

# A Strategy for Accelerated Watershed/Vegetation Restoration on the Arapaho and Roosevelt National Forests and Pawnee National Grassland

*To create ecosystem and community sustainability*



*Wildland fires have been increasing in frequency and severity*



*Vegetation management can create sustainable conditions*

## Introduction

In 1997 the Arapaho and Roosevelt National Forests and Pawnee National Grassland (ARP) Forest Plan was revised. Identified in this revision was the need to manage vegetation for healthy, productive ecosystems and to create sustainable conditions. Catastrophic wildland fires in 2000, 2002 and 2003 indicate a clear need to rapidly implement the ARP Forest Plan to achieve these desired conditions. Since late 2000 the ARP has been aggressively developing capabilities to address this impending crisis leading to development of the Front Range Fuels Treatment Partnership (FRFTP) in 2002. The ARP is now devoting the majority of our planning and implementation resources to substantially increasing the rate of vegetation treatment activities to rapidly achieve desired conditions. The leadership and employees of the ARP have committed themselves to successfully create sustainable conditions.

## Current Situations

Humans have long influenced the environment. However, since the mid-1800s the degree of change has been

accelerated due to the industrial revolution and rapidly expanding human populations. This has been especially true along the Front Range of Colorado including lands within and surrounding areas now designated as the ARP. Substantial resource extraction activities (mineral and timber removal and water diversions) occurred in the mid to late 1800s. Development has continued at varying levels since that time. Associated with development were efforts to suppress wildland fires, which were considered adverse to human needs. The combination of all development activities has caused changes in forest, shrub, and grassland vegetation which has led to other consequences. For example, large areas of the forests are now outside the Historic Range of Variability (HRV) altering the frequency of wildland fires resulting in increasingly large and severe wildland fires.

### ***Wildland Fire and Increasingly Hazardous Fuels Conditions***

Catastrophic wildland fires have been increasing in frequency and severity in the nation as a whole since the late 1980s. Since the year 2000 the ARP has experienced 3 of the largest wildland

fires recorded in its history. The increasing frequency and severity of wildland fires now threatens community and ecosystem sustainability.

Vegetation conditions are now conducive to large, stand replacing wildland fires. On the east-side of the ARP lower elevation areas of ponderosa pine and Douglas fire have missed several fire return intervals and tree densities have increased to a point that stand replacement wildland fires are occurring with increasing frequency.



*Bobcat wildland fire, Roosevelt National Forest- photo by: K. Close*

At higher elevations stand replacing fires are expected in lodgepole pine and spruce-fir stands. However, many areas of lodgepole on both the east and west

sides of the ARP are approaching an age where wildland fires can be expected to become more frequent and large due, in part, to the suppression of wildland fires over the past century. A rapid increase in the number of homes within the boundaries of the ARP has created the potential for any wildland fire to have catastrophic results in terms of loss of property, adverse effects on water quality and possibly loss of life, and even those wildland fires that do not, can cause substantial hardships and adverse economic effects due to evacuation of communities.

The ARP includes approximately 2.35 million acres of which 1.6 million acres are National Forest System (NFS) lands and 750,000 acres are non-federal lands. Due to this intermix of land ownership there are an estimated 30,000 homes situated within the ARP boundaries. Additional large areas have been developed for housing immediately outside of the forest boundaries. These zones of the Wildland Urban Intermix (WUI) place people and homes in numerous communities in areas with increasing wildland fire frequency and severity.



*Private land (white) intermingled with National Forest System lands (green)*

The ARP 1997 forest planning effort identified a need to treat approximately 117,000 acres of hazardous fuels to reduce risks to areas of high value. The selected alternative for the ARP Forest Plan indicated treatment of between 2,000 and 7,000 acres of hazardous fuels per year depending on funding levels. Since execution of the Record of Decision implementing the Forest Plan approximately 3200 acres have been treated per year.

In 2002, as part of the FRFTP (see Appendix A) the ARP undertook a rapid assessment to further refine the analysis of fuel treatment needs conducted for the Forest Plan (see Appendix B, Map 1). This effort identified over 657,000 acres

at high or very high risk of stand replacing wildland fire. From the areas at high or very high risk it was estimated that approximately 140,000 acres are high priority for treatment, based on values at risk (proximity to communities, vulnerability of watersheds, and wildfire effects on T&E species) and ecosystem restoration needs (condition class and fire regime). This is slightly higher than the 1997 Forest Plan estimate.

### ***Watersheds***

Virtually all watersheds of the ARP provide water for use throughout northeastern Colorado. Over a million residents and farmers depend upon the ARP for the majority of their water. These same watersheds are also at risk from severe wildland fires.



*Bobcat wildland fire, Roosevelt National Forest*

Recent wildland fires have clearly shown that there can be substantial adverse effects to water storage capabilities and quality following wildland fires. The drought of 2002 demonstrated the need for water storage capabilities. Any storage lost to sediment resulting from wildland fires simply makes drought situations worse. Replacement of lost storage capacity with new capacity would be very costly and controversial.

Erosion caused by severe wildland fires can also adversely affect long-term soil capability through loss of topsoil. This in turn can adversely affect forest health and dependent species.

***Insects and Disease***

Various insect pests (e.g. mountain pine beetle, Ips, etc.) and diseases (dwarf mistletoe, etc.) occur in localized areas throughout the ARP. Local infestations can cause undesirable effects to forested lands on the ARP and adjacent private lands. These localized outbreaks can create controversy and will be addressed as they occur. The focus of this strategy will be the west side of the ARP.

In the late 1990s a mountain pine beetle outbreak began on the west side of the ARP. The drought, especially in 2002, created good conditions for the beetles to reach epidemic proportions. Since 1999, the acreage affected by mountain pine beetles in this area has increased substantially (see Appendix B, Map 2). Tree mortality has occurred over large areas in the Williams Fork area and within the Arapaho National Recreation Area (ANRA). The areas to the south of the ANRA and east of the Williams Fork are at risk of being seriously affected by continued expansion of the beetles.



*Insect kill trees*

***Wildlife Habitat***

Low elevation ponderosa pine and Douglas fir old growth forests are extremely limited on the ARP. This is a result of removal of old growth forests over the past 150 years. The reduction in low elevation, old growth forest has adversely affected some wildlife species. The ARP Forest Plan indicates an increase in old growth forests is desired.

Old growth forests destroyed by the wildland fires will take 400 to 500 years to return. The treatment of low elevation, ponderosa pine forests to reduce tree density and fuels build-ups will facilitate increases in old growth forests by improving the sustainability of existing old growth forests and encouraging development of old growth conditions. A key to this is the return of short interval, low intensity fire to these forests. Increases in low elevation, old growth forests should produce increases in habitat for species adapted to these vegetation types.

Habitat for elk, mule deer, and bighorn sheep has been decreased with canopy increases in low elevation forests. Reducing tree density should improve forage habitat for these species.



*Old growth forest*

On the Pawnee National Grassland the mountain plover used to occur in relatively large numbers. However, in the 1990s numbers have been reduced. The mountain plover looks for areas with low grass and areas of bare ground to nest. These are conditions historically created by migrating bison. It is thought that the reduction of plover numbers on the Pawnee is the result of wetter than average summers in the mid to late 1990s, and associated higher amounts of residual grass. Prescribed fire is one tool that can be used to create areas of nesting habitat for mountain plovers.

These prescribed fires also serve to reduce hazardous fuel build-ups on the grassland reducing the potential for a

wildland fire to start on the Pawnee and burn uncontrolled onto surrounding private lands.



*Mountain plover- USFWS*

### **The Strategy**

Strategic treatment of vegetation can alter stand conditions and reduce the risks to ecosystems and communities by restoring sustainable vegetative conditions and thus reducing susceptibility to insects and disease and by reducing wildland fire frequency and severity. A primary goal of this strategy is the improvement of **public and firefighter safety**. Improving ecosystem sustainability will also

improve habitat conditions for wildlife, reduce risks to watersheds, and reduce the expansion of noxious weeds.



*Prescribed fire- Gross Reservoir*

The ARP Forest Plan provides goals for management of the Forests and Grassland. This strategy will accelerate achievement of several of these goals:

- Manage the ARP to assure productive, healthy ecosystems, blending social, physical, economic, and biological needs and values.
- Implement projects identified through integrated assessments at a landscape scale to enhance forest health and to create sustainable combinations of land use and resource management.

- In ponderosa pine and Douglas-fir forests, manage existing old growth and mature forests to retain and encourage old-growth qualities.
- Provide a range of successional stages of community types across the ARP landscapes that: maintains ecosystem integrity, maintains or improves habitats, protects adjacent property values, reduces wildland fire hazards, and minimizes suppression costs.

Implementation of the strategy will aid in achieving these goals thereby enhancing community sustainability and restoring fire-adapted ecosystems currently outside of expected HRV. The strategy is long-term and will allow us to move forward successfully over a ten-year period. It emphasizes treating areas with integrated values at risk (homes, watersheds, threatened or endangered species) to enhance community and ecosystem sustainability.

This strategy fully integrates the FRFTP (see Appendix A). The goal of the FRFTP is to enhance community sustainability and restore fire-adapted ecosystems. This partnership, developed with the Colorado State Forest Service,

Pike National Forest, Rocky Mountain Research Station (RMRS), and National Park Service, implements the 10-Year Comprehensive Strategy and Implementation Plan for Goal 2 (reduce hazardous fuels) and Goal 4 (community assistance). The FRFTP is the cornerstone of this strategy and success will be ensured only through cross boundary treatments developed through close coordination with partners.



*Bobcat wildland fire, Roosevelt National Forest*

A key to the success of this strategy will be integration of vegetation treatment objectives at the project level. This will be facilitated through the use of watershed level landscape assessments

to help identify potential project opportunities. Project analysis will identify integrated opportunities for achievement of vegetation management goals. For example, in 2003, approximately 85 percent of hazardous fuels reduction projects also improved wildlife habitats.



*Preble's meadow jumping mouse- USFWS*

Implementation of the strategy will: maintain watershed conditions, reduce the spread of insects or disease, and improve wildlife habitat, especially short supply habitats such as low elevation, old growth forests and shortgrass prairie. As previously discussed, continued implementation of the FRFTP is essential to the success of this strategy as it provides a critical mass of personnel, funding, and partners to allow achievement of overall vegetation management goals.

## Foundations for Success

Vegetation management has been successful in protecting watershed conditions, reducing wildland fire frequency and severity, and improving wildlife habitat. A recent study by the RMRS evaluated the Hayman wildland fire in the Upper South Platte watershed. This study concluded that fuel treatments are quite effective in reducing crown fires in short return interval systems. This reduces the potential for adverse effects to watersheds and communities. Other monitoring has shown that mountain plovers will utilize areas treated by prescribed fire.



*Fuels treatment, Stringtown, Roosevelt National Forest*

A process to streamline Endangered Species Act (ESA) consultations with the US Fish and Wildlife Service has been implemented in Colorado. This process emphasizes early coordination utilizing local level teams to facilitate the consultation process.

The ARP has developed vegetation management planning and implementation teams to facilitate expansion of fuels treatment under the National Fire Plan. These teams have successfully implemented several projects including: Winiger Ridge, Seven-mile, Sheep Creek 1, Dadd Bennett, Santa Fe and Columbine. Several other projects are currently being planned with decisions expected in 2003 and 2004. These include: Sheep Creek 2, Crystal Lakes, Sugarloaf, James Creek, Evergreen, ANRA, and Crimson. These projects have been accomplished at an accelerated rate and will provide this strategy with a strong foundation for success.

## Prioritization and Collaboration

Prioritization and collaboration is a key part of this strategy. This effort will be a continuation of the efforts already begun with the National Fire Plan and the 10-

Year Comprehensive Strategy Implementation Plan. However, to facilitate swift implementation of this strategy it will be important to enhance collaborative efforts. The District planning teams will provide the focus for this effort at the local level. This will involve increased contacts with local landowners, state, tribal, and local governments, and interested publics to identify priority areas where rapid treatments will be most beneficial. An example of this is the Larimer County Coordinating Committee. At a larger scale the FRFTP will provide an avenue for prioritization and collaboration across the Front Range of Colorado.



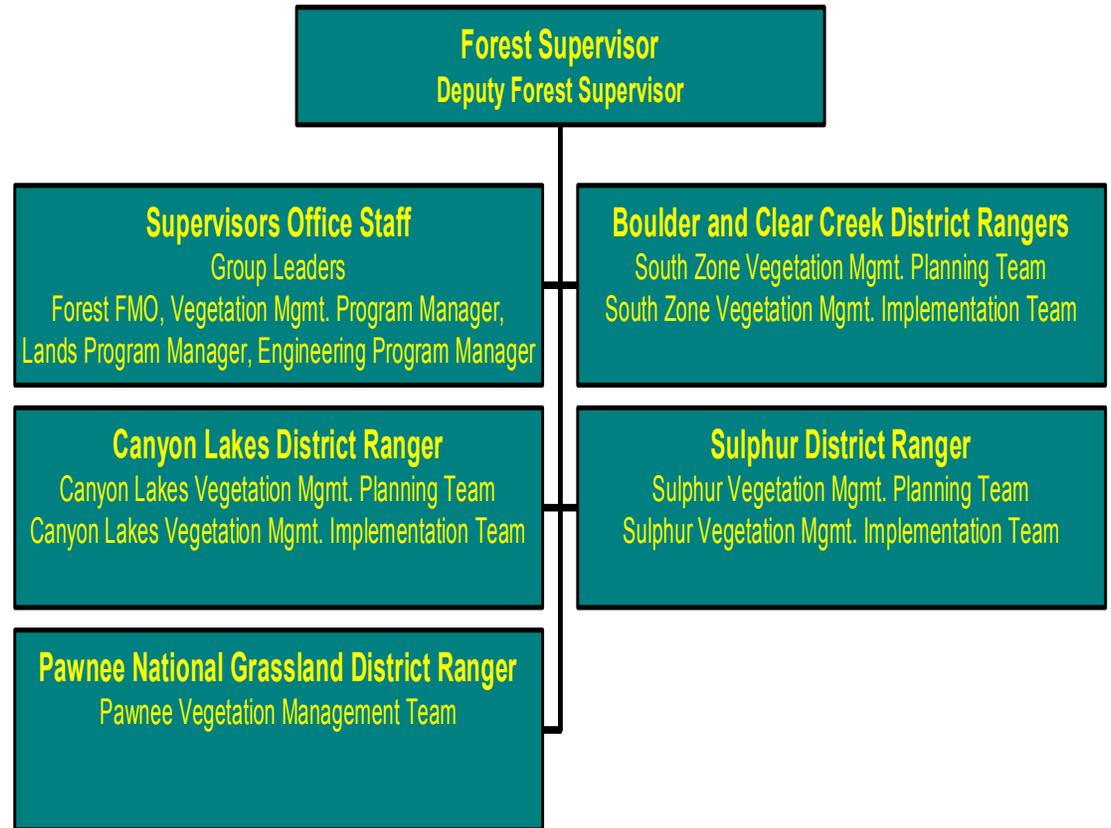
*Sugarloaf project public meeting, South Zone Planning Team*

Implementation of treatments across boundaries is important to fully achieve improvement in community and ecosystem sustainability. Community

assistance is an important part of this strategy. The collaboration process will be used to identify areas where community assistance grants would be of highest value in aiding the implementation of this strategy.

**Organizational Approaches**

This strategy builds upon established and proven organizational delivery systems at the ARP Supervisor’s Office and Ranger Districts. Dedicated planning and implementation teams have been staffed to ensure accelerated accomplishment of vegetation management projects. These core teams have and will continue to play key roles in collaboration, planning and project implementation along with state and local partners. It is vital to maintain core organizational capability in order to sustain treatment levels over the 10-year period. The expertise and knowledge of field conditions and local constituencies in the core teams will be leveraged through the use of contractors to accomplish inventory, planning, production and monitoring at higher levels of output as funding is available.



## **Proposed Activities and Funding Levels**

This strategy emphasizes vegetation management treatments to improve ecosystem and community sustainability.

The focus of the FRFTP is ponderosa pine/Douglas fir forest types where high hazard conditions (Condition Class 3 areas) combine with high value areas (housing developments, key watersheds, or threatened or endangered species habitats). These treatments have a good likelihood of improving sustainability of low elevation old growth forests. High hazard lodgepole and spruce-fir forest types (Condition Class 2), will also be treated when high value areas occur within these areas and treatment would have a positive effect in reducing risks.

Areas with ongoing insect or disease epidemics and susceptible adjacent areas will be the focus of insect or disease control efforts. At the current time the primary areas of treatments will be on the west side of the ARP.

Efforts to improve grassland ecological conditions and mountain plover habitat have been identified in the decision for management of the west-side allotments

on the Pawnee. Implementation activities will follow this decision. In addition planning is currently under way for the east-side allotments. This planning effort should be concluded in 2004.

Successful implementation of this strategy will require use of all available vegetation management tools. Thinning, prescribed fire, and timber harvest will be especially important. Various contracting approaches will be utilized as appropriate, including service, stewardship and timber sale contracts. Due to the large acreage in need of treatment and limited amounts of funding available the vast amounts of biomass generated by treatments will be utilized to offset costs whenever possible.

Implementation of this strategy will require increased funding beyond what is currently available. Cost per acre will be high due to the focus on treating acres in the WUI. Social and regulatory constraints limit additional acres that can be treated by prescribed fire. Therefore, most additional projects will need to be achieved through high cost mechanical treatments. To address funding needs the ARP will work with Regional and

Washington Office personnel and external partners to develop support for this strategy. A key will be external partner (state, tribal, and local governments, users groups, NGOs, etc.) support of the need for action.

However, the cost of implementation of this strategy is still small when compared to the value of the resources at risk. For example, wildland fire related costs have been increasing since the late 1980s with 2002 costs along the Front Range of Colorado reaching new heights with an estimated \$74 million expended.



*Helicopter ignition, Dadd Bennett prescribed fire, Roosevelt National Forest*

## 2004-2008 Action Plan

An Action Plan has been developed to implement this strategy (Appendix C).

The following is a summary of activities and estimated outputs and funding needs to implement this strategy.

### FY 2004

#### *Activities*

- Core fuels implementation and planning teams are fully staffed and functioning.
- Treatment implementation continues at an accelerated rate.
- Collaborative process focuses on project planning focus across all ownerships.
- Contracts are utilized for inventory, implementation and analysis processes.

#### *Outputs*

- Accelerate fuels treatments to 7900 acres in WUI and 3200 acres in non-WUI.
- Improve watershed conditions on 10,000 acres.
- Treat mountain pine beetles on 1300 acres.
- Improve wildlife habitat on 6900 acres.
- Conduct landscape analyses and complete NEPA for 90,000 acres.

#### *Funding needs*

- ARP: \$7,100,000; (**\$3,100,000** over P2 funding level)

### FY 2005

#### *Activities*

- Treatment implementation continues at an accelerated rate.
- Planning continues now focusing on projects 2-3 years from implementation.
- Collaborative process continues on project planning and monitoring.
- Contracts used for implementation, inventory and analysis processes.

#### *Outputs*

- Accelerate fuels treatments to 9300 acres in WUI and 3000 acres in non-WUI.
- Improve watershed conditions on 11,000 acres.
- Treat mountain pine beetles on 1000 acres.
- Improve wildlife habitat on 9800 acres.
- Conduct landscape analyses and complete NEPA for 90,000 acres.

#### *Funding needs*

- ARP: \$8,700,000; (**\$4,600,000** over FY 2005 P2 funding level)

### FY 2006- 2012

#### *Activities*

- Treatment implementation continues at an accelerated rate.
- Planning continues now focusing on projects 2-3 years from implementation.
- Collaborative process continues on project planning and monitoring.
- Contracts used for implementation, inventory and analysis processes.

#### *Outputs*

- Accelerate fuels treatments to 10,600 acres in WUI and 3000 acres in non-WUI (2006) to 14,000 acres in WUI and 3000 acres in non-WUI (2008 and beyond).
- Improve watershed conditions on 11,100 acres (2006) to 14,500 acres (2008 and beyond).
- Treat mountain pine beetles on 2000 acres (2006) (Note: current efforts to treat mountain pine beetle epidemic are anticipated to end in 2006.)
- Improve wildlife habitat on 11,500 acres (2006) to 14,500 acres (2008 and beyond).
- Conduct landscape analyses and complete NEPA for 90,000 acres.

#### *Funding needs*

- ARP: \$9,900,000 (2006) to \$12,600,000/ year (2008 and beyond); (**\$5,800,000** (2006); **\$8,500,000** (2008 and beyond) over FY 2005 P2 funding level)

## Challenges

Implementation of the Strategy will present complex challenges. There are a number of items that can limit the success of this strategy. Resolving these issues will require actions at various levels (Forest, Regional, Washington) of the Forest Service, as well as State and local governments and the private sector. The FRFTP steering group has been tasked by the Forest Supervisors of the ARP and PSICC and the Colorado State Forester to coordinate actions to address identified challenges. Several challenges and efforts to resolve them are discussed in the following:

- difficulty in removing fuels from forests due to lack of markets and cost of removal systems; *work is currently underway to provide community assistance grants to develop uses for products that need to be removed from the forests; also different treatment methods are being explored that may reduce costs of treatment;*
- uncertainty of a continuous supply of products; *work is currently ongoing to complete planning for several years of needed treatments; stewardship*

*contracts will be utilized where that is an appropriate tool;*

- *smoke management; work is continuing with the State of Colorado, EPA and researchers to improve predictive modeling and to facilitate understanding of how to best reduce long-term emissions from wildland fires;*
- *land ownership patterns and agency policy requiring extensive rights-of-ways and boundary line location; work is ongoing with Regional and Washington Office personnel to clarify needs to achieve fuels reduction goals and lands needs;*
- *interspersed ownership patterns, which will reduce treatment unit size and increase implementation costs; work is ongoing with the CSFS and other local partners to facilitate across boundary treatments and good neighbor agreements;*
- *providing short-term protection for ESA listed species while improving their long-term sustainability; work with Level 1 ESA streamlining teams is aiding completion of the consultation process.*

## Monitoring and Adaptive Management

Monitoring progress in implementing this strategy will be important to its success. Since the strategy implements the Forest Plan current monitoring strategies will be utilized. In addition, discussions and field trips with RMRS and Regional Office personnel and others will be utilized to consider the effectiveness of treatments and to provide technology transfer to field units. As new information becomes available that may enhance achievement of desired results this strategy will be modified.



*Bobcat Gulch wildland fire, Roosevelt National Forest*

## Summary

Past disruptions of natural fire cycles, as well as other management practices associated with development, have resulted in insect and disease outbreaks, loss of old growth and wildland fires of increasing frequency and severity. We appear to be in an era of large, very damaging and record setting wildland fires that threaten community and ecosystem sustainability. Vegetation treatment will help reduce the potential impacts on communities and restore health to fire-adapted ecosystems. This strategy provides a community-based approach to vegetation management through: involving communities using collaborative processes, investing in natural resources and nearby communities, using both scientific expertise and on the ground knowledge, and developing a system of monitoring and accountability as called for in the 10-year Comprehensive Strategy and Implementation Plan.