

Collaborative Forest Landscape Restoration Program Proposal

Sky Island Collaborative Forest Restoration Program

Pinaleno Ecosystem Restoration Project (PERP)

Coronado National Forest

Southeastern Arizona and Southwestern New Mexico



**Mt. Graham, Ariz. (Pinaleno Mtns) 1925. Alfred P. Jahn. Douglas-fir. Altitude about 9,500 ft.
USFS Photo Collection No. 194562**

The Coronado National Forest (Forest) is 1.7 million acres of land located in southeastern Arizona and southwestern New Mexico. The Forest consists of 12 different blocks of lands (Ecosystem Management Areas) that generally contain one or more discrete mountains that rise into the sky out of a “sea of desert.” The Forest has been conducting landscape-scale planning efforts to provide for restoration work for a number of years. This proposal presents restoration

plans for one of these ecosystem management areas or landscapes. This project has deep collaborative roots, strong science components, and provides for ecological sustainability in channel and upland systems including crucial benefits for rare, threatened, and endangered species. This project has been years in the making on a threatened and controversial landscape that has been the focus of attention for a long time. This landscape has been the focus of environmentalists, Native Tribes, rural communities and national and international scientific communities as a result of telescope development. The debate about the future of this landscape has played on while the vegetative communities have been attacked by forest insect outbreaks and catastrophic wildfires. The Forest has implemented demonstration thinning and forest health improvement projects in the PERP area in recent years to show what can management could do. A Draft Environmental Impact Statement (DEIS) for restoration work has been released and the Final Environmental Impact Statement (FEIS) and associated Record of Decision is awaiting a Biological Opinion from the U.S. Fish and Wildlife Service before being released. The FEIS clears the way to provide restoration treatments to a set of “keystone” acres of mixed-conifer forest that are accessible for treatment atop the mountain. Treatment of these acres is critical to allow prescribed fire and use of wildland fire (with resource benefit objectives, formerly fire use) to operate within the entire 186,000 acre landscape.

1. Proposed Treatment- Pinaleño Ecosystem Restoration Project (PERP)

The Pinaleño Mountains are a massive mountain range of over 300 square miles rising to nearly 11,000 feet in elevation from the surrounding semi-desert grasslands to the Forest’s only subalpine forest community. The Ecosystem Management Area contains 186,000 acres that have been analyzed for forest health restoration treatment needs. The mountain includes the largest number of ecological communities found in the southwestern United States. It is home to numerous rare wildlife and plant species including the endangered Mount Graham red squirrel (*Tamiasciurus hudsonicus grahamensis*) and the threatened Mexican Spotted Owl (*Strix occidentalis lucida*) (MSO).

Its highest point is Mount Graham (or *Dzil Nchaa Si’an* in Apache); that peak and the entire Pinaleño Ecosystem Management Area have been formally recognized as a Traditional Cultural Property important to the Western Apache tribe and has been determined eligible for listing on the National Register of Historic Places. Many other residents of southeastern Arizona also consider Mount Graham a special place. It was a historic source of timber and water and has long provided relief from summer heat. More recently, the mountain has been principally managed for its recreational and scenic values. It is also home to the Mount Graham International Observatory (MGIO); a three-telescope astrophysical facility which includes one of the largest binocular telescopes in the world. Conflicts between parties over development of the MGIO facility have been ongoing for years. However, a common recognition for the need to restore the Pinaleño ecosystem exists because the vegetative communities of this mountain have

been attacked by forest insect outbreaks and catastrophic wildfires. The highest elevations of Spruce-fir forest have been severely impacted by a wide-spread outbreak for spruce beetle. The mixed-conifer forest, while in a very threatened condition and status, still offers the opportunity to benefit from restoration treatments. Treating this zone of the mountain will also allow a comprehensive strategy to be adopted that will ultimately provide for natural fire regimes, reduced fuels, reduced catastrophic fire (and reduced suppression costs). While the total acres proposed for direct treatment under this proposal may seem modest, one must understand the topographical juxtaposition on this mountain range. The Pinaleno Mountains sit somewhat like a large pyramid with a rounded or flattened top. Majority of the mountain is too steep or remote and inaccessible to be mechanically treated but fortunately the old-growth Douglas-fir forest that is in critical need of restoration is located mostly on the portion of the pyramid that is rounded or flattened. Thus we propose to mechanically thin and restore these acres. These acres are also the most important in terms of wildlife values, cultural and historic values, etc. Once these acres are treated, prescribed fire and use of wildland fire (with resource benefit objectives) can be used to provide for long-term and landscape restoration and maintenance.

The Pinaleno Ecosystem Restoration Project (PERP) Environmental Impact Statement provides National Environmental Policy Act documentation to treat 5,754 acres over a 10-year period. Treatment of these “keystone” acres will allow prescribed fire and use of wildland fire (with resource benefit objectives) to operate across the entire 186,000 acre landscape as a long-term management strategy. All acres proposed for treatment are National Forest System lands. The project works toward reducing the risk of and increasing the resistance to wildfire, insect outbreaks, and disease on a set of “keystone” acres within the greater landscape context. The project has a primary purpose to protect and improve the long-term sustainability of the habitat for the endangered Mount Graham red squirrel. Since this remaining upper montane forest is key to the restoration on the entire mountain range, it must be treated first.

The PERP Draft Environmental Impact Statement has been released and the Final Environmental Impact Statement and Record of Decision are expected to be released in May or June 2010. The USDI Fish and Wildlife Service (FWS) and the Arizona Game and Fish Department (AGFD) were actively involved in the project design and provided biologists to the core interdisciplinary team. Treatments include overlapping activities such as thinning, prescribed fire, and other fuel reduction treatments aimed at providing hazard reduction for stand-replacing wildfire, the primary threat to the Mount Graham red squirrel. All large diameter tree components will be retained. Trees would be thinned using a forest restoration prescription over much of the area, applying variable density thinning, primarily from below, and leaving a structurally diverse, resilient old-growth forest. Treatments include both mechanical and hand felling of living and dead trees using ground and cable systems to remove much of the biomass. The residual will receive a follow up fuels treatment consisting of a mixture of broadcast and pile burning. Arizona Department of Corrections crews from two local prisons are used to thin the smaller

diameter trees and will continue to be utilized with the assistance of some force account crews. The Forest wants to complete the treatments of the larger trees under stewardship contracting. It is anticipated that the available biomass will generate new opportunities. Currently the material is an important source of fuel wood for nearby communities. Nearly 1000 acres of small-diameter tree thinning has been implemented on the landscape in order to demonstrate treatments and build confidence with the public.

Improvements and maintenance will occur on approximately 22.2 miles of haul road, and 3.7 miles of temporary roads will be constructed to transport removed material. The mountain was extensively logged in the early- and mid-twentieth century and many old logging roads still exist, with many converted to hiking trails. These old logging roads will serve as temporary roads in most instances. After operations are complete on the temporary roads, natural drainage features would be restored and roadbeds would be seeded. Roads used as trails would remain trails after operations.

Activity	Quantity
Silvicultural treatments (tree thinning) (acres)	3,016
Forest restoration prescriptions (acres)	2,155
Important wildlife area prescriptions (acres)	861
Fuel reduction treatments (acres)	3,705
Lop and scatter (acres)	3,092*
Hand cut, pile, and burn (acres)	1,741*
Masticate (acres)	461*
Underburn (acres)	2,642*
Hand cut < 6" d.b.h. trees, (acres)	1,740*
Prune (acres)	475*
Hand fell > 6" d.b.h. (removal)(acres)	1,038
Ground-based skid (acres)	1,256
Cable skid (acres)	77
Skyline yard (acres)	1,076
Tractor swing skid (acres)	228
Swing haul slash (tons)	1,514
Haul road improvements and maintenance (miles)	22.22
Temporary road construction (miles)	4.5
Swift Trail road maintenance (miles)	6.25

* These acres represent an acre of each treatment. Many of these treatments occur on the same actual acre. For example, a single acre may have pruning, lop and scatter and under burn treatments all prescribed. For this reason, the total number of treatment acres exceeds the total number of acres to receive fuels treatments in this table.

Collaboration has led to development of a significant monitoring program, especially in regards to rare, threatened and endangered species. The goal is to provide for adaptive management overtime. Success will be measured by the amount of reduction in catastrophic fire and insect outbreaks while maintaining or enhancing habitat for key species.

There is also a program underway to restore Gila Trout (a Federally-listed species) to some of the streams of the Pinaleño Mountains. A separate Environmental Assessment is in final preparation stages for this cooperative project with the Arizona Game and Fish Department, the U.S. Fish and Wildlife Service, and Trout Unlimited. The action is intended to provide for species recovery by eradicating existing populations of hybridized and non-native trout from three streams and two tributaries and to establish self-sustaining populations of Gila Trout.

2. Ecological Context- Pinaleño Ecosystem Restoration Project (PERP)



Mt. Graham, Pinaleño Mountains, A “sky island” rising to nearly 11,000 ft. in elevation.

The project will involve treatment of the mixed conifer community in the upper elevations of the Pinaleño Mountains. The mixed conifer areas mainly consist of Douglas-fir, southwestern white pine, ponderosa pine, corkbark fir, white fir, quaking aspen, and Engelmann spruce. Logging in the 1800’s primarily targeted the large old-growth Douglas-fir trees. This logging, combined with the cessation of the natural fire cycle (due to widespread livestock grazing and active fire suppression) led to the development of dense forest stands of small diameter trees. These dense stands of trees are often dominated by shade-tolerant species that are not fire-adapted.

Recent field observations of fuel loading and forest stand examinations indicate that the Pinaleño forest ecosystem is characterized by a large quantity of dead trees and a dense understory of small and medium sized trees. Based on an inventory of stands (see table below), the project area has a high average stand density index (SDI). SDI is an indicator of site occupancy by trees and is used as a measure of stress on trees in a given area (referred to as “stands”). When trees in a stand die from the stress of competition between individual trees for water, light, and nutrients, the stand is generally between 55 and 65 percent of maximum stand density. Individual tree health is best maintained when forest densities are below 35 percent of the maximum. The stands in the project area currently have a forest density averaging 73 percent of the maximum potential of a mixed-conifer forest.

Late-successional trees such as Engelmann spruce (*Picea engelmannii*), white fir (*Abies concolor*), and corkbark fir (*Abies lasiocarpa var. arizonica*) are now common in the understory, while many early successional tree species such as ponderosa pine (*Pinus ponderosa*) are dying in the overstory and not regenerating within the stands. The high stand densities within the mixed-conifer communities of the Pinaleño Mountains make the forest susceptible to further insect and disease outbreaks.

Forest stand averages of live and dead trees based on 214 stands within the project area.

Species	Basal Area Live Trees (ft ² /ac)	Stand Density Index	Average Live Tree Diameter (in)	Basal Area Dead Trees (ft ² /ac)	Average Dead Tree Diameter
White fir	31.9	64	10.6	5.2	15.4
Corkbark fir	13.3	30	7.1	5.5	11.5
Englemann spruce	18.2	37	10.3	3.6	13.9
Ponderosa pine	14.0	25	15.9	8.3	16.8
SW white pine	39.7	76	11.5	4.7	14.7
Aspen	17.0	38	8.8	3.5	11.4
Douglas-fir	82.1	153	14.6	13.5	22.4
Hardwoods*	2.1	12	5.4	0.3	5.1
Total	218.4	435	8.6	46.3	15.1

*Primarily locust, oak, and maple species.

Further, forest stand inventories show little or no regeneration of Douglas-fir (*Pseudotsuga menziesii*), a key old-growth tree species and a primary food source of the Mount Graham red squirrel. The data also reveal that a greater proportion of larger trees are dying, which represents a serious long-term trend of degrading old-growth forest characteristics. This loss is driven by stress from high stand densities, which were historically regulated by more frequent, mixed-severity wildfires in Southwestern mixed-conifer forest ecosystems.

The high stand densities and the amount of standing dead and down trees create a forest susceptible to uncharacteristic wildfire. In addition, insect activity and tree mortality have significantly increased in the Pinaleno Mountains in the past 2 decades. These insect outbreaks and the high-intensity fires that occurred have destroyed large areas of wildlife habitat, including critical habitat for the red squirrel and Mexican spotted owl. The fires increased the potential for soil erosion and flooding, diminished the scenic and recreational values of the forest, and damaged or destroyed public and private property.

By examining the fire history of the area before European settlement, one can better understand why the vegetation structure and composition of the project area are significantly different today. Tree-ring studies conducted show that widespread fires occurred frequently up until European settlement, but noticeably declined after. These studies also indicate that the forest consisted of stands of mixed-conifer species, primarily Douglas-fir, southwestern white pine (*Pinus strobiformis*), and ponderosa pine, with inclusions of lesser amounts of white fir, Engelmann spruce, and corkbark fir. The proposed project area historically experienced a frequent to mixed fire regime, with highly variable average fire return intervals, ranging from 3 to 60 years, depending largely upon each fire's location on the landscape. The result was a complex and highly diverse landscape with a mosaic of varying vegetation patterns. Fire created more openings and aspen groves, reduced the occurrence of fire-sensitive species, removed younger age classes of trees, and minimized the accumulation of dead trees on the forest floor. Fires tended to confine Engelmann spruce and corkbark fir to riparian areas, to moist pockets of mixed-conifer stands, and the highest elevations of the mountain.

Site-specific tree-ring data studies conducted in the Pinaleno Mountains indicate that the last widespread fires on the mountain occurred in 1879, and concluded that recent fire suppression had resulted in a current fuels buildup that is unprecedented for more than 500 years. From these studies and the data collected it can be concluded that far-reaching changes have occurred in forest stand densities, tree age-class distributions (shifts to smaller and younger trees), and in species composition of stands (shifts from fire-tolerant to fire-intolerant species).

Progressive insect infestations in 1996 began defoliating and killing trees in the spruce-fir and mixed conifer forests. In 1996 and 2004, large wildfires burned with active crown-consuming flames and directly reduced red squirrel population numbers through habitat loss and mortality. Population numbers of the red squirrel are at their lowest since censuses of the population began, and viability of the species is of paramount concern. The mixed conifer forest is now the primary remaining habitat for the red squirrel. Successful restoration of the mixed conifer forests is key to the persistence of the species, protecting the remaining old-growth character of the forest, building resilience to future events, and to protecting watersheds and other intrinsic values.

Vegetation treatments would include implementation of 59 different combinations. These combinations follow two general treatment strategies referred to as either "important wildlife areas" or "forest restoration" dependent upon their location within the landscape. The important

wildlife area treatment strategy is proposed in areas that contain currently unoccupied or disappeared Mount Graham red squirrel middens, Mexican spotted owl core areas, or both. This strategy is also designed to initiate forest restoration and to protect and restore degraded red squirrel habitats. Occupied Mount Graham red squirrel midden sites would not be treated.

Forest restoration treatments occur outside of known Mount Graham red squirrel midden areas and Mexican Spotted Owl core areas. In these places surrounding important wildlife areas and midden protection zones, more aggressive treatments are allowed to restore forest conditions and to create future Mount Graham red squirrel habitat.

During the project planning process, general prescriptions were first developed for the two treatment areas. After consideration of stand data, continued tree mortality from insects and wildfires, access, and other resource concerns, the general treatment prescriptions for some units were modified. Treatments were organized into three components: silvicultural treatments, fuels treatments, and removal methods. Forest restoration area treatment prescriptions would utilize a combination of variable density thinning, thinning from below, and group selection with an 18-inch-maximum-cut diameter limit and a minimum 150 ft² per acre basal area stand-stocking level target. The thinning treatments would create forest stands that are very diverse in structure and stocking level.

Important wildlife treatments combine variable density thinning, thinning from below, and group selection. These treatments stay within a 9-inch maximum diameter cut limit and a 170 ft² basal area minimum stand stocking level target. The thinning treatments would create forest stands that are diverse in structure and stocking level, but not to the same extent as stands created by the forest restoration treatments.

A system to transport removed material would be needed to accomplish project objectives. Road improvement work needed for removing and treating timber stands would include constructing temporary roads and rehabilitating the roads after use, clearing encroaching vegetation on system roads, opening and using closed-system roads (re-closing them after use), improving system roads where needed, and maintaining system roads.

All PERP activities include resource-specific design criteria that guide implementation to minimize or reduce anticipated negative effects. The project would be implemented over 10 years following a schedule that focuses treatments in areas that will protect select occupied red squirrel habitat and then treats areas of restoration away from currently occupied habitat. This strategy will allow pre- and post-treatment monitoring in units around occupied habitat before additional units are implemented. This strategy will enable resource managers to adapt implementation based upon information derived from project monitoring.

Invasion of exotic plant species has not been a significant problem in the upper montane portions of the mountain where the project is planned but mitigation measures are in place to prevent introduction of exotic species by equipment contracted or otherwise used in the project. The

Forest has an environmental assessment completed that provides for integrated treatment of invasive or noxious plant species (including herbicide use). There are some exotic insect and animals that are of special concern and will be monitored as a part of the project implementation.

Watershed considerations are a major factor for this landscape. The project area supports the flow of roughly half of all the perennial stream miles within the Willcox Playa watershed, a major contribution to the area in which Forest occupies only 16% of the watershed. Three streams, Post Creek, Grant Creek, and Ash Creek are eligible for Wild and Scenic River designation. These eligible acres represent nearly 20% of all the stream miles eligible on the Forest. Domestic water use occurs from several sources within the area including Grant Creek, Columbine Spring, Ash Creek Spring, and Riggs Flat Spring. Potential effects of wildfire to runoff and sedimentation of streams is orders of magnitude greater than effects of roads and harvest, and well outside the range of pre-burn conditions. Greatly accelerated erosion has been observed in recent wildfires, effecting soil and watershed conditions, and consequently water quality and channel morphology. Lots of downstream sedimentation, riparian area damage, property damage and channel degradation has occurred from these catastrophic wildfires. Channel habitat characteristics can change dramatically when watersheds are not stable. Observations in two area drainages (Marijilda Creek and Frye Creek) are that after severe wildfire events the width to depth ratio changed from 5.4:1 to 12.4:1 and 4:1 to 7.4:1 respectively. Substrate and bank stability changed dramatically as bedrock and cobble channel composition was filled in and covered up by fine material and nearly all herbaceous growth was scoured away.

Restoration treatments will provide watershed enhancement and protection not only within the treated areas but across the landscape and into downstream areas outside National Forest lands. Special attention to implementing best management practices will be used during all aspects of treatment both mechanical treatments and prescribed fire. In the case of prescribed fire, practices will include including constructing water bars in fire lines, reducing fuel loading in drainage channels before burning, maintaining the integrity of the streamside management zones, and planning for sufficient ground cover retention to prevent accelerated erosion of slopes following burning. Where mechanical treatments are used, soil and channel stability will be maintained or improved by sub-soiling or scarifying skid trails and landings where soils are compacted, and cross draining or re-contouring to stabilize skid trails after operations are complete. Skid trails would be rehabilitated and blocked with cull logs or trees, large rocks, or re-contoured where effective to prevent motorized travel after operations are complete. In addition, old logging roads with current erosion problems will be stabilized or rehabilitated and will be closed after being used.

3. Collaboration- Pinaleño Ecosystem Restoration Project (PERP)

Collaboration has been a major component of the project. The project itself is a product of previous extensive partnerships and it has generated increased cooperation on other restoration fronts for the Pinaleños. Collaboration concentrated on three arenas: recovery needs of the Mount Graham red squirrel, restoration of the overall Pinaleño ecosystem, and expanding understanding of the disturbance dynamics of the upper montane forests. Since 1996 the Forest has been implementing the Pinaleño Ecosystem Management (PEM) project. This was a 1,000 acre thinning project intended to illustrate and demonstrate active small diameter thinning and management on the mountain. This project was successfully implemented and has been widely accepted. The PERP project will build off of this effort and will use more complex treatments to provide for more customized and robust restoration work.

The Forest invited stakeholders into the planning process beginning in 2004. Local user and interest groups, cabin owners, and the Forest-wide NEPA mailing list were asked for input. Based on responses from this input, a biological working group made up of conservation organizations, agency personnel from the Arizona Game and Fish Department (AGFD), USDI Fish and Wildlife Service, University of Arizona (UA) Scientists, and the USDA Forest Service were developed. These parties provided insights and shared their scientific knowledge on historical fire regimes, potential strategies to initiate restoration of the forested ecosystems, and how best to protect the habitat of the red squirrel. This group eventually became the Pinaleño Science Collaborators and is currently coordinated by the AGFD.

The Pinaleño Partnership, a community collaboration group, is composed of members of environmental organizations, local community interests and leaders, and representatives of the Western Apache Tribes, was formed in 2006. Its goal is to further ecological restoration on the mountain, promote public understanding, and enlist involvement in restoration activities. This group has been interested in utilization of restoration by-products as a means of engaging the public in restoration and economic opportunities that it might represent. Partnership members intend to promote small businesses as material becomes available. The Pinaleño Partnership was awarded a National Forest Foundation grant, has a coordinator, maintains a website, and has expressed interest in helping with multi-party monitoring. As a result of the extensive collaboration and coordination the PERP DEIS generated little controversy and less than 20 comments, most of which were positive or supportive.

Directly involved science partners include the Rocky Mountain Research Station and the UA Laboratory for Tree Ring Research and the UA School of Natural Resources and the Environment, Southwestern Region Remote Sensing Program, Remote Sensing Applications Center, and the Forest Health Arizona Zone Office. The project maintains a synergistic relationship with the Pinaleño Demographic and the Pinaleño LiDAR projects. The

demographic study intends to increase understanding of how multiple disturbance events (fire, insect outbreaks, and climate variability) interact in space and time, and how they combine to influence forest species composition, spatial structure, and tree population dynamics in the upper montane forests of the Pinaleno Mountains. The LiDAR project is an effort to use new technologies to develop detailed forest structure maps across the rugged landscape to assist with both project implementation and project monitoring. This emerging science database is accessible to the entire research community and collaboration is resulting in its refinement and uses for management and monitoring. A detailed agreement for collaboration on monitoring of the Mount Graham red squirrel is in place with the UA School of Natural Resources and the Environment. This agreement has provided for baseline pretreatment monitoring, including radio telemetry work that will continue to monitor the project and assist with adaptive management.

In 2005 the Graham County Community Wildfire Protection Plan was developed. This plan incorporates the PERP area within it, classifies it as Wildland Urban Interface (WUI) at high risk because of the condition class of the vegetation and fuels and because of the important watersheds it contains, summer cabins, communications facilities and other infrastructure.

4. Wildfire- Pinaleno Ecosystem Restoration Project (PERP)

Existing forest conditions have led to large wildfires that burned with active crown-consuming fire, reduced Mount Graham red squirrel numbers through habitat loss and direct mortality, and cost millions of dollars for suppression and rehabilitation. The 1996 Clark Peak fire (6,700 acres) cost approximately \$8.1 million to suppress and rehabilitate while the 2004 Nuttall/Gibson Wildfire Complex (29,400 acres) cost approximately \$13.1 million to suppress and rehabilitate. Investing money now to provide for long-term forest and fire restorations on 186,000 acres is prudent and cost effective.

Fire behavior analysis for PERP included modeling to evaluate the existing potential for fire line intensity, crown fire, and relative hazard rating for the proposed project area under high fire danger (90th percentile) weather conditions. Based on this assessment, approximately 90 percent of the proposed treatment area could generate flame lengths over four feet. Most notable is that about 79 percent of the project area could generate high-intensity fire (greater than 11-foot flame lengths). About 85 percent of the area is susceptible to passive or active crown fire. This means indirect suppression strategies would need to be employed for most of the area until further treatment is completed. Conditions like these will result in large acreages being burned in a stand replacing or catastrophic manner and significant adverse effects on resources in general.

Modeled potential fire behavior after treatments are summarized in the tables below. Under post-treatment conditions, about 43% of the area would exhibit flame lengths less than 4 feet.

There would be a 46% reduction in high surface fire flame lengths. Passive and active crown fire would be reduced by 28%. Proposed treatments would help restore fuel conditions that facilitate low-intensity prescribed fire and increase opportunities to use of wildland fire (with resource benefit objectives). Detailed color maps showing pre and post project mapping of fire conditions and behavior are available in the PERP summary document posted at the website listed towards then end of this proposal.

Potential flame length (fire line intensity) pre vs. post treatment.

Flame Length	Fire Line Intensity Hazard Rating	Pre-treatment		Post-treatment	
		Acres	Percent	Acres	Percent
< 4 feet	Low	600	10%	2491	43%
4.1 – 8 feet	Low to Moderate	343	6%	1074	19%
8.1 – 11 feet	Moderate	280	5%	271	5%
> 11 feet	High	4528	79%	1915	33%
Total		5751	100%	5791	100%

Potential fire type pre vs. post treatment.

Fire type	Pre-treatment		Post-treatment	
	Acres	Percent	Acres	Percent
Surface Fire	875	15%	2499	43%
Passive Crown Fire	4141	72%	3081	53%
Active Crown Fire	735	13%	234	4%
Total	5751	100%	5751	100%

The Forest Plan provides for use of wildland fire (with resource benefit objectives) and the Forest has a proven record and ability of using it successfully for resource benefit objectives. Present conditions of the PERP area do not allow practical application of the use of wildland fire (with resource benefits) on majority of the Pinaleno landscape. Initial mechanical treatments are necessary to reduce ladder fuels, open the canopy, and reduce overall fuel loadings. Once these initial treatments are completed, prescribed fire and unplanned natural ignitions may be managed more safely and within the fire behavior thresholds that would be expected under natural fire

regime conditions. Ultimately, the Forest intends to use prescribed fire and use of wildland fire (with resource benefit objectives) as the dominant treatment methods on the entire 186,000 acre landscape once PERP has been implemented. The current policy of managing fires for multiple objectives (protection and resource benefit) will make this process possible, as some areas will need to be managed differently due to the complexity of the landscape including topography, vegetation, and values at risk.

The following table shows the distribution of vegetation types across the Pinaleño landscape. Prescribed fire has limited current application because of the extreme conditions, primarily in the coniferous forest types. PERP would provide for treatment of critical portions of the coniferous type so that both prescribed fire and use of wildland fire (with resource benefit objectives) can be used as appropriate across the larger landscape. In recent years more than 250,000 acres have experienced wildfire with varying degrees of severity. Fortunately, majority of the area proposed for treatment by PERP has not burned severely because of costly and intensive suppression efforts. Suppression is a short-term strategy that will ultimately fail on this landscape.

Pinaleño EMA – Distribution of Vegetation Types, Ecological Zones, NFDRS and FBPS Fuel Models, and Fuel Loadings (based on the GIS generated acres, 1986 Forest Plan).

Vegetation Type	Ecological Zones	Fire Danger Rating Fuel Models	Fire Behavior Prediction Fuel Model	Acres	Percentage	Tons/Acre
Mountain Meadow	Grassland	L	1	129	<1	0-1.0
Desert Grassland	Grassland	A	1	78,728	40	0-1.0
Deciduous Riparian	Woodland	P	9	1,299	<1	1.1-5.0
Coniferous Woodland	Woodland	L/F*	1/6*	1,701	<1	1.1-5.0
Coniferous Transition	Ponderosa Pine	U/G*	9/10*	21,926	11	18.0-25.0
Coniferous M-Conifer	Mixed Conifer	G	10	21,138	11	40.1-50.0
Coniferous Spruce Fir	Spruce-Fir	G	10	2,370	1	50.1-55.0
Coniferous Riparian	Woodland	P	9	104	<1	1.1-5.0
Broadleaf Woodland	Woodland	L/F*	1/6*	71,506	36	1.1-1.5

*Dependant upon tree density and fuel loading.

The Graham County Community Wildfire Protection Plan defines the Wildland Urban Interface (WUI) of the at-risk communities located in Graham County. Mount Graham, which includes the PERP area was identified as a high risk area. The risk analysis incorporates the current condition class, hazardous fuels, risk of ignition, fire occurrence, and the at-risk community

values. Based on the community hazard assessment conducted, Mount Graham is considered a top priority for reduction of hazardous fuels. Implementation of PERP will not only compliment adjacent projects on non-federal lands, but also improve the ability to obtain funding for those projects.

5. Utilization- Pinaleno Ecosystem Restoration Project (PERP)

Removal volumes:	
Sawlogs (CCF)	10,451
ES house logs (CCF)	502
Small round wood (CCF)	10,249
Chips (tons)	14,333
Estimated Treatment Costs(\$)	8,337,000
Estimated Revenues (\$)	231,000

The PERP Final EIS analyzed the costs and potential outputs of biomass and other potential products. The table on the left reflects the potential outputs. The costs reflect the current lack of local markets, the low values of the material being removed and the general weakness in the overall forest products markets. Most of the material currently being

removed from the mountain is utilized for personal use firewood and pole timber. The closest sawmill is located in Cutter, Arizona, approximately 80 miles away on the San Carlos Apache Indian Reservation. This mill mostly processes ponderosa pine rather than the species that will be available from PERP. The Forest wants to continue to work with the mill to evaluate opportunities for material usage. Majority of PERP material will be mainly suitable for firewood however this can be economically and culturally import to the numerous local communities. Since trees up to 18 inches in diameter will be available it is likely that this material will become of interest and use as material becomes available. The 10-year length of the project also lends itself to developing a local small-log and fuelwood facilities and would maximize product values.

The Forest has also worked with the University of Arizona on a mobile biomass pyrolysis project which may offer a higher tech opportunity to develop an array of products from biomass processing. The City of Safford also operates its own power generation facility and potentially could utilize biomass. The large copper mining operations in the area are another possible market for using biomass to assist with soils improvement and stabilization and water amelioration and filtering products and could be a low capital means of accomplishing utilization.

6. Investments- Pinaleno Ecosystem Restoration Project (PERP)

Utilization of the Arizona Department of Corrections manpower training program figures significantly in the project. The program would be expanded to help meet PERP needs. This arrangement reduces the costs to the State and provides opportunity and incentives to the low-risk inmates.

Investment by the Forest will be high given the high fuel load volumes that require treatment and the difficulty in operating in this mountainous terrain. The values at risk are also high given that this is the southernmost expanse of these forest types in the country. Once the upper montane forest can be treated successfully, restoration of the entire mountain through increased use of prescribed fire and use of wildland fire (with resource benefit objectives) becomes feasible. Additionally the cost of managing wildland fires will go down considerably if fire behavior is within acceptable levels and these fires can be used primarily for resource benefit objectives.

Based on the economic analysis in the PERP Final EIS, treatments costs will average \$1,300 per acre. If prison crews are used and haul costs are absorbed within a utilization application, it will average \$400 per acre more if hand piling and/or air curtain burning is required. Without prison crew labor an additional \$300 per acre or more should be expected. Investment by the government will be much lower if prison crews are used for the smaller material and a biomass utilization effort is successful. The Forest has a long-history of collaboration with the State to utilize department of corrections forestry crews to implement restoration projects and would like to expand and continue this effort if funding allows.

The project offers opportunities for both for profit and non-profit sectors given the interest in restoration and improved forest sustainability leading to both jobs and skills development. As material becomes available it is anticipated that additional public and private sector efforts will occur on the utilization of material. These efforts should increase both public and private sector employment.

7. Funding Estimate- Pinaleño Ecosystem Restoration Project (PERP)

Pinaleño Ecosystem Restoration Project	
Fiscal Year 2011-2019 Funding Type (annual)	Dollars/Value Planned
FY 2011-19 Funding for Implementation (per year)	\$833,700
FY 2011-19 Funding for Monitoring (per year)	\$96,000
1. USFS Appropriated Funds (per year)	\$464,850
2. USFS Permanent & Trust Funds	
3. Partnership Funds	
4. Partnership In-Kind Services Value	
5. Estimated Forest Product Value (per year)	\$23,000
6. Other (specify)	
FY 2011-19 Total (total of 1-6 above for matching CFLRP request) (per year)	\$487,850
FY 2011-19 CFLRP request (must be equal to or less than above total) (per year)	\$464,850
Funding off NFS lands associated with proposal in FY 2010 (does not count toward funding match from the Collaborative Forested Landscape Restoration Fund)	
Fiscal Year 2011-19 Funding Type	Dollars Planned
USDI BLM Funds	some adjacency potential
USDI (other) Funds	none
Other Public Funding	potential
Private Funding	potential

8. Funding Plan- Pinaleño Ecosystem Restoration Project (PERP)**Planning**

The Pinaleno FEIS is complete. The Record of Decision is expected to be signed in June 2010.

Implementation

Total annual funding requested is \$929,700 with \$464,850 from CFLR Act funds and \$464,850 from regional and forest funding.

Distribution of Regional/Forest Funding

NFVW	30%	\$139,455
NFTM	10%	\$ 46,485
WFHF	55%	\$255,668
NFWF	5%	\$ 23,242

Assumptions

The FY 2010 Final Budget is assumed to be the base level for funding. All appropriate matching funds to CFLRA would come from the Forest's adjusted base budget allocations.

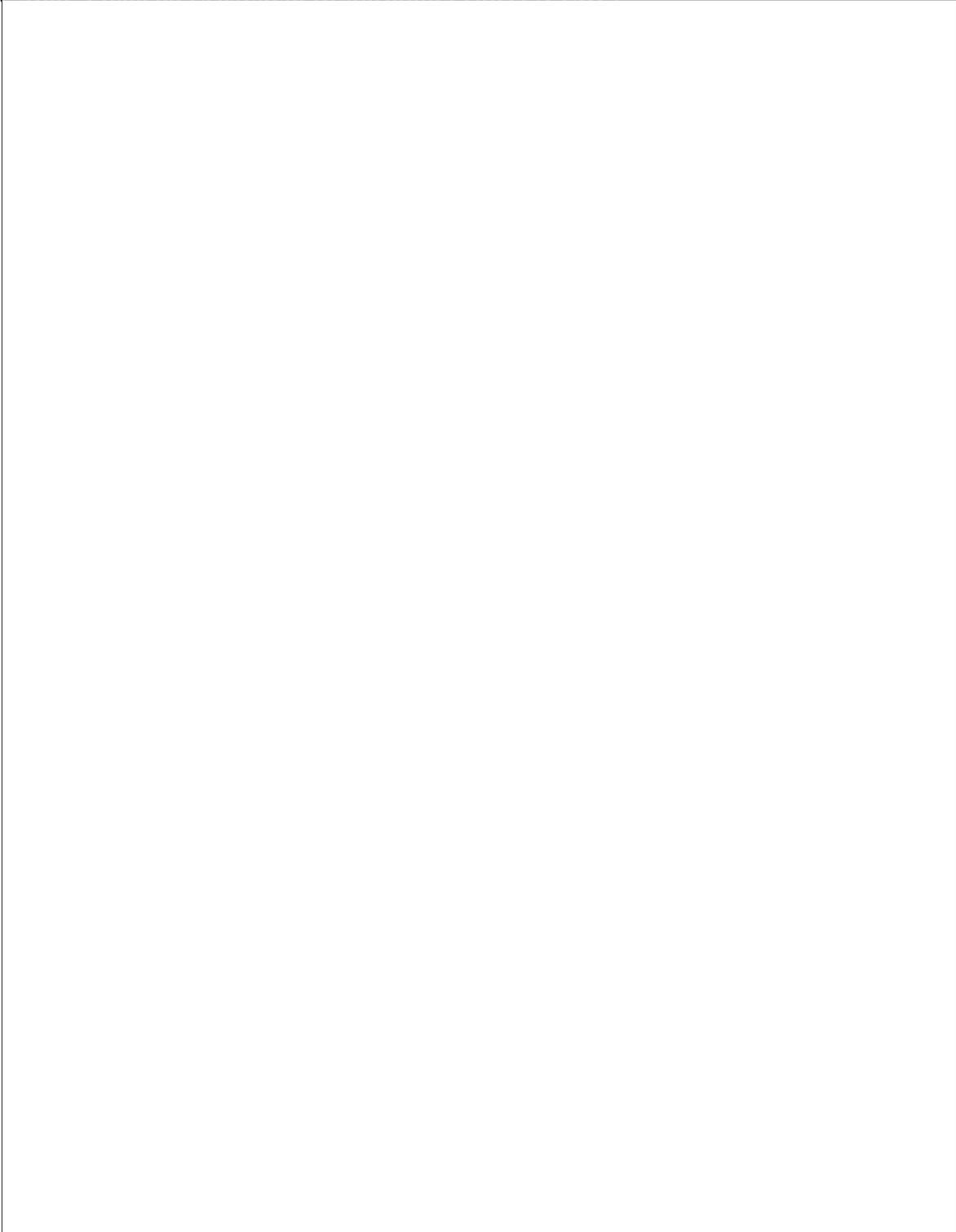
Logistical support for advanced harvest systems would be led by the Arizona Zone Forest Operations specialist.

The Piñaleno project will increase regional accomplishments. Timber, Wildlife, and Watershed accomplishments will ramp-up. It is assumed that the region would receive increased base funding at some fraction of the current per unit cost rate.

9. USDI Funding- Not Applicable

10. Other Funding- Grant applications would be made to sources such as the Arizona Game & Fish Habitat Partnership Committee Funds and Secure Rural Schools RAC Funds. Based on past history this project would be a priority project.

11. Man- Pinaleno Ecosystem Restoration Project (PERP)



12. Landscape Strategy- Pinalaño Ecosystem Restoration Project (PERP)

The CLFRP Proposal and the Landscape Strategy documents can be found at the following website: <http://www.fs.fed.us/r3/coronado/perp/perp-deis.shtml>

"The Final Environmental Impact Statement which analyzes the effects of implementing the PERP Proposal is also available at website mentioned above. The FEIS document contains detailed information on existing and desired conditions and site-specific reference information.