INTRODUCTION

Timber management and harvesting is an important tool for managing ecosystem diversity, forest insect and disease populations, tree growth and yields, recreation settings, wildlife habitat, and wildfire hazard mitigation. Timber harvesting provides forest products that help support local wood-processing industries and the communities associated with those industries. It helps meet the demands of the public for products such as lumber, fuelwood, transplants, Christmas trees, and posts and poles.

Multiple scales are considered in timber management on SJPLC-administered lands. The current conditions and future trends in relation to timber resources and harvesting activity on USFS lands were evaluated at the forest and geographic area scale. (A study of the relationship of wood-fiber production and demand in southwestern Colorado and specifically within Archuleta, La Plata, San Juan, Dolores, Montezuma, and Mineral Counties is presented in Appendix W, Volume 3, Timber Demand Study.)

LEGAL AND ADMINISTRATIVE FRAMEWORK

LAWS

- ***The Organic Administration Act of 1897***: This act states that national forests are established "to improve and protect the forest within the boundaries, for the purpose of securing favorable conditions of water flows, and to furnish a continuous supply of timber for the use and necessities of citizens of the United States."
- ***The Multiple-Use Sustained-Yield Act of 1960***: This act states that "It is the policy of Congress that the national forests are established and shall be administered for outdoor recreation, range, timber, watershed, and wildlife and fish purposes… The Secretary of Agriculture is authorized and directed to develop and administer the renewable surface resources of the national forests for multiple uses and sustained yield of several products and services obtained therefrom… the achievement and maintenance in perpetuity of a high level annual or regular periodic output of the various renewable resources of the national forests without impairment of the productivity of the land."
- ***The National Forest Management Act of 1976***: This act sets forth the requirements for Land and Resource Management Plans for the USFS.

DESIGN CRITERIA

Management guidelines and design criteria describe the environmental protection measures that would be applied to all of the alternatives at the project level in order to protect, enhance, and, where appropriate, improve resources related to timber management and wood products. Guidelines and design criteria are presented in Part 3 of Volume 2 of the DLMP/DEIS.

AFFECTED ENVIRONMENT

Existing Conditions and Trends

Final timber suitability determinations would be based on the chosen Management Area (MA) designations, as well as on other considerations (including stand size, distance from existing roads, and terrain factors like slope). A final decision on the Roadless Area Conservation Rule would also influence where timber resources could be managed as part of the suitable timber base.

The legacy of past timber harvesting and fire suppression activities have resulted in current vegetation conditions that must be considered in planning for the future. Areas that have been treated more recently would not be available for subsequent harvest activities during the planning period covered by the final approved LMP (which is approximately 15 years).

The majority of forest vegetation types are in the mature stage, with dense stand conditions (see the Vegetation section). This is especially the case for the spruce-fir, ponderosa pine and warm-dry mixed-conifer types. These stand conditions are vulnerable to future insect and/or disease attack. Timber management activities may be used to alter stand conditions in order to reduce on-going insect and disease activity, and to reduce the risk for future outbreaks.

Timber stand improvement (TSI) activities may also be used in order to reduce stand density and ladder-fuel accumulations. These types of treatments may be used prior to reintroducing fire, through prescribed fires or WFU (natural ignitions), into forest vegetation types that historically have had frequent fires.

Both timber demand and timber industry capacity have decreased. These conditions may limit future opportunities to obtain desired conditions in forested vegetation types through any type of vegetation treatments that harvest wood products.

Within the planning area, the timber management program is dependent upon the Colorado timber industry. Further reductions in the industry may eliminate timber management as a tool used to accomplish desired changes in vegetation conditions (reduction of insect and disease risk, and reduction of hazardous fuels), and meet public demands for building materials and other wood products. Costs to accomplish vegetation treatments without commercial harvests are much higher, and may prove to be prohibitive, under constrained budgets. Aspen has been managed throughout the planning area for more than six decades. Many of the stands treated in the 1940s and the 1950s are approaching maturity. It is important to determine whether or not the suitable acres are available to produce the level of aspen volume that is necessary to sustain the local aspen industry until the second-growth stands are ready for harvesting.

The Missionary Ridge Wildfire of 2002, as well as the high mortality from insects and disease, have resulted in substantive vegetative changes (including impacts to many acres of suitable timberlands). The resulting changes in age class and stocking may impact timber-yield calculations.

Long-term drought conditions have increased insect and disease related mortality, and have increased concern regarding declining forest health in all forested vegetation types.

Several determinations related to timber management must be made as part of forest planning, and these determinations are reviewed each time the LMP is revised, or when conditions change. Areas that are, and are not, suitable for timber production are identified (taking into account physical, biological, and economic factors). Where timber management is determined to be a suitable use, it must occur at sustainable levels.

The general goals for timber management on USFS lands include:

- provide for timber production[1],
- sustain healthy forest conditions, and
- create forest conditions that benefit, or are conducive to, management of other resource values (including wildlife habitat, recreation, aesthetics, water yield, and livestock grazing).

There are several components of timber management that the USFS considers in its planning process. They include determination of the:

- capability and suitability of USFS lands for timber production,
- type of silvicultural[2] systems that can be used, and
- amount of timber that can be harvested in a sustainable manner.

Capability to Produce Timber

Within the planning area, determining which areas are capable of producing commercial timber is done by evaluating physical and biological characteristics, as well as any administrative limitations, of an area. *(Capable Timber = 917,240)*

Suitability to Product

Suitability determinations are a further refinement of forested lands found to be capable of producing commercial timber. These determinations are based primarily upon social and economic considerations. This process was used to determine suitable timberland for the 1992 Amended Forest Plan. Table 3.12.1 lists the existing suitable timberland within the planning area.

Table 3.12.1 – Existing Acres of Suitable Timberland in 1992 Amended Forest Plan

CATEGORY	Acres	Percentage (%) of SJPL
USFS Suitable Timber	375,000	20%
Suitable Conifer Timber	285,784	15%
Suitable Aspen Timber	89,216	5%
BLM Suitable Conifer Timber	10,960	>1%

[1] Timber production is the purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use (FSH 2409.13 .05.26).

[2] Silvicultural system – A combination of interrelated actions whereby forests are tended, harvested, and re-established in order to produce a distinctive form and character. Systems are classified as even-aged and uneven-aged (FSH 2409.26, R2 Amendment 2409.26-96-8).

Allowable Sale Quantity

Under the 1982 forest planning rule[3], the USFS was required to determine the average annual allowable sale quantity (ASQ) in Forest Plans. This is the quantity (volume) of timber that may be sold from the suitable timberlands identified by the Forest Plan. This annual harvesting level must be sustainable over the long term. Table 3.12.2 shows the annual ASQ determined for the SJNF in both the 1983 Forest Plan and the 1992 Amended Forest Plan. The 1992 Amended Forest Plan estimated that 25%, or 6 MMBF (million board feet) of the ASQ, would be aspen.

Table 3.12.2 – SJPL Annual Allowable Sale Quantity

PLAN	Total Volume MMBF
1983 Forest Plan	41
1992 Amended Forest Plan	24
BLM	.65

* Volume in million board feet (MMBF). 1 MMBF = 1000 MBF

Timber Harvest Activity

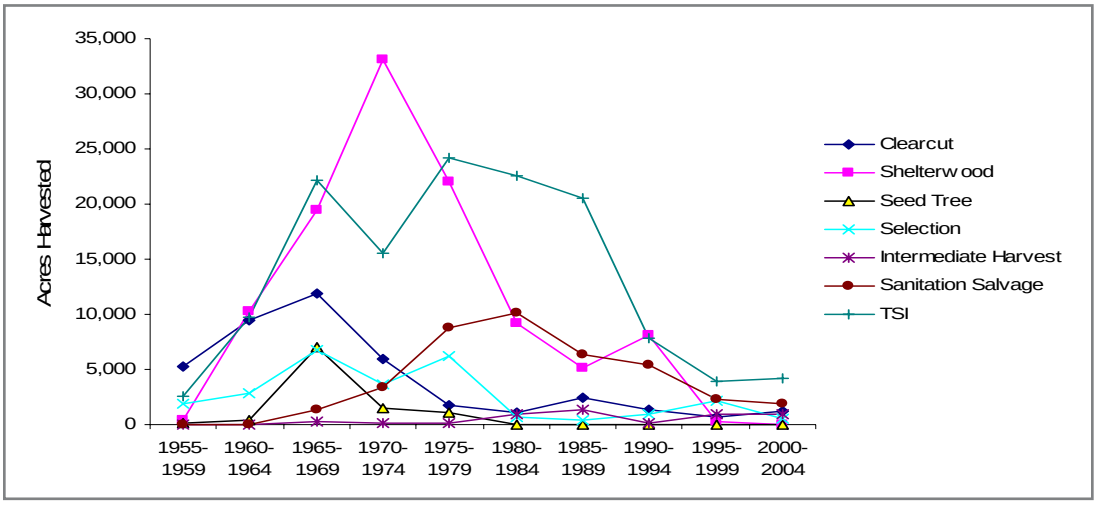
Timber harvesting activities began in the San Juan Basin in the early 1880s, approximately 20 years before the San Juan National Forest (SJNF) was established (1905). The ponderosa pine forest type was most affected (impacted) by these early multiple-entry logging activities. Since that time, harvesting activities have occurred in all commercial forest types.

Between 1955 and 2004, approximately 230,117 acres were harvested, along with another 133,246 acres of TSI. This equals 19% of the total SJNF land area (12%, if TSI acres are excluded). Harvesting figures were not available for the BLM, but are assumed to be near zero.

The even-aged silviculture system of shelterwood harvests have been the most common prescription within the planning area in the past (and primarily for spruce-fir and ponderosa pine vegetation types). Even-aged silviculture was common in the past, but is seldom used today (with the exception of application to aspen, which is nearly always clear-cut and regenerated by root suckering or “coppice”). Uneven-aged silviculture systems (including group selection and individual tree selection) are well suited to the spruce-fir and ponderosa pine forests found in the San Juan Basin, and are the most commonly used management methods today. Timber harvesting on BLM lands was primarily in the ponderosa pine type, or in the spruce-fir type in the Silverton area, and was seldom commercial in nature. Generally, trees were selected for harvesting on BLM lands based on their suitability for mining, construction, and/or for personal use for construction of homes and ranch buildings.

[3] 1982 Planning Rule (36 CFR §219.16).

Figure 3.12.1 – Acres Harvested by Silviculture Method on the SJNF, 1955 through 2004



TSI is an intermediate treatment designed to improve the composition, structure, condition, health, and growth of even- or uneven-aged stands. This treatment may include thinning, release, cleaning, weeding, and liberation. The use of this treatment in the planning area peaked in the 1980s, and continues today. TSI is primarily used for fuels reduction and restoration treatments in the dry mixed-conifer and ponderosa pine vegetation types. Sanitation and salvage cutting has occurred in ponderosa pine, mixed-conifer and spruce-fir types. In ponderosa pine forests, these methods have been used in order to treat dwarf mistletoe infestations and to recover dead trees for commercial use. Sanitation and salvage in spruce-fir forests was most prevalent in the late 1970s (to treat spruce beetle mortality). These treatments continue today, but generally on a smaller scale, with the goal of recovering pockets of sound mortality and reducing the spread of insects and disease.

During the 1960s and 19702, clear-cutting was used to harvest spruce-fir forests within the planning area. This harvesting method was discontinued for spruce-fir in the late 1970s. Clear-cutting is considered the optimum silviculture treatment in aspen forests (coppice). Most of this activity has occurred since the mid-1940s, when aspen harvesting for the Mancos match plant (currently Western Excelsior) began.

Regeneration Success

Within the planning area, timber regeneration needs have resulted from timber harvests, wildfire, and insect- or disease-caused mortality. Regeneration can occur through natural reseeding and/or suckering (as in aspen), or from artificial methods (such as hand-seeding and/or planting).

On suitable timber lands, areas must be adequately stocked (have a minimum number of live trees per acre) within 5 years following a final regeneration harvest. Final regeneration harvests include clear-cuts, shelterwood removal cut, seed tree removal cut, or a selection harvest. If natural regeneration is inadequate, it may be supplemented with hand-seeding and/or with planting. Regeneration/survival surveys are normally conducted 1, 3, and 5 years after treatment. Regeneration standards (the required number of live seedlings/saplings per acre) vary by species and by site productivity.

Past regeneration failures are most common in the higher-elevation spruce-fir harvests that occurred in the 1960s, which used the clear-cutting harvest method. Due to poor reforestation success, this method is no longer used on spruce-fir sites. Many of the initial planting efforts failed because there was no protection for planted seedlings on these sites. Table 3.12.3 summarizes the regeneration success for Englemann spruce, lodgepole pine, aspen, true fir, and ponderosa pine trees in the planning area, from 1983 to the present.

Table 3.12.3 – Regeneration Success by Tree Species – 1983 to 2004

TREE SPECIES	NATURAL REGENERATION CERTIFIED AS STOCKED	PLANTING SUCCESS	SEEDING SUCCESS	REGEN SURVEYS IN PROGRESS
White Fir	100%	--	--	0%
Subalpine Fir	82%	18%	--	0%
Aspen	98%	--	--	2%
Lodgepole Pine	8%	92%	--	0%
Engelmann Spruce	25%	72%	--	3%
Ponderosa Pine	24%	73%	--	3%
Douglas-Fir	9%	91%	--	0%
Unknown	28%	12%	--	60%

Natural regeneration has been very successful on aspen, and true-fir sites (approximately 90 to 100%), as well as on all vegetation types where selection harvesting methods have been used. Planting has been required on many spruce-fir and ponderosa pine sites where even-aged silviculture has been used and has been successful about 75% of the time.

Fuelwood Harvest

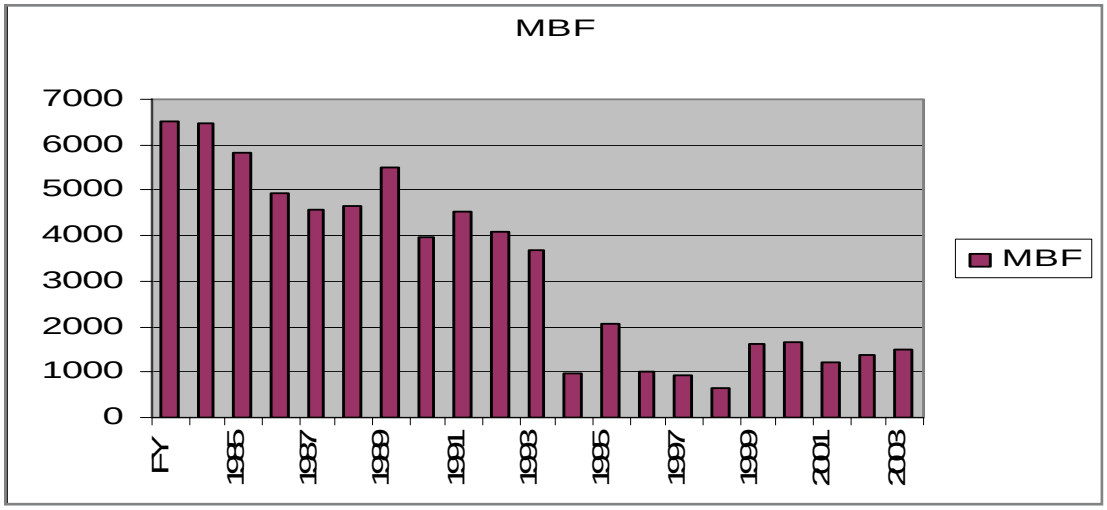
One of the goals of the current LMP is to provide a supply of fuelwood to local residents. Fuelwood harvesting is accomplished both through commercial and personal use permits. Mostly dead timber is harvested, along with limited amounts of green wood provided in specified areas.

Fuelwood areas vary by year, and affected (impacted) acres are not tracked. The volume of fuelwood harvested is monitored based on the number of permits sold. Figure 3.12.2 displays the trend in fuelwood harvesting over the past 20 years.

Volumes Harvested

A timber sale sold during one year may have volume harvested over several years. The USFS tracks harvested timber volumes by species and by type of product or component. (Saw timber is a log greater than 8 inches in diameter. Products other than logs [POL] include posts and poles with diameters less than 8 inches, as well as all aspen products.) Figure 3.12.2 displays the volume of timber sold and harvested from the planning area between 1984 and 2003.

Figure 3.12.2 - Fuelwood Harvest



Summary of Existing Conditions and Trends

Currently, approximately 49% of the USFS-administered lands within the planning area are capable of growing commercial timber. Under the 1992 Amended Forest Plan, 20% of USFS lands within the planning area are identified as suitable timberland.

Since 1955, approximately 19% of the planning area has had timber harvesting activities. This equals less than 30% of the forested cover within the planning area.

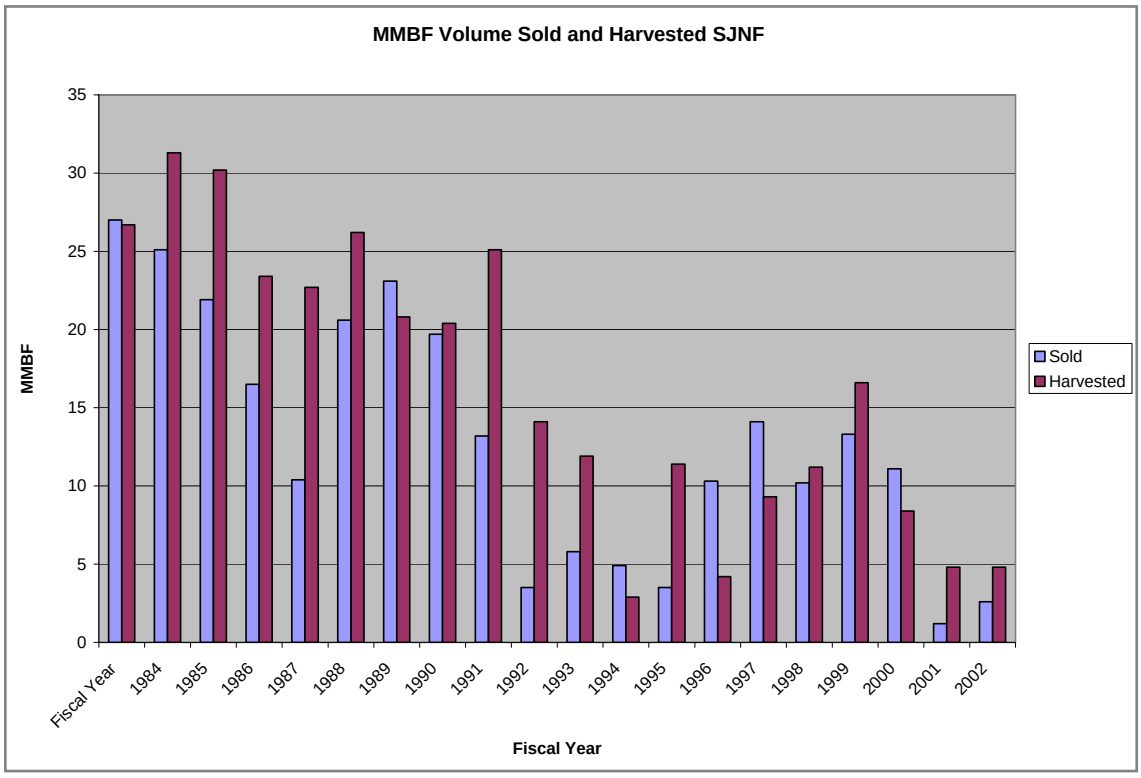
The most common harvesting methods have been shelterwood (mostly in spruce-fir and ponderosa pine), followed by clear-cut in spruce-fir (in the past) and in aspen (coppice), then by TSI, and sanitation/salvage. The most common treatment currently is selection and intermediate treatments for fuels or restoration purposes. Most fuelwood harvested in the planning area is through personal use permits.

The ASQ for the San Juan National Forest (SJNF) was never fully offered, and sold or harvested, during any year between 1984 and 2004.

Historic regeneration failures are attributed to higher-elevation spruce-fir harvests that occurred in the 1960s, where clear-cutting was the silvicultural method used.

Natural regeneration has been very successful on aspen and true-fir sites (approximately 90 to 100%), and all vegetation types where selection harvesting methods have been used. Planting has been required on many spruce-fir and ponderosa pine sites where even-aged silviculture has been used, and has been successful about 75% of the time.

Figure 3.12.3 – Volume of Timber Sold and Harvested on the SJNF (1984-2003)



The trend in total acres harvested shows a peak in the late 1980s, with a steady decline over the past 20 years. The trend in volume offered and sold over the past 20 years shows peaks in 1983, 1988, and 1997. The trend in total volume harvested over the past 20 years show a peak in 1984, 1991, and 1999. Annual harvesting activities show less fluctuation between years than do sale offerings.

Trends in fuelwood demand show a peak in 1985. Demand has leveled out at approximately 1,000 MBF over the last 10 years.

DIRECT AND INDIRECT IMPACTS

General Impacts

Volume Harvested - Estimated volumes harvested (TSPQ) are displayed in Chapter 2 of this DLMP/DEIS. Road Construction/Reconstruction - Estimated miles of road construction and miles of reconstruction of existing roads varies by alternative, and can be found in Table 3.12.4.

Reforestation Success - Past reforestation success levels displayed above in the Current Conditions and Trends sections is expected to continue at similar, or slightly improved, levels in the future.

Impacts Related to Suitability

Identification of lands suitable for timber production is one of the key elements of forest plans, and defines where timber production may occur on forest lands. Timber harvests may also occur on other lands. "Other lands" is a classification regarding lands where commercial timber production is not compatible with desired conditions and objectives, but that are physically capable and administratively available, for purposes other than the production of wood fiber (including hazardous fuels reduction, ecosystem restoration, visuals, scenic vistas habitat improvement, or other purposes).

Lands not suitable for timber harvest, due to various physical and administrative factors, (including slope, soil characteristics, productivity, and/or administrative withdrawals) are also identified within the DLMP/DEIS planning documents.

Lands identified as generally suitable for timber production (lands that area physically capable and administratively available) would vary by alternative. These lands include both lands where timber production is compatible with desired conditions and objectives, as well as lands where timber harvesting may occur (but where timber production is incompatible with desired conditions and objectives). The ratio of timber harvesting from these two categories of lands varies by alternative (see Alternatives Descriptions in Chapter 2).

Within the planning area, the majority of timber harvesting is used in order to meet desired vegetative conditions (including improvements in age-class distribution, reduction of hazardous fuels, and improvements in stand structures designed to return forest vegetation to desired conditions). Forests may be actively managed in order to reduce the intensity and extent of disturbances (including from wildfire or insect epidemics that may be undesired) and may result in damage to ecosystem processes and functions. Management activities may also be used to maintain forested vegetation at a desired point within the historical range of variability (HRV) in order to avoid broad swings in various elements that have occurred naturally over time, but that are undesired today. (An example would be a vegetation type that ranged from nearly all early seral stands over the planning area, to nearly all mature stands.) To avoid the catastrophic events that facilitated these swings (including from large-scale wildfire or insect epidemic), it may be more desirable to maintain a good mix of age classes near the center of the HRV.

DLMP/DEIS Alternatives: The alternatives vary in areas where timber management may occur in order to achieve the desired vegetative conditions (as described in the DLMP/DEIS). Alternative A would have the most acres available for management, with Alternatives D, B, and C following in descending order, respectively. Alternative A may result in the greatest opportunity to provide vegetative conditions that limit the intensity and extent of disturbances (including from wildfire and insect epidemic), whereas Alternative C may provide the least opportunity.

Table 3.12.4 – Potential Timber Treatment Acres by Vegetation Type per Year, Decade 1

	ALTERNATIVE A (NO-ACTION ALTERNATIVE)	ALTERNATIVE B (PREFERRED ALTERNATIVE)	ALTERNATIVE C	ALTERNATIVE D
Ponderosa Pine	1,000 acre restoration; 500 acre PC	1,000 acre restoration; 500 acre PC	900 acre restoration; 400 acre PC	1,500 acre restoration; 500 acre PC
Warm-Dry Mixed-Conifer	250 acre restoration; 250 acre PC	250 acre restoration; 250 acre PC	200 acre restoration; 225 acre PC	500 acre restoration; 250 acre PC
Cool-Moist Mixed-Conifer	200 acre PC	125 acre PC	20 acre PC	287 acre PC
Aspen	400 acre CC	500 acre CC	400 acre CC	600 acre CC
Spruce Fir	50 acre PC	50 acre PC	20 acre PC	113 acre PC
Road Construction (miles)	3	0	0	3
Road Reconstruction (miles)	7.2	7.6	5.6	8.2

Assumes current budget levels and industry capacity.
PC = Partial cut, individual tree and group selection, improvement cuts, shelterwood, and other partial cut harvesting methods, generally removing 30 percent or less of the existing overstory.
CC = Clear-cut.

Impacts Related to Insect and Disease Management

Insects and disease would impact the production of timber by killing and damaging trees. Alternative C would emphasize natural processes (and there is increased acceptance for insect and disease damage to the timber resource outside the suited lands). This could result in tree damage or mortality on a variety of scales, depending largely upon factors such as populations, stand conditions, and natural events (including wind and climate). Under Alternative C, there will be large areas where natural processes dominate, including insects and disease populations. At epidemic levels, insects and diseases do not respect administrative boundaries; therefore, there would be an increased risk of damage and mortality to adjacent lands actively managed (as opposed to areas where natural processes dominate). Although salvage operations are allowed in some of the natural processes areas, it would be done to meet the resource objectives of those MAs, and may not be considered a reliable source of additional wood fiber.

DLMP/DEIS Alternatives: In relation to insects and disease, Alternative C would result in the greatest potential impacts to timber, followed by Alternatives B, A, and D, respectively. These potential impacts could occur because less of the forested area would be actively managed.

Impacts Related to Fuels Treatments

Generally, fuels treatments treat understory vegetation with both prescribed burns and mechanical treatments (including mastication or thinning). These treatments have similar impacts related to thinning (as described below). Advanced regeneration may be lost, which may delay future harvests, especially where regeneration must be re-established prior to harvesting, or where stocking is insufficient to take advantage of growing conditions. Fuels treatments also improve individual tree growth and vigor due to the reduction of competition for moisture and nutrients related to the impacts of thinning. The long-term impacts of fuels treatments on timber outputs and forest health are generally positive, decreasing the potential of loss of growing stock due to crown fire and insect epidemics.

DLMP/DEIS Alternatives: Alternative D would result in the greatest benefits from fuels treatments. The benefits of the remaining alternatives would be similar to one another.

Impacts Related to Wildland Fire Use (WFU)

The impacts related to WFU within suitable timber lands are similar to the impacts described above for fuel treatments, in general. There is the potential for loss of growing stock and large investments in regenerated stands over wide areas if WFU is not carefully applied, or if unexpected weather conditions develop. In general, the improvements in growing conditions and overall forest health outweigh the risk of loss, but would continue to be carefully considered in WFU planning and administration. Proposed levels of WFU would be similar under all of the alternatives; therefore, there would be similar impacts.

DLMP/DEIS Alternatives: Impacts would be similar under all of the alternatives.

Figure 3.12.4 - Timber Suitability Alternative A

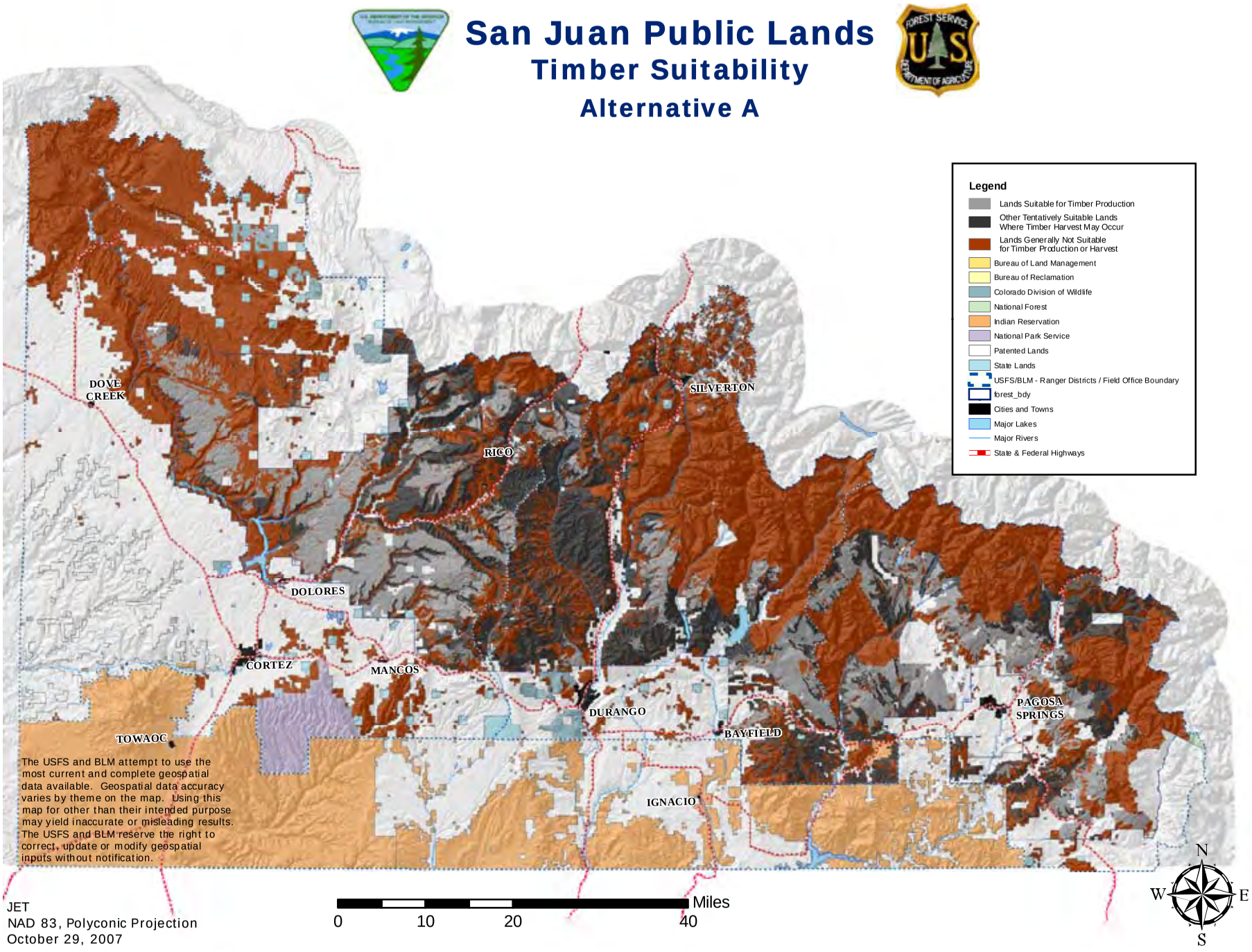


Figure 3.12.5 - Timber Suitability Alternative B

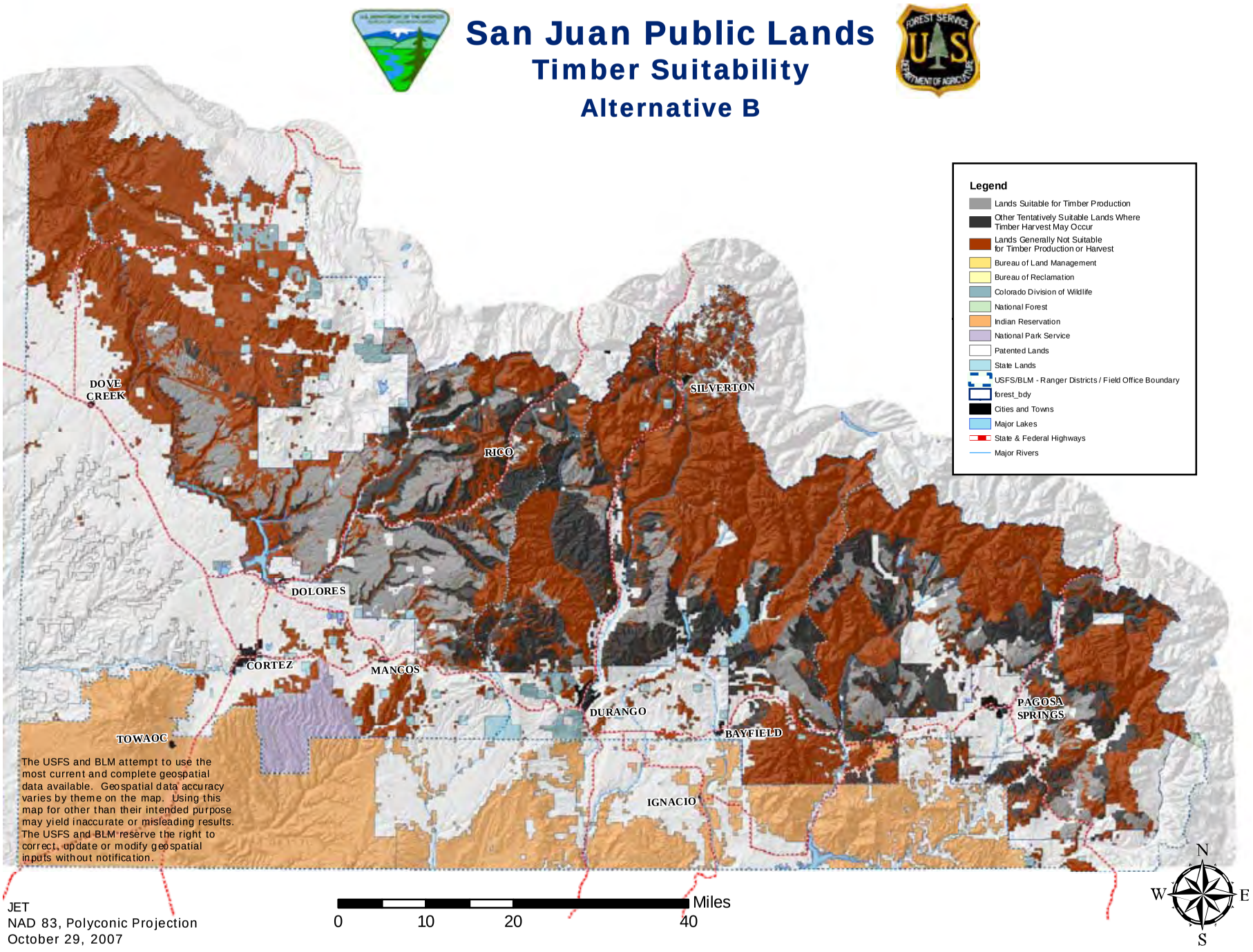


Figure 3.12.6 - Timber Suitability Alternative C

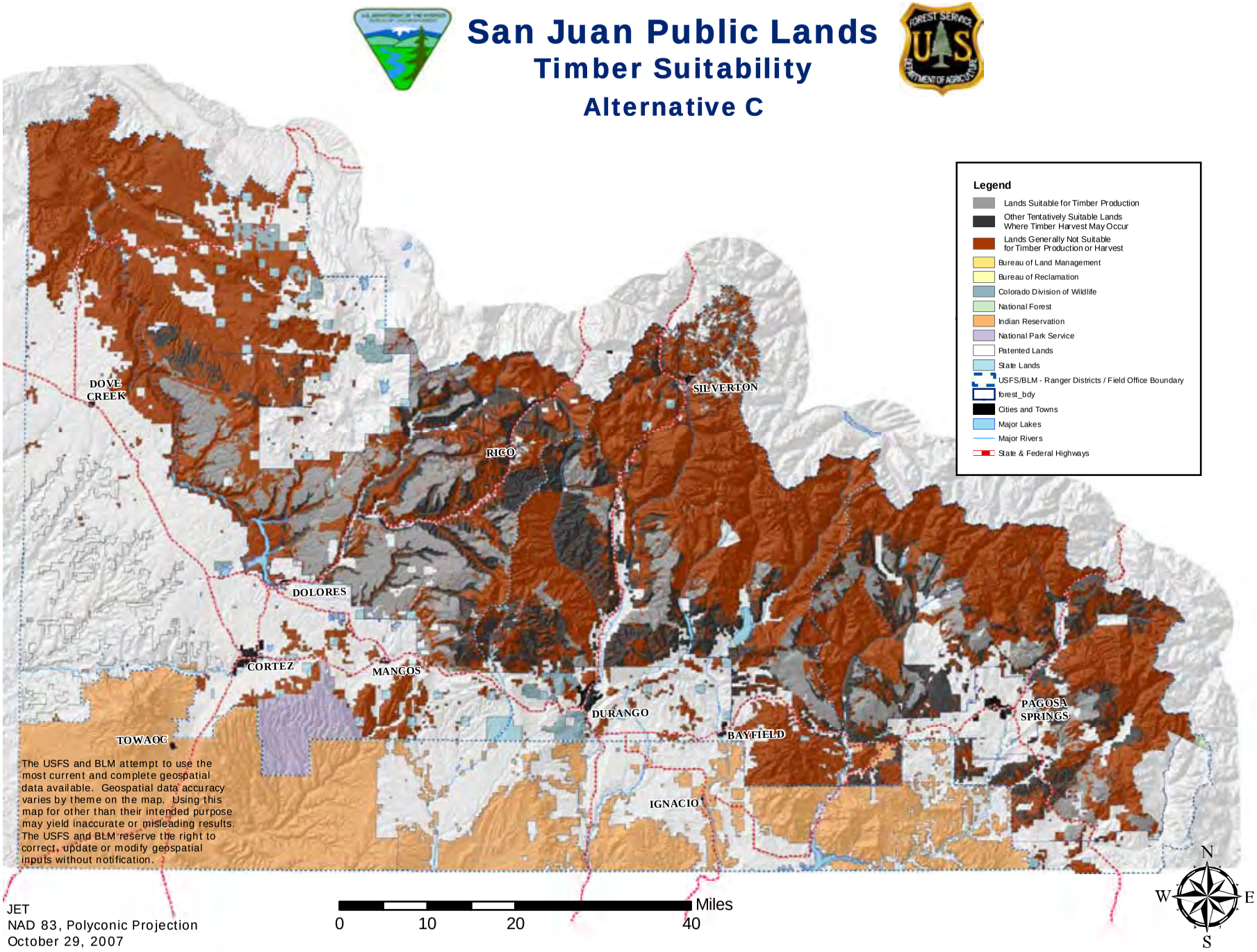
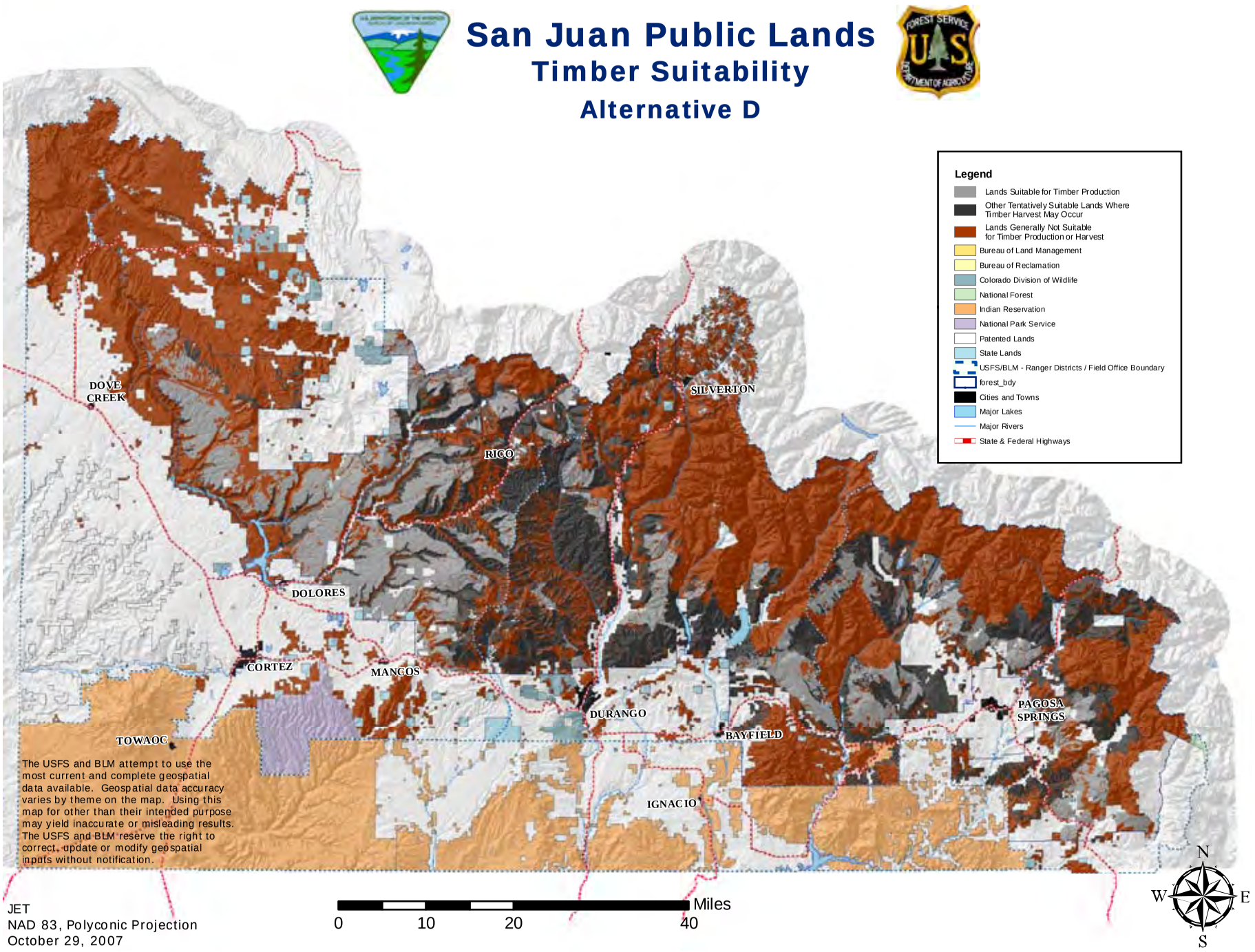


Figure 3.12.7 - Timber Suitability Alternative D



Impacts Related to Oil and Gas Development

The roads, well pads, and ancillary facilities associated with oil and gas development take forested land out of production (reducing future outputs); however, the acreage involved would be minor in comparison to overall suitable timber lands. Small short-term increases in timber outputs may occur during field development as timber is harvested (due to road and well-pad construction). These outputs are accounted for in the category of "Other Lands" lands, where timber production is incompatible with desired conditions and objectives.

DLMP/DEIS Alternatives: Impacts would be similar under all of the alternatives, except for alternatives that do not allow any new leases, which would not take any more lands out of production.

Impacts Related to Recreation

Generally, impacts to the timber program related to recreation would be small. Small short-term outputs may occur from ski area development, and from recreation facility development. These outputs are accounted for in the "Other Lands" estimates. Commercial timber or fuelwood may also be harvested when removing hazard trees from recreation facilities. User conflicts between recreationists and timber purchasers are becoming more common, particularly concerning road use. These conflicts increase restrictions on timber purchaser operations, resulting in increased costs and reduced financial efficiency.

DLMP/DEIS Alternatives: The impacts on timber production from recreation would be similar under Alternatives A, B, and D; and slightly reduced under Alternative C.

CUMULATIVE IMPACTS

The affected environment portion of this section describes historic, current, and foreseeable future activities considered with regard to cumulative impacts to the forest resource. The next 15 years are utilized as the time-frame for cumulative impacts analysis.

Given the overall size of the planning area, and the relatively small amounts of treatment proposed under all of the alternatives, timber harvesting from suited lands may result in a slight change in the age/size class distribution of the forested lands. The major agent of change to the forested lands would continue to be tree growth and senescence, with disturbance events (including wildfire, wind, insects, and disease) as the major source of deviation from that trend.

Timber harvesting also occurs on State, private, Native American tribal, and adjacent public lands. Table 3.12.5 estimates the annual average volume of these harvests. No records are kept for private lands harvests (which are generally small in volumes, but can, in some case, contribute considerably to the timber supply). Such contributors to commercial sales are, for example, private land aspen harvests and fire salvage following the Missionary Ridge Wildfire of 2002. In general, however, as harvesting from national forests has fallen, other ownership lands have seen an increase in harvesting volume, particularly in the aspen vegetation type. It is not known how long private lands can sustain the current levels of harvesting.

Table 3.12.5 – Average Annual Harvest Volume

ENTITY	AVERAGE ANNUAL HARVEST VOL MMCF
State Lands	Small variable quantities
Private Lands	Small variable quantities
Southern Ute Lands	.36
Ute Mountain Ute Lands	Small variable quantities
GMUG National Forest	2.1
Manti-La Salle National Forest	.89
Rio Grande National Forest	.52