

Pike and San Isabel National Forests and Cimarron and Comanche National Grassland's Accelerated Watershed/Vegetation Restoration Plan



View of Insect Infestation Impacts and the Westside Fuels and Insect Mitigation Project, north of Salida, Colorado

Introduction

The following strategy emphasizes steps to reduce wildfire risks to communities and the environment and correct problems associated with long term disruptions of natural fire cycles which have increased the risk of severe wildland fires to fire prone and fire dependent ecosystems. The introduction of now pervasive invasive species has also increased the wildland fire threat. Communities have grown into the forests and range lands, increasing the risk to people, their homes and water supplies. This strategy provides a united framework for resource management for internal and external collaboration and integration to accomplish this. This plan focuses on:

- ?? Vision, Goals and Objectives
- ?? Current Forest and Grassland Conditions - The Problem
- ?? AWRP focus, priorities and risk assessment
- ?? Collaboration

- ?? Integrated resource management, the 5 and 10 year action plan summary with attached action plans
- ?? Challenges and Opportunities
- ?? Conclusion

THE OVERALL VISION: is to actively manage PSICC lands to:

- ?? Reestablish natural forest and grassland conditions to a healthy condition.
- ?? Reduce the risks, and hazards to all values from high-intensity wildfires.
- ?? Sustain and promote natural viable populations and habitat of native and desired non-native species consistent with healthy forest conditions.
- ?? Protect and restore watersheds.

Goals and Objectives

This strategy addresses the need to: manage hazardous fuel loadings; the increasing insect infestation problems; reduce wildland fire impacts; protect and restore high value watersheds; protect and restore wildlife habitats; and enhance ecosystem sustainability and sustainability of communities in high hazard priority areas within the PSICC. This will be done by promoting ecosystem health and conservation using a collaborative and integrated resource management approach. The goal of the strategy is to restore fire-adapted ecosystems through identification, prioritization and rapid implementation of hazardous fuel and other vegetative management treatment projects on the PSICC.

The PSICC Forest and Grasslands

The PSICC is composed of two National Forests (Pike and San Isabel N.F.s) a total of six ranger districts. The PSICC also includes two National Grasslands composed of two ranger districts. The districts on the Pike are: the South Platte R.D, west and south of Denver, the Pikes Peak R.D. west and northwest of Colorado Springs, the South Park R.D. just east of the Continental Divide and near several smaller communities with several continually growing urban interfaces. The San Isabel has three ranger districts: The San Carlos R.D. south and west of Canon City, Colorado. The Salida R.D. is adjacent to the community of Salida, Colorado and south of the community of Buena Vista, Colorado. The Leadville R.D. is adjacent to the community of Leadville, Colorado, and north of the community of Buena Vista. The Grasslands are composed of two ranger districts: The Cimarron R.D. which is located adjacent to Elkhart, Kansas and the Comanche R.D. which is adjacent to Springfield, Colorado and south southeast of La Junta, Colorado.

The PSICC manages a very wide variety of ecosystems, broken into 4 zones: Grasslands Zone – 534,000 acres; the Foothills Zone, which is a transition zone at 5,000 to 7,500 foot elevation with Gambel Oak, pinion and juniper and some emergence of ponderosa pine along with riparian areas with cottonwoods and willows; the Montane Zone is at higher elevations, 6,500 to 10,000 foot elevation, with ponderosa pine in drier sites, quaking aspen interspersed with ponderosa pine, Douglas fir and blue spruce on north facing slopes and drainages, and lodgepole pine in higher elevations. Deciduous species such as alder and willow species are scattered in riparian zones and extremely wet sites; the fourth zone is the Sub Alpine and Alpine Zones above 10,000 foot elevation, in steep mountainous slopes with little vegetation. This zone has grasses, forbs and lichens along with sub alpine fir, limber pine and some brush species.

Table 1: Total Vegetated Area on the PSICC, 2,600,542 acres

Douglas Fir	450,000 acres
Lodgepole Pine	33,000 acres
Ponderosa Pine	364,000 acres
Spruce/Fir	392,400 acres
Shrub	114,200 acres
Pinyon/Juniper	61,100 acres
Grasslands on the Pike and San Is.	222,200 acres
Grasslands	534,100 acres

THE PROBLEM

Mild winters, warm, dry summers and consecutive years of severe drought continue to place added pressure on the PSICC's already stressed forests and grasslands. The outbreak of *pinyon ips beetles* that took much of the state by surprise last year has expanded and begun to reveal its true impacts to southern Colorado. Many infestations of mountain pine beetles have reached epidemic proportions in some locations and are dramatically increasing throughout the ponderosa and lodgepole pine forests.

The summer of 2003 did not bring a repeat of the previous year's dramatic wildfires, but the challenge of addressing fire-related impacts remain. Large fire incidents burned approximately 150,000 acres on the PSICC in 2002, leaving many critical watersheds in need of both emergency and long-term rehabilitation. The relatively mild fire season of 2003, gave the PSICC some breathing room to strengthen public and resource protection treatments that were initiated in the wake of the 2002 fire season events.

This strategy describes the current hazardous fuels, insect infestation and the general forest health situation on the PSICC and presents a blueprint to address this condition over the next 5 to 10 years. The PSICC is well prepared to address these problems with skilled staffing, local economic capabilities adjacent to three major metropolitan areas and many smaller adjoining communities with various supportive local, county, state and federal partners. This project describes the Accelerated Watershed/Vegetation Restoration Plan (AWRP) for the PSICC, to restore watersheds and ecosystems to sustainable, healthy and functioning levels through a 5 and 10 year action plan and 10 year strategy.

The current fire risk and beetle infestations are tied together by a common factor of overly dense forests caused by 100 years of fire suppression and prolific ponderosa pine and mixed conifer tree growth. The stress caused by this overcrowding is exacerbated by cycles of drought. High wildfire hazard and risk areas overlap with bug infestation tracts in many locations.

Today's forest conditions are significantly different than historic, "natural" conditions (Romme et al, 2002). Major contributors to reducing the diversity of forest types, ages, conditions, and densities within the forests have been the virtual exclusion of fire, coupled with natural forest growth and reductions in forest management. Many of the region's forests including the Pike and San Isabel

National Forests are unnaturally dense and concentrated in older age classes. This lack of diversity, along with intense competition for water and light, has left many forest stands vulnerable to insect and disease attack, catastrophic wildfire and other types of damage. Annual trends of both acres burned and acres with insect infestations have increased sharply across the forests over the past decade. Perhaps more alarming than the simple number of acres affected is the stark departure from historic norms in the severity and spatial extent of individual wildfire and insect events. Today's wildfires and insect outbreaks simply do not contribute to biological diversity in the same ways they once did. The PSICC has been working with the regional office and the information generated by **historic range of variation assessments** to identify references for evaluating the magnitude and significance of the changes in ecosystems that have resulted from 20th century fire exclusion and other alterations in disturbance regimes and resource use. With these references then collaboratively we can identify the most urgent priorities for restoration and other treatments, but also develop a range of models for guidelines in developing management approaches for integrated resource management.

Hazardous Fuels, Insect Infestations, and Poor Forest Health

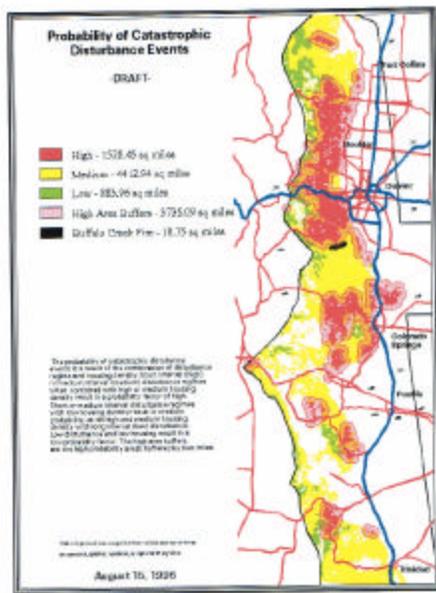
This strategy emphasizes the treatment of hazardous fuels to reduce risks to communities (**Wildland Urban Interface – WUI**, high, moderate or low rating is gauged by the level of population density and housing density per acre, WUI is defined as the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels) by reducing wildfire intensity through restoring fire to a more natural role in the surrounding landscape, thereby **increasing firefighter and aviator safety** and effectiveness by potentially reducing the intensity of wildfires. The most effective means of reducing large fire suppression costs, protecting community values, restoring forest and grassland health, and improving firefighter and aviator safety, is an aggressive vegetation treatment program. Over the long-term, an aggressive vegetation treatment program is the surest means of reversing wildfire costs, and restoring the resiliency and health, of forests and grasslands (Wildfire Suppression: Strategies for Containing Costs, NAPA Report, 09/02). Treatments are particularly important in fire-dependent ecosystems, where prolonged fire exclusion has resulted in over-accumulated fuels. The 10 Year Comprehensive Strategy, the National Fire Plan, the Healthy Forest Restoration Act, the Cohesive Strategy all have contributed to forging this PSICC AWRP design. Reducing risk to our firefighters, aviators, communities, municipal watersheds and restoring the health of our forests and rangelands are the central themes of these initiatives and of this strategy.

An estimated 900,000 acres of system lands within the 2.8 million acres of the PSICC are overcrowded with dense stands of ponderosa pine, mixed conifer trees and decadent growth from grass and shrub species. The PSICC specifically the Pike and San Isabel National Forests have a mushrooming mix of homes situated within forested areas. These areas of WUI are at substantial risks from wildfire. An estimated 750,000 people live within or adjacent to the intermix zone along the front range south and west of Denver, west of Colorado Springs and Pueblo and east of the Continental Divide to the New Mexico state line.

The risks to firefighters and aviators in suppressing intense wildfires, and communities and natural resources from wildfires can be reduced by the strategic treatment of hazardous fuels and other resource driven vegetation manipulation treatments. This strategy and accompanying action plans provides a framework to facilitate implementation of proactive and protective measures that are appropriate to reduce the risk of wildland fires to communities and the environment. This strategy will expand and promote the accelerated treatments of hazardous vegetation buildups and insect

infested areas on the PSICC reducing the risk from wildfires and infestation damages, and overall improve forest health. *This strategy builds upon the Front Range Fuels Treatment Strategy, and previous successes such as; the Upper South Platte Watershed Restoration Project, Westside and Cheeseman Reservoir projects.*

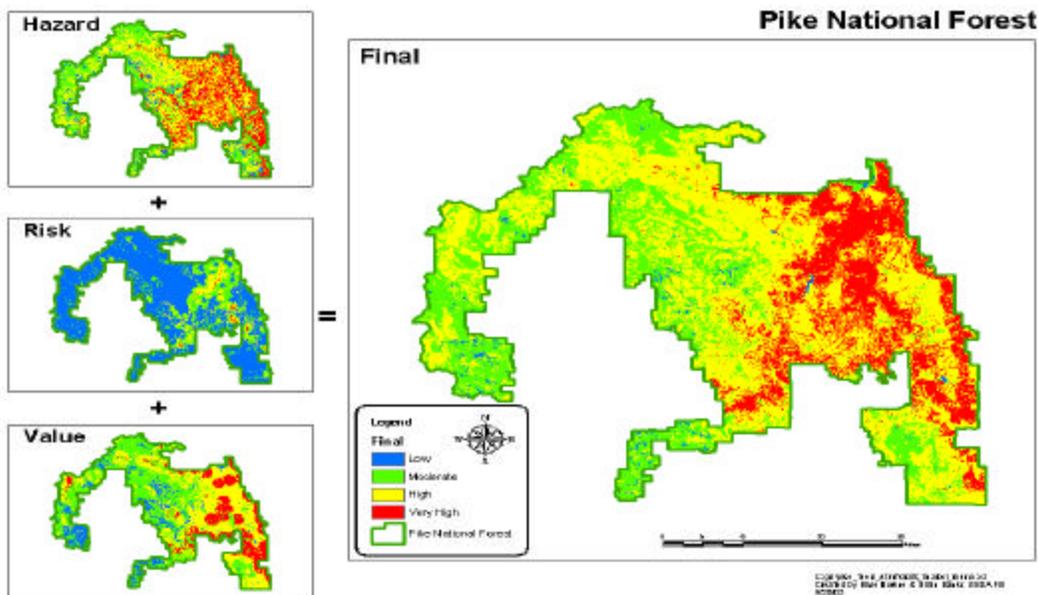
Figure 1: This Red Zone map demonstrates areas along the Front Range at High Risk



The rapidly expanding urban interface along the Colorado front range is at risk from wildfires. This picture shows one of many residential areas within the Front Range that were threatened by the Hayman Fire. Over 20,000 people living in the Front Range, adjacent to the Pike and San Isabel National Forests, were evacuated during the 2002 fire season, because of the threat from wildfires. These fires created substantial loss of residential property.

PSICC Hazardous Fuels and Vegetation Management Treatment Priorities

A “rapid assessment” was conducted for the Front Range Fuels Treatment Partnership on the Pike and Arapaho and Roosevelt National Forests in 2002, to determine high priority fuels treatment areas. This assessment was predicated on a combination of elements; “**hazards, risks and values**” and a **composite of these elements**. The strategy was based first on a large scale assessment of hazardous fuel conditions within the PSICC enabling the identification of broad areas where treatment needs are of the greatest concern. Maps were developed that delineate areas of low to very high hazards, risks and values. These maps provide an indication of both overall treatment needs and indication areas with the most immediate needs. The most immediate needs are demonstrated where the composite ratings for hazards, risks and values are all very high, bright red. A brief explanation of hazards, risks and values is as follows: **Hazards** - are a combination and weighting of three elements making up the vegetation hazard, including fire regimes 1, 2 and 3 and condition class mapping, crown closure, vegetation type, slope and aspects, and also references bug infestations; **Risks** - areas with high historical fire occurrence and areas with probability of fire occurrence; **Values at risk** - include housing density, WUI (how many homes per acre), watersheds (key watersheds for municipalities and high value ecological function) administrative sites, recreation sites, T & E species and habitat. The potential for damage is much greater in Condition class 2 and 3 in fire regimes 1, 2 and 3 in the timber, than the grasslands. This assessment validates a total of **500,000** acres of high priority areas on the PSICC.



A similar version of this “rapid assessment” and map is underway on the San Isabel N.F. and the Grasslands to demonstrate high priority high hazard areas.

This is only a piece of the puzzle of where to locate and invest in treatment projects, This assessment needs to be reevaluated as time goes on, and as hazards increase as housing density increases in the WUI, and as insect infestations continue to mushroom. Also our Colorado State Forest Service (CSFS) and BLM partners need to complete their assessments on private and federal lands adjoining national forest lands in the interface where hazardous fuels place communities and the forest at risk. CSFS has completed their assessment adjacent to the Pike National Forest on the east side of the

Front Range, but still agencies have work to do on private lands and BLM lands throughout the front range, and adjacent to the San Isabel National Forest.. This strategy emphasizes fuels reduction treatments in ponderosa pine/douglas fir forest types where high hazard conditions (condition classes 2 and 3 areas) combine with high value areas (housing developments, key watersheds or threatened or endangered species habitats). However, high hazard lodgepole and spruce/fir forest types will also be treated when urban interface occur within these areas and treatment would have a positive effect in reducing risks and improving ecosystem sustainability. We would like to reemphasize that, insect infestation, T & E habitat priorities, high priority vegetation/watershed management projects are all referenced and weighted in the model to prioritize treatment areas.

There are many areas of the PSICC that are classified as high risk and high hazards and others which may not be so obvious but are significant and in need of attention. These areas fall into the category of WUI grasslands. A head fire in mixed or tall grass prairie is one of the fastest moving types of fire. Grassland fires have extreme rates of spread but fortunately lower resistance to control. Still these grassland head fires create risks to the wildland urban intermix in the prairies.

Habitat at Risk/Forest Plan Revision,/Monitoring and Evaluation

The importance of wildlife habitat on the PSICC cannot be understated, and wildlife issues are among the most complex in PSICC management. Both wildlife biologists and foresters understand that a diversity of habitat at various spatial and temporal scales in a forest structure will result in more and different species of wildlife. With the revision of the PSICC Forest plan, this provides us a very opportune moment to develop strategic objectives that address forest wide bio-diversity, habitat and forest health desired future conditions with descriptions of desired age class and structural stages and distribution of forest conditions across the landscape, with a strategic path to its accomplishment. Just as Desired Conditions will be integral to establishing project and treatment objectives, it will also be an integral benchmark for forest plan monitoring and evaluation. Monitoring will determine 1) whether management actions are moving the landscape toward the desired future condition; 2) whether treatments need to be adjusted to achieve this condition or 3) reevaluating the desirability of the future conditions that have been identified as the goal. Desired Conditions are incrementally being establishment on the PSICC through the current planning process, beginning with the Grasslands and into the future progressing to the forests.

Throughout the PSICC prescribed fire is being used to implement portions of recovery plans for Mexican Spotted Owl and Pawnee Montane Skipper. Wildfire is one of the identified threats to spotted owls. Fuel reduction in owl habitat reduces this threat. Pawnee Montane Skipper habitat is slowly declining in suitability. Prescribed fire will begin the return of the habitat to a greater suitability for this species. Overall fuels reduction has greater benefit to game and non-game species. Fuels reduction reduces the risk of wildfires which causes greater mortality among species than prescribed fires. Fuels reduction benefits local animals by providing open understory conditions. On the grasslands several species of concern benefit from fuels reduction. The Mountain Plover, formerly being considered for federal listing, is drawn to short-grass areas that have been recently burned for nesting and feeding. Prairie dogs are a keystone species of the grasslands which have their largest populations in recently burned short grass prairie. There are many ongoing wildlife habitat improvement projects in the works and planned over the next 5 to 10 years: Mountain Plover Habitat and antelope habitat improvement projects on the Grasslands rx burns, Lesser Prairie Chicken Brood Habitat improvement burns and mechanical projects, Quail Habitat Improvement burns and riparian improvement projects, Tarryall Bighorn Sheep Habitat Improvement rx burns, Queen's Canyon Bighorn Sheep Habitat Improvement rx burns, burning for big game habitat improvement in the

mountains near Salida, Aspen regeneration projects on the South park R.D., Rx burns for turkey, elk, ecosystem improvements throughout the PSICC for wildlife habitat.

WUI and Key Watersheds

Our priorities are high hazard, risk and value areas at risk. Of the areas with the greatest population densities, with key watersheds, in fire regimes 1, 2 and 3, condition classes 2 and 3, these areas have rated out high in priority setting, in addition we need to weigh ecosystem health restoration benefits (where treatments will have collateral healthy forest benefits, improved wildlife habitat, product removal for local economy benefit, companion projects etc.) tipping the scales for one project or another.

There are so many high priority areas and communities at risk adjacent to or within the PSICC, how do we choose which areas to treat and what communities to work with. These communities need to demonstrate their buy in for fuels treatment, if the community isn't receptive to hazardous vegetation treatments, fuels planning and fire planning then our probability of success for the investment may not be as high in some areas as it would be in others. The PSICC will continue collaboration with local, county, state and other federal agencies to inform and educate communities and the public about the need for hazardous fuels and overall vegetation management programs in high priority areas, so communities can make the choice to embrace these opportunities or not. *(See Collaboration section in regards to Research Projects for the Front Range Fuels Treatment Partnership efficiencies and overall Fuels and Vegetation Project management).*

Types of treatment may be:

- ?? Commercial timber sales (Stewardship contracts, IDIQ, Service Contracts)
- ?? Thinning
- ?? Slash piling
- ?? Hydro-axe
- ?? Hot-saw
- ?? Roller chopping

Follow up treatments after first entry would be:

- ?? Pile burning
- ?? Broadcast burning
- ?? Maintenance projects with prescribed burns or mechanical in both timbered lands and on the Grasslands.

Key watersheds of concern are:

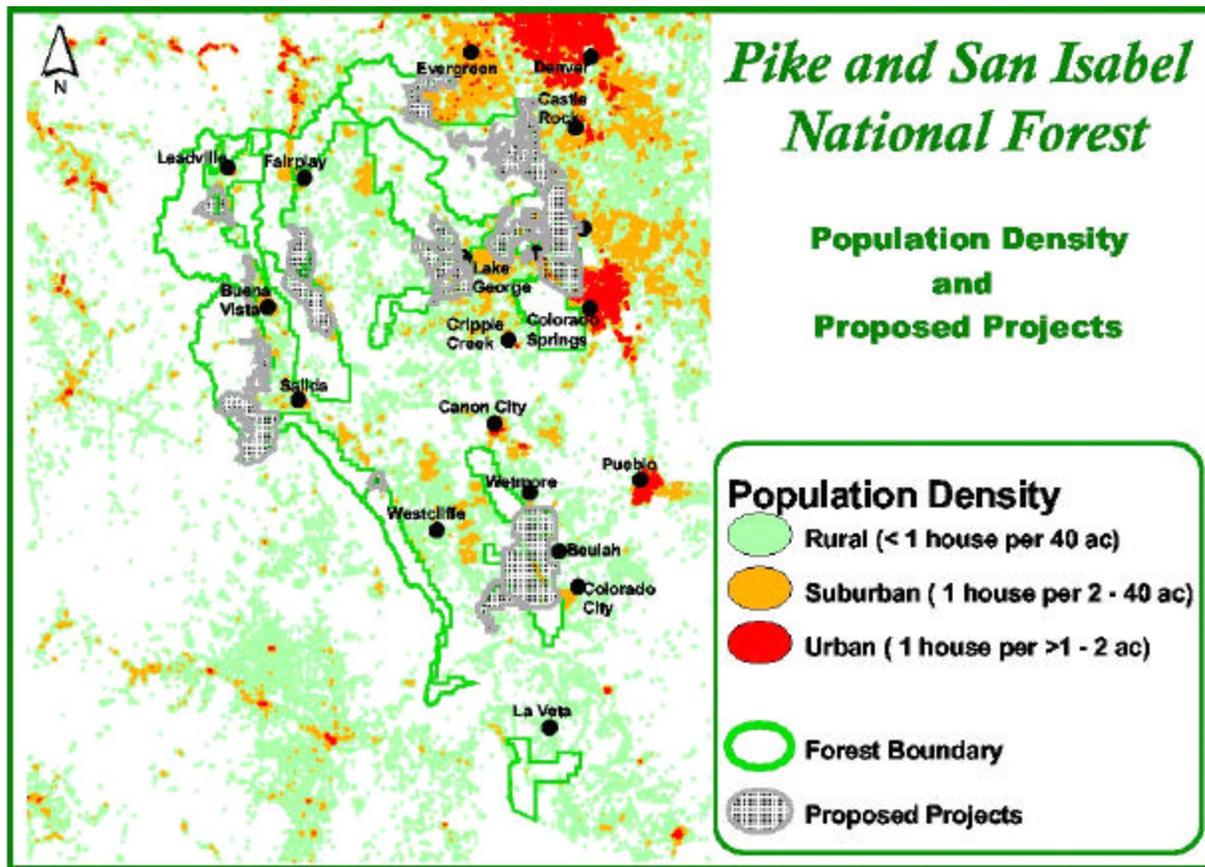
Wildfires pose a significant risk of adverse effects to the quality of municipal water supply or the maintenance of the system to the following key watersheds and feeder streams.

- ?? South Platte Watershed providing water to Denver and adjacent communities, and many mountain communities. Tributaries feeding into the South Platte provide municipal water to smaller communities in the mountains, Tarryall River, Trout Creek watersheds.
- ?? Arkansas River provides water to communities large and small along the main tributary including, Salida, Canon City, and Colorado Springs just to name a few. The

smaller tributaries feeding into the Arkansas River provide municipal water to many smaller communities, for instance Beulah, Wetmore, Westcliff, Florence.

AWRP Focus

The PSICC's focus will be areas with a high number rating from the rapid assessment model used on the PSICC. Generally speaking these areas are: along the I-285 corridor, northern and southern Rampart Range east and west aspects, South Platte Watershed Restoration, areas near small mountain communities adjacent to all districts on the PSICC, Arkansas River Watershed restoration projects, Westside project near Salida, Box Creek Project, O'haver Project, Wet Mountain projects on the San Isabel N.F., riparian restoration projects on the Grasslands, grassland ecosystem health projects, prescribed burns for wildlife habitat improvement, timber sales in most of these areas in the mountains, stewardship contracts, vegetation watershed improvement projects, wildlife habitat improvement projects throughout many of these areas as well as noxious weed mitigation projects across the mountain zones and the grasslands. (See attached map of priority project areas on the PSICC, **Figure 4**)



There is also a great need to improve overall **monitoring** for ongoing and future projects. There are continuing needs to evaluate and validate our success of past and ongoing projects or failures and make adjustments where needed to improve program efficiency and capitalize on our efforts whether successful or not, all project planning includes monitoring plans. Based on **adaptive management** our goal is to use a continuous process of action based on doing, learning, sharing and improving.

Non-WUI Condition Class 2 and 3/Noxious Weeds/Timber Programs

Although there are fewer urban values at risk in some areas of the PSICC there are potentials for significant loss of natural resources. Wildfires may cause damage to forage, range improvements, timber, streams and riparian areas and produce severely burned areas such as the damages from Hayman Fire. The Hayman Fire for example created major ash and sediment flows impacting water quality and storage capacity at Cheeseman Reservoir (which supplies a significant amount of water to Metropolitan Denver). The Buffalo Creek Fire in 1996, increased sedimentation into Strontia Springs Reservoir causing millions of dollars of treatment and maintenance costs for Denver Water Board. These large intense fast burning fires also create major smoke emission effects to large metropolitan areas, Denver, Colorado Springs, Pueblo and smaller mountain and grassland communities. Also the loss of forest vegetation could be lost for up to a century without tree replanting. Old growth trees killed by wildfire will take 400 to 500 years to re-grow. Intense burning wildfires may adversely affect federally threatened and endangered species. Wildfires also leave burned areas that may give footholds to invasive weeds and insect infestations. Restoration of many of the large fires on the Pike National Forest include a great emphasis on **noxious weed management**. The grasslands are emphasizing noxious weed management, cutting out tamarisk stands in riparian areas and treating the stumps to prevent future re-growth of species. This is a high priority undertaking for the forest program, and is a funded program of work not only to benefit the Cimarron and Purgatory River systems and Pickett Wire on the Comanche but also deal with noxious weeds across the PSICC. When planning prescribed burn projects, an interdisciplinary approach is used so that the Forest and District Range Management and Invasive Species Program Managers have an opportunity to be involved in the identification of issues pertinent to their programs. This includes identifying known noxious weed infestations and scheduling of the burns considering when the areas will have last been grazed and when grazing will occur following the burn.

Prior to a prescribed burn, the known noxious weed infestations are planned to be treated with herbicides or some other treatment. Following the prescribed burn, the areas around known noxious weed infestations are checked and infestations are treated/re-treated to prevent additional spread. This noxious weed identification and monitoring process is included in all planning and implementation of timber and vegetation management projects.

These Non-WUI project areas sometimes can be treated at a less cost because of the decreased complexity of not having to deal with a complicated urban interface. Prescribed burning costs less in non-wui areas because there isn't the need to have a larger organization to reduce the prescribed burn risk to values. Also smoke management can be very costly and some times constrains the use of prescribed fire in or near urban areas. Approximately 70% of the hazardous fuels reduction projects are tied to the urban interface and reducing risks and hazards to communities, the other 30% are implemented in Non-WUI areas.

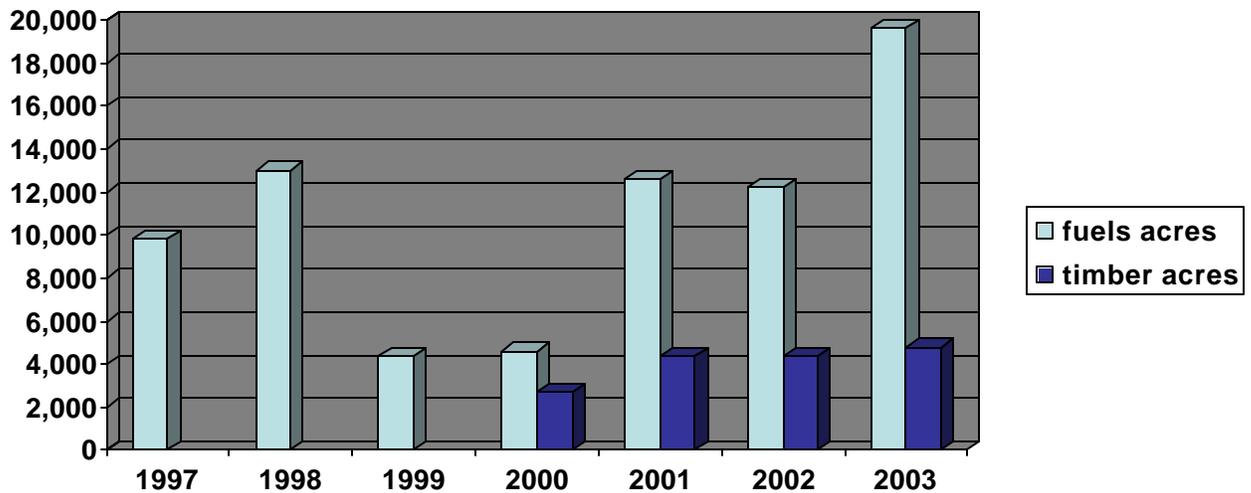
Fuel and timber treatment accomplishments have been successful in reducing wildfire intensity over the past years, for instance Trout Creek Timber Sale, Miller Gulch, Spring Creek, thinning and

prescribed burn areas, and Divide prescribed burn, Polhemus Burn all played a role in modifying fire behavior from the Hayman Fire.

In addition to achieving project objectives, removal of trees provides raw materials to forest products companies, wood products for consumers and jobs and economic diversity in local communities. Restoring forest health can support a commercially self sufficient timber program without subsidies, with provisions to fully maintain, or contribute toward the restoration of the structure and composition of structurally complex old growth stands according to the pre-fire suppression old growth conditions characteristic of the forest type, while considering the contribution of the stand to landscape fire adaptation and watershed health, and retaining the large trees contributing to old growth structure. . The symbolic relationship between national forests and the forest products industry rests on the critical need for certainty and predictability. Without some notion of the magnitude of likely offerings, it is improbable that investments will occur in wood processing facilities. The PSICC has been experiencing limited competition between contractors for timber sales, hazardous fuels contracts, etc., due to the uncertainty of the current and future size and dimension of the forest vegetation management programs. Over the years, timber product and fuels management programs, have been up then down, and industry needs to witness a sustained forest program generating forest products and commitment. (See the 5 and 10 year action plan summary in **Tables 3, 4, 5, and 6**).

Figure 2

Past Fuels and Timber Treatment Accomplishments across the PSICC



AWRP Collaboration With External Partners

Meeting the objectives of this strategy requires a coordinated effort across landscapes to restore and maintain the health of fire prone ecosystems. Because of the breadth of this challenge, this plan will be most successful if it involves collaborative input from local, tribal, state and federal governments as well as interested stakeholders to best inform private and public managers who are actively involved in decision making on their respective lands. A collaborative community based approach to wildland fire combines cost effective fire preparedness, suppression and vegetation management to

protect communities and environments with a proactive approach. This approach recognizes fire as part of the ecosystem: focuses on hazardous fuels reduction, integrated vegetation management and allocates and utilizes resources in a cost efficient manner over a long term basis. A roundtable forum is being developed by the Front Range Fuels Treatment Partnership (FRFTP) to involve interest groups/stakeholders to foster involvement, gain understanding and support the success of the FRFTP. The first meeting of this group will be April 16, 2004. This group will be composed of researchers, county officials, environmentalists, etc..

This strategy, has been developed by the PSICC by means of consultation with our local, state and federal partners through time. A key to the PSICC's current success is our noteworthy collaboration on all that we do in hazardous fuels management in concert with timber management and other vegetative management areas. The key to success of this strategy will be extensive public involvement, and local, county and state government collaboration in identifying and supporting specific treatment areas and types, such as the use of **Wyden Amendment** authorities and **Good Neighbor Policy** for fuels treatment work across boundaries. This strategy will continue to build upon current partnerships and create new partnerships between the PSICC and local, county, state and other federal agencies. The PSICC needs to continue to develop and implement collaborative processes for identifying and prioritizing fuel treatment projects for the PSICC and adjoining private lands. To facilitate swift implementation of this strategy it will be important to enhance collaborative efforts. This will involve increased contacts with all partners to continue to confirm and identify high priority areas where rapid treatment will be most beneficial. Each year the forest supervisor, forest staff, district rangers and district staffs meet with counties and many communities to identify forest health issues and disturbances to work towards a prioritization system for the managers of these lands to form and coordinate strategies to deal with the risks and hazards to natural resources and communities. The PSICC borders or lays within 23 different counties in Colorado. There is also continued intergovernmental collaboration with Fish and Wildlife Service for Section 7 consultations, tribal government collaboration for input into cultural resource concerns. There is a tremendous amount of partnering with the Arapaho and Roosevelt National Forests on the Front Range Fuels Partnership objectives and desired future conditions, shared assistance for prescribed burning and rely on each other for wildland fire management support, etc..

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 across boundary treatments, and the implementation of this strategy. Community assistance will primarily focus on two areas; providing assistance to aid in execution of fuels reduction and vegetation treatment projects that will compliment treatments on NFS lands, and providing assistance in developing and expanding markets for underutilized wood products and expand the utilization of wood removed during vegetation management activities.

With all of this said, there is a need for science to corroborate our vegetation management efforts and project planning for the future. We have nurtured a unique partnership with the Rocky Mountain Research Station. The Regional Forester has increased funding to the research station for research to facilitate accelerating fuels treatments in the Colorado Front Range. These projects will provide a foundation of science to all of our efforts working with partners and stakeholders. Following is a short list of research projects funded in 2003: Social Acceptability of Fuels Treatment; Mixed Conifer Fire History Research; Mechanical Fuel Treatments in the Front Range, effective spatial placement and location of treatments to breakup fire pathways; Fire Severity as Influenced by Insect Caused Tree Mortality.

Collaboration - Outside Partners

1. **Front Range Fuels Treatment Partnership** – CSFS, BLM, NPS, RMRS, 10 counties, two national forests, many communities of varying sizes and complexities, Denver Water Board, CDOW, Fish and Wildlife service, over 250 fire departments, and 10 emergency management offices, private landowners, Coalition for Upper South Platte, front range fuels treatment partnership roundtable forum participants. The Colorado FRFTP is a strategy to integratively accelerate fuels treatment across boundaries. The probability of success to accelerate accomplishments with a partnership is much higher than if individual agencies are working alone. The rapid assessment of high priority acres to be treated over the next 10 years demonstrates that the partnership has close to 500,000 acres to treat to reduce wildland fire risks to many listed communities.
2. **Upper South Platte Watershed Restoration Project** – Denver Water Board, CDOW, F & WS, communities in Upper South Platte Watershed, CSFS, private landowners. Coalition for Upper South Platte.
3. **San Isabel N.F.** - HPP, Elk Foundation, Upper Arkansas Coalition, private landowners, close relation with CDOW, CSFS, Mesa Antero homeowners, Chaffee County fire protection district, Chaffee County commissioners, BLM, state parks and recreation, GARNA, local industry development, Colorado Mountain College.
4. **Cimarron and Comanche National Grasslands** – HPP, Elk Foundation, CDOW, F & WS, Baca County, Morton County, Kansas State Forestry, Kansas State Wildlife, National Wild Turkey Federation, Quail Unlimited, CSFS, BIA, Hutchinson College, Las Animas County.

One purpose of this strategy is to compliment the 10 Year Comprehensive Strategy Implementation Plan and increase the rate of hazardous fuels and vegetation management to restore fire adapted ecosystems. This strategy focuses on Key Points 3 (fuels treatment) and 4 (community assistance) increasing our ability to reduce risks to; public and firefighter safety, population densities in the WUI, watersheds providing municipal water, ecosystem function and threatened and endangered species. One goal of the strategy is to identify, prioritize and rapidly implement **integrated vegetation management treatment projects** on the PSICC. This strategy covers a multiple year timeframe of 5 to 10 years, and will allow us to move forward successfully over this period. It provides a model of how to implement the collaborative frame work outlined in the Implementation Plan.

Insects and Disease

Forest Insect and Disease Status and Impacts on the Pike and San Isabel National Forests

General aerial detection surveys of damage and mortality in forest stands due to insects, disease, and other forest health stressors show that tree losses due to forest insects continues to increase across the Forests. The 2003 aerial survey results were not available during the development of this plan, therefore we relied on the results of the 2002 survey. A comparison of the 2002 survey to previous surveys serves as a good indication of the problems and trend. Most of the following information was provided by the Lakewood and Gunnison forest Health Management Service Centers.

From the surveys we can see the two most important pest problems on the Forests. These are mountain pine beetle and Ips spp. bark beetles. The results of the survey are displayed in **Table 2**.

Table 2

Pest	Acres Affected	Estimated Trees Affected
Mountain Pine Beetle	47,139	90,001
Ips spp.	2,714	3,680
Subalpine Fir Decline	1,535	2,819
Douglas-fir Beetle	575	261
Aspen Decline	285	n/a
Dwarf Mistletoe	1,215	n/a
Wind-throw	800	n/a
Aspen Defoliation	661	n/a
Pinon Decline	36	n/a
Spruce Budworm	35	n/a

Also displayed are three maps showing the major pest related tree losses during 2002. Mountain pine beetle continues to cause significant losses in ponderosa and lodgepole pines. Since the mid 1990's the number of pine trees killed by mountain pine beetles have approximately doubled each year.

Figure 3 is a graph of the increase in mountain pine beetle caused mortality in Colorado. The trend is the same for the Pike and San Isabel N.F.s. The *mountain pine beetle* epidemic in the Upper Arkansas Valley (Chaffee County) has reached epidemic proportions and has spread north and east over Kaufman Ridge onto the Pike National Forest in Park County and it has spread south and east into the O'haver Lake area. The West Side Project (Salida and Leadville R.D.s) is currently implementing prevention, control and salvage measures on the west side of the valley. The proposed Black Trout and Kaufman projects are designed to continue these treatments in the areas newly infested by the bark beetle to the north and east of West Side. The O'haver Project will address forest health needs to the south and east of West Side. *Figure 4* is a map of the amount of pine forest killed by mountain pine beetle in 1997 compared to 2002.

The second most important insect concern is *IPs spp. bark beetles*. The pine engraver beetle *Ips pini*, and to a lesser degree *Ips calligraphus* are rapidly increasing in combination with the drought conditions of the past few years. Pine engraver problems are often associated with severe drought; and this species can increase in logging slash and fire damaged trees and then move into and kill healthy pines. As we conduct more thinnings, tree mastICATIONS, and prescribed burns, the possibility of attracting and breeding more *Ips beetles* is a legitimate concern. But given the magnitude of the areas in need of management and the time it will take to accomplish the work, especially the time of the year, opportunities during the field season, and the beetle flight period would only extend the time needed for project competition. Some of the post thinning leave trees may be lost to ongoing *Ips* beetle activity but an aggressive thinning approach coupled with prescribed fire will result in a more resilient sustainable forest.

The occurrence of *Douglas-fir bark beetle* declined in 2002. However, with the large acreage of fire damaged Douglas fir after the Hayman Fire and other fires, entomologists expect that Douglas fir beetle will increase significantly over the next two to four years.

Figure 5. Insect damage on the Pike in 2002

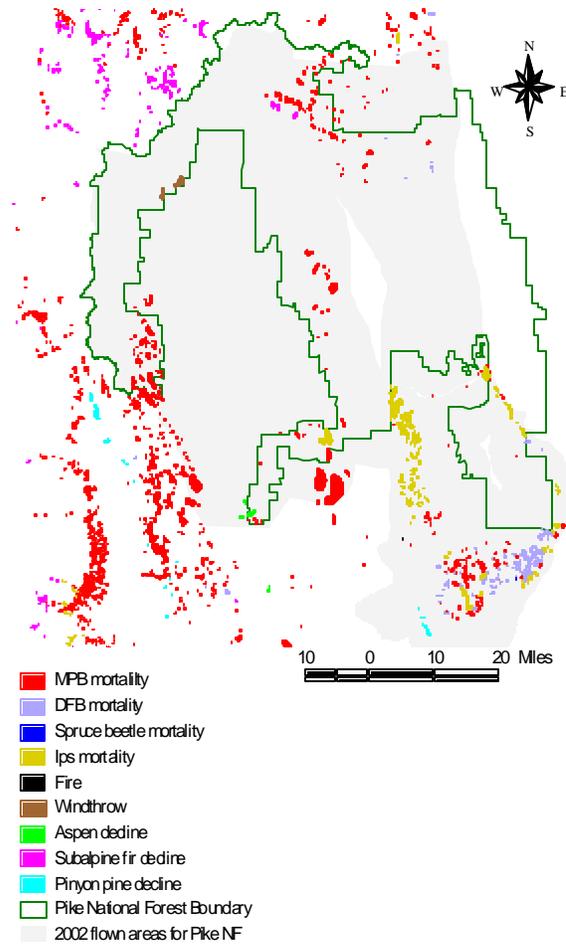


Figure 6. Pest-related tree losses on the northern San Isabel National Forest, 2002¹.

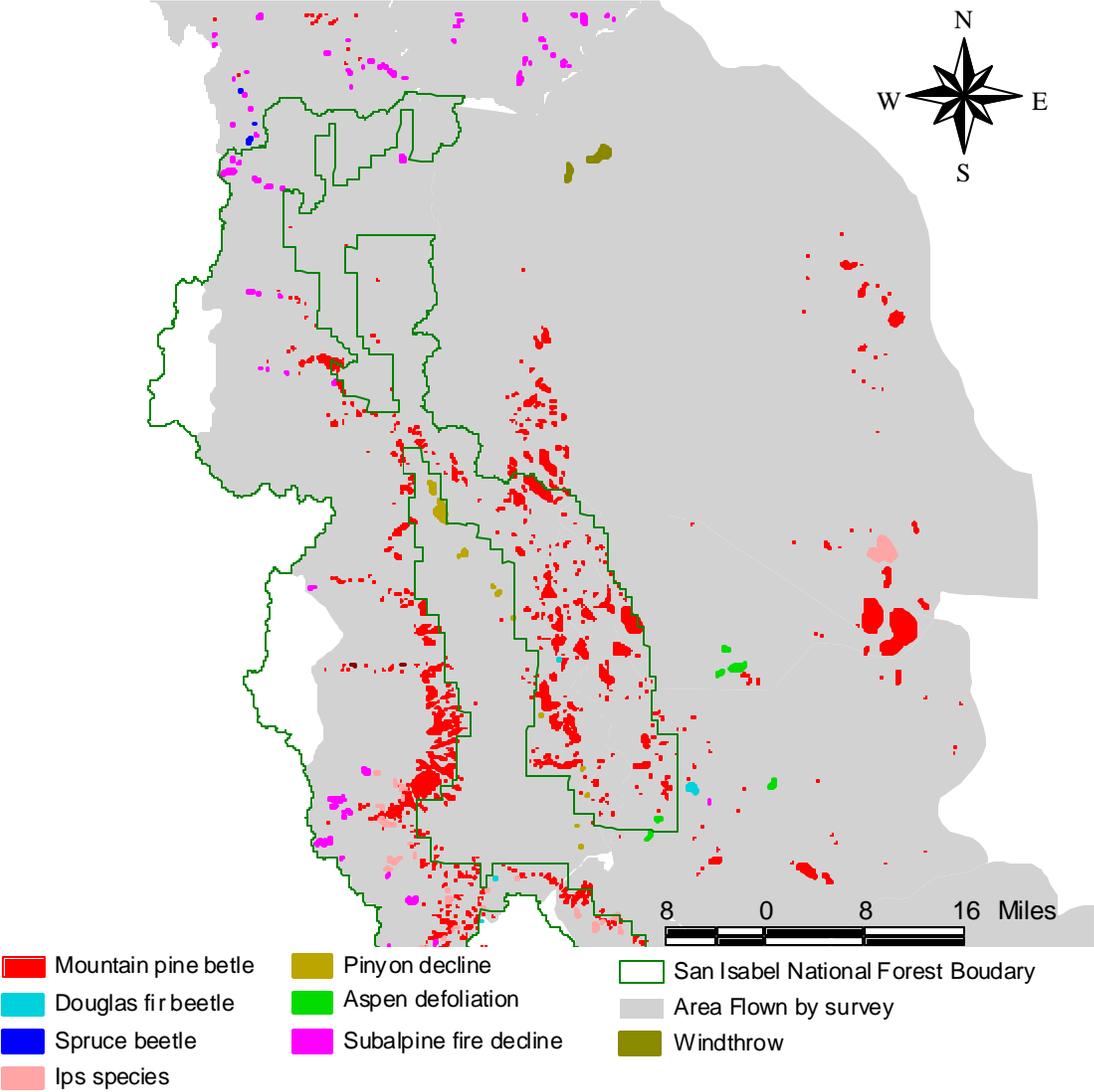


Figure 7. Pest-related tree losses on the southern San Isabel National Forest, 2002¹.

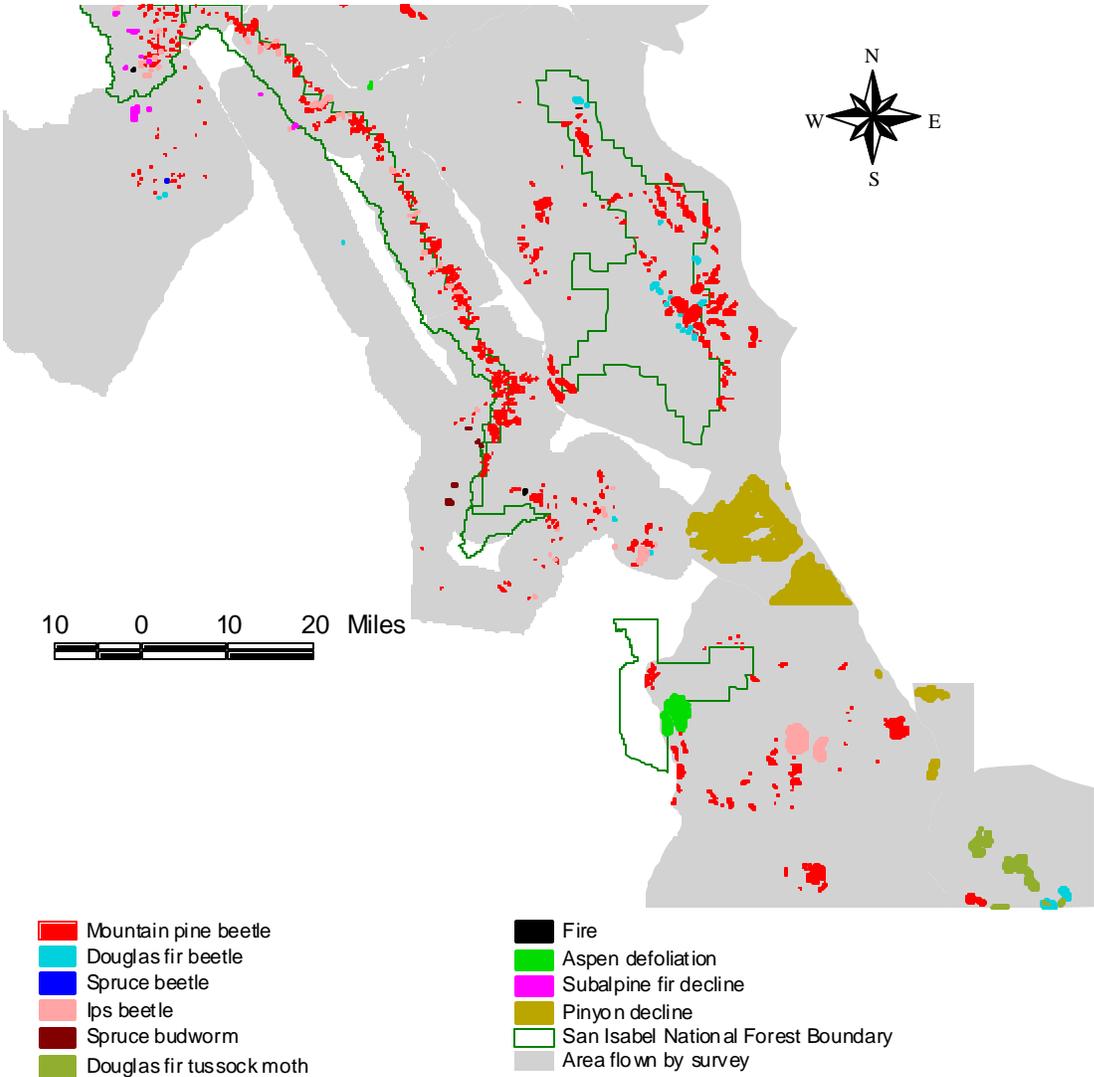


Figure 8.

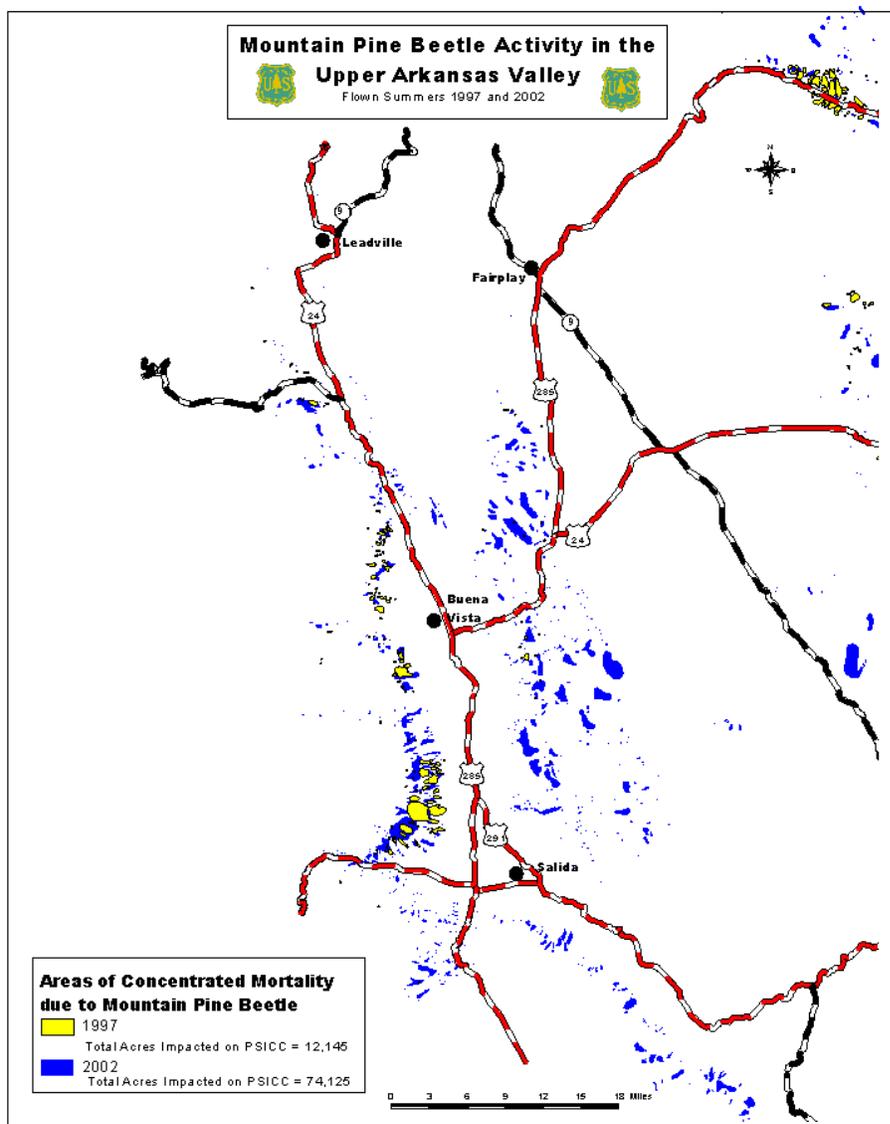


Table 3– Five Year Vegetation/Fuel Treatment Program Current (FY04-08)

FY	Fuel Treatment (WFHF)		Tree Thinning (NFVW and KV) (includes noxious weeds treatments)		Timber Harvest	Forest Health Program (SPFH)	Wildlife	Total Effective Treatment (80% of total)
	Acres	Funds (mil. \$)	Acres	Funds (mil. \$)				
04	22,000	6.7	500	.100	2,300	500	1,200	26,500
05	23,000	6.7	500	.100	2,900	500	1,500	28,400
06	23,000	6.7	500	.100	2,838	500	1,500	28,338
07	23,000	6.7	500	.100	2,800	500	1,700	28,500
08	23,000	6.7	500	.100	3,100	1,000	2,000	29,600
Total	114,000	33.5	2,500	.500	13,938	3,000	7,900	141,338

Table 4 – Five Year Vegetation/Fuel Treatment Program Increased (FY04-08)

FY	Fuel Treatment (WFHF)		Tree Thinning (NFVW and KV) (includes noxious weeds treatments))		Timber Harvest	Forest Health Program (SPFH)	Wildlife	Total Effective Treatment (80% of total)
	Acres	Funds (mil. \$)	Acres	Funds (mil. \$)				
04	23,000	6.7	1,500	.300	2,300	500	1,820	29,120
05	24,541	7.60	1,500	.200	2,900	1,000	3,205	33,146
06	36,545	11.32	1,500	.200	2,800	1,000	3,200	45,045
07	41,623	12.40	1,500	.200	5,316	1,000	2,150	51,589
08	38,187	11.90	1,700	.200	4,301	1,000	2,470	47,658
Total	163,896	53.55	6,200	1.78	17,617	4,500	12,845	206,558

Table 5 – 10 Year Vegetation/Fuel Treatment Program Current (FY04-13)

FY	Fuel Treatment (WFHF)		Tree Thinning (NFVW and KV) (includes noxious weed treatments)		Timber Harvest	Forest Health Program (SPFH)	Wildlife	Total Effective Treatment (80% of total)
	Acres	Funds (mil. \$)	Acres	Funds (mil. \$)				
04	23,000	6.7	500	.079	2,200	500	1,800	27,970
05	23,000	6.7	500	.0665	2,900	500	1,500	28,400
06	23,000	6.7	500	.066	2,838	500	1,500	28,070
07	23,000	6.7	500	.066	2,800	500	1,700	26,910
08	25,000	7.5	500	.066	3,100	500	2,000	29,600
09	25,000	7.5	600	.079	2,900	1,000	2,000	32,000
10	27,000	8.15	600	.079	3,000	1,000	2,000	34,100
11	27,000	8.15	600	.079	3,000	1,000	2,000	34,100
12	27,000	8.15	700	.093	3,100	1,000	2,100	34,600
13	30,000	9.70	700	.093	3,100	1,000	2,100	37,800
Total	252,000	75.96	5,800	.766	29,519	31,906	4,800	324,645

Table 6 – 10 Year Vegetation/Fuel Treatment Program Increased (FY04-13)

FY	Fuel Treatment (WFHF)		Tree Thinning (NFVW and KV) (including noxious weed treatments)		Timber Harvest	Forest Health Program (SPFH)	Wildlife	Total Effective Treatment (80% of total)
	Acres	Funds (mil. \$)	Acres	Funds (mil. \$)				
04	23,000	6.7	1,500	.300	2,300	500	1,820	29,120
05	24,541	7.60	1,500	.200	2,900	1,000	3,205	33,146
06	36,545	11.32	1,500	.200	2,800	1,000	3,200	45,045
07	41,623	12.40	1,500	.200	5,316	1,000	2,150	51,589
08	38,187	11.90	1,700	.200	4,301	1,000	2,470	47,658
09	37,278	11.18	1,500	.200	4,270	1,500	2,500	47,048
10	38,000	10.35	2,000	.300	4,270	1,500	2,500	48,270
11	38,000	11.40	2,000	.300	4,300	2,000	3,000	49,300
12	38,000	11.40	2,000	.300	4,300	2,000	3,000	49,300
13	38,000	11.40	2,000	.300	4,300	2,000	3,000	49,300
Total	353,174	109.28	17,200	2.50	39,057	13,500	26,845	449,776

Five Year Strategy and Ten Year Strategy Summary

In five years the **500,000 acres** of high priority to treat areas is projected to increase by about 75,000 additional acres for a new total of **575,000 acres**. This is due to tree growth and insect infestation and disease. In 10 years this increase would be 150,000 acres and priority acres would be at **650,000 acres**. **Table 4** and Table 6 both display aggressive programs to treat these growing forest health issues. **Table 4** demonstrates that with an increased program after 5 years of treatment the PSICC would have treated **36%** of the high hazard acreage, **206,558 acres** and return fire to the landscape. Table 6 demonstrates that with an accelerated program **70%** of the high hazard acres, close to **449,776 acres**, would be treated at least once. If we stayed at a static program, in 5 years we would have treated **25%** of the priority acres, **141,338 acres** and after 10 years **50%** of the priority acres **324,645 acres**. All of these calculations consider the yearly increase of the insect infestations and the increase in tree growth.

There are a number of items that will challenge the success of this strategy.

- ?? Sustained funding
- ?? Difficulty in removing fuels from forest and supporting new markets for biomass utilization. Developing and expanding markets for traditionally underutilized wood products, such as those removed during hazardous fuels management activities. Stewardship contracting will assist in better utilizing small diameter wood products and developing utilization facilities.
- ?? Efficiently utilizing contracting authorities
- ?? Contractor's uncertainty of a continuous supply of products due to environment processes.
- ?? Smoke management challenges
- ?? Increasing implementation costs per acre for mechanical treatment, high fuel loading build ups and interspersed ownership patterns which will increase implementation costs. As funding becomes available to sustain a static program or accelerate in treatments then of course a improved economy of scale will occur with contractors.
- ?? Once the PSICC reaches the threshold of 25,000 acres treated in fuels then an organizational workload assessment needs to be conducted to determine what organization is needed to accelerate treatment to 30,000 plus acres each year. Currently at 20,000 acres annual treatment project preparation crews and layout crews are working long hours and are of great demand to the point we have used enterprise teams to conduct some prep and layout on several projects. As we continue with IDIQ contracts, stewardship and service contracts we will also need additional COs and CORs to manage these contracts. Then of course as the San Isabel N.F. accelerates treatments into the future, fuels planners, and fuels crews may be needed to manage the workload, similar to the organization on the Pike N.F..
- ?? As we evolve into more stewardship contracts this will compromise our KV abilities and collections into the future. In lieu of this we would not have these funds for support of future treatments, but would have to rely on other BLIs to keep pace with fuels treatment increases.
- ?? One more challenge will be as we accelerate our programs, our partners may need to assess their organizations to keep pace with us, for instance: section 7 consultation with Fish and Wildlife Service may need to assess what organization they need to support our planning and consultation needs. CSFS, BLM, counties, etc., may need to be assessing

their organizations to be conducting landscape type of projects across boundaries to be most efficient.

The challenges presented above also present several opportunities to mitigate these challenges. But still there are challenges such as smoke management in the Front Range of Colorado and our dealings with Air Pollution Control Division for instance. Over the next year or two the Front Range National Forests personnel must demonstrate to APCD our abilities to efficiently and successfully manage emissions and smoke created by our operations and how we can appropriately minimize human impacts in these communities and metropolitan areas. With this performance then our credibility will also increase and with that an enhanced working relationship with APCD. This is one area though that we need the region's interaction to push for new smoke management prediction models such as eliminating SASEM and integrating new modeling programs such as Blue Sky that can better model and predict prescribed burn project emission effects to receptors. We also need the region and the Washington Office to demonstrate to APCD other effective tools available that are being used in many other regions to treat slash and dead and down materials, such as the air curtain destructor. Other challenges are of course the need for a sustained and increased hazardous fuels budget to accelerate fuels management programs and accomplishments over the next 5 to 10 years. With a sustained or increased budget then our contractors will have greater confidence in our forests operations and can provide a greater economy of scale service to the forests. This will reduce contract costs and increase efficiencies especially with biomass utilization opportunities and facilities.

Along with these challenges come opportunities and solutions.

Conclusion

Past disruptions of natural fire cycles, as well as other management practices, have resulted in wildfires, insect infestations and other disturbances of increasing intensity and severity. We appear to be in an era of large, very damaging and record setting wildfires that threaten community and ecosystem sustainability. Treatment of hazardous fuels and insect infestations will help reduce the impacts of wildfires on communities and restore health to fire adapted ecosystems. In order to expand our hazardous fuels and vegetation management programs to address risks and hazards as well as insect and disease damage on the National Forests and other lands and conduct efficient land stewardship projects, we need to apply all mechanisms to reduce this dangerous vegetation buildup. This strategy provides a community based approach to wildfire and hazardous 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. We will continue to pursue an accelerated vegetation management program. Programs that focus on restoration of fire prone and fire dependent ecosystems and better integration of vegetation management, forest health, wildlife, range, watershed, and other available dollars will be more aggressively explored.

