures developed by the Forest Service to attain and maintain state water quality goals and objectives. BMPs are certified by the state agency with water pollution control authority, approved by the Environmental Protection Agency, and also included in current plans.

3.3 BIOLOGICAL COMPONENTS

A general discussion of the current condition of the biological components that could be affected by the decision to be made follows. A more detailed, Forest-specific discussion can be found in each of the Forest Plans for the six affected national forests.

3.3.1 Forest Vegetation

Throughout Chapter 3, Affected Environment, and Chapter 4, Environmental Consequences, reference is made to "historic range of variation (HRV)" and "properly functioning condition (PFC)" when discussing vegetative conditions. While these two concepts share many commonalities, they do differ. A detailed explanation can be found in Appendix D.

The discussion below summarizes information on vegetation important to goshawk habitat. Additional information on vegetation on Utah's NFs is available from numerous sources, including the vegetation resource report in the Project Record (Exhibit L), the *Region 4 Properly Functioning Condition Assessment* (USDA Forest Service 1996), the Properly Functioning Condition Assessments for the Uinta Mountains (USDA Forest Service 1998b), the Wasatch Mountains (USDA Forest Service 1998a), the Dixie NF (USDA Forest Service 1997), the Utah High Plateaus and Mountains Section (USDA Forest Service 1996a), and the Manti-LaSal NF (in draft, USDA Forest Service 1998c), *Aspen Community Types of the Intermountain Region* (Mueggler, 1988), *Coniferous Forest Habitat Types of Northern Utah* (Mauk and Henderson, 1984), and *Coniferous Forest Habitat Types of Central and Southern Utah* (Youngblood and Mauk, 1985).

The best single source for information on vegetation types used by the northern goshawk is in *The Northern Goshawk in Utah: Habitat Assessment and Management Recommendations* (Graham et al. 1999) which describes the current and potential vegetation types across Utah and the value of these types to the northern goshawk. The information contained therein is herewith incorporated by reference.

National forest vegetation types that could potentially be affected by the decision associated with this environmental document include all forest types with the exception of woodlands (pinyon-juniper, oak, oak-maple) and brushlands. Included within the affected forested types are understory species and small openings (generally less than 1 acre in size) that contain non-arboreal vegetation species. Non-arboreal vegetation provides important habitat for prey species of the goshawk.

Spruce-Fir - This vegetation type ranges from pure Engelmann spruce to pure subalpine fir forests. In most instances, however, it occurs as a mixed species forest. Blue spruce is a component of this type.

Structural stages are not balanced throughout the project area in this type because the majority of the type is in mature to old age classes. Due to the high elevation, short snow-free growing season, and moist environment, these ecosystems have relatively few fires. The primary disturbance agents in these spruce-fir ecosystems are most likely insects, with fire as a secondary agent.

The potential is high for major changes in the current stand structure and composition for this type. Changes occur naturally as overstory trees age and die from agents such as insect epidemics, stand-replacing fires, or a combination of the two on broad landscape scales (USDA Forest Service 1996). Smaller scale changes may be induced by minor events such as wind throw, small fires, avalanches, etc. Depending on edaphic conditions and insect populations, small scale disturbances can lead to major spruce beetle outbreaks. These change agents influence vegetative structure, species composition, and successional dynamics in spruce-fir communities (Habeck and Mutch 1973, Aplet et al. 1988, Baker and Veblen 1990, Veblen et al. 1991, Veblen et al. 1994). Based on research in northern Utah, Jenkins et al. (1998) describes four potential successional pathways for spruce-fir forests after stand-replacing fire. Major shifts from old, late seral to young forests in spruce beetle epidemic areas are currently occurring in portions of the Fishlake, Manti-LaSal, and Dixie NFs.

Aspen - Quaking aspen is distributed throughout the project area, with the largest concentrations in central and northern Utah. Age generally varies from 60 to 120 years. Aspen is considered an early seral species on most sites but may be long-persistent or "stable," forming an edaphic climax on others. Where aspen is seral, fire has been the most important disturbance factor influencing changes in structural stages and composition and minimizing dominance by conifer species (USDA Forest Service 1996). The fire return

interval is less frequent today compared to historical averages due to the combined effects of fire suppression and fuels reduction by herbivory (Bartos and Campbell 1998). Where aspen is stable, the mechanisms that keep aspen are not fully understood and may be site dependant and variable.

Most of the quaking aspen (both seral and stable) is in a mid to late seral stage and is dominated by older age classes. Many areas are becoming dominated by conifers through plant succession (seral sites), reducing quaking aspen area. Decline in aspen is due to a number of factors including succession to conifers, grazing, and fire suppression.

Changes in the abundance of aspen-dominated landscapes have occurred over the past 125+ years partly as a result of exclusion of fire in combination with herbivory (ibid.). Bartos and Campbell (1998) conclude that of the 2.1 million acres of NFS lands in Utah that were once dominated by aspen, aspen now dominates the landscape on only 800,000 acres. This equates to an approximate 60% decline in aspen-dominated landscapes on NFS lands in Utah. Decline in aspen is due to a number of factors including succession to conifers, grazing, and fire suppression.

If current trends continue, it is likely that significant acres of seral aspen cover types will convert to dominance by coniferous species by following plant succession. The ability of aspen to recolonize the site may be limited or lost by long-term site dominance of conifers. Loss can occur since aspen in Utah regenerates by suckering and not through seedling establishment. This, in turn, could affect the resiliency of the site to disturbance. Aspen has been replaced on some stable sites by sagebrush (ibid.1998). This seems to be related to fire prevention and grazing pressure on aspen seedlings where aspen is on the edge of its range. Given recent and current conditions and trends, there is a risk to loss of some stable aspen as well as seral aspen.

Lodgepole Pine - Lodgepole pine is typically an early seral tree species ranging over extensive areas of northern Utah. It readily regenerates naturally after fire and is often found in pure, even-aged stands. Lodgepole pine has a history of extensive mountain pine beetle epidemics at elevations generally below 9,600 feet, where the more susceptible sites are located (Amman et al. 1973); Dwarf mistletoe is the most common disease (Van Der Kamp and Hawksworth 1985). Currently lodgepole pine structural stages are not balanced within the analysis area; thus, these systems are not within the "properly functioning condition," defined in the *Region 4 Properly Functioning Condition Assessmen*t (USDA Forest Service 1996). Most lodgepole pine forests are in the mature and old age classes, except for recently harvested and burned areas, which account for less than 20% of total lodgepole acres (O'Brien 1999). The historical fire regime is one of lethal, stand-replacing fires.

The percentage of the type under intensive management is small (<15-20% of the cover type), and where clearcutting has been concentrated harvest has resulted in a landscape highly fragmented when compared to the historical pattern (i.e., patch size is much reduced over the historical pattern).

The primary short-term risk is related to stand structural changes in the mature age class caused by bark beetle epidemics. Following these epidemics, risk of unwanted wildland fire increases. Long-term risks are related to large, rapid swings from mature-aged and late seral forests to grass/seedling and early seral stages. Current fragmentation within some areas will pose a risk to species that are dependant on the historical pattern of stand structures and habitat sizes and shapes.

Mixed Conifer - This cover type typically includes a mix of coniferous species. The mix is variable depending on site, elevation, and geographic location. Stands are dominated by one or more of the

coniferous species. Aspen is a component of many mixed conifer stands; however, it is not the principal species in this type. In southern Utah and adjacent areas of Colorado this type may contain as many as seven species; in northern Utah and adjacent areas of Wyoming, there may be only two to three species. Mixed conifer cover types may include Engelmann spruce, blue spruce, subalpine fir, white fir, Douglas-fir, ponderosa pine, lodgepole pine, limber pine, aspen, and occasionally bristlecone pine. In this assessment, stands dominated by Douglas-fir and/or white fir are included in the mixed conifer group.

Site conditions vary from dry white fir and Douglas-fir sites to generally moist, high elevation sites dominated by spruce and lodgepole pine in the Uinta Mountains. Sites classify as subalpine fir, white fir, or Douglas-fir habitat types, indicating that these species are the potential "climax" species for the site.

In the high elevation mixed conifer sites of the Uinta Mountains, the fire regime is little altered over much of the area. In these areas, the fire regime shares more in common with the spruce-fir regime than with the lower elevation, drier mixed conifer sites.

On the drier, warmer mixed conifer sites, more fire-adapted seral species such as ponderosa pine, Douglas-fir, aspen, and lodgepole pine historically were common due to fire history throughout these types (USDA Forest Service 1996). Fire suppression during the first part of this century has eliminated most of the non-lethal "cleaning" fires and allowed the more shade-tolerant late seral species to increase, increasing stand densities and ladder fuels. The current conditions, where stand densities are higher than historic, puts additional competitive stress on what large, seral trees remain.

The most significant risk is to the mid- and lower elevation portions of the mixed conifer type and is associated with fire and the long-term exclusion of fire. Fire exclusion has affected stand structure and increased ladder fuel development. Stand-replacement fires, outside of historical ranges of intensity and size, are likely (USDA Forest Service 1996). The historic balance of patterns and structures could be compromised by large stand-replacing fires, or continued exclusion of frequent non-lethal fires.

Ponderosa Pine Type - This cover type is found on the Ashley, Dixie, Manti-LaSal, and Fishlake NFs. In southern Utah this type is found between gambel oak/sagebrush or pinyon/juniper at lower elevations and mixed conifers (Douglas-fir and white fir) at higher elevations. Ponderosa pine sites are generally warm and dry with annual precipitation of 16 to 24 inches. Structures are normally multi-layered with a range of tree sizes. Much of the historical type (on seral sites) is now dominated by mixed conifer due to the exclusion of non-lethal, "cleaning" fires and succession. Structures are predominantly made up of larger late seral species in the mid to mature-aged classes, and are overly dense (as compared to historic conditions).

Climax ponderosa pine forests characteristically have very low numbers of trees per acre and very little dead material on the forest floor because of the short time between fire events (Covington and Moore 1994). Those portions of the ponderosa pine type in southern Utah were historically park-like and open forests, where crown closure was never achieved due to site quality and moisture limitations (strong root competition occurs before crown closure on these sites). Climax ponderosa pine stands might better be termed "woodlands" than "forests." On such sites, the average crown closures that might be achieved are in the neighborhood of 30 to 40%. An increase in pinyon and juniper has been noted on some climax pine sites, a result of the lack of fire.

Most of the type has had various levels of timber harvest during the past century, removing much of the large ponderosa pine component (Graham et al. 1999). Harvest, in combination with pine beetle outbreaks

during the 1970s, has resulted in a decrease of "old-growth" ponderosa pine stands. Most stands have regenerated well, and there are many fully stocked stands of relatively small sized trees.

The risk is high in this cover type for uncharacteristic, lethal wildland fires which may compromise the historical balance of patterns and structures. Replacement of ponderosa pine by more competitive late seral species such as Douglas-fir and white fir results in a net loss of ponderosa pine forest; such vegetation patterns are outside the historical range of conditions (USDA Forest Service 1996).

3.3.2 Non-Arboreal Understory Vegetation

Non-arboreal vegetation that may be affected by the decision associated with this environmental assessment include species that are associated with the forested vegetation types described above as understory species, species within small openings (generally less than 1 acre in size), and species located on forest/non-forest ecotones (generally within 200 feet of the forest canopy). Detailed lists of understory species may be found in Mueggler 1988, Youngblood and Mauk 1985, and Mauk and Henderson 1984. Understory vegetation provides habitat for goshawk prey species; changes in understory species composition, distribution, and structure may have impacts on prey species and consequently on goshawks.

Recent forest inventory data (O'Brien 1999) summarized the percent of canopy cover for understory shrubs, forbs, and grasses associated with various forested cover types (see Appendix E, Table 1). Because of fire exclusion, trees have expanded into some areas that were historically non-forest or only contained scattered trees. Examples of this can be found throughout the analysis area.

Shrubs - Shrubs are most common in understories of early seral stands where adequate sunlight reaches the forest floor. As forested stands progress through successional stages and forest canopies close, the associated shrub species may shift to more shade tolerant species or may diminish on the site. In fire-adapted ecosystems, periodic low intensity fires kill the above ground portion of most shrubby species, allowing sprouting species to develop young, vigorous stems and non-sprouting species to regenerate from seed. Periodic fires maintain a diverse, vigorous understory while keeping shade tolerant tree species in check. In the absence of fire, many shrubs have declined or aged and become decadent.

Graminoids - Grasses and sedges are an understory component in most forested types. Graminoids are generally more plentiful in early seral forests or young forests in early vegetative structural stages. As most graminoid species do not tolerate dense shading, they are most common along forest edges and in small openings within forested stands. Graminoids generally respond favorably to fire by regenerating from the roots and/or from seed.

Forbs - Forbs are a common understory component of virtually all forest stands. Some forb communities are considered the potential natural vegetation for the site. That is, they will dominate the site in perpetuity under proper management. Tall forbs make up the understory of some of the more productive aspen sites. The aspen/tall forb cover type is one of the most commonly encountered aspen cover types in the project area and is most prevalent in northern Utah (Mueggler 1988).

Approximately 50% of the tall forb type was lost due to improper grazing during the early euro-American settlement era, which caused a significant loss of the deep, rich soils (USDA Forest Service 1996). Site restoration is very difficult, or nearly impossible, because of the soil loss.

3.3.3 Riparian and Wetland Vegetation

Riparian areas are highly productive and heavily utilized by humans and animals. Riparian zones are characterized by sedges, grasses, shrubs, trees, and other vegetation. They maintain relatively high water tables and act as "sponges" by holding water in streambanks, thereby raising the water table in the surrounding areas and providing a more stable stream flow (GAO, 1988). Diversity of vegetation is an important characteristic of riparian areas in good condition (Chaney et al. 1990). Unlike adjacent terrestrial communities, water is more readily available for plant uptake in riparian zones, and duration of this free, unbound water may influence community composition (Youngblood et al. 1985).

Late seral riparian communities are stable by nature; they are dominated by deep rooted, often rhizomatous, species which generally take several years (5-7 years) to show the effects of changes in management. Late seral riparian communities may show improvement more quickly because the desirable plant communities are already in place. In contrast, early to mid-seral greenline communities will show downward trends more quickly because they are typically dominated by weakly rooted species that are more easily displaced through continued surface disturbance and through water action against stream banks lacking adequate protection because of the weak rooting systems. Early seral greenlines will take more time to improve because the species necessary to colonize and develop into communities stable enough to hold streambanks are not well represented (Padgett 1995).

Riparian areas occupy relatively small areas, are fragile, and are vulnerable to severe alteration due to the combination of restricted area, distinct microclimate, distinct vegetative structure and composition, and water quantity and quality (Thomas 1979). Riparian areas have been significantly affected over the past century (USDA Forest Service 1996). Most of these effects have been negative, including: lowering of water tables, erosion of stream channels, exotic plant encroachment, removal of beaver populations, concentrated runoff and increased sediment from road construction, sedimentation caused by increased overland flow and soil erosion from upland areas that are outside of properly functioning condition, changes in vegetation composition, and often a loss of the historic fire disturbance patterns that served to regenerate riparian vegetation. All have contributed to degradation of riparian areas (ibid.).

The Properly Functioning Condition Assessment reports (ibid.) and the High Utah Plateaus and Mountains Section (USDA Forest Service 1996a) conclude that riparian areas throughout the Region have been significantly affected over the past several decades, indicating a pattern of riparian systems being lost to encroachment of spruce-fir, ponderosa pine, Douglas-fir, and sagebrush. Increases in tree encroachment into riparian areas can be attributed to reduced influence of fire on landscapes. The riparian complex in the Intermountain Region is considered to be generally at a high state of departure from properly functioning condition. This is not to suggest that all riparian complexes in the Intermountain Region are necessarily in a downward trend. Where direct human induced factors are involved, conditions have improved in recent years.

Dr. Fee Busby (1978) reported that "Probably the poorest rangeland conditions--including riparian and stream ecosystems and trout habitats--occurred between 1885 and 1935" when large numbers of sheep and cattle were allowed to graze the intermountain area as unregulated "free range." He found that "Today most of our western range is in fair condition and is stabilized in that condition." Dr. Alma Winward concurs, indicating that although there are continuing impacts on riparian systems, they are generally holding their own or improving (1997).

3.3.4 Wildlife and Fish

The climate and vegetation within the project area is highly influenced by elevation and latitude. In general, the elevations of the six affected national forests range from 3,000 to 13,000 ft., with rugged and broken topography. In addition to the major mountain ranges, such as the Uintas and Wasatch, major plateaus are found in the project area, such as the Markagunt and Tavaputs. Precipitation on NFS lands ranges from 10 to more than 40 inches annually. With this variation in topography, climate, soils and geology, a wide range of forest compositions and structures are typical. These diverse landforms and plant communities support a large number of wildlife species including goshawks and their prey.

Goshawk Habitat and Abundance - The goshawk is the largest of the three species of Accipiter in North America. Members of this genus inhabit coniferous, deciduous, and mixed forests. Distribution of the goshawk is Holartic with three recognized subspecies breeding in North America: the northern goshawk (*Accipiter gentillis atricapillus*), Queen Charlotte (*A.g. laingi*), and the Apache (*A.g. apache*) (USDI Fish and Wildlife Service 1997). Little information exists on the historical distribution of goshawks in the project area. Early records indicate that it was an uncommon permanent resident, primarily found in montane conifer and quaking aspen habitats throughout the State (Behle et al. 1985). Occasionally it nested in cottonwood (*Populus* spp.) cover types in lower valleys (White and Lloyd 1965). Studies and surveys over the past 20 years indicate that the goshawk occurs across the project area in a wide variety of forest cover types. While goshawks have been observed foraging in pinyon-juniper type during the winter months, goshawk use of pinyon pine and juniper, along with winter habitat use, is poorly understood. Similarly, while observations of nests have been reported during the winter months, there are no documented nests occurring in the pinyon-juniper type (ibid.). Because of this the pinyon-juniper type was not included in alternative direction and will not be discussed further.

The northern goshawk is managed as a regionally sensitive species by the Intermountain Region of the USDA Forest Service. It is also a State of Utah sensitive species. It has had these designations since 1991 and 1997, respectively. The northern goshawk has also been identified as a management indicator species (MIS) on four of the six affected national forests - Ashley, Dixie, Fishlake and Uinta NFs. Owners or administrators of forests inhabited by the goshawk include the USDI National Park Service (NPS), USDI Bureau of Land Management (BLM), USDA Forest Service, State of Utah, as well as Native American tribal lands and private lands. The USDA Forest Service administers the majority of the lands that were ranked by Graham et al. (1999) as containing high and optimum valued goshawk nesting habitat (Appendix E, Table 2); and the majority of important foraging habitat. The largest proportion of overall high and optimum habitat (has both high quality nesting and foraging habitat) is managed by the Forest Service, with BLM, NPS, State, private and Native American entities managing smaller amounts (Appendix E, Table 3).

In Utah, all forested landscapes were identified as potentially suitable habitat for some portion of the northern goshawk's life cycle. Currently, the majority of suitable habitat is considered to be of medium or high value, well connected and distributed throughout the state (Graham et al. 1999, USDI Fish and Wildlife 1998). Although all forested landscapes are used to some extent, certain forest cover types appear to be occupied by goshawks more than others (Graham et al. 1999). Cover types most often occupied by goshawks (based on sightings and nest locations) are Engelmann spruce, subalpine fir, lodgepole pine and quaking aspen, either single or mixed species forests (ibid.). Ponderosa pine can be a locally important species, particularly in riparian areas where the species is mixed with quaking aspen.

Important internal components of forests include snags, multiple canopies, and down woody debris (Reynolds et al. 1992; Graham et al. 1999). These components are important to goshawks both directly and indirectly as nesting habitat as well as habitat for prey species and tend to vary across forest type. For example, spruce/fir forests have complex forest structures with multiple canopies and large amounts of down woody debris. Lodgepole pine forests have simple forest structures, single canopies and have small amounts of down woody debris except in very old forests.

Forests are complex and dynamic. Each forest cover type important to the goshawk and its prey has a wide range of biophysical attributes that result in a variety of stand structures and compositions which are influenced by a wide range of disturbance factors. Disturbances in these cover types range from those induced by wind, snow, ice, and fire to those that are human-caused. The affected national forests are widely used for human habitation, timber extraction, recreation, livestock grazing, as well as being important sources of water. Disturbances which occur within each of the forest types discussed in the vegetation section (3.3.1) occur in varying amounts/degrees and present their own unique threats to the goshawk and its habitat. The degree of the threat depends on where, when, how intense, and how long the disturbance occurs.

The forests and woodlands in the project area are dominated by late seral species *(*Appendix E, Table 4). Depending upon the type, white fir, subalpine fir, Douglas-fir, pinyon pine, and juniper often dominate these forests. In addition, most forests contain many seedlings and saplings, creating very dense forests, which are prone to insect, disease, and stand replacing fires. Ponderosa pine, quaking aspen and lodgepole pine, which are early and mid-seral species, are often poorly represented. Forests dominated entirely by late seral species, in general, are more unsuitable than those dominated by a variety of early mid and late seral species. In addition to being unsuitable and at a higher risk to stand replacing fires and insect and disease problems, these dense stands may become undesirable for both nesting and foraging by goshawks. Little is known about goshawk habitat use in nonbreeding habitat (Graham et al. 1999)

The current condition of specific cover types addressed above (3.3.1) affects goshawk use of habitat in the following ways:

- *White fir* - Current structural attributes make this cover type undesirable for the goshawk compared to the more open ponderosa pine, Douglas-fir, or quaking aspen forests typical of this cover type historically. Key factors limiting the values to goshawks is the current dense stocking levels and multiple canopy layers, and large trees for nesting are limited. Dense, multistory canopies are likely to hinder foraging opportunities by obstructing flight and sight lanes (Graham et al. 1999).
- *Subalpine fir* - Late seral species dominate, primarily subalpine fir and Engelmann spruce mixed with lodgepole pine (ibid.). Without some form of stand-replacing disturbance the two major early seral species of the type, quaking aspen and lodgepole pine, will continue to decline from their already low representation. Quaking aspen is one of the more important tree species in Utah to wildlife species, including goshawk and its prey. The decline in aspen and lodgepole in this type has impacted goshawks. Where this cover type is dominated by late seral species, such as subalpine fir, it provides poor to marginal habitat due to cluttered multistory stands and the lack of prey (except for snowshoe hare).
- *Lodgepole pine* - Past bark beetle activity has killed many trees in this cover type. However, the present condition of this cover type appears to be part of a normal cycle and most stands will continue to develop naturally. Surface fires that have frequented these forests could once again thin the even-aged structure (ibid.). Goshawks are currently nesting successfully in lodgepole pine

stands with predominantly dead overstories. However, habitat values are expected to decrease as the standing dead trees fall.

- *Engelmann spruce* - The current high proportion (79%) of mid- and old-aged trees in this type make these stands highly susceptible to infestations of spruce bark beetles (Graham et al. 1999, USDI Fish and Wildlife Service 1998). Bark beetles have attacked and killed many large trees within the several thousands of acres infested over the last several years. As a result, goshawk habitat, especially nesting habitat, has been adversely affected where high bark beetle mortality has occurred.
- *Ponderosa pine* - This cover type is dominated by ponderosa pine even though gambel oak and quaking aspen are important seral species (Graham et al. 1999). The majority of acres within this cover type have been partially cut in the past due to its high economic value, removing mature trees important for goshawk nesting. Domestic livestock grazing, along with the exclusion of fire, has disrupted native fire cycles and probably has contributed to the decrease of early seral species (ibid.) which are important to the habitat quality in this type. Forests have also become more dense (though less than other cover types) which is also adversely altering goshawk foraging habitat for the same reasons as stated above for other types.
- *Quaking aspen* - This cover type, and the quaking aspen it supports, is probable the most valuable goshawk habitat in Utah and is currently relatively stable. Many successional changes occur in the grass, forb and shrub layers as they respond to the different disturbances. But these changes are not of great influence on habitat quality for goshawks. The primary threats to quaking aspen stands growing on this type are browsing by domestic and wild ungulates and stand-replacing fires that ignite from adjacent types (Graham et al. 1999, USDI Fish and Wildlife Service 1998). Without a major disturbance or overgrazing, these stands should remain relatively stable, resilient, and available for goshawks, both in the short- and long-term (Graham et al. 1999).
- *Douglas-fir* - This cover type is dominated by Douglas-fir or Douglas-fir mixed with other species. Less than 2 percent of the type is occupied by ponderosa pine (ibid.), one of the primary seral species. The current multiple canopies and dominance by Douglas-fir within this type, make it very susceptible to root diseases and insects. As a result, current forests of this cover type are relatively unstable and are at risk to wide spread stand replacing disturbances including epidemics of insects and diseases. Without the reintroduction of fire or restoration activities to stabilize conditions and promote seral species, these forests will continue to be unstable and decrease in value for the goshawk (Graham et al. 1999).

The northern goshawk nests in a wide range of forested cover types. Most of the 421 known nests located during project level surveys occur in mid-elevation (6,000 ft.) to high-elevation (10,000 ft.) sites occupied by mature quaking aspen or coniferous forests. There are some regional differences in goshawk use of certain forest cover types. For example, few nests were found in the northeastern national forests high elevation Engelmann/subalpine fir forests; while in southern national forests, Engelmann spruce was used frequently for nesting. In the project area's northern national forests, the greatest proportion of the known nests occurs in mixed lodgepole pine and quaking aspen forests; in southern Utah, the greatest proportion of nests occur in Engelmann spruce, and ponderosa pine (Appendix E, Table 5). Goshawk use of ponderosa pine for nesting is moderate when compared to use in lodgepole pine/quaking aspen (ibid.). In contrast, goshawks extensively use the ponderosa pine cover type in northern Arizona (Reynolds et al. 1994). However, Reynolds et al. (1992) and Graham et al. (1999) found that goshawks nest in sites with similar structural characteristics within each cover type in Utah and Arizona/New Mexico; generally, mature to old forests with relatively large trees, high canopy closure (relative to surrounding areas), sparse ground cover and open understories (Appendix E, Table 6).

This limited use of ponderosa pine forests may be due to the current forest conditions on national forests. These forests were partially cut following mountain pine beetle outbreaks in the 1970s and 1980s. With many large trees removed, nesting habitat for goshawks was reduced. In northeastern national forests, historical nests were observed in ponderosa pine forests but no active nests have been located since the forests were harvested in the late 1980s (Graham et al. 1999). And, there is limited evidence of goshawk nesting activity in southern national forests ponderosa pine forests which were also partially harvested during the 1970s-1990s resulting in large areas of low density, relatively small diameter trees.

However, there are differing opinions in the biological community on the importance or role of habitat attributes associated with the goshawk and its prey. These differences, described by AGFD (1993); FWS Region 2 (1992), and Crocker-Bedford and Chaney (1988), focused primarily on canopy closures, the need for open understories, and the amounts of mature and old forests in some home ranges. They contend that higher canopy closures are needed than promoted by Reynolds et al. (1992), dense understories are not necessarily a problem, and the amount of mature and old forest recommended in Reynolds et al. (1992) or how it's impacted by activities is inappropriate.

Also, in 1996 The Wildlife Society completed a technical review of Reynolds et al. (1992) *Management Recommendations For The Northern Goshawk In The Southwestern United States* (Braun et al. 1996). It asserted that these recommendations represented an innovative approach to forest management because they encouraged forest managers to consider forest ecosystems as assemblages of interacting species of plants and animals. It went on to state that prescriptions for habitat management to benefit northern goshawk needed to be ecosystem-specific, realizing that prescriptions may need to be tailored to the watershed scale. But, it cautioned against the widespread implementation of the recommendations without additional management direction to insure consistency and monitoring of their effects on the goshawk, and other components of the forest system (ibid.). Reynolds et al. (1992) was one of the foundation documents of Graham et al. (1999).

Reynolds et al. (1992) defined desired conditions for goshawk foraging habitat on the basis of prey ecology. The "food web" approach to habitat management received support from the technical reviewers (Braun et al. 1996). This same approach was used by Graham et al. (1999) to characterize goshawk foraging habitats in Utah. Important prey species described by Graham et al. (1999) include avian and mammal species, such as snowshoe hare, woodpeckers, jays, and grouse. For a list of selected goshawk prey species refer to Appendix E, Table 7. These species were identified from field observations made during the breeding season, including several mammals identified as dominant prey by Squires and Reynolds (1997). However, due to the lack of data based on direct observations, the variety of mammals in goshawk diets may be underestimated (Boal and Mannan 1994). Important habitat attributes for maintaining populations of selected prey include large down woody debris, snags, large trees, understory vegetation, openings, mix of structural stages, and interlocking tree crowns (ibid.). For a more complete description of these attributes and their relation to selected prey species, refer to Appendix E, Table 8.

Graham et al. (1999) concluded that, in general, existing habitat appears to be capable of supporting a viable population of goshawks at the state spatial scale. These finding were consistent with the FWS's Twelve-Month Finding On The Petition To List The Northern Goshawk which concluded that while forest management (e.g., timber harvest and fire exclusion) has changed the vegetation characteristics throughout much of the western United States, the goshawk continues to be well-distributed throughout its historic range. And, no evidence was found to indicate that the goshawk population is declining in the western United States, that habitat is limiting the overall population, that there are any significant areas of

extirpation, or that a significant curtailment of the species habitat or range is occurring (**FR**, June 29, 1998, Vol. 63, No. 124, pages 35183-35184).

However, differing opinions from the biological community exist on the subject of declining populations. Reynolds et al. (1992), Braun et al. (1996), USDI Fish and Wildlife Service (1998), Graham et al. (1999), and Kennedy (1997) found no evidence from the information they reviewed to indicate that northern goshawk populations are declining either in the State of Utah or in the western United States. Their findings differed from those of Smallwood (1998) and Crocker-Bedford (1990 and 1998) who believed evidence of decline does exist. The debate centers around the methods and variables that are most appropriate for assessing whether a species has declined significantly to warrant listing under the Endangered Species Act (ESA). DeStefano (1998), recognizing the strengths from approaches described by Kennedy (1997), Smallwood (1998) and Crocker-Bedford (1998), recommended more research and management at all levels -- populations, communities, and ecosystems, and felt the goshawk is a good candidate for this multilevel approach.

Based on determinations found in the HCS *(*Utah NFs et al. 1998*)* and the Assessment (Graham et al. 1999), the absence of evidence of a population decline on NFS lands since 1991, and the FWS findings **(FR**, June 29, 1998, Vol. 63, No. 124, pages 35183-35184), the Goshawk Technical Team concluded that the goshawk population in the State of Utah is viable.

Threatened, Endangered, and Proposed Plant and Animal Species - Section 2 of the ESA states that "...all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act." Section 7 of the ESA directs Federal departments and agencies to ensure that actions authorized, funded, or carried out by them are not likely to jeopardize the continued existence of any threatened or endangered species or result in destruction or adverse modification of their critical habitats.

Several threatened, endangered, and proposed (TEP) species found on the six Utah NFs are occasionally observed in forested habitats; however, they do not require them for foraging or reproduction. Only two TEP species require forest habitat for foraging and/or reproduction, or may be affected by disturbances in adjacent forested habitat -- the Canada lynx and Mexican Spotted Owl. Therefore, only these two species are discussed in detail.

Historically, the Canada lynx is known to occur in the northern part of Utah, primarily in the Uintas and Bear River Mountain Ranges. Therefore, the Canada lynx discussion in Chapter 4 only addresses potentially suitable habitat in northern Utah.

The Mexican Spotted Owl has been documented nesting in southern Utah only. A documented occurrence was made in northeastern Utah, however no nest was located. Unlike the Pacific Northwest's Northern Spotted Owl, the Mexican Spotted Owl has only been documented nesting in steep walled canyon complexes in Utah . Thus, further discussions concerning the Mexican Spotted Owl in Chapter 4 focus on potentially suitable habitat in these steep-walled canyons or along the surrounding canyon rims.

Refer to Appendix E, Tables 9 and 10 for a complete list of TEP species that occur on the six Utah NFs .

Management Indicator Species and Sensitive Plant and Animal Species - Many other wildlife, fish and rare plant species inhabit Utah's NFs other than those discussed above. The NFMA directs that on NFS lands, habitats for all existing native and desired non-native plants, fish, and wildlife species will be

managed to maintain at least viable populations of such species. In achieving this objective, habitat must be provided for the number and distribution of reproductive individuals needed to ensure the continued existence of a species throughout its geographic range and the maintenance of diverse and productive habitats for wildlife, fish and sensitive plants (FSM 2601-2603).

Because it would be impossible to monitor the effects of management on every individual species that occurs, NFMA specified that "certain vertebrate species ... shall be identified for selection as indicators of the effects of management." Management indicator species (MIS) have been identified in each of the six Utah forest plans. Sensitive species, economically or socially important species, species that have special habitat needs, and other species have typically been designated as MIS. Effects to MIS species is the basis for disclosure of effects to all wildlife species found on NFS lands affected by this amendment. However, only those MIS and sensitive species which occur in habitats used by goshawks are discussed. A complete listing of sensitive plant and animal species is in Appendix E, Tables 11 and 12, respectively. Table 13 in Appendix E provides a complete listing of MIS species for each national forest affected, with those species which occur in habitats used by goshawks identified.

Species associated with aquatic and riparian habitats only are not discussed. Current direction in forest plans is not affected by this amendment and will continue to protect these systems.

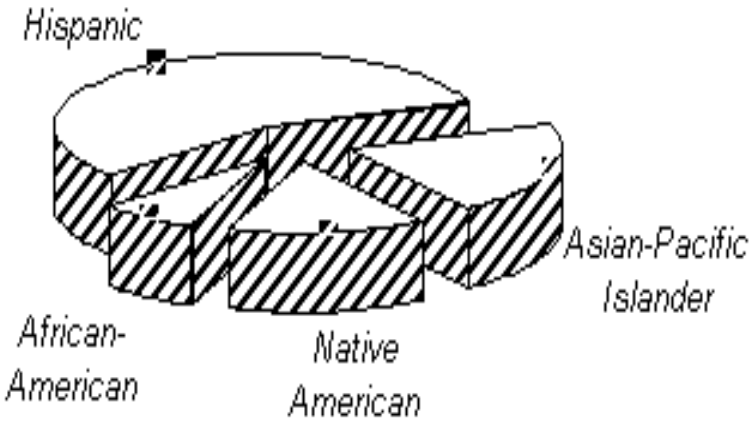
3.4 SOCIAL COMPONENTS

The population base affected by this project is primarily Utah as well as small portions of southwestern Wyoming, and western Colorado. Although the area of influence includes states other than Utah, the social components focus on Utah with the analysis focusing on the changes that have occurred since those forest plans were developed in the early and mid-1980s. A more detailed, Forest-specific discussion on social components is in each of the Forest Plans for the six affected national forests.

3.4.1 Environmental Justice

Environmental justice ensures that Forest Service programs, policies, and activities affecting human health or the environment do not exclude minorities and low income groups from participation in or the benefits of programs or activities based on race or economic status.

In 1990, minorities made up about 9 percent of the state’s total population. By mid-1998, Utah’s minorities made up almost 12 percent (252,000) of the total population (2,100,000), putting it above the national average (Ogden Standard Examiner 1999).



African-Americans make up 0.9 percent of the population (18,900); Hispanics, 6.8 percent (142,800); Asian/Pacific Islands, 2.5 percent (52,500); and Native Americans 1.8 percent (37,800) (ibid.). The majority of minorities and the greatest concentration of African Americans, Asians, and Hispanics reside in Salt Lake, Davis, Weber, and Utah Counties. The majority of Native Americans live in Salt Lake, San Juan, Uintah, Duchesne, and Utah Counties. Minority groups live throughout Utah and are employed in the full spectrum of occupations. Some work for industries related to forest products or services and may be dependent on forest products or services for their livelihood (Utah Governor's Office 1999).

There are seven Native American tribes living on reservations in Utah. The largest reservation groups are the Uintah and Ouray tribes (17,200+) in Duchesne and Uintah Counties. The Navajo Nation reservation located in San Juan County has approximately 5,500 people. And, there are approximately 645 Paiutes living on reservations in Iron, Millard, Sevier, and Washington Counties; 251+ Ute Mountain tribal members live on reservations in San Juan County and on Trust Land; 76+ Goshute tribal members are in Juab and Tooele Counties; and 32+ Skull Valley Goshute tribal members are in Tooele County. Representatives from 26 other tribes also live in counties throughout the State (ibid.).

Most of the Ute Nation is located in or adjacent to the Uinta Mountain Range and the Ashley NF. The Navajo Nation is in southeastern Utah and northern Arizona with strong interests in land management activities on the Manti-LaSal, Dixie, Ashley, Fishlake, Uinta, and Wasatch-Cache NFs. The White Mesa Ute tribe has cattle permits on the Manti-LaSal NF (ibid.). Native Americans have both non-traditional (economic) as well as traditional ties to the land, religious/heritage sites located on various national forests.

Utah has a low poverty rate. Statistics (ibid.) show 8.9% of the total population of Utah in poverty. Only six states have lower poverty rates. The national average was 13.3% in 1997. The majority of low income residents live in the highly populated counties including Salt Lake, Utah, Weber, and Davis. Some small towns and communities adjacent to national forests have a greater percentage of low income residents due to a dependency on agriculture or trade industries for income. Of the rural counties, San Juan and Duchesne Counties have the highest percentage of low income residents (28.3% and 20.7%, respectively).

Some low income residents could be dependent on forest products or resources for their livelihood, but data is not available to substantiate.

3.4.2 Social Groups, Values, and Systems

Although most Utah residents live in urban environments and work in non-agricultural jobs, Utah's NFs are important to them for water, recreation, and other resources. While people living within and adjacent to national forests can be extremely influenced by forest management activities, forest management activities can also affect other individuals and groups on a local, regional, and national basis.

Increasingly, rural communities are diversifying their economies and expanding their interest in and uses of national forests. Communities that once depended almost exclusively on commodity production from the forests for their economic well-being are now capitalizing on a wider range of goods and services.

Cities are important links in the delivery of recreation services and information because national forest visitors use urban lodging and restaurant facilities, equipment suppliers, and outfitting services before traveling to recreation destinations. Urbanites are an increasingly important constituency of the national forests.

Key social groups influencing forest management activities include industry and agriculture (loggers, ranchers, farmers, miners), recreation (ski resorts, outfitted recreationists, hikers and backpackers, motorized recreationists, non-motorized recreationists, water recreationists, hunters, anglers, etc.), environmentally-oriented groups, and business interests. It should be noted that an individual may fit into several groups, depending on the issue or activity of concern.

The following descriptions of the various groups and their value systems are in general categories developed for analytical purposes; individuals may not perfectly fit a specific group. Cross ties may exist between these groups because of such factors as religious affiliations, family relations, social organizations, and recreational preferences.

Ranching-Farming - This group is comprised of individuals involved in livestock production and the growing of grain crops, hay and pasture, and vegetable crops. Many are long-time residents of Utah with ranches and farms having been passed to successive generations. This group also includes ethnic minorities, usually Hispanics, who provide manual labor to the ranchers and farmers. In some instances, the land sustains this group's life style and livelihood. Livestock production declined overall in Utah for 1998 as compared to 1997. Currently, economic instability in ranching and farming creates uncertainty in this group. Grazing on public lands is an integral part of many ranch operations.

Timber Operators/Wood Product Manufacturing - This group includes individuals involved in logging, the manufacturing of wood products, and commercial firewood cutting. Although these industries are not major employers in Utah, all six of the affected national forests have commercial wood production.

The traditional timber industry in the project area is comprised primarily of small, family-operated business ventures. These small businesses are scattered across Utah and in adjacent areas in southeastern Wyoming and western Colorado. They generally operate close to their home base, where products are available nearby. This makes it possible for working family members to spend their evenings and weekends at home, rather than camped at a work site.

Several company-owned mills are located in Utah. These qualify as ‘‘small businesses’’ according to the rules of the Small Business Association. These companies employ both local and out-of-state loggers and workers. Their ties to local communities are not as strong as with the traditional family-based operations.

While no large industry is located within the project area, large industry is a player in the timber market in Utah. Louisiana-Pacific (operating out of Colorado and Wyoming) and Boise Cascade (operating from Idaho) actively seek opportunities and occasionally purchase sales in the State. Both companies have become more active in the State in recent years.

Recreationists - Easily the largest and most visible on national forests, this group includes local residents as well as visitors from throughout the United States and the world. They use forests seasonally for a wide variety of recreational purposes including hunting, fishing, camping, hiking and backpacking, rock-climbing, water skiing, mountain biking, river-running, snowmobiling, and snow skiing. Another important recreational group are falconry clubs, located primarily in the Uintah Basin.

Scenic quality is the landscape character (the visual combination of natural and cultural attributes) that provides landscape identity, sense of place, and scenic integrity (the completeness of the desired character). Landscapes with variety in vegetative patterns, water features, and rock and land forms can tolerate human-built elements or natural events and have high scenic integrity. Conversely, landscapes with monotonous character reveal deviations quickly and have low scenic integrity. All resource management activities attempt to achieve long-term sustainable goals within the scenic integrity objectives identified in the forest planning process.

Retail Trade, Tourism, and Service - This group sells merchandise, provides lodging, amusement and professional services, and works in finance, insurance, and real estate. They include long-time residents and newcomers to the area. Although employment opportunities for this group are not directly dependent on commodity outputs from national forests, they are dependent on the economic stability and growth of the area, especially recreational opportunities. Their employment, life style, and income can be linked to the strength of other activities in or around national forests. For example, winter skiing conditions that attract large numbers of skiing enthusiasts directly affects incomes for communities adjacent to ski resorts and the hotels, food services, transportation, and entertainment services offered.

Mining/Minerals Production - Utah’s NFs contain significant mineral deposits in amounts usable for commercial production. Less than one percent of Utah’s population are employed in this industry (Utah Governor’s Office 1999).

3.4.3 Heritage Resources

The Heritage program protects and interprets the historic and cultural heritage of NFS lands and shares related information with the public for its enjoyment and education**.** Utah’s NFs manage for a wide diversity of uses and users including interpretation for the general public, conservation for scientific values and future generations and access for Native American traditional practices. A more detailed, Forest-specific discussion on heritage resources is in each of the Forest Plans for the six affected national forests.

Legal Framework - The Forest Service is required to inventory and evaluate cultural resources on NFS lands and to protect, enhance and nominate significant cultural resources for listing in the National

Register of Historic Places (NRHP). The criteria for listing in the Register refer to the qualities of significance in American history, architecture, archaeology and culture. Once a site has been evaluated for its National Register significance, management activities are generally focused on those determined to be eligible for the NRHP.

Section 106 of the National Historic Preservation Act of 1966, as amended, requires the Forest Service to determine if federally funded, permitted, or licensed activities will affect significant cultural resources. An undertaking is any project that can result in changes to the character or qualities of a site that make it eligible for the National Register. For most projects, consideration of the effects of an undertaking on cultural resources proceeds in sequential steps of inventory, evaluation and determinations of effect. Consultation with the State Historic Preservation Office, the Advisory Council on Historic Preservation and interested parties occurs during these various phases to assist in identification efforts and to find ways to lessen impacts if adverse effects are anticipated.

For large or complex projects or classes of undertakings that would require numerous individual requests for comment or where effects cannot be fully determined in advance of an undertaking, the implementing regulations for Section 106 allow agencies to develop programmatic procedures and to implement phased compliance programs [36 CFR §80013(a)].

Cultural Resources - Cultural resources consist of sites, structures and objects used by prehistoric and historic peoples. These phenomena represent the physical remains of past human lifeways and activities in the forests. Prehistoric representations may include scatters of chipped stone tools, groundstone artifacts and ceramics (termed lithic and ceramic scatters), pithouse depressions, pueblo ruins, stone and mud food storage granaries, living trees which were peeled by native peoples to obtain inner bark for food, rockshelters, stone tool quarries, sweat lodges, projectile points and other manifestations of aboriginal life styles spanning the last 12,000 years. Historic site types may include trails from Spanish exploration, pioneer settlement, and early military use, structures and modified landscape features from mining, ranching, homesteading, railroading, and recreation activities and developments during government administration of the forests.

The Forest Service seeks to provide the American people and future generations with opportunities to enjoy and appreciate the nation's rich and diverse cultural heritage. The affected national forests offer unique opportunities to protect and interpret the nation's shared American heritage contained within archaeological and historical sites. Their cultural resources represent both ancient lifeways and the traditions of living peoples. Some ceremonial sites are still in use by Native Americans today. For example, Bears Ears Peak is an important site to Native Americans.

Human habitation of the mountains, valleys, canyons and mesas of the Utah NFs has been continuous for the last 10,000 years and probably longer. Remains of past human lifeways are found throughout the forests. Since the mid-1970s, the Forest Service has conducted cultural resource inventories to identify and evaluate cultural resources. These surveys have been conducted largely in advance of proposed undertakings on federal lands. Since that time, approximately 244,000 acres of NFS lands have been examined inventoried at various survey intensities resulting in the identification of over 8,300 sites.

Appendix E, Table 14 provides data on the status of cultural resource inventories and inventoried sites. Using this Table, it is tempting to generalize about the number of sites that should be expected to be located within the Utah NFs. However, because many of the surveys to locate cultural resources were conducted in support of other land developments, and not strictly to gain data that could be used to predict

the numbers, types and location of sites in the forests, it is not possible to provide accurate estimate of the total number of expected sites in each of the Forests without much more detailed analysis/data.

The affected national forests contain sites which are also listed in the National Register of Historic Places. On the Dixie NF these include the Mountain Meadows Massacre Site, the Pine Valley Chapel and Tithing Office and the Long Flat Prehistoric Stone Tool Quarry. In the Fishlake NF, the Gooseberry Historic District containing approximately 175 individual prehistoric properties and the Aspen Cloud Rockshelters have been nominated to the National Register. On the Manti-LaSal NF, the historic Great Basin Range and Watershed Research Station containing approximately 10 buildings and associated features and the Pinhook Battlefield Site are listed in the National Register. In addition, an area within the Monticello Ranger District of the Manti-LaSal NF containing prehistoric Anasazi pueblo sites may be eligible for listing as a Historic District.

Interpreted historic sites in the Utah NFs include Swett Ranch and the Ute Fire Lookout (Ashley NF), Bullion Canyon Gold and Silver Mining Sites (Fishlake NF), the Great Basin Research Station, Stuart Ranger Station, Dry Wash and Devils Canyon Ruins (Manti-LaSal NF), and Wildcat Ranger Station (Dixie NF).

A more complete discussion of cultural resource is included in the individual Forest Plans.

3.5 ECONOMIC COMPONENTS

The geographic area described in this Environmental Assessment includes the entire State of Utah, with small portions of Wyoming and Colorado, and is economically complex. There are substantial amounts of timber, forage, recreation, water, fish, wildlife, minerals, and other resources or resource uses provided from NFS lands in the area under consideration. The economic value associated with these resources and uses is substantial. State and private lands provide additional amounts of many of those resources and resource uses, but those uses are not addressed in this document because the management direction applies only to lands administered by the Forest Service. The total geographic area also encompasses many cities, towns, and rural populated areas. Each of these population centers or areas has its own economic structure, which is integrated with a wider subregional economy, which, in turn, is part of an even larger regional economy. All are affected by State, national, and international economic activity and events.

The state with the largest area affected is Utah, thus economic sectors in this state are most likely to be affected by changes in management direction proposed. Though changes may have some effects to the economies of Colorado and Wyoming, due to the limited area affected (less than 1% of either state) the change will not measurably affect economic sectors in those states. Therefore, discussions below will focus on the economic sectors in the State of Utah, with limited discussions concerning the economies in Wyoming and Colorado.

Of the industry groups contributing to Utah's economy, the services sector is the largest. It accounts for one-third of all employment and is expected to claim 417,000+ jobs by 2001 (Utah Governor's Office 1999). Service-producing industries contain many diverse activities including transportation, communication, and utilities; trade (wholesale and retail); finance, insurance and real estate; services and government.

The smallest job category is agriculture with about 23,950 workers, 2% of total employment. It includes nursery workers, animal caretakers, gardeners and grounds keepers as well as farm and ranch occupations.

Although it is expected that agriculture will grow by 2,000+ new jobs over the 1996 to 2001 period, this is the smallest rate of growth of any of the job categories and growth will occur mostly in job titles related to landscaping and lawn services (ibid.).

A more detailed, Forest-specific discussion on economic components is in each of the Forest Plans for the six affected national forests This analysis focuses on the changes that have occurred since those forest plans were developed in the early and mid-1980s.

3.5.1 Wood Products

The traditional timber industry in the project area is comprised primarily of small, family-operated business ventures. These small businesses are scattered across Utah and in adjacent areas in southeastern Wyoming and western Colorado. They generally operate close to their home base, where products are available nearby. Production for each mill varies from only a few hundred thousand to a few million board feet per year. Their markets are generally local and may often be limited by product type.

Several company-owned mills are located in Utah. These qualify as ‘‘small businesses’’ according to the rules of the Small Business Administration. These companies employ both local and out-of-state loggers and workers. It is not unusual for these operations to truck logs from 100 miles or more from their mills. Their markets are both local and regional.

While no large industry is located within the project area, large industry is a player in the timber market in Utah. Louisiana-Pacific (operating out of Colorado and Idaho) and Boise Cascade (operating from Idaho) actively seek opportunities and occasionally purchase sales in the State. Both companies have become more active in the State in recent years due, in part, to relatively large salvage sales being offered as the Forest Service has tried to cope with epidemic levels of insects that have not previously been experienced within the State. The volume offered in these sales has exceeded previous norms.

Congress mandates that national forests be managed for multiple uses. Timber commodity production is one of the identified uses. While Utah’s forest lands are not the high-producing lands of some other parts of the country, they do produce some quality wood. Until recent years nearly all of the lumber produced from Utah’s forests was used locally. In recent years, with harvest productions down in some of the traditional lumber producing portions of the West, Utah logs and lumber have become more attractive and are being trucked to neighboring states. From 1994 through 1998 Utah’s NFs produced approximately 150 million board feet (averaging 30 million per year) for a value of approximately $22,000,000 ($4.4 million per year) (Paroz 1999). This production contributed jobs to local economies, and approximately 25% of these funds are returned to the counties for use in schools and on local roads (Payments in Lieu of Taxes). For Fiscal Year 1997, the State of Utah received in payment from national forest receipts totalling $1,598,864.83 (USDA Forest Service 1997a).

3.52 Grazing

Vegetation management on NFS lands helps meet the goal to provide multiple benefits within the capabilities of ecosystems. The program continues to reflect an ecosystem perspective emphasizing restoration and long-term health of rangelands. The Forest Service manages rangelands for multiple uses. The balance among these uses and values has changed over time in response to changes in demands for these various goods and services

Where livestock grazing is a use, many factors affect the supply and demand for forage for livestock. One factor that influences supply of forage for grazing available on a national forest is the limitations applied to grazing where it occurs. A general framework for these constraints is contained in the affected Forest Plans. Specific grazing capacities, and therefore, maximum supply potential on the national forest, is established through the allotment planning process on individual allotments. The maximum amount of use determined for an allotment is established considering the desired vegetation conditions for the allotment area, range productivity and trends, other resource conditions and uses. Allotment management plans are updated periodically, as funds are available and as resource conditions and other factors warrant.

The lands most commonly associated with providing forage for grazing by both wild and domestic ungulates are grasslands and shrublands, but forest lands (especially aspen) also support an understory of grasses, shrubs, and forbs. The demand for domestic animal grazing is a derived demand, depending ultimately on the demand for sheep and cattle products. The limiting factor on grazing is supply. Examining demand for forage presents some difficulties because less than 10 percent of forage consumed by livestock is leased or sold in an observable market. The price for forage from private lands is usually not determined by competitive bidding within a market system because this forage is often produced within the farm or ranch enterprise. Prices for forage from NFS lands is set by federal laws. In Utah, most of the grazing land base is federally owned and not competitively leased. Grazing fees that permittees pay, which is determined by a formula, has been $1.35 per head month for the past few years.

Livestock grazing on the Utah NFs is a historic and traditional use of the forage resource. Early settlers grazed livestock in Utah long before the establishment of the national forests. The national forests issue term grazing permits for livestock that specify the type and number of livestock and the season of use. There are 539 active allotments on the six Utah NFs and 12 vacant allotments

Demand for cattle and sheep is primarily a function of domestic demand. In the nation and throughout the project area, overall demand for beef is increasing in response to population increases, while per capita demand continues to decrease. Associated with this, the inventory of cattle has been increasing. Consequently, the amount of forage needed for cattle is increasing. On the six affected national forests, supply is at capacity. In FY 1997, these national forests permitted use of forage for 634,000 animal unit months (AUMs) of privately owned livestock on NFS lands.

3.5.3 Mineral Resources

The Forest Service and Intermountain Region are mandated to foster economic activity by facilitating energy and mineral development on NFS lands, and to protect historic and natural values. Exploration, development, and production of energy and minerals within NFS contributes to economic growth, creates jobs in rural communities, and raises revenues for the Treasury and States. The unique geology of Utah's NFs contributes significantly to the amount of mineral activity that will occur within its boundaries.

Mineral activities and Forest Service authority to manage them depends on the types of commodity and the legal status of the NFS lands on which they occur.

In general, mineral commodities can be classified into three categories:

- Mineral Materials
- Leasable Minerals
- Locatable Minerals

In addition, land status affects the legal authorities which apply to management and disposal of these minerals.

- NFS lands reserved from the public domain.
- Acquired lands. All minerals on acquired lands are disposed of through leases issued by the BLM. In all cases the BLM must obtain FS consent prior to issuing leases on acquired lands. Since the acreage of acquired lands is small and activities discretionary, this category of land status is not discussed further in this EA.
- Lands with outstanding or reserved rights.

The following describes the mineral activities in these categories which are occurring on the National Forests in Utah.

Mineral Materials - Mineral materials are common minerals such as stone, gravel, cinders, and decorative rock whose disposal is authorized under the The Materials Act of July 31, 1947. This Act provided for the disposal of mineral materials on the public lands through bidding, negotiated contracts, or free use. The Forest Service has full authority to make decisions regarding disposal of mineral materials on all categories of NFS lands.

In FY98, approximately 200,000 tons of mineral materials were removed from NFS lands in Utah, with approximately 1/2 of that volume removed by the Forest Service for its own use. This level of use is expected to grow as the demand for construction and maintenance of public and private infrastructure increases.

Activities associated with the removal of mineral materials include excavation, temporary storage and transport of the materials. Typical sites are small, from less than 1 acre to 5 acres. Most mineral material sites are adjacent to or near existing access roads, and do not require signicant amounts of new access construction.

Authority for disposal of mineral materials for both Aquired and NFS lands are similar, but on certain acquired lands disposal is limited to certain public agencies and purposes.

Locatable Minerals - These are minerals which are disposed of on NFS lands under the authority of the General Mining Law of 1872. This law grants individuals a statutory right to explore for and develop these minerals, unless the land is formally withdrawn from mineral entry. Forest Service authority to manage locatable mineral activities is limited to some extent, in that we may not deny proposed operations, or make them impossible through imposing restrictive management requirements or conditions. However within those sideboards, the Forest Service may require mitigation and conditions to minimize adverse impacts on surface resources.

The primary locatable mineral activity on the national forests in Utah is exploration and mining for lode gold, silver, copper, and other metals. Exploration and mining for these commodities typically occurs in areas where historic mining has occurred, or where the geology is conducive to the discovery and production of economically valuable mineral deposits.

Typical surface disturbing activities associated with locatable minerals include:

- *Prospecting* - Identifying an area that has potential for mineral development involves activities with limited surface disturbance such as geologic mapping, soil or water sampling.
- *Exploration* - Physically searching for a mineral deposit within an area. Typical exploration activities include construction of roads, drill pads, underground adits and trenching.
- *Development* - Gathering information to determine whether a deposit can be mined/developed involves activities described under exploration, and also include construction of mine facilities such as adits, open pits, waste dumps, milling and other support facilities.
- *Production* - Production of minerals from the deposit involves use of the facilities constructed under development
- *Reclamation* - Restoration of the area following production of areas disturbed by mining.

Most locatable mineral activity in the recent past involves maintenance of existing facilities with hopes of improved economics for the specific commodity, with limited new exploration and production of minerals. There are no large (defined as requiring more than 1/2 person years of administration) locatable operations on NFS lands in Utah. The Manti-LaSal NF contains a gypsum mine and the Uintah NF contains a limestone mine reporting significant mineral production.

Future locatable mineral activity is likely to occur in areas of existing operations and where the geology is favorable for the formation of economic mineral deposits. Significant future exploration or development is not expected and the potential for future mineral discovery is considered low.

On acquired lands, minerals which are locatable on NFS lands are disposed of by prospecting permit (exploration) and leasing rather than under the 1872 Mining Law. The BLM issues prospecting permits and leases for hardrock minerals on aquired lands, but must obtain the consent of the Forest Service to do so. The amount of leasable hardrock activity in Utah is insignificant.

Outstanding And Reserved Mineral Rights - Outstanding and reserved minerals rights are rights to the mineral estate held by an entity other than the holder of the surface rights, in this case, the Forest Service. Two such areas are within the affected environment: on the Evanston Ranger District, Wasatch-Cache NF, where the railroad has retained the mineral rights for the railroad grant lands and around Strawberry Reservoir on the Uinta NF where the Water Users Association has the right to lease the minerals and collect royalties.

The Forest Service may impose reasonable restrictions on persons exercising outstanding or reserved mineral rights, but may not deny or unreasonably restrict such activities. The reserved mineral rights may include all minerals.

Leasable Minerals - The Mineral Lands Leasing Act of February 25, 1920 was the first law which authorized the Secretary of the Interior to issue leases for certain minerals (currently applies to coal, phosphate, sodium, potassium, oil, oil shale, gilsonite, and gas). This law removed these minerals from the operation of the General Mining Law of 1872 and applies to NFS lands. In 1970 the Geothermal Steam Act added geothermal steam to the list of minerals that could be leased on National Forest System Lands by the Secretary of the Interior.

Most leasable activities except for oil and gas, occur on lease, after a lease has been issued. The exception is prospecting which is described below. Prospecting activities are approved through issuance of a prospecting permit or exploration license issued by the BLM or the FS. The BLM must have the FS consent for prospecting permits and exploration licenses issued for coal. The Forest Service issues prospecting permits for oil and gas. The BLM does not need FS consent to issue prospecting permits and exploration licenses for solid, non-energy leaseable minerals (phosphates for example); however, the BLM generally accepts Forest Service recommendations.

The BLM is responsible for issuing all leases on Federal lands and on private lands for which the Federal government retains mineral rights. The BLM cannot issue oil and gas, coal leases for lands administered by the Forest Service without their consent. Leases are issued for a 10-year period and can be extended if discoveries and production occur.

For solid, non-energy, leasable minerals such as phosphate or sodium, the Forest Service does not have consent authority over leasing and lease operation decisions except on acquired lands. The authority rests with the BLM. However, the BLM generally accepts Forest Service recommendations on lease issuance and lease operations.

The Forest Service identifies areas on NFS lands which are available for leasing either through the NEPA process and individual environmental statements, or through the forest planning process. In areas where exploration and development of leasable minerals would adversely affect other resources or public uses, the NEPA or forest planning process is used to identify measures to mitigate impacts. Such mitigation measures are then applied to leases as either stipulations to uses or as restrictions on surface occupancy.

Once a lease is issued, the lessee obtains legal rights to exploration and development subject to the terms of the lease and applicable state and federal law. Post-lease activities (exploration, development, production, reclamation) on the lease must be approved by the Forest Service and BLM. At this time, site specific resource protection measures are developed through the NEPA process and applied through conditions of approval to the surface use plan of operations. Such measures must be within the scope of the rights granted under the terms of the lease.

Typical activities which may occur in exploration and development of leasable minerals are:

- *Prospecting* - Prospecting for solid leasable minerals include activities similar to that described for locatable minerals.

  Prospecting for oil and gas typically involves collection of seismic data. This activity consists of a source of ground induced vibration, typically by explosives or mechanical, truck-mounted thumper," and a listening or receiving device. These methods require vehicular access, but typically utilize existing roads where necessary. Prospecting may occur off-lease as well as on-lease.

  All prospecting, whether on or off lease, is authorized by issuance of a prospecting permit or exploration license. Prospecting activities on-lease are considered part of the legal right granted by the lease and may not be denied, while off-lease prospecting is discretionary on the part of the Forest Service, except in of solid, non-energy minerals where FS authority is limited to recommending to the BLM, measures to protect surface resources. In all cases measures to protect

surface resources are applied to the to activities through conditions imposed in the prospecting permit or exploration license.

- *Exploration* - Solid leasable exploration is similar to that described for locatable minerals, and typically occurs on-lease, after a lease has been issued.

  Oil and gas exploration is typically done by drilling an exploratory well. This typically involves road and drill pad construction and operation of drilling rig and support facilities. This activity typically on-lease, after a lease has been issued.

  Such exploration activities are regulated by the FS or BLM through conditions of approval which are applied to operating or surface plans. For oil & gas and coal, the FS must approve these plans, for solid, non-energy leasable minerals the FS recommends such measures to the BLM. These measures are designed to minimize adverse surface resource disturbance. The extent to which exploration activities can be regulated is controlled by the terms of the lease as well as other state and federal legal requirements.

- *Development* - Develop of solid leasable minerals is similar to that described for locatable minerals. Phosphate is typically developed with open pit mining methods, while in Utah, coal is developed via underground mining methods. The FS can regulate (in the case of coal), or recommend regulation to the BLM through requiring conditions of approval to be included in operating or surface plans, so long as the basic legal right to development which was granted the lessee is not impaired.

  Oil or gas development occurs through a series of production wells. The number and spacing of production wells and associated road access depends on the characteristics of the oil or gas resource discovered. The Forest Service can regulate the location of roads and drill pads through requiring conditions of approval in operating or surface use plans, so long as the basic legal rights to development granted the lessee are not impaired.

- *Production* - Production of leasable minerals from the deposit involves use of the facilities constructed under development

- *Reclamation* - Restoration of the area following production of areas disturbed by exploration, development and production activities.

Significant leasable mineral activity on NFS lands in Utah include exploration and development of phosphate, coal and oil and gas.

Oil and Gas - The following table displays the acreage on Utah's National Forests which are under oil and gas lease:

Table 4: Acreage under oil and gas lease on Utah's National Forests

Forest	Pending	To BLM	Issued & Extended	Producing	Available 2-Yrs Noncomp.	Suspended Leases	Forest Totals
Ashley	.00	.00	97,107.50	5,200.16	.00	.00	102,307.66
Dixie	.00	.00	1,850.00	9,370.43	.00	3,501.00	14,721.43
Fishlake	.00	.00	1,280.00	.00	.00	.00	1,280.00
Manti-LaSal	.00	33,422.32	209,486.47	16,409.88	115,584.78	.00	376,983.45
Uinta	.00	.00	880.00	.00	.00	.00	880.00
Wasatch-Cache	10,621.81	.00	52,969.39	16,838.24	27,654.30	40.00	108,123.74
TOTALS	**10,621.81**	**33,422,32**	**363,573.36**	**47,818.71**	**143,239.08**	**3,541.00**	**604,296.28**

Future Oil & Gas Activity - Three EISs have been prepared by the Forest Service for oil and gas leasing on Utaho Forests:

- *Ashley and Uinta NFs*: In September 1997, the Ashley and Uinta NFs issued a Final Environmental Impact Statement (FEIS) and Record of Decision (ROD) for the Western Uinta Basin Oil and Gas Leasing (USDA Forest Service 1997). The area involved is approximately 401,000 acres of adjacent portions of the Uinta and Ashley NFs. The area encompasses lands with high and moderate potential for oil and gas occurrence located on the south unit of the Duchesne Ranger District, Ashley NF, and a portion of the Uinta NF's Heber and Spanish Fork Ranger Districts south and west of Strawberry Reservoir. Of the 401,000 acres of NFS lands, approximately 204,000 acres are within the Ashley NF and 197,000 acres are within the Uinta NF. The study area included portions of Duchesne, Wasatch, and Utah counties.

- *Manti-La Sal NF*: In January, 1993, a ROD was signed in connection with a FEIS concerning oil and gas leasing (USDA Forest Service 1993). The decision was made to resume oil and gas leasing on lands administered by the Forest. The FEIS considered site specific resources and land areas. The selected alternative allows for oil and gas leasing in those areas where lease stipulations and site-specific requirements would be effective in preventing or mitigating impacts and would preclude leasing in those areas where post-lease activities could result in unacceptable impacts. It addition, it provides a reasonable opportunity to explore for and produce oil and gas reserves.

- *Wasatch-Cache NF*: In 1994 an EIS was prepared by the Wasatch-Cache and Ashley NFs (USDA Forest Service 1994) that identified non-Wilderness Federal lands with Federal mineral rights that should or should not be made available for oil and gas exploration, development, and production on the North Slope of the Uinta Mountains. The Forest Service proposed to make most of the NFS lands on the North Slope available for oil and gas leasing and to authorize the BLM to offer certain lands for leasing. That decision was implemented on 160,000 acres. The BLM proposed to offer for lease all lands authorized by the Forest Service.

Other - For solid, non-energy, leasable minerals such as phosphate or sodium, the Forest Service does not have consent authority over leasing and lease operation decisions. The authority rests with the BLM. However, the BLM generally accepts Forest Service recommendations on lease issuance and lease operations. Leases for all other leasable minerals on NFS lands and acquired lands, such as coal, may not

be issued without Forest Service consent. Once a lease is issued, operating or surface use plans and surface use protection measures are approved by the Forest Service.

Solid, Leasable Minerals - The following table displays existing leases, licenses, or prospecting permits for other leasable minerals on NFS lands in the project area:

Table 5: Acres under leases, licenses, or prospecting permits for other leasable minerals on NFS lands in the project area.

Forest	Mineral Commodity	Type	Acres
Manti-LaSal	Coal	Lease	98,009.132
	Coal	License	4,760.46
Fishlake	Coal	Lease	5,681.49
Ashley	Phosphate	Lease	4,716.36
Uinta	Phosphate	"Other"	840

Future, Solid Leasable Minerals - Two new coal leases are currently being evaluated on NFS lands administered by the Manti-La Sal NF. They include the Cottonwood Canyon Tract (9,244 acres State coal) and the Flat Canyon Tract (2,692 acres Federal coal). If leased, these areas would add additional coal reserves to already existing underground mining operations. Only one large coal lease tract remains which would require the development of a new portal facilities complex. This is the North Horn Tract (21,000 acres) which would most likely be accessed from NFS lands in Rock Canyon MMA (Minerals Management Area) Management Unit. At the present time, there are no applications to lease this area but receipt of a lease proposal from industry for this area is reasonably foreseeable within the next 10 years. There are other areas available for further consideration for coal leasing on NFS lands in the Wasatch Plateau Coal Field, however leasing of these areas at the present time is not reasonably foreseeable. They would generally require new portal complexes to develop and do not contain sufficient reserves to warrant development considering the current market and mining technology. Other expansions of existing mining operations would occur by adding existing adjacent leases to the permit area or increasing the size of existing leases via lease modifications. Modifications to existing leases are limited to 150 acres per lease.

There is limited potential for phosphate exploration and development activities to expand onto the NFS leases. However, there is a limit to possible expansion as teh depth to the phosphate deposits increases with increasing elevation, as one moves onto NFS lands.

3.5.4 Recreation/Tourism

Recreational activities by residents and tourists alike is the fastest growing use of the national forests and grasslands. In 1997, about 43 percent of the outdoor reaction use on public lands in the nation was hosted by the Forest Service. This included 60 percent of the nation's skiing and significant percentages of hiking, camping, hunting, fishing, and driving for pleasure. The Forest Service generates many benefits through the sustainable management of national resources. Recreation on national forests is big business. Nationally, the national forests and grasslands contribute $134 billion to the gross domestic product, with the largest share associated with outdoor recreation and travel/tourism (USDA Forest Service 1999b).

Outdoor recreation is an important activity to many Utah residents and a primary use of Utah's NFs. Established recreation sites (camping and picnic sites, ski resorts, lakes, and other areas) attract many recreation visitors. Scenic travel through the color country of southern Utah and through the Uinta Mountains is popular as is a wide variety of other recreational pastimes. Ski resorts, once only open during

winter months, are rapidly becoming four season resort locations and are offering customers a wide variety of summer activities including mountain biking, hiking, golf, alpine slides, and more. Some ski resorts in the region are receiving more visitors in summer months than in the regular ski season.

Skiing is an important industry in Utah with six major ski resorts on NFS lands attracting 1,675,743 skier visitors days in 1998 (Contreras 1999). These resorts include Brian Head, Alta, Brighton, Snow Basin, Snowbird, and Solitude. Other ski resorts, such as Park City, Deer Valley and Beaver Mountain, are on private land but adjacent to national forest land.

It is projected that outside visitors spend an average of $300 per day which mean millions of dollars in revenue to the Utah economy (Utah Governor's Office 1999). In addition, the 2002 Olympics will be held throughout the Wasatch Range. This event is already bringing increased national and international attention to skiing and other recreational activities in Utah.

3.5.5 Transportation/Access

Access is the opportunity to enter NFS lands for personal and reasonable use of other lands and rights within the NFS lands. Road access to NF-administered lands is important to many users, supports the bulk of economic activity generated from agency lands, and represents a substantial public investment. While very minor construction might be necessary, no major new routes are known or planned.

The National Forest Transportation System for the project area, approximately 12,116 miles of roads, includes 3,826 miles of arterial or collector roads, that serve all users and 8,290 local roads, that are typically passable by high-clearance vehicles. Access to the remaining 248 miles of roads is restricted by gates or other methods. Forest Service vehicles drive system roads daily to accomplish a variety of administrative tasks such as fire suppression, contract administration, resource projects, and law enforcement. Where the primary purpose identified for road construction and reconstruction is for access, the majority of future reconstruction will address user safety and mitigation of resource damage (backlog of deferred maintenance).

In March, 1999, the Chief of the Forest Service announced an 18-month suspension of permanent and temporary road construction and reconstruction in unroaded areas of NFS (referred to as interim roads policy) (USDA Forest Service 1999a) through issuance of a proposed interim rule to a new 36 CFR §212.13.

3.5.6 Special Uses

The special use program authorizes the use of NFS lands for more than 200 different types of activities, providing benefits to other Federal State and local governments; commercial and industrial entities; and private individuals. Many special use permits authorize use of facilities and services necessary for public health, welfare, safety, convenience, and national security, such as pipelines, highways, and telephone lines. These authorizations may be of short-term or long-term duration. There are nine broad categories of special uses authorizations, with several types of uses in each broad category (Project Record, Exhibit U):

- Recreational
- Agricultural
- Community & Public Information

- Feasibility, Research, Training, Cultural Resources & Historical
- Industrial
- Energy Generation & Transmission
- Transportation
- Communication
- Water (non-power generating)

Utah's NFs have issued approximately 3,675 special use permits (affecting approximately 82,314 acres) in these broad categories. The majority are recreational permits. See Appendix *E*, Table 15 for a detailed listing.

Several permitted ski resorts have requested expansion on their operations.

3.5.7 Administrative Considerations

Utah's NFs have typically has been weighted toward support of recreation, vegetation management, and rangeland related programs, in terms of program size and number of personnel employed. The vegetation (timber) management program is small on most forests. The Ashley and Dixie NFs have traditionally had the largest programs. Limited numbers of full-time personnel manage the vegetation program.

Much of the on-the-ground work is accomplished by temporary, seasonal employees under the direction of permanent staff. By the nature of temporary employment, there can be substantial turn over of employees from year to year. This necessitates the maintenance of a continual training program to insure that technical application and implementation of projects are within acceptable bounds. The Office of Personnel Management places a 6-month limitation on season of employment for temporary employees. Additionally, many seasonal employees are college students, which may further reduce the potential season of work. These limitations make it necessary for managers to balance the need for training with the need for field work in order to accomplish work necessary for the implementation of projects.