

Collaborative Forest Landscape Restoration

2011 Proposal: Sage Steppe and Dry-Forest Restoration on the Modoc Plateau, Northeastern California and Western Nevada

Modoc National Forest



Contents

Executive Summary.....	1
Ecological, Social, and Economic Context.....	2
Summary of Landscape Strategy	5
Proposed Treatment.....	6
Collaboration and Multiparty Monitoring	11
Utilization	15
Benefits to Local Economies	17
Funding Plan.....	20
Attachment A - Table of Projected Accomplishments	A-1
Attachment B – Results – “Cost Savings” of the R-CAT Spreadsheet.....	B-1
Attachment C - Members of the Collaborative.....	C-1
Attachment D – Letter of Commitment	D-1
Attachment E – TREAT Spreadsheet	E-1
Attachment F-Funding Estimates	F-1
Attachment G – Map of Project Area	G-1

Executive Summary

Dominant vegetation types: sage steppe and dry forests

Total acreage of the landscape: 2,022,511 acres (6.5 million acres with all partners included)

Total acres to receive treatment: 297,205 acres on the Modoc National Forest

Total number of NEPA-ready acres: 25,681

Total number of acres in the NEPA process: 53,321 (see Proposed Treatment section)

The most significant restoration needs and actions on the landscape are to (1) restore sage steppe ecosystems by removing junipers that have encroached since European settlement, and (2) treat dry forests to restore and maintain ecologically appropriate vegetation structure and diversity.

The highest-priority desired outcomes of the project at the end of the 10-year period are to (1) treat sage steppe and dry-forest habitat in support of various collaborative efforts, (2) restore vegetation conditions that facilitate natural processes and allow reintroduction of fire to maintain ecosystems over time, and (3) develop resilient and adaptable vegetation mosaics that are able to withstand environmental changes and disturbances

Biomass and sawtimber are the most significant utilization opportunities expected from implementation of the various restoration activities. Biomass would be used for power generation, fuelwood pellets, or both. Long-term stewardship contracts would result in a substantial and predictable stream of forest by-products available to industry, which would encourage development of closer markets. The forest is working with partners and industry to establish a local biomass power plant or portable fuelwood pellet mill(s).

We are coordinating with the Shasta-Trinity NF and plan to expand this effort to include the Fremont-Winema NF in the future. Thirteen collaborators and numerous partners are working on this project with the Modoc NF: Indian tribes, federal agencies, state agencies, universities, county governments, nongovernmental organizations, and local landowners.

This project would create new jobs in green energy production and on restoration crews. We estimate the net value of restoration between \$606 and \$1,402 per acre (based on values from the Oregon Forest Resources Institute 2006). Additional community benefits would accrue from proactive enhancement of sage-grouse habitat (a USFWS candidate species) and range allotments. We expect project benefits to significantly exceed costs over the life of the project.

Total dollar amount requested in FY11: \$1,614,715

Total dollar amount requested for the life of the project: \$16,717,785

Total dollar amount provided as Forest Service match in FY 11: \$3,142,090

Total dollar amount provided as Forest Service match for the life of the project: \$25,376,890

Total dollar amount provided in partnership match in FY 11: \$135,000

Total dollar amount provided in partnership match for the life of the project: \$1,800,000

Total in-kind amount provided in partnership match in FY 11: \$1,345,571

Total in-kind amount provided in partnership match for the life of the project: \$2,545,571

Time frame for the project from start to finish: 2008 to 2025 (includes post-project monitoring for five years)

Ecological, Social, and Economic Context

This proposal describes a 10-year, landscape-level restoration strategy for the sage steppe and dry-forest ecosystems on and adjacent to the Modoc National Forest. Northeastern California and northwestern Nevada contain a variety of habitats for unique plants, wildlife, and fish. Nestled in northeastern California, the Modoc National Forest is a land of ecological contrasts, including vast stands of sagebrush intermixed with coniferous forests, ephemeral wetlands, lava flows, and high-desert plateaus. These features are highlighted in the Modoc Plateau, Medicine Lake Highlands, and Warner Mountain ecoregions. Vernal pools on the Modoc Plateau provide habitat for two federally listed annual grass species, as well as five Region 5 sensitive plant species. Sagebrush areas provide habitat for five endemic sensitive plant species, as well as one of only two known occurrences of a candidate plant species for federal listing. Geologically, the Modoc NF is unique in the world for its obsidian sources, which have added to the rich prehistoric and settlement history. The vastness and remoteness of the Modoc and expansive adjacent ranches create a penetrating solitude that is valued by both locals and visitors, while continuing the cultural heritage of this place.

The Sage Steppe/Dry-Forest Restoration Project is contained within the 6.5 million-acre focus area (figure 1, below). This area includes portions of four national forests, three Bureau of Land Management (BLM) field office lands, two US Fish and Wildlife Service national wildlife refuges, tribal lands, and private lands. The Modoc NF is a mostly contiguous area flanked by BLM, private and tribal lands.

The objective of the Sage Steppe/Dry Forest Project is to treat landscapes regardless of ownership in a holistic fashion. Accordingly, the Modoc National Forest has engaged many partners in all phases of planning, implementation, and monitoring; see Section 4, Collaboration and Multi-party monitoring, as well as attachment C, for a listing of them.

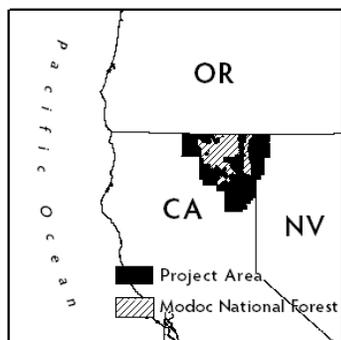


Figure 1. Location of Project

The Modoc Plateau, a dominant feature on the Modoc National Forest, is a large, high-desert plateau that contains dry-forest pine stands, juniper woodlands, as well as sage steppe habitats; this landscape is home to sensitive plants found only here and several focus fish and wildlife species. The Modoc National Forest is a blend of coniferous forest and sagebrush stands that reflect the subtle changes of aspect, slope, and site. Historic landscape vegetation patterns in the sage steppe habitats consisted of a mosaic of big and low sagebrush, grasslands, and western juniper. Historically, low-

intensity, fire-controlled seedling numbers and growth promoted fire-tolerant species and maintained a variety of forest conditions, such that the historic forest included a higher proportion of low-density stands of trees than exists today. Fires naturally reduced accumulating fuels from leaves, branches and needles, and maintained wildlife habitat for species that require an open stand structure. Forest stands that had fewer trees likely had higher general vigor and were less susceptible to attack from insects during dry summers, especially during sustained drought.

Within the Modoc National Forest project landscape, there exists close to 785,000 acres of sage steppe ecosystem, of which approximately 240,000 acres are threatened by varying stages of juniper encroachment (sources: Sage Steppe Ecosystem FEIS, R5 Remote Sensing Lab's existing vegetation data layer). Approximately 200,000 of 888,216 acres of the dry forest within the Modoc National Forest project landscape are at significant risk of volume loss due to pests and disease over the next 15 years (sources: Forest Health Monitoring Division of the R5 Remote Sensing Lab's pest and

disease risk data, R5 Remote Sensing Lab's existing vegetation data layer, Sage Steppe Ecosystem FEIS).

During the past 150 years human influences—livestock grazing, timber management, introduction of nonnative invasive species, and fire suppression—have altered natural conditions. The Modoc Plateau is a landscape whose historical plant communities were created and maintained by fire; the absence of wildfire over the last 100 years has subsequently degraded natural plant community composition and function. This has resulted in widespread juniper encroachment into sage steppe communities and significantly increased fuel loads in the dry forest. Dr. Miller of Oregon State University and others found a 75 percent reduction in the shrub understory once juniper canopy exceeded 30 percent.

In both cases, understory vegetation has been adversely affected and natural processes have been altered. In the past, low-intensity fires promoted growth of fire-resistant species and more open stands of trees and shrubs. These stands were more resilient to disturbances, and provided habitat for wildlife, fish, and plant species that evolved in the area.

Invasion by nonnative plants, including annual invasive grasses such as cheatgrass and medusahead, as well as other noxious weeds including dyer's woad, Scotch thistle, Canada thistle, Mediterranean sage, Dalmatian toadflax, spotted knapweed, hoary cress, crupina, and Klamathweed, has severely degraded portions of the Modoc Plateau. Many of these species increase dramatically following fire, and annual invasive grasses can even alter fire regimes due to their high flammability and early-season production and drying. Presence of these invasive species also reduces wildlife habitat quality by replacing valuable forage plants.

Scientific models predicting the effects of climate change indicate that dry forests may experience warmer, drier summers and warmer winters. It is also predicted that precipitation patterns will change, with the snow line becoming higher and less precipitation falling as snow. Summers are likely to be drier than they are currently. Historic temperature and precipitation data reflect these trends locally.

There is also a reduction in hydrologic values due to reduction of ground cover and increases in erosion caused by increased juniper density. Some of the streams in the project area are impaired by excess sediment and runoff that cause physical stream channel changes, which in turn increase water temperatures and decrease fish habitat quality.

Wildlife species have experienced subsequent changes in distribution and abundance with the changes in vegetation patterns. Sage grouse and antelope, historically an integral part of sage steppe habitats, have decreased. Thousands of greater sage-grouse, a Forest Service sensitive and USFWS candidate species, occupied the Devil's Garden Plateau until a major decline occurred, which appears to have begun in the 1950's. According to the Devil's Garden-Clear Lake Sage-grouse Working Group, increases in juniper density are the primary factor in the decrease in the amount and quality of greater sage-grouse habitat. Similarly, pronghorn antelope habitat also appears to be affected in part by juniper encroachment, as well as the expansion of noxious weeds and exotic annual grasses. There has been a similar decrease in the amount of potential mule deer and elk foraging opportunities with the increase in overstory coniferous canopy cover. In addition, there is a need for recruitment of large-diameter pines to provide habitats for species such as bald eagle, another Forest Service sensitive species.

Consequently, we anticipate that future wildland fires would begin to exhibit augmented fire intensity and severity characteristics that increase risk and exposure to firefighters and the public, jeopardize resource values, and increase fire management costs.

Modoc County is consistently in the lowest 20 percent of California counties in median household income, per capita income, and other recognized indicators of economic status. Unemployment and percentage in poverty are constantly much higher than the state average. The population is stagnant and total employment has declined for ten years. The population is growing older as younger citizens leave the county to find employment. The total employment number is below that of the year 2000.

The county is poorly located to compete for the relocation of existing and expanding businesses. Biomass related industry is the county's best hope for creating jobs and increasing tax revenues. It would allow for the use of a renewable resource without having to address the drawbacks of producing a product that must be shipped a long distance to market.

Biomass would have a two-fold direct benefit to the local economy. Jobs would be created both for the operation of the facility(ies), as well as employment generated with the production and transporting of the wood chips. There would be additional property taxes generated with the installation of the power plant.

Perhaps of equal importance to the local economy would be the indirect impact from the major improvement to land health from the treatments that produce the biomass. Grazing on the Modoc National Forest is a key component in the private sector of the county economy. Densification of western juniper in the sage steppe ecosystem is having a significant impact on forage production available for livestock. Treatments done under the CFLR project would have significant benefits for sage-grouse and other sage steppe-dependent species. Enhancement of this habitat would not only provide for these species, but also help maintain grazing at viable levels.

Six Indian tribes have relevant interests in the proposed project: the Ft. Bidwell Indian Community, Cedarville Rancheria, Alturas Rancheria, Susanville Rancheria, Klamath Tribes, and Pit River Tribe. The following are projects that take place in participating agreements with these various tribes: noxious weed control, native tobacco restoration, fuels reduction, and watershed restoration. These projects would be addressed within the scope of the sage steppe restoration efforts because the tribes want improvements on Forest Service land adjacent to tribal lands. In addition, the proposed project area would possibly create a job training or employment opportunity for tribal members.

While much reduced from levels of the past, mule deer and pronghorn hunting is still an important component of the local economy. Most biologists agree that habitat reduction caused by the increased density of western juniper is a major cause for the substantial reduction in area herds. The treatments that produce a biomass waste stream would make substantial improvements to big-game habitat. CFLR also proposes treatments, both in the sage steppe and timberlands, that would enhance the burgeoning Rocky Mountain Elk population. This could also become a mainstay of local commerce.

The CFLR planning area is ringed with several biomass power plants. However sales of wood chips for these plants were already problematic, even before the recent spike in diesel fuel prices. CFLR is well positioned to provide an assurance of supply for a locally sited plant that could buy wood chips because there would be considerably lower freight costs. The local Alternative Energy Working Group is in the preliminary stages of developing a joint powers authority, which could hold stewardship contracts that would implement CFLR projects. These contracts would then provide additional supply assurance for the investment sought to develop a facility. Private investment would be needed to go with public investment for a jointly owned public-private operation. A fully public-owned plant could not use the tax credit, which could equal 40 percent of the total cost.

The economic impact of our proposed project can be estimated by viewing the outcomes of similar projects and in-depth economic analyses. An analysis by Northern Arizona University concluded it was cost effective to spend up to \$505 per acre to restore forests to prevent catastrophic fire and associated fire suppression costs in Arizona's ponderosa pine forests (Analysis of Costs and Benefits of Restoration-Based Hazardous Fuel Reduction: Treatments vs. No Treatments, 2003). An analysis prepared for the Oregon Forest Resources Institute estimated net benefits of fuel reduction treatments in eastern and southern Oregon ranged from \$606 to \$1,402 plus per acre. The results also suggest that environmental benefits of forest biomass use for energy are well in excess of the market value of the electricity produced (Biomass Energy and Biofuels from Oregon's Forests, 2006).

Our proposed project is similar in design to the White Mountain Stewardship Project on the Apache and Sitgreaves National Forests of Arizona. That project created 226 direct forest industry jobs and 93 indirect jobs for a total of 319 total jobs (www.futureforest.info/). A report published by The Nature Conservancy predicted the project would generate \$6,782,290 in tax revenue over its ten-year life span (The First Five Years of the White Mountain Stewardship Project, 2010).

An analysis for the Oregon Department of Energy estimated that operation of a five-megawatt plant would create 16 jobs at the plant and 18 jobs in procurement, for a total of 39 new jobs. A larger, 25 megawatt plant was estimated to support 71 new jobs (Biomass Resource Assessment and Utilization Options for Three Counties in Eastern Oregon, 2003). The numbers of indirect jobs expected were not reported. However, the Oregon Forest Resources Institute concludes that indirect job creation is usually in the range of two to three indirect jobs created for each direct job. See Benefits to Local Economies for specifics on how these figures apply to Modoc County.

Summary of Landscape Strategy

The Modoc National Forest CFLR proposal fits directly with the US Forest Service Mission, "...to sustain the health, diversity, and productivity of the nation's forests and grasslands to meet the needs of present and future generations." The Modoc NF is working to achieve quality land management under the sustainable multiple-use management concept to meet the diverse needs of people in part by (1) promoting the productivity and diversity of National Forest System lands in addition to those adjacent to ours, regardless of jurisdiction (2) collaborating with people and responding to their diverse needs in making decisions, (3) developing and providing scientific and technical knowledge to improve our capability to manage the Modoc NF. The foregoing information was drawn from the following Forest Service Web site: <http://www.fs.fed.us/aboutus/mission.shtml>

There are two guiding documents for sage steppe restoration: (1) the Sage Steppe Ecosystem Restoration Strategy FEIS, which amended the Modoc NF Forest Plan (<http://www.fs.fed.us/r5/modoc/projects/sagebrush-restoration-web/FEIS/FEIS%20Index.shtml>), and (2) the Conservation and Recovery Strategy for Sage-grouse (*Centrocercus urophasianus*) and Sagebrush Ecosystems within the Devil's Garden / Clear Lake Population Management Unit (<http://greatbasin.wr.usgs.gov/LWG/LWGdetail.asp?State=CA&LWG=35>).

For dry-forest systems, the Upper Pit River Watershed Management Strategy provides management options (<http://www.pitriveralliance.net/>).

With respect to sage steppe systems, the purpose of the Sage Steppe Ecosystem Restoration Strategy (Sage Steppe Strategy) is to adopt an approach for juniper management on National Forest and Bureau of Land Management lands to restore the sage steppe ecosystem and associated vegetative communities to desired habitat conditions reflecting ecological processes that existed prior to

European settlement (p. ii FEIS). More specifically, the purpose of the Sage Steppe Strategy is to restore sage steppe ecosystem processes and vegetation conditions that resemble historic mosaics so that historic fire return intervals in the sage steppe can be sustained. Additional objectives include improving watershed function and condition, restoring biodiversity and productivity (for both plants and animals), managing fuels to conform to the National Fire Plan requirements, and implementing, (where appropriate) national renewable-energy direction.

The sage steppe ecosystem provides a significant forage base for livestock permittees in Modoc County. Livestock management is one of the primary businesses supporting Modoc County making restoration of sage steppe habitats extremely important. This, coupled with the potential listing of the sage-grouse, makes implementation of sage steppe restoration projects critical from a social, economic, and ecological standpoint. The acres chosen for treatment are a priority because treatments have a great chance of success due to the presence of native understories (which increase the likelihood of treatment success), as well as the strong partnerships in place to help in planning, implementation, and monitoring of restoration activities. One side benefit from some of the acres proposed for treatment would also be a steady stream of biomass.

Dry-forest management in part comes under the strategies included in the Upper Pit River Watershed Management Strategy. The mission of the Pit River Alliance, the umbrella organization of collaborators working toward large-scale management goals in the Pit River basin, is to foster partnerships that achieve integrated long-term cultural, economic, and environmental health of the watershed through community participation. Among their goals is improvement of water quality and quantity in the Pit River and tributary streams, as well as sustaining and improving upland vegetation and wildlife communities. One of their specific objectives is to improve and maintain forest ecosystems through various activities, including thinning, thereby maintaining and increasing forest products industry capacity in order to implement treatments (Upper Pit River Management Strategy p. 25). The areas proposed for treatment in the dry forest would provide community stability through the flow of goods such as biomass and sawlogs

Other restoration activities such as targeted treatment of noxious weeds and watershed improvements would also aid in watershed enhancement while providing jobs in the local community. See the Benefits to Local Economies section and attachment E for specifics.

Proposed Treatment

The proposed treatment is a 10-year, landscape-level restoration strategy for sage steppe and dry-forest ecosystems. The treatment landscape is defined by the vegetation regardless of land ownership. However, modeling conventions make using this approach difficult. Therefore, the RCAT landscape will encompass the majority of treatment polygons; however, some treatments may occur on the Warner Mountains and western portions of the Doublehead and Big Valley Ranger Districts that are outside of the RCAT but within the boundaries of our collaborative partnerships. The smaller subset polygon was drawn to encompass the majority of the treatment areas without adding significant non-treated NFS acres, which would skew the results of the outputs of the models. There are 155,000 acres on the Modoc NF that are planned for treatment using CFLR, appropriated, and partners' funds, as these become available. The Shasta-Trinity NF would be included in future CFLR requests, pending acceptance of the Modoc NF proposal.

Multiple objectives would be met by treatments across the landscape. Thinning would restore resilience to dry-forest and sage steppe stands by returning systems to the conditions where fire is an important mechanism in their maintenance. Restoration treatments would reduce forest susceptibility to insects, pathogens, and large-scale fires by reducing tree density and promoting fire-

and drought-adapted tree species. Likewise, restoration treatments in the sage steppe would reestablish sagebrush and associated grass and forb species by reducing juniper density. All of these restoration treatments would, in turn, provide for habitat for special-status wildlife species and enhance native plant understories.

Ecosystem restoration efforts would include the use of the following: prescribed fire, mechanical thinning of coniferous trees, treatment of invasive plants, plantings of native species, fencing, water developments, and watershed restoration. See attachment A for a list of activities and funding needs tied to each one.

Sage steppe treatment priorities have been strategized in part through efforts of the Sage Grouse Working Group. The highest-priority sites are located in areas that currently or recently contained sage-grouse. The secondary priorities are those lands that provide corridors for movement of grouse within and between population management areas (i.e., north towards BLM Forest Service lands in Oregon). The working group contains both federal and non-government partners, who are conducting treatments on their own lands. In the case of the USFWS, the Clear Lake Refuge is totally encompassed by the Modoc National Forest. USFWS personnel have completed sage steppe and sage-grouse habitat improvements throughout the refuge. They are also helping coordinate with the NRCS, the efforts on private lands contained within and adjacent to the boundaries of the Modoc NF.

Dry-forest strategic planning is part of the Upper Pit River Watershed Management Strategy. Restoring forest ecosystems to fire-adapted, resilient systems is one of the foci of this strategy.

Our goal is to develop resilient and adaptable forest stands that are better able to withstand inevitable environmental changes and disturbance. Dry-forest restoration treatments would change forest stand susceptibility to insects and pathogens by reducing tree density and promoting fire- and drought-adapted tree species through selective thinning and planting with pine, following disturbances. Dry-forest restoration treatments would increase landscape heterogeneity with strategically located treatments, and would change stand susceptibility to insects and pathogens by reducing tree density and changing tree species composition to promote fire- and drought-adapted pines. Historic conditions and conditions anticipated as a result of climate changes, would drive site-specific treatment prescriptions that reduce tree density, shift tree species composition, and manage fuels. The desired forest structure at the landscape scale would be patchier and composed of even- and uneven-aged forest at variable, but overall lower densities, that are based on site capacity. Managing forest density improves the health and reduces tree mortality, resulting in reduced fuel loadings and accumulation.

In general, treatments would work to restore historic patterns of stand structure, fire intensity, and fire frequency. Treatments in dry-forest stands could provide habitat for two Region 5 Sensitive species (bald eagle and great grey owl), as well as mule deer and elk.

Another example would be the removal of encroaching junipers, encouraging the growth of understory vegetation. These grasses, forbs, and shrubs in turn provide foraging habitats for native wildlife and livestock. Wildlife species provide recreational opportunities (e.g., hunting, wildlife viewing) while livestock operations are a backbone industry for Modoc County and the surrounding communities.

Restoration efforts would benefit multiple resources. After treatment, stands would function closer to the pre-1870's landscape functioning described in the Sage Steppe Ecosystem Restoration Strategy FEIS. Sage steppe stands would contain a mosaic of grasses, different stages of sagebrush with scattered juniper trees, and juniper woodlands. Frequent fires of varying intensities would help

maintain resilient stands. Native understory plants would increase, providing wildlife habitat and maintaining soil productivity and watershed health. Sage-dependent species such as Swainson's hawk (Region 5 sensitive species), brewer's sparrow, loggerhead shrike, and mule deer would benefit from sage steppe improvements; pygmy rabbit (a California species of special concern) would benefit as well.

The increases in long-term ground cover and the use of best management practices (BMPs) would minimize soil erosion and maintain water quality. The implementation of watershed improvement projects proposed under this grant would improve watershed function. The amount of short-term disturbances and erosion would be minimal due to implementation of BMPs. The anticipated positive trends in long-term ground cover and stream function are consistent with the direction of the Modoc NF Forest Plan, with respect to watershed and soil resources.

Additional activities to enhance understory vegetation include the following: (1) monitoring understory plant and invasive species responses to juniper removal treatments; (2) noxious weed treatment, within the protocols of the 2008 Modoc National Forest Noxious Weed Treatment Project FEIS and ROD, including both physical and chemical treatments; and (3) restoration plantings to bolster the native plant community and increase its resistance to non-natives, using native seed sources from local genetic stock. Funding from the CFLR for noxious weed treatment would expand current levels of treatment implemented through cooperative agreements with the Pit River Tribe, Central Modoc Resource Conservation District, and the Alturas Field Office of the BLM.

In anticipation of the need for native grass seed of local genetic stock for sage steppe restoration, a native grass seed grow-out project was initiated in 2009. Funding was acquired to establish 1.25 acres of native grass seed production plantings at J. Herbert Stone Nursery, for three years of seed production. Native grass seed was collected from the Modoc National Forest in 2009, sufficient to plant 0.25 acre during the fall, 2009 sowing at the nursery. Additional native grass seed was collected in 2010, sufficient to sow an additional acre at J. Herbert Stone Nursery in fall 2010. An additional \$2,600 is currently obligated to the Bend Seed Extractory for seed cleaning and testing of future Modoc National Forest native seed collections and for future seed increase grow-outs. A resource advisory committee grant proposal was submitted for 2011 funding of further native seed collection, through a partnership with a local non-profit group, The River Center (Alturas), using a crew of local high school students.

Additional restoration of native tobacco (*Nicotiana attenuata*), a culturally important but declining species used by Native Americans, is being performed with Regional Native Plant Materials funding in cooperation with Cultural Advocates for Native Youth, an organization based in the Cedarville Indian Rancheria. This project would use burn piles from sage steppe restoration projects, which provide the preferred habitat for native tobacco.

CFLR funding would be used to increase production of seed from local native plant populations, as well as develop container stock for out-plantings. The Shasta-McCloud Management Unit Greenhouse and Nursery, on the Shasta-Trinity National Forest, would grow container stock of forb and shrub species for restoration plantings, including species of traditional cultural importance to local Indian tribes. By bolstering native plant communities in areas at risk of noxious weed infestations, we have an opportunity to prevent large-scale infestations, which can be very expensive and very difficult to combat, particularly annual invasive grasses.

Use of local genetic stocks retains the genetically-based ecological adaptations to local climate and site characteristics. Use of seed or container stock plantings would be focused on those sites where

the risk of noxious weeds exceeds the risk of ecological adaptation losses through dilution of native plant genetics already present. Wherever possible, treatments would strive for prevention of weed infestation and spread through support of the on-site native plant community. A project-specific noxious weed and rare plant survey would be performed, and a weed risk assessment would be developed for each project site.

Restored vegetation is expected to contain a diverse mix of native grasses, forbs, and shrubs, as well as retained old-growth juniper trees that reflect locally adapted genotypes of native vegetation. Long-term monitoring, in accordance with established protocols, would identify deviations from this anticipated goal, and would trigger an adaptive management response in project implementation protocols to achieve the desired outcome.

Old-growth juniper trees are maintained thorough the sage steppe project areas through monitoring occurring both during and after the project implementation phases. The results of this monitoring would be housed in an interagency database being developed by the BLM and USGS. Old growth would be maintained in the dry-forest stands by both the implementation of standards and guidelines in the Sierra Nevada Forest Plan Amendment, and marking guidelines.

The best available science was the underpinning for the selection of treatments in the Sage Steppe Strategy FEIS. There is also a built-in adaptive management loop within the Sage Steppe FEIS ROD with the formation of the technical advisory committee that enables managers to review treatments to discern whether they need to be altered, based on the most current science.

Within the sage steppe treatments, the Sage Steppe Ecosystem Restoration Strategy FEIS provides the programmatic NEPA framework and large-scale cumulative effects analyses for activities in this ecosystem. The ROD for the Strategy amended the Modoc NF Forest Plan, adding design standards to projects being implemented within the scope of the strategy. Several site specific projects pertaining to juniper density reduction, water source improvements, and habitat protection are currently in the NEPA process. These smaller projects have used the Council on Environmental Quality regulations for categorical exclusions (CEs) to implement the NEPA. Other similar projects, also using the categorical exclusion, will be completed this winter. Future projects under the Sage Steppe Ecosystem Restoration Strategy would cover additional juniper work, fencing, habitat improvements, and native vegetation improvements.

Within the dry-forest type, the Sierra Nevada Forest Plan Amendment, together with the Modoc NF Forest Plan, are the guides. Projects within this ecosystem would involve more thinning from below, reduction of fuels through various treatments (prescribed burning, thinning, mowing) and habitat enhancement activities. At least six projects have decisions and are ready for implementation. Another nine projects are identified as future activities to support this landscape proposal. These projects would provide timber and biomass products.

To provide for treatments over the ten-year time frame, site-specific projects pertaining to this landscape restoration would be analyzed, applying the appropriate NEPA process to assure decisions are “fresh” and required surveys are conducted to provide the foundation of the effects analyses. Depending on survey results, potential impacts of projects, resources present, and types of land allocations, most of the smaller projects may be completed using categorical exclusions to implement the NEPA process. Larger-scale projects involving more complicated analyses, such as may occur with the presence of certain resources or land allocations, would use environmental assessments or environmental impact statements to document the NEPA process.

Approximately 9 percent of projects are classed as NEPA-ready acres (25,681 acres), meaning they have completed the NEPA process. However, another 18 percent (53,321 acres) are at some point

in the NEPA process and are projected to be completed during the second half of 2011 or first half of 2012. The remaining projects (approximately 73 percent of the proposal) are slated for funding—depending on completion over the following 7 to 8 years with approximately 6 percent already identified in 2013, 2 percent in 2014, another 2 percent in 2015, and 63 percent over the remaining years. Without an actual funding base, out-year planning is difficult. Analysis areas (NEPA acres) may or may not reflect actual treatment acres; they are usually larger. However, across the landscape, what is not treated and why is just as important as what is treated. All acres considered need to be analyzed for effects. The map in attachment G shows the location of proposed treatments.

The removal of fire from the sage steppe landscape, combined with heavy historic grazing (expressed in the Sage Steppe Ecosystem Restoration Strategy FEIS, p. 5), has altered the vegetation in such a manner that the potential for uncharacteristic fire behavior has become prevalent in this ecosystem. In areas with the most severe departure from historical conditions (condition class three), juniper trees dominate the sites, resulting in total removal of brush, grasses, and forbs that historically carried frequent fires. In areas of condition class two, juniper trees are less dominant but the density of sagebrush is having similar effects on the grasses and forbs.

Cumulatively, the density of juniper and sagebrush has reduced the fine fuels (grasses and forbs) that would have burned frequently (3 to 100-year fire return interval) and maintained the natural mosaic pattern of grasses, brush, and sparse juniper, characteristic of the desired conditions within the sage steppe ecosystem. Without management intervention on these lands, juniper and sagebrush would continue to homogenize the landscape, causing stand-replacing fires with unvarying severity that would continue to degrade this ecosystem.

Effective fire suppression and land-use practices over the last century have altered forest structure and increased fuel loads within the dry-forest ecosystems on the Modoc National Forest. Stands of ponderosa pine and juniper have continued to move away from historically frequent fire-return intervals (2 to 25 years), the vegetative conditions associated with low-intensity fire behavior. High accumulations of surface fuels (needles, litter, branch wood), ladder fuels (understory saplings, smaller trees, and brush), and canopy (continuous foliage and branch wood as a result of tree density) have increased the potential for fires that are uncharacteristic of historical fire intensities and severity. The accumulation of fuels and dense canopy has increased the potential for stand-replacing, catastrophic fire behavior.

The goal is to reduce potential wildfire severity, size, and cost by implementing hand and mechanical thinning in conjunction with prescribed burning to support ecological restoration and return the natural processes that would reestablish the vegetative conditions associated with historical fire regimes (fire regime condition classes two and one). Reduction of surface fuels, the interruption of the horizontal and vertical continuity of ladder and canopy fuels, and the mosaic of vegetative conditions created as a result of restorative activities stated above, would reduce expected fire intensity levels and fire severity within treatment areas. Areas treated would also give fire managers the ability to allow fires to burn to meet resource objectives naturally, without the threat of potential damage to the ecosystem or private property.

We propose to treat approximately 3,000 acres annually with prescribed fire. An approximate breakdown of 1,000 acres of pile burning and 2,000 acres of broadcast burning is planned in the treatment areas over the decade of CLFR funding. We would implement the burns in strategic bands across the focus area, keeping in mind that the uncharacteristic fires experienced on the Modoc Plateau are wind-driven events. The bands of fuels treatments across the landscape would allow fire managers multiple options on how to engage and handle wildfires started in or around the

treatment areas identified. The proposed treatments would be monitored by the fuels specialist for treatment effectiveness.

The Modoc NF cannot treat every acre identified in this landscape. However, we expect to realize a landscape-level reduction in fire spread, severity, and size as a result of the strategic placement and interaction of past, current, and future treatments identified within this proposal area. (The proposed treatments are located near past treatments and planned to be connected over time, thereby capitalizing on past treatments. The Modoc N.F. could potentially experience \$6,000,000-plus (based moderate beneficial use according to the R-CAT analysis) in fire suppression costs savings over the life of the treatment. Essentially, as the land is brought under the proposed management, suppression costs would decrease and we would allow naturally occurring fire to meet resource objectives. The cost savings may be realized beyond the ten-year analysis in that prescribed burning, fire allowed to burn to meet resource objectives, and fuel treatments would continue in the focus area beyond the life of the CFLR funding.

This proposal would reduce long-term costs by analyzing and identifying areas within the landscape where expected fire behavior and fire effects are consistent with desired conditions. We would also manage wildland fire to meet resource objectives.

The Modoc National Forest is located in two separate counties, Lassen and Modoc. Each county has separate fire safe councils that have met in the past to coordinate fire concerns. The Modoc NF has worked with both fire safe councils to assist in developing community wildfire protection plans (CWPPs) to protect areas near the wildland-urban interface (WUI). Treatments proposed here are similar to the treatments planned and implemented in the CWPPs, and would assist in protecting critical infrastructure (i.e., roads) and small communities.

Collaboration and Multiparty Monitoring

Northeastern California has long managed sage steppe and dry-forest resources in a collaborative manner. During the fall of 2010, the Modoc National Forest, the Alturas Field Office (BLM), Modoc County, and the North Cal-Neva Resource Conservation District received the Partners in Conservation Award signed by the Secretary of the Department of the Interior, Ken Salazar, in recognition for the planning and implementation of sage steppe restoration activities; sage steppe restoration is one of the key components of the CFLR proposal.

The following organizations have worked together on resource management issues; their membership includes livestock permittees, environmental groups, state and federal agencies, sportsmen's organizations, and elected officials: The Northeast California Resource Advisory Council, the Modoc-Washoe Experimental Stewardship Program, the Modoc County Resource Advisory Committee, the Modoc County Land Use Committee, the Timber Program Working Group, the Sage Steppe Technical Advisory Committee, and the Alternative Energy Working Group. The Modoc-Washoe Experimental Stewardship Program, founded in 1984, has the longest history of advising and recommending management options to the Modoc National Forest and the BLM Surprise Field Office (Cedarville). These organizations are readily available to aid in the various facets of management needed to enable the Modoc NF to succeed with its CFLR restoration activities.

A number of these groups have participated in the development of the Sage Steppe Ecosystem Restoration Strategy and in dry-forest management. The Sage Steppe Ecosystem Restoration Strategy FEIS is the first landscape planning document of its kind in the nation, in that it crosses ownership boundaries (FS and BLM). It is also the first planning effort with a county government as a full planning partner. In addition, there are new collaborative groups that have been helping with

planning, implementation, and monitoring. They are also now participating in the development of the CFLR proposal. See attachments C & D for a list of collaborators and their letter of commitment for the Modoc CFLR. Many of our partners have provided letters of support for the CFLR proposal. These letters are available for review at <http://www.fs.fed.us/r5/modoc/>.

The strategy of the CFLR proposal is based on the Sage Steppe Ecosystem Restoration Strategy FEIS and Record of Decision. These documents are in themselves the result of collaboration between the FS, BLM, and many other partners. The FEIS was funded in part by the Modoc County Resource Advisory Committee.

The Modoc National Forest has a long history of working with partners to accomplish management objectives. For the purpose of this proposal, partners are categorized as those organizations that have been instrumental in implementation, but have not been meeting in a scheduled fashion to strategize implementation and monitoring activities. In many cases, partners have provided money to carry out treatments such as aspen regeneration; sage steppe restoration; threatened, endangered, and sensitive fish, wildlife, and plant species habitat enhancement; and thinning and prescribed burning. Many of the partnerships dovetail with the CFLR-proposed treatment activities.

Partners for noxious weed treatment are the Central Modoc Resource Conservation District, Bureau of Land Management, and Pit River Tribe. The NRCS and Goose Lake Resource Conservation District are assisting with mapping noxious weeds on the forest, and are treating noxious weeds on lands adjacent to the forest. The River Center (Alturas) is a partner for interpretative panels and native grass seed collection in support of native plant community restoration. Cultural Advocates for Native Youth, affiliated with the Cedarville Indian Rancheria, is a partner for native tobacco restoration. Following is a list of groups with whom we have collaborated on this proposal:

- Indian tribes: Pit River Tribe and Cedarville Indian Rancheria
- Federal agencies: Surprise, Alturas, and Eagle Lake Field Offices of the Bureau of Land Management, USDI Fish and Wildlife Service – Modoc and Klamath Basin National Wildlife Refuges and Klamath Falls Office, and the USDA Natural Resource Conservation Service
- State agencies: California Department of Fish and Game, the University of California Cooperative Extension, Oregon State University (in an advisory capacity)
- County agencies: Modoc County Land Use Committee, Modoc County Resource Advisory Committee, Lassen Fire Safe Council
- Special districts: North Cal-Neva Resource Conservation and Development, and Goose Lake, Central Modoc, Lava Beds-Butte Valley, and Pit Resource Conservation Districts
- Nongovernmental organizations: Rocky Mountain Elk Foundation, National Wild Turkey Federation, California Deer Association, Pacific Forest Trust, The River Center (Alturas), The Watershed Research and Training Center, Mule Deer Foundation, Ducks Unlimited, CO Top, and local landowners

Some of the partners listed above are also active in collaborative efforts to manage sage steppe and dry-forest ecosystems. We are coordinating with the Shasta-Trinity NF and plan to expand this effort to include the Fremont-Winema NF in the future. A number of groups—not just one—are collaborating to help the Modoc NF plan, implement, and monitor the CFLR projects. This is because the project area consists of a series of small communities in a county of about 9,000 people. Therefore, we do not have a lot of resources and must cooperate to attain common goals.

Various organizations are working to establish multiparty monitoring across various jurisdictions. Other efforts have used collaborative forums to help provide alternative management strategies.

Some of these organizations are the Goose Lake Fishes Working Group, the Modoc-Washoe Experimental Stewardship Program (above), the Devil's Garden/Clear Lake Sage-Grouse Working Group, and Modoc Economic Vitality.

These collaborative groups have helped develop overall management strategies, which are the foundation of the proposed CFLR proposal, and several have also begun implementation. Treatments have occurred on federal lands (USFS, BLM, and USFWS), as well as private lands. These groups have been working together for five to ten years on various stages of sage steppe and dry-forest restoration. However, these efforts are just the beginning; much remains to be accomplished.

Although multiple partners have worked with the Modoc NF in support of the various phases of the dry-forest and sage steppe management, the collaborative strategies from the Devil's Garden/Clear Lake Sage Grouse Working Group and the Pit River Watershed Alliance tie directly into support of the CFLR proposal. The Pit River Watershed Alliance was formed in December 1999. Since that time, a variety of stakeholders (including Modoc NF) have participated in the alliance and identified priority projects and resource issues. The alliance holds quarterly meetings; the group's activities enable private landowners and stakeholders in addition to local, state and federal agencies, to share ideas, skills, and leverage funding opportunities to complete projects. The alliance provides a forum where these efforts can be coordinated, so that important work is addressed and duplication of effort is avoided. The alliance uses a consensus decision-making process.

The Devil's Garden/Clear Lake Sage-Grouse Working Group is made up of the various stakeholders involved with greater sage-grouse population and habitat management, including local livestock permittees, state and federal agency biologists, University of California Cooperative Extension staff, and NRCS personnel. The major stakeholders have met over the span of six years to develop management strategies that could provide for everyone's needs, from improved greater sage-grouse habitat to associated increases in livestock forage. Also, the group coordinates obtaining funds from various grants for restoration activities. By increased communication fostered by their meetings, they have been able to prioritize areas for restoration and remove duplication of efforts, thereby increasing efficiency of restoration activities. The Clear Lake Sage-Grouse Working Group was formed in 2004 to address the declining Clear Lake sage-grouse population. The working group consists of landowners and public land permittees, individuals from the Bureau of Land Management (BLM), California Department of Fish and Game (CDFG), Lava Beds-Butte Valley Resource Conservation District (RCD), Ore-Cal Resource Conservation and Development (RC&D), U.S. Forest Service (USFS), U.S. Fish and Wildlife Service (USFWS), National Park Service, Lava Beds National Monument (NPS), Natural Resource Conservation Service (NRCS), and University of California Cooperative Extension (UCCE). The working group usually meets quarterly, sometimes monthly. They use majority rule in their decision-making process.

The working group completed the *Conservation Strategy for Sage-Grouse (*Centrocercus urophasianus*) and Sagebrush Ecosystems within the Devil's Garden/Clear Lake Population Management Unit* in April, 2010. The strategy is intended to be viable for 20 years, with an annual review process. The working group established some specific goals and actions in chapter six of the strategy to address the sage-grouse population decline. The success of this conservation strategy depends on the continued cooperative partnership and participation among the agencies, organizations and private individuals identified in this strategy, as well as others who may join the effort in the future. Some measures have already been taken, such as translocations, grazing management adjustments, and juniper cutting, to improve sage-grouse numbers and habitat. The following actions that have been planned are habitat restoration and maintenance in areas occupied by sage-grouse, management of wildfire and livestock

grazing to maintain or enhance sage-grouse habitat, establishing a self-sustaining or increasing population of sage-grouse. Monitoring sage-grouse population parameters would provide the feedback to assess the effectiveness of the treatments.

The monitoring efforts for sage steppe and dry-forest treatments would focus on implementation and effectiveness monitoring. Implementation (short-term) monitoring would measure attributes that are a result of our treatments. This is an annual requirement that would serve as a baseline for our actions. It would include such measures as presence of invasive plant species, residual vegetation height, stream bank stability, riparian and upland vegetative communities, prescribed-fire intensity, and browse utilization. Effectiveness (long-term) monitoring occurs within three to five years of project implementation, and provides us with the information that determines if our treatments were effective in achieving the desired conditions. Monitoring requires the integration of multiple resources (e.g., range, wildlife, fisheries, and watershed). It is key in validating assumptions made in the development of project prescriptions. Dr. Richard Miller of Oregon State University would provide training and advice to the Modoc NF monitoring project manager.

A comparison and aggregation of data can be accomplished from the standardization of monitoring methodologies. A group of technical experts from a number of different entities developed a basic set of methods to address monitoring elements (Sage Steppe Ecosystem Restoration Strategy, Vegetation Monitoring Protocols 2009). These monitoring protocols include assessing noxious weeds, juniper, and other sage steppe vegetation. The implementation and coordination of such a monitoring strategy can be constrained by costs and available funding. The BLM Alturas Field Office staff, is coordinating monitoring and using the resulting data to address the overall sage steppe ecosystem restoration strategy. They have received funding to develop the data base for monitoring results for FY 11. Currently they are working with the USGS in this endeavor.

The monitoring conducted for the sage steppe treatments would be reported to a technical advisory committee as prescribed in the Sage Steppe FEIS Record of Decision. The results of the monitoring are to be used in a feedback loop for adaptive management to alter management prescriptions as needed.

NRCS and USFWS are partners in assessing and monitoring wildlife distributions, riparian conditions, range production, and health. CFLR funding would be used in part to augment the monitoring currently accomplished to determine project effectiveness of sage steppe treatments, especially those conducted in support of the NRCS Sage-Grouse Initiative.

The Modoc NF would monitor stream conditions as required by the North Coast Regional Water Quality Control Board. Also, the North Coast Regional Water Quality Control Board, the Central Valley Regional Water Quality Control Board, and the Lahontan Regional Water Quality Control Board require the Modoc NF to monitor adherence to the best management practices.

An integral piece of this initiative lies in use of treatment by-products through stewardship contracting, allowing wood product value to contribute to restoration treatments. To this end, the forest is working with Modoc County, North Cal-Neva Resource Conservation and Development, The Watershed Research and Training Center, and others to attract and develop industry infrastructure and alternative markets to reduce biomass transportation costs and support local economic development. With the successful multi-year implementation of this proposal, there would be opportunities for Modoc County to actively recruit a new facility within a short haul of CFLR restoration activities. Long-term stewardship restoration contracts with reliable product streams are a key feature of this strategy. The premise that this collaborative strategy is built on is simple: If we provide a dependable stream of restoration by-products (in this case, biomass) to the market, we

could attract investors to site a power plant, a pellet plant, or both, to the vicinity of Alturas. This facility would be closer to where treatments are occurring, thus reducing the cost of transporting biomass. When haul costs are reduced, restoration treatments that were previously done with service contracts costing the taxpayer an average of \$300 per acre could be done with a forest products stewardship sale. These savings would allow us to restore more acres, while boosting the local economy and retaining valuable infrastructure and woodworking skills. By contrast, if we continue with our present program level, the number of acres we would be able to restore would gradually decrease over time as appropriated budgets decrease. The skilled workforce and infrastructure critical to managing land and resources would continue to decline.

Pretreatment monitoring in the dry forest would be accomplished by the forest silviculturist through the establishment of stand exams or by walk-through evaluations documented in writing in the stand record card (R5 form 2400-205). Pretreatment monitoring may also be accomplished by sale preparation personnel and documented in writing in the timber harvest activity record card – pre-sale data (R5 form 2400-202).

Posttreatment monitoring would be accomplished by either timber sale administrators, harvest inspectors, or contracting officer's technical representatives (COTR's) ensuring contractor compliance with contract specifications. Posttreatment monitoring inspections would be documented in writing on either contract daily diaries (FS form 6300-20) or timber sale administration inspection reports (R5 form 2400-181), and kept in their respective contract folders. Posttreatment monitoring may also be documented on the timber harvest activity record card – post sale data (R5 form 2400-202). The multiparty monitoring group would review the monitoring data to develop and recommend adaptive management measures.

Utilization

An integral piece of this initiative lies in use of treatment by-products through stewardship contracting, allowing wood product revenue to contribute to restoration treatments. Topography and other environmental factors provide the Modoc National Forest an advantage over other national forests in California: Most forest landscapes and vegetation types are well suited to whole-tree mechanical forest restoration treatments that can be followed up with prescribed underburning. Whole-tree mechanical logging produces biomass and small sawlogs.

The forest has a long history of proactive management that generates wood product for facilities in Modoc and adjacent counties. In recent years, the forest has been able to sell biomass and multiproduct timber sales for base rates. This generates little revenue, but saves the government approximately \$350 to \$450 per acre in acres treated. Additionally, the estimated market value resulting from proposed restoration treatments amounts to approximately \$3 million in sawlog products and \$12 million in biomass products over the next decade. This infusion of money would translate to a dramatic increase in business development and opportunities within the local communities.

Often, particularly in the case of sage steppe restoration, where the value of juniper removed does not cover costs, projects must be augmented with appropriated funding. Multi-product timber sale or stewardship contracts in the dry-forest system are generally in a better position economically. When packaged strategically, sawlog value can support removal and processing of biomass material. Where feasible, the forest would incorporate dryland forest projects with biomass projects to offset the low value of the material. Presently, haul costs, poor market conditions, and limited appropriated funding to implement projects significantly limit expansion of needed restoration treatments. There is overwhelming agreement among partners that the answer to accelerating

restoration and reducing cost of treatments is long-term stewardship contracting. A sufficient and guaranteed product stream would attract and support development of a local market for forest products. Haul costs are increasing and are the single greatest factor limiting the acres of restoration the forest can implement. A biomass or pellet plant located in the Canby-Alturas area closer to restoration treatments on national forests, BLM lands, and private lands would reduce haul costs, increase by-product use, and thereby increase product value. This would create local jobs and fuel more restoration treatments. It would be a positive feedback loop. Several feasibility studies for local power plant sitings have been completed, and one is underway in Klamath Falls, Oregon. Local public and private lands can easily provide sustainable product to support several small or one medium biomass or pellet facility—or both. But lack of guaranteed product stream over time is a major deterrent for investors.

Wood products from harvest activities on the forest currently go to facilities in (1) Bieber, California (c. 50 miles west of Alturas) where there is a 7-megawatt power plant, a post-and-pole operation, and sawmill with small- and large-log capacity; (2) Burney, California (c. 90 miles west of Alturas), which has three power plants and two sawmills; (3) Wendel, California (c. 90 miles south of Alturas), which has a 25-megawatt power plant, and (4) Klamath Falls, Oregon (c. 100 miles northwest of Alturas), which has an oriented strand board and co-generation facility. Susanville, California (c. 105 miles south of Alturas) and Lakeview, Oregon (55 miles north of Alturas) both have biomass facilities planned, but they are not yet operational. Haul costs to all these facilities are too high to be economically feasible for most restoration treatments on the forest.

Providing a steady supply of wood chips would support local mills. Based on data collected on the BLM Alturas Field Office by their staff and a representative of the Watershed Research and Training Center, they estimated that 10,000 green tons of biomass per acre per year could be generated from BLM juniper stands (J. Jungwirth, personal communication to Mary Flores 16 Feb 2011). This value is consistent with what the Modoc NF could generate from areas proposed for biomass under this proposal.

The Modoc's 15-year average of 1,500 acres per year in biomass thinning-underburn-type restoration treatment in dry forest is significant, but represents only about five per cent of the dry-forest land base on the forest. We are fortunate to have regional markets for biomass; however, markets are too distant to support expanding treatments much beyond current accomplishments funding.

Infrastructure investment is key to stretching limited partner and appropriated funding, and would increase restoration capacity over the long term. The forest is aggressively working with Modoc County, North Cal-Neva Resource Conservation and Development, The Watershed Research and Training Center, and others to develop industry infrastructure and alternative markets that would increase capacity and support local economic development. The Watershed Center is working on identifying technologies with the capacity to use 10,000 to 20,000 BDT per year. Using this technology, up to 13 jobs could be supported by a small (3-megawatt) biomass-powered pellet facility. This is a moveable pellet manufacturing system with the capacity to use 10,000 BDT tons per year and generates about \$165 per ton gross revenue. Installation of a single Biojoule system could provide up to 13 jobs. Roughly the same amount of jobs could be supported by a small (3 megawatt) biomass facility. For every \$1.00 spent in payroll, machinery, supplies for forest restoration and fuels reduction, and in the operating costs of the biomass and pellet plants, another \$1.40 to \$2.40 would circulate in the local economy (data from the Ecosystem Workforce Program, University of Oregon, 2010).

The forest typically averages a 50:50 split between sawlog and biomass output in any given year. However, the average percentage split over the next decade is projected to be 55 percent sawlog to

45 percent biomass. Mechanical whole-tree restoration treatments would generally remove excess conifers between 3 and 30 inches diameter at breast height, excluding old-growth juniper. Biomass stewardship contracts account for and use needles, limbs, and bole wood. Multi-product timber sales would generate sawlogs and biomass. In addition to biomass and sawlog use, firewood, post and pole, and other niche markets for forest products, i.e., juniper and cedar boughs, juniper collection for bonsai production, juniper processing for specialty applications, use restoration treatment by-products.

To treat fuels generated from these niche markets, the forest will use a juniper cutting prescription to either lop and scatter or pile and burn. Stand density would be the determining factor as to which prescription to use. Use of wood cutters would help in the reduction of fuel by removing any dried juniper boles that were cut and left. In turn, any fire allowed to burn in the cut areas to meet resource objectives would produce minimal smoke. The smoke emissions are shorter in duration and would not have major impacts to local communities due to the low population base of Modoc County.

Benefits to Local Economies

Providing a dependable stream of restoration by-products to a local power plant or pellet mill would create jobs in the local area. Wood products harvested on the forest now go to facilities in Bieber, Burney, and Wendel, California or Klamath Falls, Oregon for processing. Implementation of this project would make it economically feasible to build a plant closer to the biomass supply, by assuring a sufficiently large and constant flow of biomass material. Restoration activities would also be a source of jobs, i.e., crews to treat noxious weeds. Restoration would have other benefits, including the value of proactive preservation and enhancement of sage-grouse habitat and range allotments, reduced fire suppression costs, reduced forest health costs, and a net increase in local seasonal employment. The estimated net benefits of this restoration proposal would significantly exceed the anticipated costs.

Economic projection factors developed by the University of Oregon applied to our CFLR funding request, which averages \$1,671,779 annually, projects that this project would create 25 jobs and an economic impact of \$4,139,808 annually for the 10-year life of the project (The Employment and Economic Impacts of Forest and Watershed Restoration in Oregon, 2010). Scaling economic projections from a report to the Oregon Department of Energy for a 5-megawatt biomass plant, to the projected biomass stream that would be created by this project, results in an estimate of 27 jobs created (Biomass Resource Assessment and Utilization Options for Three Counties in Eastern Oregon, 2003). Results from the TREAT spreadsheet in attachment E show similar projections in creation of jobs.

All restoration treatments to be implemented in the sage steppe are designed to result in an increase in sage steppe grass, forbs, and brush species, resulting in a corresponding upward trend in overall range condition over time. Based on local research, forage production and quality increased eight- to ten-fold depending on the pretreatment plant composition and posttreatment management. Crude protein levels in desired range plants were 50 percent greater in cut, as compared to uncut, juniper woodlands. Ranching is one of the primary industries in Modoc County and providing forage over time would provide directly to community stability.

In addition, other restoration work such as noxious weed treatments and watershed restoration activities would generate jobs. A number of temporary employees work with the Modoc NF resource specialists to perform surveys that are the basis of the analysis for treatments activities. The augmentation of the Modoc NF's budget with CFLR implementation and monitoring funds

would enable the forest to expand employment opportunities to local individuals and businesses. When stewardship and service contracts are employed, the forest would use best-value criteria to award contracts. This would allow the forest to give preference to local contractors and to outside contractors who hire from the local work force. If this proposal is accepted, the forest contracting department would set up a training workshop to help local contractors with questions pertaining to submission of contract bids. This includes both local contractors from Modoc County, as well as contractors from surrounding communities. Contracts by NRCS permittees that would be funded under the NRCS Sage-Grouse Initiative would also provide additional jobs.

A local contractor pool could compete for the projects funded through the CFLR proposal: equipment operators, rock and gravel suppliers, timber fallers, and others. It would also stimulate formation of new businesses, adding to the local contractor pool.

The forest has an agreement with the Pit River Tribe that could be the vehicle for providing job training and development programs that could result from implementing restoration work. Restoration work would also include plantings of culturally important native plant species, using container stock produced at the Mount Shasta Nursery. This agreement would also be used for herbicide treatment on noxious weeds on the forest, which would enable the tribe to maintain a weed crew for its own lands while providing additional job opportunities. Past accomplishments include noxious weed removal, fence building, native tobacco restoration, and fuels reduction treatment.

The Modoc Economic Development Committee, a local non-profit organization leading community efforts to revitalize the local economy, supports recreation and tourism as an important component of the local economy. Many community businesses rely on visitors to the area to make their businesses viable. Implementation of this project would enhance the recreation opportunities and cause a potential increase in visitor use. Restoration of the sage steppe ecosystem would create a more park like setting visually pleasing to visitors. Additionally, viewing wildlife is recognized as a primary use of the forest; the restoration would improve habitat, thereby increasing the probability of visitors encountering wildlife.

Additionally, the forest has proposed to establish the Cedar Pass Children's Forest (CPCF) located within the project boundary. The primary component of the CPCF would be an outdoor education program that would offer place-based, experiential learning in the forest environment. The project would expand each year and has the capacity to serve more than 900 students grades K-12. Forest staff is partnered with the local school districts, a local charter school, natural resource agencies, and community groups to expose students to service and learning projects that meet state standards. In this way, students learn about forest succession and ecology, forest management, range management, fisheries, wildlife, geology, and recreation.

This proposal outlines a strategy to accomplish approximately 297,000 acres of restoration in sage steppe and dry forest that would generate a dependable stream of a wood products through long-term stewardship contracts necessary to attract investment in a local biomass or wood pellet facility. The requirements and technology associated with mechanical removal for biomass and sawlogs is a well-established, proven methodology on the forest, and is the basis of our vegetation management program now.

This approach is integral to this strategy. Treatments would generate products that would offset some, but far from all, of the restoration costs. Partner funding, appropriated funding, and wood product and bioenergy markets determine the extent of treatment opportunities on the Modoc National Forest. Since the Modoc National Forest funding levels are static to decreasing, it is even

more critical to develop sustainable partnerships and product use opportunities. Development of local markets would reduce the cost of and expand future restoration treatments as well as reduce future fire-suppression costs. With added industry capacity, additional jobs and job training opportunities would be created.

Once there are local outlets for products from restoration activities, future implementation costs are expected to decrease. In addition, there would be a corresponding decrease in fire-suppression costs; see the Fire section for specifics. Restoration projects using biomass and small log material would increase and sustain local employment opportunities. A steady stream of biomass material would better attract potential investors in developing a local pellet plant. For the past 13 years, a portable sawmill operator (Specialized Lumber), based in Alturas, has used juniper trees to mill logs into floor, ceiling, and fencing products. An increase in material supply would allow small operations like this to expand and increase employment opportunities to the local work force.

There are opportunities as well to increase community stability by offering employment to youth working on various aspects of restoration. The River Center (Alturas) would employ and train youth for native seed collection. The Youth Conservation Corps could help with the restoration activities that use hand-held equipment. Youth from the Cedarville Indian Rancheria are expected to assist with native plant restoration through an agreement with Cultural Advocates for Native Youth.

Small-business opportunities have far-reaching benefits for our communities outside of simply employment. A local contractor who has been awarded juniper contracts on the forest produces juniper sawlogs and sells them to REACH, Inc. in Klamath Falls, Oregon. REACH, Inc., a non-profit organization, promotes equality and acceptance of people with disabilities; they produce juniper wood products such as decking, landscape bark, flooring, square posts, peeled poles, paneling, and lumber. Their goal is to teach skills to people with disabilities, so that they can be productive members of society. The partnership that REACH has built with the community is aimed at encouraging the growth and development of these relationships.

Implementation of restoration activities has a ripple effect by allowing for the education of forest users and the public as a whole. Working with The River Center (Alturas) to collect native seed is a prime example of how holistic restoration activities benefit partners across the focal area. The River Center is a local, nonprofit organization whose mission is to foster natural-resource stewardship and promote the sustainability of the local community. They are able to reach audiences through hands-on training programs like their natural resources summer camp, school field trips, and their interpretative displays at their visitor, interpretive, and resource center. They are an invaluable partner in providing education about the restoration efforts that the federal agencies are engaged in, and the environmental, social, and economic benefits from these activities.

The Modoc County Resource Advisory Committee also funded the creation of interpretative panels in coordination with the Highway 139 Ecosystem Restoration Project. The panels, in part, describe watershed and habitat improvement projects; the habitats consist of sage steppe, aspen, and black oak. One panel details the changes that juniper expansion has had on the function of these systems and the importance of treatment. These handicapped-accessible panels and pullouts are located on one of the busiest byways on the Modoc National Forest. We expect them to enhance understanding of restoration efforts for all levels of cognitive abilities and visitor capabilities. The Modoc NF expects to have the fabricated panels in place by early summer 2011 and to begin using the site at Howard's Gulch Campground as an outdoor classroom with its various partners.

The impending end to Secure Rural School funding will place an additional burden on county government. Consequently, the county is becoming proactive in seeking opportunities to create new

jobs and retail sales, thereby generating a new revenue stream for the operation of county government. The county views this CFLR proposal as having the potential to help do all of these.

With the successful implementation of this proposal there would be opportunities for the county to be an active recruiter of a new facility within a short haul of CFLR restoration activities. The use of long-term contracts or agreements, perhaps even partially held by the county, would go a long way in surmounting the largest obstacle to building a facility—the uncertainty of supply. In addition, with the supply questions answered, the county would have an option to seek a portion of the construction capital through various lending sources available only to government entities. This would allow a portion of the income to return directly to the county to provide needed services for its citizens.

Funding Plan

Multiparty monitoring is increasingly important as federal budgets have the potential to decrease. By pooling our efforts, partners can bring different resources to the table, including alternative funding sources to aid in the monitoring program. The sage steppe monitoring program is still in its beginning phases. In FY 2010 and 2011, the Alturas BLM Office provided salary time and additional money from their state office to develop the database for the sage steppe monitoring results. When one takes into account the difficulties in developing a platform that can be accessed and populated by several different agencies, one realizes the momentous task that is before the various partners in this effort.

CFLR funds would be used to provide in part the baseline and implementation monitoring field data to help support the sage steppe and dry-forest monitoring on National Forest System lands. Pending CFLR funding, the USFS would also provide funding to USFWS to expand their sage-grouse monitoring efforts currently conducted on USFS system lands. Eight percent of the CFLR request would support monitoring efforts. These funds are captured in attachment F, row 2, The Match from the Modoc NF and row 10, the Total CFLR Request.

A wide variety of federal investments are planned, and in some cases have been implemented, both by the Modoc National Forest and its various partners: grade and water control structures to restore wet-meadow hydrology (NRCS); prescribed fire (USFS and BLM); juniper thinning (all); fencing to enhance wildlife habitats (all); planting and establishment of native vegetation—grasses, forbs, shrubs and conifers (USFS and NRCS with their partners); conifer thinning (USFS); wildlife guzzler installation (USFS & sportsmen's groups); and greater sage-grouse habitat improvement (all).

Livestock permittees have improved their private lands within the forest boundary, developing and fencing springs, constructing stock ponds, and planting willows. Others have worked with the local resource conservation districts to treat noxious weeds on their various private lands. Since components of ecosystems such as plants and animals cross ownership boundaries, these improvements enhance ecosystem function across the entire landscape. However, neither these non-federal investments nor the USFWS Partners in for Fish and Wildlife were included in the following attachments.

Inherent in the NRCS sage-grouse initiative funds is the 25 percent non-federal match provided by participating permittees. Those matching dollars help fund the same types of projects mentioned above. The additional 75 percent NRCS match constitutes the largest share of the partner in-kind seen in the executive summary, attachment A, and attachment F. As directed, however, this match and other partner funds (e.g., Modoc County RAC, USFWS Klamath Falls Office) were not used in attachment E, so the benefit to the economy as well as the projected development of jobs does not reflect the total ripple effect by implementation of the CFLR proposal.

Attachment A - Table of Projected Accomplishments

Performance Measure	Code	Number of units to be treated over 10 years using CFLR funds	Number of units to be treated over 10 years using other FS funds	Number of units to be treated over 10 years using Partner Funds	CFLR funds to be used over 10 years	Other FS funds to be used over 10 years	Partner funds to be used over 10 years
Acres treated annually to sustain or restore watershed function and resilience	WTRSHD-RSTR-ANN	1000	1600	200	500000	800000	100000
Acres of forest vegetation established	FOR-VEG-EST	250	250	10	60000	60000	10000
Acres of forest vegetation improved	FOR-VEG-IMP	50000	50000	6000	5273000	5273000	900000
Manage noxious weeds and invasive plants	INVPLT-NXWD-FED-AC	3,693	307	0	2,404,150	200,000	0
Highest priority acres treated for invasive terrestrial and aquatic species on	INVSPE-TERR-FED-AC						

Performance Measure	Code	Number of units to be treated over 10 years using CFLR funds	Number of units to be treated over 10 years using other FS funds	Number of units to be treated over 10 years using Partner Funds	CFLR funds to be used over 10 years	Other FS funds to be used over 10 years	Partner funds to be used over 10 years
NFS lands							
Acres of water or soil resources protected, maintained or improved to achieve desired watershed conditions.	S&W-RSRC-IMP	See WTRSHD-RSTR-ANN	See WTRSHD-RSTR-ANN	3000	See WTRSHD-RSTR-ANN	See WTRSHD-RSTR-ANN	2,482,400
Acres of lake habitat restored or enhanced	HBT-ENH-LAK						
Miles of stream habitat restored or enhanced	HBT-ENH-STRM	5.3	10.7	4	200,000	400,000	150,000

Performance Measure	Code	Number of units to be treated over 10 years using CFLR funds	Number of units to be treated over 10 years using other FS funds	Number of units to be treated over 10 years using Partner Funds	CFLR funds to be used over 10 years	Other FS funds to be used over 10 years	Partner funds to be used over 10 years
Acres of terrestrial habitat restored or enhanced	HBT-ENH-TERR	See RG-VEG-IMP & FP-FUELS-NON-WUI	See RG-VEG-IMP & FP-FUELS-NON-WUI	18,140	See RG-VEG-IMP & FP-FUELS-NON-WUI	See RG-VEG-IMP & FP-FUELS-NON-WUI	298,600
Acres of rangeland vegetation improved	RG-VEG-IMP	20,500	6,260	27,265	6,104,000	280,000	2,629,170
Miles of high clearance system roads receiving maintenance	RD-HC-MAIN						
Miles of passenger car system roads receiving maintenance	RD-PC-MAINT						
Miles of road decommissioned	RD-DECOM						
Miles of passenger car system roads improved	RD-PC-IMP	1000	2000		800,000	3,500,000	

Performance Measure	Code	Number of units to be treated over 10 years using CFLR funds	Number of units to be treated over 10 years using other FS funds	Number of units to be treated over 10 years using Partner Funds	CFLR funds to be used over 10 years	Other FS funds to be used over 10 years	Partner funds to be used over 10 years
Miles of high clearance system road improved	RD-HC-IMP						
Number of stream crossings constructed or reconstructed to provide for aquatic organism passage	STRM-CROS-MTG-STD						
Miles of system trail maintained to standard	TL-MAINT-STD						
Miles of system trail improved to standard	TL-IMP-STD						
Miles of property line marked/maintained to standard	LND-BL-MRK-MAINT						

Performance Measure	Code	Number of units to be treated over 10 years using CFLR funds	Number of units to be treated over 10 years using other FS funds	Number of units to be treated over 10 years using Partner Funds	CFLR funds to be used over 10 years	Other FS funds to be used over 10 years	Partner funds to be used over 10 years
Acres of forestlands treated using timber sales	TMBR-SALES-TRT-AC	37500 (subset of forest vegetation improved)	37500 (subset of forest vegetation improved)	0	See FOR-VEG-IMP	See FOR-VEG-IMP	See FOR-VEG-IMP
Volume of timber sold (CCF)	TMBR-VOL-SLD	179990	179990	0	See FOR-VEG-IMP	See FOR-VEG-IMP	See FOR-VEG-IMP
Green tons from small diameter and low value trees removed from NFS lands and made available for bio-energy production	BIO-NRG	201000	201000	0	See FOR-VEG-IMP	See FOR-VEG-IMP	See FOR-VEG-IMP
Acres of hazardous fuels treated outside the wildland/urban interface (WUI) to reduce the risk of catastroph	FP-FUELS-NON-WUI	10000	10000	3000	See FOR-VEG-IMP	See FOR-VEG-IMP	See FOR-VEG-IMP

Performance Measure	Code	Number of units to be treated over 10 years using CFLR funds	Number of units to be treated over 10 years using other FS funds	Number of units to be treated over 10 years using Partner Funds	CFLR funds to be used over 10 years	Other FS funds to be used over 10 years	Partner funds to be used over 10 years
ic wildland fire							
Acres of hazardous fuels treated inside the wildland/urban interface (WUI) to reduce the risk of catastrophic wildland fire	FP-FUELS-NON-WUI	3330	670	0	See FOR-VEG-IMP	See FOR-VEG-IMP	See FOR-VEG-IMP
Acres of wildland/urban interface (WUI) high priority hazardous fuels treated to reduce the risk of catastrophic wildland	FP-FUELS-WUI						

Performance Measure	Code	Number of units to be treated over 10 years using CFLR funds	Number of units to be treated over 10 years using other FS funds	Number of units to be treated over 10 years using Partner Funds	CFLR funds to be used over 10 years	Other FS funds to be used over 10 years	Partner funds to be used over 10 years
fire							
Number of priority acres treated annually for invasive species on Federal lands	SP- INVSPE- FED-AC	25 (a subset of acres shown above as treated for invasives plants)	25 (a subset of acres shown above as treated for invasives plants)	0	30,000	10,000	0
Number of priority acres treated annually for native pests on Federal lands	SP- NATIVE – FED-AC						

Assumptions for Attachment A: The Forest made the following assumptions when filling out Attachment A. 1) The rangeland vegetation improved (RG-VEG-IMP) included the lands where juniper encroachment is beginning as well as those stands that have significant juniper overstory, but sufficient native understories to warrant treatment. Junipers encroaching into pine stands are included in FOR-VEG-IMP. 2) The planting acres (FOR-VEG-EST) represented an average program, where there is no need to plant after a large stand replacing events. 3) The FOR-VEG-IMP included the following vehicles for treatment: pre-commercial thinning, commercial timber sales, pruning, and underburning. 4) S&W-RSRC-IMP included roads improved utilizing Legacy funding. Other watershed treatments are included in the WTRSHD-RSTR-ANN. 5) Noxious weed management (INVPLT-NXWD-FED-AC) consists of sites that needed multiple treatments to control, contain, or eradicate weed occurrences. 6) Acres of terrestrial habitat (HBT-ENH-TERR) includes: rangeland vegetation acres (which were developed as part of the Sage Grouse Initiative), sensitive plant enhancement, and wildlife habitat improvement projects such as guzzler installation and aspen enhancement. There

are acres that improve terrestrial wildlife habitat, such as prescribed fire acres that were implemented in partnership with Rocky Mountain Elk Foundation, that are included in other rows and not in this one. 7) The TIMBR-VOL-SLD row includes both sawlog and biomass. 8) The FP-FUELS-NON-WUI row includes rx burn acres only and not acres where mechanical treatments were used to decrease fuels; those are captured in the FOR-VEG-IMP row. 9) Partnership monies were estimated based on the levels that the Forest has historically received or expectations of funds from partners (like NRSC Sage Grouse Initiative). They include both partnership funds and in-kind match as categorized in Attachment F. 10) SP-INVSP-E-FED-AC shows weed treatments near TESW plants or other resource concerns.) Monitoring costs are reflected in attachment F.

Attachment B – Results – “Cost Savings” of the R-CAT Spreadsheet

(Includes documentation of data sources and assumptions used to populate the table—begins next page.)

R-CAT Results	
Proposal Name: Sage Steppe and Dry Forest Restoration on the Modoc Plateau	
Start Year	2011
End Year	2019
Total Treatment Acres	274,583.00
Average Treatment Duration	20
Discounted Anticipated Cost Savings - No Beneficial Use \$	(20,239,510)
Discounted Anticipated Cost Savings - Low Beneficial Use \$	(7,073,297)
Discounted Anticipated Cost Savings - Moderate Beneficial Use \$	6,092,917
Discounted Anticipated Cost Savings - High Beneficial Use \$	14,870,393

Start year rationale: 2011	Documentation Page
<p>This page is intended to help you record and communicate the assumptions and calculations that feed the risk and cost analysis tool package spreadsheet</p>	<p>Response / Information Column</p>
<p>Was the analysis prospective (projecting activities, costs and revenues that are planned by the proposal) or retrospective (using actual acres, revenues and costs in an analysis looking back over the life of the project)?</p>	<p>Retrospective, future markets and cost are nearly impossible to predict.</p>
<p>Start year rationale:</p>	<p>2011 Start year for ongoing projects planned.</p>
<p>End year rationale:</p>	<p>2019 Final year for projects planned.</p>
<p>Duration of treatments rationale:</p>	<p>Treatments are good for 20 years due to lack of moisture and growing season length.</p>
<p>All dollar amounts entered should reflect undiscounted or nominal costs, as they are discounted automatically for you in the R-CAT spreadsheet tool? Did you provide undiscounted costs, and in what year data are your costs and revenues provided.</p>	<p>All costs have been computed from most recent data and not discounted. Revenue is predicted from past sales but is influenced greatly on market conditions. Costs are based on current projects occurring on the forest.</p>
<p>Average treatment cost per acre rationale:</p>	<p>Took into consideration all costs associated with implementation of on the ground cost. This includes burning, hand piles, marking/prep, botany surveys and archeology surveys. Costs for the entire treatment area were figured and then spread out for every acre of the treatment area. Hand piling juniper is the high cost of the proposal.</p>
<p>Rationale for actual costs per acre of treatment by year is used:</p>	<p>There is no good manner to predict the actual cost for treatment for the entire treated acres. The pine dry forest has potential revenue in those treatments where the juniper has very little value. The cost are based on projected cost per acre and spread over the entire acres treated. See spreadsheet to document how costs where allocated.</p>
<p>Average treatment revenue per acre rationale:</p>	<p>Primary revenue is from the dry forest pine. Total potential revenue was figured by current and expected sales and volumes. This revenue was then totaled and spread over the entire treatment area. Additionally we looked at all current fuel wood sales and projected them into this model.</p>

<p>This tool is intended to be used to estimate Forest Service fire program costs only, did you conduct your analysis this way or have you taken an all lands approach?</p>	<p>All lands Approach.</p>
<p>Total treatment acres calculations, assumptions:</p>	<p>Total acres is the area predicted to be treated.</p>
<p>Treatment timing rationale with NEPA analysis considerations:</p>	<p>The number of acres each year are the predicted acres NEPA will be completed to allow implementation.</p>
<p>Annual Fire Season Suppression Cost Estimate Pre Treatment, Assumptions and Calculations</p>	<p>Small fire costs were from 2001 to 2006 fire seasons.</p>
<p>Did you use basic Landfire Data for you Pretreatment Landscape?</p>	<p>We used the California Fuels Landscape (updated 08/27/2010) developed by the Pacific Strategic Support Cache.</p>
<p>Did you modify Landfire data to portray the pretreatment landscape and fuel models?</p>	<p>We used the California Fuels Landscape (updated 08/27/2010) developed by the Pacific Strategic Support Cache, Since this dataset is updated yearly</p>
<p>Did you use ArcFuels to help you plan fuel treatments?</p>	<p>No, interactions with collaborators and Interdisciplinary team members.</p>
<p>Did you use other modeling to help plan fuel treatments, if so which modeling?</p>	<p>We used the Landscaped Editor function in the Wildland Fire Decision Support System (WFDSS) to simulate the treatment prescriptions, then the Fire Spread Probability model in WFDSS to test the post treatment landscape and derive the percent reduction of the probable area burn. The analysis used 3 days for the duration of the 500 fire simulations under average Energy Component (ERC) for August 15th. Data used was the 082710 version of the California Fuels Landscape (.LCP) at 120 meter resolution. Ignition files used were points on a 5,000 meter grid within the project boundary. Analyst: Phil Bowden</p>
<p>Did you model fire season costs with the Large Fire Simulator?</p>	<p>No, Because of time constraints we did not.</p>
<p>If, so who helped you with this modeling?</p>	<p>Phil Bowden</p>
<p>If not, how did you estimate costs, provide details here:</p>	<p>Cost were averaged from 2001-2006 fire season.</p>
<p>Did you apply the stratified cost index (SCI) to your Fsim results?</p>	<p>No, we used FSPPro.</p>
<p>Who helped you apply SCI to your FISH results?</p>	

Did you filter to remove Fsim fires smaller than 300 acres and larger than a reasonable threshold?	
What is the upper threshold you used?	
Did you use median pre treatment costs per fire season?	Yes
Did you use median post treatment costs per fire season?	Yes, adjust from our average pre treatment fire season discounted by our change in FSPro pre and post runs.
Did you test the statistical difference of the fire season cost distributions using a univariate test?	No
What were the results?	5347 acres per year at a 13% change expressed in the FSPro runs.
Did you estimate Burned Area Emergency Response (BAER) costs in you analysis?	Previous experience and fires show that about .05% of the fire cost is BEAR.
Did you use H codes or some other approach to estimate these costs?	No
Did these cost change between pre and post treatment?	Yes
Did you estimate long term rehabilitation and reforestation costs in your analysis?	No
How did you develop these estimates, and did these cost change between pre and post treatment?	We figured 5% of our Pre and Post treatment cost of suppression.
Did you include small fire cost estimates in your analysis?	Yes, used the years of 2001-2006 for small fire costs.
If so, how did you estimate these costs, what time period is used as a reference, and did these cost change between pre and post treatment?	Averaged true fire cost thru 2001-2006.

<p>Did you include beneficial use fire as a cost savings mechanism in your analysis?</p>	<p>Yes, Opportunity to use Fire for Resource Benefit in areas that Have NEPA Coverage was considered.</p>
<p>How did you estimate the percent of contiguous area where monitoring is an option for pretreatment landscape?</p>	<p>We have areas that are covered in the Forests Fire Management Plan.</p>
<p>How did you estimate the percent of contiguous area where monitoring is an option for post treatment landscape, and why did you select the percentage of your landscape for low, moderate and high?</p>	<p>We used Fire Management estimation in deciding the probability of managing fire in terms of achieving resource benefit in the varying circumstances.</p>
<p>How did you derive an estimate for the percentage of full suppression costs used in fire monitoring for beneficial use?</p>	<p>Reduction in suppression resources needed to suppress fire and type s of resources required to monitor said fire.</p>
<p>Did you ensure that you clicked on all the calculation buttons in cells in column E after entering your estimates?</p>	<p>Yes,</p>
<p></p>	<p></p>
<p>Did you make any additional modifications that should be documented?</p>	<p></p>

Modoc NF – Sage Steppe and Dry-Forest on the Modoc Plateau Project

Methodology for Fire Spread Probability Model (FSPro) analysis

Fire Spread Probability (FSPro) Modeling:

1. Test the fuels landscape with different lengths of fire simulations: 7 day and 3 day simulation were tested. The goal of this testing was to find the simulation duration that analyzes the post treatment landscape adequately without being so long that the simulated fires have ample time to burn through the treatment area even if the treatment area slows fire spread significantly. Eventually a turtle gets to the finish line if given enough time. The 3 day simulation duration was selected.
2. Due to time constraints The FSPro model in WFDSS was used to test both the pre & post treatment landscapes instead of the preferred Fire Behavior Simulator (FSim).
3. ArcMap GIS was use to clip the FSPro pre & post treatment raster outputs to the project area.
4. Then to derive the percent reduction of the probable area burned these outputs were compared.
5. This percent reduction can be applied to the historic acreage burned for the area and then used in the R-Cat spreadsheet.

Fire Simulation Inputs

Weather Station: Rush Creek RAWS

Fuel Moisture Data: The average Energy Component (ERC) for August 15th 3/20 – 11/01/1997 - 2010

Fire Simulation duration: 3 days

Number of Fire Simulations: 500

Winds: Gusts & Ten minute average 7/01 – 10/15/1997 - 2010

Simulated Ignition: Points on a 5,000 meter grid located within the project boundary were used.

Analyst: Phil Bowden (916)640-1119 pbowden@fs.fed.us

Pre-treatment Spatial Fuels Attributes

The 08/27/2010 version of California Fuels Landscape (.LCP) developed by the Pacific Southwest Region’s Strategic Support Cadre at 120 meter resolution was used because it has modeled past wildfire behavior in the local area very adequately. This dataset is also updated yearly and did not have to be modified for recent treatments and wildfires. The California Fuels Landscape is derived from the existing vegetation (CALVEG) dataset. Information on this dataset can be found at: <http://www.fs.fed.us/r5/rsl/clearinghouse/forest-veg.shtml>

Post-treatment Spatial Fuels Attributes

The Modoc National Forest’s Fuels and Vegetation Management Staff provided GIS Shape files with which assigned landscape modifications for the simulated treatments. These modifications were put into the following 3 groups:

Shape File Name	Fuel Model	Canopy Base Height	Canopy Bulk Density	Canopy Cover
Forest Units	If TUorTL then 183	Set to 9.0 meters	Multiply by 0.70	Multiply by 0.70
Sage Steppe CBH 14	122	If <= 4.0m set 4.0m	Multiply by 0.2	Multiply by 0.2
Sage Steppe CBH5	122	If <= 1.8m set 1.8m	Multiply by 0.1	Multiply by 0.1

The Landscaped Editor function in the Wildland Fire Decision Support System (WFDSS) was then used to simulate these treatment prescriptions on the pre-treatment California Fuels Landscape (.LCP).

Fire Spread Probability (FSPro) Modeling Limitations

Fire spread only is modeled and there are no outputs for the probability of other fire behavior attributes such as flame length, fire type, and fire line intensity.

Unlike the preferred Fire Behavior Simulator (FSim) FSPro does not simulate the probability of fire ignitions happening. Due to this fact the pre and post treatment acreage change is quite arbitrary and should not be used as an input into the R-CAT spreadsheet.

Also point ignitions on a 5,000 meter grid may not adequately test the posttreatment landscape.

Variations in the wind & ERC scenarios between the pre & post treatment simulations will also contribute to changes in burn probabilities. The high number of fire simulations (500) should reduce the effects from this variation.

Attachment C - Members of the Collaborative

Organization Name	Contact Name	Phone Number	Role in Collaborative
BLM - Surprise Field Office (Cedarville, CA)	Allen Bollschweiler & Garth Jeffers	530-279-6101	Implementation & monitoring
BLM-Alturas Field Office (Alturas, CA)	Tim Burke	530-233-4666	Implementation & monitoring
Klamath Basin National Wildlife Refuge (Tulelake, CA)	Ron Cole	530-667-2231	Implementation & monitoring
Modoc County-Resource Analyst (Alturas, CA)	Sean Curtis	530-233-3276	Planning & Coordination
Modoc NF	Kimberly Anderson	530-233-5811	Integrated in all phases
Modoc Vitality Working Group (Alturas, CA)	Dwight Beeson & James Cavasso	530-233-1999	Advisor for economic stability
NRCS – Alturas Field Office (Alturas, CA)	Matt Drechsel	530-233-4137	Integrated in all phases
NRCS – Tule lake Field Office (Tulelake, CA)	David Ferguson	530-667-4247 x102	Integrated in all phases
Oregon State University (Corvallis, OR)	Dr. Richard Miller	541-737-1622	Advisor -monitoring
Pit River Conservation District (Adin, CA)	Buck Parks	530-299-3178	Integrated in all phases
Pit River Watershed Alliance (Alturas, CA)	Stacey Hafen	530-233-8871	Integrated in all phases

Resource Conservation District – Central Modoc (Alturas, CA)	Kate Hall	530-233-8878	Integrated in all phases
Resource Conservation District –Lava Beds-Butte Valley (Tulelake, CA)	Mike Byrne	530-667- 4247x110	Integrated in all phases
The River Center (Alturas, CA)	Valerie Lantz	530-233-5085	Native Grass Seed Collection and education

Attachment D – Letter of Commitment



Forest
Service

Modoc
National
Forest

800 West 12th Street
Alturas, CA. 96101
(530) 233-5811
TTY (530) 233-8708

File Code: 1930/2400
Route To: ((2020))

Date: February 8, 2011

Subject: Modoc NF - FY 2011 Attachment D for CFLR

To: Regional Forester

The Modoc National Forest and its myriad partners, who have common goals to provide both resilient ecosystems and sustainable communities, are seeking opportunities to expand the collaborative restoration currently underway across northeastern California. This work involves enhancing livestock grazing opportunities, while restoring sage-grouse habitat in sage steppe systems that have been degraded by changes in fire regimes. In addition, treatments in the dry-forest systems would provide a steady stream of goods to sustain current mills and develop additional local markets; these efforts are intended to increase treatment efficiency, while decreasing costs. The cumulative effect of vegetation treatments would restore ecosystem resiliency, thereby decreasing potential resource loss due to wildfire.

Working with our various partners, we are truly striving to implement the "All Lands Approach," realizing that is our best hope for continued success in the future. These partners are actively engaged in all phases of projects – from helping develop grants to fund the planning efforts through post-project monitoring.

The following collaborators are providing signatures in support of the Modoc National Forest's ten-year, multifaceted project Collaborative Forest Landscape Restoration Project. The signature page included with this letter is to fulfill the requirements for attachment "D" in the FY 2011 grant proposal. If you have any questions concerning this proposal, please contact me at (530) 233-8700 or Mary Flores at (530) 279-6116. Thank you for your time and consideration.

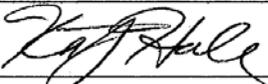
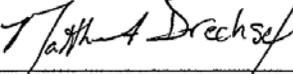
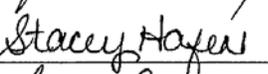
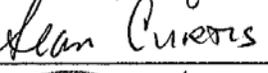
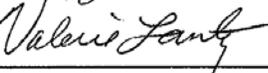
KIMBERLY H. ANDERSON
Forest Supervisor

Enclosure



Modoc National Forest Collaborative Forest Landscape Restoration Signatures of Commitment

We, the undersigned, are in collaboration with the Modoc National Forest and are committed to aiding their efforts to restore sage steppe and dry forest ecosystems as proposed in their Collaborative Forest Landscape Restoration Program grant proposal. The activities on the Modoc National Forest enhance the restoration treatments occurring across our various ownerships and with our organizations.

Name	Organization	Date	Signature
Kate Hall Watershed Coordinator	Central modoc Resource Conservation District	2/8/2011	
ALLEN BOLLSCHWEILER FIELD OFFICE MANAGER	Bun	2/8/11	
Matt Drechsel District Conservationist	NRCS	2/8/11	
Stacey HAFEN Dir. of Admin. Svcs	NORTH CALIF. NEVADA RCD Pit River Watershed Alliance	2-8-11	
SEAN CURTIS Resource Analyst	MODOC COUNTY	2-8-11	
Tim Burkz Field Manager	BLM Alturas	2/11/11	
Valerie Lantz Executive Director	The River Center	2-11-11	
CDwight Beeson	Modoc Vitality Working Group Plumas Bank	2-11-11	

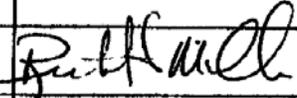
Please send the signed page to Warner Mountain Ranger District, PO Box 220, Cedarville, CA 96104, Attention: Mary Flores or FAX to 530-279-8309, Attention: Mary Flores.

FEB-16-2011 03:05P FROM:RANGELAND ECOLOGY AN (541) 737-0504

TO:915302798309P8486282P.1/1

Modoc National Forest Collaborative Forest Landscape Restoration Signatures of Commitment

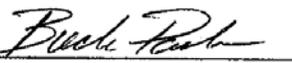
We, the undersigned, are in collaboration with the Modoc National Forest and are committed to aiding their efforts to restore sage steppe and dry forest ecosystems as proposed in their Collaborative Forest Landscape Restoration Program grant proposal. The activities on the Modoc National Forest enhance the restoration treatments occurring across our various ownerships and with our organizations.

Name	Organization	Date	Signature
RICHARD MILLER	OREGON STATE UNIVERSITY	2/16	

Please send the signed page to Warner Mountain Ranger District, PO Box 220, Cedarville, CA 96104, Attention: Mary Flores or FAX to 530-279-8309, Attention: Mary Flores.

Modoc National Forest Collaborative Forest Landscape Restoration Signatures of Commitment

We, the undersigned, are in collaboration with the Modoc National Forest and are committed to aiding their efforts to restore sage steppe and dry forest ecosystems as proposed in their Collaborative Forest Landscape Restoration Program grant proposal. The activities on the Modoc National Forest enhance the restoration treatments occurring across our various ownerships and with our organizations.

Name	Organization	Date	Signature
David F. Ferguson	NRLCS	2/9/2011	
Dale Gove	DFG	2/9/11	
Edward Ward	Pit River Rod & Gun CLUB	2/9/11	Edward Ward
Buck Parks	Pit RCD	2/9/11	

Please send the signed page to Warner Mountain Ranger District, PO Box 220, Cedarville, CA 96104, Attention: Mary Flores or FAX to 530-279-8309, Attention: Mary Flores.

Attachment E – TREAT Spreadsheet

Detailed Average Annual Impacts Table (For CFLR Fund Contributions Only)

	Employment (# Part and Full-time Jobs)			Labor Inc (2010 \$)		
	Direct	Indirect and Induced	Total	Direct	Indirect and Induced	Total
Thinning-Biomass: Commercial Forest Products						
Logging	52.9	63.0	115.9	2,579,025	3,196,982	5,776,007
Sawmills	25.2	48.3	73.5	1,366,009	2,118,906	3,484,915
Plywood and Veneer Softwood	-	-	-	-	-	-
Plywood and Veneer Hardwood	-	-	-	-	-	-
Oriented Strand Board (OSB)	-	-	-	-	-	-
Mills Processing Roundwood Pulp Wood	-	-	-	-	-	-
Other Timber Products	0.7	0.8	1.5	26,561	36,709	63,270
Facilities Processing Residue From Sawmills	5.0	11.5	16.6	382,483	576,138	958,621
Facilities Processing Residue From Plywood/Veneer	-	-	-	-	-	-
Biomass--Cogen	2.9	1.9	4.7	263,287	142,623	405,911
Total Commercial Forest Products	86.7	125.6	212.2	4,617,366	6,071,358	10,688,724
Other Project Activities						
Facilities, Watershed, Roads and Trails	0.0	0.0	0.0	0.0	0.0	0.0
Abandoned Mine Lands	0.0	0.0	0.0	0.0	0.0	0.0
Ecosystem Restoration, Hazardous Fuels, and Forest Health	0.0	0.0	0.0	0.0	0.0	0.0
Commercial Firewood	5.0	1.0	6.1	91,982.4	55,937.8	147,920.1
Contracted Monitoring	0.0	0.0	0.0	0.0	0.0	0.0
Total Other Project Activities	5.0	1.0	6.1	91,982	55,938	147,920
FS Implementation and Monitoring	39.7	9.9	49.5	1,155,467	499,721	1,655,188
Total Other Project Activities & Monitoring	44.7	10.9	55.6	\$1,247,449	\$555,659	\$1,803,108
Total All Impacts	131.4	136.5	267.8	\$5,864,815	\$6,627,017	\$12,491,832

Attachment F-Funding Estimates

Fiscal Year 2011 Funding Type	Dollars Planned
1. FY 2011 funding for implementation:	4,517,461
2. FY 2011 funding for monitoring	52,600
3. USFS appropriated funds:	2,377,000
4. USFS permanent & trust funds:	423,000
5. Partnership Funds	135,000
6. Partnership In-Kind Services Value (NRCS-Alturas & Tulelake)	1,345,571
7. Estimated Forest Product Value	41,250
8. Other (specify) Legacy Funds	248,240
9. FY 2011 Total (total of 1-6 above for matching CFLRP request)	4,570,061
10. FY 2011 CFLRP request (must be equal to or less than above total)	1,614,715
Funding off NFS lands associated with proposal in FY 2011 (does not count toward funding match from the Collaborative Forested Landscape Restoration Fund)	
Fiscal Year 2011 Funding Type	Dollars Planned
11. USDI BLM Funds	
12. USDI (other) Funds	
13. Other public funding	
14. Private funding	

Fiscal Year 2012 Funding Type	Dollars Planned
1. FY 2011 funding for implementation:	3,466,500
2. FY 2011 funding for monitoring	53,000
3. USFS appropriated funds:	2,150,000
4. USFS permanent & trust funds:	310,000
5. Partnership Funds	145,000
6. Partnership In-Kind Services Value (NRCS-Tulelake)	600,000
7. Estimated Forest Product Value	59,500
8. Other (specify) Legacy Funds	255,000
9. FY 2011 Total (total of 1-6 above for matching CFLRP request)	3,519,500
10. FY 2011 CFLRP request (must be equal to or less than above total)	1,764,000
Funding off NFS lands associated with proposal in FY 2011 (does not count toward funding match from the Collaborative Forested Landscape Restoration Fund)	
Fiscal Year 2012 Funding Type	Dollars Planned
11. USDI BLM Funds	
12. USDI (other) Funds	
13. Other public funding	
14. Private funding	

Fiscal Year 2013 Funding Type	Dollars Planned
1. FY 2011 funding for implementation:	3,014,700
2. FY 2011 funding for monitoring	53,000
3. USFS appropriated funds:	2,150,000
4. USFS permanent & trust funds:	310,000
5. Partnership Funds	155,000
6. Partnership In-Kind Services Value (NRCS-Tulelake)	400,000
7. Estimated Forest Product Value	52,700
8. Other (specify) Legacy Funds	0
9. FY 2011 Total (total of 1-6 above for matching CFLRP request)	3,067,700
10. FY 2011 CFLRP request (must be equal to or less than above total)	1,649,165
Funding off NFS lands associated with proposal in FY 2011 (does not count toward funding match from the Collaborative Forested Landscape Restoration Fund)	
Fiscal Year 2013 Funding Type	Dollars Planned
11. USDI BLM Funds	
12. USDI (other) Funds	
13. Other public funding	
14. Private funding	

Fiscal Year 2014 Funding Type	Dollars Planned
1. FY 2011 funding for implementation:	2,824,000
2. FY 2011 funding for monitoring	53,000
3. USFS appropriated funds:	2,150,000
4. USFS permanent & trust funds:	310,000
5. Partnership Funds	165,000
6. Partnership In-Kind Services Value (NRCS-Tulelake)	200,000
7. Estimated Forest Product Value	52,000
8. Other (specify) Legacy Funds	0
9. FY 2011 Total (total of 1-6 above for matching CFLRP request)	2,877,000
10. FY 2011 CFLRP request (must be equal to or less than above total)	1,653,215
Funding off NFS lands associated with proposal in FY 2011 (does not count toward funding match from the Collaborative Forested Landscape Restoration Fund)	
Fiscal Year 2014 Funding Type	Dollars Planned
11. USDI BLM Funds	
12. USDI (other) Funds	
13. Other public funding	
14. Private funding	

Fiscal Year 2015 Funding Type	Dollars Planned
1. FY 2011 funding for implementation:	2,628,500
2. FY 2011 funding for monitoring	53,000
3. USFS appropriated funds:	2,150,000
4. USFS permanent & trust funds:	310,000
5. Partnership Funds	175,000
6. Partnership In-Kind Services Value	0
7. Estimated Forest Product Value	46,500
8. Other (specify) Legacy Funds	0
9. FY 2011 Total (total of 1-6 above for matching CFLRP request)	2,681,500
10. FY 2011 CFLRP request (must be equal to or less than above total)	1,659,315
Funding off NFS lands associated with proposal in FY 2011 (does not count toward funding match from the Collaborative Forested Landscape Restoration Fund)	
Fiscal Year 2015 Funding Type	Dollars Planned
11. USDI BLM Funds	
12. USDI (other) Funds	
13. Other public funding	
14. Private funding	

Fiscal Year 2016 Funding Type	Dollars Planned
1. FY 2011 funding for implementation:	2,543,000
2. FY 2011 funding for monitoring.	53,000
3. USFS appropriated funds:	2,150,000
4. USFS permanent & trust funds:	210,000
5. Partnership Funds	185,000
6. Partnership In-Kind Services Value	0
7. Estimated Forest Product Value	51,000
8. Other (specify) Legacy Funds	0
9. FY 2011 Total (total of 1-6 above for matching CFLRP request)	2,596,000
10. FY 2011 CFLRP request (must be equal to or less than above total)	1,665,415
Funding off NFS lands associated with proposal in FY 2011 (does not count toward funding match from the Collaborative Forested Landscape Restoration Fund)	
Fiscal Year 2016 Funding Type	Dollars Planned
11. USDI BLM Funds	
12. USDI (other) Funds	
13. Other public funding	
14. Private funding	

Fiscal Year 2017 Funding Type	Dollars Planned
1. FY 2011 funding for implementation:	2,526,200
2. FY 2011 funding for monitoring	53,000
3. USFS appropriated funds:	2,150,000
4. USFS permanent & trust funds:	210,000
5. Partnership Funds	195,000
6. Partnership In-Kind Services Value	0
7. Estimated Forest Product Value	24,200
8. Other (specify) Legacy Funds	0
9. FY 2011 Total (total of 1-6 above for matching CFLRP request)	2,579,200
10. FY 2011 CFLRP request (must be equal to or less than above total)	1,670,515
Funding off NFS lands associated with proposal in FY 2011 (does not count toward funding match from the Collaborative Forested Landscape Restoration Fund)	
Fiscal Year 2017 Funding Type	Dollars Planned
11. USDI BLM Funds	
12. USDI (other) Funds	
13. Other public funding	
14. Private funding	

Fiscal Year 2018 Funding Type	Dollars Planned
1. FY 2011 funding for implementation:	2,545,000
2. FY 2011 funding for monitoring	53,000
3. USFS appropriated funds:	2,150,000
4. USFS permanent & trust funds:	210,000
5. Partnership Funds	205,000
6. Partnership In-Kind Services Value	0
7. Estimated Forest Product Value	33,000
8. Other (specify) Legacy Funds	0
9. FY 2011 Total (total of 1-6 above for matching CFLRP request)	2,598,000
10. FY 2011 CFLRP request (must be equal to or less than above total)	1,675,615
Funding off NFS lands associated with proposal in FY 2011 (does not count toward funding match from the Collaborative Forested Landscape Restoration Fund)	
Fiscal Year 2018 Funding Type	Dollars Planned
11. USDI BLM Funds	
12. USDI (other) Funds	
13. Other public funding	
14. Private funding	

Fiscal Year 2019 Funding Type	Dollars Planned
1. FY 2011 funding for implementation:	2,562,500
2. FY 2011 funding for monitoring	53,000
3. USFS appropriated funds:	2,150,000
4. USFS permanent & trust funds:	210,000
5. Partnership Funds	215,000
6. Partnership In-Kind Services Value	0
7. Estimated Forest Product Value	40,500
8. Other (specify) Legacy Funds	0
9. FY 2011 Total (total of 1-6 above for matching CFLRP request)	2,615,500
10. FY 2011 CFLRP request (must be equal to or less than above total)	1,680,715
Funding off NFS lands associated with proposal in FY 2011 (does not count toward funding match from the Collaborative Forested Landscape Restoration Fund)	
Fiscal Year 2019 Funding Type	Dollars Planned
11. USDI BLM Funds	
12. USDI (other) Funds	
13. Other public funding	
14. Private funding	

Fiscal Year 2020 Funding Type	Dollars Planned
1. FY 2011 funding for implementation:	2,565,000
2. FY 2011 funding for monitoring	53,000
3. USFS appropriated funds:	2,150,000
4. USFS permanent & trust funds:	210,000
5. Partnership Funds	225,000
6. Partnership In-Kind Services Value	0
7. Estimated Forest Product Value	33,000
8. Other (specify) Legacy Funds	0
9. FY 2011 Total (total of 1-6 above for matching CFLRP request)	2,618,000
10. FY 2011 CFLRP request (must be equal to or less than above total)	1,685,115
Funding off NFS lands associated with proposal in FY 2011 (does not count toward funding match from the Collaborative Forested Landscape Restoration Fund)	
Fiscal Year 2020 Funding Type	Dollars Planned
11. USDI BLM Funds	
12. USDI (other) Funds	
13. Other public funding	
14. Private funding	

Assumptions for Attachment F – Base rates are used, which do not reflect what the industry gets from the product or how that would provide important revenue for them. In-kind money and work consists of funds livestock permittees are spending on USFS allotments and NFS system lands under the Sage-Grouse Initiative.

Attachment G – Map of Project Area

