ECOLOGICAL, SOCIAL AND ECONOMIC CONTEXT

A deep irony provides the context for this proposal. The Roaring Fork Valley is home to and hosts the wealthiest and most influential people in the world. Its cultural, intellectual and recreational offerings are unparalleled – as is the uplifting beauty of the landscape that is the central draw to this place. Yet it is the land that has fallen into a degraded and in some cases hazardous condition. To use a well-worn cliché, we are cooking our goose.

Following 50 years of intense mining activity at the turn of the last century and several recent decades of rapid population growth and associated development, the landscapes of the Roaring Fork Valley are functioning at a sliver of their native potential. Tenacious post-development suppression of natural disturbance regimes such as fire has left vegetation in whole watersheds in mature and over mature, single-age cohort condition. Forests in this condition are left more vulnerable to insect epidemics and fire regimes outside their normal range. Combined with development in big game winter range, poor forage and structural conditions exist valley-wide for big game populations and multi-age stand dependant species. This is due to increased reliance for browse in the remaining transitional range not taken up in development. Hunting on the White River NF accounts for over $41 Million in economic activity with another $27 Million generated from wildlife viewing activities. The majority of game habitat in the Roaring Fork Valley is in poor condition. If landscape scale reintroduction of disturbance is not undertaken through CFLRP funding we should anticipate a meaningful decline in wildlife habitat in the next decade.

Local developers and homeowners have received little to no education of the role they can play in protecting their structures from wildfire. A concerted and strategic public education campaign is necessary to empower the public's responsibility to improve wildfire defensibility. Other desired conditions include reductions of wildfire movement from National Forest lands to residential areas, as well as increasing the ability to manage wildfire while improving wildlife habitat. As the public understands the reasoning behind restoration activities like prescribed burns and making forests more diverse people will develop shared ownership of local forest restoration and the necessity of an "all-lands" approach.

Some of the most limiting factors to achieving the scale of treatments necessary to meaningfully effect the landscape are lack of resources, need for better collaboration with existing resources, and public understanding and readiness for the needed restoration treatments. The Future Forest Initiative (FFI) addresses all of these and will act as a catalyst for innovative, integrated and adaptive management of the entire Roaring Fork Valley Landscape. The Future Forest Roundtable (FFR) is the convening mechanism to nurture this shared ownership of the lands stewarded by private landowners, Pitkin and Garfield Counties, the BLM, State Forest Service and the DOW.

Even in the face of mounting science measuring the impacts of our warming planet, adaptive management recognizes that in complex systems certainty of outcome is impossible. Creating a dynamic landscape regime capable of responding to unpredictable changes will allow for the most effective management. Aspen's Canary Initiative, the conservation efforts of FFR members like the Aspen Skiing Company, Aspen Global Change Institute, Community Office for Resource Efficiency,

and the climate change strategies included in the Roaring Fork Watershed Plan all combine to create a depth of commitment to climate change leadership unlike anywhere else in the world. These resources will continue to guide the adaptive restoration strategy of the Future Forest Initiative.

Water from the Roaring Fork Valley is an important water source for six western states and millions of water users in the arid West. Impacts to the riparian and stream function of water courses of the Roaring Fork Valley are substantial. Even with degraded conditions, $532 million of economic activity is currently generated from fishing each year on the White River National Forest (WRNF.) The Future Forest Initiative focuses on the largest free flowing drainage of the Roaring Fork Watershed, which is compromised by diversions for Colorado's Front Range. Significantly improved watershed conditions in the wild and scenic eligible drainage are quite achievable and cost effective. This activity will meaningfully improve economic outputs from this valuable stream. The Future Forest Roundtable, in partnership with the Roaring Fork Watershed Collaborative, will more effectively oversee and mobilize public education and action to protect the watershed from further diversion and degradation.

Bark beetle and other insects and disease are beginning to affect larger portions of the Roaring Fork Valley forests. There is currently a lull in infestation rates. During this lull we have an opportunity to increase stand age and species diversity and reduce the risk of spread of infestations through brood tree removal. If CFLRP resources do not come to the Roaring Fork Valley, we will likely fail to diversify age-class and species diversity for the next generational cycle.

Trees removed from restoration activities will be targeted for use in the local communities as carbon neutral fuel, house logs for local construction and producing biochar for range improvement, mine tailing and oil pad remediation, range improvements and carbon sequestration . The White River NF intends to be a model forest for developing use of biochar for mine tailing and oil pad remediation and carbon sequestration. CFLRP resources deployed on the Future Forest Initiative can be vital to our understanding of effectively expanding this exciting frontier of climate mitigation. Perhaps most important is that these efforts serve as a model for all other Rocky Mountain states where bark beetle infestations have moved across the landscape.

Millions of tons of coal have been removed from the Crystal River drainage of the Roaring Fork Valley. Mine tailing reclamation has been modestly successful in the area. Stream courses have been severely modified and leaching of metals and other toxins from tailing piles continue to limit the biological function of the largest drainage in the Roaring Fork Valley. Vast opportunities exist to replace removed carbon stores with the stabilized carbon of biochar made from beetle-killed trees. Biochar placement in the coal mining tailings shows promise for reducing the toxicity of tailings run-off while improving water holding capacity of soils, meaningfully improving revegetation potential.

The positive impacts to the local economy from restoration activities, including new industries and jobs, even though they may be modest, are an important part of a new strategy being energized by the Governor. With many mountain resort economies dependent on the development/construction industry, which has been devastated due to the recession, strong efforts are being made to diversify these economies through growing a portfolio of new industries, especially those that are part of the

"new energy economy." Opportunities in this sector will continue to be favorably held within local economic development strategies.

The Roaring Fork Valley enjoys over a million visitors a year as a subset of the most visited National Forest in the Nation. Visitors are attracted to the recreation and stunning landscapes of the Roaring Fork Valley with little recognition or investment in the poor functional condition of the landscape for wildlife, fish, and overall watershed health and forest resiliency. If we are to be successful in improving landscape function we need to be successful in gaining the ownership of our visiting and local public in the restoration of the landscape. Providing for the highest quality trails and visitor experiences, including leveraging opportunities for conservation education, will continue to play an essential role in increasing the public's connection to the land and ownership of its improved well being.

LANDSCAPE STRATEGY

By 1949, with the arrival of 2000 people in Aspen for a summer festival celebrating Geothe and humanitarianism, the world began to experience its extraordinary nexus of culture, recreation and stunningly beautiful landscape. This nexus continues to account for the million-plus visitors a year to the most frequented National Forest in the nation.

Visitors, and residents, are attracted to the recreation and singular landscape of the Roaring Fork Valley with little understanding of what is necessary to maintain the health of the land and water given increasing demands on and degradation of both. Even with degraded conditions, $532 million of economic activity is currently generated from fishing each year. This land is an international gem, and it is in disrepair. If we are to be successful in improving landscape function we must begin restoration in earnest now using a whole-systems approach. And we must be successful in gaining the ownership of our visiting and resident public in the health of the landscape.

Thus, creating innovations in public education around restoration and conservation ecology is a centerpiece of the "Roaring Fork Valley Restoration Strategy." This document will continue to be updated and honed by the Future Forest Roundtable as it guides the restoration activities on the valley landscape. It can be reviewed at: www.fs.usda.gov/whiteriver then navigate to Land and Resource Management section for documents used to support this CFLRP proposal.

The specific parcels of land chosen for immediate restoration within the valley landscape are priorities because they strategically reflect the major themes of the RFV Restoration Strategy. And most importantly, they each reflect collaboration between FFR participants in ways that can be leveraged significantly through greater formalization of the Roundtable. The galvanizing agreement among FFR participants is that this land is unique and priceless, it is in need of care and we need to strategically begin to restore it given limited resources to do so.

The RFV Restoration Strategy focuses on these interdependent elements:

- health of the land and water
- recreation and education

- economic opportunities in line with the new energy economy

The ecological health of the land and water is the central priority since all other goals are dependent on it. Increasing educational opportunities for the public within recreation and other outreach channels is intended to increase ecological literacy and thus increase social license for restoration strategies. There are already well over a million people being given conservation education through several FFR organizations. With the development of specific campaigns, with unified messaging, also targeting Home Owner's Associations within the valley (like the Starwood neighborhood which includes highly influential members,) can yield exciting and needed results. Human activity continues to encroach on valley habitat, converting winter range to housing and other development, and placing homes in WUI areas. Since humans have altered ecological function at a landscape level, restoring ecological function at a less than landscape scale will be ineffective.

The RFV Restoration Strategy builds on the strong involvement of FFR individuals and organizations in the Roaring Fork Valley Watershed Collaborative, which has developed a comprehensive Watershed Plan. Water from the Roaring Fork Valley is the primary water source for six western states and millions of water users in the arid West. With water issues inextricably tied to forest health, the strategic and extensive science of the Watershed Plan will be used to guide restoration activities.

Another important theme includes monitoring and adapting restoration to climate change. Home to world-class athletes, intellectuals, and global political and economic leaders, the Roaring Fork Valley is arguably one of the most socially significant international locales. It is also one of the most visionary in the arena of climate action. The Canary Initiative was started in 2005 to promote climate issues with the City of Aspen. Since then they have developed a Climate Action Plan for the City. The City of Aspen electric system is roughly 75% renewable, what we think to be unprecedented in the country. The communities of the Roaring Fork Valley have won numerous Dept. of Energy and state grants to develop pioneering renewable energy and climate action innovations. Adapting forest management to climate impacts will build on the initiative and resources already available here.

The Roaring Fork Biomass Consortium, a subset of organizations within the FFR, has received a $19,000 grant from the Governors Energy Office to study the feasibility of biomass energy in the Valley from a feedstock supply and an economic feasibility basis. Completion of the study is expected to be largely completed by the time of the CFLRP awards. The results of the study will help the FFR guide the fiber utilization from restoration activities. These targeted uses are attractive in that they lend themselves to relatively more simple carbon accounting. The restoration projects included in the FFI proposal involving biochar treatments reflect a globally significant opportunity for the biochar movement. They are pilot efforts that will provide the measurement and learning necessary to finally give the movement global traction, providing many new jobs in a restoration/new energy economy.

PROPOSED TREATMENTS

Priority 1: 55,000 Acre Wildlife Habitat Improvement-Across the Roaring Fork Valley mountain shrub communities are trending outside their historical condition: age class diversity, variable shrub height, density of sprouting shoots, species composition and encroachment of junipers and other conifers are diminishing critical habitat value. The result is reduced forage values for bighorn sheep, elk and deer, and a decrease in vegetation composition that benefits a variety of songbirds, small mammals, and other native fire-adapted species. The restoration goal is to bring these communities back into their historic conditions to restore plant health, vigor, and accomplish regeneration. In addition, periodic treatments of fire-adapted communities increase and/or maintain overall forage quantity and quality in areas serving as important deer, elk, and bighorn sheep range.

A variety of wildlife and plants, including threatened and sensitive species, would benefit from this proposal due to enhanced forage quality, returning age class diversity to vegetation communities, returning nutrients to the soil, and other benefits. As private land development continues to degrade native vegetation or eliminate it, National Forest System (NFS) lands along with adjacent private and county land serves an increasingly important role to provide quality wildlife habitat. The habitat improvement project was developed in collaboration with the FFR, and in particular the Colorado Division of Wildlife (CDOW) and Pitkin County. These entities will be involved with coordinating implementation of treatments on adjacent private and county lands. These lands include many of the units for which prescribed fire will occur in order to achieve the same restoration goals and objectives. Twenty four treatment units are distributed over five blocks. Treatments will comply with all Forest Plan objectives, standards, and guidelines for management area prescriptions. The large number of wildlife that depend on NFS lands across the landscape and the widespread distribution of degraded habitat across four major watersheds establishes a need for treatment at a large scale. The 24 treatment areas have been prioritized starting with those treatments where social license and collaborative potential is greatest. For FY2011 the first three are Woody Creek, Filoha Meadows in the Crystal River, and Collins Creek. For the complete list of projects ranked by priority see: http://www.fs.usda.gov/whiteriver then navigate to Land and Resource Management section for documents used to support this CFLRP grant.

This proposal will fund approximately 24,000 acres of prescribed fire treatments and 2,000 acres of combined prescribed burning and mechanical treatment of small diameter brush are in roadless areas. All treatments approved would comply with roadless rules at the time of implementation. The only tree cutting proposed in roadless areas involves the Four Corners/Starwood project (see below). Otherwise for the rest of the Roaring Fork Valley, vegetation to be cut in roadless areas involves small diameter shrubs (less than 6 inches diameter) such as Gamble's oak, serviceberry, mountain mahogany, and other mountain shrubs. Ecosystem health will result by promoting age class diversity, variable shrub height, density of sprouting, and species composition. Fire treatments in and outside roadless areas involve these shrub species in addition to decadent and stagnant aspen vegetation. All mechanical treatments of large diameter trees are outside roadless areas. NEPA will be finished by April, 2011. Estimated cost of the project: $480,000 of which $240,000 is requested from this CFLRP grant.

Priority 2: Four-Corners/Starwood Treatments-The Forest Service proposes to remove approximately 3,000 dead trees or trees infested with Mountain Pine Beetle on the White River National Forest adjacent to the community of Starwood in Aspen, Colorado. Trees would be hand felled and then removed via helicopter. The purpose of this proposal under the Healthy Forest Restoration Act (HFRA) is to reduce forest fuel loading adjacent to Starwood, remove mountain pine beetle brood trees, and lower tree stand densities.[1] Additional objectives are to promote regeneration and tree age class diversity and maintain or improve deer and elk winter range habitat. This proposal has been developed in collaboration with the private community of Starwood and the National Forest Foundation. Other activities associated with this proposal include: lopping and scattering of slash; hand or aerial Verbenone applications; and planting pine, spruce, and fir saplings if natural regeneration fails. Verbenone applications would be used to disperse mountain pine beetle pheromone in an attempt to reduce future beetle infestations in the area. Planting may be used to regenerate some locations and to create stand diversity in the project area. All White River National Forest Land and Resource Management Plan standards and guidelines and other pertinent Federal, State, and local laws and regulations will be complied with on this project. This project offers the FFR an opportunity to provide a model that provides education to homeowner associations on helping create defensible space around their homes in addition to lessening the fire danger by removing beetle infested trees on National Forest System Lands. Estimated cost of the project is $1.5 million provided by the Starwood Homeowners Association. NEPA will be finished by Spring/Summer 2011.

Priority 3: Aspen Ski Company forest health project-The purpose of this project is to maintain and improve forest health[2] conditions in forests located within each of the four Aspen Ski Company (ASC) permitted ski areas. Forest health has deteriorated regionally due to a combination of problems such as mountain pine and spruce beetle infestations, sudden aspen decline, mistletoe, and past drought. Without intervention, stand resilience and overall forest health is likely to continue deteriorating. Maintaining a diversity of tree species and age classes for example, can help encourage stand resilience thereby improving forest health. Age class diversity is one way to assure future resiliency of a forested landscape to a threat such as mountain pine beetle. There is a need to implement vegetation treatments identified in each of the existing ski area Resource Management Plans in order to maintain healthy ecosystems. There is also a need for retaining forest cover sufficient to maintain a positive guest experience at each resort as well as preserving old growth. Treatment units have been identified and a menu of options developed to respond to varying levels of forest health needs or insect infestation. Proposed treatments include: a combination of tree cutting and removal of dead or infested trees, stimulate regeneration, or reduce the threat of wind throw;

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[1] Scientific theories regarding whether the MPB epidemic increases wildfire danger offer conflicting information (go to the White River National Forest website: http://www.fs.usda.gov/whiteriver then navigate to Land and Resource Management section for documents used to support this CFLRP grant.)

[2] *Forest health is a condition wherein a forest has the capacity across the landscape for renewal, for recovery from a wide range of disturbances, and for retention of its ecological resiliency, while meeting current and future needs of people for desired levels of values, uses, products, and services.* (USDA Forest Service. 2007. An Assessment of Forest Ecosystem Health in the Southwest, Rocky Mountain Forest and Range Experiment Station, Southwestern Region General Technical Report RM-GTR-295. Available on-line at: www.rmrs.nau.edu/publications/rm_gtr_295/index.html.)

planting seedlings; or applying insecticide on individual high value trees. Objectives are to remove hazard trees, maintain a diversity of tree species and age classes, and retain forest cover sufficient to maintain a positive guest experience at the resorts. Treatments are proposed on approximately 4,293 acres at all four resorts. These figures represent the maximum area of tree islands and forested stands that could be treated; however treatments are not expected to occur on every acre identified. Treatment menus are based on current and desired forest health conditions for each unit and may be adjusted to address conditions at the time of implementation. Treatments will be consistent with Forest Plan standards and guidelines. NEPA will be finished by Fall 2011. The estimated Cost of the project is an estimated $600,000 with costs shared by the Aspen Ski Company and the WRNF.

Priority 4: Crystal River Watershed projects-The Colorado River meets the water and power needs of the nearly 30 million people within the seven Colorado Basin states and Mexico. Most of the water supply comes from headwater snowmelt. As a major supplier of headwater snowmelt to the Colorado Basin, the mostly high-elevation forested Roaring Fork Watershed is critical to ensuring that an adequate supply of high-quality water flows downstream. Most of these high-elevation areas fall within the White River National Forest which comprises 70 percent of the watershed's area. The Forest helped form and lead the Roaring Fork Watershed Collaborative, an informal gathering of local officials, planners, resource managers and interested citizens, to address critical water issues in the watershed. The Roaring Fork Watershed Plan, including the 2008 State of the Roaring Fork Watershed Report came from this group. The Plan represents a coordinated effort to identify and address water resources issues in the watershed. The companion Roaring Fork Restoration Strategy identifies and addresses forest issues in the watershed.

To address aquatic and forest issues at a landscape-scale, the Crystal River Basin, the largest drainage in the Watershed was selected the focus watershed restoration project. This Basin contributes more than 50 percent of the snowpack to the watershed and unlike the other major rivers in the watershed it is free-flowing. Coal Creek, a major tributary of the Crystal River, is on the state's 303 (d) list as impaired for iron and on the monitoring and evaluation list for sediment. Sediment delivery from Coal Creek effects the lower 18 miles of the Crystal River consequently, the Colorado Division of Wildlife manages the river as a put and take fishery. The Crystal River is significantly flow altered and more than 70 percent of the riparian and instream habitat is heavily modified to severely degraded. This project will: restore populations of the forest-sensitive Colorado River and the endangered Greenback cutthroat trout; improve water quality, reduce sedimentation, and improve riparian and instream areas for 23 miles of stream. This will be accomplished by obliterating more than seven miles of roads, bank sloping and planting three miles of streams; designing and reconstructing several miles of stream channel using Rosgen designs, restoring vegetation in 300 acres and incorporating carbon sequestration techniques for a historic coal mining area. The project will improve stream flows and riparian habitat, reduce flooding risk and improve the trout fishery, a major economic driver in the Valley. The USFWS estimated the White River National Forest fishery is worth half a billion dollars.

Priority 5: Recreation projects- Recreation projects are presented for CFLRP funding to improve and maintain trails to standard for a total of 565 miles. This reflects the intention of the FFI to

nurture the connection of people to the land while providing information and education to create ownership of landscape restoration. NEPA is complete for much of the project. The budget estimate for this project is $1,327,000.

Priority 6: Smuggler Mtn.-The close proximity of private homes on the edge of Aspen to city, county and WRNF administered lands requires close collaboration with all stakeholders for any proposal that might change how the land is managed. Social license will not be granted until social and political concerns are addressed along with ecological and physical constraints for this area. Scientific assessments by consultants have identified 404 acres on the WRNF recommended for treatment due to the Mountain Pine Beetle (MPB) epidemic. At this time the City of Aspen, Pitkin County, ForTheForest and the White River National Forest are in the preliminary planning stages of creating a collaborative management plan in which the primary force for co-managing Smuggler Mtn. is recreational use. The theme of the plan will be addressing ways to educate the recreating public about landscape scale restoration. Until this plan is completed, with help from the FFR, no further management actions to address the MPB epidemic will be considered.

Priority 7: Burnt Mountain-This proposed timber sale of approximately 800 acres would provide commercial wood products to local industries by harvesting dead, infested and green trees to create favorable regeneration in a mature forest with declining growth rates. This will also improve habitat and forage conditions for wildlife. The need to maintain tree growth for sustained yield of forest products will be accomplished by altering stand structures to increase age class and species diversity. This project will to be funded by the White River National Forest as part of our match for this RFV restoration effort. NEPA will be finished by Summer 2011. The estimated cost of project is $1,280,000.

Priority 8: Oil and Gas Pad Reclamation (2-3 acres)-The biochar restoration of an oil and gas well pad will be accomplished. Biochar treatment has been shown to increase the success of seedling establishment on heavily compacted soils with minimal soil organic matter, nutrients, and water retention. A trial will be established to look at four different biochar application rates (2.5, 5, 10, and 20 tons per acres equivalent.) The site will be monitored over two growing seasons. Roughly fifteen tons of biochar will be required from 60 tons of woodchips at <10% moisture. This priority is not shown on Attachment G because the exact location has not yet been determined. NEPA will be finished Winter 2012. The budget estimate for this treatment over a two-year period is $206,790.

Existing vegetation conditions within the RFV proposed for treatment and desired outcome

Mountain Shrub: This is community dominated by Gamble's oak, mountain mahogany, and serviceberry that provides big game winter range and habitat for a variety of local wildlife including nesting birds and raptors. Some sagebrush may be scattered throughout. A variety of grasses and forbs in the understory are present in a healthy shrub community. Currently decadent and over browsed vegetation shows hedging and clubbed terminal sprouts. Often the grass/forb component is browsed annually to stubble. Some shrublands exhibit a high density of stems in a uniform age class,

while other areas have shrub clumps surrounded by sparsely vegetated ground, grasslands or aspen. Treatments will promote a more variable and open stand structure with a mixture of plant species. The result will be a shrub community with an increased variability in age classes as a result of the natural variability in fire intensity that is caused by prescribed fire. Fire will induce sprouting of shrubs that provide wildlife browse and cover. New shoots, sprouts, and stems will have increased nutrient levels for wildlife. Acorn production from older-aged oaks will remain since these oaks tend to be largely unaffected by prescribed fire. Thermal and escape cover will remain at moderate to high levels across treatment areas, although there would be localized reduction in cover at some sites where vegetation is consumed from greater fire intensity. Desirable vegetation conditions should persist for 15-30 years after treatment. Additional treatments at 1 to 3 year intervals 2 or 3 times after the initial treatment can help remove dense shrub sprouting stimulated by fire. *Approximate acres to be treated are 21,000 acres in 21 units.*

Pinyon-juniper: Although pinyon-juniper is a dominant vegetation type at low elevations in the Roaring Fork Valley, the absence of fire and similar disturbance has promoted encroachment of young to mid-aged pinyon-juniper trees into adjacent mountain shrublands. With encroachment, species diversity declines; resulting in a monoculture juniper stand and conversion of sagebrush and shrublands to a woodland community. Retaining old growth pinyon-juniper trees will be part of the treatment design providing important habitat to native wildlife. *Approximate acres to be treated are 1,600 acres in 12 units.*

Aspen: There are areas within the Roaring Fork Valley where mountain brush is encroaching on aspen and where aspen is in decline. Healthy aspen vegetation provides important elk calving areas, and habitat for a variety of wildlife if managed to provide multiple age classes across the landscape. At the longest fire return intervals, mountain shrubs persist in the understory of these aspen stands. As shrubs encroach, aspen regeneration declines sharply creating stagnant or stunted conditions.

Fire treatments will be designed to rejuvenate aspen availability, abundance, and distribution, stimulating aspen sprouting within a few years of treatment. Cutting aspen will also stimulate sprouting. The desired condition would be stands exhibiting aspen regeneration either in small groups or across larger areas having favorable site conditions producing a high degree of diversity. *Approximate acres to be treated are 22,500 acres in 23 units.*

Conifer, Aspen/conifer: There are areas of lodgepole and other conifer vegetation that have been affected by insects and fungal pathogens or have become stagnant due to lack of regeneration. As these stands mature their remaining live crown shades out understory growth and they become less viable habitat for wildlife. These forests provide spring calving and summer foraging habitat for big game and habitat for a variety of other sensitive wildlife. Without a treatment to invigorate regeneration and thin the overstory, the vegetation will continue to decline. Conifer stands would show a similar improvement in variability of forage and cover. In the short term cutting select groups of trees will create small openings. Retaining old growth is also a goal in these conifer stands. Over the long-term, multistoried stands would benefit a variety of wildlife. Treatment of aspen is described in the above section. *Approximate acres to be treated are 4,200 acres in 2 units for wildlife*

habitat improvement. An additional 2,473 acres in this forest type will be treated through funding by the WRNF and partners.

Grassland: Many subalpine grassland communities have become suppressed due to lack of recent fire. As a result these areas have accumulated a thick mat of dead material that appears to negatively affect plant sprouting. Open subalpine parks are important for big game. This is a Thurber fescue dominated subalpine grassland community with dead grass stems and litter mat on the ground under plants. Little or no weed infestation is evident. The same suite of grasses and flowering plants would be present after fire treatments. The amount of litter and dead plant matter should be reduced returning nutrients to the soil. *Approximate acres to be treated are 760 acres in 2 units.*

Description of proposed treatments and anticipated vegetation effects

Prescribed fire- Fire would be broadcast across approximately 26,200 acres of target vegetation in 10 units outside sensitive areas of concern. Treatments would occur in spring (April-May) or fall (September-October), following any needed treatments for noxious weeds and establishment of control lines. Target vegetation includes mountain shrub, mountain shrub/aspen, pinyon-juniper/mountain shrub, and grassland. Other vegetation within treatment units are not targeted. Objectives of fire treatments (outside grasslands) are to achieve 40-60% consumption of target vegetation within a unit, by way of top-killing shrubs and under-burning dry ground litter and debris, dead grasses and forb stems. Top-killing shrubs leaves the dead stems on the plant and thins the density of stems until sprouts return. Objectives for top-killing may be set at 80%, but variable site conditions during prescription often cause consumption to be 20-40% less that objective over an entire burn area. In the analysis area, shrub sprouting has been documented to start within a few months of fire treatments done in spring. In aspen, burning under canopy trees consumes burnable litter, debris, and dead grass stems in a mosaic pattern without killing trees, due to the variable intensity typical of a prescribed fire. Aspen is known to sprout in response to fire and a more open shrub and ground layer would allow establishment of aspen regeneration, grasses and forbs. Burned ground litter and dead branches may be visible until snowfall, although new sprouting would occur during the first growing season. Where grassland fire treatments have been done in fall in other areas of the WRNF, the start of grass sprouting in spring has been unaffected by treatments. Burn areas may be visible for a month or two before snowfall, then visible for a few months in spring until grass and forbs sprout.

Mechanical/fire treatments-Mechanical treatments will be blended with prescribed fire treatments across 19,400 acres in 11 units to consume vegetation, ground litter, and dry fuels under shrubs and trees. These treatments would occur in mountain shrub/aspen vegetation for the benefit bighorn sheep and other big game. Objectives of blended treatments are those described above. Mechanical treatment includes cutting or mulching vegetation using a mechanical implement or chainsaws on flat terrain or where sparse vegetation does not carry fire. Prescribed fire would be used on steeper slopes with dense vegetation. The primary reason for using mechanical equipment rather than prescribed fire is because variable weather, smoke persistence, or close proximity to homes and infrastructure may limit the applicability of fire.

There would be two types of mechanical treatments used to clear vegetation. In one type, a hydro-axe, roller chopper, mulcher, or similar implement would be used to chop or grind target vegetation. These may be affixed to tracked or wheeled equipment. Treatments may occur in spring (April-May) or summer/fall (July-October), following any needed treatments for noxious weeds. Target vegetation includes mountain shrub and pinyon-juniper/mountain shrub.

Other vegetation within the treatment unit, including sagebrush, is not to be targeted. Objectives of treatments are to achieve 60-80% reduction of target vegetation within a unit, while retaining islands of vegetation, vegetation along stream zones, steep slopes, etc. Rocky terrain and rock outcrops are problematic when conducting these treatments and are thus avoided. Ground and soil disturbance is most likely in areas of sharp turns, particularly with tracked equipment.

No road construction is needed for this type of equipment. The second type of mechanical treatment is chainsaw brushing, thinning, or select tree clearing. Treatments my occur in spring (April-May) or summer/fall (July-October), following any needed treatments for noxious weeds. Target vegetation includes mountain shrub and pinyon-juniper/mountain shrub, mountain shrub/aspen. Other vegetation within treatment units, including sagebrush and conifer, is not to be targeted. Objectives of treatments are to achieve 40-60% reduction of target vegetation within a unit, while retaining islands of mature vegetation, vegetation along stream zones, steep slopes, etc. The intent is to thin shrubs or fell select canopy aspen trees in dense pockets in the mountain shrub/aspen vegetation and remove encroaching young pinyon-juniper trees and thin shrubs in the mountain shrub vegetation.

Thinning vegetation increases light penetration to the ground and stimulates sprouting and regeneration. Shrub sprouting may begin within a few months of treatments if done in spring, or may be delayed until the following growing season if done in summer/fall. Mechanical thinning is designed to occur outside the primary migratory bird reproduction and nesting period to allow for rearing young.

A third type of mechanical treatment would be select tree or group select tree cutting in 4,300 acres of conifer or aspen vegetation in two units. Treatments would occur in summer/fall (July-October), following any needed treatments for noxious weeds. Other vegetation within treatment units is not to be targeted. Objectives of treatments are to achieve a 40-60% reduction of target vegetation within a unit. Effects to vegetation are the same as a timber sale; select tree cutting, opening the canopy to increase light penetration to the ground and stimulate sprouting and regeneration. Trees may be left on the ground or hauled out to landings for removal or fuelwood gathering.

Issues and Implementation

The WRNF is currently analyzing effects in an environmental analysis. Preliminary scoping for issues raised during the comment period have been addressed and NEPA is expected to be finished by April, 2011. Implementation of the project will start during the 2011 field season and extend over a ten year period. Treatments will be scheduled based on resource availability, and for prescribed fire, take in to account weather, smoke dispersal, fuel moisture, and protection of any constructed and

natural features. Treatments will be designed to meet the desired conditions that will result in mosaic patterns that create a healthy, vigorous, and diverse environment for wildlife.

Wildfire in the Roaring Fork Valley

Current Wildfire Conditions:

Active fire suppression by government land management agencies over the last hundred years has created "unnatural" fuel loading in the Roaring Fork Valley. This in turn has produced the potential for historically uncharacteristic scale of stand-replacing wildfire. The WRNF Fire Management Plan can be found at http://www.fs.usda.gov/whiteriver then navigate to Land and Resource Management section for documents used to support this CFLRP grant. The plan was updated in the summer of 2010 and reflects how these "unnatural" conditions influence fire management decisions for our proposal.

The Fire Regimes and current Condition Class of the Roaring Fork Valley vegetation within the proposed burn blocks are given in the following **Table 1**:

Fire Regime	**Frequency**	**Fire Severity**	**WRF Vegetation Cover Types**	**Condition Class**
I	0-35 yrs	Low	Ponderosa Pine, dry site Douglas-fir	1
II	0-35 yrs	Stand Replacement	Sagebrush, Grass, Forb	1
III	35-100 yrs	Mixed	Gamble Oak, Mixed Mtn. Shrub	1-2
IV	35-100 yrs	Stand Replacement	Aspen, PJ, low elevation mixed conifer	1
V	>200 yrs	Stand Replacement	Spruce-fir; lodgepole; alpine krummholz	1

Notes: Aspen and conifer stands with heavy downed dead or encroachment could be condition classes 2 or 3 depending on how decadent the mature stand is.

How wildfires will be managed: Post treatment fire behavior after restoration is expected to be of lower severity and intensity, with minimal stand replacing runs. In areas successfully treated with prescribed fire, the lack of available fuels will minimize flame lengths and produce backing and or short duration slope runs mimicking fire behavior normally found in fire adapted ecosystems.

Natural fire regimes will be reestablished by means of applying the appropriate mechanical fuels treatments, prescribed fire and/or a combination of both to the landscape as presented in detail in this treatment section. Natural fire regimes may be maintained on the landscape with a combination of prescribed fire and/or wildfire where appropriate. In "C" and "D" polygons (as described in the White River Fire Management Plan) natural ignitions fire will be evaluated for opportunities to allow it to assume its natural role in a restored ecosystem. There is a great need to educate the public on the natural role of fire in the ecosystem. In 2009 the Difficult Fire gave the federal fire community, officials from the City of Aspen and Pitkin County, as well as the DOW, the first opportunity in the

Roaring Fork Valley to participate directly in the decision to manage the Difficult Fire with minimum suppression tactics. All the above parties appeared together as a panel on local television to explain their decision.

In some areas of this restoration plan wildfire may not be allowed to play its natural role due to social, political or management considerations. In this case more aggressive public education will be needed to achieve greater social license. Until such time, prescribed fire projects will continue to be presented to the FFR and agreed upon projects will appropriately apply prescribed fire to the landscape as needed to maintain the restored landscape.

These prescribed fire projects will consist of both broadcast and pile burning as appropriate. Monitoring will determine the maintenance schedule required for each unit and will be based on an acceptable range of variability determined by resource specialists on the forest in collaboration with the FFR.

Considering the many wildland/urban interface lands found within this landscape, the FFR will play a pivotal role in updating Community Wildfire Protection Plans (CWPP) which will emphasize the need of private land owners to assume greater responsibility for taking actions to help create defensible space around their properties. Without these attempts the Four-Corners/Starwood project to reduce the potential for large catastrophic fires will be far less effective. The current CWPPs in the Roaring Fork Valley include those within Pitkin County (Conundrum, Marble, Missouri Heights, Snowmass and the county-wide CWPP) and one county-wide CWPP for Garfield County.

The costs of managing wildfires in the Roaring Fork Valley as obtained from fire managers on the Upper Colorado River Interagency Fire Management Unit vary from $50 to $1600/acre. After the restoration projects in this grant, long-term management costs for follow-up Rx burning and mechanical treatments should be significantly reduced to $50- $200/acre. These figures reflect over 150 years of fire experience from the fire managers who know this area well.

COLLABORATION

As a foundational element of this proposal we offer the following Collaboration Plan (see below) to guide the further development of the collaborative infrastructure necessary for the greatest success of the FFI. The Plan will be presented for review and action by the Future Forest Roundtable at its next meeting February 25. The FFR has the advantage of learning from other successful collaboratives with longer histories and applying that knowledge with an ability to move forward toward implementation with greater agility, understanding, purpose, and effectiveness.

The FFR has a unique capacity for leveraging influence that has big dividends. One of our roundtable leaders said, “The people who run the world come through our forest.” Evidence for this is the $1.5 million brought to this proposal from one private source for one of the projects we are submitting. It is very likely that other potential funders are waiting for the Forest Service to make a long-lasting commitment, rather than the promise of a paradigm shift toward collaborative management, before any further large investments are made in the FFI. This two-edged sword is a collaboration conundrum. However, it takes influence to gain greater influence. For instance, the leverage value of

the NGO non-profit groups participating in the FFR totals over $70 million dollars. Political influence also exists in the form of a resolution supporting passed by the Pitkin County Board of County Commissioners (BOCC.)

Collaboration Plan

The projects included in the "Future Forest Initiative" (FFI) proposal, will be collaboratively managed by the Future Forest Roundtable (FFR). By supporting the collaboration and treatments of multiple federal and state agencies and private landowners, the FFI is able to leverage resources from a variety of private and public sources to achieve increasingly vital management goals.

While the FFR convened for the first time in March of 2010, it includes several decades long partnerships between its participants and the Forest Service (see Attachment C.) The Roaring Fork Conservancy (RFC) and the WRNF have labored together as part of the Roaring Fork Watershed Collaborative since 2005. The results are the science based "*State of the Roaring Fork 2008*," "*Phase II Guidance Document, Illuminating the Way Ahead,"* both part of the Roaring Fork Watershed Plan; a report: "*Fostering Implementation of the Roaring Fork Watershed Plan*,"[3] as well as a draft implementation guide (soon to be posted on the RFC's website: http://www.roaringfork.org where the above documents may be found.) Together, as partners in the FFR, the WRNF and RFC staff based their scientific input into this grant on those previous efforts.

The intention of the FFR is to develop a collaborative approach to improve the ecosystem health of the landscape, using the best available science, community input and adaptive management. Collaborative partnering facilitated by this grant will create essential national backing for landscape scale restoration across the NFS.

Participants thus far in the Future Forest Roundtable acknowledge the very nascent stage of formal development of its collaboration. However, given the ecological and economic urgency to restore the extraordinary Roaring Fork Valley landscape, FFR participants have mobilized behind the FFI. They have committed to building the collaborative infrastructure necessary to support a new culture of shared management of the forest. While there has always been a culture of collaboration and innovative partnerships in the Roaring Fork Valley, participants in the FFR recognized the growing need to formalize a roundtable structure that can leverage the collective creative and monetary resources of its members (with combined annual budgets of well over $70,000,000) for the health of the forest.

There is broad acknowledgement among the FFR participants of the value in coming together now, and to use the FFI as a catalyst to begin a new era of collaborative management. The integrity of the FFR collaboration will drive the implementation of the FFI projects, and make possible globally significant land management strategies for future generations – thus it is at the heart of this proposal.

[3] The result of five graduate students from the University of Michigan's School of Natural Resources and Environment (SNRE) completion of their year-long master's project to help implement the Roaring Fork Watershed Plan. The team identified models of collaborative watershed-scale governance and management as well as successful approaches to public outreach and education.

The collaboration will also continue to bring the best thinking and science to our landscape restoration goals to achieve the objectives of the CFLRP grant.

Acknowledged benefits to formalized collaboration include:

- Ability to adapt forest management to climate change more nimbly and accurately
- Ability to attract alternative funding
- Increased creative potential of FFR participants
- Creating integrated and unified messaging in public education campaigns
- Creating new educational opportunities wherever FFR participants host people on the land
- Ability to take action on restoration innovations, like biochar, with the best thinking and collaboration of FFR participants
- Ability to educate the people of global influence who visit/live here and spread ecological literacy, especially around climate change

Coordination-FFR participants will collectively raise $10,000.00 to fund a coordinator for March, April and May of 2011 to support the creation of organizational structure, working agreements, decision-making processes and fiscal agency for the roundtable. The coordinator will build on the relationships and collaboration that have been fostered through the development of the FFI. The March-May time frame allows for formal structure to be in place to ensure collaborative management of the FFI projects. The commitment of the FFR participants to this process has already created new alliances, such as the Roaring Fork Biomass Consortium that is studying the feasibility of practical use of biomass in the Roaring Fork Valley. With help from the Governor's Energy Office $90,000 was raised for this study.

The coordinator will employ the best practices from collaborative efforts that have come before. The FFR will utilize the wealth of resources available through the National Forest Foundation, the Western Collaboration Assistance Network, the Keystone Center and others in formalizing its structure and process.

For instance, as the research detailed in Collaborative Leadership (Jossey-Bass, 1994) shows, successful collaborative efforts

"…produced concrete, tangible results. That is, a fundamental impact on a root cause of a problem, or situation was made; the effort generated more than simply a set of activities or some structure building devoid of real impact on the problem."

The Roundtable collaboration will be strengthened by producing positive impacts on the ground that are collectively supported by the FFR participants.

One of the strategies for building connectivity, and thus creative working relationships between roundtable participants so essential to large-scale restoration, will include facilitated partner meetings and field trips. Not only will these activities build relatedness and trust between participants, but also greater understanding of the restoration projects and treatments of the FFI.

Proposal Development-After reviewing the CFLRP criteria, FFR participants agreed to focus on projects with existing collaborative elements as well as those that will foster strategic collaboration for greater positive impacts to the landscape.

Sustained Management of the FFR-Following is a list of the various tasks and duties that may be required of the coordinator position:

1. Provide coordination and facilitation of all Roundtable meetings and related activities, to include:

A. Arrange for, participate in and facilitate all Roundtable meetings and conference calls, to include preparation and distribution of agendas; arrangements for meeting rooms and/or call-in lines; arrangement for refreshments, if needed; and preparation and distribution of meeting notes and follow-up items.

B. Maintain a record of assignments accepted by Roundtable leadership as well as any other Roundtable members or work groups and facilitate follow-up and implementation.

C. Make arrangements for Roundtable field trips, as needed.

D. Maintain a current calendar of all Roundtable and related events.

E. Maintain a current contact list of all members and working groups of the Roundtable.

F. Arrange for storage and organization of all Roundtable documents including minutes, reports, presentations, publications, photos and related materials.

G. Coordination, with direction from the Roundtable leadership, of an annual budget.

H. Track and manage FFI budget and grant requirements.

2. Coordinate internal and external communication involving the Roundtable leadership, participants and partners, to include:

A. Develop and implement an active communications plan

B. Coordinate internal and external communications between Roundtable meetings.

C. Develop a Roundtable web presence. And provide timely updates and linkages to ensure accuracy.

D. Utilize various communication techniques to organize and report out the direction, progress, and accomplishments of the group.

E. Prepare an annual report that details Roundtable accomplishments for the preceding twelve months and lists the focus of the Roundtable for the next twelve months.

F. Prepare an annual report that details FFI progress as required by the CFLRP grant requirements.

G. Receive general phone inquiries for the Roundtable and, if necessary, forward to the appropriate

individual or agency for follow up.

Multi-party Monitoring-Collaborative multi-party monitoring will be conducted under a 25 year plan written by the Colorado Forest Restoration Institute (CFRI) that will be tailored to the proposed projects in the Roaring Fork Valley. This will include a protocol that will establish an ecological baseline before any work is accomplished on-the-ground and will monitor vegetation pre-treatment, post-treatment, woody debris, etc. Monitored plots will be systematically recorded by members of the Future Forest Roundtable and those recruited from the public, including local high school and college students throughout the life of this project and beyond. The intention is to be uniquely engaged in climate change monitoring through the efforts of internationally recognized FFR partner the Aspen Global Change Institute (AGCI.)

The WRNF is uniquely poised to lead the way in adapting forest management and restoration practices in the context of projected climate change in the 21st century. To this end, we propose to complement MPM efforts informed by CFRI with a monitoring system that would, at the outset, characterize the current climate of the WRNF and, on an ongoing basis, help inform climate change resilient restoration practices. In partnership with the AGCI, we will seek guidance from leading scientists for the establishment of a basic forest climate observation network. Once established, data from this monitoring network, complemented with climate change and bioclimatic modeling, will be analyzed and reported to the FFR so that such knowledge feeds into adaptive management. This operational effort will inform field work on forest management aspects such as forest productivity, fire risk, exotic invasive species and species migration, and carbon cycle analysis and management.

The potential for education of the public around managing and restoring the forest for climate change impacts is also unique. The WRNF is not only the most visited forest in the country, but perhaps, due to the types of visitors, the most globally significant in terms of its influence. From the world leaders who come to the Aspen Institute, to the CEO's who vacation in the area, to the celebrities who have homes in the Valley, the people who frequent the WRNF are among the most influential in the world.

Our monitoring strategy will be based upon the recommendations of the Forest Service climate change report from the USFS Rocky Mtn. Research Station in Fort Collins that can be found at: http://www.fs.fed.us/rmrs/docs/climate-change/climate-change-research-strategy.pdf

UTILIZATION

Wood fiber by-products of restoration activities for the Roaring Fork Valley CFLRP proposal will be targeted for use in the local area. To maximize restoration, climate and economic benefits from this restoration by-product, fiber will be targeted for use as local construction material in the form of house logs, wood fuels (fire-wood and biomass) and biochar (http://www.biochar-international.org/biochar). The Roaring Fork Biomass Consortium, a subset of organizations, including the Forest Service, within the FFR, has received a $19,000 grant from the Governors Energy Office as part of a $90K effort to study the feasibility of biomass energy in the RFV (http://www.aspendailynews.com/section/home/144023). The study will include analysis from a feedstock supply and an economic feasibility basis. Completion of the study is expected to be

completed by the time of the CFLRP awards. The results of the study will help the Future FFR guide the fiber utilization from restoration activities. These targeted uses are attractive in that they lend themselves to relatively more simple carbon accounting.

Biochar, "charcoal" produced from pyrolosis of wood chips, has shown tremendous promise as a soil amendment and remediation tool in many small scale trials. Biochar's known water retention properties may allow for improved revegetation success and, if shown to be cost-effective in larger scale applications, may potentially be an important new tool for water management in the arid West. The FFR will be exploring an economic framework for a potentially new biochar industry in the region. CFLRP resources will be used to potentially deploy 4 levels (20,000 square feet, 3 acres, 15 acres and 1000 acres) of production scale field trials of biochar/compost applications. Trials will measure biochar's efficacy to reduce impacts of metals contamination in mining wastes, stabilize mass wasting sites, remediate effects of oil and gas pad development and improve revegetation of highly compacted soils and mining waste piles. Trials will determine the economic feasibility of use of biochar for these large scale applications. Biochar in these applications has the additive carbon mitigation advantage in that biochar remains quite stable in soils as it provides soil organics without volatilization of greenhouse gasses.

Production scale field trials for biochar in this proposal should utilize between 850 (first three levels of deployment) and 13,350 tons (all levels) of wood fiber depending on which of the four scales of deployment are achievable with funding. Sufficient wood material will be available from restoration activities contained in this proposal to meet volumes necessary for these trials.

While there are existing wood fuel production and utilization facilities in the area, it is unlikely that fiber from the Roaring Fork Valley will be cost effective enough to economically reach those facilities at this time. The Roaring Fork Biomass Consortium analysis will help us determine how much of our restoration biomass can be valued as an energy product.

Treatments proposed in this application will produce approximately 194,000 green tons of biomass if all material is used for that purpose. We know that significant volumes of wood material from restoration treatments will be suitable for construction grade material and house logs. The later end use products do not have robust local markets at this time.

To the extent that new markets in biochar, wood energy and local construction material can be promoted by creating a known feedstock supply via this project, value capture for restoration by-products will be returned to additional restoration activities. Biochar as an agricultural soil amendment and waste rock and oil pad remediation product may prove to have the highest value for restoration by-products in this Roaring Fork Valley at this time.

BENEFITS TO LOCAL ECONOMY

The communities of Aspen and the surrounding Roaring Fork Valley arguably attract, on a regular basis, some of the most influential and powerful people in the world. This makes it a strategic place for the USFS to model innovations in collaborative landscape level restoration, restoration economy and climate change action. The Roaring Fork Valley (RFV) and the USFS lands receive over a

million visitors a year. Visitors from all over the world come to the RFV to enjoy fishing, hunting, hiking, camping and wildlife viewing in the majestic setting of Central Colorado. The local economy has always been directly tied to the health and vitality of this extraordinary land.

Restoration investments funded by the CFLRP grant in the RFV will provide unparalleled public, and world leader exposure to innovative landscape level management for watershed and climate change action. This proposal, while having demonstrable ecologic and climate advantage and local economic implications, is structured to recognize the potential global reach of likely observers, investors and participants in local restoration and climate change activities. Investing in restoration and climate change action in the RFV is likely to attract world class thinkers and people of influence to the ecological and economic challenges facing local landscapes. We will be a laboratory for global restoration and climate action. Globally important institutions located in Aspen such as the Aspen Institute and Rocky Mountain Institute have for decades convened world leaders and scientists to discuss the most urgent ecologic, economic and social issues of our day. If this proposal is funded, the FFR will maximize what makes this place so unique by bridging such influential capacity building with on-the-ground achievements.

The counties of the Roaring Fork Valley suffer from a lack of economic diversity with Pitkin and Eagle County's heavy reliance on Ski Industry and associated service sector jobs and Garfield County's heavy reliance on gas and oil associated industry. Lack of economic diversity leaves the counties of the Roaring Fork Valley particularly vulnerable to the volatility of the gas and oil markets and the available disposable incomes of the nation. The current economic downturn has hit many of the RFV communities extremely hard. Particularly hard hit has been minority communities within the RFV that rely on service and construction sectors. If funded, the FFI proposal will build a framework for the new restoration sector of economy. This sector will provide for sustained direct employment over the next decade while improving sustaining environmental services and related employment for decades following project completion. Restoration activities will provide skilled and semi-skilled labor opportunities that can help replace some of the employment found in the particularly depressed construction and forest product related sectors.

If funded, the CFLRP portion of the (FFI) proposal will potentially provide for approximately 17 direct jobs in the Roaring Fork Valley utilizing Deputy Undersecretary of Agriculture Jay Jensen's course employment factor of 23 jobs per $1M spent on restoration activities. Using the same metric, an additional 34 direct jobs will be created with USFS and partnership funds. It is expected that many economic sectors will be stimulated to add employment opportunity including alternative energy, biochar, tourism and outfitter/guide industries.

It cannot be overstated that almost all of the economy of the Roaring Fork Valley is dependent on the health and beauty of the landscape. Seventy percent of the lands of the Valley are managed by the US Forest Service and another 6 percent by the Bureau of Land Management. The Valley is home to five world renowned ski areas that drive the majority of economic activity for the area.

FUNDING PLAN

Multi-Party Monitoring

The multi-party monitoring budget funds an integrated, partner-based strategy that will allow for baseline, implementation, and effectiveness components. Due to the high public interest, adaptive management and landscape scale nature of this project, it will be essential to provide for a relatively robust monitoring strategy for the effort. Because of the scale of the restoration activities, the USFS has chosen a NEPA clearance strategy that requires resource specialists to visit each treatment unit at least year in advance of project implementation and provide input on avoiding resource impacts and set up monitoring as part of a yearly operating plan. A yearly allocation of resources for this internal monitoring will be required as a portion of the total monitoring program for successful implementation and adaptive nature of this proposal.

We are partnering with the Aspen Global Change Institute (AGCI) to develop a climate change monitoring protocol to measure the effectiveness of our treatments and to establish a long term monitoring of the changes in the Valley due to changes in climate. This monitoring will help guide year to year adaptive management actions in our effort to create a more climate resilient landscape, while adding to the scientific understanding of the efficacy of restoration management related to climate change. AGCI is proposing an approximately $28,000 monitoring program in the first year, a $150,000 program in the second year and a $100,000 in the third year. Partner funding is expected to cover this monitoring effort beyond the allocation requested.

It is expected that the FFR will be integrally involved with AGCI in the development of the necessary monitoring strategy beyond what will be minimally necessary to meet USFS commitments included in our NEPA documents. Due to the high caliber of science expertise included on the FFR, monitoring investment included in this proposal are very likely result in the basis for important contributions to the restoration and climate change science literature.

Federal and Non-Federal Investment in the landscape

Combined Federal Resources of CFLRP ($7.51M) and USFS regular allocation ($1M) should generate an approximately $27.1M investment in restoration in the Roaring Fork Valley over the next decade. Other yet solidified partnerships with USDA Rural Development, BLM and Governor Hickenlooper's economic development effort will surely expand the resources available to the project area.

The White River National Forest has selected the Roaring Fork Valley project as a model for similar efforts beginning undertaken on all five districts of the Forest. More successful landscape scale restoration planning and partnership development will be spurred by success and lessons learned from this project. All five District plans will be cumulative for improving watershed conditions for the Upper Colorado landscape. No other associated non-federal partnerships are deemed necessary for the success of this project.