

Topic 6 - Timber Suitability

Introduction

National Forests have long been a provider of forest products for lumber and many other uses. This topic discussion is intended to meet requirements for analyzing timber suitability for forest planning. The affected environment section provides information on the recent history of timber production related to the Wasatch-Cache, and this is followed by a discussion of the environmental consequences of the six alternatives that are being analyzed.

Laws, Policy, and Direction

The **National Forest Management Act of 1976** requires identification of areas suitable and available for timber harvest and determination of the Allowable Sale Quantity (ASQ) from those lands, and the certification of reforesting those lands within five years following harvest.

Affected Environment

The National Forest Management Act and its implementing regulations require identifying those lands that are suitable for timber management. Suitable lands include forested lands outside of withdrawn areas (such as designated Wilderness) where reforestation can be assured and timber management activities can take place without causing irreversible resource damage to soils productivity or watershed conditions. Regulations require that lands identified as not suited for timber production be examined at least every ten years to determine if they have become suited (36 CFR 219.12(k)(4)(ii)).

The assessment of suitable timberlands identifies two categories: “tentatively suited” lands are those available forest lands that are physically suited for potential timber management, and “suitable” timberlands are that portion of the tentatively suited lands determined appropriate for timber management under a given alternative. Tentatively suited lands are the same for all alternatives. Suitable lands may be thought of as those lands that are capable of growing forest stands, available for timber production and management, and managed under a prescription category (5.2 and 6.2), with an emphasis on managing timber for growth and yield, while maintaining or restoring forested ecosystems. The acreage of suitable lands varies between alternatives depending upon the management prescriptions applied within the alternative. The suitable lands for each alternative are evaluated to determine the range of potential timber harvest levels for that alternative.

Two terms are used to describe timber harvest levels: the Allowable Sale Quantity (ASQ) and The Long Term Sustained Yield Capacity (LTSYC). Allowable Sale Quantity is a term that is frequently misunderstood. The ASQ is the maximum amount of timber that may be offered for sale each decade for a given alternative. It is a management-determined limit that has been analyzed and shown to be sustainable over time without exceeding the growth on those lands. Timber that contributes to ASQ comes from suited timberlands and varies by alternative. The

Long Term Sustained Yield Capacity represents the maximum level of sustainable timber production that suitable lands are capable of producing, and may be greater than the ASQ. It may not be less than the ASQ, however.

Timber harvest may also occur on unsuited lands that are within management prescriptions such as 5.1, 6.1, 3.1, 3.2, 4.3, and 4.4. These prescriptions while not emphasizing commodity production, allow the use of timber harvest to achieve management objectives. The volume produced from these lands therefore would be incidental to other management objectives and not included in the ASQ. The timber sale program for the Forest is the total of the ASQ volume (from MPC 5.2/6.2) and the volume offered from other MPCs.

Table TM-1. displays the timber volume offered and sold since the 1985 Forest Plan was signed. Units are million board feet (MMBF) and thousand cubic feet (MCF).

Table TM-1. Timber volume offered and sold since inception of Forest Plan in 1985.

FiscalYear	Offered		Sold	
	MMBF	MCF	MMBF	MCF
1986	13.9	2780	12.9	2580
1987	11.8	2360	11.5	2300
1988	12.4	2480	12.4	2480
1989	14.2	2840	14.0	2800
1990	8.6	1720	8.6	1720
1991	10.0	2000	10.0	2000
1992	10.0	2000	10.0	2000
1993	10.0	2000	10.0	2000
1994	5.5	1100	4.6	920
1995	2.4	480	1.8	360
1996	6.6	1320	1.7	340
1997	5.4	1080	7.5 ¹	1500
1998	5.7	1140	7.6 ¹	1520
1999	3.1	620	5.0 ¹	1000
2000	4.7	940	4.7	940

Timber Market and Demand

The Wasatch-Cache is a competitive market for timber sales; most sales offered receive bids from two or more bidders. Occasionally, a sale will receive no bids on the initial offering. There are several reasons sales may receive no bids at the initial offering, including market conditions, and sale characteristics such as species, minimum bid price, timing restrictions, etc. Sales that have been prepared in the past few years have been driven by a wide range of objectives designed to meet multiple resource needs. These sales include a larger percentage of smaller, less valuable trees than in the past and are more expensive to harvest. This occasionally has resulted in a sale receiving no bids, especially when the market is high. However, all sales that

¹ Sold volume totals that exceed the offered volume reflect sales receiving no bid in prior years that subsequently were reoffered and sold in the current year.

received no bids have been reoffered and subsequently sold. Demand for timber is not a limiting factor in the timber program on the Wasatch-Cache.

The Forest participates in the Small Business Administration timber program. A certain percentage of the sales offered by the Forest are “set-aside” to be processed by small business under this program. The percentage is recalculated every 5 years, and was recomputed in the fall of 2000. Currently, 66% of the Wasatch-Cache timber sales must go to small business. Several small businesses operate mills adjacent to the Wasatch-Cache National Forest and depend upon the forest to provide a portion of their supply. These include Blazzard Lumber, Leavitt Lumber, and Thompson Logging in Kamas, UT; Ayres and Baker in Mountain View, WY; Jensen Lumber in Ovid, ID. Intermountain Resources of Montrose, CO also has recently purchased sales from the Forest. One large business, Louisiana-Pacific, operates mills in Belgrade and Deer Lodge, MT and Saratoga, WY which process timber purchased on the Forest. There are also several small companies and individuals that purchase small sales.

The location of these mills reflects a significant change in the market situation since the initial Forest Plan was developed. Traditionally, all the volume sold on the forest was processed at mills in local communities. In the past 3 or 4 years, bidders from outside the local area have begun to look to the Wasatch-Cache as a source for timber, with the result that we are now selling timber to processors in adjacent states as well as local mills. This reflects the need for mills to expand their source areas to meet demand

Changes in Suitability Based on Implementation and Monitoring Results

The Five Year Monitoring Report (USFS, 1992) identified several areas that needed to be addressed during plan revision, including timber availability assumptions, technical feasibility and implementation assumptions, and integrated resource analysis procedures. The 1985 Forest Plan identified 166,000 acres of suited lands, much of it located within inventoried roadless areas.

Technical concerns centered on harvest method assumptions and implementation of Forest Plan standards and guidelines. The monitoring report found that during implementation of the plan, land management prescriptions applied on the ground differed from what was proposed in the plan. For example, harvest in high elevation spruce stands was modeled to occur in two or three entries. In reality, the silvicultural prescriptions currently being applied involve selection harvest, which results in lower yields per entry than the 1985 plan projections. The 1985 plan also projects growth response from thinning in dense, small diameter stands of lodgepole pine on the North Slope of the Uinta Mountains. Subsequent monitoring and analysis has indicated that many of these stands will not respond to thinning. The monitoring report indicated that these stands should be removed from the suitable base or identified as a separate component until markets for this material develop. In addition to the problems meeting expected outputs forecast in the Forest Plan, implementation of standards and guidelines has resulted in deferral of some expected treatments. The monitoring report identified hiding cover and leave strips adjacent to harvest units as examples of standards and guidelines that are affecting timber production on the forest.

In the process of Plan implementation, site-specific analyses have repeatedly revealed areas of high water tables and wet "pothole" complexes, primarily on the North Slope Uinta Mountains, that were not identified during the 1985 Forest Plan development. These areas where regeneration is difficult, or irreversible soil damage may occur by use of ground based equipment and road construction have been reclassified as not tentatively suited for timber management and removed from the suitable timber base.

More recently, standards and guidelines in the 1985 Plan have been modified to provide habitat for sensitive species that were not addressed in the original plan. An example is the northern goshawk; guidelines have been developed and a forest-wide amendment completed that is incorporated in the proposed revised plan.

The 1985 Forest Plan projected harvest on approximately 5,300 acres in roadless areas on the North Slope. In reality, harvest activity has occurred on approximately 1,200 acres of these lands. Treatments have been deferred due to the sensitive nature of roadless lands, and the need to reevaluate long-term management objectives for these areas.

Timber outputs in revision are based on the integration of goals which address the multiple values and uses of a given management area. Prescriptions applied vary by alternative to reflect a range of approaches to timber and forestland management.

Insects and Disease

Insect caused mortality is a normal function of the forest ecosystem. Most of the major forest insects attack and kill individual trees or small groups of large, old trees, frequently of low vigor or under stress from drought or root disease. However, if the population increases dramatically, large numbers of trees may be attacked, resulting in widespread mortality over extensive acreages. The lack of fire within existing forests of the Wasatch-Cache has skewed stand structure toward older age classes, with high numbers of large diameter trees per acre. These conditions increase the potential for extensive insect related mortality. The large continuous acreage of older, dense forests provides a suitable host to support insect populations and allow endemic levels of activity to rapidly increase to epidemic levels.

Several insect species have been active on the Forest since the plan was implemented. The largest impact has been from the mountain pine beetle on the North Slope. An epidemic occurred around the time the plan was signed which resulted in high mortality levels in lodgepole pine stands occupying approximately 150,000 acres on the Wasatch-Cache and Ashley National Forests. Salvage logging to remove the dead trees was conducted over 1200 acres on the east end of the Mountain View Ranger District, concluding in the spring of 2000. Standing dead trees still occupy several hundred acres in the roadless area to the south of Beaver Meadows Reservoir and west toward Hoop Lake. Root systems of the trees are now deteriorated to the point that significant wind throw is expected in the near future, which will substantially increase fuel loadings. Currently, mountain pine beetle populations are at endemic levels in this area. Aerial surveys completed in fiscal year 2001 indicated low levels generally across the forest, with some increased mortality in the Smith and Morehouse, Beaver Creek and North Fork Provo

River areas on Kamas District. A limited beetle suppression effort within campgrounds and undeveloped sites on the Kamas District is currently underway.

Douglas-fir bark beetle activity is generally decreasing across the forest, although pockets of mortality occur on every District. Large groups of mortality continue to be recorded near Spawn Creek, Rigby Hollow, Beaver Mountain and Tony Grove Lake on the Logan District. Douglas-fir Tussock Moth caused extensive mortality of subalpine fir and Douglas-fir on 2250 acres of the Ogden Ranger District in 1990. Dead trees were salvaged from the area over the next two years. No other outbreaks of this insect have been detected since that time.

Drought in the late 1980's to early 1990's led to a large increase in western balsam bark beetle populations. Western balsam bark beetles continue to kill groups of subalpine fir across the Forest, but in general populations are considered to be at low levels.

Englemann spruce beetle has increased on the Logan, Ogden, and Evanston Ranger Districts since the 1985 Forest Plan was developed. Spruce beetles were found west of Whitney Reservoir on the Evanston District in 1988, infesting trees that had been blown down the previous year. Salvage efforts to remove the down trees and the use of pheromone baits to control the populations were completed over the next four years. Approximately 1000 acres were treated in this manner. A second area was impacted a few years later; approximately 1000 acres of spruce-fir stands were attacked in 1995 in the vicinity of the T.W. Daniels Experimental Forest on the Logan District. Aggressive suppression activities consisting of removing beetle infested trees and the use of pheromone traps were conducted in 1996 and 1997 in an attempt to prevent an increase in the insect population. At the same time, spruce beetle was also rapidly increasing on the Ogden District, extending from Dairy Ridge north to the Spencer Basin area. The same suppression strategy was employed in that area in 1998 and 1999. Both suppression attempts were successful in reducing the populations.

The use of suppression techniques did not dramatically alter the stand conditions, however, leaving the residual spruce susceptible to further infestation (Bentz and Munson, 2000). A timber sale has been prepared to treat spruce stands in the vicinity of Daniels Experimental Forest in an attempt to limit the effects of future outbreaks and regenerate the spruce component. Treatment consists of removing small groups of mature trees and planting spruce seedlings, and commercial thinning the surrounding stands to maintain vigor of the trees and reduce their susceptibility to beetle attacks. This proposed sale has been delayed as a result of litigation. Examination of the Logan treatment area during the summer of 2002 indicated increased beetle activity, with numerous recently attacked trees.

Aspen defoliation and dieback has been mapped on several districts. Over 600 acres on the Logan District, 600 on the Kamas District, over 1000 acres on the Salt Lake District, and several thousand acres on the Ogden District are affected. The cause of this discoloration and leaf dieback are unknown at this time.

Environmental Consequences

Effects on the Timber program from the various alternatives depend upon the amount and the quality of the timber offered for sale. The amount offered annually is important to lumber mills dependent upon National Forest timber in planning their operations. The quality of the timber offered, specifically such variables as size of the timber, degree of insect and disease problems and species composition, affect the value and economic feasibility of the offering. Other factors that influence a prospective purchaser's decision whether or not to bid for National Forest timber include accessibility, distance from the mill and special requirements or contract provisions that have the potential to increase the cost of timber processing.

As explained in the affected environment section, the ASQ represents the maximum amount of timber that can be offered for sale each decade from suitable lands. That level has been analyzed and shown to be sustainable over time without exceeding the growth on those lands. It is not, however, a guaranteed output level. The actual output will be determined through site-specific analysis. Timber that contributes to ASQ comes from suited timberlands and varies by alternative.

In addition to the ASQ volume, some volume may be derived from management efforts on the unsuited lands that fall within management prescriptions that allow timber harvest. This non-ASQ volume would not be offered on a regular basis, but would depend upon opportunities arising through management for non-timber objectives. This volume, together with the ASQ volume is the Total Sale Program Quantity (TSPQ).

General Effects

Each alternative differs from the others in the amount of lands available for timber management as well as the objectives for timber management. Each, therefore, affects the timber program differently.

Alternative 1

This alternative allows natural processes to prevail, and all lands would be considered not suited for timber production. Timber harvest would not be used to meet other resource objectives. No volume would be offered under this alternative; it would therefore eliminate timber as a program in the Wasatch-Cache. Mills that are dependent upon National Forest timber would have to find other sources or go out of business. Small local mills would be most affected due to their inability to compete with larger mills that can draw from larger source areas to meet their needs.

Alternative 2

Alternative 2 emphasizes restoring natural processes with active human management, conservation of large roadless areas, and allowing uses where they are compatible with restoration or maintenance of properly functioning conditions. This alternative designates no lands as suited for timber production; therefore, the allowable sale quantity would be zero. However, it does allow harvest of timber to meet other resource objectives. The timber program

could continue with the purpose of restoring processes, but timing of offerings would be irregular and the volume would vary considerably. Up to 650 acres of tentatively suitable lands could be harvested annually under this alternative, providing up to 4200 CCF (2.1 MMBF). Harvest would concentrate on vegetation types that are considered at risk, such as bark beetle susceptible stands of spruce and lodgepole pine, and aspen stands that are subjected to conifer encroachment. A substantial volume of aspen and relatively low quality fir would likely be available from restoration efforts. Timber within some inventoried roadless areas would be available under terms of the National Roadless Area Conservation Rule, however that availability is so limited that it is unlikely much timber volume would be supplied from roadless lands (see discussion below under effects on timber management from inventoried roadless area management).

The effect of this alternative on local mills would depend upon their having an existing market or developing a market for lower value species, and a source of supply to provide for their demand between National Forest offerings. Currently, there are limited markets for aspen and fir in the Wasatch-Cache area. This alternative would have less effect upon the local mills than Alternative 1, but would provide less volume on a regular basis than the other alternatives. Mills would not be able to count on a steady supply sufficient to meet their capacity.

Alternative 3

This alternative emphasizes ecosystem functioning and sustainability while providing some commodity outputs. It designates 38,000 acres as suitable, where management activities would focus on timber production. Road construction is permitted in some inventoried roadless areas depending on management prescription. Approximately 225 suitable acres would be treated annually, providing an ASQ of approximately 3400 CCF (1.6 MMBF) annually. Additional volume might be available from unsuited lands with prescriptions that allow harvest, but not on a regular basis. A maximum of 525 acres of unsuited lands could be harvested in this alternative, providing up to an estimated 3400 CCF (1.6 MMBF). Sale offerings would depend upon opportunities and funding as in Alternative 2. A majority of ASQ volume offered would be conifer, while volume from other than suited lands would include a greater percentage of aspen and low quality fir. The volume of timber provided by this alternative would be less than that needed to supply one mill on an annual basis, but would contribute volume toward meeting that demand.

Alternative 4

Alternative 4 continues management under direction of the 1985 Forest Plan as amended to address needs for change identified since 1992. Adjustments have been made in the tentatively suited lands due to operability and other concerns. It designates 193,900 acres as suitable for timber production. More of the inventoried roadless areas would be available for treatment and road construction than Alternative 3. Approximately 625 suitable acres could be treated annually, resulting in an ASQ of approximately 6700 CCF (3.3 MMBF). Approximately 20% would be aspen. As with Alternatives 2 and 3, some additional volume could be made available from unsuited lands, depending upon funding and opportunities. An additional 625 acres of unsuited lands could be treated under this alternative, providing an additional 5800 CCF (2.9

MMBF). This alternative would contribute significantly toward meeting local demand, but would not satisfy it completely.

Some reallocation of funds into the timber program would be necessary to achieve this level of output from suited lands.

Alternative 5

Alternative 5 is designed to address the concern that the Forest should be used to directly benefit local economies by providing predictable, sustained outputs while allowing a variety of other uses. This alternative designates the largest amount of suited lands of any alternative. Most of the current roadless areas would be available for harvest and road construction. A total of 226,000 acres would be considered suitable for timber production. Approximately 1250 acres would be treated annually, with an ASQ of approximately 12500 CCF (6.2 MMBF). With the emphasis on providing raw material for industry, treatments would concentrate on developing high quality material. Species mix and size and quality of timber offered for sale would tend to make sales under this alternative more economical and desirable to industry than any other alternative. The level of offered volume would completely satisfy the demand for one or two local mills.

As with the other alternatives, some additional volume could be made available from unsuited lands to achieve objectives other than timber production. However, with the increase in the amount of suitable timberlands, and the corresponding reduction in the acreage of unsuited lands, this contribution is estimated to be relatively small. Up to 310 unsuited acres could be treated annually, providing an additional 2400 CCF (1.2 MMBF).

Producing this level of timber would require a significant shift in dollar allocation within the Forest budget. This would require additional staffing to complete sale planning, preparation and administration activities.

Alternative 6

Alternative 6 emphasizes biodiversity by conserving large roadless areas and concentrating activities in areas where they can be sustained. Harvest would be allowed on 28,900 acres of suitable timberlands, virtually all of which are located in the Uinta Mountains. Approximately 200 acres of suitable lands would be treated annually, generating an ASQ of approximately 4000 CCF (2.0 MMBF). Additional volume would be available from other management prescription lands as with the other alternatives. An additional 300 acres of unsuited lands could be treated annually, providing up to an additional 4800 CCF (2.4 MMBF). These treatments would concentrate on restoration of forest types identified as at risk, specifically spruce and lodgepole pine stands, and aspen encroachment areas. Roadless areas might contribute some volume, but only under the terms of the National Roadless Area Conservation Rule.

This effect of this alternative on local mills is similar to the effects of Alternative 3.

Alternative 7

Alternative 7 is similar to Alternative 6, but has more suitable timberlands and does not implement the Roadless Area Conservation Rule. Harvest would be allowed on 28,900 suitable acres, all of which are located in the Uinta Mountains. Approximately 200 acres of suitable lands would be treated annually, generating an ASQ of approximately 4000 CCF (2.0 MMBF). As with the other alternatives, additional volume may be provided by treating unsuited lands to achieve management objectives and the desired future condition. An estimated 500 acres could be harvested annually from the unsuited lands, generating an additional 5000 CCF (2.5 MMBF). As with the other alternatives, harvest from the unsuited lands is uncertain and irregular in its offerings.

The effect of this alternative on local mills is slightly more beneficial than Alternative 6, and less than Alternatives 4 and 5.

Table TM-2. Available Timberland by Alternative

Available Timberland ²	Alt.1	Alt. 2	Alt.3	Alt.4	Alt. 5	Alt.6	Alt.7
Suited for Timber Production (Acres)³	0	0	38,000	193,900	226,000	28,900	28,900
Unsuited and Harvest Allowed⁴ (Acres)	0	79,900	131,600 ⁵	55,200	71,800	72,100	171,400
Total Acres	0	79,900	169,600	249,100	297,800	101,000	202,100

Allowable Sale Quantity, Total Sale Program Quantity and Long-Term Sustained Yield Capacity

As stated in the opening paragraphs of this section, timber yield from a given alternative is expressed as three separate but related values. The Allowable Sale Quantity is the maximum volume that may be offered under the alternative from the suited lands. The Total Sale Program Quantity is the potential yield from suited and non-suited lands. The non-suited contribution to TSPQ is not a regularly scheduled yield, but depends upon other resource objectives and opportunities. The Long-Term Sustained Yield Capacity represents the maximum potential from suited lands only. Table TM-3. presents these levels in both cubic and board foot measures.

² From GIS layer of available capable aspen and conifer merged with management prescriptions for each alternative.

³ Areas available and capable with Management Prescription 5.2 or 6.2.

⁴ Areas available and capable with Management Prescriptions that allow other harvest for non-timber objectives.

⁵ Of these acres, an estimated 60,000 allow harvest but no road construction.

**Table TM-3. ASQ, TSPQ And LTSYC Estimates From VDDT For All Alternatives
In Millions Of Cubic Feet (mmcf) and Millions of Board Feet (mmbf)**

		Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt.6	Alt. 7
ASQ	mmcf/yr	0	0	.3	.67	1.3	.4	.4
ASQ	mmbf/yr	0	0	1.6	3.3	6.2	2.0	2.0
TSPQ	mmcf/yr	0	.4	.6	1.28	1.55	.81	.9
TSPQ	mmbf/yr	0	2.1	3.2	6.2	7.4	3.9	4.5
LTSYC	mmcf/yr	0	0	1.0	4.9	4.9	.87	.87
LTSYC	mmbf/yr	0	0	5.0	25.0	25.0	4.3	4.3

Effects on timber management from recreation and scenery management

In areas managed for timber production (Management Prescription Category (MPC) 5.2/6.2 which varies by alternative), recreation activities may need to be curtailed during actual harvest activities to ensure public safety. Scenic integrity objectives are matched with management prescription categories so that where timber production is emphasized (MPC 5.2/6.2), the scenic integrity objective (low) allows for dominant changes in landscape character over the short term. Timber harvest is not allowed in areas managed for developed recreation (MPC 4.5) except for purposes of removing hazard trees and ensuring future tree cover where desired. MPCs 4.1 and 4.2 emphasize non-motorized recreation and do not allow timber harvest. Prescription 2.5 is scenic byways and also does not allow timber harvest. In areas with recreation prescriptions that allow timber harvest, scenic integrity objectives must be incorporated into harvest design and may affect the amount of volume as well as harvest operations. Site-specific analysis must incorporate scenery management according to the prescription and also the degree of sensitivity of the area for viewing by recreation users. Timber operations may be subject to timing restrictions for public safety in areas with heavy recreation use. The effects on timber management are directly related to the amount of suitable land; the greater the proportion of suitable lands, the less restrictive the recreation and scenery management effects. Recreation and scenery management effects will be greatest in Alternative 2, since that alternative has no suitable base. Conversely, Alternative 5 will have the least recreation and scenery effects, because it has the greatest total acreage of suitable lands. Effects for Alternatives 3, 4, 6 and 7 will be between these two extremes, in proportion to the total suitable lands with each alternative.

Effects on timber management from inventoried roadless area management

Management of inventoried roadless areas varies significantly by alternative and has a direct effect on availability of forestlands for timber harvest. Alternative 1 does not allow timber harvest anywhere, regardless of prescription. In other Alternatives, areas recommended for (MPC 1.5) are not available for harvest of timber. Alternative 2 has the most acres of tentatively suited timber recommended for wilderness at 39,000 acres. Alternatives 4 and 5 do not recommend any inventoried roadless areas for wilderness. Alternatives 3, 6, and 7 are intermediate, with 9,000, 13,500, and 14,000 acres respectively, of tentatively suited lands recommended for wilderness.

In Alternatives 2 and 6, the National Roadless Area Conservation Rule (Federal Register, January, 2001) is applied as an overlay to all prescriptions. Road construction and reconstruction are not allowed in inventoried roadless areas, nor is cutting, sale, or removal of timber except: for the cutting, sale or removal of generally small diameter trees which maintains or improves roadless characteristics *and*: 1) to improve habitat for threatened, endangered, proposed, or sensitive species, or 2) to maintain or restore ecosystem composition and structure, such as reducing the risk of uncharacteristic wildfire effects. Given this, regardless of whether the prescription usually would allow timber harvest, in all inventoried roadless areas, unsuited acres in Alternatives 2 and 6 are essentially not available for conventional timber harvest. In Alternatives 3, 4, 5, and 7, some roadless areas are managed under prescriptions that allow timber harvest, while others are not. The acres of available timber shown above in Table TM-2 reflect differences in roadless area prescriptions that allow more timber harvest opportunities in Alternatives 3, 4, and 5, than in Alternatives 2 and 6. Alternative 7, with 171,400 acres of unsuitable land provides more harvest opportunities than 2, 3 and 6, and less than 4 and 5.

Effects on timber management from fire and fuels management

Fire and fuels management play an important role in reaching desired future conditions, a role that varies by alternative. Projected use of fire along with mechanical treatment of fuels and varying degrees of timber harvest are tools for returning vegetation to properly functioning conditions. Use of fire is allowed in areas managed under prescription 5.2 and 6.2 in all alternatives, but stand-replacing fires will generally not be used in forest stands within these MPCs. Therefore, the primary difference between alternatives is in the number of acres of unsuited lands that occur in MPCs that do not emphasize timber. Alternatives 2, 3, 6, and 7 allow prescribed fire to be used as a primary tool in many areas that Alternatives 4 and 5 dedicate to timber production (MPC 5.2). Alternative 2 has the highest acreage of projected fire use. Projected burning in Aspen/Conifer and Conifer/Aspen cover types in Alternatives 2, 3, 6, and 7 would reduce the total volume available for timber harvest. In alternatives 4 and 5, timber production and harvest are emphasized with concurrent de-emphasis of prescribed fire. Fuels management priorities are primarily in the urban wildland interface in oakbrush, and therefore will have little effect on timber management. Fuels management in conifer cover types can be accomplished with timber harvest, however materials removed will tend to be smaller size, and lower value and quality than needed to meet commercial timber demand.

Effects on timber management from wildlife and aquatic resources management

Standards, guidelines, and conservation strategies included in the Proposed Forest Plan apply to all alternatives and as such guide timber management to maintain biodiversity, species viability and habitat protection and improvement. These generally have effects on the amount of area that can be harvested, the type of harvest allowed, volume available, methods of handling snags and large woody debris, sizes of trees to be removed or left, management of roads both during and after harvest, and timing of harvest activities.

In Alternatives 2 and 6, terrestrial wildlife habitat is emphasized (MPC 3.2) on an estimated 32,000 and 29,000 acres respectively of unsuited acres. Although this prescription does not

allow “commercial timber harvest”, some timber could be removed as part of a vegetation treatment to meet habitat objectives. In Alternative 3, terrestrial wildlife habitat is emphasized (MPC 3.2) on an estimated 80,000 unsuited acres. Again some timber could be removed on all of these acres, but in Alternative 3, road construction would not be allowed on the 55,000 inventoried roadless acres included, thus restricting the type and amount of access. In these areas, terrestrial wildlife habitat objectives would shape all aspects of any timber removal. Prescribed fire could also be considered in the same areas if it met habitat objectives. Site-specific analysis would decide what tools (timber removal, burning or a combination) should be used to meet objectives for habitat. Therefore these acres could not be counted upon for regular sustained volumes or high quality materials to be removed. In Alternatives 4 and 5 terrestrial habitat emphasis (MPC 3.2) applies to 1,700 and 7,700 acres respectively but commercial timber harvest is allowed. Therefore, timber harvest in these areas would be designed to achieve habitat objectives and might result in different treatment (less volume, more restrictions) than would be the case in an area where timber production is being emphasized (MPC 5.2).

Alternative 7 uses slightly different MPCs than the other alternatives. Terrestrial habitat emphasis (MPC 3.2) has been divided into those lands that can be developed (3.2d) and those where development is not allowed (3.2u). Timber harvest is permitted on 40,800 acres of 3.2d in Alternative 7, and not permitted on 46,800 acres of 3.2u. As with the other alternatives, this harvest would not be offered on a regular basis, and may include species or sizes of trees that are less commercially valuable than those on suitable lands.

The recent listing of the Canada lynx as a Threatened species under the Endangered Species Act may affect timber management, primarily by delaying pre-commercial thinning of dense, young lodgepole pine stands. This effect is not alternative dependent, because requirements are applicable to all lands within the habitat, regardless of prescription. The lynx guidelines state that precommercial thinning in lodgepole pine stands may be allowed if it is shown to result in enhancement or maintenance of snowshoe hare and lynx habitat. The primary effect would occur in those stands that cannot meet the above criteria. In stands that cannot be thinned, the effect would be to reduce the growth rate of trees due to competition and delay the growth into a merchantable size. The length of the delay would vary depending upon site quality and growth rates of the individual stands but could last for up to 20 years.

Lynx guidelines may have some limited effect on timber yield, depending upon the amount of unsuitable habitat within a particular Lynx Analysis Unit (LAU). The guidelines state that management activities may not change more than 15% from suitable to unsuitable habitat condition within a 10 year period, and that in LAUs with 30% or more habitat in an unsuitable condition, no vegetation management activities that would further increase unsuitable conditions would be allowed. This effect is expected to be minor, because no LAU currently exceeds 15% in an unsuitable condition, and no alternative harvests sufficient acreage to exceed the threshold levels of disturbance. For example, the alternative with the greatest number of acres harvested in a decade (Alt. 5) harvests only 12,400 acres from suitable lands forest-wide in the first decade. This equates to approximately 5% of the total suitable acreage in the alternative. It is unlikely that the entire 12,400 acres would fall within a single LAU, but would be spread throughout the suitable lands. Therefore, the effect is relatively minor.

In alternatives 2 and 6 watershed integrity and aquatic habitat are emphasized (MPC 3.1) on an estimated 58,000 and 41,000 acres of the unsuited acres. As above for terrestrial habitat, these areas do not allow commercial timber harvest but do allow vegetation treatment. For any removal of timber, riparian and aquatic habitat objectives would shape all aspects of timber harvest. Prescribed fire could also be considered in the same areas if it met objectives. Site-specific analysis would provide for decisions on what tools (timber harvest, burning or a combination) should be used to meet objectives for habitat. Therefore, timber harvest in these areas would be designed to achieve habitat objectives and might result in different treatment (less volume, more restrictive design) than would be the case in an area where timber production is being emphasized (MPC 5.2).

Alternative 7 subdivides MPC 3.1 into two separate categories: 3.1a, which allows harvest for aquatic habitat purposes, and 3.1w, which emphasizes watershed integrity and does not allow harvesting. In this alternative, 11,400 acres of unsuited lands are included in 3.1a, and 32,400 acres of unsuited lands are in MPC 3.1w. This alternative has more of the unsuited lands in a restrictive prescription category than does either Alternative 2 or 6.

Effects on timber management from insects and disease

As described in the affected environment section, insect and disease caused mortality is a normal function of the forest ecosystem. However the degree to which populations increase dramatically, attacking large numbers of trees and potentially resulting in widespread mortality over extensive acreages can be influenced through timber management. Alternative 1 has the highest potential for insect and disease outbreaks that could affect potential values of timber. Alternative 5 provides the greatest level of active stand structure management, and would therefore have the lowest potential for insect outbreaks.

Effects on timber management from Research Natural Areas and Special Interest Areas

Research Natural Areas (RNA) are withdrawn lands and are therefore not available for timber harvest under any alternative. Management Prescriptions for Special Interest Areas (SIA) do not allow commercial timber harvest, but they do allow for vegetation treatment including tree removal for purposes of research, education, and/or to maintain or protect values for which the area was established. Alternative 1 does not allow timber harvest anywhere regardless of prescription. Alternative 2 and 6 include an estimated 7,000 and 6,000 acres, respectively, of SIA lands that are unsuited. The total unsuited SAI land in Alternative 7 is between Alternatives 2 and 6 (6400 acres). These lands cannot be counted on for any kind of sustained timber production. In Alternatives 3, 4, and 5 SIA acres are not tentatively suited and therefore have no effect on timber management.

Effects on timber management from Soil and Water Resources Management

Soil and water resources are addressed in all timber management activities, regardless of Alternative. The major effects on the timber resource are in mitigation of potential effects, and practices to avoid adversely impacting the soil and water resources. Practices such as timing

restrictions on harvesting activities during wet periods will be analyzed in all harvest proposals and implemented wherever necessary under all alternatives.

Effects on timber management from Oil and Gas Resources Management

Oil and gas management affects timber management primarily during the development stage. In the past, timber harvest has been deferred in the vicinity of oil and gas development to eliminate the combined impacts of harvest and development. This restriction has only been applied during the development stage, and represents a temporary limitation on timber management. Oil and gas development benefits timber management through the development of a high standard road system to service the well sites. These roads can be used to access timber that would otherwise be inaccessible or require timber road construction, if site-specific analysis determines the road should remain in place. The likelihood of effects from oil and gas development on timber management is greatest in Alternative 5 and the smallest in Alternative 1.

Effects on timber management from Heritage Resources Management

Heritage resources effects are similar to soil and water in that they apply to all harvest proposals, regardless of alternative. The effects of heritage resources tend to be tied to a specific location and are addressed by avoiding disturbance to the location. The probability of encountering significant heritage resources increases with increasing area available for timber harvest. Therefore, Alternative 5 would most likely have the greatest impacts from heritage resources, although the effect is considered to be small.

Effects on timber management from livestock grazing

Grazing by wildlife and domestic livestock affects timber management primarily through browsing or trampling damage to young conifer and aspen seedlings. Such damage tends to occur along trails and where topography and water sources cause animals to congregate. In some cases the concentration of animals may prevent the establishment of tree regeneration in these areas. Repeated browsing of aspen sprouts by livestock or wildlife may affect aspen stand structure over time. The repeated removal of sprouts may result in more open stands than would otherwise occur. This tends to be limited to those areas where the animals congregate and is therefore relatively limited. Grazing effects to conifer stands occur primarily through trampling and are limited to concentration areas.

Livestock grazing is not prohibited under any alternative, and although acres of suitable rangelands vary by alternative, actual grazing impacts are dependent on herding, salting, and maintenance of improvements such as fences. Grazing impacts on timber management generally have not been significant with current grazing levels and, therefore, effects are similar for Alternatives 1 - 7.

Cumulative Effects

Timber management in the National Forest has effects on, and is affected by, adjacent state and private lands management. When insect and disease outbreaks are ignored, especially after

periods of drought and if forestlands are primarily mature and old, they can move through an entire landscape regardless of ownership. Wildfire is another area where adjacent land ownerships can have an effect on National Forest lands and vice versa. Alternative 1 has the greatest potential for impacts to non-national forest timber management because of highest likelihood of insect, disease, and uncharacteristic wildfire. Alternatives 2, 3, 6, and 7 project a combination of prescribed fire and harvest to return stands to a mix of age classes that would be more resistant to uncharacteristic disturbance. Alternative 2 would potentially have the greatest effect on prevention, with Alternatives 3, 6 and 7 at about half the acres treated. Alternatives 4 and 5 use more harvest and less prescribed fire with total acres treated at about half of that for Alternatives 3 and 6.

The timber program of the Wasatch-Cache National Forest is influenced by and has effects on a new timber economy that is emerging in the State of Wyoming. This economy has been shaped by a series of significant changes (Rideout and Hesseln, 2000). The following excerpts from this report highlight factors affecting timber management in the broader context:

“Nearly half of the volume processed in Wyoming's mills now comes from private supplies. With continuing industry consolidation, Forest Service sales face increased competition from state and private sources and the prospects of fewer bidders and longer haul distances. In essence, the Forest Service stumpage market position is changing from that of a dominant supplier to competitor with other sources. To the extent that such trends continue, a natural outcome would be to see more negotiated contracts with purchasers as the agency seeks vegetative services on low quality material and receives fewer bids per sale resulting from consolidation.

Private supplies remain unknown with certainty but will play a greater role in the future of Wyoming's timber industry. Our interviews of processors suggested both declining private volumes under contract, and a historical recognition of underestimating the quantity and resilience of private supplies (primarily to a confusion between inventory and supply). Wyoming's private timber supplies are often associated with multi-function ranches and affected by the price of timber relative to other ranch products and services such as the price of beef. To the extent that private timber continues to increase in importance, expanding extension services could be considered.”

Data from the State of Utah presents a similar pattern of declining public land timber and increasing private harvesting. In 1966, public lands provided 90% of the timber supply within the state. By 1996, the public land contribution had fallen to approximately 60%.

Timber management activities on private lands adjacent to the National Forest may have an effect on management on the Forest. Site-specific analysis for proposed sales considers the reasonably foreseeable activities on private lands. Depending upon the level and location of such activities, National Forest management may have to be deferred, delayed or modified to meet watershed level objectives. This effect is assumed to be greatest with alternatives 4 and 5, which have the greatest amount of suited lands, and therefore most likely to have treatments proposed in areas with adjacent private holdings.