CHAPTER 2 - ALTERNATIVES

This chapter summarizes project scoping (2.1), identifies the issues raised about the proposal (2.2, 2.3, and 2.4) and describes and compares the alternatives considered for this project. Alternatives developed in detail were designed to respond to the purpose and need for the project (see Chapter 1) and to respond to major issues raised during the analysis (see section 2.2 of this Chapter). In total, 8 alternatives were considered. Four of these were developed in detail.

2.1 Scoping

Scoping is the process used to determine the bounds of the project. More specifically, scoping is the process by which issues (Chapter 2) and effects (Chapter 4) of a proposal are identified. This information is then used to modify a proposal, develop alternatives, or develop mitigation measures for the project that reduce or eliminate adverse impacts. The process involves Forest Service employees, other federal, state, and county agencies, Native American Indian tribes, as well as members of the public who have expressed an interest in the project.

As stated in Chapter 1, an Environmental Assessment (EA) for this project was first published in July of 1999 (The Hoffman Creek and Sailor Lake EA). Scoping for that project began in September 1998 with a notification of a proposed action. Prior to that, in June of 1998, the Great Lakes Indian Fish and Wildlife Commission (GLIFWC) along with Red Cliff Band, Lac du Flambeau Band, and Bad River Band of the Lake Superior Chippewa tribes were sent a draft proposal. Interdisciplinary team members met with members of the natural resources staff of the Lac du Flambeau Band later that same month. The primary issue raised at that time was the lack of an oak component within the general area of Park Falls. The draft proposal was modified at that time to include some oak planting (see Chapter 1, Section 1.4.2).

There were 10 comments received on the Hoffman Creek and Sailor Lake EA from 8 organizations/individuals. The majority of the concerns raised about the project fell into two areas: ecological processes and patterns; and vegetation management. Typical comments on ecological processes related to how the alternatives would or would not fragment the forest or provide for general biodiversity. Typical comments on vegetation management related to the amount of pioneer vegetation that should be managed for within the project area. Some comments were received on general NEPA process and laws (range of alternatives and significance of effects).

Based on these comments as well as concerns about potential impacts to areas being considered for roadless inventory areas in the Forest Plan revision, a choice was made to modify the project boundary, develop additional alternatives, and document the environmental analysis in an Environmental Impact Statement (EIS).

Public involvement and scoping for the modified project (called the Hoffman-Sailor West Project) began with publication of a Notice of Intent (to prepare an environmental impact statement) that appeared in the Federal Register of documents on April 24, 2001. In addition to the appearance of the NOI in the Federal Register, a notice was published in the Park Falls Herald newspaper. Those who expressed an interest in the project were sent a detailed proposed action that included identification of some alternatives that would include even-aged openings greater than 40 acres in size. In addition to the

public, Forest Service employees, other federal, state, and county agencies, and Native American Indian tribes were notified.

A total of 80 (non Forest Service) responses to the proposed action for the Hoffman-Sailor West project were received.

Of the 80 responses, 20 responses contained no substantive comments on the proposal and were requests to receive further mailing, requests to be taken off of mailing lists, or requests for additional information (Hoffman-Sailor West Correspondence Index).

Another 37 responses contained only general comments concerning approval or disapproval of National Forest management. A typical comment in this category was "….logging is an inappropriate use of public forests…" or "….I agree with actively managing our forest as per the Forest Plan." These comments are related to forest planning level decisions and are outside the scope of this proposal.

The remaining responses identified resources of concern in the project area or general NEPA process comments. Comments about resources of concern were, for the most part, general in nature. A typical comment about a resource of concern related to impacts of a particular project type such as clearcutting or prescribed burning. In some cases there was clarification about what impacts the respondents were concerned about. For instance, with prescribed burning, some responses questioned what the impacts to air quality would be. Typical comments about the NEPA process related to things like alternative development and effects analysis.

A Draft Environmental Impact Statement for the Hoffman-Sailor West project was prepared and sent to interested and affected parties on January 27, 2003 for a 45-day notice and comment period.

A total of 13 timely responses to the DEIS were received. Of these 13 responses, 4 were requests for additional information. Of the remaining 9 responses, 4 were from other federal, state, or tribal agencies. The remaining 5 responses were from individuals representing themselves or organizations with an interest in the project area. The 9 timely and substantative comments along with the agency (Forest Service) response to them are included in this document, Appendix E.

As a summary, most of the comments received related to the selection of an alternative rather than new major issues or effects. There were some new issues raised such as potential impacts from deer herbivory, potential increases in beaver populations and insect populations. These issues were examined and found to be not relevant to the type and extent of impacts that would be caused by the proposed activities. These types of issues are summarized in Appendix B. Also see Appendix E, Response to Comments. There were other comments that related to whether or not the proposals were consistent with the Forest Plan revision. Some commenters wanted to see additional cumulative effects analysis. As a result of these types of comments, Chapter 4 of the FEIS includes some additional analysis related to potential impacts to vegetation that would occur as a result of implementing other proposed timber harvest activities outside the project area on other Forest Districts.

Included in Appendix E is the response to the review of the DEIS by the U.S. Environmental Projection Agency (EPA). The U.S. EPA reviewed the DEIS pursuant to the NEPA, Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act (CAA). The EPA rated the DEIS and the preferred alternative (Alternative B) as EC-2 (environmental concerns due to insufficient information). EPA found the DEIS to have insufficient information on potential cumulative effects on forest health from issues related to aspen management. More specifically, EPA's

concerns were related to the potential for over population of deer, beaver, and forest tent caterpillar. Additional analysis was conducted and included in this FEIS. As a result of this analysis, no additional issues relative to the project or adverse cumulative effects within or outside the project area were identified. See Appendix E.

Additional detailed records of public comments made during this project are included in the analysis record. The remaining portion of this chapter identifies the major and minor issues identified for this project and how they relate to the affected environment.

2.2 Major Issues

This section contains a summary of the major issues identified for this analysis. The Council for Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7, "….determine the scope (1508.25) and the significant issues to be analyzed in depth…". These issues were determined to be major because they were used to develop alternatives to the proposal or they have environmental effects that could vary by alternative. Project design and mitigation measures that would be implemented with the alternatives do not eliminate the effects that could occur on these resources.

2.2.1 Federally Threatened and Endangered Species (Bald Eagle)

Within the Hoffman-Sailor West area, one federally listed species is known to occur (bald eagle). Bald eagles can be impacted by activities near their nest sites and by a change in habitat (removal of nest or perch trees) that could occur as a result of timber harvest. There is one recently established (2001) nest in the project area.

2.2.2 Landscape Pattern

The structure of the existing forested upland landscape is predominantly a pattern of dispersed age and size classes with small patch sizes. The upland forest has a wide range of vertical structure and many areas of forest are less than 30 years old. Soft edges of this type (forested edges rather than the type of edge formed between forest and agricultural land or urban areas) do have some effect on the overall functioning of the area for some species of neotropical migrant songbirds (NTMB). Edge effects and effects on landscape pattern (amount of interior forest habitat) could potentially be increased or decreased by the pattern and size of the temporary openings created with clearcut and shelterwood harvests which are used to regenerate early successional habitat.

2.2.3 Visual Quality

Visual quality (primarily within recreation areas and along traveled corridors including lake shore) is an important aspect of managing the Chequamegon-Nicolet National Forest. Some areas of the Forest are classed as more visually sensitive than others. Retention areas are areas that are considered to be very sensitive. Within these areas the desired condition is a natural forested appearance with the landscape showing little evidence of management activities. Main roads, recreation trails, and some water bodies are also visually sensitive areas with a visual quality objective of partial retention. These areas have a moderate sensitivity level where management activity is somewhat more apparent than in retention areas. Other visually sensitive areas are areas with a recreation opportunity spectrum of semi-primitive, motorized. The location, type, and size of timber harvest activities could result in more or less effect on the visual resource by alternative.

2.2.4 Economics

The Forest Service and the public are concerned that timber harvest projects can be done in a cost effective manner and that the alternatives considered clearly identify the direct implementation costs and revenues associated with them.

2.3 Minor Issues

Because the potential impacts to the specific resources listed in this section were found to be minor (due to effective project design and mitigation measures that would be implemented with the alternatives and because the minor impacts that could occur do not vary by alternative), these issues are not documented further in this FEIS.

Additional information on mitigation effectiveness, monitoring, and references related to each issue identified in this section is primarily contained in the project record document titled "Issues Addressed by Mitigation, Project Design, or Alternative Development (Sept. 23, 2002)". Some additional information is also contained in the project record document titled "Hoffman-Sailor West Project Effects Analysis (Nov. 1, 2002)". Chapters 2 and 4 of the Environmental Assessment for Hoffman Creek and Sailor Lake Opportunity Areas (July 1999) also have information related to these issues.

2.3.1 Regional Forester Sensitive Species

Within the Hoffman-Sailor West project area, five Regional Forester Sensitive Species (sensitive species) have the potential to be impacted by the types of project activities being conducted. While other sensitive species may occur in the project area or have habitat in the project area, a Biological Evaluation conducted for this analysis (see Appendix A for a summary) did not identify any specific impacts that could occur to those species or their habitat as a result of implementing any of the alternatives.

Northern goshawks and red-shouldered hawks have generally better nesting success in a mixed hardwood forest with limited canopy gap formation and a hemlock/white pine component. Creating canopy gaps near a nest site may make the area more susceptible to predation by fisher and great horned owls, and competition by red-tailed hawks. Opening gaps also promotes regeneration and understory growth that could interfere with flight paths of the raptors. There are no known active goshawk or red-shouldered hawk territories in the project area. Only one thinning harvest treatment in the project area has been identified as having medium/good potential nesting habitat for goshawks and red-shouldered hawks. Project prescriptions, design and mitigation measures 17 and 39 (see Table 2-2) prescribe enhancing the hardwood component in this area and prevent formation of large holes in the canopy. These measures provide for some additional sunlight to reach the forest floor to allow for limited regeneration of intolerant tree species, while not opening up the canopy to the point where there is greatly increased chance of predation by fisher or great horned owls or competition by red-tailed hawks. This will maintain the area as medium to good potential nesting habitat for goshawks and red-shouldered hawks.

Trumpeter swans and black terns both prefer large, shallow wetlands, with a mix of emergent vegetation and open water. Black terns typically nest in floating vegetation or on islands in the middle of open water. The difference in nesting structures between the two species is that trumpeter swans nest on mounds (muskrat houses, beaver lodges) rather than floating vegetation that the black tern utilizes. This type of habitat is available in the project area (lakes and impoundments). Though no trumpeter swans or black terns have been observed nesting in the Upper Squaw Creek Impoundment, full drawdowns of the

impoundment (and re-filling) during critical spring months could result in loss of reproduction for black terns or trumpeter swans that may be using the impoundment. For example, established nests could be flooded, or there could be a lack of food source for young with low water levels and associated low insect hatches. Project prescriptions, design and mitigation measures 41 and 42 (see Table 2-2) prevent water level manipulation during critical times for trumpeter swans and black terns. Water level manipulation during the months of May and June is prevented. These months are most critical for the nesting success of black terns and trumpeter swans.

American elm is found scattered across the District landscape, and is located in very small amounts (1-2% of the stands basal area) in 4 stands in the project area. Only one stand with a known elm component is proposed for harvest activity. The main threat to this once prevalent tree species is Dutch elm disease, not harvesting activity. Harvest activity, specifically the use of logging equipment, can damage healthy elm trees potentially increasing their susceptibility to disease. Project prescription, design and mitigation measure 40 (see Table 2-2) prevents cutting of healthy American elm.

2.3.2 Reptiles and Amphibians

The alternatives include extended drawdowns of Squaw Creek Impoundment in order to improve waterfowl habitat (Proposed Action, page 5, and Purpose and Need, page 12, of Hoffman-Sailor West Project Proposed Federal Action, April 18, 2001). The majority of the drawdowns that would occur are the partial ones in the summer season. These types of drawdowns have very minor environmental effects due to their short duration, timing, and nature. Overwinter drawdowns and more extended drawdowns have the potential to strand fish, cause decline in invertebrate populations, and freeze out amphibians and reptiles that may be hibernating in the mud bottoms of the impoundments. There are no species of sport fish known to occur in the Squaw Creek Impoundment. Project prescriptions, design and mitigation measures 41 and 42 (see Table 2-2) limit the timing of water removal prior to the time of hibernation of most amphibians and reptiles. They also limit the rate of drawdowns so that fish and invertebrates are not stranded.

2.3.3 Non-Native, Invasive Species

Activities proposed in this analysis (such as log landing use and construction, road construction, regeneration site preparation, and some prescribed burning activities) could result in bare soils that need some seeding to prevent erosion and sedimentation. The Forest Plan requires favoring native plant species when restoring disturbed areas. Restoration activities could result in the spread of non-native, invasive species.

There are 2 known locations of non-native, potentially invasive species (garlic mustard and black locust) within the project area. Project activities will not result in the spread of these plants. Both locations are being treated to eliminate the presence of these plants.

Project prescription, design and mitigation measure 43 (see Table 2-2) requires the use of native grass species for use in erosion control and establishment of ground cover. This helps prevent the establishment of non-native, invasive plants on disturbed areas with exposed soil by planting fast growing, non-invasive, native species, and therefore shortening the amount of time that exposed soil is present and vulnerable to seeding by non-native, invasive plants.

2.3.4 Within Stand Vegetation Structure and Species Diversity

There are several overall biodiversity concerns related to management of pioneer types of tree species such as aspen. Because of prolific root sprouting following clearcutting, aspen can become the dominating tree species within an area. This type of even-aged management can lead to stands that are

less complex in structural diversity as well as tree species type diversity. Stands with a mix of tree species and tree and shrub height diversity are often used by a variety of non-game wildlife species. A conifer species component can be an important structural element that provides habitat for songbirds and cover for other wildlife. Many of the existing stands of aspen and paper birch in the project already have a mix of other species such as white spruce, balsam fir, red maple, and pine, which if maintained as an element of the stand, provide species and structural diversity. Project prescriptions, design and mitigation measures 19, 20, 21, 22, 23, 24, 26, 27, 29, 30, 32, 33, 34, and 35 (see Table 2-2) all pertain to maintaining or increasing the within stand species diversity in many of the harvest areas by retaining or planting conifer, oak, and other species.

Natural regeneration of hemlock (a conifer) in portions of Wisconsin has been increasingly rare. In part, this may be due to poor conditions for seeding and in part because of browsing by rabbits and deer. Vegetation inventory information for the Hoffman-Sailor West project area indicates that hemlock is a very minor vegetation component. Hemlock is known to occur in only two stands within the project area. Harvesting hemlock where it is a minor stand component could eliminate it as part of any future stand due to reduction in the amount of trees left as a seed source. Only one stand known to have hemlock (less than 10%) is proposed for harvest treatment. Project prescription, design and mitigation measure 36 (see Table 2-2) prevents harvest of hemlock.

Pine and spruce plantations vary in the amount of diversity they have within them, but in general, as plantations are repeatedly thinned, other tree and shrub species start to develop in the understory. The pine and spruce plantations proposed for thinning in the project area have (in most cases) been thinned several times already and are becoming increasingly diversified in species and structure. This is because as plantations mature and are thinned, less of the growing space is occupied by the planted species and tree height increases allowing increasing development of understory structure. Thinning these areas will most likely lead to further increases in the amount of tree/shrub species and structural diversity within the stand. Project prescription, design and mitigation measure 28 (see Table 2-2) prevents elimination of minor species components within conifer plantations.

Both live and dead snags provide habitat for a number of plant, animal, and insect species and add structural diversity to the vegetation within an area. Cutting practices in mature stands can eliminate this component. Cutting practices in mature stands can also reduce the amount of mast (nut) and fruit producing trees in an area. Both of these could result in reduced plant and animal populations that depend on these types of habitats. Project prescription, design and mitigation measure 76 (see Table 2-2) retains these elements in all harvest areas.

Another important component of the forest ecosystem is large, rotting wood. This component is particularly important as habitat for fungi, insects, reptiles, and amphibians. Harvest activity, particularly clearcuts in mature timber areas, could eliminate the potential for having trees available to fall to the forest floor and decay. Project prescription, design and mitigation measures 75 and 76 (see Table 2-2) retain these elements in all harvest areas by maintaining islands of mature forest in all clearcut and shelterwood harvest areas. Trees left will eventually fall to the forest floor, providing a source of rotting wood.

2.3.5 Soil Productivity

Some of the proposed projects are in areas of predominately silt capped soils that are easily rutted and compacted when saturated. Because of the low permeability of these soils and their tendency to hold water close to the surface for extended periods of time, there is a high rutting and compaction hazard with the use of heavy logging equipment. Other sites in the project area have soils that are generally dry

and do not have a high rutting and compaction hazards except during periods of rain or high water tables. Rutting increases the potential for erosion and could cause root damage to surrounding trees. Compaction, even without the soil displacement that occurs with rutting, can also cause loss of soil productivity. Excessive rutting, compaction, and erosion can lead to a decrease in site productivity and water infiltration, which reduces tree growth as well as reduces tree regeneration success.

Soil movement (erosion) could also occur in some of the project areas with activities such as skid trail construction, road construction, and log landing construction. These activities can expose soil and if this occurs in areas of steep slopes, soil movement could occur and site productivity could be diminished.

Project prescriptions, design and mitigation measures 68, 69, and 70 (see Table 2-2) reduce the potential for rutting, compaction, and erosion to occur with implementation of the project activities identified in the alternatives.

The End of Decade Monitoring Report (1986-1996) for the Chequamegon-Nicolet National Forest, page 3, notes that the findings to date indicate the impact of management activities over the past decade have had no appreciable effects to the long term productivity of the land on the Chequamegon-Nicolet National Forest.

2.3.6 Wetlands

Non-channel wetlands need protection from activities that can change or irreversibly alter the wetland community. Wetlands provide a variety of functions including providing ecosystem diversity, flood control, water recharge, etc. Executive Order 11990 provides general direction for wetland protection. This Order directs us to "minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands". Section 404 of the Clean Water Act protects wetlands from unauthorized filling with a permitting procedure which is administered by the U.S. Army Corps. of Engineers. 40 CFR 230 (Guidelines for Specification of Disposal Sites for Dredged or Fill Material) also gives guidance in protecting wetlands from disposal of dredged or fill material by generally prohibiting the activity within a wetland if suitable upland sites are available. None of the projects proposed cause a loss of wetlands or will result in disposal of dredged or fill material within a wetland.

Altering the subsurface drainage of a wetland is also a concern. Temporary road construction and use, skidding, and landing construction could alter the hydrology of a wetland. Slash from timber harvest can fill in small wetland pockets. Some of the timber harvest areas being proposed have small wetland pockets within them or are adjacent to larger wetlands. Some temporary road construction areas have to cross wetlands and some existing winter roads may be used to cross wetlands in order to implement the proposed projects and alternatives.

Project prescription, design and mitigation measure 71 (see Table 2-2) prohibits permanently filling wetlands and small woodland ponds. If wetlands need to be crossed, crossings are only permitted under frozen conditions. Under this measure, there will be no wetland loss and only minor direct impacts to wetland vegetation. Forested wetlands will not be harvested. This measure meets Wisconsin's State Best Management Practices (BMPs) which have been monitored and found to be effective in keeping impacts to wetlands at an acceptable level if correctly implemented.

In October of 1995, base line monitoring of BMPs began. At that time, 6 Forest timber sales were monitored for compliance to over 120 BMPs. Rating criteria included whether or not BMPs were applied correctly and whether or not there was an adverse impact to water quality or wetlands. Most of

the federal timber harvest projects had a perfect score and no impacts to wetlands or water quality were noted in any of the 6 sales (ref. 2509 November 30, 1995 Memo).

In September 2000, a field review of a timber sale unit on the Medford unit of the Medford-Park Falls Ranger District was conducted. An issue was raised about a spring pond and surrounding wetland within the harvest area and whether or not the areas were adequately protected. The interdisciplinary review of the area showed that when the stand was marked, mitigation measures for protection of woodland ponds and wetlands were followed. The wetland and spring pond were not being adversely impacted by the activity (Moose Timber Sale Stand 66-26 Spring Pond, September 26, 2000 Field Trip).

2.3.7 Water Quality

The primary potential impact to water quality from the activities normally associated with Forest Plan implementation would be sediment from non point sources such as timber harvest operations (logging road and skid trail construction and use, operation of heavy equipment used for timber harvest). Exposed soils can erode. Eroded soils could eventually be delivered to streams and lakes as sediment. Exposed soil within riparian habitat (a transition zone between water and upland habitat), because of the proximity to water, has the highest risk of adding sediment to the surface water system. Exposed soil on steep slopes also has the potential to impact water even if it does not occur in close proximity to water. Runoff can travel farther in less time on sloped land than it would on flat land. Slash left in perennial and intermittent drainages could lead to a build up of small particle matter in the stream channels which could decrease water clarity much like sedimentation. Removal of tree cover can result in a short term increase of surface water runoff delivered to streams and other water bodies. Project prescriptions, design and mitigation measures 70, 72, and 73 (see Table 2-2) reduce the potential for sedimentation.

Large fallen logs, other woody material and leaves that fall into streams can benefit streams and aquatic ecosystems by providing nutrients, food for aquatic insects, and cover for fish. Too much organic material being recruited into streams (as is possible with logging slash being left in streams) can reduce dissolved oxygen levels through the decomposition process. Dissolved oxygen is needed for fish survival and reproduction. Large organic debris decomposes slowly in water over a long period of time and does not cause any substantial decline in dissolved oxygen levels. Clearcut and shelterwood harvests can remove most of the potential for large woody debris as does beaver activity along streams with a heavy aspen component (Dalyrmple Creek). Tree tops from any type of harvest adjacent to water could be left in streams and cause a temporary decrease in dissolved oxygen levels.

Clearcut and shelterwood harvests can remove a shade source adjacent to streams. During mid summer (periods of peak water temperatures) this would result in an increase in the expected peak water temperatures which would affect cold water fish species (by changing their metabolism and development) and would also cause a reduction in dissolved oxygen levels. Project prescriptions, design and mitigation measures 72 and 73 (see Table 2-2) prevents slash disposal in streams and requires that a shade source be kept adjacent to water. Other design measures (19, 20, 21, 32, and 33) require planting long lived species adjacent to water to provide a shade source and a source of large woody debris.

Impoundment drawdowns result in more water flowing down stream. If water is released too quickly, it can erode stream banks causing an increase in sediment down stream. When refilling impoundments, water flows downstream can be cut off or severely limited. This could cause some change to the aquatic ecosystem. Project prescriptions, design and mitigation measures 41 and 42 (see Table 2-2) requires control of down stream flow during impoundment drawdowns and eliminates the potential for these effects to occur.

Antifreeze, fuels, and lubricants used in equipment and machinery needed to implement the proposed projects can potentially contaminate water sources. Harvesting equipment is often fueled and serviced on site so there is a possibility of spills of these fluids. Project prescription, design and mitigation measure 74 (see Table 2-2) reduces the potential for any accidental release of fuels to reach water by prohibiting refueling of equipment within 100 feet of any surface water.

All of the measures implemented for protection of water quality meet, and in some cases exceed Wisconsin's State Best Management Practices (BMPs) which have been monitored and found to be effective in keeping impacts to wetlands at an acceptable level if correctly implemented. In October of 1995, base line monitoring of BMPs began. At that time, 6 Forest timber sales were monitored for compliance to over 120 BMPs. Rating criteria included whether or not BMPs were applied correctly and whether or not there was an adverse impact to water quality or wetlands. Most of the federal timber harvest projects had a perfect score and no impacts to wetlands or water quality were noted in any of the 6 sales (ref. 2509 November 30, 1995 Memo). Monitoring BMPs has continued and as noted in the End of the Decade Monitoring Report (1986-1996) for the Chequamegon-Nicolet National Forests (page 68), federal timber sales have had correct application of BMPs about 95% of the time.

Forest Supervisor's Activity Review of Timber Sale Administration, Sale Preparation and Theft Prevention for the Medford-Park Falls Ranger District, Chequamegon-Nicolet National Forest, Final Report, July 21 and 22, 1999 found that water/riparian mitigation measures (similar to the ones currently used) were implemented and effective.

2.3.8 Health and Safety (Use of Prescribed Fire)

Some of the alternatives (B and D) include one 16 acre wildlife opening that would be maintained with prescribed fire. Prescribed fire is a tool used to reduce the amount of woody vegetation and set back forest succession in wildlife openings for species that use this kind of habitat. Burning also recycles nutrients and stimulates growth of desirable vegetative components. Concerns with the use of prescribed fire in this location are impacts to Sailor Lake Campground users and fire escape. The prescribed burn is about 1/3 mile from the Sailor Lake Campground. In some situations, smoke from the prescribed burn could reach the campground and be annoying. The opening has not been burned in the past and there is no existing barrier or fire line to control the extent of the fire (Proposed Action, page 5, Hoffman-Sailor West Project Proposed Federal Action, April 18, 2001). Project prescription, design and mitigation measure 44 (see Table 2-2) requires that a burn plan that meets public safety and smoke management parameters be adhered to for the prescribed burn. Also, burning will not be permitted on the opening weekend of fishing season or on holiday weekends when the campground is open (project prescription, design and mitigation measure 45).

Burn plans are developed to indicate the parameters for a safe, effective prescribed burn. All Prescribed Burn Plans are required to document that burn prescription requirements on the burn day were met and the effectiveness of meeting resource objectives. Ref.: Management Ignited Prescribed Fire Burn Plan. C66-S46 PFO (part of NW Riley) Prescribed Burn. 1999. Medford-Park Falls Ranger District, Chequamegon-Nicolet National Forest.

2.3.9 Heritage Resources

The federal government is required by law to find and protect heritage resource sites that may be eligible for the National Register of Historic Places. There is a concern that earth and vegetation disturbing activities could impact heritage resources (prehistoric and historic sites such as Indian campsites, burial grounds, logging camps, homesteads, etc.). Damage could occur from using heavy equipment or by digging. Indirect effects to sites could occur from equipment vibration and noise. Surveys conducted

prior to 2001 identified 16 sites within certain portions of the Hoffman-Sailor West area. The remaining portion of the Hoffman-Sailor West area was surveyed in 2001 and an additional 5 sites were found. The entire area has now been surveyed, but sites have not yet been evaluated for their historical or archaeological significance.

For this reason, all reported heritage resources will be excluded from proposed project activity areas so they will not be directly or indirectly affected. Surveys are conducted in consultation with the Forest Archaeologist and the State Historic Preservation Officer (SHPO). Project prescription, design and mitigation measure 46 (see Table 2-2) prevents disturbance of unevaluated heritage resource sites. This measure results in avoidance of the sites by any potentially impacting activities. In the event that previously unrecorded heritage resources are discovered prior to or during project implementation, all disturbing activity within and near the discovery would cease. The discovery would be assessed by the Forest's professional heritage staff and any treatment changes identified as needed (in consultation with State and Tribal Historic Preservation Officers) to protect the site would be considered and assessed at the time of discovery.

Over a ten year period (1991-2000) the Chequamegon-Nicolet National Forest's Heritage Resource staff have monitored approximately 400 recorded heritage resource sites located on National Forest lands. Many of these sites were monitored because of their proximity to land and resource management activities that could potentially render adverse effects. Results of these monitoring activities showed that avoidance of sites was over 99% effective. (Mark Bruhy, Forest Archaeologist, 03/30/2001 message).

2.3.10 Private Land and Special Forest Uses

Some of the proposed projects are adjacent to private land. Some trees, or their tops, could fall onto private land during harvest operations. This is not only unsightly to the landowner, but could make access to the property difficult. Project prescription, design and mitigation measure 49 (see Table 2-2) requires removal of any tree tops and other logging debris (slash) that falls on private land. This will be accomplished through inclusion of appropriate clauses (CT6.7-SLASH DISPOSAL MEASURES, 10/79) in the timber sale contracts, and enforcement of that contract clause.

Not all of the boundary lines adjacent to private property have been surveyed and marked to standard. This could lead to potential trespass situations. Project prescription, design and mitigation measure 50 (see Table 2-2) requires property boundaries be marked to standard prior to layout, marking, and selling of a timber sale. This measure results in a reduction for the potential for trespass situations.

Some private property owners have permits from the District for road access to their property. Some of those roads are also needed for access to project activity areas. Additional maintenance may be needed to keep these roads in good repair due to the additional use they would receive during project implementation. Project prescription, design and mitigation measure 51 (see Table 2-2) prevents blocking access to private property. These roads will be maintained to their existing condition during harvest operations and skidding timber on the surface of the special use road will only be allowed during frozen ground conditions which further limits damage to the road surface.

Within the project area, along the southern end of FR 139, there are special use permits for buried telephone and electrical power lines. These lines are buried within the road right of way. Heavy equipment could damage the lines if they do any digging or earth disturbance in the area of the lines. Project prescription, design and mitigation measure 52 (see Table 2-2) requires notification to the timber sale purchaser of buried lines. Potential damage to telephone and power lines are reduced by requiring

that the timber sale purchaser coordinate and cooperate with the utility companies to prevent damage to the lines and the unnecessary interruption of service. This is accomplished through insertion of the appropriate clause (CT6.22-PROTECTION OF IMPROVEMENTS NOT OWNED BY THE FOREST SERVICE, 01/80) in the timber sale contract, followed by sale administrator enforcement of that contract clause.

2.3.11 Trail Use

There are several motorized and hunter-walking trails in the project area that can be used as roads for access to the proposed project activities (see section 3.1.3, Chapter 3). Trail use is needed to avoid construction of about 14 new miles of access road (Hoffman-Sailor West Roads Analysis, July 11, 2001). Such use could conflict with the recreation use of these trails. Without mitigation, there is a potential for user conflicts and safety concerns with the dual use that can be expected if the project activity occurs. Project prescription, design and mitigation measure 63 (see Table 2-2) limits the occupation and use of trails so that conflicts are minimized and safety hazards are eliminated. In personal consultation with four district employees (September 12, 2002) who have been on the Medford-Park Falls District since 1986 (Dale Bluedorn -Timber Sale Administrator, Vic Peterson - Trails Technician, Mike Bablick - Wildlife Technician, and Gene Grapa - Assistant Ranger in Recreation) there hasn't been any accidents on our motorized trails (ATV/snowmobiles) as a result of dual use of these trails/road for timber sale purposes.

2.3.12 Other Potential Recreation Use Conflicts

There are several proposed timber harvest activities adjacent to the Sailor Lake campground. These projects could be helpful in removing hazard trees along the fringes of the campground and allow more air movement or breeze for campers, but could cause some disturbance or safety hazard to recreation visitors in the campground. Wild rice planting and establishment could interfere with recreation use of Sailor Lake. Project prescriptions, design and mitigation measures 64, 65, 66, and 67 (see Table 2-2) reduce potential disturbance and ensures safety of campground users. Timber harvest operations (cutting or skidding) are not permitted adjacent (within ¼ mile of improvements) to Sailor Lake Campground from May 1 through November 1, which is the period when the campground is open. No log decking areas are permitted within 100 feet of cleared right of way on Forest Road 138. All logging activity or decking is prohibited within the Sailor Lake Campground area. Wild rice planting will occur only in the southwest bay of Sailor Lake and will be kept away from the shoreline adjacent to the Sailor Lake Campground, on the north end where the boat landing lies, and private property on the east shoreline where motorized use is heaviest.

2.4 Non-Relevant Issues

There were issues raised by the public or other agencies that are not relevant to the potential effects of this project. For instance, one commenter was concerned about impacts to caves and wildlife species that use caves. There are no caves in the project area. Non-relevant issues were identified as those: outside the scope of the proposed action; already decided by law, regulation, Forest Plan, or other higher level decision; irrelevant to the decision to be made; or conjectural and not supported by scientific or factual evidence. The Council for Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7, "….identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)…". More information on these issues and reasons regarding this categorization can be found in Appendices A and B. Appendix A contains information on threatened, endangered and sensitive species (TES) and management indicator species (MIS) that were dismissed from further study. Appendix B contains information on other types of issues in this category.

2.5 Alternative Development

The major driving issue in development of alternatives to the proposed action for this analysis was related to the amount of interior forest habitat that could be maintained within the project area in order to provide some habitat for birds and animals that utilize older, interior forest and to decrease the potential predation effects on birds related to the amount of edge habitat.

2.6 Alternatives Considered in Detail

The Forest Service developed four alternatives in detail, including the No Action (Alternative A) and Proposed Action (Alternative B) in response to issues and the purpose and need for the project. This section identifies the management activities that will occur in each. Maps of each of the action alternatives can be found at the end of the Appendices (at the end of this document). Alternatives B through D each have two alternative maps. One shows vegetation treatments/projects and the other map shows road projects. Each project is identified on the Alternative Maps with a project number. These project numbers correspond to detailed project tables that are included in Appendix D.

All acreage and mileage figures in this document are estimates based on a variety of data sources. Most of the figures have been rounded.

Table 2-1 is a summary of project activity for each alternative. Additional alternative comparison information is included in section 2.7 of this document.

Table 2-1: Alternative Project Summary

Alternative Projects	Alternatives			
	A	B	C	D
Clearcut Harvest (acres)	0	1770	1860	2290
Shelterwood Harvest (acres)	0	280	220	390
Overstory Removal Harvest (acres)	0	150	160	160
Selection Harvest (acres)	0	350	350	350
Thinning Harvest (acres)		740	710	710
Total Timber Harvest (acres)	**0**	**3290**	**3300**	**3900**
Total Tree Planting (acres)	**0**	**190**	**200**	**290**
Total Wildlife Opening Maintenance (acres)	**78**	**68**	**6**	**44**
Total Prescribed Burning (acres)	**0**	**16**	**0**	**16**
Wild Rice Planting	**no**	**yes**	**yes**	**yes**
Water Impoundment Drawdowns	**yes**	**yes**	**yes**	**yes**
Duck Nesting Box Installation	**no**	**yes**	**yes**	**yes**
Classified Road Closure (miles)	**0**	**8**	**8**	**9**
Classified Road Construction (miles)	0	1.5	1.1	1.3
Temporary Road Construction (miles)	0	2.5	1.8	2.0
Total Road Construction (miles)	**0**	**4**	**3**	**3**
Road Decommissioning (miles)	**0**	**28**	**23**	**25**

2.6.1 Alternative A, No Action

This alternative is the No Action alternative as required. In this alternative, no timber harvest, planting, road projects, or nesting box installation would occur.

Routine use and maintenance of roads, campgrounds, trails, and other facilities in the project area would continue to occur in this alternative as well as Alternatives B through D. Maintenance of existing wildlife openings and water impoundments would occur. Other management activities that would occur in this alternative could include fire suppression (as needed) and firewood gathering or other forest products gathering. Existing special uses such as recreation use permits, utility permits, and road use permits would continue. Existing Native American Indian tribal agreements and uses would continue in the project area.

2.6.2 Alternative B, Proposed Action, and Agency Preferred Alternative

Alternative B, with minor modifications is the alternative that was first proposed to meet the purpose and need. This alternative is also the Agency preferred alternative.

Maps of the alternative can be found at the end of this document. Site specific prescriptions, design and mitigation criteria for each activity area is shown in Appendix D. Appendix D also includes other specific information about each of the activity areas.

Project design and mitigation measures that apply to and further describe each activity are found following the alternative descriptions in section 2.6.5, Table 2-2. These measures apply to all action alternatives and the site-specific projects as applicable.

Alternative B includes the following projects:

Timber harvest of approximately 3290 acres. This harvest would yield an estimated 23 million board feet (MMbf) of timber volume (primarily aspen pulpwood). Treated stands would be grouped into several timber sales to be offered starting in 2003. More specifically, timber harvest and regeneration treatment in Alternative B includes:

Clearcut harvest of about 1770 acres that includes about 1380 acres of aspen types, 320 acres of paper birch, 10 acres of balsam fir, and 60 acres of hardwoods. The intent of most of these harvests is to naturally regenerate aspen with some mixed aspen, conifer and hardwood stands.

Two stage shelterwood harvest of about 280 acres of paper birch with the intent to regenerate paper birch and some mixed birch, conifer, and oak stands.

Overstory removal harvest of about 150 acres of aspen, fir, and paper birch. Removal of the aspen, fir, and birch overstory will allow previously planted spruce and some hardwood to grow into the overstory resulting in a stand of trees with a different dominant species.

Selection harvest of about 350 acres of mixed hardwood stands. This selection harvest will result in a stand of similar composition to the present. The intent of the treatment is to move the areas towards an uneven-aged condition.

Thinning harvest of about 740 acres of primarily mixed hardwoods, white spruce and red pine. Forest type following treatment would remain the same as currently exists.

Tree planting of about 190 acres. Most of the planting will occur scattered through shelterwood harvest areas. Other areas being planted include projects adjacent to Sailor Lake and Dalyrmple Creek. Most of the planting will include a mix of tree species that would include white pine, white spruce, red pine, red oak, and hemlock.

Permanent wildlife opening maintenance of about 70 acres. Most of the wildlife openings will be maintained through mechanical methods. About 20 acres will be maintained through prescribed burning and mechanical methods.

Wild rice planting of about 5 acres in the shallow bay on the southwest side of Sailor Lake. Seeding would occur for several years in a row and would continue until about 5 acres of wild rice is established. Wild rice will also be maintained and planted along the shoreline of Upper Squaw Creek Impoundment.

Upper Squaw Creek Impoundment water level drawdowns. In most years, water levels in this constructed water impoundment would be lowered partially during the summer to mimic natural water fluctuations, and stimulate vegetation growth. Overwinter and year long drawdowns would also be conducted on an intermittent basis. Overwinter and year long drawdowns include lowering the water levels to the creek channel and are used to keep the flowage at a ratio of about 50:50 open water to emergent vegetation. In addition to water level drawdowns, wood duck nesting boxes will be placed around the Upper Squaw Creek Impoundment.

Road closure of about 7.6 miles of classified Forest system road. A road may be closed either by sign, gate, berm, rock, or other materials to effectively prevent cars and trucks from utilizing the road. Classified roads that are closed are needed for management of the forest but are opened and utilized only on an intermittent basis.

Classified road construction of about 1.5 miles.

Temporary road construction of about 2.5 miles. Temporary roads are immediately decommissioned following completion of the project activity that required the road.

Road decommissioning of about 28.3 miles of roads. These roads are no longer needed for access and use of the project area. About 17.2 miles of road could be decommissioned anytime following a decision. About 11.1 miles will be used for access to timber harvest activities and then decommissioned following completion of the activities. The objective of decommissioning is to return the road to a productive forest condition. A berm is usually installed to block the road entrance from vehicle use. In many cases, effectively blocking the entrance is enough to result in re-vegetation of the road.

2.6.3 Alternative C

Alternative C was developed to use as a direct comparison to Alternative B for the issue of landscape pattern. Alternative C was developed to increase patch size of vegetation type and age classes over those in Alternative B. As a result, this alternative has clearcuts and shelterwood harvest areas larger

than 40 acres. It also has the same approximate acreage of clearcut and shelterwood treatments as Alternative B. Locations of clearcut and shelterwood treatments vary somewhat from the locations in Alternative B. Depending on location and surrounding landscape features, maintenance of permanent wildlife openings also contributes to edge. For this reason, the wildlife openings being maintained in this alternative would be reduced from Alternative B.

Maps of the alternative can be found at the end of this document. Site specific prescriptions, design and mitigation criteria for each activity area is shown in Appendix D. Appendix D also includes other specific information about each of the activity areas.

Project design and mitigation measures that apply to and further describe each activity are found following the alternative descriptions in section 2.26.5, Table 2-2. These measures apply to all action alternatives and the site-specific projects as applicable.

Alternative C includes the following projects:

Timber harvest of approximately 3300 acres. This harvest would yield an estimated 24 million board feet (MMbf) of timber volume (primarily aspen pulpwood). Treated stands would be grouped into several timber sales to be offered starting in 2003. More specifically, timber harvest and regeneration treatment in Alternative C includes:

Clearcut harvest of about 1860 acres that includes about 1230 acres of aspen types, 530 acres of paper birch, 30 acres of balsam fir, and 70 acres of hardwoods. The intent of most of these harvests is to naturally regenerate aspen with some mixed aspen, conifer and hardwood stands.

Two stage shelterwood harvest of about 220 acres of paper birch and some balsam fir with the intent to regenerate paper birch and some mixed birch, conifer, and oak stands.

Overstory removal harvest of about 160 acres of aspen, hardwood, and paper birch. Removal of the overstory will allow previously planted spruce and some hardwood to grow into the overstory resulting in a stand of trees with a different dominant species.

Selection harvest of about 350 acres of mixed hardwood stands. This selection harvest will result in a stand of similar composition to the present. The intent of the treatment is to move the areas towards an uneven-aged condition.

Thinning harvest of about 710 acres of primarily mixed hardwoods, white spruce and red pine. Forest type following treatment would remain the same as currently exists.

Tree planting of about 200 acres. Most of the planting will occur scattered through shelterwood harvest areas. Other areas being planted include projects adjacent to Sailor Lake and Dalyrmple Creek. Most of the planting will include a mix of tree species that would include white pine, white spruce, red pine, red oak, and hemlock.

Permanent wildlife opening maintenance of about 10 acres. Wildlife openings will be maintained through mechanical methods.

Wild rice planting of about 5 acres in the shallow bay on the southwest side of Sailor Lake. Seeding would occur for several years in a row and would continue until about 5 acres of wild rice is established. Wild rice will also be maintained and planted along the shoreline of Upper Squaw Creek Impoundment.

Upper Squaw Creek Impoundment water level drawdowns. In most years, water levels in this constructed water impoundment would be lowered partially during the summer to mimic natural water fluctuations, and stimulate vegetation growth. Overwinter and year long drawdowns would also be conducted on an intermittent basis. Overwinter and year long drawdowns include lowering the water levels to the creek channel and are used to keep the flowage at a ratio of about 50:50 open water to emergent vegetation. In addition to water level drawdowns, wood duck nesting boxes will be placed around the Upper Squaw Creek Impoundment.

Road closure of about 7.9 miles of classified Forest system road. A road may be closed either by sign, gate, berm, rock, or other materials to effectively prevent cars and trucks from utilizing the road. Classified roads that are closed are needed for management of the forest but are opened and utilized only on an intermittent basis.

Classified road construction of about 1.1 miles.

Temporary road construction of about 1.8 miles. Temporary roads are immediately decommissioned following completion of the project activity that required the road.

Road decommissioning of about 22.7 miles of roads. These roads are no longer needed for access and use of the project area. About 14.7 miles of road could be decommissioned anytime following a decision. About 8.0 miles will be used for access to timber harvest activities and then decommissioned following completion of the activities. The objective of decommissioning is to return the road to a productive forest condition. A berm is usually installed to block the road entrance from vehicle use. In many cases, effectively blocking the entrance is enough to result in re-vegetation of the road.

2.6.4 Alternative D

Alternative D was developed to address the issue of landscape pattern. Alternative D was developed to increase patch size of vegetation type and age classes over those in Alternative B. As a result, this alternative has clearcuts and shelterwood harvest areas larger than 40 acres. Locations of clearcut and shelterwood treatments vary somewhat from the locations in Alternative B. Alternative D has more clearcut harvest than Alternatives B and C. Alternative D is more aggressive in treating the older age classes of birch and aspen in order to increase overall productivity. Depending on location and surrounding landscape features, maintenance of permanent wildlife openings also contributes to edge. For this reason, the wildlife openings being maintained in this alternative would be reduced from Alternative B.

Maps of the alternative can be found at the end of this document. Site specific design and mitigation criteria for each activity area is shown in Appendix D. Appendix D also includes other specific information about each of the activity areas.

Project design and mitigation measures that apply to and further describe each activity are found following the alternative descriptions in section 2.6.5, Table 2-2. These measures apply to all action alternatives and the site specific projects as applicable.

Alternative D includes the following projects:

Timber harvest of approximately 3900 acres. This harvest would yield an estimated 29 million board feet (MMbf) of timber volume (primarily aspen pulpwood). Treated stands would be grouped into several timber sales to be offered starting in 2003. More specifically, timber harvest and regeneration treatment in Alternative D includes:

Clearcut harvest of about 2290 acres that includes about 1580 acres of aspen types, 610 acres of paper birch, 30 acres of balsam fir, and 70 acres of hardwoods. The intent of most of these harvests is to naturally regenerate aspen with some mixed aspen, conifer and hardwood stands.

Two stage shelterwood harvest of about 390 acres of paper birch and some balsam fir with the intent to regenerate paper birch and some mixed birch, conifer, and oak stands.

Overstory removal harvest of about 160 acres of aspen, hardwood, and paper birch. Removal of the overstory will allow previously planted spruce and some hardwood to grow into the overstory resulting in a stand of trees with a different dominant species.

Selection harvest of about 350 acres of mixed hardwood stands. This selection harvest will result in a stand of similar composition to the present. The intent of the treatment is to move the areas towards an uneven-aged condition.

Thinning harvest of about 710 acres of primarily mixed hardwoods, white spruce and red pine. Forest type following treatment would remain the same as currently exists.

Tree planting of about 290 acres. Most of the planting will occur scattered through shelterwood harvest areas. Other areas being planted include projects adjacent to Sailor Lake and Dalyrmple Creek. Most of the planting will include a mix of tree species that would include white pine, white spruce, red pine, red oak, and hemlock.

Permanent wildlife opening maintenance of about 30 acres. Wildlife openings will be maintained through mechanical methods.

Wild rice planting of about 5 acres in the shallow bay on the southwest side of Sailor Lake. Seeding would occur for several years in a row and would continue until about 5 acres of wild rice is established. Wild rice will also be maintained and planted along the shoreline of Upper Squaw Creek Impoundment.

Upper Squaw Creek Impoundment water level drawdowns. In most years, water levels in this constructed water impoundment would be lowered partially during the summer to mimic natural water fluctuations, and stimulate vegetation growth. Overwinter and year long drawdowns would also be conducted on an intermittent basis. Overwinter and year long drawdowns include lowering the water levels to the creek channel and are used to keep the flowage at a ratio of about 50:50 open water to emergent vegetation. In addition to water level

drawdowns, wood duck nesting boxes will be placed around the Upper Squaw Creek Impoundment.

Road closure of about 9.1 miles of classified Forest system road. A road may be closed either by sign, gate, berm, rock, or other materials to effectively prevent cars and trucks from utilizing the road. Classified roads that are closed are needed for management of the forest but are opened and utilized only on an intermittent basis.

Classified road construction of about 1.3 miles.

Temporary road construction of about 2.0 miles. Temporary roads are immediately decommissioned following completion of the project activity that required the road.

Road decommissioning of about 25.4 miles of roads. These roads are no longer needed for access and use of the project area. About 14.7 miles of road could be decommissioned anytime following a decision. About 8.0 miles will be used for access to timber harvest activities and then decommissioned following completion of the activities. The objective of decommissioning is to return the road to a productive forest condition. A berm is usually installed to block the road entrance from vehicle use. In many cases, effectively blocking the entrance is enough to result in re-vegetation of the road.

2.6.5 Project Prescriptions, Design Criteria and Mitigation Measures

Table 2-2 shows detailed project descriptions (prescriptions and design criteria) and mitigation measures (project design criteria which protect or enhance certain resources). The far left column shows an ID# for each. The center column is the detailed narrative of the measure. The last column lists a cross-reference back to the purpose and need (Chapter 1) and/or to the issue of concern (Chapter 2). These measures are an integrated part of each of the action alternatives and were developed in response to a specific need or issue identified during the analysis. For example, measure 32 addresses the need to convert an area adjacent to Dalrymple Creek away from aspen to improve water quality and trout habitat. Each project activity in each alternative includes a list of the project design and mitigation measures that would be applicable to that particular area. Appendix D contains this information in a table format.

Table 2-2: Project Prescriptions, Design and Mitigation Measures - Description

ID#	Project Prescriptions, Design Measures, and Mitigation Measures	Issue/ Need
Project Descriptions		
1	Clearcut Harvest: This type of harvest removes most of the overstory trees in an area which encourages regeneration of primarily pioneer types of vegetation. This is an even-aged method of harvest. Many of these areas have a hardwood, balsam fir, white spruce, and pine component in the overstory or understory. These components will remain in the newly regenerated stand by marking reserve islands (for the longer lived species) and by protecting advanced regeneration of hardwoods, fir, spruce and pine. Depending on how the area is logged, some post harvest treatments may be needed to remove unmerchantable trees that would interfere with regeneration of pioneer types of vegetation. The aspen stands that would be planned for this type of harvest would primarily regenerate to aspen. Paper birch stands proposed for this type of harvest would convert to a higher aspen percentage. Red maple and other hardwood types proposed for this treatment may have an increase in the aspen component, but are intended to remain primarily hardwood.	1.4.1 1.4.2 1.4.3 1.4.6

Table 2-2: Project Prescriptions, Design and Mitigation Measures - Description		
ID#	**Project Prescriptions, Design Measures, and Mitigation Measures**	**Issue/ Need**
2	Two Stage Shelterwood Harvest: This is an even-aged method of harvest that removes a portion of the canopy and leaves a partial overstory as a seed source and a source of high shade to provide the best possible conditions to establish regeneration of a new stand of trees. The goal in most of the areas being proposed for shelterwood harvest is to regenerate some paper birch. When regenerating paper birch, some exposure of mineral soil is needed in order to provide a suitable seedbed. Following the first cut, heavy equipment will be used to expose mineral soil. Once regeneration is established (about 3years in age), the overstory will be removed in a second cut. This would occur in about 7-10 years following the first harvest treatment.	1.4.2 1.4.6
3	Overstory Removal Harvest: This type of harvest removes the overstory to allow the understory trees to become the new stand. Most of the stands proposed for this kind of harvest have an existing understory of planted white spruce. Removal of the aspen and birch overstory will allow the spruce and some hardwood to grow into the overstory and will regenerate some of the aspen and birch. The resulting composition will be a mixed stand of spruce with hardwood, aspen and some paper birch. The resulting age structure may have several age classes of trees depending on the age of the planted spruce. Spruce and hardwood pockets of a commercial size (greater than 5 inches diameter) would be thinned with this proposed treatment.	1.4.2 1.4.6
4	Selection Harvest: In a selection harvest, the types and sizes of trees being removed is not uniform. The objective is to remove individual trees of a variety of sizes in order to move the area towards an uneven-aged condition. Also, some small groups of trees are removed within each stand in order to encourage natural regeneration of seedlings. These small openings (canopy gaps) range from 20 to 60 feet in diameter and would comprise 10-16% of the stand area. Depending on the existing structure of the stand, it could take several harvest entries over a period of decades to reach an uneven-aged condition and structure.	1.4.2 1.4.6
5	Thinning Harvest: This type of harvest removes selected trees to increase growth and production on the residual trees in an even-aged stand. The trees designated for harvest would generally be the ones exhibiting slower growth rates, signs of insect or disease infestation, and having crooks, forks or other characteristics that would be less desirable for use in wood products.	1.4.2 1.4.6
6	Permanent Opening Maintenance: This project includes using mechanical methods (mowing or use of hand held brush saws), to reduce the amount of woody vegetation regenerating in open grass or brush areas.	1.4.2
7	Permanent Opening Maintenance: This project includes using prescribed burning and mechanical methods (mowing or use of hand held brush saws), in combination, to reduce the amount of woody vegetation regenerating in open grass or brush areas in one stand. Plow lines may be needed for fire breaks. Prescribed burning is generally accomplished in early spring following thaw. The best timing for killing back woody brush would be when the grasses are still dry enough to carry a fire, but the woody vegetation has started to leaf out.	1.4.2
8	Wild rice planting is proposed for the shallow bay on the southwest side of Sailor Lake. Seeding would occur for several years in a row and would continue until about 5 acres of wild rice is established. Wild rice will also be planted in Upper Squaw Creek Impoundment.	1.4.3
9	Upper Squaw Creek Impoundment Drawdowns: In most years, water levels in this constructed water impoundment would be lowered partially during the summer to mimic natural water fluctuations, and stimulate vegetation growth. Overwinter drawdowns for this flowage are also proposed in order to keep a percentage of emergent vegetation for forage. Overwinter drawdowns are expected to be needed within the next 5 years. The proposal for overwinter drawdowns includes lowering the water levels to the creek channel. Year long drawdowns are also expected to be needed. Year long drawdowns would be considered only if the overwinter drawdowns no longer accomplish the objectives for keeping the flowage at a ratio of about 50:50 open water to emergent vegetation. In order to repair and maintain the impoundment and dam, drawdowns at other times are also proposed and would be implemented as needed.	1.4.3
10	About 20 wood duck nesting boxes will be placed around the Upper Squaw Creek Impoundment. Boxes will be placed along the shoreline or over open water and placed so that the openings would face away from other boxes in the vicinity.	1.4.3

Table 2-2: Project Prescriptions, Design and Mitigation Measures - Description		
ID#	**Project Prescriptions, Design Measures, and Mitigation Measures**	**Issue/ Need**
11	Road Closure: Road closures are conducted to prevent damage to classified roads, to reduce maintenance costs, or to prevent other resource damage from occurring by allowing use of a road. Classified roads that are closed are needed for long term management of the forest, but are generally only utilized on an intermittent basis. A road may be closed either by sign, gate, berm, rock, or other materials to effectively prevent cars and trucks from utilizing the road.	1.4.7
12	Classified Road Construction: This is the construction of a road needed for long term management activities and built to a certain standard. The standards or specification of the road depends on the desired traffic service and maintenance level of the road. Construction involves, cutting and removing the merchantable trees, then grubbing out the stumps through the use of heavy equipment such as a bulldozer. The road is usually 14 feet or wider, has a road template (road crown and ditches), and would consist of native materials with some crushed aggregate.	1.4.7
13	Temporary Road Construction: Temporary roads are the lowest standard roads needed for short term (temporary) management activities. This would normally involve, cutting and removing the merchantable trees on the site, then grubbing out the stumps through the use of heavy equipment such as a bulldozer. The temporary road is usually 10 to 14 feet wide. The road surface consists of native material. If fill is needed it would be removed following completion of the activity. In some cases, a temporary road may be nothing more than a frozen down surface. If drainage structures such as temporary culverts and bridges are needed, they would be removed. Natural drainage features are restored upon completion of the activity and the road would be blocked from use with a berm, slash from harvest activity, or other methods (immediate decommissioning).	1.4.7
14	Road Decommissioning: Decommissioning is an activity that results in the stabilization or restoration of unneeded roads to a more natural state. Decommissioning may range from partial to complete restoration of the road by re-sloping the banks, restoring ditches, loosening up the compacted soil layers, reseeding open areas, and / or planting trees in the old roadway corridor. A berm is usually installed to block the road entrance from vehicle use. In many cases, effectively blocking the entrance is enough to result in re-vegetation of the road.	1.4.7
Further Project Prescriptions		
15	In these selection harvest units, utilize the stand structure guidelines found on page IV-48 of the Forest Plan. In these selection harvest units, canopy gap sizes will range from 20 to 40 feet in diameter. From 10 to 12 percent of the stand area will be harvested as canopy gaps.	1.4.2
16	In these selection harvest units, utilize the stand structure guidelines found on page IV-48 of the Forest Plan. In these selection harvest units, canopy gap sizes will range from 40 to 60 feet in diameter. About 16 percent of the stand area will be harvested as canopy gaps.	1.4.2
17	In these hardwood thinnings, short rotation species such as aspen, paper birch and balsam fir will be discriminated against.	1.4.2 2.3.1
18	In these hardwood thinnings, mature paper birch and poor quality sugar maple will be discriminated against. Favor yellow birch, red maple, and other hardwood species such as basswood and ash.	1.4.2
19	Project 017003b will be divided into 2 units, with the dividing line between the 2 cutting units established at least 600 feet from Dalrymple Creek. The western portion of 017003b will be clearcut with the objective of regenerating aspen. Aspen, paper birch and hardwood will be designated for cut. There is some plantation white spruce that is about 5 inches in diameter that will be retained. There are some dry sites in this unit that can be spot planted to red pine and red oak if natural regeneration does not occur. The eastern portion of 017003b (the portion of the stand within 600' of Dalrymple Creek) will be shelterwood cut with the objective of regenerating to long lived conifer and northern hardwoods. The aspen will be designated for cut leaving about a 20% crown cover of paper birch to suppress the aspen regeneration. Existing hardwoods will be retained. Existing pine regeneration will be protected to the extent possible. Spot plant the area (where there isn't the desired composition of long lived species) with red pine and red oak on the dry sites and white pine and white spruce on the poorly drained sites.	1.4.4 2.3.4 2.3.7

Table 2-2: Project Prescriptions, Design and Mitigation Measures - Description		
ID#	**Project Prescriptions, Design Measures, and Mitigation Measures**	**Issue/ Need**
20	Project 017017 will be divided into 2 units, with the dividing line between the 2 cutting units established at least 600 feet from Dalrymple Creek. The western portion of 017017 will be clearcut with the objective of regenerating aspen, though other species are acceptable. Spot plant white spruce as needed to obtain a fully stocked stand. The eastern portion of 017017 will be clearcut with the objective of conversion to red pine, white pine, white spruce, and hemlock. Logging should be done to produce some disturbance of the ground to create conditions for planting. Plant the area to white pine, white spruce and hemlock.	1.4.4 2.3.4 2.3.7
21	Project 017003a will be divided into 2 units, with the dividing line between the two cutting units being Forest Road (FR) 652. The western portion of 017003a will be clearcut with the objective of regenerating aspen, though other species are acceptable. Spot plant white spruce as needed to obtain a fully stocked stand. The eastern portion of 017003a will be shelterwood with the objective of regenerating the area to long lived conifer species. A residual overstory of about 20-25% will be left to suppress aspen suckering. Summer log this stand to suppress aspen suckering. White spruce, white pine, and hemlock will be planted.	1.4.4 2.3.4 2.3.7
22	Spot plant within 300' of Sailor Lake with red oak and white pine. This will be done in canopy openings or along the shoreline following selection harvest. The objective is to have some of the white pine and oak mature into the canopy. These stands would remain primarily mixed hardwoods.	1.4.5 2.2.1 2.3.4
23	These stands will be shelterwood harvested. The first cut would leave a 20-40% crown cover which would be primarily paper birch as a seed source. The reserved trees should also contain some other species such as balsam fir, spruce, and maple for species diversity. Site preparation (scarification) is to be done within 2 years after the harvest. Mineral soil on 50-60% of the ground could be exposed. In these shelterwoods, spot plant red oak on drier sites and white pine and spruce on less well drained sites to obtain a fully stocked stand following harvest and site preparation. Before the regeneration reaches more than 4 feet in height, the rest of the overstory will be removed.	1.4.2 2.3.4
24	Mark the stand as a paper birch shelterwood, leaving a 30-40% crown cover of paper birch, red maple, and other associated species, except where aspen is present. Where aspen is present do not leave any crown cover within 50 feet of any aspen. The result will be a patchy blend of mini shelterwoods and mini clearcuts. Site preparation (scarification) is to be done within 2 years after the harvest within the shelterwood areas. Mineral soil should be exposed on 50-60% of the ground. In these shelterwoods, spot plant red oak on drier sites and white pine and spruce on less well drained sites. When the oak, paper birch, red maple, white spruce regeneration is about 4 feet in height, the overstory will be removed. Where white pine is planted, the overstory will be left in place as weevil control until the white pine is 20-25 feet in height. The areas with aspen regeneration will not have any site preparation by scarification, though limited hand scalping could be done where we wish to create more within stand diversity by supplementing the aspen regeneration with planted red oak and white pine.	1.4.2 2.3.4
25	The boundary of this project (086025a) will be extended to FR 139F on the western side.	
26	The 2-6" diameter white spruce in this clearcut harvest area should be reserved and protected to the extent possible during logging.	1.4.2 2.3.4
27	Protect advanced balsam fir regeneration where possible. Regenerate stand to a mixed aspen and balsam fir stand.	1.4.2 2.3.4
28	In pine and spruce stands, thinning harvest should be done in such a way as to leave other minor species components within the stand and to break up plantation rows along open travel corridors. No more than 40% of the basal area should be removed from any pine or spruce stand during any one thinning.	1.4.2 2.3.4
29	Wait one growing season after logging to give aspen a chance to sprout, then do a stocking survey. Follow up with site preparation and plant white spruce where the aspen regeneration is inadequate to fully stock the site.	1.4.2 2.3.4

Table 2-2: Project Prescriptions, Design and Mitigation Measures - Description		
ID#	**Project Prescriptions, Design Measures, and Mitigation Measures**	**Issue/ Need**
30	Protect as many of the planted white spruce in the understory as possible.	1.4.2 2.3.4
31	Use a combination of mechanical brushing and burning to keep the area in an open grassland condition for a variety of species that need this type of habitat. Its proximity to Sailor Lake also will make it available as a waterfowl feeding area. Prescribed burning will not occur on a yearly basis, but will be timed to allow fuel buildup. Mechanical brushing can also be used to reduce woody vegetation encroachment.	1.4.2 1.4.3
32	This project area will be divided into 2 harvest units. For a distance of 300 feet from Dalrymple Creek, and for a 100 foot distance from the perennial stream to the west, the stand will be marked as a shelterwood, leaving 60 Basal Area (BA) of residual merchantable sized trees. Preferred residual would be white spruce, hemlock, white spruce, and hardwood; however, since there are not enough of these species present, some aspen and paper birch will be left. A mixture of white pine, hemlock and red oak will be hand planted. Seedling protection methods such as vexar tubes, repellant sprays, etc. will be used to protect the seedlings from deer browse. The remainder of the stand will be clearcut and regenerated to aspen.	1.4.4 2.3.4 2.3.7
33	Project 017003 will be divided into 2 units, with the dividing line between the cutting units being established at least 300 feet from Dalrymple Creek. East: The eastern portion of 017003 (the portion of the stand within 300' of Dalrymple Creek) will be a shelterwood cut with the objective of regenerating it to long lived conifer and northern hardwoods. The aspen will be designated for cut leaving about a 20-25% crown cover of primarily paper birch to suppress the aspen regeneration. Existing hardwoods will be retained. Existing pine regeneration will be protected to the extent possible. Spot plant the area (where there isn't the desired composition of regeneration) with red pine and red oak on the dry sites and white pine, white spruce, and hemlock on the poorly drained sites. Summer log to minimize aspen regeneration. West: The western portion of 017003 will be clearcut with the objective of regenerating aspen. Aspen, paper birch and hardwood will be designated for cut. There is some plantation white spruce that is about 5 inches in diameter that will be retained. If and where natural regeneration does not occur, do site prep, followed by planting red pine and red oak on the dryer sites and white spruce on the wetter sites.	1.4.4 2.3.4 2.3.7
34	Reserve northern hardwood and merchantable size white spruce for visual quality reasons.	1.4.2 2.2.3 2.3.4
35	Reserve any white pine that has a sound top. Cut the white pine with blister rust infected tops.	1.4.2 2.3.4
Project Design and Mitigation Measures		
36	In stands where hemlock is less than 10% of the basal area, all hemlock will be reserved rather than harvested. Release of under story or sub-canopy hemlock is encouraged.	1.4.2 2.3.4
37	Any existing white or red pine greater than 5” in diameter at breast height (DBH), in activity areas adjacent to Sailor Lake, will be reserved from harvest.	1.4.2 1.4.5 2.2.1 2.3.4
38	Site disturbing land use activities (including timber harvesting activities) will not be permitted from February 15 to August 1.	2.2.1
39	Thinning will be done in a manner that would limit any canopy gap to no more than 40 feet in diameter. No more than 12 percent of the stand area will be harvested as canopy gaps.	2.3.1
40	Any healthy American elm greater than 5” in diameter at breast height (DBH) will be reserved from harvest.	2.3.1

Table 2-2: Project Prescriptions, Design and Mitigation Measures - Description		
ID#	**Project Prescriptions, Design Measures, and Mitigation Measures**	**Issue/ Need**
41	Mid-summer, partial drawdowns of Upper Squaw Creek Impoundment are subject to the following conditions: The water drawdown will start no sooner than July 1st and water levels will be back to full pool by October 1. The water will be drawn down to the extent needed to expose mudflats. The water will be drained slowly, not exceeding more than 5 inches per day. When refilling, a minimum of 25% of the base flow of the stream will be allowed to pass downstream.	2.3.1 2.3.2 2.3.7
42	Full, overwinter drawdowns of Upper Squaw Creek Impoundment will be used when areas of wild rice are becoming established, 1-3 years following planting. Full, overwinter and year-long drawdowns will be used to stimulate wild rice growth and control submergent vegetation when more than 30% of the open water is covered with undesirable vegetation (submergent mats, coontail, lily pads). These drawdowns are subject to the following conditions: The water drawdown will start around the middle of October and be completed before freeze up in the middle of November. The water will be drained slowly, not exceeding more than 8 inches per day. Water levels will be brought back to full pool starting with spring thaw (generally sometime in March) and ending in the middle of April. When refilling, a minimum of 25% of the base flow of the steam will be allowed to pass downstream.	2.3.1 2.3.2 2.3.7
43	When seeding grasses on disturbed soils, a combination of 2 or more species will be used. The seed types used will be native.	2.3.3
44	A site specific burn plan that falls within acceptable parameters for safety, smoke management, and resource effects will be completed with approved signatures before any prescribed burning can take place.	2.3.8
45	Prescribed burning will not occur on opening weekend of fishing season, on the Memorial Day weekend, on the 4th of July, or on Labor Day weekend.	2.3.8 2.3.12
46	All activities will be designed to avoid known heritage sites. This can be accomplished by ensuring that the treated project area boundary excludes the known site, by treating the known site as a leave island within the project area, etc. There will be no earth or vegetation disturbing activities permitted within a heritage site boundary. Any heritage sites within or near a project activity will be monitored to ensure that an impact is not occurring.	2.3.9
47	Road easements or permits or landowner permission is needed prior to use of portions of roads leading to these activity areas.	2.3.10
48	The road approach onto FR 136 will be realigned for safety/visibility purposes prior to hauling from these units.	
49	Any tree tops and other logging debris that falls onto private land will be removed (pulled back to National Forest System land).	2.3.10
50	Where proposed harvest unit boundaries are adjacent to private property, property boundaries will be established to standard (appropriate corner monuments are placed and boundary line has survey markers placed every 200') to avoid potential trespass situations.	2.3.10
51	Roads under special use permits for access to private land will be kept clear and usable during timber harvest operations and will be maintained to their existing condition during harvest operations. All decking, skidding, and hauling will be done in such a way as not to unreasonably block or prevent the permittee's access to their property. Skidding timber on the surface of the special use road will only be allowed during frozen ground conditions.	2.3.10
52	Within the project area, along the southern end of FR 139, there are special use permits for buried telephone and electrical power lines. The timber sale contract will include "protections of improvements" clause and identify known locations of buried and overhead lines. The operating plan for harvest units along the southern end of FR 139 will include notification to the timber sale contract holder that there are buried and overhead lines along FR 139 and contact of the utility company is required prior to any activity that may disturb these lines.	2.3.10

Table 2-2: Project Prescriptions, Design and Mitigation Measures - Description		
ID#	**Project Prescriptions, Design Measures, and Mitigation Measures**	**Issue/ Need**
53	The length of temporary openings resulting from clearcutting and the 2nd cut of shelterwood harvests cannot exceed 900 feet along travel corridors and water bodies managed for retention and partial retention visual quality objectives (sensitivity level 1 & 2 areas). Corridors subject to this mitigation are State Highway 70, FR 139, FR 138, FR 136, Forest Trail (FT) 102, and FT 121/130.	2.2.3
54	Along travel corridors and water bodies managed for retention and partial retention visual quality objectives, temporary openings resulting from clearcutting and the 2nd cut of shelterwood harvests will be designed to blend with the surrounding landscape. Techniques to accomplish this include, but are not limited to feathering heights of the vegetation around the edges of the opening, placing reserve islands along travel corridors, and by keeping snag and cull tree retention in the visual background. Corridors subject to this mitigation are Highway 70, FR 139, FR 138, FR 136, FT 102, and FT 121/130.	2.2.3
55	Clearcuts and the 2nd cut of shelterwood harvests will be designed in such a way as to break up long sight distances by leaving about 200 feet of standing patches of trees (these could be present and future den/snag trees, and mast or budding trees for wildlife). Patches of mature trees left within a clearcut or shelterwood harvest area should meet wildlife and visual quality objectives when possible. All temporary openings resulting from clearcutting and shelterwood harvests will have a natural appearing, irregular shape. Corridors subject to this mitigation are State Highway 70, Forest Road (FR) 139, FR 138, FR 136, FT 102, and FT 121/130.	2.2.3
56	Within 100 feet of travel corridors and water bodies managed for retention and partial retention visual quality objectives, marking paint will face away from the corridor as much as possible (in some cases, it may be necessary to place some paint at the base of the tree that would be facing the corridor). Sailor Lake shoreline is subject to this mitigation. Corridors subject to this mitigation are Highway 70, FR 139, FR 138, FR 136, FT 102, and FT 121/130.	2.2.3
57	Along FT 102, and 121/130, the following slash disposal guidelines will apply: Logging slash will be completely removed from the edge of the cleared right of way back 15 feet. From 15 feet to the "seen" area or 50 feet (whichever comes first) away from the right of way, slash will be lopped and scattered to a height not to exceed 24 inches.	2.2.3
58	Along Highway 70, FR 139, FR 138, FR 136, and Sailor Lake Campground, the following slash disposal guidelines will apply: Logging slash will be completely removed from the edge of the cleared right of way back 50 feet. From 50 feet to the "seen" area or 100 feet (whichever comes first) from the edge of the right of way, slash will be lopped and scattered to a height not to exceed 24 inches. In addition, along Highway 70, logging slash from 100 feet to the "seen" area or 300 feet will be lopped and scattered to a height not to exceed 48 inches.	2.2.3
59	Along all other forest trails (as listed in Appendix A of the Hoffman-Sailor West Roads Analysis), the following slash disposal guidelines will apply: All logging slash will be completely removed from the cleared right of way. All logging slash will be lopped and scattered to a height not to exceed 24 inches from the edge of the cleared right of way back 15 feet.	2.2.3
60	Along FR 508, FR 550, and all other, classified roads (as listed in Appendix A of the Hoffman-Sailor West Roads Analysis) logging slash will be completely removed from the edge of the cleared right of way back 10 feet unless slash is a part of road closure mitigation stated elsewhere in this document.	2.2.3
61	No logging decks are permitted within 50 feet of the cleared right of way on the portion of FR 139 from Sailor Lake Picnic Area north to Highway 70.	2.2.3
62	Posts used to install duck boxes will be made of a material and color to blend with the surrounding landscape.	2.2.3
63	Portions of FT 102, FT 128 (FR 136D), and FT 130 are hunter walking trails that can be used for access to harvest units when no other access route exists. Portions of FT 102 and FT 121(which is also FT 130) are motorized trails that can be used for access to harvest units when no other access route exists. When used for access, the following restrictions apply: These trails can be used for hauling wood and transporting equipment and personnel to the harvest unit. Skidding (operations where logs would drag on the trail surface) is prohibited on the trails except where crossings are needed and designated by the timber sale administrator. Skid crossing areas must be placed so that they can be seen from a safe distance in either direction. Log landings must be placed off the trail far enough so that logs and logging vehicles will	2.3.11

Table 2-2: Project Prescriptions, Design and Mitigation Measures - Description		
ID#	**Project Prescriptions, Design Measures, and Mitigation Measures**	**Issue/ Need**
	not be within the cleared right of way. Harvest equipment cannot be parked or left within the clearing limits of the trail. Warning signs will be posted along the trail when harvest activity is occurring. Signs must be posted so that trail users coming from either direction will be adequately warned of logging activity ahead. All logging vehicles will drive with headlights on while using the trails. A speed limit of ten miles per hour will be posted on sections of trails where timber harvest activity is occurring. This speed limit applies to all users of the trail when posted. These trails will be kept in a condition of good repair so that they can be safely used by all. Any damage to the trail resulting from timber harvest use will be repaired immediately. When snow is present on FT 121, and 102, snow plowing for harvest activity must be done in such a way as to leave sufficient snow for snowmobile use (a minimum of 2 inches of compacted snow or 4 inches of loose snow), and that it be plowed wide enough (where possible) to allow snowmobiles and logging trucks to pass at the same time. Hauling on hunter walking trails will be prohibited on weekends and holidays during regular deer and grouse seasons. Hauling on motorized/snowmobile trails will be prohibited on weekends, holidays, and from December 20 through January 5.	
64	Timber harvest operations (cutting or skidding) are not permitted adjacent (within ¼ mile of improvements) to Sailor Lake Campground from May 1 through November 1, which is the period when the campground is open.	2.3.12
65	No log decking areas are permitted within 100 feet of the cleared right of way on Forest Road 138. All logging activity or decking is prohibited within the Sailor Lake Campground area.	2.3.12
66	The harvest boundary of the harvest units adjacent to Sailor Lake Campground will be established at a minimum of 50 feet from any campsite or improvements.	2.3.12
67	In order to reduce potential impacts to recreation use of Sailor Lake, wild rice planting will occur only in the southwest bay of Sailor Lake. About 5 acres will be established. Wild rice will be kept away from the shoreline adjacent to the Sailor Lake Campground and private property on the east shoreline.	2.3.12
68	Operation of heavy equipment within timber harvest units that have soils that are easily rutted or compacted only when soil moisture is high or during spring breakup will be subject to the following mitigation: Operation of harvesting and hauling equipment will be permitted only when soils are dry or frozen. Evidence of rutting, compaction, or erosion will be the determining factor for halting timber harvest operations.	2.3.5
69	Operation of heavy equipment within timber harvest units that have soils that are easily rutted or compacted any time of the year depending on soil moisture conditions will be subject to the following mitigation: Operation of harvesting and hauling equipment will be permitted only when soils are dry or frozen. Evidence of rutting, compaction, or erosion will be the determining factor for halting timber harvest operations.	2.3.5
70	Temporary road and skid trail slopes will generally be kept less than 10%. Where temporary roads and skid trail slopes exceed a 10% slope, water diversion structures (lead off drainages, water bars, etc.) will be installed based on the guidelines in Wisconsin's Forestry Best Management Practices for Water Quality (BMPs). Stabilization and seeding of disturbed soils on slopes greater than 10% are required following project implementation. This would include stabilization and seeding of temporary roads, skid trails, and landings.	2.3.5 2.3.7
71	Avoid use of heavy equipment in wetlands where possible. Small wetland pockets and woodland ponds will be avoided because equipment and vehicles can go around them. New roads and skid trails will also avoid wetland pockets and ponds. Wetland pockets and ponds will be avoided by designing roads and skid trails to go around them, by marking them on sale maps as reserve areas, and by other methods. Some long, narrow wetlands, or larger wetlands that isolate upland forest land that cannot be avoided during harvest operations. Within harvest units, on skid trails, unimproved roads, and on newly constructed roads, wetlands can be crossed by heavy equipment under the following conditions: Essential crossings will be designated during project design and/or by the sale administrator prior to use. Operation of heavy equipment (this includes trucks and passenger vehicles, harvesting and hauling equipment) in wetlands will only be allowed under frozen	2.3.6

Table 2-2: Project Prescriptions, Design and Mitigation Measures - Description		
ID#	**Project Prescriptions, Design Measures, and Mitigation Measures**	**Issue/ Need**
	conditions or as necessary to pack and freeze a crossing. If there is still open water within the wetland crossing, temporary drainage and support structures including floating mats, culverts, corduroy, chunkwood, or portable bridges will be used to maintain cross flow, subsurface drainage patterns, and to support equipment and vehicles. All drainage structures, support structures, and temporary fill will be removed after use is completed and the area will be restored to its original elevation. Wetlands and woodland ponds will not be used for log landings or slash disposal areas.	
72	Along all navigable streams (all those currently showing on USGS topographical maps and are generally perennial or intermittent), lakes, and impoundments, logging slash will be removed 100 feet beyond the high water mark. Operation of logging equipment (skidders, feller/bunches, haul trucks) and construction of temporary roads, skid trails and log landings are prohibited along navigable streams within 100 feet of the high water mark. When slopes facing the drainage are 30% or greater and continue beyond 100 feet in horizontal distance from the high water mark, then these practices are prohibited from the high water mark to 20 feet beyond the first break in the slope facing the water. Within 100 feet of all navigable streams (all those currently showing on USGS topographical maps and are generally perennial or intermittent), lakes, and impoundments, harvest prescriptions will leave at least 60 square feet of basal area per acre in trees 5 inches in diameter and larger. Long lived tree species will be promoted over pioneer types of vegetation such as aspen, paper birch and balsam fir.	1.4.4 2.3.7
73	Along all non-navigable streams (those drainages which may be found during project design, but are not currently showing on USGS topographical maps, and are intermittent or ephemeral in nature), logging slash will be removed from the visible channel. Operation of logging equipment (skidders, feller/bunchers, haul trucks) and construction of temporary roads, skid trails and log landings are prohibited along non-navigable streams within 15 feet of the high water mark except at designated crossings. Non-navigable stream crossings will be designated and approved by the Forest Service. Crossings will be designed to cross channels at right angles. Road and skid trail surfaces approaching the channel will be designed to prevent runoff from entering the channel. Use of stream crossings during winter months or dry months will be encouraged to minimize the potential for erosion and sedimentation (normal low or no flow periods). Temporary drainage structures including culverts or portable bridges will be used to maintain the expected stream flow. Use of temporary fill will be kept to a minimum. Temporary fill material will be stabilized to prevent washing into drainages (by rip rap, sediment fence, or other methods). All drainage structures and temporary fill will be removed after use is completed and the area will be restored to its original contours and stabilized.	2.3.7
74	Purposeful release of any fuel, lubricant, or antifreeze on the Forest is prohibited. Accidental spills of these substances must be reported as soon as possible to the Wisconsin Department of Natural Resources and the Forest Service. Refueling and lubrication of equipment will not occur within 100 feet of surface water (streams, wetlands, etc.).	2.3.6 2.3.7
75	In clearcut and shelterwood areas that are about 15-25 acres, leave a 1 acre island of upland, mature forest. In areas that are from 26 acres to 40 acres, leave two, 1 acre islands of upland, mature forest. In areas that are over 40 acres, leave 5-10% of the area in mature islands ranging in size from 2 to 10 acres each. Conifer, if present within the stand, should be represented in the leave islands. Placement of leave islands should be coordinated to meet visual quality objectives when possible. In clearcut and shelterwood harvest areas, maintain at least 2 snags per acre that are at least 12" in diameter (maintain smaller diameter snags if there are not any that are greater than 12").	1.4.3 2.3.4
76	In all timber harvest areas, reserve at least 2 den trees per acre and 2 snags per acre. Leave some mast and fruit producing trees when present (oak, hickory, cherry, ironwood). Leave all apple and plum trees.	2.3.4
77	Decommission any time.	1.4.7
78	Decommission with timber harvest sale.	1.4.7

Table 2-2: Project Prescriptions, Design and Mitigation Measures - Description		
ID#	**Project Prescriptions, Design Measures, and Mitigation Measures**	**Issue/ Need**
79	This road accessing the Hogsback Hiking Trail, will be decommissioned with berms, ripping, and planting of trees.	1.4.7
80	Leave for parking or log decking area.	1.4.7
81	Construct to traffic service level D standards.	1.4.7
82	Close with berm, rocks, or other methods.	1.4.7
83	Close this road with a gate.	1.4.7
84	Close with berm, rocks, gate or other methods.	1.4.7
85	Frozen use/access only.	2.3.5 2.3.6 2.3.7
86	This replaces a portion of FT 130/121. This will be a dual use trail and road with a gate off of FR 136.	1.4.7
87	When decommissioning this road, block access on both ends.	1.4.7
88	When decommissioning this road, block access (construct closures) on both ends.	1.4.7
89	Decommission all but the north end of this road and leave as a turnaround.	1.4.7
90	Future access to gravel pit. Berm now. When the road is reconstructed for access to the pit, replace the berm with a gate.	1.4.7

2.7 Alternative Summary and Comparison

Table 2-3 compares effects indicators for each of the alternatives. A narrative follows the table and includes an effects summary. For additional information on the effects of the alternatives, see Chapter 4.

Table 2-3: Alternative Effects Comparison					
Issue / Resource	**Existing Condition**	**Alternative**			
		A	**B**	**C**	**D**
Federally Threatened and Endangered Species (see sections 1.4.5, 2.2.1,3.2.1, 4.2.1, and Appendix A)					
Bald eagle nest tree impacts	No	No	No	No	No
Acres of new future bald eagle nesting habitat provided	0	0	13	13	13
Findings for all federally threatened, endangered, candidate species	NA	No Effect	No Effect	No Effect	No Effect
Regional Forester Sensitive Species (see sections 2.3.1 and Appendix A)					
Impacts to population viability expected?	NA	No	No	No	No
Management Indicator Species (white-tailed deer) (see sections 1.4.3, 3.2.2, and 4.2.2)					
Amount of aspen in the project area (acres)	7600	7600	7860	8090	8170
Average clearcut size in the project area (acres)	20	0	26	53	51
Management Indicator Species (ruffed grouse) (see sections 1.4.3, 3.2.2, and 4.2.2)					
Amount of aspen in the project area (acres)	7600	7600	7860	8090	8170
Percent of aspen in the project area (% of all federal land)	36	36	37	38	38
Average clearcut size in the project area (acres)	20	0	26	53	51
Aspen 0-20 years old in the project area (percent of the aspen)	13	7	29	29	33
Amount of aspen in Squaw Creek Wildlife Area (acres)	1307	1307	1392	1371	1423

Table 2-3: Alternative Effects Comparison					
Issue / Resource	**Existing Condition**	**Alternative**			
		A	**B**	**C**	**D**
Percent of aspen in Squaw Creek Wildlife Area (% of federal land)	36	36	38	37	39
Average clearcut size in Squaw Creek Wildlife Area (acres)	11	0	21	21	24
Aspen 0-20 years old in Squaw Creek Wildlife Area (percent of aspen)	15	9	27	26	32
Management Indicator Species (brook trout) (see sections 1.4.4, 3.2.3, and 4.2.3)					
Habitat improvement along Dalrymple Creek (% of total stream miles)	0	0	6	9	9
Forest Vegetation Composition (see sections 1.4.2, 3.2.4, and 4.2.4)					
Aspen increase (acres)	0	0	265	494	574
Aspen percent (Forest Plan range = 35-65%)	36	36	37	38	38
Landscape Pattern (see sections 2.2.2, 3.2.5 and 4.2.5)					
Average patch size (acres) of 0-10 year age class	20	0	26	53	51
Average patch size (acres) of all age classes	37	37	32	35	35
Interior to edge habitat ratio (In the existing condition of the project area, the interior to edge ratio is 1/3. This means that for every 1 acre of forest interior habitat, there are 3 acres of forest edge habitat.	1/3	1 /2.3	1/3	1/3	1/3
Visual Quality (see sections 2.2.3, 3.2.6 and 4.2.6)					
Temporary openings in semi-primitive motorized areas (percent)	NA	0	7	7	8
Temporary openings in Retention and Partial Retention (percent)	NA	0	6	7	9
Pulpwood Production (see sections 1.4.1, 1.4.6, 3.2.7, and 4.2.7)					
Total volume produced (MMbf, million board feet)	NA	0	23	24	29
Aspen less than 21 years old (percent)	13	7	29	29	33
Economics (see sections 3.2.8 and 4.2.8)					
Revenue/cost ratio of timber harvest	NA	NA	1.25	1.25	1.19
Transportation System (see sections 1.4.7, 3.2.9, and 4.2.9)					
Total road density for project area (miles/square mile)	3.1	3.1	2.3	2.5	2.4
Total road density for semi-primitive, motorized area (miles/square miles)	3.1	3.1	2.3	2.5	2.4

A Biological Evaluation conducted for the Hoffman-Sailor West project concluded that there would be no effect on federally threatened and endangered species in any alternative and that there would be no impacts to population viability of Regional Forester Sensitive Species in any alternative (also see Appendix A).

In all the action alternatives (B through D), future bald eagle nesting habitat will be improved. There is no provision for future bald eagle nesting habitat in Alternative A.

For the Management Indicator Species (MIS) white-tailed deer and ruffed grouse, habitat will be improved in all the action alternatives by the availability of food and cover habitat (clearcuts) and an increase in forest types utilized for food (aspen). In Alternative A, there will be no aspen in the younger age classes needed for food and cover within the project area. Of the action alternatives, Alternative B provides clearcuts that are closest to the optimum size for deer and grouse utilization.

For the Management Indicator Species (MIS) brook trout, habitat will be maintained in all alternatives. There will be an improvement to habitat in Alternatives B through D from converting areas along Dalrymple Creek to tree species less preferred by beaver as a food source. This will result in more streamside shade and help maintain the cooler water temperatures needed for brook trout. Alternatives B through D all result in about 10 percent of the stream being improved in this manner.

The primary difference between alternatives in forest vegetation composition is the amount of aspen that would be maintained in the project area. In Alternative A, aspen types remain at their current level. There is an increase in aspen in Alternatives B through D. Alternative B increases aspen types by about 1 percent. Alternatives C and D increase the aspen types by about 2 percent.

There are limited differences in the overall landscape pattern of the project area by alternative. When looking at the forested areas over 30 years old, interior to edge ratios remain fairly constant across the alternatives. In Alternatives C and D, which were designed to have larger patches (clearcuts) to increase interior forest, the interior to edge ratios remain about the same.

Visual quality in visually sensitive areas (retention and partial retention visual quality objectives) and in semi-primitive, motorized recreation settings will vary by alternative. Overall, management activities will be more noticeable in Alternatives B through D than in Alternative A. The most noticeable differences in Alternatives B through D relate to the amount of the visually sensitive areas that will be impacted by the project activities. In Alternative D, the amount of temporary openings in visually sensitive areas could exceed Forest Plan guidelines. In Alternative C, the amount of temporary openings in visually sensitive areas would not exceed Forest Plan guidelines, but, because of an increased size of individual openings in Alternative C, temporary openings in Alternative C would be more noticeable than the temporary openings in Alternative B.

Alternatives B and C keep the percent of aspen types in the 0-20 year age class closest to the desired 30 percent. Alternatives A and D could lead to a less evenly distributed amount of aspen production over time.

The revenue to cost ratio for timber harvest is about the same in all alternatives. Alternative D is not as efficient in the revenue/cost ratio as Alternatives B and C due to an increased amount of planting.

The needs for the transportation system are best met in Alternative B, although all the action alternatives move the road density in the project area and in the semi-primitive, motorized portions of the project area closer to the desired road densities.

2.8 Alternatives Considered but Eliminated from Detailed Study_

Several alternatives to the proposed action (Alternative B) were considered, but eliminated from detailed study and comparison.

One alternative considered was to increase the amount of aspen regeneration in the Squaw Creek Wildlife Area (see Special Management Area Map at end of this document) and to keep clearcut harvest unit size to about 10 acres for optimizing grouse habitat. The average size of all clearcuts and shelterwoods in the proposed action (Alternative B) is 26 acres. The average size of the clearcuts and shelterwoods within the Squaw Creek Wildlife Management Area is 21 acres. While the average sizes of the patches do not optimize grouse habitat, they are within a range that provides good habitat. Making the units smaller increases costs of design, layout, and administration of the harvest. Many of the mature aspen stands in the Squaw Creek area are adjacent to Forest Trail 128 which has a visual quality objective of partial retention. Forest Plan guidelines in partial retention areas call for no more than 7 % of the area being in temporary openings (seedling/sapling sized forest) at any one time (Forest Plan page IV-111). Because the trail bisects the Squaw Creek area, the total amount of clearcut and shelterwood harvest that could occur within the Squaw Creek Wildlife Management Area at any one

time is less than the 20-25 % that would be optimal for grouse management. This alternative was not developed in detail because Forest Plan visual management objectives could not be met.

Another alternative that was considered was to regenerate the mature aspen and paper birch along State Highway 70 by clearcutting. Highway 70 traverses the Park Falls land base and is considered to be a visually sensitive corridor (visual quality objective of retention) due to it being the main access road for most visitors to the Park Falls area of the National Forest. While clearcutting is not prohibited in retention areas by the existing Forest Plan, preliminary analysis indicated that clearcutting would not meet Forest Plan revision visual management guidelines. A broader issue of the amount of maturing aspen and paper birch along Highway 70, but outside this project area was also raised. Having large acreages of aspen and birch dieing off at about the same time along Highway 70 could be a substantial impact on visual quality and potentially more so than clearcutting small sections at a time. Rather than dealing with these issues in a piecemeal fashion, the clearcut units along Highway 70 within the project area have been eliminated from analysis at this time. Future plans to address these issues would be to look at the composition and visual quality needs along the entire Highway 70 corridor at a point prior to major decline in the maturing aspen and paper birch stands.

Another alternative that was considered included a proposal to increase the conifer vegetation component within the project area by treating aspen stands with prescriptions that would convert them to balsam fir or other mixes of conifer in order to provide the conifer vegetation structure and composition within aspen stands to address issues such as neo-tropical migrant songbird habitat. This alternative was not considered in detail for the following reasons. Many of the aspen stands have a conifer component (primarily balsam fir). Balsam fir and other conifers would be kept within these aspen stands by the inclusion of mitigation and harvest prescription measures identified in Table 2-2 of this Chapter. This would result in maintenance of the conifer component across the entire landscape within the project area in all alternatives. With these measures, the conifer component would be kept without type conversion treatments that would further reduce the aspen component rather than slightly increase it as stated in the purpose and need (see Chapter 1).

Comments were received that requested that burning be considered to regenerate paper birch rather than the use of mechanical site preparation. It was suggested that mechanical site preparation methods for paper birch regeneration may produce different results in understory vegetation composition. Fire is historically the action that created most of the paper birch on the landscape in the Park Falls area. Because of extensive logging in the 19th and early 20th century, and the extensive and sometimes severe slash fires that followed logging, paper birch was able to expand significantly beyond its normal ecological abundance to the extent we find it today. Today's forest is not harvested in the way it was harvested at the turn of the 20th century and fire is not a significant factor in the forested landscape. Fire, as a tool for paper birch regeneration, is problematic for several reasons: First, paper birch needs mineral soil for germination and more importantly successful seedling establishment. The conditions that produced optimal sites for paper birch to dominate were probably hot slash fires that burned off enough of the forest floor duff layer to expose mineral soil. The areas where paper birch is a significant component in the landscape today is probably where white pine and hemlock were historical significant components. Conifer type slash would be expected to produce hotter fires than slash dominated by hardwoods. It would be difficult to duplicate the kind of fire regime that resulted in the existing paper birch stands. Other issues related to use of prescribed fire on a large scale include safety, smoke production, and the ability for having ground conditions that would support a fire that would expose mineral soil and create conditions for successful paper birch regeneration. The District has used mechanical site preparation methods to successfully establish paper birch. For these reasons, an

alternative that uses prescribed fire as the site preparation method for paper birch regeneration was dropped from detailed consideration.